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THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum for first class mailing, also available as fourth-class mail at $250.00; foreign mailing $85.55 additional; single copies $6.60 each.

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CONSOLIDATED LISTING OF RECENT OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the OFFICIAL GAZETTE *from July 1, 1964, through December 31, 1976. These notices and rule changes are currently in effect unless otherwise noted.*

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INFORMATION AND CORRESPONDENCE

(1) OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Director of Administration.

Feb. 20, 1969.

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) GROUP NUMBER SHOULD APPEAR ON COMMUNICATIONS RELATING TO PENDING APPLICATIONS

It is again requested that the Group number be typed on amendments and other communications relating to pending applications in order to expedite the handling of mail and to conserve manpower. The number of the Group should be placed on the right-hand side, opposite the Serial Number or name of applicant. In view of the vast amount of mail, continued careful attention to these details will do much toward avoiding delay in handling of mail.

C. A. KALK,
Director of Administration.

Nov. 6, 1969.

[869 O.G. 345]

(3) IDENTIFICATION FOR APPLICATION CORRESPONDENCE

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on the Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL–85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Assistant Commissioner.

Mar. 5, 1971.

[885 O.G. 2]

(4) IDENTIFYING APPLICATION CORRESPONDENCE WITH ISSUE BATCH NUMBER

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Assistant Commissioner
for Administration.

Jan. 16, 1976.

[943 O.G. 519]

(5) HAND DELIVERY OF PAPERS

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

(6) Post Card Receipt Reminder

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

(7) Status Inquiries

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the OFFICIAL GAZETTE are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

(8) Change of Address

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
May 28, 1975.

[935 O.G. 1352]

(9) Change of Address or Practitioner in a Plurality of Patent Applications

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

(10) Access to Patent Application and Interference Files

In order to insure that access to patent application and interference files is given only to persons who are entitled thereto or who are specially authorized to have access under Rule 14 of the Rules of Practice in Patent Cases, and to insure also that the file record identifies any such specially authorized person who has been given access to a file, the following practice will be observed by all personnel of the Patent Office:

1. Access, as provided for in the Rules of Practice, will be given on *oral request* to any applicant, patentee, assignee, or attorney or agent of record in an application or patent only upon *proof of identity* or upon *recognition* based on personal acquaintance.
2. Where a power of attorney or authorization of agent was given to a registered firm prior to July 2, 1971, access will be given upon oral request as in paragraph 1 above to any registered member or employee of the firm who has signatory power for the firm.
3. Unregistered employees of attorneys or agents, public stenographers, and all other persons not within the provisions of paragraphs 1 and 2 above will be given access only upon presentation of a *written authorization for access* signed by a person specified in paragraph 1 above, which authorization will be entered as a part of the official file.

ROBERT GOTTSCHALK,
Nov. 24, 1971. *Acting Commissioner of Patents.*

[893 O.G. 810]

(11) Express Mail

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner
for Administration.
May 15, 1975.

[936 O.G. 1554]

(12) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Certificate of Mailing of Correspondence

On June 21, 1976, notice was published in the Federal Register (41 FR 24895) of a proposal to amend Title 37, Code of Federal Regulations by adding new §§ 1.8, 3.55 and 4.23. Interested persons were invited to comment on the proposal on or before August 20, 1976. Twenty-two comments were submitted. Nineteen were favorable to the proposal and two were neutral. One adverse comment was received. Consideration was given to these comments, as well as to 147 comments received in response to an earlier notice published in the OFFICIAL GAZETTE of the Patent and Trademark Office on January 20, 1976 (942 O.G. 1073). Of these 147 comments, 131 were in favor of a certificate of mailing procedure, 11 were opposed and 5 were neutral. Both sets of comments, and a summary and analysis of each set, are available for public inspection in Room 11E10 of Crystal Plaza Building 3 at 2021 Jefferson Davis Highway in Arlington, Virginia.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. Except in those cases spelled out in new § 1.8, papers and fees will be considered as being timely filed if they are deposited with the U.S. Postal Service on or before the expiration of the period set for response. However, the date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The exceptions spelled out in new § 1.8 are intended to exclude from the new procedure those cases where filing in the Office, or with the Commissioner, is a requirement of statute. In view of five comments questioning the authority of the Commissioner to adopt the new procedure, two further exceptions have been included in § 1.8. In all other cases, the new procedure would not be inconsistent with statute, and therefore would be within the authority of the Commissioner to adopt. The suggestion, advanced in eight comments, that there should be no exceptions, was not adopted.

One comment suggested that attestation be made on a personal knowledge basis and this suggestion has been adopted. In response to another comment, the text of § 1.8 has been amended to indicate more clearly who may sign the certificate. Finally, several comments expressed concern about the possibility of fraud. However, the use of a post card receipt (see Notice dated November 21, 1968) would seem to minimize this possibility.

The addition of a new § 1.8(a) establishes a Certificate of Mailing procedure. New § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Form § 3.55 is designed for use in patent cases and form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are hereby amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of patent applications;

(ii) The filing of trademark applications;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act, 15 U.S.C. 1059;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act, 15 U.S.C. 1064(a), 1064(b);

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or Section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Customs and Patent Appeals;

(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under Section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2); and

(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

(b) In the event that correspondence or fees are timely filed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under § 1.68 or § 2.20 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing.

PART 3—FORMS FOR PATENT CASES

2. By adding a new § 3.55 as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ____________________.

Date

____

Name of applicant, assignee, or
Registered Representative

____

Signature

____

Date

PART 4—FORMS FOR TRADEMARK CASES

3. By adding a new § 4.23 as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ____________________.

Date

____

Name of applicant, assignee, or
applicant's attorney

____

Signature

____

Date

Effective date: These amendments shall become effective on November 1, 1976.

Dated: September 28, 1976.

C. MARSHALL DANN,
*Commissioner of
Patents and Trademarks.*

Approved: September 17, 1976.

BETSY ANCKER-JOHNSON,
*Assistant Secretary for
Science and Technology.*

[FR Doc. 76-28915; Filed 10-1-76; 8:45 am]

[951 O.G. 1342]

(13) CERTIFICATE OF MAILING PROCEDURES

The Patent and Trademark Office has promulgated new Rules 1.8 and forms 3.55 and 4.23 which establish a new Certificate of Mailing Procedure, effective November 1, 1976.

In order to assist the Patent and Trademark Office in the effective handling of these certificates, the following guidelines are suggested.

Location of Certificate

The preferred location for the Certificate of Mailing is at the end of any correspondence mailed to the Office. In those situations where the certificate accompanies a fee or other form such as the issue fee transmittal form PTO-85, which does not have space for a certificate, the certificate should appear on a separate cover letter which refers to the accompanying paper. When a separate cover letter is used, a clear identification of the type of correspondence should be included.

Although not specifically required by the rule, it is preferred that the certificate be signed by the applicant, assignee, or attorney. The certificate should be signed separately from the correspondence itself. Suggested wording of the certificate is set forth in form 3.55 for patent cases and form 4.23 for trademark cases.

A separate certificate should be made for papers filed in each individual application, if papers for several different applications are mailed in a single envelope.

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period.

WILLIAM FELDMAN,
Oct. 26, 1976. *Deputy Assistant Commissioner for Patents.*

[952 O.G. 918]

(14) AVAILABILITY OF U.S. PATENT CLASSIFICATION SUBCLASS LISTING MICROFILM

The Patent and Trademark Office announces the availability of the 7th edition of the microfilm publication "U.S. Patent Classification—Subclass Listing" (Patent and Trademark Office Publication PAT-002.1-7604-M), which is offered for sale through the National Technical Information Service (NTIS).

This publication presents in sequence by the classes, subclasses and digests of the official U.S. Classification, the patent numbers of the U.S. patents which are classified as "originals," "cross references," and "unofficial cross references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. Symbols appear in conjunction with patent numbers to denote those patents which are cross-reference classified in a subclass.

All U.S. patents issued through March 1976 (including through patent number 3,947,895, reissue patent 28,754, design patent 239,419, and plant patent 3,855) and all reclassification through order number 519 are included in this publication. It supersedes the publication dated June 1974.

The entire publication consists of 10 reels of 16 mm negative microfilm which is priced as listed below. A choice of 3M or Recordak cartridges or "Thread Easy" magazines is offered, as well as plain reels.

Reel Number	Accession Number*	Classes
1-10	PB 255 750	All.
1	PB 255 751	D1-D99, 2-29.
2	PB 255 752	30-68.
3	PB 255 753	69-105.
4	PB 255 754	106-148.
5	PB 255 755	149-198.
6	PB 255 756	199-235.
7	PB 255 757	236-260 (through subclass 326s).
8	PB 255 758	260 (remainder)-296.
9	PB 255 759	297-339.
10	PB 255 760	340-528.

*Purchaser should add the appropriate single letter code to the accession number to represent the manner in which the film is to be supplied:

P = Plain reel in box.
M = Reel in 3M cartridge.
R = Reel in Recordak cartridge.
T = Reel in "Thread Easy" magazine.

The reels are priced as follows:

		Domestic	Foreign
Full set (PB 255 750)	Plain reels	$42	$57
	Cartridges	$62	$77
Individual reels	Plain reels	$6	$7.50
	Cartridges	$8	$9.50

Address orders to:

National Technical Information Service
U.S. Department of Commerce
Springfield, Va. 22161

Enclose payment in check or money order or authorization to charge the amount of the order to the purchaser's NTIS deposit account or American Express Card, giving the account number.

ALFRED C. MARMOR,
Aug. 24, 1976 *Administrator for Documentation.*

[951 O.G. 3]

(15) SUBSTITUTE POWERS OF ATTORNEY

The Patent and Trademark Office has recently received correspondence in certain applications under the title "Substitute Power of Attorney" wherein the principal attorney of record attempted to name other attorneys as his substitute in those applications.

Since the power of the principal attorney may be revoked, or terminated as by his death, revocation or termination of said power of the principal attorney will also terminate the power of those appointed by him. Thus, a principal attorney may appoint an associate attorney whose power terminates with that of the principal, but he may not appoint a "substitute" and any attempt by the principal to appoint a "substitute" attorney whose power survives his own shall not be recognized by the Office.

WILLIAM FELDMAN,
Dec. 17, 1975. *Deputy Assistant Commissioner for Patents.*

[942 O.G. 1074]

(16) CHANGE IN LEGAL HOLIDAYS

Those doing business before the Patent Office are hereby reminded that by Public Law 90—363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
New Year's Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, the fourth Monday in October.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, JR.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

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(17) RELOCATION OF CUSTOMER RELATIONS CENTER

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557-2003.

WILLIAM I. MERKIN,
January 1976. *Acting Assistant Commissioner for Administration.*

[943 O.G. 519]

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(18) AVAILABILITY OF PATENT APPLICATION DRAWINGS FOR REPRODUCTION

Clients of private commercial reproduction services requesting patent application drawings to make drawing reproductions for U.S. and foreign filings have caused printing problems and delays in allowed applications in which the Base Issue Fee has been paid.

In order to prevent any delay in the printing and issuance of applications in which the Base Issue Fee has been paid, access to the drawings of patent applications which have been scheduled for printing will not be normally available. Delays in obtaining patent application drawings by commercial reproduction services, after the application has been scheduled for printing, can be avoided if requests for reproductions are made either before or promptly after receipt of the Notice of Allowance and prior to the payment of the Base Issue Fee.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
May 6, 1975.

[934 O.G. 1324]

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(19) PUBLIC SEARCH ROOM FOR PATENTS

Establishment of New Procedures and Revisions of Regulations

One of the major obligations of the Patent and Trademark Office is to make patent information available for public inspection. The quality of this service depends upon promoting an environment conducive to research and maintaining the integrity of the files in the Public Search Room for Patents.

To emphasize our commitment to providing this environment with complete and orderly files for public use, the Patent and Trademark Office is establishing new procedures and revising the Regulations for using the facilities of the Public Search Room for Patents. The new procedures and revised Regulations will become effective August 23, 1976. The new procedures for the Search Room include the requirement that users obtain and show, prior to entering the Search Room facilities, a User Pass. This pass can be obtained at a special desk near the guard station. User Passes will be issued to persons not under prohibition from using the search facilities who agree to abide by the Regulations of the Public Search Room for Patents by signing a statement to that effect. User Passes are non-transferable and are valid until reissue or revocation for cause.

The new procedures also include the requirement that persons entering and exiting the Search Room use designated lanes. Persons exiting the Search Room will automatically pass electronic sensing equipment designed to detect any marked documents or materials being removed from the Search Room. The sensing equipment is capable of detecting marked documents and materials in briefcases and parcels and under clothing. The equipment does not use X-ray or other high energy radiation and is, therefore, completely safe and harmless to persons, photographic film, magnetic tape and electronic or mechanical devices such as wristwatches. The Patent and Trademark Office is now preparing older documents in the Classified and Application files for use under this system. All new patents are marked for sensing before being placed in the Classified files.

Whenever a marked document is transported past the sensing equipment, Patent and Trademark Office officials and the security guards will be alerted to the removal of the document, and a gate on the exit lane will lock. Persons triggering the alarm will be asked to cooperate in identifying the source for the alarm. Failure to cooperate when the alarm is triggered could result in detention of the person, seizure of any briefcase or the like, or other legal measures deemed necessary and appropriate in the specific case.

In order to assure that the changes in the Search Room fully apply to the Record Room, the entrance to the Record Room will be relocated within the Search Room. This change is currently under way.

The revised Regulations for the Search Room appear below, and a reprinting of the Regulations brochure incorporating the revisions will soon be available in the Search Room. The substance of the changes in the procedures and the revised Regulations for the Search Room, as well as any pertinent information that will assist users in the changeover, will be prominently posted in the Search Room. In order to maintain an environment conducive to research, the revised Regulations will be strictly enforced.

Although these new procedures and revised Regulations may cause some inconvenience, it is hoped that with your understanding and cooperation they will result in improvement in search facilities which will benefit all participants in our patent system.

REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS OF THE PATENT AND TRADEMARK OFFICE

The Public Search Room for Patents is defined as that area comprising the foyers off the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices, Microfilm Center, restrooms and telephone areas off these foyers; the stacks, Record Room, study and copier areas between the foyers; and the Mezzanine.

Under applicable statutes and regulations, including 49 U.S.C. 486(c); 41 CFR Subpart 101-20.3 and appropriate Sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Public Search Room for Patents.

1. All persons using these facilities are subject to the regulations governing conduct on Federal Property, as specified in 41 CFR Subpart 101-20.3.
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. Food and beverages in any form are not to be consumed except in designated areas.
5. Loud talking, use of radios, or any other form of activity which may disturb other members of the public is forbidden.
6. Children brought into the Public Search Room for Patents must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patents and records shall not be removed from the facilities without proper authorization; nor shall they be mutilated. The unlawful removal or mutilation of records is forbidden by law and is punishable by fine or imprisonment or both (18 U.S.C. 2071).

10. The presence or use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission. The use of dictating equipment is prohibited, except in designated areas.
11. Library trucks or carts are to be used for transporting bundles only. They are not to be used for storage while making searches.
12. Patents temporarily removed from bundles for copying must be replaced promptly.
13. All bundles of patents must be promptly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Search Room after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling, shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be shown upon request to authorized Patent and Trademark Office personnel.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark Office personnel upon request.
19. Packages, briefcases or other personal effects are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents, and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

C. MARSHALL DANN,
July 9, 1976. *Commissioner of Patents and Trademarks.*

[949 O.G. 2]

RECORDS AND FILES

(20) ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts only of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Dec. 15, 1965. *Commissioner.*

[822 O.G. 769]

(21) NOTIFICATION RE: CONFLICT IN ASSIGNMENT IN CERTAIN APPLICATIONS

Effective September 12, 1966, Assignment Branch will discontinue mailing notification in cases where there is a conflict in assignment between an original application and its divisional, continuation, substitute, or continuation-in-part application.

Assignments from original applications are applied without charge ONLY to divisional, continuation, or substitute applications where the date of the assignment is prior to the filing date of the later-filed application. (Continuation-in-part applications require separate assignments if they are to be issued to the assignee.)

Practitioners are reminded of the provisions of Rule 334. Unless an assignment is filed at or prior to the date of payment of the issue fee, the patent will normally be issued in the name of the inventor.

Section 306 of the Manual of Patent Examining Procedures will be amended appropriately.

W. R. ARMSTRONG,
Director, Office of Patent Services.

Concurred:
(signed) R. A. WAHL,
Assistant Commissioner.

[830 O.G. 442 (Sept. 12, 1966)]

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(22) RECORDING OF INSTRUMENTS

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. 1111]

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(23) REMINDER

Furnishing Assignment Data at Time of Payment of Base Issue Fee

Practitioners are once again reminded of Rule 334, revised November 1969, which requires that . . . "At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent Office. In the event an assignment has been filed, such statement must include the name of the assignee and indicate whether or not an acknowledgment of a recorded assignment has been received from the Patent Office."

The Issue Fee Transmittal Form POL 85*b*, revised December 1969 and May 1973, provides space (Item 2) for Assignment Data which should be completed to comply with the Rule. Unless an assignee's name and address are identified in Item 2 of the Issue Fee Transmittal Form POL 85*b*, the patent will issue to the applicant. *Assignment Data printed on the patent will be based solely on information so supplied.*

A request for correction of error arising from incomplete or erroneous information furnished in Item 2 of POL 85*b* will not be granted as a matter of course and will be subject to adherence to all the requirements of Rule 323.

The recording of instruments in the Assignment Division is not affected by this Notice.

WILLIAM I. MERKIN,
Dec. 19, 1974. *Assistant Commissioner for Administration.*

[930 O.G. 984]

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(24) CERTIFIED COPIES OF APPLICATION AS ORIGINALLY FILED

The Patent Office has discontinued placing the assignments of record on the file wrapper of patent applications, except when a title report is requested or upon allowance of the case. Accordingly, the copies of applications prepared in response to requests for a certified copy of a patent application as filed, will no longer include an indication of assignments. Applicants desiring an indication of assignments of record should request separately certified copies of assignment documents.

ROBERT J. RISH,
Acting Assistant Commissioner
for Administration.

[887 O.G. 1042 (6-22-71)]

(25) ASSIGNEE NAMES

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL–85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL–85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[942 O.G. 186]

FEES AND PAYMENT OF MONEY

(26) FEES IN CONNECTION WITH AMENDMENTS TO PATENT APPLICATIONS

This notice supplements the Notice of September 10, 1965, 818 O.G. 1207, September 28, 1965, relating to the administration of the act of July 24, 1965, Public Law 89–83, increasing certain fees payable to the United States Patent Office.

That act provides for the payment of additional fees on presentation of certain claims during the prosecution of applications. This provision applies in the case of applications filed on or after October 25, 1965, the effective date of the act. In such cases, when any amendment is filed which presents additional claims over the total number covered by fees previously paid, it should be accompanied by any additional fees due.

As in the case of claims presented after an application is filed and before first action, described in the Notice of September 10, 1965, when independent claims are subsequently presented so that the number of uncanceled independent claims in the application as amended exceeds the number of such claims paid for, an additional fee of $10 is due for each such additional claim. Similarly, an additional fee of $2 is due for each claim added in excess of the number of uncanceled claims, independent or dependent, already paid for.

Treatment of Amendments Unaccompanied by Fees Due

Amendments filed during and after the prosecution of an application and not accompanied by the entire fee due upon such filing will be treated as follows:

If such an amendment is filed in reply to an Office action it will be regarded as not being fully responsive thereto and the practice set forth in section 714.03 of the Manual of Patent Examining Procedure will be followed, care being taken to avoid any abuse of this practice by attorneys as, for example, by habitual submission of such amendments without fees or with insufficient fees.

If an amendment which is not filed in response to an Office action is of such a nature as to require a fee and is not accompanied by the full fee required, it will not be entered and the applicant will be so advised.

Amendment During Interference

An amendment filed in connection with a motion to add counts to an interference (Rule 233) must be accompanied by the claim or claims to be added and with the appropriate fees, if any, which would be due if the amendments were to be entered. It may be that the amendments will never be entered. Only upon the granting of the motion is it necessary for the other party or parties to present the claims, but the fees must be paid whenever presented.

Claims which have been submitted in response to a suggestion by the Office for inclusion in an application must be accompanied by the fee due, if any.

Amendment After Requirement for Restriction

After a requirement for restriction or election of species, nonelected claims will be included in determining the fees due in connection with a subsequent amendment unless such claims are canceled.

Refunds

Money paid in excess or by mistake in connection with an amendment will be refunded in the usual manner.

Amendments affecting the claims cannot serve as the basis for granting any refund.

Money paid in connection with the filing of a proposed amendment will not be refunded by reason of the nonentry of the amendment.

EDWARD J. BRENNER,
Jan. 13, 1966. *Commissioner of Patents.*

[823 O.G. 814]

(27) DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

(28) PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will not be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

(29) DEPENDENT CLAIMS

Although the notice published on October 5, 1965, in 819 O.G. 3, explained that for the purposes of the present fee bill, Public Law 89–83, approved July 24, 1965, the Patent Office will consider a proper dependent claim as being one which incorporates by reference a single preceding claim, whether independent or dependent, and includes all the limitations of the claim so incorporated, there appears to be still some uncertainty on this matter and it is therefore thought to be desirable to elaborate it.

Since the initial determination, for fee purposes, as to whether a claim is dependent must be made by persons other than examiners, it is necessary, at that time, to accept as dependent virtually every claim which refers to another claim, without determining whether there is actually a true dependent relationship. Such acceptance does not, however, preclude a subsequent holding by the examiner that a claim is not a proper dependent claim.

An essential characteristic of a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim. Thus, for example, if claim 1 recites the combination of elements *a*, *b*, *c* and *d*, a claim reciting the structure of claim 1 in which *d* was omitted or replaced by *e* would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

The fact that a dependent claim which is otherwise proper might require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways.

Any claim which is in dependent form but which is so worded that it does not, in fact, include every limitation of the claim on which it depends, will be required to be cancelled as not being a proper dependent claim; and cancellation of any further claim depending on such a dependent claim will be similarly required. The applicant may thereupon amend the claims to place them in proper dependent form, or may redraft them as independent claims upon payment of any necessary additional fee.

The basis for the difference in fees between independent and dependent claims is the fact that the examination of a dependent claim is normally a comparatively simple matter after the claim on which it depends has been examined. This relationship, however, obtains only when the independent claim represents a bona fide attempt to define the invention and to distinguish it from the known prior art. Accordingly, the presentation of a claim which on its face is obviously unpatentable or indefinite, as basis on which other claims are dependent, is not considered to be proper practice. One example of such a practice involves the use of a claim drawn to "all the features of novelty herein disclosed," with other claims, which actually recite the features thought to be novel, being dependent on the first. A similarly objectionable arrangement would involve the use, as a basic independent claim, of a claim merely reciting "a wheeled vehicle," "an amino acid" or "an internal combustion engine."

Such a practice as that just described involves not only an attempt to evade the fee provisions of Public Law 89–83, but also the presentation of a claim known by the attorney or agent presenting it to be unpatentable. Any registered patent attorney or agent who makes a practice of presenting claims of this character may be called on to explain his actions.

(signed) EDWARD J. BRENNER,
June 8, 1966. *Commissioner.*

[828 O.G. 1]

(30) DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

APPLICATION CONTENT

(31) GUIDELINES FOR DRAFTING A MODEL PATENT APPLICATION UNDER THE REVISED RULES

The following guidelines illustrate the preferred layout and content for patent applications. They have been prepared to supplement the amendments to the rules which are effective January 1, 1967. These guidelines are suggested for the applicant's use.

Arrangement and Contents of the Specification

The following order of arrangement is preferable in framing the specification and, except for the title of the invention; each of the lettered items should be preceded by the headings indicated.

(a) Title of the Invention.
(b) Abstract of the Disclosure.
(c) Cross-References to Related Applications (if any).
(d) Background of the Invention.
  1. Field of the Invention.
  2. Description of the Prior Art.
(e) Summary of the Invention.
(f) Brief Description of the Drawing.
(g) Description of the Preferred Embodiment(s).
(h) Claim(s).

(a) *Title of the Invention:* (See Rule 72(a).) The title of the invention should be placed at the top of the first page of the specification. It should be brief but technically accurate and descriptive.

(b) *Abstract of the Disclosure:* (See Rule 72(b), MPEP 608.01(a), and 831 O.G. 1328, October 25, 1966.)

(c) *Cross-References to Related Applications:* (See Rule 78 and MPEP 201.11.)

(d) *Background of the Invention:* The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions. The statement should be directed to the subject matter of the claimed invention.
(2) Description of the Prior Art: A paragraph(s) describing to the extent practical the state of the prior art known to the applicant, including references to specific prior art where appropriate. Where applicable, the problems involved in the prior art, which are solved by the applicant's invention, should be indicated.

(e) *Summary:* A brief summary or general statement of the invention as set forth in Rule 73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(f) *Brief Description of the Drawing:* A reference to and brief description of the drawing(s) as set forth in Rule 74.

(g) *Description of the Preferred Embodiment(s):* A description of the preferred embodiment(s) of the invention as required in Rule 71. The description should be as short and specific as is necessary to adequately and accurately describe the invention.

Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field to which the invention pertains, form a part of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(h) *Claim(s):* (See Rule 75.) A claim may be typed with the various elements subdivided in paragraph form. There may be plural indentations to further segregate subcombinations or related steps.

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims.

Claims should preferably be arranged in order of scope so that the first claim presented is the broadest. Where separate species are claimed, the claims of like species should be grouped together where possible and physically separated by drawing a line between claims or groups of claims. (Both of these provisions may not be practical or possible where several species claims depend from the same generic claim.) Similarly, product and process claims should be separately grouped. Such arrangements are for the purpose of facilitating classification and examination.

The form of claim required in Rule 75(e) is particularly adapted for the description of improvement type inventions. It is to be considered a combination claim and should be drafted with this thought in mind.

In drafting claims in accordance with Rule 75(e), the preamble is to be considered to positively and clearly include all the elements or steps recited therein as a part of the claimed combination.

Oath

(See Rule 65.) Where one or more previously filed foreign applications are cited or mentioned in the oath, complete identifying data, including the application or serial number as well as the country and date of filing, should be provided.

EDWARD J. BRENNER,
Date: Oct. 12, 1966. *Commissioner of Patents.*

[832 O.G. 5]

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(32) USE OF METRIC SYSTEM OF MEASUREMENTS IN PATENT APPLICATIONS

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

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(33) FILING OF NON-ENGLISH LANGUAGE APPLICATIONS

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required

by 35 U.S.C. 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and
(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(s); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. 1552]

EXAMINATION OF APPLICATIONS

(34) INFORMAL APPLICATIONS OF FOREIGN APPLICANTS

This Notice is of special interest to attorneys and agents prosecuting applications on inventions originating abroad.

Many applications filed in this Office correspond in form and substance to the requirements (regulations) of countries foreign to the United States. Since they were not originally drafted to comply with our Rules of Practice, especially those based on 35 U.S.C. 112, the first examination cannot be the full and complete one contemplated under current examining procedures. This first examination is necessarily limited, under MPEP 702.01, to pointing out the informalities and citing the results of a search, the search being based upon the invention so far as it can be understood from the foreign type of claims, often coupled with a somewhat generalized disclosure. Since U.S. Patent Office policy is to accord equal treatment to *all* cases regardless of origin, current examining procedures as explained in the address reprinted in 803 O.G. 893, subject these applications to final determination on the second action. It is obviously to applicant's advantage to *file* the application with an adequate disclosure and with claims which conform to the U.S. Patent Office usages and requirements. This should be done whenever possible. If, however, due to the pressure of a Convention deadline or other reasons, this is not possible, applicants are urged to submit *promptly, preferably within three months after filing,* a preliminary amendment which corrects the obvious informalities. The informalities should be corrected to the extent that the disclosure is readily understood and the claims to be initially examined are in proper form, particularly as to dependency, and otherwise clearly define the invention. "New matter" must be excluded from these amendments since preliminary amendments do not enjoy original disclosure status, section 608.04(b), MPEP

EDWARD J. BRENNER,
Mar. 4, 1965. *Commissioner of Patents.*

[812 O.G. 1295]

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(35) EXAMINATION OF CLAIMS FOR PATENTABILITY UNDER 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.,* 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

[949 O.G. 3]

(36) Claims Copied From Patents

Applicants and their attorneys or agents are reminded of the requirement of Rule 205(b) (37 CFR 1.205(b)) of the Rules of Practice that "Where an applicant presents a claim copied or substantially copied from a patent, he must, at the time he presents the claim, identify the patent, give the number of the patented claim, and specifically apply the terms of the copied claim to his own disclosure, unless the claim is copied in response to a suggestion by the Office."

The requirement of Rule 205(b) (37 CFR 1.205(b)) applies to claims copied in an application at the time of filing as well as to claims copied in an amendment to a pending application. If an applicant, attorney, or agent presents a claim copied or substantially copied from a patent without complying wtih Rule 205(b) (37 CFR 1.205(b)) the examiner may be led into making an action different from what he would have made had he been in possession of all the facts. Therefore, failure to comply with Rule 205(b) (37 CFR 1.205(b)), when submitting a claim copied from a patent, may result in the issuance of an Order To Show Cause why the application should not be stricken from the files of the Patent Office. If a satisfactory answer is not filed within the period set in the Order it may be necessary to strike the application under Rule 56 (37 CFR 1.56).

This reminder is being published to emphasize to applicants and their attorneys or agents the importance of complying with the requirement of Rule 205(b) (37 CFR 1.205(b)) at the time the claim is copied.

WILLIAM FELDMAN,
Apr. 10, 1974. *Acting Assistant Commissioner for Patents.*

[922 O.G. 442]

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(37) Examination of Patent Applications Having an Issue of Fraud

This notice deals with the general procedures established within the Patent Office for the handling, during ex parte examination, of applications in which, or in relation to which, some facts appear or representations are made raising an issue of fraud.

Such applications should be forwarded by the examiner to the Office of the Assistant Commissioner for Patents as soon as the facts or representations are discovered. The application will then be reviewed and a determination made as to whether immediate action on the issue of fraud is necessary or whether the consideration of such an issue should be delayed until after the normal ex parte examination by the examiner (if such examination has not previously taken place).

Where compelling reasons dictate immediate action, the application will not be returned to the examining group for normal ex parte examination until such action is complete. Otherwise, the application will be returned to the examining group. The examiner will complete the examination as to all matters except that any issues relating to possible fraud will not be considered or commented upon. When this examination is completed the application will be returned to the Office of the Assistant Commissioner for Patents. An investigation will then be undertaken to resolve the issues relating to the possible fraud. Such an investigation may include a requirement for additional information from applicant, or from the examiner, should it be necessary for the proper conduct of the investigation.

If the investigation reveals a prima facie case of fraud an Order to Show Cause why the application should not be stricken under Rule 56 of the Rules of Practice [37 CFR 1.56] will be issued.

If a prima facie case of fraud does not exist, or is adequately rebutted, a decision will be entered in the application file stating that the Patent Office has found no evidence necessitating striking the application. The application will then be returned to the examining group or other appropriate Patent Office section for further action.

WILLIAM FELDMAN,
Jan. 2, 1975. *Acting Assistant Commissioner for Patents.*

[930 O.G. 1455]

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(38) Practice Re Markush-Type Claims

This notice deals with Markush-type claims which include a plurality of alternatively usable substances or members. In most cases this recitation by enumeration is used because there is no appropriate or true generic language.

Where an application claims two or more independent and distinct inventions, the Commissioner, under the provisions of 35 U.S.C. 121, may require the application to be restricted to one of the inventions.

A Markush-type claim is directed to "independent and distinct inventions," if two or more of its members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

If the claim is of that nature, the examiner is authorized to reject it as an improper Markush claim and for misjoinder under 35 U.S.C. 121 and to require the applicant to restrict the application to a single invention. In making such a requirement, the examiner will (1) clearly delineate the members or groups of members believed to constitute improperly joined inventions, and (2) state reasons fully explaining why they are independent and distinct. Applicant's response to such a requirement should be an election of a single adequately disclosed and supported invention, with or without restriction of the claim(s) to that invention. Of course, the response must not introduce new matter into the application. See 35 U.S.C. 132 and *In re Welstead*, 59 CCPA 1105, 463 F. 2d 1110, 174 USPQ 449 (1972). A refusal to elect a single invention will be treated as a non-responsive reply.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it is directed to independent and distinct inventions. In such a case, the examiner will not follow the procedure outlined in the preceding paragraph and will not require restriction.

Where the examiner has rejected the claim and required restriction and the applicant has responded without restricting the claim(s) to a single invention, the examiner shall, if the position is adhered to, again reject the claim and any other Markush claims not restricted to the elected invention. No further examination of these claims is required unless and until such rejection has been overcome. However, if the search of the single elected invention develops prior art which would render both the elected invention and the improper Markush claim(s) unpatentable, such prior art may be applied in rejections of both without a complete search of the subject matter of the improper Markush claim(s). Otherwise, only true generic claims and those restricted to the elected invention will be examined in the usual manner.

Review of the rejection will be by appeal to the Board of Appeals under 35 U.S.C. 134.

C. MARSHALL DANN,
May 1, 1974. *Commissioner of Patents.*

[922 O.G. 1016]

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(39) Restriction Between Inventions

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

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(40) Citation of Prior Art by Applicants

The purpose of this notice is to set forth positive guidelines for applicants, their attorneys and agents who desire to submit prior art for consideration by the Patent Office. Such citations of relevant art are welcomed and are encouraged. In order that they may be most effectively considered by the examiner, however, with as little disruption of the regular examination process as possible, it is requested that they be submitted in accordance with the following guidelines.

(1) Citations should be submitted within three months after the application filing date if possible. Any citation made after the first action on the merits (if this occurs more than three months after filing) should be accompanied by an explanation of why it was not earlier presented. This may take the form of a statement that it was made as soon as the art or other material was discovered, or as soon as its pertinency was appreciated, indicating the date of discovery of the cited material or its pertinency.

(2) Full text copies of the pertinent portions of all such prior art citations or other material relevant to patentability of the claimed invention should be supplied, whether the citation is made in a separate paper or in the specification of the application. This will be unnecessary in the case of pending or abandoned United States applications (e.g. Defensive Publications). In the case of publications, a copy of the title page, its copyright notice or other indication of a publication date, and copies of the entire pages which contain the text of the relevant material will be sufficient.

While patent copies are, of course, available in the Patent Office, failure of the applicant to include copies of the cited art means that the examiner must interrupt his examination until copies can be ordered and received. Since the person making the citation will have copies in hand, an overall saving in time and more expeditious examination will result if copies are supplied with the citation.

(3) If the reference is not in English, a translation of its pertinent portions should be included.

(4) Accompanying each citation should be an indication of its pertinency to the claimed subject matter, together with any reasons applicant may wish to point out why the claims are considered to be patentable over the cited material.

All citations of prior art or other material submitted in accordance with the above guidelines and submitted before all claims have been indicated as allowable will be fully considered by the examiner.

While the Patent Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other material not submitted in accordance with these guidelines will be considered by the examiner. Consequently, any patent issuing on the application in question would not be expected to be accorded the usual presumption of validity with respect to such cited art or material.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an *Ex parte* Quayle action, a notice of allowability (POL–327), an examiner's amendment (POL–37), or a Notice of Allowance, any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(*b*) A timely affidavit under Rule 131 with respect to the material cited; or
(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other material cited raises a serious question as to the patentability of the claimed subject matter.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under Rule 183 (37 CFR 1.183) requesting a waiver of Rule 312 (37 CFR 1.312). Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

Submitted citations will not in any way diminish the obligation of examiners to conduct independent prior art searches, or relieve examiners of citing pertinent prior art of which they may be aware, whether or not such art is cited by the applicant. Nothing in this notice is intended to relieve applicants of any responsibility they may have to cite known prior art to the Patent Office.

If the specification or a separate paper filed in the application contains citations relating to background material, applicant has the responsibility of determining whether or not such material is sufficiently relevant to the claimed invention that full compliance with these guidelines is necessary.

Prior art submitted by applicant in the manner provided herein will not be supplied with an Office action, but will be listed on the Form PO–892, "Notice of References Cited," along with other prior art relied upon by the examiner during the examination. Only that prior art listed by the examiner on Form PO–892, will be printed on the patent. However, the complete listing of applicant's citations will be in the application file and will be available for inspection by the public after issuance of the patent.

Citations of prior art may be placed of record in the patented file after the grant of the patent at the request of the patentee (see Section 100(d) of Title 35, United States Code, for definition of patentee). Any such submissions by the patentee will be placed in the patented file without comment by the Patent Office. Citations submitted to the Patent Office by third parties will not be placed in the record of a patented file unless the party submitting the art certifies that he has sent the owner of record copies of the cited art and of his letter transmitting it to the Patent Office.

Prior Notices

This notice supersedes the notices of:
December 10, 1963 (797 O.G. 733)
April 24, 1964 (802 O.G. 601)
June 22, 1964 (804 O.G. 1)
July 24, 1964 (805 O.G. 294)
April 13, 1967 (837 O.G. 1032)

WILLIAM FELDMAN,
Aug. 12, 1974. *Deputy Assistant Commissioner for Patents.*

[926 O.G. 2]

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(41) Citation of Prior Art by Applicants

This notice supplements the notice of August 12, 1974, published in the Official Gazette of September 3, 1974 (926

O.G. 1), and is in response to some of the concerns expressed by members of the patent bar. That notice set forth guidelines the following of which would result in assurance by the Office that the examiner will fully consider the prior art or other material submitted by applicants, their attorneys and agents.

One of the guidelines stated, "If the reference is not in English, a translation of its pertinent portions should be included." In recognition of the high costs of translations, that guideline is hereby modified to accept an alternative to a translation. Accordingly, in lieu of a translation, it shall be sufficient, for purposes of the notice of August 12, 1974, if an equivalent English language patent or publication is provided and identified as an equivalent.

Also, where the applicant has submitted prior art in accordance with the guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application. Of course, any change in applicant's position regarding the cited art and its relevancy to the claimed subject matter should be indicated.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 19, 1975.

[935 O.G. 902]

(42) "MERE FUNCTION OF MACHINE"—REJECTION

In view of the decision of the Court of Customs and Patent Appeals in *In re Tarczy-Hornoch* appearing at 158 USPQ 141, process or method claims will no longer be subject to a rejection by Patent Office examiners solely on the ground that they define the inherent function of a disclosed machine or apparatus. Accordingly, the subject matter of MPEP 706.03(r) is inapplicable and hereby cancelled.

RICHARD A. WAHL,
Assistant Commissioner.

Feb. 10, 1969.

[861 O.G. 343]

(43) EXPRESS ABANDONMENTS

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(i) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

[934 O.G. 2]

(44) ENVIRONMENTAL QUALITY

In signing the National Environmental Policy Act on the first day of this decade, President Nixon declared, "The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment." This landmark legislation declares that it is the continuing policy of the Federal Government to use all practicable means and measures to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. The Act further directs that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act.

In accordance with the desires of the President and this mandate of the Congress, the Patent Office will accord "special" status to all patent applications for inventions which materially enhance the quality of the environment of mankind by contributing to the restoration or maintenance of the basic life-sustaining natural elements—air, water, and soil. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the applications by serial number and filing date, and should be accompanied by affidavits or declarations under Rule 102 explaining how their inventions contribute to the restoration or maintenance of one of these life-sustaining elements.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Jan. 29, 1970.

[871 O.G. 673]

(45) APPLICATIONS RELATED TO ENERGY

In his Message of April 18, 1973, to The Congress "Concerning Energy Resources," the President stated that "with 6 percent of the world's population, we consume almost a third of all the energy used in the world." The President noted that our energy demands "now outstrip our available supplies, and at our present rate of growth, our energy needs a dozen years from now will be nearly double what they were in 1970." The President's Message of April 18 called for the development of a more comprehensive, integrated national energy policy and announced specific steps to carry out the policy. On June 29, 1973, the President announced a series of additional actions to deal with the Nation's energy problem. Among those actions were major efforts in energy research and development and in energy conservation.

In order to enhance and further the goals and actions announced by the President, the Patent Office will, on request,

accord "special" status to all patent applications for inventions which materially contribute to (1) the discovery or development of energy resources, and (2) the more efficient utilization and conservation of energy resources. Examples of inventions in category (1) would be those relating to further developments in fossil fuels (natural gas, coal, and petroleum), nuclear energy, solar energy, etc. Category (2) would include inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, household appliances, etc. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under rule 102 by the applicant or his attorney or agent explaining how the invention materially contributes to category (1) or (2) set forth above.

Requests should be addressed to the Commissioner of Patents, Washington, D.C. 20231.

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Date: Oct. 26, 1973.

Approved:
BETSY ANCKER-JOHNSON, Ph.D.,
Assistant Secretary for Science and Technology.

[916 O.G. 2]

(46) RECORD OF INTERVIEWS IN PATENT APPLICATIONS

Applicants and their attorneys or agents are reminded that a complete written statement as to the substance of any interview with regard to an application must be made of record in the application, whether or not an agreement with the examiner was reached at the interview. The necessity to so complete the record of an application is emphasized by the requirements of Rules 2 and 133(b). Rule 2 provides in part that

> "All business with the Patent Office should be transacted in writing.
>
> * * * * *
>
> "The action of the Patent Office will be based exclusively on the written record in the Office."

Obviously, the action of the Patent Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews. In addition to the requirement of Rule 2, Rule 133(b) is specific that

> "In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for response to Office actions as specified in Rules 111, 135."

Applicants and their attorneys or agents are responsible for compliance with the requirement for a complete written statement except in those situations in which it is agreed that the examiner will issue an Office action upon the application without further written response on behalf of applicant. In those situations, the examiner will make the substance of the interview of record in the Office action. The examiner may also complete the record of an interview if significant matters are inadvertently omitted from a written statement filed on behalf of applicant.

Noncompliance on behalf of applicant with the above noted requirement for a complete written statement when filing a response, will result in the applicant being given one month from the date of the notifying letter or the remainder of any period for response, whichever is longer, to complete the response and thereby avoid abandonment of the application (Rule 135(c)). Except for the paragraphs under the heading "EXAMINER TO CHECK FOR ACCURACY" the substance of this notice supersedes Section 713.04 of the Manual of Patent Examining Procedure.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 9, 1974.

[926 O.G. 2]

(47) STATEMENTS FILED UNDER ATOMIC ENERGY ACT AND NASA ACT

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an application which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 13, 1973.

[914 O.G. 2]

(48) Patent Examining and Appeal Procedures

[37 CFR Part 1]

Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of Title 35 of the United States Code, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.175, 1.194, 1.196, 1.291, 1.292 and 1.346, and by adding §§ 1.69, 1.97, 1.98, 1.99 and 1.109.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, on or before December 7, 1976, on which date a hearing will be held at 9:30 a.m. in Room 11–C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissoner of their intended appearance. All comments received will be available for public inspection in Room 11–E10 of Building 3.

This proposal has been reviewed pursuant to EO 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

Background

The purpose of the proposed changes is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures.

In recent years there has been extensive public discussion concerning the U.S. patent examining system. Much of it stemmed from the 1966 Report of the President's Commission on the Patent System. The Commission made 35 recommendations for improvements, most of them requiring legislation. As a result, bills were introduced in the 90th Congress in 1967 and hearings were held on those and subsequent bills. The most recent patent bill to receive Congressional attention, S. 2255, 94th Congress, was passed by the Senate on February 26, 1976. It now appears, however, that no patent legislation will be enacted during the current year.

Certain of the proposals that have been made in the various bills can be implemented under the Commissioner's rulemaking authority and within the confines of the Office's current budget. In other cases more limited changes can be implemented in this way. Since it may be some time before the law is revised, it is believed appropriate at this time to consider rule changes of this nature. The Patent and Trademark Office has prepared the present proposals after a review of the various bills and taking into account comments and suggestions received from interested parties.

In addition to strengthening examining and appeal procedures, the proposed rules might serve as models for subsequent legislation or simplify the patent law revision effort by dispensing with the need for certain legislative changes. The proposed rules are intended to: (1) permit patent owners and others to bring new prior art to the attention of the Office more readily through reissue applications; (2) assist examiners by providing them with "patentability statements" in all applications; (3) define and clarify the duty of applicants and others to bring information relevant to pending applications to the attention of the examiner; (4) modify the requirements for oaths and declarations to help ensure that relevant information is disclosed; (5) make available to the public Office decisions that would be of important precedent value; (6) refine the existing rules governing public use proceedings and protests to the grant of patents; (7) modify appeal procedures to authorize, in appropriate cases, oral arguments by examiners and rejections of allowed claims by the Board; and (8) create a more complete record of reasons for allowing patents.

Reissue Applications

Proposed § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. Existing § 1.175 requires reissue applicants to file an oath or declaration alleging that they believe "the original patent to be wholly or partly inoperative or invalid * * *" This requirement is dispensed with in proposed § 1.175(a)(1) unless the applicant believes this to be the case. New paragraph (a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus the proposed section permits a patentee to file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure could be used at any time during the life of a patent. During litigation a court might, if it chose, stay proceedings to permit new art to be considered initially by the Office in a simpler and less expensive proceeding. In accordance with existing § 1.176, reissue applications will continue to be acted on by the examiner in advance of other applications.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 U.S.C. 251 does not authorize reissue of a patent unless it is "deemed wholly or partly inoperative or invalid." However, the record of prosecution of the reissue application will indicate that the prior art has been considered by the examiner.

Proposed § 1.11 opens reissue applications to inspection by the general public. It is already Office policy to open reissue applications to inspection by opponents of the patentee in litigation or an interference at the opponent's request. The proposed rule opens all reissue applications. Since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

Proposed § 1.11(b) provides for announcement of the filings of reissue applications in the Official Gazette. This announcement would give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. However, in accordance with proposed § 1.291 members of the public will not be permitted to participate as parties in proceedings before the examiner. See discussion below.

Patentability Statement

Proposed §§ 1.97–1.99 provide for the filing of a patentability statement, similar to what has sometimes been called a patentability "brief," in every patent application. The statement would assist examiners by informing them of the relevant prior art considered by the applicant and giving an explanation of the most relevant references before they undertake their searches. The statement is not intended to serve as a substitute for the search by the examiner, but only as a starting point and supplement for the search. The statement should provide a more complete written record distinguishing the claims from the prior art.

While the statement will impose some additional burden on applicants, applicants are already required by existing law to bring pertinent information to the attention of the examiner. The statement will serve as a reminder to applicants, attorneys and agents of their responsibility for citing pertinent information.

The patentability statement proposal represents an extension of the Office's existing policy on citation of prior art by applicants.[1] The proposal is similar to the rule change proposal published on September 9, 1969,[2] and to section 131(b) of S. 2255, 94th Congress.

Proposed § 1.97(a) requires the statement to be filed within two months after filing an application, in order to make it available by the time of the examiner's first action. Paragraph (b) makes clear that applicants will not be refused an examination or a patent for any inadvertent failure to comply with the requirements for the statement. Paragraph (c) is intended to avoid any inference as to the thoroughness of any search that is made, or any implied obligation to make any search at all.

Section 1.98(a), specifying the content of the statement, requires a listing of relevant information and a "concise" explanation of the references considered most relevant. This emphasizes that a lengthy legal document is not desired. The term "patentability brief" is avoided because the statement contemplated generally would be less detailed than an appellate brief. Only the key features of pertinent references and the most important differences from the claimed invention need be discussed in a few sentences.

Section 1.98(a) states that the statement is to explain why the invention is patentable over prior art which the applicant considered most "relevant" during preparation of the application. The term "relevant" is defined. As to the "most relevant" references, the requirement is for an explanation of those references which meet this qualification in the opinion of the applicant, which will not necessarily be the same as the opinion of the examiner or subsequent reviewing body. The requirement that only the most relevant references need be explained is an attempt to minimize extra burden on the applicant and the Office.

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[1] See notice of August 12, 1974, 926 O.G. 2.

[2] 34 FR 14176, 866 O.G. 1402.

It of course requires persons to exercise judgment in deciding what information to cite. No way has been found to avoid the exercise of judgment if the examiner is to be provided only with information useful to him. The intent of the Office is to avoid penalizing persons for good faith errors in judgment in deciding what information to bring forward. Reasons for patentability need not be stated if no relevant information was considered in preparing the application. The statement could comprise a mere statement that no information was considered.

Proposed § 1.98 requires, except in the case of duplicative references, that a copy of the pertinent portion of each patent or publication considered relevant be submitted. This includes copies of United States patents as well as foreign patents. While patents are of course available in the Office, if the applicant does not include copies the examiner will have to interrupt his examination until copies can be ordered or located. Since the person making the citation has copies in hand, it is believed that an overall saving in time can be achieved by requiring the applicant to supply the copies in all cases. With the widespread availability of copying equipment this burden is now less than in the past. While translations of pertinent portions of foreign language references will be helpful to the examiner, this has not been made a requirement of the proposed rule. When existing translations are readily available they should be submitted.

Proposed § 1.99 provides for updating patentability statements. This is consistent with the duty under existing case law to cite relevant information at any time during the prosecution of an application.

Duty of Disclosure

Proposed § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The proposal codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the Federal courts. The expanded wording of § 1.56 is intended to be helpful especially to those individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and, although not binding on them, may perhaps offer useful guidance to the courts.

The first sentence of § 1.56(a) names the individuals who have a duty to disclose information to the Office. The second sentence states that the duty is to disclose all information that they believe might reasonably be expected to affect a decision of the examiner.[3] It is somewhat more than that information which in fact would or should cause the examiner to reject claims allowable "but for" the information.[4] As noted below, however, paragraph (c) of proposed § 1.56 does not necessarily provide for a penalty when relevant information is not disclosed. The third sentence of paragraph (a) makes clear that the duty of disclosure is less for those persons who are less involved in the preparation or prosecution of the application.

Proposed § 1.56(b) retains the substance of existing § 1.56 and further defines with more particularity the grounds for striking an application. Since the courts have held patents unenforceable under the equitable doctrine of unclean hands when the requirements for fraud in the common law sense are not met, the term "inequitable conduct" is added to the rule. Paragraph (b) also makes clear that a failure to comply with the duty of disclosure may amount to fraud or inequitable conduct.

Paragraph (c) sets forth the criteria that must be satisfied before an application will be stricken for failing to comply with the duty of disclosure. It is believed to reflect the current state of the case law. For fraud or inequitable conduct most courts require "clear and convincing evidence" and an intent to withhold information, or gross negligence equivalent to intent.[5] The cases are not uniform on how material or relevant the information withheld must be. Paragraph (c)(1) adopts a "might reasonably be expected to affect" test. Paragraph (c), however, establishes only the minimum requirements that must be met for striking an application. It leaves the Office with discretion to require a higher degree of materiality (for example, a "but for" test) in appropriate circumstances.

Proposed § 1.346 explicitly requires a reasonable basis to support every assertion of improper conduct under § 1.56 made by a registered practitioner in any Office proceeding. The change in § 1.346 is not a change in substance but is only for emphasis. Concern has been expressed over the increasingly common practice of making "boiler plate" allegations of fraudulent procurement. Proposed § 1.346 gives specific notice that groundless charges of fraud or inequitable conduct may serve as a basis for disciplinary proceedings against registered practitioners under § 1.348.

Oaths and Declarations

Proposed § 1.69 is intended to correct the anomalous situation in which foreign applicants are required to sign an oath or declaration in a language that they may not understand. It requires use of a language which is understood.

Proposed § 1.69(a) requires that persons must understand the content of documents to which foreign language oaths or declarations relate. The term "understands" provides flexibility for persons who cannot read the language in which the specification and claims are written to have the content explained to them.

Proposed § 1.69(b) anticipates that the Office will publish oaths and declaration forms in the languages of those countries from which a significant number of applications are received. An applicant who does not or is unable to use such a form, or any reproduction of such a form, must submit a verified English translation of the oath or declaration at the time it is filed. An exception is made for oaths or declarations under § 1.65, for which a verified English translation may be filed no later than two months after the filing date.

Proposed § 1.52 is changed to be consistent with the requirement of § 1.69 for foreign language oaths and declarations.

Proposed § 1.65(a)(1) requires inventors to acknowledge a duty to disclose information relevant to the patentability of their inventions. While the oath will not define the duty of disclosure fully, acknowledgement in general terms that such a duty exists will emphasize the importance of the duty to inventors who may not be familiar with the requirements of patent law and regulations. If this proposal is adopted the change in § 1.65 also would be incorporated in all appropriate sections in 37 CFR Part 3, "Forms for Patent Cases."

Decisions Made Public

Proposed § 1.14(d) is intended to make more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public. The proposed rule includes reference to decisions of the Board of Patent Interferences as well as the decisions of the Board of Appeals and the Commissioner, which were previously covered.

It provides for public dislosure of the subject decisions whenever the applicant or party in interest fails to take the prescribed steps to prevent such disclosure after being given appropriate notice. It is applicable in the case of decisions that would have significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It places the burden on the Office to identify significant decisions. It is anticipated that no more than a few dozen decisions each year would be considered of sufficient importance for publication under the authority of this paragraph.

Protests and Public Use Proceedings

Proposed §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions as aids in avoiding the issuance of invalid patents.

Section 1.291(a) provides that protests will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests would have to be accompanied by copies of prior art documents relied upon, although protests without copies would not necessarily be ignored. This is similar to the requirement of proposed § 1.98 that copies of patents and publications accompany patentability statements. § 1.291 does not contemplate permitting a protester to participate in any further proceeding as a party. In the case of applications available to the public, such as reissue applications, the protester could file papers rebutting statements made by the applicant. The examiner at his discretion might request a protester to submit additional written information or might provide extra time for comments by a protester to be filed.

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[3] See S. 2255, 94th Congress, § 131(b)(1)(B).

[4] See e.g., In re Multi-District Litigation Involving Frost Patent, 398 F. Supp. 1353, 1369, 185 USPQ 729, 741 (D. Del. 1975); Kayton et al., Fraud in Patent Procurement: Genuine and Sham Charges, 43 Geo. Wash. L. Rev. 1, 40 (1974).

[5] E.g., Norton v. Curtiss, 433 F. 2d 779, 167 USPQ 532 (CCPA 1970).

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted.[6] The material submitted is not examined by the Office, but is available to members of the public inspecting Office records.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy.

In § 1.292 the requirement that petitioner offer to bear the Office's expenses in conducting the public use proceeding is deleted.

Proposed § 1.292 is also intended to ensure that the application file wrapper records the existence of public use proceedings. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to physically accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper itself is available.

Patent Appeals

Proposed § 1.194, first, makes clear that oral hearings should be requested only when the appellant considers a hearing necessary or desirable for a proper presentation of his appeal and, second, provides for oral arguments by examiners before the Board in certain appeals.

In most instances, well-written, fully developed arguments in the appellant's brief and the examiner's answer are the most effective way of arguing a case before the Board of Appeals. The legal and technological issues presented in appeals are, for the most part, best presented and understood using the precision of the written word. No adverse implications will be drawn as to the merits of the appeal from an applicant's waiving an oral hearing.

If an appellant considers an oral hearing necessary or desirable for a proper presentation of his appeal, an oral hearing will be scheduled upon request.

Proposed § 1.194(b) permits oral argument by, or on behalf of, the primary examiner whenever either the examiner or the Board believes it would be helpful. It incorporates the present practice of permitting examiners to present oral argument before the Board of Appeals (MPEP 1209). It gives the Board the additional discretionary authority to require examiners to present oral argument to ensure that all issues are fully and accurately presented.

It has been the Board's experience that effective oral argument, when needed, can be presented in less than the 30 minutes allowed in the present rule. Since March 20, 1975, it has been the Board's practice to limit oral argument to 20 minutes.[7] This practice is reflected in the proposed rules. Arguments by examiners would also be limited to a maximum of 20 minutes. It is anticipated that examiners often would utilize substantially less than 20 minutes since their role would be one of rebuttal and answering questions.

Proposed § 1.196(b) authorizes the Board of Appeals to reject allowed claims. The Board's lack of authority in the past has resulted in some anomalous situations. This proposal is not intended, however, as an instruction to the Board to reexamine every allowed claim in every appealed application. It is intended to give the Board authority to act when it becomes apparent during the Board's consideration of rejected claims that one or more allowed claims should also be rejected, on either the same or on different grounds than applied against the rejected claims.

Although the statutory authority of the Board of Appeals to review "adverse decisions of examiners" (35 U.S.C. 7) has not been narrowly construed,[8] it has been held that since a general rule authorizing review of favorable decisions of the examiner has not been promulgated, the Board lacked such authority.[9]

The Commissioner can "prescribe as a rule of practice, generally applicable, that a favorable decision by a primary examiner may be reviewed, in the Commissioner's behalf, by some officer or by some board to which has been delegated the duty of making such review." [10] Proposed § 1.196(b) exercises the Commissioner's discretion to designate the Board of Appeals to review in their capacity as Examiners-in-Chief favorable decisions by the examiner in cases which are otherwise before it.

As proposed, § 1.196(b) would permit an applicant, at his option, to waive reconsideration by the examiner and by the Board of Appeals and treat the Board's rejection of allowed claims as the final decision of the Board. If the applicant elects to follow that course, the Board's rejection of allowed claims would be directly reviewable by the Court of Customs and Patent Appeals or the District Court for the District of Columbia.[11]

Reasons for Allowance

Proposed § 1.109 authorizes examiners to prepare a written record of the reasons for allowing claims in an application when they believe the reasons will not be apparent from other papers of record. In many cases the reasons for allowance will be evident from the examiner's rejections and the applicant's amendments and arguments overcoming the rejections. Moreover when the examiner's reason for allowance is merely that he can locate no relevant prior art, a statement of reasons probably will be meaningless.

On the other hand, courts and others occasionally have commented that statements of examiners' reasons for allowance would be useful in some circumstances.[12] When an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive, an explanation could be helpful to anyone later attempting to evaluate the patent. When an examiner withdraws a rejection for reasons not suggested by the applicant, an explanation could be useful.

Proposed § 1.109 gives the examiner discretion as to whether to prepare a statement of reasons for allowance. The last sentence of proposed § 1.109 permits the applicant to file a statement commenting on the reasons for allowance. Although the examiner would routinely consider the applicant's comments, his reasons would not ordinarily be amended. It is anticipated that the Patent and Trademark Office would prepare guidelines for examiners on administration of the rule. An experiment might be undertaken with a small number of applications before deciding whether to adopt a permanent rule.

Proposed Rules

The text of the proposed added and revised sections and paragraphs of sections is as follows (additions are indicated by arrows; deletions are bracketed):

§ 1.11 *Files open to the public.*

* * * * *

(b) ►All release applications and applications◄ [Applications] in which the Office has accepted a request filed under § 1.139 ►, and related papers in the application file,◄ are open to inspection by the general public, and copies may be furnished upon paying the fee therefor. ►The filing of reissue applications will be announced in the OFFICIAL GAZETTE.◄

§ 1.14 *Patent applications preserved in secrecy.*

* * * * *

(d) ►Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner on petition,◄ [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection ►(§ 1.11 and paragraphs (a) and (b) of this section) shall◄ [(paragraph (b) of this section) may] be published or made available for ►public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within one month after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time to request reconsideration and seek court review before any portions of decisions are made public over their objection◄ [publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language ►except as provided in § 1.69◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

§ 1.56 ►*Duty of disclosure; striking of*◄ [*Improper*] *applications.*

►(a) A duty to disclose information to the Patent and Trademark Office rests on the inventor, each of the attorneys or agents who prepares or prosecutes the application, and every other individual who is involved in the preparation or prosecution of the application and who is associated with the inventor, the assignee or anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they believe to be relevant to the patentability of the claimed invention, i.e., information that might reasonably be expected to affect the decision of the examiner. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.◄

►(b)◄ Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office,] may be stricken from the files ►if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant;

(2) Altered or partly filled in after being signed or sworn to; or

(3) Any fraud or inequitable conduct is practiced or attempted on the Office in connection with it, including any violation of the duty of disclosure.◄

►(c) In order for an application to be stricken for failure to comply with the duty of disclosure, it must be established by clear and convincing evidence that:

(1) Information was withheld which might reasonably be expected to affect a decision of the Office on patentability; and

(2) The withholding was deliberate or grossly negligent.◄

§ 1.65 *Statement of applicant.*

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information that he believes relevant to the patentability of the invention.◄ He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) * * *

* * * * *

►§ 1.69 *Foreign language oaths and declarations.*◄

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.◄

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.◄

►PATENTABILITY STATEMENT◄

§ 1.97 *Filing of patentability statement.*

►(a) At the time of filing the application or within two months thereafter, there shall be filed a patentability statement. The statement must be separate from the specification but may refer to matter contained in the specification.◄

►(b) The examiner will decline to examine any application in which the statement is defective or has not been filed. If a statement has been filed but is defective, the applicant will be given an opportunity to submit an amended statement. If no statement has been filed within two months after filing the application, the applicant may submit one later, provided the failure to file has been inadvertent and there is presented an adequate explanation of why it was not submitted earlier.◄

►(c) The statement shall not be construed as a representation that a search has been made or that no better art exists than that which has been considered. This section does not impose an obligation to make any search of patents, publications or other information outside the knowledge of the individuals who have a duty of disclosure under § 1.56.◄

►§ 1.98 *Content of patentability statement.*◄

►(a) The statement shall include: (1) A listing of the relevant patents, publications or other information, if any, considered by the applicant and/or any attorney or agent during preparation of the application; (2) a copy of at least the pertinent portion of each listed patent or publication; and (3) a concise explanation of the reasons why the claimed invention is believed patentable over the patents, publications or other information which applicant considers most relevant. If no such information was considered, the statement shall so state. By "relevant" information is meant that which might reasonably be expected to affect the decision of the examiner.◄

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[6] See notice of August 12, 1974, 926 O.G. 2.

[7] See notice of March 20, 1975, 933 O.G. 1010.

[8] In re Loehr, 500 F.2d 1390, 183 USPQ 56 (CCPA 1974); In re Haas, 486 F.2d 1053, 179 USPQ 623 (CCPA 1973); In re Hengehold, 58 CCPA 1099, 169 USPQ 473, 480 (1971); In re Searles, 164 USPQ 623 (CCPA 1970).

[9] Watson v. Bruns, 239 F.2d, 948, 111 USPQ 325 (D.C. Cir. 1956).

[10] Id.

[11] See In re Crowell, 17 CCPA 1009, 39 F.2d 681, 5 USPQ 84 (1930). See also In re Forstrom, 27 CCPA 1160, 111 F.2d 181, 45 USPQ 343 (1940), and In re Kirschbraun, 18 CCPA 735, 44 F.2d 675, 7 USPQ 132 (1930), for direct review of Board's decision on claims presented for the first time before the Board.

[12] E.g., Album Graphics, Inc. v. Ivy Hill Lithograph Corp., 378 F. Supp. 705, 709–10, 181 USPQ 321, 324–25 (S.D.N.Y. 1973).

►(b) When two or more patents or publications considered relevant are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered relevant should be transmitted if an existing translation is readily available to the applicant.◄

►(c) Information cited or referred to by the examiner or applicant in a parent application must be included in the statement if considered relevant.◄

►§ 1.99 *Updating of patentability statement.*◄

►If an applicant, attorney or agent learns of additional relevant patents, publications or other information after filing the patentability statement and prior to issuance of a patent, the additional information shall be submitted to the examiner promptly, together with the explanation and copies required by § 1.98. This material may be incorporated into other papers or amendments being submitted to the examiner concurrently.◄

►§ 1.109 *Reasons for allowance.*◄

►If the examiner believes his reasons for allowing claims in an application will not be apparent from other papers of record, he may notify the applicant of the reasons for allowance. Such reasons may be incorporated into an Office action rejecting other claims of the application or may be the subject of a separate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner.◄

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) ►When the◄ [That] applicant verily believes the original patent to be wholly or partly inoperative or invalid, ►stating such belief◄ and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defects.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.◄

►(5)◄ [(4)] Particularly specifying the errors ►or what might be deemed to be errors◄ relied upon, and how they arose or occurred.

►(6) Stating that◄ [(5) That] said errors ►, if any,◄ arose "without any deceptive intention" on the part of the applicant.

* * * * *

§ 1.194►*Oral*◄ *Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.◄

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.◄

►(c)◄ If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] ►twenty minutes each for the appellant and for the primary examiner◄ unless otherwise ordered before the hearing begins.

§ 1.196 *Decision by the Board of Appeals.*

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(b) ►Although the Board of Appeals normally will confine its decision to a review of rejections made by the primary examiner, should it◄ [Should the Board of Appeals] have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, ►or knowledge of any grounds for rejecting any allowed claim,◄ it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection of the claims. The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the primary examiner. The statement shall be binding upon the primary examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the primary examiner, avoids the additional ground for rejection stated in the decision. The applicant may waive such reconsideration before the primary examiner and have the case reconsidered by the Board of Appeals upon the same record before them. Where request for such reconsideration is made the Board of Appeals shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The applicant may waive reconsideration by the Board of Appeals and treat the decision, including the added grounds for rejection given by the Board of Appeals, as a final decision in the case.

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§ 1.291 *Protests ►and prior art citations by public◄ [to the grant of a patent.]*

►(a)◄ The patent statutes do not ►prohibit◄ [provide for] opposition to the grant of a patent on the part of the public. [Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being referred to the examiner having charge of the subject matter involved for his information.] ►A protest to the grant of a patent specifically identifying the application to which the protest is directed will be entered in the application file, and if timely submitted and accompanied by a copy of any prior art documents relied upon will be considered by the examiner.◄

►(b) Citations of prior art may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations will be entered without comment by the Patent and Trademark Office.◄

►(c) Protests and prior art citations by the public, and any accompanying papers or exhibits, should either (1) reflect that a copy of the same has been served upon the applicant or patentee or his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible.◄

§ 1.292 *Public use proceedings.*

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(b) The petition and accompanying papers should [be filed in duplicate, or served upon the applicant, his attorney or agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding] ►either (1) reflect that a copy of the same has been served upon the applicant, his attorney or agent of record; or (2) be filed in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.◄

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it ►(including

good ground to support any assertion of improper conduct under § 1.56)◄; and that it is not interposed for delay.

Dated: September 17, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 28, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.76-28916; Filed 10-1-76; 8:45 am]

[951 O.G. 1343]

(Pending—No Final Action Taken)

APPEALS

(49) HEARINGS BEFORE THE BOARD OF APPEALS

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been sucessful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Mar. 20, 1975.

[933 O.G. 1010]

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(50) REPLY BRIEFS

Applicants should clearly and specifically indicate in their reply briefs the new points of argument "raised in the examiner's answer" to which said reply briefs are directed. Rule 193(b) does not permit general rebuttal of each statement made in the examiner's answer; Consequently a reply brief which is not restricted to answering "new points" may be refused consideration in toto.

EDWIN L. REYNOLDS,
Apr. 15, 1969. *First Assistant Commissioner.*

[862 O.G. 343]

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(51) APPEALS—CONFIDENTIAL MEMORANDA

The practice of presenting confidential memoranda to the Board of Appeals is hereby terminated. All correspondence with the Board of Appeals, whether by the Examiner or the applicant will be on the record. No unpublished decisions which are unavailable to the general public by reason of 35 U.S.C. 122 will be cited by the Examiner or the applicant except that either the Examiner or the applicant has the right to cite an unpublished decision in an application having common ownership with the application on appeal.

WILLIAM E. SCHUYLER, JR.,
July 28, 1970. *Commissioner of Patents.*

[877 O.G. 733]

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(52) EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works v. Joy Manufacturing Co.*, 167 USPQ 170, 171: ". . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205-12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court

or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

INTERFERENCES

(53) INTERFERENCE PRACTICE

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

[935 O.G. 3]

(54) INTERFERENCE PRACTICE

Settlement Agreements

Inquiries by attorneys have been made from time to time at the Board of Patent Interferences as to why the Commissioner does not give notice to the parties or their attorneys of record, a reasonable time prior to termination of an interference, of the requirement relative to the filing of settlement agreements, citing 35 USC 135(c), second paragraph.

Attention is called to the fact that notice is given in the second full paragraph of Form POL–76, the letter to the parties advising them of the declaration of the interference.

WALTER A. MODANCE,
Oct. 15, 1975. *Chairman, Board of Patent Interferences.*

[940 O.G. 570]

(55) ACCESSIBILITY OF NON-FINAL DISCOVERY OPINIONS AND ORDERS ISSUED BY THE BOARD OF PATENT INTERFERENCES

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
  1.10 Requests and service under § 1.287(a)
  1.20 Requests under § 1.287(b)
  1.30 Motions for additional discovery under § 1.287(c)
    1.31 Related to derivation
    1.32 Related to abandonment, suppression, and concealment
    1.33 Related to inequitable conduct
    1.34 Other
  1.40 Motions under § 1.287(d)(1)
  1.50 Action under § 1.287(d)(2)
  1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

(56) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Revision of Rules in Interference Practice

On February 19, 1976, notice of proposed rulemaking regarding the revision of §§ 1.228, 1.243, 1.244, 1.254, and 1.256 of Title 37, Code of Federal Regulations, was published in the Federal Register (41 FR 7513). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 26, 1976 was allocated for such purposes. Five comments were received. The comments and a summary of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. All but one of the comments were favorable to the proposed changes. In view of the one adverse comment received, the proposal to amend § 1.254 is not being adopted. Section 1.228 was amended as proposed to provide a time for oral arguments at the hearing set under the provisions of said section and §§ 1.243 and 1.244 were rearranged without changing the wording therein. Finally, § 1.256 was amended to amplify the procedure therein.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Part 1 of Title 37, Code of Federal Regulations is hereby amended as follows:

§ 1.228 *Summary Judgment.*

When an interference is declared on the basis of a showing under § 1.204(c), such showing will be examined by an Examiner of Interferences. If the Examiner considers that the facts set out in the showing provide sufficient basis for the interference to proceed, the interference will proceed in the normal manner as provided by the regulations in this part; otherwise an order shall be entered concurrently with

the notice of interference pointing out wherein the showing is insufficient and notifying the applicant making such showing that summary judgment will be rendered against him because of such insufficiency at the expiration of a period specified in the notice, not less than 30 days, unless cause be shown why such action should not be taken. In the absence of a showing of good and sufficient cause, judgment shall be so rendered. Any response made during the specified period will be considered by a Board of Patent Interferences without an oral hearing unless such hearing is requested by the applicant, but additional affidavits, declarations or exhibits will not be considered unless accompanied by a showing in excuse of their omission from the original showing. If the applicant files a response to the order to show cause, the patentee will be furnished with one copy of the showing under § 1.204(c) and will be allowed not less than 30 days from its mailing date within which to present his views with respect thereto. He shall also be entitled to be represented at any oral hearing on the matter. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than 30 minutes for each party. The Board will determine, on the basis of the original showing and the response made, whether the interference should be allowed to proceed or summary judgment should be entered against the junior applicant.

§ 1.243 *Motions before the Board of Patent Interferences*

(a) Motions relating to matters other than those specified in § 1.231 will be determined by a patent interference examiner or the Board of Patent Interferences, as may be deemed appropriate. Such motions shall be made in writing and shall contain a full statement of the action sought and the grounds therefor, and satisfactory proof of any facts required must accompany the motion. Oral hearings will not be held except on order of a patent interference examiner or Board of Patent Interferences. Briefs or memoranda in support of such motions shall accompany the motion. Any opposition to the motion, together with any brief or memorandum in support thereof, shall be filed within 20 days from the date of service of the motion unless some other date is set by the patent interferences examiner.

(b) Typewritten briefs may be used in connection with all motions. By stipulation of the parties subject to approval or by order of the tribunal before whom the motion is pending, briefs may be received if filed otherwise than as prescribed.

(c) In oral hearings on motions, the moving parties shall have the right to make the opening and closing arguments. Unless otherwise ordered before the hearing begins, oral arguments will be limited to 30 minutes for each party.

(d) Any request for reconsideration or modification of a decision or other action by the Board of Patent Interferences or patent interference examiner must be filed within 20 days after the date of the decision or other action and any reply thereto must be filed within 20 days from the date of service of the request. With regard to requests for reconsideration of a decision after final hearing, see § 1.256(b).

§ 1.244 *Petition to the Commissioner from decisions on motions.*

There is no appeal from decisions rendered on motions, but the Commissioner may consider on petition any matter involving abuse of discretion or the exercise of his supervisory authority, or such other matters as he may deem proper to consider. Any such petition must comply with § 1.181 and, if not filed within 20 days from the decision complained of, may be dismissed as untimely. Any opposition thereto must be filed within 20 days from the date of service of the petition.

§ 1.254 *Briefs at final hearing.*

Briefs at final hearing before the Board of Patent Interferences shall be submitted in printed form, except that when not in excess of 50 legal-size double-spaced typewritten pages, or the equivalent thereof, and in any other case where satisfactory reason therefor is shown they may be submitted in type written form. If submitted in printed form, they shall be the same in size and the same as to page and print as is specified for printed copies of testimony. Typewritten briefs shall conform to the requirements for typewritten copies of testimony, except that legal size paper may be used and the binding and covers specified are not required. Every brief of more than 15 pages shall contain a subject index with page references, supplemented by a list of all authorities referred to, together with references to pages thereof. Three copies of each brief must be filed. The times for filing briefs will be set at an appropriate stage in the proceeding prior to final hearing. The brief for the junior party shall present a full, fair statement of the questions involved, including his position with respect to priority evidence presented on behalf of other parties, and a clear statement of the points of law or fact on which he relies. The main brief for each party shall contain a copy of the counts in interference.

§ 1.256. *Final hearing.*

(a) Final hearings will be held by the Board of Patent Interferences on the day appointed at the designated time. If either party appears at the proper time, he will be heard. After the day of hearing, the case will not be taken up for oral argument except by consent of all parties. If the Board of Patent Interferences be prevented from hearing the case at the time specified, a new assignment will be made, or the case will be continued from day to day until heard. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to not more than one hour for each party. A junior party may reserve a portion of his time for rebuttal purposes, but a full, fair opening of his case must be made, including his position with respect to the case presented on behalf of other parties. After a contested case has been argued nothing further relating thereto will be heard unless upon request of the Board of Patent Interferences

(b) Any request for rehearing or reconsideration, or modification of the decision after final hearing, must be filed within 30 days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto must be filed within 15 days from the filing of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304).

Effective date: These amendments shall become effective on August 31, 1976.

Dated: June 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-19526; Filed 7-6-76; 8:45 am]

[949 O.G. 3]

MISCELLANEOUS

(57) DISCLOSURE DOCUMENT PROGRAM

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Jan. 4, 1971.

[883 O.G. 3]

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(58) NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Banla, Director, Office of Publications (Room 2–5C26), Patent and Trademark Office, Washington, D.C. 20231, Attention: Shirley A. Hammel (Telephone 703/557–3794), or Lillie M. Harrison (Telephone 703/557–1985).

This notice is effective with the publication date and supersedes the notice published on this subject in 934 O.G. 886, dated April 25, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

[939 O.G. 3]

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(59) POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.
ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.
ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.
BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.
BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.
BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.
BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.
CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.
CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.
CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.
CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.
CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.
COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.
DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.
DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.
DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.
DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.
GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.
HARTFORD, CONN. 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.
HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.
HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.
INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.
KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.
LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.
MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.
MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.
MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.
MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.
NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.
NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.
NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.
PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.
PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.
PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.
PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.
RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.
RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.
ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.
SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.
SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.
SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.
SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.
SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 386]

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(60) PATENT COOPERATION TREATY: IMPLEMENTING LEGISLATION AND RATIFICATION

Public Law 94–131, as reprinted below, implements the Patent Cooperation Treaty (see Official Gazette, Volume 876, page 341; July 14, 1970) which was signed by the United States and 34 other countries in 1970. After enactment of the implementing legislation on November 14, 1975, the United States ratified the Treaty on November 26, 1975, thereby becoming the first country with major patent activity to do so. In accordance with the provisions of Article 63 of the Treaty, it enters into force three months after eight countries have adhered to it, four of which must have certain defined major patent activity.

Up to the time of United States ratification eight countries with only minor patent activity had adhered to the Treaty. Ratification by the United States, therefore, represents a significant step in the direction of bringing the Treaty into force. Other countries with major patent activity, and especially European countries, have been awaiting United States ratification before adhering themselves. Consequently, it is hoped that United States commitment to the Treaty has been demonstrated and will encourage adherence by other countries with major patent activity, thereby bringing into force a Treaty which would offer many advantages and benefits to patent applicants and patent offices alike. Because of the necessary action of other countries in bringing the Treaty into force, no exact date can be given at this time. It is presently estimated, however, that at least the necessary number of countries would be reached in Fiscal Year 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Dec. 11, 1975.

Public Law 94-131
94th Congress, S. 24
November 14, 1975

An Act

To carry into effect certain provisions of the Patent Cooperation Treaty, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35, United States Code, entitled "Patents", be amended by adding at the end thereof a new part IV to read as follows: Patent Cooperation Treaty.

"PART IV.—PATENT COOPERATION TREATY

"Chapter 35.—DEFINITIONS

"Sec.
"351. Definitions.

35 USC 351. **"§ 351. Definitions**

"When used in this part unless the context otherwise indicates—

"(a) The term 'treaty' means the Patent Cooperation Treaty done at Washington, on June 19, 1970, excluding chapter II thereof.

"(b) The term 'Regulations', when capitalized, means the Regulations under the treaty excluding part C thereof, done at Washington on the same date as the treaty. The term 'regulations', when not capitalized, means the regulations established by the Commissioner under this title.

"(c) The term 'international application' means an application filed under the treaty.

"(d) The term 'international application originating in the United States' means an international application filed in the Patent Office when it is acting as a Receiving Office under the treaty, irrespective of whether or not the United States has been designated in that international application.

"(e) The term 'international application designating the United States' means an international application specifying the United States as a country in which a patent is sought, regardless where such international application is filed.

"(f) The term 'Receiving Office' means a national patent office or intergovernmental organization which receives and processes international applications as prescribed by the treaty and the Regulations.

"(g) The term 'International Searching Authority' means a national patent office or intergovernmental organization as appointed under the treaty which processes international applications as prescribed by the treaty and the Regulations.

"(h) The term 'International Bureau' means the international intergovernmental organization which is recognized as the coordinating body under the treaty and the Regulations.

"(i) Terms and expressions not defined in this part are to be taken in the sense indicated by the treaty and the Regulations.

"Chapter 36.—INTERNATIONAL STAGE

"Sec.
"361. Receiving Office.
"362. International Searching Authority.
"363. International application designating the United States: Effect.
"364. International stage: Procedure.
"365. Right of priority; benefit of the filing date of a prior application.
"366. Withdrawn international application.
"367. Actions of other authorities: Review.
"368. Secrecy of certain inventions; filing international applications in foreign countries.

35 USC 361. **"§ 361. Receiving Office**

"(a) The Patent Office shall act as a Receiving Office for international applications filed by nationals or residents of the United States. In accordance with any agreement made between the United States and another country, the Patent Office may also act as a Receiving Office for international applications filed by residents or nationals of such country who are entitled to file international applications.

"(b) The Patent Office shall perform all acts connected with the discharge of duties required of a Receiving Office, including the collection of international fees and their transmittal to the International Bureau.

"(c) International applications filed in the Patent Office shall be in the English language.

"(d) The basic fee portion of the international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall be paid on filing of an international application. Payment of designation fees may be made on filing and shall be made not later than one year from the priority date of the international application. Post, p. 690.

35 USC 362. **"§ 362. International Searching Authority**

"The Patent Office may act as an International Searching Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau.

35 USC 363. **"§ 363. International application designating the United States: Effect**

"An international application designating the United States shall have the effect, from its international filing date under article 11 of the treaty, of a national application for patent regularly filed in the Patent Office except as otherwise provided in section 102(e) of this title. Post, p. 691.

35 USC 364. **"§ 364. International stage: Procedure**

"(a) International applications shall be processed by the Patent Office when acting as a Receiving Office or International Searching Authority, or both, in accordance with the applicable provisions of the treaty, the Regulations, and this title.

"(b) An applicant's failure to act within prescribed time limits in connection with requirements pertaining to a pending international application may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the treaty and the Regulations, and provided the conditions imposed by the treaty and the Regulations regarding the excuse of such failure to act are complied with.

35 USC 365. **"§ 365. Right of priority; benefit of the filing date of a prior application**

"(a) In accordance with the conditions and requirements of section
35 USC 119. 119 of this title, a national application shall be entitled to the right of

priority based on a prior filed international application which designated at least one country other than the United States.

35 USC 119.
"(b) In accordance with the conditions and requirement of the first paragraph of section 119 of this title and the treaty and the Regulations, an international application designating the United States shall be entitled to the right of priority based on a prior foreign application, or a prior international application designating at least one country other than the United States.

Post, p. 692.
"(c) In accordance with the conditions and requirements of section 120 of this title, an international application designating the United States shall be entitled to the benefit of the filing date of a prior national application or a prior international application designating the United States, and a national application shall be entitled to the benefit of the filing date of a prior international application designating the United States. If any claim for the benefit of an earlier filing date is based on a prior international application which designated but did not originate in the United States, the Commissioner may require the filing in the Patent Office of a certified copy of such application together with a translation thereof into the English language, if it was filed in another language.

"§ 366. Withdrawn international application 35 USC 366.

Infra.
"Subject to section 367 of this part, if an international application designating the United States is withdrawn or considered withdrawn, either generally or as to the United States, under the conditions of the treaty and the Regulations, before the applicant has complied with the applicable requirements prescribed by section 371(c) of this part, the designation of the United States shall have no effect and shall be considered as not having been made. However, such international application may serve as the basis for a claim of priority under section 365 (a) and (b) of this part, if it designated a country other than the United States.

"§ 367. Actions of other authorities: Review 35 USC 367.

"(a) Where a Receiving Office other than the Patent Office has refused to accord an international filing date to an international application designating the United States or where it has held such application to be withdrawn either generally or as to the United States, the applicant may request review of the matter by the Commissioner, on compliance with the requirements of and within the time limits specified by the treaty and the Regulations. Such review may result in a determination that such application be considered as pending in the national stage.

"(b) The review under subsection (a) of this section, subject to the same requirements and conditions, may also be requested in those instances where an international application designating the United States is considered withdrawn due to a finding by the International Bureau under article 12(3) of the treaty.

"§ 368. Secrecy of certain inventions; filing international applications in foreign countries 35 USC 368.

"(a) International applications filed in the Patent Office shall be subject to the provisions of chapter 17 of this title. 35 USC 181 et seq.

"(b) In accordance with article 27(8) of the treaty, the filing of an international application in a country other than the United States on the invention made in this country shall be considered to constitute the filing of an application in a foreign country within the meaning of chapter 17 of this title, whether or not the United States is designated in that international application.

"(c) If a license to file in a foreign country is refused or if an international application is ordered to be kept secret and a permit refused, the Patent Office when acting as a Receiving Office or International Searching Authority, or both, may not disclose the contents of such application to anyone not authorized to receive such disclosure.

"Chapter 37.—NATIONAL STAGE

"Sec.
"371. National stage: Commencement.
"372. National stage: Requirements and procedure.
"373. Improper applicant.
"374. Publication of international application: Effect.
"375. Patent issued on international application: Effect.
"376. Fees.

35 USC 371. "§ 371. National stage: Commencement

"(a) Receipt from the International Bureau of copies of international applications with amendments to the claims, if any, and international search reports is required in the case of all international applications designating the United States, except those filed in the Patent Office.

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2) of the treaty, at which time the applicant shall have complied with the applicable requirements specified in subsection (c) of this section.

"(c) The applicant shall file in the Patent Office—

"(1) the national fee prescribed under section 376(a)(4) of this part;

"(2) a copy of the international application, unless not required under subsection (a) of this section or already received from the International Bureau, and a verified translation into the English language of the international application, if it was filed in another language;

"(3) amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent Office by the International Bureau, and a translation into the English language if such amendments were made in another language;

35 USC 111 et seq.
35 USC 115.
"(4) an oath or declaration of the inventor (or other person authorized under chapter 11 of this title) complying with the requirements of section 115 of this title and with regulations prescribed for oaths or declarations of applicants.

"(d) Failure to comply with any of the requirements of subsection (c) of this section, within the time limit provided by article 22 (1) or (2) of the treaty shall result in abandonment of the international application.

"(e) After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 of the treaty, except with the express consent of the applicant. The applicant may present amendments to the specification, claims, and drawings of the application after the national stage has commenced.

"(f) At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with.

35 USC 372.

"§ 372. National stage: Requirements and procedure

"(a) All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent Office.

"(b) In case of international applications designating but not originating in, the United States—

"(1) the Commissioner may cause to be reexamined questions relating to form and contents of the application in accordance with the requirements of the treaty and the Regulations;

35 USC 121.

"(2) the Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations.

"(c) Any claim not searched in the international stage in view of a holding, found to be justified by the Commissioner upon review, that the international application did not comply with the requirement for unity of invention under the treaty and the Regulations, shall be considered canceled, unless payment of a special fee is made by the applicant. Such special fee shall be paid with respect to each claim not searched in the international stage and shall be submitted not later than one month after a notice was sent to the applicant informing him that the said holding was deemed to be justified. The payment of the special fee shall not prevent the Commissioner from requiring that the international application be restricted to one of the inventions claimed therein under section 121 of this title, and within the scope of the requirements of the treaty and the Regulations.

35 USC 373.

"§ 373. Improper applicant

35 USC 111 et seq.

Post, p. 692.

35 USC 119.

"An international application designating the United States, shall not be accepted by the Patent Office for the national stage if it was filed by anyone not qualified under chapter 11 of this title to be an applicant for the purpose of filing a national application in the United States. Such international applications shall not serve as the basis for the benefit of an earlier filing date under section 120 of this title in a subsequently filed application, but may serve as the basis for a claim of the right of priority under section 119 of this title, if the United States was not the sole country designated in such international application.

35 USC 374.

"§ 374. Publication of international application: Effect

"The publication under the treaty of an international application shall confer no rights and shall have no effect under this title other than that of a printed publication.

35 USC 375.

"§ 375. Patent issued on international application: Effect

Post, p. 691.

"(a) A patent may be issued by the Commissioner based on an international application designating the United States, in accordance with the provisions of this title. Subject to section 102(e) of this title, such patent shall have the force and effect of a patent issued on a national application filed under the provisions of chapter 11 of this title.

"(b) Where due to an incorrect translation the scope of a patent granted on an international application designating the United States, which was not originally filed in the English language, exceeds the scope of the international application in its original language, a court of competent jurisdiction may retroactively limit the scope of the patent, by declaring it unenforceable to the extent that it exceeds the scope of the international application in its original language.

35 USC 376.

"§ 376. Fees

"(a) The required payment of the international fee, which amount is specified in the Regulations, shall be paid in United States currency. The Patent Office may also charge the following fees:

"(1) A transmittal fee (see section 361(d));

"(2) A search fee (see section 361(d));

"(3) A supplemental search fee (to be paid when required);

"(4) A national fee (see section 371(c));

"(5) A special fee (to be paid when required; see section 372(c));

"(6) Such other fees as established by the Commissioner.

"(b) The amounts of fees specified in subsection (a) of this section, except the international fee, shall be prescribed by the Commissioner. He may refund any sum paid by mistake or in excess of the fees so specified, or if required under the treaty and the Regulations. The Commissioner may also refund any part of the search fee, where he determines such refund to be warranted.".

Sec. 2. Section 6 of title 35, United States Code, is amended by adding a paragraph (d) to read as follows:

35 USC 6.

"§ 6. Duties of Commissioner

* * * * * * *

"(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.".

Sec. 3. Item 1 of section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 41.

"§ 41. Patent fees

"(a) The Commissioner shall charge the following fees:

Post, p. 691.

"1. On filing each application for an original patent, except in design cases, $65; in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.".

Sec. 4. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42.

"§ 42. Payment of patent fees; return of excess amounts

Ante, p. 686, Supra.

"All patent fees shall be paid to the Commissioner who, except as provided in sections 361(b) and 376(b) of this title, shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.".

SEC. 5. Paragraph (e) of section 102 of title 35, United States Code, is amended to read as follows:

“§ 102. Conditions for patentability; novelty and loss of right to patent

35 USC 102.

* * * * * * *

“(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or”.

SEC. 6. The first sentence of section 104 of title 35, United State Code, is amended to read as follows:

“§ 104. Invention made abroad

35 USC 104.

“In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.”.

35 USC 119.
Ante, p. 686.

SEC. 7. The second sentence of the second paragraph of section 112 of title 35, United States Code, is amended to read as follows:

“§ 112. Specification

35 USC 112.

* * * * * * *

“A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

“Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

“A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.”.

SEC. 8. Section 113 of title 35, United States Code, is amended to read as follows:

“§ 113. Drawings

35 USC 113.

“The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented. When the nature of such subject matter admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof. Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.”.

SEC. 9. Section 120 of title 35, United States Code, is amended to read as follows:

35 USC 120.

“§ 120. Benefit of earlier filing date in the United States

35 USC 112.
Ante, p. 686.

“An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.”.

SEC. 10. The first paragraph of section 282 of title 35, United States Code, is amended to read as follows:

35 USC 282.

“§ 282. Presumption of validity; defenses

“A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.”.

Effective dates.
35 USC 351 note.

SEC. 11. (a) Section 1 of this Act shall come into force on the same day as the entry into force of the Patent Cooperation Treaty with respect to the United States. It shall apply to international and national applications filed on and after this effective date, even though entitled to the benefit of an earlier filing date, and to patents issued on such applications.

(b) Sections 2 to 10 of this Act shall take effect on the same day as section 1 of this Act and shall apply to all applications for patent actually filed in the United States on and after this effective date, as well as to international applications where applicable.

(c) Applications for patent on file in the Patent Office on the effective date of this Act, and patents issued on such applications, shall be governed by the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act.

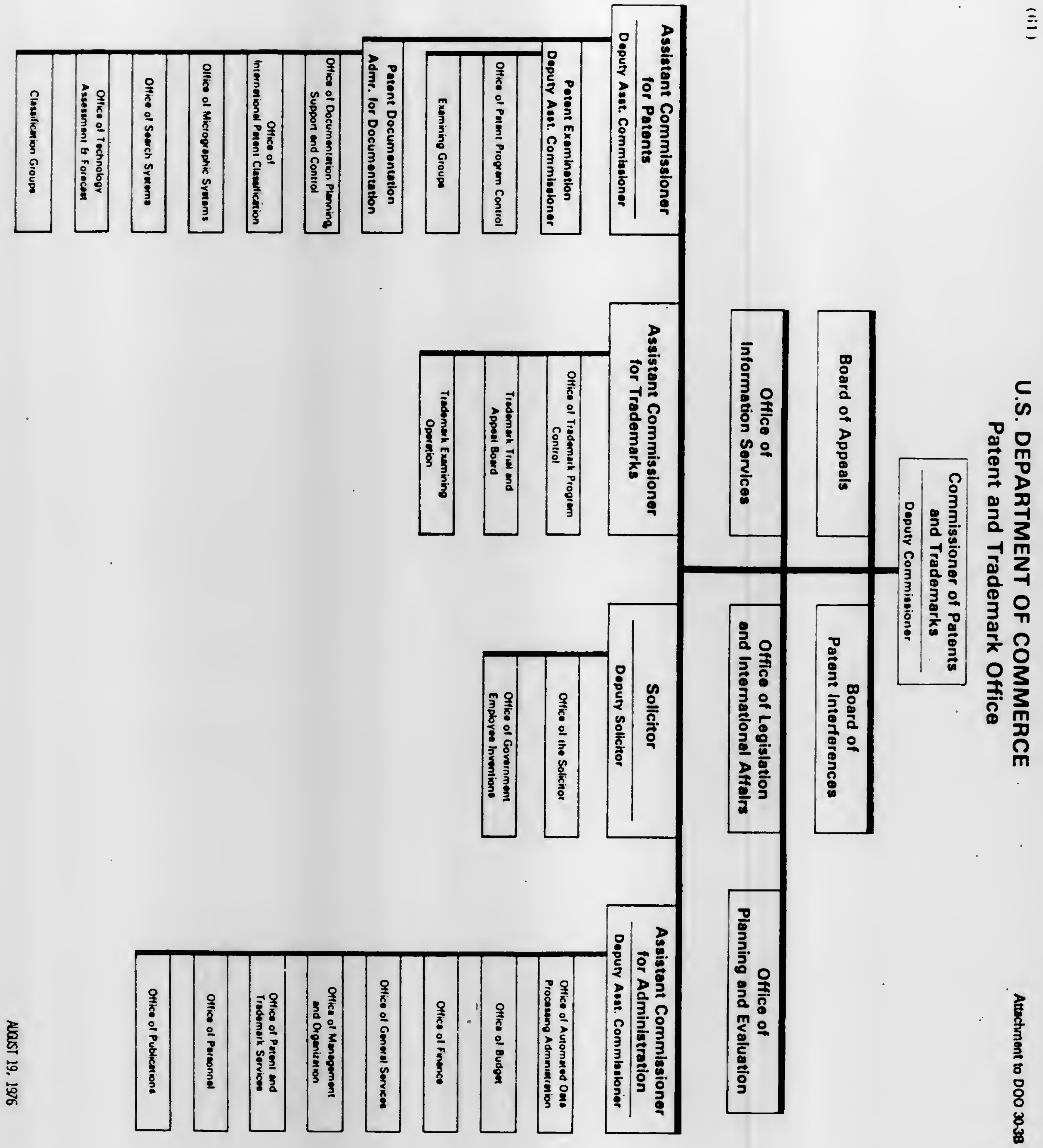
Approved November 14, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-592 (Comm. on the Judiciary).
SENATE REPORT No. 94-215 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 121 (1975):
June 21, considered and passed Senate.
Nov. 3, considered and passed House.

[942 O.G. 177]

(61)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Attachment to DOO 30-38

AUGUST 19, 1976

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES

TRADEMARK SECTION

The following is a compilation of the more important notices and rule changes concerning trademarks which have been published in the Official Gazette *of the Patent and Trademark Office from July 1, 1964 through December 31, 1976. Inclusion of older notices published prior to July 1, 1964 is not believed to be useful, nor are any notices or changes included which have been rescinded or whose substance has now been incorporated in the trademark rules or in the Trademark Manual of Examining Procedure.*

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(300) INTERVIEWS INVOLVING TRADEMARK APPLICATION

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, Jr.,
Assistant Commissioner.

July 6, 1964.

This supersedes the notice of February 10, 1958, 728 O.G. (TM 1).

[804 O.G. TM 147 (July 28, 1964)]

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(301) CHANGE IN FORMAT FOR PUBLISHING TRADEMARKS FOR OPPOSITION

Section 30 of the Trademark Act of 1946 as amended by Public Law 772, 87th Congress, approved October 9, 1962, 76 Stat. 769, provides for the filing of a combined application for the registration of a trademark in more than one class.

The present practice of publishing the mark with pertinent data under each class in which registration is sought results in needless duplication.

Beginning with the issue of November 3, 1964, "Marks Published for Opposition" will be divided into two sections. In Section 1, all marks presented in combined applications for registration in more than one class will be published with only one reproduction of each mark.

The reproduction of the mark will be followed by the class numbers and titles, and under each class will appear the description of the goods in connection with which the trademark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

Trademarks presented in applications for registration in a single class will be published, as in the past, in class order, in Section 2.

The same procedure will be followed in the notice of the issuance of registrations on the Supplemental Register.

EDWIN L. REYNOLDS,
Sept. 18, 1964. *First Assistant Commissioner.*

[807 O.G. TM 51 (Oct. 13, 1964)]

(302) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Allowance of Application

The following amendment is made, to take effect on publication in the Federal Register. Notice and public procedure and deferment of the time of taking effect are deemed unnecessary in view of the nature of the amendment, which is procedural only.

The purpose of the change is to eliminate the procedural step of signing a trademark application file prior to allowance, which has been found to be burdensome and which is unnecessary since the allowance of the application, subject to possible inter partes proceedings, has already been approved by an Examiner having full signatory authority.

Section 2.82 is amended by striking out the clause "the Examiner will sign the application file to indicate allowance and," so that the section as amended will read as follows:

§ 2.82 *Allowance of application.*

If no opposition is filed within the time permitted (§§ 2.101 and 2.102), or if filed and dismissed, and if no interference is declared, or concurrent use proceeding instituted, the application will be prepared for issuance of the certificate of registration as provided in § 2.151.

(Sec. 1, 66 Stat. 793, 35 U.S.C. 6; 60 Stat. 427, 15 U.S.C. 1057)

Dated: Mar. 23, 1966.

EDWARD J. BRENNER,
Commissioner of Patents.

Approved:
J. Herbert Holloman,
Assistant Secretary for Science and Technology.

Published in 31 F.R. 5554; Apr. 8, 1966

[826 O.G. TM 61 (May 10, 1966)]

(303) Publication of Material in "Notices" Sections of Patents and Trademarks Official Gazette

Effective Jan. 3, 1967, publication of material in the Patent and Trademark "Notices" sections of the Official Gazette will occur only once.
Dec. 1, 1966.

[833 O.G. TM 108 (Dec. 20, 1966)]

(304) Powers of Attorney in Registered Trademark Files

On and after February 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C. M. WENDT,
Jan. 30, 1967. *Director.*

[835 O.G. TM 95 (Feb. 21, 1967)]

(305) Charges Against Deposit Accounts Under Special Conditions

The practice as to deposit accounts is hereby extended to include charges against deposit accounts under special conditions. Charges under this practice shall not exceed $50 for each trademark application, registration or opposition.

The Director and the Assistant to the Director of the Trademark Examining Operation are authorized to make a charge against a deposit account provided prior approval, as by telephone, is obtained from the applicant, registrant, attorney or agent. This practice is limited to ex parte appeals to the Trademark Trial and Appeal Board, oppositions, affidavits under the provisions of Section 8, and applications for renewal and may be exercised only in emergency situations, such as where a party is unable to file the fee within the statutory period.

When such a charge is made, prior approval will be indicated in the file by identification of the name of the authorizing party, the date and the type of authorization, the purpose for which the charge is made, and the deposit account number.

WILLIAM E. SCHUYLER, Jr.,
Commissioner of Patents.

[879 O.G. TM 151 (Oct. 27, 1970)]

(306) Separation of the Patent and Trademark Sections of the Official Gazette

Effective February 2, 1971, the Official Gazette will be separated into two parts to be known as the *Patent Official Gazette and the Trademark Official Gazette.*

* * * * *

Orders for subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the Official Gazette will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the Official Gazette will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the Patent Official Gazette and the Trademark Official Gazette will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

WILLIAM E. SCHUYLER, Jr.,
Dec. 29, 1970. *Commissioner of Patents.*

[882 O.G. TM 33 (Jan. 12, 1971)]

(307) Preface to the Trademark O.G. Notices

In September 1970, a Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce. The Purpose of this Committee was to advise the Patent Office on ways to increase the efficiency and effectiveness of the administration of the Trademark Act. A report of this Advisory Committee has been received by the Commissioner of Patents. After reviewing the recommendations, although the review is not complete, it has been decided to make certain changes in trademark practice and procedure, and to propose changes in the rules of practice. Beginning with this issue of the Official Gazette and in subsequent issues as needed, announcements will be published concerning changes in procedures and proposed amendments to the Trademark Rules of Practice.

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WILLIAM E. SCHUYLER, Jr.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(308) Request for Extension of Time in Which to Oppose

The Patent Office is adopting a new procedure to be used when filing a request for an extension of time in which to oppose under Section 13 of the Trademark Act and Rule 2.102, Trademark Rules of Practice. All requests for extension of time should be submitted in triplicate. The Patent Office will stamp each copy of the request with the action taken and send a copy to the requester and the applicant. The third copy will be entered in the file.

The purpose of this new procedure is to expedite the handling of extensions of time by eliminating the preparation of a formal notice of the disposition of the request. Further, this procedure will provide the applicant with additional information concerning the potential opposition.

WILLIAM E. SCHUYLER, Jr.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 3 (Aug. 3, 1971)]

(309) Recording of Documents Affecting Title

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

WILLIAM E. SCHUYLER, Jr.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(310) Trademark Examining Procedure for Amended Applications; Reporting Oldest Dates of Amended Trademark Applications

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the Official Gazette (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

RENE D. TEGTMEYER,
July 15, 1971. *Assistant Commissioner.*

[889 O.G. TM 6 (Aug. 3, 1971)]

(311) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter 1—Patent Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Recognition of Attorneys and Agents, Standards of Conduct, and Patent Application Petitions

These rules changes eliminate present provision for the recognition and registration of firms of attorneys and agents for practice in patent and trademark cases, and permit registered attorneys and agents to file papers in patent applications without the need for filing powers of attorney or authorizations. The changes further establish the Code of Professional Responsibility of the American Bar Association as the standard of conduct for those practicing before the Patent Office insofar as the Code is not inconsistent with Patent Office rules. Other changes eliminate the present requirement for a petition or other express request for a patent and liberalize requirements as to inventor names.

The changes relating to the discontinuance of the recognition and registration of firms are intended to obviate problems incident to such registration such as, for example, the lack of certainty as to the responsibility of individual attorneys and agents for actions taken by registered nonpartnership business entities, such as professional corporations, the problems associated with the rights to firm names and registration numbers upon dissolution or reorganization of firms, and the recognition as "firms" of groups of attorneys or agents, such as parts of corporation organizations, when the attorneys and agents are not in fact associated as partners. Acceptance of papers filed in patent applications by registered attorneys and agents upon a representation that the attorney or agent is authorized to act in a representative capacity is for the purpose of facilitating responses on behalf of applicants in patent applications, and, further, to obviate the need for filing powers of attorney or authorizations of agent in individual applications when there has been a change in composition of law firms or corporate patent staffs. Interviews with a registered attorney or agent not of record will, in view of 35 U.S.C. section 122, be conducted only on the basis of information and files supplied by the attorney or agent.

Provision is made for an applicant to supply an address to receive correspondence from the Patent Office concerning his application, in addition to his residence address, so that the Patent Office may direct mail to any address of applicant's selection, such as a corporate patent department, a firm of attorneys or agents, or an individual attorney, agent, or other person. In connection with patent applications pending upon the effective date of the changes in which a firm is the only representative of record (and in connection with divisions and continuations thereof not requiring execution by the applicant), the address of the firm will be considered to be the correspondence address for the application. Powers of attorney and authorizations of agent in favor of registered individual attorneys and agents will, of course, continue to be recognized and accepted.

The amendments to §§ 1.344 and 2.13 are intended to provide a more definite and uniform standard of conduct for those engaged in practice before the Patent Office than do present rules. The Code of Professional Responsibility of the American Bar Association is incorporated by reference in the rule with a statement as to where copies thereof may be inspected or obtained. The rule specifies that the standards referred to are those set forth in the Code of Professional Responsibility as amended February 24, 1970, and the rule does not, therefore, refer to standards imposed by later amendments of the Code. Any standards in other Patent Office rules which are inconsistent with standards imposed by the Code (as, for example, the limitations in § 1.345(b) on the distribution of professional announcements and the duties imposed by § 1.205(b)) remain in force.

The elimination of the requirement for a petition requesting the grant of a patent and the relaxation of requirements as to the names of applicants are intended to simplify patent application procedures. Section 1.76 is being revoked as redundant in view of revisions in § 1.57.

Notice of proposed rule making regarding revocation of §§ 1.35 and 1.61 and revision of §§ 1.14, 1.21, 1.33, 1.34, 1.36, 1.51, 1.52, 1.57, 1.76, 1.341, 1.343, 1.344, 1.346, 1.347, 2.13, and 2.15 of Title 37, Code of Federal Regulations was published in the Federal Register of Janutry 15, 1971 (36 F.R. 611). Interested persons were given an opportunity to participate in the rulemaking process through submission of comments in writing and at an oral hearing held on March 23, 1971. The rules are being adopted after full and careful consideration of all the material submitted. The departures from the published text reflect certain of the views expressed in the submitted material.

Effective date. This revision shall become effective on the date of its publication in the Federal Register (7–2–71).

In consideration of the comments received and pursuant to the authority contained in Section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), and Section 31 of that Act (66 Stat. 795; 35 U.S.C. 31), Title 37 of the Code of Federal Regulations is hereby amended as follows:

* * * * *

18. Section 2.13 is revised to read as follows:

§ 2.13 *Professional conduct.*

Attorneys and other persons appearing before the Patent Office in trademark cases must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association as amended February 24, 1970, insofar as such code is not inconsistent with this part. A copy of the said code is available for inspection in the Office of the Solicitor, U.S. Patent Office, Room 11C04, Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 East 60th Street, Chicago, Ill. 60637.

19. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or agent.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him, or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved:
JAMES H. WAKELIN, JR.,
Assistant Secretary for
Science and Technology.

Published in 36 F.R. 12616; July 2, 1971

[890 O.G. TM 60 (Sept. 14, 1971)]

(312) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Access to Pending Applications

A proposal was published at 36 F.R. 16194 to amend § 2.27 by deleting the requirement to show good cause in order to obtain access to a pending application file.

After consideration of all comments and suggestions submitted by interested persons, the amendment as proposed is hereby adopted, subject to the following changes:

1. The title of § 2.27 is changed by inserting the word "trademark" after the word "pending."

2. In paragraph (b) of § 2.27 the word "trademark" after the word "pending" is deleted.

Access to a pending application will be granted upon oral request at the office of the Director of the Trademark Examining Operation. The files will be ordered at 2 p.m. each day and will usually be available for inspection by 3 p.m. the same day. Files must be inspected in the presence of office personnel and papers may not be removed without authorization. Copies of the contents of files may be made only in the Trademark Search Room or by the Document Service Branch. Written requests for copies of the contents of application files may be addressed to the Document Service Branch; the cost is 30 cents per page.

The procedure for access to published and registered files and terminated inter partes proceedings will remain unchanged. Access to a published application is granted by request in the Trademark Docket Section. In order to obtain access to a registered file or terminated inter partes proceeding, an order must be placed in the Trademark Docket Section. These files are available either the same day or the morning of the following day.

Effective date. This amendment is effective on the date of its publication in the Federal Register (12–31–71).

ROBERT GOTTSCHALK,
Dec. 21, 1971. *Acting Commisioner of Patents.*

JAMES H. WAKELIN, JR.,
Assistant Secretary for
Science and Technology.
December 22, 1971.

* * * * *

Published in F.R. 24506, Dec. 31, 1971

[895 O.G. TM 2 (Feb. 1, 1972)]

(313) INITIAL PROCESSING OF APPLICATIONS

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

Approved:
JAMES H. WAKELIN, JR.,
Assistant Secretary for
Science and Technology.

Published in 37 FR 942; Jan. 21, 1972

[895 O.G. TM 193 (Feb. 22, 1972)]

(314) TRADEMARK OFFICE ACTIONS

Effective Apr. 1, 1972, trademark applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

ROBERT GOTTSCHALK.
Feb. 7, 1972. *Commissioner of Patents.*

[895 O.G. TM 238 (Feb. 29, 1972)]

(315) PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

[897 O.G. TM 2 (Apr. 4, 1972)]

(316) BULKY SPECIMENS IN TRADEMARK AND SERVICE MARK APPLICATIONS

Many of the applications which are being received in the Trademark Application Section contain specimens which are too bulky to be placed inside the application file. The handling and storing of these bulky specimens is taking more time and space than can be justified. The trademark rules do not provide for filing bulky specimens, and applicants and attorneys are requested to adhere to the precise provisions of the rules.

Trademark Rule 2.56 requires that specimens be of a material suitable for being placed in a file, be capable of being arranged flat (preferably not more than one inch in thickness), and not be larger than 8½ x 13 inches. If specimens of this character cannot be furnished, Trademark Rule 2.57 provides that facsimiles in the nature of photographs or similar reproductions be filed. Facsimiles must not be larger than 8½ x 13 inches and should clearly and legibly show the mark and all matter used in connection therewith.

In order to reduce the quantity of bulky specimens and to avoid the possibility of delay in examination due to bulky specimens, the following procedure has been adopted:

When specimens cannot be fitted into the file, the Trademark Application Section forwards the specimens to the Examiner separate from the file and attaches to the file two copies of a form which is a pre-examination memorandum pointing out that the bulky specimens are not acceptable and that proper specimens should be filed promptly. Upon receipt of the file and the forms, the Examiner mails one copy of the form to the applicant, or applicant's attorney if there be one, and places the other copy in the file. The Examiner will then destroy four of the bulky specimens, retaining one until proper specimens or facsimiles are received. Failure to furnish proper specimens as requested in the memorandum may delay the process of examination of the application.

ROBERT GOTTSCHALK,
June 16, 1972. *Commissioner of Patents.*

[900 O.G. TM 176 (July 25, 1972)]

(317) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Abandonment of Application

A proposal was published at 37 FR 18391 to revise § 2.68. Full consideration has been given to all comments received pursuant to this notice and changes in the text of the original proposal have been made in view thereof.

The revision of § 2.68 permits an attorney or other person representing the applicant to abandon or withdraw an application. Prior to this revision, the applicant was required to sign the statement of abandonment. The rule is further revised by the addition of a sentence which indicates that in a Patent Office proceeding, abandonment of the application does not affect any rights which the applicant may have in the mark. The word "withdrawal" which has been added to the rule is synonymous with the word "abandonment" in the context of this rule and may be used by those who prefer to do so.

Effective date. This revision shall become effective on March 27, 1973.

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Published in 38 F.R. 7985; Mar. 27, 1973

[909 O.G. TM 254 (Apr. 24, 1973)]

(318) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT OFFICE, DEPARTMENT OF COMMERCE

PARTS 2 AND 6—RULES OF PRACTICE IN TRADEMARK CASES

International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise § 6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new § 6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act for all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the OFFICIAL GAZETTE, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§ 6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the OFFICIAL GAZETTE when the List is available from local sources or the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C

Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

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Date: May 14, 1973.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved:
BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210 (June 26, 1973)]

(NOTE: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice; prior U.S. schedule of classes was redesignated as Rule 6.2.)

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(319) TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was composed of officials from the Department of State, the U.S.

Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973; in the OFFICIAL GAZETTE of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

[912 O.G. TM 205 (July 24, 1973)]

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(320) FORM PARAGRAPHS AND PRINTED FORMS IN TRADEMARK CASES

In September of 1971, the Trademark Examining Operation began utilizing form paragraphs for the purpose of accelerating the preparation and typing of first action Office letters and to increase the uniformity in the application of the Trademark Statute and the Rules by Trademark Examiners.

The form paragraphs presently total 136 and cover those objections and grounds for refusal which are commonly relied upon by Trademark Examiners in first Office actions. In some cases, the paragraphs contain blanks to be filled in by the Examiner. In addition, the Examiner may add additional sentences to the paragraphs.

The form paragraphs have been placed on magentic tapes mounted on automatic typewriters. Where the use of a form paragraph is appropriate, the Examiner identifies the paragraph to be typed by a preassigned number which is used by the typist to effect the automatic typing of the paragraph.

The Examiner may add any additional paragraphs to the letter which are not covered by an appropriate form paragraph, in which case the typist merely manually adds the paragraph to the letter.

The form paragraphs are amended from time to time to incorporate improvements in the wording as the need for such becomes apparent. Also, new paragraphs are added and old paragraphs eliminated, as experience dictates the need.

In addition, the Office has adopted a printed first action form with check-off boxes to indicate to the applicant the appropriate objection or ground of refusal in first Office actions. This form is used only where it can be used appropriately as a complete first Office action. It is not used in any case to supplement a first Office action incorporating paragraphs not encompassed by the form action. It has been found that the form action is appropriate for use in approximately 15–20% of the first actions going out of the Office.

The form first action is also designed for use as a notice of the publication of an application for opposition.

Copies of the text of the form paragraphs used with the automatic typewriters and copies of the first action form may be obtained by addressing a request for the same to the "Commissioner of Patents, Washington, D.C. 20231."

Date: June 29, 1973.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[912 O.G. TM 310 (July 31, 1973)]

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(321) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER 1—PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Lawful Use for Supplemental Register and Size of Facsimiles

The Patent Office is revising §§ 2.47 and 2.57 of the trademark rules of practice. Section 2.47 is being revised to set forth that the year's use which is the basis for registration on the Supplemental Register must be lawful use. Existing § 2.47 states that the year's use for the Supplemental Register must be "continuous use," whereas section 23 of the Trademark Act of 1946 specifies that such use must be "lawful use." The purpose of this revision is to conform the wording of § 2.47 to the wording of the statute. This revision does not effect any change in practice, as in applying the rule the term "continuous use" has been treated as having the same meaning as the term "lawful use" in the statute.

Section 2.57 is being revised to set forth that facsimile specimens are not to exceed 8½ inches wide and 13 inches long. Existing § 2.57 states that facsimiles shall be not larger than specified for the drawing That statement is now incorrect due to a recent amendment of the drawing length to 11 inches. The purpose of this revision is to correct the wording of §2.57, and to conform the wording of rule 2.57 to the wording of § 2.56 (Specimens) which has already been amended to specify that specimens are not to exceed 8½ inches wide and 13 inches long.

Since these revisions impose no burden on any person, notice and public procedures thereon are deemed unnecessary.

Therefore, pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123), and section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6, as amended October 5, 1971, 85 Stat. 364), Part 2 of Chapter I of Title 37 of the Code of Federal Regulations is hereby revised as follows:

1. Section 2.47 is revised to read as follows:

§ 2.47 *Supplemental register.*

In an application to register on the Supplemental Register, the application shall so indicate and shall specify that the mark has been in lawful use in commerce, specifying the nature of such commerce, by the applicant for the preceding year, if the application is based on such use. When an applicant requests registration without a full year's use of the mark, in accordance with the last paragraph of section 23 of the act, the showing required must be separate from the application.
(Sec. 23, 60 Stat. 435; 15 U.S.C. 1091)

2 Section 2.57 is revised to read as follows:

§ 2.57 *Facsimiles.*

When, due to the mode of applying or affixing the trademark to the goods, or to the manner of using the mark on the goods, or to the nature of the mark, specimens as above stated cannot be furnished, five copies of a suitable photograph or other acceptable reproduction, not to exceed 8½ inches wide and 13 inches long, and clearly and legibly showing the mark and all matter used in connection therewith, shall be furnished.

Effective date. These revisions shall become effective on July 16, 1973.

Dated: July 5, 1973

RENE D. TEGTMEYER,
Acting Commissioner of Patents

Approved:
BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

Published in 38 F.R. 18876; July 16, 1973

[913 O.G. TM 2 (Aug. 7, 1973)]

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(322) CHANGES IN FORMAT FOR PUBLISHING TRADEMARKS FOR OPPOSITION

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see OFFICIAL GAZETTE of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the OFFICIAL GAZETTE of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the OFFICIAL GAZETTE entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see OFFICIAL GAZETTE of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
>
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

- Section 1. International classification—Application in more than one class
- Section 2. International classification—Application in one class
- Section 3. Prior United States classification—Application in more than one class
- Section 4. Prior United States classification—Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

RENE D. TEGTMEYER,
Mar. 22, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 122 (Apr. 16, 1974)]

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(323) WORDING IN VERIFICATION OR DECLARATION OF TRADEMARK APPLICATION

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the present language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance, Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

RENE D. TEGTMEYER,
Mar. 25, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 186 (Apr. 23, 1974)]

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(324) MAIL DELAYS AND PETITIONS TO REVIVE (TRADEMARKS)

Since applications that become abandoned unintentionally present burdens to both the Patent Office and the applicant, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure (which is similar to the procedure adopted for patent applications at 910 O.G. 402 and 910 O.G. TM 76) provides for an automatic petition to revive.

When a trademark communication which falls within the circumstances enumerated below is mailed to the Patent Office more than three full days prior to the due date, a conditional petition may be attached to the communication. If the communication is received in the Patent Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were either placed in the United States mail as first class or air mail or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office by the due date, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places the application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

A suggested declaration form for the petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited in ( ) the United States mail as first class or air mail, or ( ) the mail outside the United States as air mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on ____________________, which date is more than three full days prior to the due date, at ______________________, by ______________________.
(Location) (Name of individual)

In the event that such communication is not timely filed in the Patent Office, it is requested that this paper be treated as a petition to revive and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. ________ in the name of ____________________.

The undersigned declares further that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: (Signature of applicant or applicant's attorney)
And
Date: (Signature of person mailing, if other than the above)

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

RENE D. TEGTMEYER,
Mar. 21, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 126 (Apr. 23, 1974)]

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(325) SIGNATURE TO AMENDMENT TO SUPPLEMENTAL REGISTER

Heretofore, in amending a trademark application from the Principal Register to the Supplemental Register and there had not been a full year of use prior to the date the application was filed, the statement in the amendment, to the effect that the mark had been in use for a year, was required to be signed by the applicant.

Effective with this notice, the amendment may hereafter be made by the attorney, and the signature of the applicant normally will not be required merely because some of the year of use necessary for registration on the Supplemental Register occurred after the application was originally filed on the Principal Register. If the Examiner has basis for believing that there is some reason for further inquiry or signature by applicant, the Examiner may of course take appropriate action.

The filing date which will be effective for an application so amended will be the date the amendment is filed, as the application when originally filed was not sufficient for registration on the Supplemental Register. Trademark Rule 2.75.

RENE D. TEGTMEYER,
Apr. 4, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 250 (Apr. 30, 1974)]

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(326) TRADEMARK APPLICATIONS UNDER SECTION 44 WITHOUT SPECIMENS AND USE

A significant number of applications are being filed under Section 44 of the Trademark Act of 1946 without specimens and without a statement of use, on the basis of the decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited*, 177 USPQ 717 (TT&A Bd. 1973), so that it appears desirable to provide the public with information as to the manner in which the Patent Office is handling such applications. This procedure has been incorporated into the Trademark Manual of Examining Procedure. However, since the Manual is not yet ready for distribution, this notice is being published at this time.

The memorandum which is being sent with the filing receipt to each applicant who falls within the above circumstances explains the procedure and reads as follows:

U.S. Department of Commerce

PATENT OFFICE

Trademark Application Filed Under Section 44
of the Act of 1946;

(No Allegation of Use and No Specimens)

MEMORANDUM TO ACCOMPANY FILING RECEIPT

The decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited*, 177 USPQ 717, rendered by the Trademark Trial and Appeal Board on May 7, 1973, appears to indicate that use and specimens should no longer be requisites for applications under Sections 44(d) and 44(e) of the Trademark Act. That decision has, however, been appealed to the United States District Court for the District of Columbia.

In view of the civil action filed in this case, use and specimens as requirements for such applications are not being eliminated. The Office is therefore assigning to the above-identified application a filing date which is conditional upon the ultimate decision in the above case of *Lecroy* v. *Langis*, and is mailing a filing receipt. However, this application will not be forwarded for examination until the decision in the case becomes final. A copy of the drawing will be placed in the search room with the following stamped thereon: "Withheld from Examination—Sec. 44."

The applicant has the following alternatives:

> If applicant files specimens and a statement that the mark is in use (such statement being verified or in the form of a declaration under Rule 2.20), the application will be forwarded for examination with a filing date of the date of receipt of the specimens.
>
> If a statement of use and specimens are not filed, the application will be withheld from examination until termination of the appeal of the above decision. If the decision is affirmed, the application will be forwarded for examination. If the decision is reversed, the application will become an informal application and the papers will be returned.

C. M. WENDT,
Mar. 22, 1974. *Director, Trademark Examining Operation.*

RENE D. TEGTMEYER,
Apr. 4, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 250 (Apr. 30, 1974)]

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(327)

TITLE 37

Patents, Trademarks, and Copyrights

CHAPTER I

PATENT OFFICE, DEPARTMENT OF COMMERCE

PART 1

RULES OF PRACTICE IN PATENT CASES

PART 2

RULES OF PRACTICE IN TRADEMARK CASES

Addition of Metric (S.I.) Equivalents

The Commissioner of Patents is revising §§ 1.84, 1.253, 2.31, 2.52, 2.56 and 2.57 of the rules of practice to set forth and encourage use of the metric system of measurements in papers submitted to the Patent Office. These changes provide dual dimensions in both the patent and trademark rules of practice.

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[922 O.G. TM IX, X, XI, XII (May 14, 1974)]

(328) TRADEMARK REGISTRATION TREATY

Trademark Act of 1946

The text of the Trademark Registration Treaty (TRT), signed on June 12, 1973, was reproduced in the OFFICIAL GAZETTE of July 24, 1973 and three post-conference documents were published in the OFFICIAL GAZETTE of March 12, 1974. The questions of United States ratification and of the legislation which would be necessary for its implementation in the United States are now under study in the Patent Office. Interested persons and organizations have been requested to submit their views on these questions to the Patent Office prior to September 1, 1974.

Reproduced below is an outline of the changes in the Trademark Act of 1946 which might be required, or desirable, if the TRT is ratified and implemented. This outline is intended as a guideline to possible legislation designed to implement the requirements of the Treaty and to provide equivalent benefits to national applicants.

In regard to a few of the provisions, alternatives have been indicated. Where this is done, the order of their presentation herein does not necessarily indicate any order of preference.

This material, as well as that previously published, is made available in order to assist interested persons in their own studies of the question of ratification by the United States and implementing legislation rather than constituting a position of the Patent Office on these questions.

C. MARSHALL DANN,
Apr. 29, 1974. *Commissioner of Patents.*

OUTLINE

Introduction

This paper is an outline of possible changes in the Trademark Act of 1946 (60 Stat. 427; 15 U.S.C. 1051 et seq.), as amended, which may be required or desirable if the Trademark Registration Treaty, signed by the United States and thirteen other countries as of December 31, 1973, is ratified and implemented.

The subject is dealt with in two parts. Part I outlines changes in the domestic trademark statute which would be applicable in the case of national applications to register marks in the United States Patent Office. Part II concerns additional provisions which would be necessary in order to assimilate the proposed Treaty to this national law.

For convenience, reference is made, following some of the sections, to the article of the Treaty which requires or gives rise to the change under consideration.

PART I—CHANGES IN THE TRADEMARK ACT OF 1946, AS AMENDED

A. *Requirements for Registration on the Principal Register*

1. As an alternative to actual use, a trademark, service mark, certification or collective mark, can be registered by a person based on a declared intention to use the mark in commerce. [Article 19(3), (4)]. Special use requirements are applicable to registrations secured on this basis. (See B below).
2. As an alternative to signing by the applicant, an application may be signed by a duly appointed representative. (Article 26). Present qualifications for representation before the Patent Office (attorney admitted to practice in a State or District of Columbia) continue to apply, however.
3. Verified statement of the claim to ownership is no longer required (Article 5).

B *Special Requirements for Intent Applicants/Registrants*

1. (*a*) Applicant/registrant must commence use of the mark in commerce within three years of filing date and must declare such commencement of use during the fourth year, including the same details, etc., use dates, label specimens, etc.) as those declared by a use applicant at time of filing. [Article 19(3)].

   (*b*) Time period for filing the declaration may be shortened (three months from date of notice) on petition of interested person if the mark is involved in any proceeding under the Act on or after date of expiration of the three year use moratorium.

   Alternative: Shorter period for filing the declaration (e.g., 3½ years) and delete (*b*) above.
2. Consequence of failure to file an acceptable declaration within the prescribed time limit is cancellation of the registration or, if still pending, refusal of the application. Consequence of compliance as to part only of the goods and/or services is limitation of the registration or application to those goods and/or services. [Article 19(3)].
3. Time period for commencement of use may be extended beyond three years only upon showing of special circumstances which justify non-use.
4. Where later intent application(s) for same mark is (are) filed by the same or a related person prior to four (*Alternative*: five) years from the filing date of the earliest one, the period for commencement of use (three years) is counted from the filing date of earliest application. This provision means that a person cannot abuse the intent to use provisions by filing successive intent applications at or close to the expiration of successive three year periods, securing a new three year moratorium on use requirements with each new case. [Article 19(3)].

C. *Related Company Provision*

A minor change provides that intended use as well as use may inure to benefit of a related company. Thus, for example, an intent application by a parent company would be valid if the evidence supporting the intent concerned adoption of the mark by and related activities of a controlled subsidiary.

D. *Registration on the Principal Register*

1. If a registration based on an intent application is issued before the declaration of use is filed, the certificate of registration indicates this fact in lieu of the dates of use.
2. *Date of registration* is the same date as the filing date, which is defined as the date on which all basic elements of an application are received by the Patent Office. (See Trademark Rule 2.21.) Certificate also indicates the *date of issue,* defined as the date of the OFFICIAL GAZETTE in which notice of the issuance of the registration is published. [Article 11(2)].
3. A certificate of registration is prima facie evidence of the validity of the registration, the right of the registrant to exclude any other person from securing or maintaining a confusingly similar registration, and the exclusive right to use only for those goods or services in respect of which the mark is declared in the certificate of registration, or in a subsequently filed declaration of use, to be in use in commerce.

E. *Duration of Registration, Sixth Year Affidavit and Renewal*

1. Term of registration and of renewal is changed from twenty years to ten years, counted from the *date of registration.* [Article 17].
2. Sixth year affidavit of use remains applicable to all registrations, with its due date counted from *date of issue* of the registration (Change only in terminology).

   Alternative: Same, except that due date is counted from *date of registration.*
3. Sixth year affidavit must show use *in commerce.*
4. A renewal application need not be verified. (Article 17).
5. A late renewal application may be filed within six months (rather than three) after the date of expiration of the term. (Article 17).

F. *Assignment*

An application or registration based on intent is not assignable prior to filing the declaration of use. Exception: successor to the entire business of the original applicant.

Alternative: Assignments of registered or applied for marks without good will are valid.

G. *Examination Procedure and Oppositions*

1. Time for response to office actions is reduced from six months to three months. Purpose is to expedite completion of ex parte examination in maximum number of cases prior to cut-off. (See 3 below).
2. No mark may be refused ex parte for a reason *not* communicated to applicant prior to fifteen months from the filing date. This limitation is not applicable to a refusal determined by a decision of the TTAB or a court. [Article 12(2)].
3. Cut-off at twelve months from filing date for publication of the mark for opposition, whether or not the ex parte examination, including any appeal therefrom, has been completed. If an opposition is filed against a still pending case, full opposition proceedings are deferred until completion of the ex parte examination. If the opposed mark is eventually determined to be registrable, then full opposition proceedings are commenced, unless the opposer withdraws. [Article 12(2)].

   Alternative: Publish all marks promptly after filing and receive oppositions concurrently with the ex parte examination, deferring full opposition proceedings (as above), however, until completion of the ex parte examination.
4. Oppositions need not be verified and may be filed by a duly authorized attorney.
5. Time to oppose may not be extended to a date later than fifteen months, counted from the filing date. [Article 12(2)].

H. *Cancellation of Registrations*

1. A petition to cancel need not be verified and may be filed by a duly authorized attorney.
2. The time period for cancellation based on unrestricted grounds (i.e., 5 years) is counted from the *date of issue* of the registration (Change only in terminology).

I. *Incontestability*

The time period for incontestability is counted from the *date of issue* of the registration (Change only in terminology).

J. *Appeals*

Minor change provides for an appeal from a refusal to accept a declaration of use.

K. *Constructive Notice*

Constructive notice is applicable from *date of issue* of registration (Change only in terminology).

Alternative: Constructive notice applicable as of the date of first publication.

L. *The Supplemental Register*

1. Special Requirement of one year's use prior to filing date is deleted, making Supplemental Register registrations subject to the same use requirements, i.e., use or intention to use, as registrations on the Principal Register. [Article 19(3)].
2. Petition to cancel a Supplemental Register registration need not be verified and can be filed by a duly authorized attorney.
3. Non-use is a ground for cancellation only after expiration of three years from the filing date. [Article 19(3)].

M. *Infringement Remedies, Evidence and Priority*

1. Owner of a registration based on an intent application may not start any action for infringement until the declaration of use has been filed and accepted. Any remedies for infringement of registered marks based on intent are applicable only to period after commencement of continuing use. [Article 19(3)].
2. A certificate of registration is prima facie evidence of exclusive right to use only for those goods or services in respect of which the mark is declared in the certificate of registration, or in a subsequently filed declaration of use, to be in use in commerce. (Consistent with M 1 above).
3. In an action based on an incontestable registration, defense based on innocent adoption and continuous use (i.e., section 33(b)(5)) is subject to the condition that the defendant must be innocent of knowledge not only of prior use of the registrant, but, where applicable, of registration based upon a previously filed declaration of intention to use.
4. For the purpose of determining priority of rights in *any* proceeding under the Act, an application or registration based on intent to use is accorded the same effect *as if* the applicant or registrant had commenced use of the mark in commerce on the filing date. Except where priority is accorded in a Patent Office proceeding, or in an appeal therefrom, prior to three years from the filing date, a condition to the according of priority on this basis is filing and acceptance of the declaration of use. [Article 19(3)].

N. *International Convention Provisions*

1. The waiver of use requirements for an application based on registration of the mark in a country with which we have a treaty relationship is deleted. Since all applicants have the alternative of securing a registration based on an intention to use the mark in commerce, the waiver of use requirements is no longer necessary and such applications are subject to all requirements of the Act. Similarly, the first sentence of section 44(c) is deleted, being unnecessary in view of the general limitation on actions for infringement based on unused marks. (See M 1).
2. A minor change in section 44(d)(4) provides that a registration based on intent is not subject to the limitation of this subparagraph if the declaration of use has been accepted prior to issuance of the registration.

O. *Definitions*

1. The words "or intended to be used" are inserted in several of the definitions to take into account the new basis for registration.
2. Filing date, date of issue and date of registration are defined. (See D 2). Careful definition of "filing date" is important since it is the basis for determining the priority of intent applications. (See M 4).
3. The definition of abandonment is modified to the extent that non-use for two consecutive years is prima facie abandonment only if the two year period terminates on a date later than the date of expiration of three year use moratorium. Also, failure to commence use within the prescribed period, coupled with absence of any intention to commence use, constitutes abandonment. [Article 19(3)].

PART II—IMPLEMENTATION OF TRADEMARK REGISTRATION TREATY

A. *Definitions*

For purposes of the Act, an international application, international registration or later designation under the Trademark Registration Treaty (TRT) is defined to include only one which designates the United States; contains a declaration of intention to use the mark in commerce with or in the United States (or is accompanied by a declaration of actual use of the mark in such commerce); and is published and communicated to the Patent Office as required by the TRT. [Articles 10, 11, 19(4)].

B. *Effect in the United States of Proceedings Under the Treaty*

1. International applications, international registrations and later designations as defined above (See A), and the recordings related thereto, are accorded all of the effects, and their applicants or owners are entitled to all of the benefits, in the United States provided by the TRT, subject to all of the requirements of the TRT and, except as listed below, of the Trademark Act.
2. Exceptions to full application of the Trademark Act are:
   - (*a*) The fee referred to in section 1 is waived. (*Note:* A fee equivalent to the U.S. application fee is paid to the International Bureau and the amounts of the fees collected on behalf of the United States are paid to the U.S. in lump sums.) [Article 19(1)].
   - (*b*) The requirement to designate an agent for service in the application [i.e., present section 1(d)] is waived, provided that such person must be designated on or prior to date on which the owner replies to any communication by the examiner or otherwise institutes or defends any proceeding under the Act. Until such person has been designated, notices or process may be served upon the Commissioner. Consequence of failure to designate such person on or prior to the first to occur of the above events is cancellation of any effect of the international registration in the United States. [Article 19(7)].
   - (*c*) A certificate of registration issued by the Patent Office based on an international registration shall also indicate the number and date of the international registration to which it relates.
   - (*d*) The *filing date* under the Act of an international registration is the international registration date. The *date of issue* is the date on which registration effect in the United States of an international registration comes into existence pursuant to a notice to this effect published in the OFFICIAL GAZETTE, as

in the case of publication of issuance of a national registration. [Article 11(1)(2)].

(*e*) The recording of a change in ownership, or in the name of the owner, of an international registration shall not be accorded any effect as the recording of an assignment unless, within three months from the date of publication of such recording under the TRT, instruments of assignment conforming to the requirements of the Trademark Act are recorded in the Patent Office. [Article 14(4)].

(*f*) Renewal of the effect of an international registration in the United States by the International Bureau is not subject to the requirements of section 9, provided that the registrant shall file in the Patent Office, prior to the expiration of six months counted from the starting date of the term of renewal, a declaration as to use of the mark in commerce. Consequences of failure to file an acceptable use declaration are the same as in the case of failure to file or filing of an unacceptable fourth year declaration of use (See Part I, B 2).

Note: The renewal fee is collected and distributed in the same way as the filing fee. (See (*a*) above.) [Article 17, 19(1), 19(3)].

C. *Authority of the Commissioner*

The Commissioner is authorized to accord and deny effects, communicate notifications, make attestations, decide petitions, determine the amount of and receive payments of fees, and perform all other acts as provided by the TRT, subject to the requirements thereof.

D. *Notifications*

The Commissioner is required to effect all required notifications promptly. Where the time limitation of the TRT is stated in terms of the date of receipt, the notification shall be transmitted to the International Bureau no later than 14 days from the due date via Registered Air Mail.

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Final Note: The above outline does not include final provisions concerning the effective date of certain changes. Generally, changes that might have an effect on existing rights would be effective only as to applications filed on or after the effective date of the amended Act.

[922 O.G. TM 1, 2, 3 (May 28, 1974)]

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(329) TRADEMARK MANUAL OF EXAMINING PROCEDURE NOW AVAILABLE

The Trademark Manual of Examining Procedure (designated in brief as TMEP) may be ordered on a subscription basis from the Superintendent of Documents at the following address:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The price of a subscription is $8.10, plus $2.05 for foreign mailing. Payment should accompany the order. (Orders should *not* be placed with the Patent Office.)

The purpose of the Trademark Manual of Examining Procedure is to provide an authoritative reference work on practices and procedures relative to prosecution of applications to register marks in the Patent Office. Revisions necessary to keep the Manual current will be made by issuance of sets of revision pages from time to time as part of the Manual subscription. Early information as to changes in the Manual will be given prior to issuance of revision pages by notices in the OFFICIAL GAZETTE or by change notices furnished to Manual subscribers.

The Trademark Directives which were issued as Series 1 (pre-Manual) pending publication of the Manual, have been incorporated in the Manual, and there will be no further Directives in that Series. (For announcements as to the pre-Manual Directives, see OFFICIAL GAZETTES of August 31, 1971, Vol. 889, No. 5, and April 4, 1972, Vol. 897, No. 1.)

RENE D. TEGTMEYER,
May 29, 1974. *Assistant Commissioner for Trademarks.*

[923 O.G. TM 204 (June 25, 1974)]

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(330) SHORT TITLES FOR INTERNATIONAL TRADEMARK CLASSES

The United States Patent Office will, effective immediately, associate the following word titles with the respective international trademark class numbers:

GOODS

1 Chemicals
2 Paints
3 Cosmetics and cleaning preparations
4 Lubricants and fuels
5 Pharmaceuticals
6 Metal goods
7 Machinery
8 Hand tools
9 Electrical and scientific apparatus
10 Medical apparatus
11 Environmental control apparatus
12 Vehicles
13 Firearms
14 Jewelry
15 Musical instruments
16 Paper goods and printed matter
17 Rubber goods
18 Leather goods
19 Non-metallic building materials
20 Furniture and articles not otherwise classified
21 Housewares and glass
22 Cordage and fibers
23 Yarns and threads
24 Fabrics
25 Clothing
26 Fancy goods
27 Floor coverings
28 Toys and sporting goods
29 Meats and processed foods
30 Staple foods
31 Natural agricultural products
32 Light beverages
33 Wines and spirits
34 Smokers' articles

SERVICES

35 Advertising and business
36 Insurance and financial
37 Construction and repair
38 Communication
39 Transportation and storage
40 Material treatment
41 Education and entertainment
42 Miscellaneous

These short titles are not an official part of the international classification. Their purpose is to provide a means by which the general content of numbered international classes can be quickly identified. Therefore the titles selected consist of short terms which generally correspond to the major content of each class but which are not intended to be more than merely suggestive of the content. Because of their nature these titles will not necessarily disclose the classification of specific items. The titles are not designed to be used for classification but only as information to assist in the identification of numbered classes. For determining classification of particular goods and services and for full disclosure of the contents of international classes, it is necessary to refer to the Alphabetical List of Goods and Services and to the names of international classes and the explanatory notes in the volume entitled "International Classification of Goods and Services to Which Trade Marks Are Applied," published by the World Intellectual Property Organization (WIPO). The full names of international classes appear also in Section 6.1 of the Trademark Rules of Practice.

The short titles are being printed in the OFFICIAL GAZETTE in association with the international class numbers under MARKS PUBLISHED FOR OPPOSITION, Sections 1 and 2, under TRADEMARK REGISTRATIONS ISSUED, PRINCIPAL REGISTER, Section 1, and under SUPPLEMENTAL REGISTER, Sections 1 and 2.

Adoption of the international classification by the United States as its system of classification was announced in the OFFICIAL GAZETTE of June 26, 1973 (911 O.G. TM 210).

Date: June 18, 1974.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[924 O.G. TM 155 (July 16, 1974)]

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(331) HAND DELIVERY OF TRADEMARK PAPERS

Trademark papers which are not accompanied by fees or by authorization to charge a deposit account, may be filed by hand in the Trademark Docket Section or in the Incoming Mail Section of the Mail and Correspondence Division. However, to avoid confusion concerning money matters, when papers which are accompanied by fees or by authorization to charge a deposit account are filed by hand, they should be delivered only to the window in the Incoming Mail Section of the Mail and Correspondence Division where personnel can immediately refer the money or the charge to the Cashier. Trademark Examiners should not be requested to receive papers for filing (either with or without fees) since there is no convenient procedure by which the Examiners can transmit such papers to proper locations.

If a receipt is desired from the Trademark Docket Section, it may take the form of a duplicate copy of the paper or of a card identifying the paper and the application. The receipt will be date-stamped at the same time as the paper and handed back to the person delivering the paper. If a receipt is desired from the Incoming Mail Section, a card should be used. The card will be date-stamped and handed back to the person delivering the paper.

When a card is used for receipt, it should contain sufficient information to identify the paper and the application clearly, such as applicant's name, the serial number and filing date of the application, the mark, and the title or description of the paper being filed.

In the discretion of the Assistant Commissioner for Trademarks, or of the Director of the Trademark Examining Operation, or of the Trademark Trial and Appeal Board, papers appropriate for those Offices (such as petitions or briefs) may be filed by hand in such Offices.

The procedure set forth in the notice entitled "Hand-Delivery of Papers" in the OFFICIAL GAZETTE of February 26, 1974 (919 O.G. TM 180) pertains to papers for patent applications. The designation "Examining Group" used in that notice relates to the patent examining area of the Patent Office. (The equivalent designation in the trademark examining area is "Examining Division.")

RENE D. TEGTMEYER,
Aug. 21, 1974. *Assistant Commmissioner for Trademarks.*

[926 O.G. TM 132 (Sept. 17, 1974)]

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(332) TRADEMARK REGISTRATION TREATY POST CONFERENCE INFORMATION

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and 13 other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. The substance of post conference documents on the history of the treaty, a brief summary of its provisions and advantages, and explanatory notes on each of the articles, were reproduced in the OFFICIAL GAZETTE of March 12, 1974. In addition, an outline of the possible changes in the "Trademark Act of 1946, As Amended," which may be required or desirable if the Trademark Registration Treaty is ratified and implemented was published in the OFFICIAL GAZETTE of May 28, 1974.

The World Intellectual Property Organization (WIPO), which served as the Secretariat of the Vienna Diplomatic Conference at which the Trademark Registration Treaty was adopted, has now circulated an additional post conference document, consisting of explanatory notes on the regulations under the treaty. These notes are intended to facilitate the reading of the text of the regulations, providing, where a rule refers to certain articles of the treaty or to other rules of the regulations, brief information on those articles or other rules. This document is supplemental, and similar in format, to the one comprising notes on the articles which was published on March 12, 1974.

The Office will supply a photo copy of these explanatory notes on the TRT regulations (TRT/PCD/4, dated July 31, 1974) to any interested person who may request such copy.

C. MARSHALL DANN,
Dated: Sept 17, 1974. *Commissioner of Patents.*

[927 O.G. TM 124 (Oct. 15, 1974)]

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(333) REALIGNMENT OF PATENT OFFICE HANDLING OF OPPOSITION PAPERS

In order to increase efficiency in processing papers, all activities connected with the handling of oppositions have been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board. As a result of the transfer, requests for extension of time to oppose and matters pertinent thereto are now received and processed by the staff of the Trademark Trial and Appeal Board rather than by the staff of the Office of the Director of the Trademark Examining Operation.

No substantial change in procedure in the handling of papers relative to oppositions and extensions of time is contemplated by this realignment of duties in the Patent Office. Reasonable requests for extensions of time to oppose will continue to be granted with liberality particularly if there is no protest by another party and if the parties are negotiating or otherwise exploring bases for settlement, and fees for both verified and unverified oppositions will continue to be required to be filed within the time prescribed for opposing.

RENE D. TEGTMEYER,
Nov. 14, 1974. *Assistant Commissioner for Trademarks.*

[929 O.G. TM 62 (Dec. 10, 1974)]

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(334) TRADEMARK SEMINAR IN OFFICE PRACTICE AND PROCEDURE

A Seminar in Office Practice and Procedures was established in 1973 as a training course for new trademark examiners. The course covers all phases of trademark law, office practice and procedure. The seminar deals with both substantive and procedural issues. Among the topics covered are types of marks, types of applications and registrations, ownership of marks, procedural and substantive examination of application, with emphasis on the statutory grounds for refusal to register, classification of goods and searching.

Members of the Seminar will prosecute a sample application through the various stages of Office procedures beginning with the initial examination and preparation of a first action, the final refusal to register based on statutory grounds, the writing of an examiner's statement on appeal, and concluding with an oral hearing before the Trademark Trial & Appeal Board.

Lectures are conducted by supervisory personnel, senior examiners, members of the Trademark Trial & Appeal Board and attorneys from outside the Patent Office.

The Seminar is given in the U.S. Patent Office, 2011 Jefferson Davis Highway, Crystal Plaza, Arlington, Va. The Seminar is conducted twice a year. The next course is scheduled for Feb. 3 to March 7, 1975. Classes meet from 9:00 A.M. to 11:30 A.M. Monday through Thursday.

While the course is intended for new trademark examiners, a limited number of applicants from government agencies and from outside the government will be accepted for training on a space available basis. The Seminar is normally limited to ten students. To be eligible for training, a candidate should possess a law degree, and be involved in trademark practice. The fee for attendance at this course is $400.00.

Additional information concerning this Seminar may be obtained from the Office of Trademark Program Control at the Patent Office. Inquiries should be addressed to the Commissioner of Patents, U.S. Patent Office, Washington, D.C. 20231, Attention: Office of Trademark Program Control, or by telephone at 703-557-3881.

RENE D. TEGTMEYER,
Jan. 3, 1975. *Assistant Commissioner for Trademarks.*

[930 O.G. TM 246 (Jan. 21, 1975)]

(335)

Public Law 93-600
93rd Congress, H. R. 8981
January 2, 1975

88 STAT. 1955

An Act

To amend the Trademark Act to extend the time for filing oppositions, to eliminate the requirement for filing reasons of appeal in the Patent Office, and to provide for awarding attorney fees.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Trademarks. Extension for filing oppositions. 15 USC 1063.

SECTION 1. Section 13 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by deleting the second sentence and substituting therefor: "Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause. The Commissioner shall notify the applicant of each extension of the time for filing opposition.".

15 USC 1071.

SEC. 2. Section 21 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by deleting subsections (2). (3). and (4) from paragraph (a) and substituting therefor:

Notice of appeal.

"(2) Such an appeal to the United States Court of Customs and Patent Appeals shall be taken by filing a notice of appeal with the Commissioner, within sixty days after the date of the decision appealed from or such longer time after said date as the Commissioner appoints. The notice of such appeal shall specify the party or parties taking the appeal, shall designate the decision or part thereof appealed from, and shall state that the appeal is taken to said court.

Hearing, notice.

"(3) The court shall, before hearing such appeal, give notice of the time and place of the hearing to the Commissioner and the parties thereto. The Commissioner shall transmit to the court certified copies of all the necessary original papers and evidence in the case specified by the appellant and any additional papers and evidence specified by the appellee, and in an ex parte case the Commissioner shall furnish the court with a brief explaining the grounds of the decision of the Patent Office, touching all the points involved in the appeal.

"(4) The court shall decide such appeal on the evidence produced before the Patent Office. The court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent Office and govern further proceedings in the case.".

Attorney fees. 15 USC 1117.

SEC. 3. Section 35 of the Trademark Act of 1946 (60 Stat. 427), as amended, is amended by adding the following sentence at the end thereof: "The court in exceptional cases may award reasonable attorney fees to the prevailing party.".

Effective date. 15 USC 1063 note.

SEC. 4. This Act shall become effective upon enactment, but shall not affect any suit, proceeding, or appeal then pending.

Approved January 2, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-524 (Comm. on the Judiciary).
SENATE REPORT No. 93-1400 (Comm. on the Judiciary).
CONGRESSIONAL RECORD:
  Vol. 119 (1973): Oct. 15, considered and passed House.
  Vol. 120 (1974): Dec. 18, considered and passed Senate.

[931 O.G. TM 58 (Feb. 11, 1975)]

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(336)

REPORT
OF THE
UNITED STATES DELEGATION
TO THE
VIENNA DIPLOMATIC CONFERENCE ON INDUSTRIAL PROPERTY, 1973

Vienna, Austria

May 17 to June 12, 1973

Submitted to the Secretary of State

DANIEL M. SEARBY,
Chairman of the Delegation.

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1. Title, Site and Date of Conference

Vienna Diplomatic Conference on Industrial Property, 1973, Vienna, Austria, May 17 to June 12, 1973.

2. Brief Background

The Vienna Diplomatic Conference on Industrial Property was held from May 17 to June 12, 1973, with the Government of Austria serving as the host. Within the framework of the Diplomatic Conference, there were three Conferences: (a) the Conference on the Trademark Registration Treaty; (b) the Conference on the Protection of Type Faces and their International Deposit; and (c) the Conference on the International Classification of the Figurative Elements of Marks.

(a) *Conference on the Trademark Registration Treaty*

One of the most important international trademark problems for American companies is the complexity and high cost of establishing and protecting trademarks in foreign markets under national laws and procedures. Separate actions in approximately 150 different jurisdictions (i.e., independent states, possessions, territories, etc.) are now required in order to extend protection of a mark throughout the world.

The Patent Office, with the support of the Bureau of International Commerce in the Commerce Department and the Department of State, engaged in an extensive study of the question of U.S. participation in an international trademark filing agreement beginning in 1965. Consideration was first given to the possibility of U.S. adherence to the existing Madrid Agreement for International Registration of Marks, which is a special arrangement under the basic Paris Industrial Property Convention to which the U.S. is a party. By 1968, it became clear that there was substantial opposition by certain private interests to U.S. adherence to the Madrid Agreement in its present form. During the period 1968–1970 consideration was given to revision of the Madrid Agreement with a view to bringing in not only the U.S. but other important nonmember countries such as the United Kingdom and Japan.

The effort to develop a new trademark registration agreement was initiated by a United States-sponsored resolution which was approved unanimously by the administrative organs of the Paris Convention in September 1970. It was undertaken within the broader framework of the Paris Convention, which has 80 member States, rather than the more restricted Madrid Agreement, which has only 21 member States. This effort was directed toward establishing a new treaty—the Trademark Registration Treaty (TRT).

A series of preparatory meetings were held at which drafts of the Treaty and Regulations were developed. These meetings included a Consultants Group in March 1971 and three Committees of Experts in October 1971, May 1972, and December 1972.

On the basis of these meetings, the World Intellectual Property Organization (WIPO), the Secretariat for both the Paris Industrial Property Convention and the Madrid Agreement, prepared various drafts of the TRT. Certain of these drafts were published by the U.S. Patent Office and circulated to all interested parties (e.g., American Bar Association, National Association of Manufacturers, U.S. Trademark Association) in the United States for comment. Patent Office personnel also held numerous meetings with interested groups to explain and discuss the TRT.

(b) *Conference on the Protection of Type Faces and their International Deposit*

There were a number of meetings on the question of creating a special international agreement for the protection of type faces during the 1960's. U.S. interest and participation in these earlier meetings was limited. About 1970 U.S. industry had become more concerned about the possibility of providing some form of protection for type faces. As a consequence, the U.S. did participate in the fifth session of the Committee of Experts in February 1971 and the sixth session of the Committee in March 1972.

Designing a new type face is an important corollary activity of manufacturers of typesetting machines. The design of a new type face is expensive. Therefore, U.S. industry and the various typographic associations are very much interested in design protection. New technological developments in phototypesetting equipment have made it imperative to have new type faces for these machines.

Under U.S. law, however, except for so-called exotic type faces, the present design patent protection is very limited and, from the viewpoint of private industry, inadequate. Further, the existing Copyright Office regulations are such that type faces are not subject to copyright.

The United States was invited by the Director General of the World Intellectual Property Organization to be represented at the Vienna Conference with respect to the negotiation of an Agreement for the Protection of Type Faces.

Because of the strong interest of the U.S. type face industry, the United States decided to participate in the negotiations but not to sign the Agreement.

(c) *Conference on the International Classification of the Figurative Elements of Marks*

The general purpose of this Agreement is to establish uniformity among countries with respect to the development and use of a classification system which could be applied to the design elements of trademarks.

The existing Nice Agreement, to which the United States is a party, has already established an international classification of goods and services for the purpose of registering trademarks and service marks.

A 1971 Committee of Experts discussed the question of the diplomatic instrument that might serve as a legal framework for the proposed Classification of Figurative Elements. Since opinion in the Committee was divided, the Committee of Experts finally concluded that it would be preferable to submit two alternative drafts to the Vienna Diplomatic Conference: a draft Protocol, an Additional Act, to be annexed to the Nice Agreement, and the draft of a separate Agreement.

* * * * *

9. Conclusions

(a) *Trademark Registration Treaty*

In order to become a party to the Trademark Registration Treaty, the United States is required to effect material changes in its trademark law, principally the granting of limited national registration effect to marks which are not in use during the available three year period when use is not required. There are differences of opinion in the private sector as to the desirability of these changes as well as others of lesser importance which the treaty requires.

(b) *Agreement for the Protection of Type Faces and Their International Deposit*

The United States would, if it became a party to the Type Faces Agreement, probably accord protection under its copyright law. Some amendment of the copyright law may be required for this purpose. However, a new Register of Copyrights was appointed in November 1973 and she is reviewing the question of protection of type faces. A new interpretation of the copyright law may justify domestic copyright protection and may facilitate U.S. acceptance of this Agreement.

(c) *Agreement Establishing the International Classification of the Figurative Elements of Marks*

The Agreement Establishing the International Classification of the Figurative Elements of Marks closely parallels both the Nice and Strasbourg Agreements and is generally acceptable to the United States. However, we do not contemplate becoming a party to the Figurative Elements Agreement at the present time. The existence of the Agreement presents no problem for the United States but permits an opportunity for us to do in-depth studies of the revisions of the Classification in order to determine our particular interest in the system.

[931 O.G. TM 6 (Feb. 11, 1975)]

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(337) Conference of Parties in Trademark Inter Partes Proceedings

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

> Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/ or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

[932 O.G. TM 2 (Mar. 4, 1975)]

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(338) Patent and Trademark Cases

[37 CFR Parts 1, 2, 4]

Rules and Procedures

Notice is hereby given that, pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440, 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952 (66 Stat. 793, 35 U.S.C. 6), as amended October 5, 1971 (85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending § § 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.18, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2.120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187 and 4.2.

All persons are invited to present their written views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 1, 1975. No oral hearing will be held. Written comments or suggestions will be available for examination by interested persons at Crystal Plaza Building 3, Room 11C17a, 2021 Jefferson Davis Highway, Arlington, Virginia.

Assignment records open to public inspection. The proposed revision of § 1.12 is intended to make clear the existing practice that assignment records relating to trademark applications and registrations are open to the public. The present wording, which is based on the amendment of § 1.12 on August 23, 1965 (819 O.G. 443), does not clearly distinguish between the procedure to be applied to patent records and to trademark records. In view of a number of inquiries as to the manner in which the amendment was to be applied, a notice was published in the OFFICIAL GAZETTE of January 18, 1966 (822 O.G. 769) stating that assignments relating to applications for registration of trademarks will be open to public inspection as heretofore. Since assignment records relating to trademark applications and registrations have always been open to the public, which practice continues at the present time, it is believed desirable to make the practice clear.

In the third sentence of the section, language is added to indicate that the requirement for written authority applies only to patent applications.

Time less than six months. It is proposed to revise paragraph (b) of section 1.136 to read "sufficient cause" rather than "good and sufficient cause." This revision is merely for consistency of language with other sections in this part and does not represent any change in practice.

Reconsideration of decision. It is proposed to revise paragraph (b) of § 1.197, paragraph (b) of section 1.256, paragraph (c) of § § 2.129 and 2.144, to provide that the Board of Appeals, the Board of Patent Interferences, and the Trademark Trial and Appeal Board may, for sufficient cause, extend the time for filing a request for rehearing or reconsideration, or modification of a decision rendered by these Boards. Proposed revised paragraph (b) of § 1.256 and paragraph (c) of § 2.129 provide similar opportunity for extension of time for filing a reply to such a request in inter partes cases. The purpose of these revisions is to eliminate the necessity for waiver of a rule by the Comissioner in order for a party to obtain an extension of time.

In these sections, as well as in the related § § 1.244(c), 2.127(b), 1.304 and 2.145(d), it is proposed to use the term "request" rather than "petition" in connection with rehearing or reconsideration, in order to avoid redundancy and in order to clearly distinguish such action from a petition to the Commissioner.

Time for appeal or civil action. Proposed revised § 1.304 and proposed revised paragraph (d) of § 2.145 clarify the portion of each which relates to the time for filing appeal or commencing civil action in cases where a request for rehearing or reconsideration, or modification of a decision, is filed. Present § § 1.304 and 2.145(d) provide for an extension of time for appeal or civil action if a request for rehearing is filed within thirty days after a decision, but their language is subject to the interpretation that they deny any extension if the request for rehearing is filed more than thirty days after the date of a decision. It has been the practice of the Patent and Trademark Office, however, in those cases where the thirty days to file a request for rehearing has been enlarged by waiver of rule by the Commissioner under § 1.183 or § 2.148, to consider the waiver as also applying to the thirty day period specified in § § 1.304 and 2.145(d). *Dresser Industries, Inc.* v. *Safety-Kleen Corporation,* 183 USPQ 180 (Comr. Pats. 1974).

In order to clarify the meaning of § 1.304 and paragraph (d) of § 2.145, it is proposed to revise these sections to eliminate all reference to a definite time for filing a request for rehearing, and to include instead reference to the provisions for filing request for rehearing which are made in § § 1.197(b), 1.256(b), 2.129(c) and 2.144. Such sections are proposed to be revised to provide for extension of the basic time specified therein.

Proposed revised § 1.304 and paragraph (d) of § 2.145 also provide that the time for appeal or commencing civil action (whether it be the original sixty days, or the thirty days extension after decision on a request for rehearing) may be extended by the Commissioner upon a showing of sufficient cause.

Proposed revised § 1.304 is arranged in three subsections identified as (a), (b) and (c), and paragraph (d) of § 2.145 is arranged in three subsections identified as (1), (2) and (3). The purpose of separate subsections is to provide a means for easier reading and understanding of these sections in view of the fact that three different points are included in the sections. The proposed rearrangement does not affect practice.

Elimination of reasons of appeal in trademark cases. It is proposed to revise paragraphs, (a), (b) and (d) of § 2.145 to eliminate reference to the need to file the reasons of appeal in the Patent and Trademark Office when appealing a decision of the Trademark Trial and Appeal Board to the U.S. Court of Customs and Patent Appeals, consistent with the modification of section 21 of the trademark act made by Pub. L. 93–600, enacted January 2, 1975.

Recognition for representation, powers of attorney, and correspondence with attorney. It is proposed to revise §§ 2.18 and 4.2 to clarify the existing practice of the Patent and Trademark Office in relation to firms of attorneys and powers of attorney, and the handling of correspondence with attorneys and other recognized persons, in trademark cases.

Under present practice firms of attorneys are not recognized for practice before the Office in trademark cases. The persons identified in § 2.12 who may represent others before the Office are persons to whom individual responsibility may attach for actions taken and who must conform under § 2.13 to the Code of Professional Responsibility of the American Bar Association. Section 2.12(a) pertains to attorneys at law and does not provide for representation by a firm of attorneys as distinguished from individual attorneys. Further, reference to representation by a firm of attorneys was eliminated from § 2.15 by amendment effective July 2, 1971 (see 890 O.G. TM 60, September 14, 1971). If a firm name is given in the signature location on a paper filed by an attorney, nevertheless under § 2.15 an individual attorney must actually sign the paper.

It is not necessary under existing practice for an attorney at law filing a paper in connection with a trademark case to have a power of attorney from the party whom he represents. Normally, a letter of transmittal on an attorney's letterhead for a paper not required to be signed by the attorney, such as an application, or an attorney's signature on a paper during prosecution, or a personal appearance, is sufficient for an attorney to be recognized as a party's representative. If deemed necessary, further proof may be required under § 2.17 (a) of an attorney's authority to act for a party or an attorney's qualifications under § 2.12(a).

Although not needed, a written power of attorney is accepted if it is filed. Such power may be revoked, and if revoked, the Office will not thereafter recognize such attorney in that case unless he is again specifically appointed. Any written power of attorney which is filed should designate individuals and not firms of attorneys; a power of attorney which designates a firm rather than individuals is not considered to be a power but merely a direction that correspondence be addressed to that firm. (See 890 O.G. TM 60, September 14, 1971.)

It is proposed to eliminate from § 4.2 (power of attorney form) the requirement to identify bar membership, since further proof may be required under section 2.17(a) if there appears to be any reason to question either an attorney's authority to represent a party or an attorney's qualifications under § 2.12(a). It is further proposed to eliminate from § 4.2 present Note (8) which calls for the names of law firm members and their bar membership if a firm name is used, and to add a new Note (8) which indicates that individuals should be appointed and that naming a firm will serve only as a designation of address for correspondence.

Proposed revised § 2.18 is intended to clarify the practice relative to the address to which correspondence is sent by the Office when an attorney at law or other recognized person is acting on behalf of a party. When an attorney or other recognized person is representing a party, correspondence is sent to such attorney or other recognized person at the address specified when such person's representation is established. The Office will not undertake to correspond with more than one person at more than one address. Therefore if another attorney or recognized person files a paper, the paper will be accepted but correspondence will continue to be sent to the address of the attorney or representative as already established in the file until the Office receives written instruction by the attorney or other representative, or by the party being represented, to send correspondence to another address. A subsequently filed power of attorney or authorization of agent is regarded by the Office as a change of address for correspondence even though there is no revocation of the previous power or authorization, but in other situations a specific request is necessary, and language such as "Send correspondence to (giving address, or name and address)", is the most desirable means for changing the correspondence address. Other types of statements will be accepted by the Office if their intention is sufficiently clear to be reasonably interpreted as a request to change the address to which correspondence is to be sent. Neither the appointment of an associate attorney nor the filing of a paper by a different recognized representative has any effect on correspondence unless an instruction to change the correspondence address is included.

The Office does not send notice or acknowledgment of changes of address. Only a written revocation of a written power of attorney is acknowledged by the Office.

Designation of domestic representative by person not domiciled in the United States. In § 2.37 and paragraph (a)(4) of § 2.185, it is proposed to change the terms "appointment" and "resident agent" to "designation" and "domestic representative," respectively, to conform to the language of section 1(d) of the Trademark Act of 1946. This will not change present practice.

Effective filing date for the Supplemental Register. In § 2.75 it is proposed to add the word "effective" before "filing date" in order to make clear the existing practice that, when the filing date of an amendment to convert an application for registration on the Principal Register to an application for registration on the Supplemental Register becomes the filing date of the latter application, such date is considered to be the effective filing date of that application. This change in wording is in agreement with the language "effective filing date" used in § 2.83.

Publication of marks placed in interference. The proposed revision of § 2.80 restores a reference to publication of the mark in case of interference which was omitted inadvertently when § 2.80 was amended as of March 1, 1972 (896 O.G. TM 2). Although interference is not now declared except upon petition to the Commissioner (amendment of § 2.91 as of March 1, 1974 (896 O.G. TM 2)), the practice of publishing the mark when interference is declared was continued.

Fee for petition to revive a multiple class application. It is proposed to revise paragraph (e) of § 2.85 to delete reference to a petition to revive and thereby to make clear that only one fee is required for a petition to revive an abandoned application in which there is more than one class. Section 31 of the trademark act specifies a fee which shall be paid "on filing each petition for the revival of an abandoned application" without qualification as to the number of classes in the application, and therefore only one fee for each petition is considered to be necessary. For the same reason, in connection with multiple class registrations, under existing practice a single fee is sufficient for issuance of a new certificate of registration following change of ownership of a mark (§ 2.171) or correction of a registrant's mistake (§ 2.175), for certificate of correction of registrant's mistake (§ 2.175), or for amendment or disclaimer after registration (§ 2.173).

Fee required for each class being opposed, and insufficient fees for classes in application being opposed. Proposed revised §§ 2.101, 2.102 and 2.103 make clear the existing requirement that when there is more than one class in an application (such as in a combined application), the required fee must be paid for each class when filing an opposition against such application.

These proposed revised sections also provide that when the fees which accompany an opposition are insufficient to cover all classes in the application being opposed, which may occur with a combined application, opposer should specify the classes in which opposition to registration of the mark is sought, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to process the opposition promptly in the particular classes which opposer desires. This is in accord with present practice. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Joining persons in an opposition. Proposed revised § 2.01 provides that two or more persons may be joined in an opposition, but that the required fee for each class in which each person seeks opposition must be paid for each person so joined. By this revision, existing practice is incorporated into this section. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Unverified opposition during extension of time. It is proposed to further revise §§ 2.102 and 2.103 to permit an unverified opposition to be filed by an attorney or agent during an extension of time for opposition as well as within the original thirty days for opposition after publication of the mark. Present practice limits the filing of an unverified opposition to thirty days after publication. Nevertheless it has been found that some oppositions filed during extensions of time are unverified, and that when the defect is discovered, either there is insufficient time in the extended period to file a verified opposition or the period has expired. It seems desirable to eliminate a situation that has in some cases proven to be a difficulty for opposers. Since the main effort and cost of preparing and filing an opposition is expended even though the opposition is unverified, it is believed that in most instances opposers will file verified oppositions in extended opposition periods. Further, any unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing. For both reasons it is believed that the proposed change in practice will not result in any undue delay in registration.

Proposed revised § 2.102 provides that an opposition filed within an extension of time to oppose must be accompanied by the required fee for each class, and states that the oppositions should be verified or include a declaration in accordance with § 2.20. However, in case verification or declaration cannot be secured within the extension of time, proposed revised § 2.103 provides that an unverified opposition may be filed within an extension of time to oppose. Such unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing.

Extension of time to oppose. It is proposed to further revise § 2.102 to make clear existing practice as to who may request an extension of time to oppose and who may file opposition during an extension of time. Request to extend the time for filing opposition must be made by a person who is eligible to oppose, that is, a person who believes that he would be damaged by the registration of the mark on the Principal Register. An attorney at law or other person recognized to represent a party may file a request for extension of time on behalf of a potential opposer *La Maur Inc. v. Andis Clipper Co.*, 181 USPQ 783 (Comr. Pats 1974). The potential opposer must be identified in the request for extension because an extension of time is a personal privilege which is normally granted only to the person who has requested it. A problem has been, however, that complete information is sometimes not available at the time request for extension of time must be filed, so that there is a misidentification of the potential opposer, or, where there are parties in privity, for example related companies, one of the interested parties is named whereas later the other will be found to be the proper party to oppose. For this reason, it is considered desirable to permit opposition to be filed during an extension of time by a person whose name varies or is different from the name of the person to whom the extension was granted, provided the difference in names constitutes mere misidentification as a result of mistake and is not a difference in entity, or provided the persons designated are in privity, such as in the case of related companies under section 5 of the trademark act. This practice is in accord with the decision in *F. Jacobson & Sons, Inc. v. Excelled Sheepskin Co.*, 140 USPQ 281 (Comr. Pats. 1963). An analogous situation is found in *Universal Oil Products Co. v. Rexall Drug and Chemical Co.*, 174 USPQ 458 (CCPA 1972), where a parent company was permitted to oppose although the mark on which opposition was based was owned by the parent's subsidiary company.

When there is uncertainty between persons in privity as to which will ultimately be the proper opposer, it is desirable that the persons and their relationships be identified as clearly as possible in the request for extension of time.

First thirty-day extension of time to opposed. It is proposed to revise § 2 102 consistently with Pub. L. 93–600, effective January 2, 1975, which provides for a first thirty-day extension of the time for filing an opposition upon request without showing good cause.

Transmittal of opposition. It is proposed to revise § 2.105 to eliminate reference to transmittal of an opposition by the Examiner of Trademarks to the Trademark Trial and Appeal Board, in view of the fact that all activity connected with the processing of oppositions has been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board.

It is further proposed to revise § 2.105 by changing the word "notice" throughout the section to the word "notification" and also by changing the word "Institution" in the heading of the section to the word "Notification". The purpose of these changes is to make clear the present practice of regarding the paper which is prepared in accordance with this section to be merely a notification to the parties of the existence of a proceeding which commenced at the time the opposition was filed.

Fee required for each class for cancellation, and insufficient fees for classes in registration. Proposed revised §§ 2.111 and 2.112 make clear the existing requirement that when there is more than one class in a registration, the required fee must be paid for each class when filing a petition to cancel the registration. A petition to cancel which is accompanied by fees insufficient to cover each class in the registration should specify the classes for which cancellation is sought, so that the Office will not be required to select classes or make further inquiry in that respect, and cancellation may be accomplished promptly in the classes desired. This is in accord with present practice.

Order compelling discovery in inter partes cases. Because of the increasing burden upon the Trademark Trial and Appeal Board as a result of the frequency and complexity of the motions being filed to compel discovery under rules adopted July 1, 1972 (898 O.G. TM 170, May 16, 1972), it is considered desirable that before seeking an order from the Board compelling discovery, the parties themselves be required to attempt to resolve the issues by mutual agreement. It is proposed to accomplish this by revising paragraph (e) of § 2.120 to require that a motion for an order compelling discovery be supported by an affidavit or a declaration in accordance with § 2.20 stating that the moving party or its attorney has conferred with the opposing party or its attorney in good faith in an effort to resolve by agreement the issues raised by the motion and that the parties have been unable to reach agreement with respect thereto, or specifying the parts of the issues, if any, which have been resolved. See *Angelica Corporation v. Collins & Aikman Corporation*, 183 USPQ 378 (TT&A Bd. 1974), and *Cool Ray, Inc. v. Eye Care, Inc*, 183 USPQ 618 (TT&A Bd. 1974).

Requirements for depositions. It is proposed to revise paragraph (g) of § 2 123 by adding a subsection numbered (3) thereto in order to restore to this section a designation of the existing requirements as to the form of depositions which was omitted inadvertently when paragraph (g) of this section was amended as of July 1, 1972 (898 O.G. TM 170, May 16, 1972).

Comments on inter partes procedures in general. In addition to the changes in inter partes procedures which are proposed herein, the Patent and Trademark Office is currently making an overall review of the efficiency and effectiveness of all of the amended inter partes rules of procedure in trademark cases which became effective as of July 1, 1972 (898 O.G. TM 170, May 16, 1972). The Patent and Trademark Office would welcome comments on any present inter partes procedures separate from comments on the specific revisions proposed herein.

Requests for reconsideration of decisions on motions. Motion procedures before the Trademark Trial and Appeal Board under §§ 2.127 and 2.129 follow the Federal Rules of Civil Procedure, which results in a multiplicity of types of motions being available. Some of these could be finally dispositive of a case and appeal could be taken from them. It therefore seems desirable to distinguish in trademark cases between the procedures as to decisions on motions which are finally dispositive of a case and decisions on motions which are not finally dispositive. To accomplish this it is proposed to revise paragraph (b) of § 2.217 to limit the section to motions which are not finally dispositive of a case. Any request for rehearing of such motions must be filed within thirty days, as is the existing practice. It is proposed to revise paragraph (c) of § 2.219 to include a reference to decisions on motions which are finally dispositive of a case and thus to make it clear that a request for rehearing of any final decision (including those on motions) may be filed within thirty days and that such time may be extended for sufficient cause.

Fee required for each class on appeal, and insufficient fees for classes in application on appeal. Proposed revised § 2.141 makes clear the existing requirement that when there is more than one class in an application (such as in a combined application), the prescribed fee must be paid for each class when appealing to the Trademark Trial and Appeal Board.

The proposed revised section also provides that when the fees which accompany an appeal are insufficient to cover all classes in the application being appealed, which may occur with a combined application, applicant should specify the classes in which appeal is taken, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to set up the appeal promptly in the particular classes which applicant desires. This is in accord with present practice.

Requirements for affidavit or declaration under section 8 of the Act of 1946. Proposed revised § 2.162 provides that an affidavit or declaration in accordance with § 2 20 containing either a statement of use or recitation of facts as to excusable nonuse must be filed before the expiration of the specified sixth year. However, if the evidence supporting the statement of use is not submitted or is found to be deficient, such supporting evidence may be filed thereafter, and may be considered even though filed after the expiration of the sixth year, and if the recitation of facts as to nonuse are found not to be sufficient, further evidence or explanation may be submitted and may be considered even though filed after the expiration of the sixth year. The statement of use or the recitation of facts as to excusable nonuse in the affidavit or declaration meets the statutory requirement of making a showing within the sixth year, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company,* 177 USPQ 274 (Comr. Pats. 1973).

The phrase "specifying the nature of such use" is omitted from paragraph (c) of proposed revised § 2.162 because its meaning is unclear and it does not identify any requirement which is necessary for an affidavit or declaration under section 8 of the act.

The proposed revised section also makes it clear that where there is more than one class in a registration, a statement of use or a statement as to nonuse, and appropriate evidence in support thereof, is necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration. An affidavit or declaration under section 8 which is accompanied by fees insufficient to cover each class in the registration should specify the classes to which the affidavit or declaration pertains, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to determine promptly the question of acceptance or refusal in relation to relevant classes.

Surrender for cancellation. Proposed revised § 2.172 makes clear the existing practice of regarding a request to delete one entire class, or more than one entire class but less than the total number of classes, from a registration in which there is more than one class, as a surrender of a registration as to the specified class or classes, and not as an amendment of a registration. Each class is treated in effect as a separate registration. On the other hand, deletion of less than all of the goods or services in a class constitutes amendment of a registration as to that class. No fee is required for surrender, whereas a fee is required for each class which is amended.

Requirements of application for renewal. It is proposed to revise paragraph (c) of § 2.183 to provide that when facts are recited in an application for renewal to show excusable nonuse and such facts are found to be deficient, additional evidence or explanation may be considered by the Examiner even though filed after the expiration of the initial six month period for applying has expired, or after the three month delay period in the class of a delayed application for renewal. The recitation in the application of facts to show excusable nonuse meets the statutory requirement of making a showing within the required time, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company,* 177 USPQ 274 (Comr. Pats. 1973).

Section 2.183 as proposed to be revised also makes clear the existing practice that when there is more than one class in a registration, a declaration or verified statement of use and a specimen or facsimile, or a recitation of facts as to nonuse, are necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration when renewing the registration. An application for renewal which is accompanied by fees insufficient to cover each class should specify the classes with regard to which renewal is desired.

Signature of translator for English translation. The proposed revision of paragraph (a)(2) of § 2.185 is intended to make it clear that the signature necessary for an English translation of a foreign document is the signature of the translator of the document, and that the signature only is needed, not a verification or a declaration in accordance with section 2.20.

Certificate of registration may issue to assignee. Proposed revised § 2.187 sets forth more specifically the procedure for giving notice to the Patent and Trademark Office in time to permit issuance of a certificate of registration in a name other than the name of the original applicant. If an assignment document or a certificate of change of name is of record in the Assignment Division of the Patent and Trademark Office before the notice of publication of a mark is mailed, there is sufficient time for the necessary information to reach the application file before the application is prepared for issuance of the certificate of registration. Also, if at any time prior to the preparation of the application for issue, a paper is filed in an application stating that a document has been filed for recordation, the application can be flagged and held until the necessary information reaches the file from the Assignment Division.

If a certificate of registration is to be issued to an assignee, there must be in the application file an address for such assignee; if there is not, the inquiry necessary to obtain the address may delay the issuance of the certificate of registration.

Change in name of Patent Office. All of the sections proposed to be modified herein have been revised to reflect the change in the name of the Patent Office to the Patent and Trademark Office, and the change in title of the Commissioner of Patents to Commissioner of Patents and Trademarks, in accordance with Pub. L. 93–596, effective January 2, 1975.

* * * * *

Dated: Jan. 28, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:
DAVID B. CHANG,
Assistant Secretary for Science and Technology.

Published in 40 F.R. 6361, Feb. 11, 1975

[932 O.G. TM 84 (Mar. 11, 1975)]

(NOTE.—The text of the revised rules as adopted appears in Item 346 hereinafter.)

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(339)

EXPANDED EXPLANATORY NOTES FOR INTERNATIONAL TRADEMARK CLASSIFICATION

As a part of the international classification for trademarks and service marks, the World Intellectual Property Organization (commonly known as WIPO) has published an alphabetical list of goods and services with an indication of the classes into which the goods and services fall, and in association therewith has published explanatory notes to assist in classifying where it is thought that there is likely to be special difficulty in deciding upon the correct classification. The United States has prepared a set of expanded explanatory notes, to be used in association with the alphabetical list of goods and services prepared by WIPO, which includes essentially all the material in the explanatory notes published by WIPO but which also contains information on additional items. Because of the additional material in the United States notes, they are designated "expanded explanatory notes."

The expanded United States notes identify the international classes by number and by international name. The short titles which the United States has applied to the international class numbers are also included. (See 924 O.G. TM 155 (July 16, 1974).) Under each international class name is the heading "Including" followed by a group of illustrative items; then there is a second heading "Not including" followed by another group of items with indication of the classes in which these items fall. The items chosen are ones in areas where there may be confusion between related classes, and in particular are items which will serve to delineate to a greater extent the problem areas encountered in the examination of trademark and service mark applications in the United States under the international classification system. It is hoped that the expanded notes will provide more understanding of the basis of international classification in accordance with existing WIPO guidelines and will be helpful in determining the classification of goods and services which are not itemized in the international alphabetical list.

The United States expanded explanatory notes deal primarily with goods rather than services, inasmuch as the international and prior United States classes for services largely coincide as to their contents. The major areas in which the correlation of service classes is not exact are identified in the expanded United States notes.

The first version of the expanded explanatory notes was submitted by the United States to the Committee of Experts of WIPO at its meeting in Geneva, Switzerland, in September 1973, and the subject of expanded notes is still under consideration. The expanded explanatory notes published with this notice are the first revision of the expanded notes prepared by the United States, and the notes may be further revised from time to time as the need arises. The expanded notes are used by the examiners in the United States Patent and Trademark Office as a guide to classification, along with the alphabetical list of goods and services published by WIPO.

RENE D. TEGTMEYER,
Mar. 5, 1975. *Assistant Commissioner for Trademarks.*

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NOTES:

(1) This first revision of the Expanded Explanatory Notes appeared in the OFFICIAL GAZETTE of Apr. 29, 1975 (933 O.G. TM 285).

(2) The terms in parentheses immediately under the class numbers are the short titles which the United States has applied to the international class numbers. See 924 O.G. TM 155 (July 16, 1974).

(3) For information relating to ordering the English edition of the "International Classification of Goods and Services To Which Trademarks Are Applied," see 911 O.G. TM 210 (June 26, 1973). However, prices are subject to change. As of March 1975 the price of the international classification and 5 supplements was 3 pounds 55 pence.

[933 O.G. TM 285 (Apr. 29, 1975)]

(NOTE.—The detailed text of the Expanded Notes appears in section 1401.02(c) of the Trademark Manual of Examining Procedure.)

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(340)

INTERNATIONAL INDUSTRIAL PROPERTY PROTECTION DEVELOPMENTS REPORTS ON CONFERENCES ATTENDED BY OFFICIALS OF U.S. PATENT AND TRADEMARK OFFICE

Representatives of the U.S. Patent and Trademark Office are frequent participants at international intergovernmental meetings where matters relating to industrial property protection are discussed. These include meetings on patent and trademark classification, mechanized information retrieval, assistance programs for developing countries, and periodic conferences pursuant to international treaties to which we are a party.

When the results of these deliberations have been of particular significance, for example, texts of new treaties such as the Patent Cooperation Treaty and the Trademark Registration Treaty, they have been made available to readers of the OFFICIAL GAZETTE *by publication of the relevant documents.*

To keep readers current on relevant international activities as they occur, even in their evolving state, more frequent status reports seem desirable.

We have in the past solicited views from the private sector on important issues by way of circular letters and questionnaires addressed to heads of organizations, industrial groups and patent law associations. We plan to continue using this method of communication.

In order that the entire readership of the OFFICIAL GAZETTE *be kept advised, however, we intend to publish from time to time summary reports of the more significant international meetings that we attend. The first such report follows.*

I am hopeful that this series will be helpful. Please do not hesitate to give us your views on the matters presented or your suggestions on how to improve the presentation of this series.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

REPORT ON THE MEETING OF THE AD HOC GROUP OF GOVERNMENTAL EXPERTS ON THE REVISION OF THE PARIS CONVENTION, FEBRUARY 11 TO 17, 1975

This Ad Hoc Group of Governmental Experts was convened pursuant to a resolution of the Coordination Committee of WIPO adopted in September 1974, as follows:

> "The Director General will create and convene an Ad Hoc Group of Governmental Experts coming from states both members and non-members of the Paris Union to study all aspects to the question of revising the Paris Convention including, inter alia, additional provisions of special benefit to the developing countries."

The meeting was well attended: almost fifty countries were represented. Also represented were five intergovernmental organizations and nine international nongovernmental organizations.

The developing countries expressed concern that the systems of patents protection as currently practiced were hampering rather than facilitating the transfer of technology to them. Algeria, Cuba and the Ivory Coast were principal spokesmen. They pointed out that developing countries hold a very small percentage share of the total pool of patents and voiced the view that in too many instances enterprises of developed market economy countries were protecting their exports through the use of patents, to the detriment of industrialization objectives of developing countries.

Accordingly, their major attention was focussed on ways to avoid the utilization of patents in a manner considered by them "abusive" to interests of developing countries. In this regard, they identified a few areas which they thought possibly susceptible to correction by amendment of the Paris Convention.

A change in the national treatment clause of article 2 of the Paris Convention was suggested, based on the contention that the equality principle leads to unequal benefits. Support was expressed for "preferential treatment" for their nationals "without reciprocity." Developing countries urged that compulsory licensing be made available for use by developing countries at an earlier date than is now permitted under the Paris Convention. It was also suggested that a greater transfer of know-how associated with patented technology was needed to accomplish domestic working. Additionally, suggestions were made to exclude certain technological subject matter from the scope of coverage of patent grants and to reduce in certain instances the term of the patent grant.

The Socialist countries, with the Soviet Union as their chief spokesman, expressed a favorable disposition to a "modernization" of the Paris Convention which supported the aspirations of developing countries. They asserted the desirability of incorporating into the Paris Convention provisions for giving greater recognition to inventors' certificates, the principal incentive to inventors in Socialist countries. Another theme repeated by these countries was the desirability of extending industrial property protection provisions of the Convention to include scientific discoveries.

The developed market economy countries also expressed support for promoting the transfer of technology to the developing countries, but pointed out that careful analysis is needed to determine the best ways to accomplish this. In their view, the Paris Convention has been very successful since its inception in promoting international trade in industrial property and the Convention may well be sufficiently flexible to permit tackling the problems experienced by developing countries without amendment. In any event, the practical problems which are being experienced should be identified with greater precision and clarity so that the approaches developed would be suitable to meet the realities of the current situation.

Several developed market economy countries pointed out the practical reality that the technology which developing countries need is owned privately in industrialized countries. Therefore, the transfer of that technology can only be achieved when the owners of that technology are encouraged to transfer it to the recipient country in a commercial arrangement on mutually acceptable terms based on a comfortable working relationship between the parties.

Attention was also called to the fact that there are several alternative ways of assisting developing countries within the framework of the World Intellectual Property Organization. In particular, mention was made of the preparation of a new Model Law on Inventions, the technical assistance and technical information programs under Chapter 4 of the Patent Cooperation Treaty, and the activities of the Permanent Program for the Acquisition by Developing Countries of Technology Related to Industrial Property. It was also pointed out that some of the desires of the developing countries could be achieved by changes in their national laws, without change in the Paris Convention.

The group of experts after a full discussion adopted the following recommendation:

> "*The Ad Hoc Group of Governmental Experts on the Revision of the Paris Convention for the Protection of Industrial Property,* convened in accordance with the decisions taken at the September 1974 sessions of the Coordination Committee of the World Intellectual Property Organization (WIPO) and the Executive Committee of the Paris Union for the Protection of Industrial Property,
>
> "*Meeting* at Geneva from February 11 to 17, 1975,
>
> "*Noting* the interest that developing countries have manifested in the revision of the Paris Convention,

"1. *Agrees* that, at this stage of the work, the following questions be considered:

(i) National Treatment
(ii) Independence of Patents
(iii) to (v) Non-Working and Delays in Working of the Patented Invention: Compulsory Licenses; Licenses of Right
(vi) Preferential Treatment Without Reciprocity
(vii) Technical Assistance
(viii) Types of Protection other than Patents (Inventors' Certificates, etc.)
(ix) Marks; Industrial Designs; Appellations of Origin
(x) Reservations
(xi) Deletion of Article 24
(xii) Scope of Protection of Process Patents
(xiii) Right of Priority
(xiv) Unanimity Rule

"2. *Recommends:*

(*a*) that the Director General, taking into account the need to respect the basic principles of the Paris Convention and to take into consideration the concerns of the developing countries, prepare a study containing an analysis of the issue and outlining possible alternative solutions in respect of the said points and any connected questions,

(*b*) that the report containing the said study be communicated to the Governments of all countries members of the United Nations system of organizations for their comments,

(*c*) that, as a continuation of the work towards the revision of the Paris Convention, the Ad Hoc Group of Governmental Experts be convened, as soon as possible, in a second session,

(*d*) that the competent organs of WIPO and the Paris Union and all other interested organizations, in particular the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Industrial Development Organization (UNIDO), be informed of the results of the first (present) session of the Ad Hoc Group of Governmental Experts,

(*e*) that other United Nations bodies, particularly the United Nations Conference on Trade and Development and the United Nations Industrial Development Organization, interested in the transfer of technology be consulted as to the contribution they could make to the further work of the Ad Hoc Group of Governmental Experts."

The issues forming the basis of the fourteen questions, thirteen of substantive law and one of procedure mentioned in paragraph 1 of the resolution, were developed to some degree by the members of the Committee of Experts as follows:

"A. *Questions of Substantive Law*

"*Question No. 1: National Treatment.* It was generally understood that the principle of national treatment should remain unaffected in the relations between developed countries,* this term covering both market economy and Socialist countries which are not developing countries. The question here is rather whether, in the relations of developing countries to developed countries, national treatment should not, on certain points—yet to be identified—suffer exceptions totally or within certain limits also to be defined. The total exception to national treatment on certain points may require the definition of minimum standards of protection to be respected in any case. Whether such derogations from national treatment would apply also in the relations between developing countries would also have to be considered.

"The examples of possible cases where certain derogations from the national treatment principle were mentioned concerned smaller fees for nationals than foreigners, the requirements of working the patented invention on the territory of the developing country and the duration of the patent.

"Moreover, the question should be examined whether, in a case where an invention was made by a resident of the country or where an invention was worked in the country, national treatment should not apply unconditionally, irrespective of the nationality of the patentee of other person working the invention.

"*Question No. 2: Independence of Patents.* The question here is whether the principle of full independence embodied in Article *4bis* of the Paris Convention should be maintained, or whether exceptions to it should be allowed, particularly where the foreign applicant in the developing country claims priority of an earlier foreign application on which no patent was issued because of lack of patentability or where the patent so granted was later invalidated for that reason. Furthermore, the question should be studied how decisions taken in respect of an invention in any foreign country could be made available to the national office of any developing country in which an application for that invention had been filed.

"*Questions Nos. 3 to 5: Non-Working and Delays in Working of the Patented Invention; Compulsory Licenses; Licenses of Right.* The questions here are whether any developing country should not be permitted to impose requirements for working the patented invention which are more stringent for foreigners than nationals, whether the time limits in Article 5A of the Paris Convention should not be shortened, whether licenses of right—whose concept still required precise definition—should not be allowed by the Paris Convention and whether it should not be specified that importation did not satisfy the requirement of working in the country.

"*Question No. 6: Preferential Treatment Without Reciprocity.* The question here is whether in certain respects nationals of developing countries should not receive more favorable treatment in developed countries than nationals of the developed countries. One example was mentioned, that is, the fees to be paid: whether the amount of the fees charged for the application for, and maintenance of, a patent in a developed country should not be less than the fees to be paid by the nationals of countries which are not developing countries.

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*The Delegation of Canada reserved its position as to this conclusion, and generally as to the possibilities of enlarging any proposed amendments which were appropriate for both developed and developing countries, so as to make them of universal application. The Director General indicated that amendments of benefit to all members States could be so enlarged.

"*Question No. 7: Technical Assistance.* The question here is whether the Paris Convention should not contain provisions—similar, for example, to those contained in the Patent Cooperation Treaty—concerning technical assistance to developing countries. It was noted that under Article 7 of the Convention Establishing the World Intellectual Property Organization the institutional framework for such technical assistance existed but that budgetary considerations might militate in favor of including provisions on technical assistance also in the Paris Convention. It was suggested that Article 19 could be made use of in order to establish special unions devoted to technical assistance.

"*Question No. 8: Types of Protection Other than Patents (Inventors' Certificates, etc.).* The most important question here is whether inventors' certificates should not, as far as their legal nature so permits, be treated in the Paris Convention on an equal footing with patents and, consequently, expressly referred to in Article 1 and all other relevant provisions of that Convention. It was mentioned in this connection that the free choice, for foreigners on the same terms as for nationals, between patents and inventors' certificates would have to be consequently generalized. A further question here is whether inventors' certificates granted for industrial designs rather than technical inventions should also be expressly mentioned. Finally, the question of the inclusion in the text of the Paris Convention of references to special types of patents should be examined.

"*Question No. 9: Marks; Industrial Designs; Appellations of Origin.* Examples mentioned of questions to be considered here were: whether a more precise definition of the time limit mentioned in Article 5C(1) of the Paris Convention was not required in order to ensure early enforcement of any use requirements: whether the prohibition of the use of geographical designations as trademarks should not be established or, to the extent that it existed, reinforced; whether the protection of appellations of origin should not be reinforced and, in cases of conflict between an appellation of origin and a trademark, the former should not prevail; whether the protection against false indications of source and unfair competition in general should not be strengthened to allow for swifter action against abuses; whether the obligation to protect any well-known mark (*marque notoirement connue*) was always compatible with the interests of developing countries in which similar national marks were registered before the registration of the well-known mark; whether the possibility of providing for compulsory licenses for trademarks and industrial designs, in certain well-defined cases, should not be provided for; whether Article 6 of the Paris Convention concerning the indepedence of trademarks need not be revised; finally, whether the possibility of pronouncing the lapse of industrial designs, in certain well-defined cases, should not be provided for.

"*Question 10: Reservations.* The question here is whether any exception from the obligations of the Paris Convention allowed for developing countries should not be exercisable by way of a reservation to the relevant provision of that Convention. This could allow of a more flexible system, tailor-made for the needs of the country making reservations.

"*Question No. 11: Deletion of Article 24.* The question here is whether Article 24 of the Paris Convention has not become anachronistic and should not be deleted.

"*Question No. 12: Scope of Protection of Process Patents.* The question here is whether developing countries should not be exempted from the rule embodied in Article *5quater* of the Paris Convention according to which the patentee has, with regard to imported products, all the rights which the process patent grants to him with respect to products manufactured in the country.

"*Question No. 13: Right of Priority.* All aspects of Article 4 of the Paris Convention should be examined, including the question whether the duration of the right of priority should not be longer for applicants who are nationals of developing countries when they apply for patents in developed countries.

"B. *Question of Procedure*

"*Question No. 14: Unanimity Rule.* The question here is to weigh the relative advantages and disadvantages of amending the Paris Convention by unanimity or a qualified majority."

These narrative synopses will form the basis for the study which the Director General will undertake as specified in paragraph 2(*a*) of the resolution. Following completion of the Director General's study, the report he prepares will be circulated to all member countries of the UN system of organizations for their comments and following receipt of these a second meeting of the Ad Hoc Group of Governmental Experts Concerning the Revision of the Paris Convention will be called. This may take place in the Spring of 1976.

[935 O.G. TM 71 (June 10, 1975)]

(341) Trademark Registration Treaty Post Conference Information

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and thirteen other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. Other documents and materials concerning the treaty were published in the OFFICIAL GAZETTES of March 12, 1974, May 28, 1974, and October 14, 1974.

The World Intellectual Property Organization (WIPO) has now circulated an additional post conference document, which contains a catchword index to the articles and rules of the Trademark Registration Treaty.

In the belief that this index is not of such general interest as those which were previously published, and in lieu of its publication herein, the Office will supply a photocopy of the catchword index (TRT/PDC/7, dated April 25, 1975) to any interested person who may request such copy.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: May 23, 1975.

[935 O.G. TM 152 (June 17, 1975)]

(342) Mail Delays and Conditional Petitions To Revive (Trademarks)

In view of the "Post Office to Addressee" express mail service offered by the U.S. Postal Service, the conditional petition practice as to trademarks, announced in the OFFICIAL GAZETTE (921 O.G. TM 126), is hereby extended to cover this type of service.

Where the addressee is the Patent and Trademark Office, this service provides for the delivery of mail to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C. 20231, no later than 3:00 p.m. on the next workday following its deposit before 5:00 p.m. at any postal facility in the United States with an Express Mail window.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent and Trademark Office by means of the "Post Office to Addressee" express mail service and the communication is deposited at a U.S. Postal Service-Express Mail window by 5:00 p.m. on a day which is at least the day preceding the due date, a conditional petition be attached to the communication.

If the communication is received in the Patent and Trademark Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were deposited at an

Express Mail window no later than 5:00 p.m. on a day which is at least the day preceding the due date, and were requested to be mailed via the "Post Office to Addressee" Express Mail Service. Since mail handled in this manner may reasonably be expected to reach the Patent and Trademark Office no later than 3:00 p.m. of the next workday following its deposit at an Express Mail window, any mail delays beyond such time will be considered to constitute unavoidable delay to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent and Trademark Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

A suggested declaration form for the conditional petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited at an Express Mail window in a U.S. Postal Service's facility and intended to be mailed using the U.S. Postal Service's "Post Office to Addressee" Express Mail service in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, prior to 5:00 p.m. on ____________________________, which date is at least the day preceding the due date, at ______________________, by
(Location)

____
(Name of Individual)

In the event that such communication is not timely filed in the Patent and Trademark Office, it is requested that this paper be treated as a petition and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. __________ in the name of ___________________.

The undersigned declares further that all statements made herein are true, based upon the best available information; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any registration resulting therefrom.

Date ____________ ____________________________
(Signature of applicant or applicant's attorney)
And

Date ____________ ____________________________
(Signature of person mailing, if other than the above)

June 24, 1975.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[936 O.G. TM 288 (July 29, 1975)]

(343) REVISION OF FORM PARAGRAPHS AND OF FIRST ACTION FORMS FOR TRADEMARK APPLICATIONS

The Patent and Trademark Office has concluded its first review and revision of those form paragraphs used in trademark application actions (see 912 O.G. T.M. 310 for further information on the use of these paragraphs). The revision includes new paragraphs on points not previously covered as well as changes to existing paragraphs for clarification and simplification. Additionally, the Trademark Manual of Examining Procedure has been referenced where appropriate.

The revision was implemented in April 1975. A copy of the paragraphs may be obtained by addressing the Commissioner of Patents & Trademarks, Washington, D.C., 20231, Attention: Office of the Director of the Trademark Examining Operation.

The Office has also reviewed and revised the format of the one-page first action letter which contains check-off boxes for refusals, informalities, and notice of publication. Use of the revised letter will begin about September 1975 upon exhaustion of supplies of the previous form.

BERNARD A. MEANY,
Sept. 5, 1975. *Assistant Commissioner for Trademarks.*

[939 O.G. TM 104 (Oct. 14, 1975)]

(344) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Revision of Administrative Fees

On August 21, 1975, notice of proposed rulemaking was published in the FEDERAL REGISTER (40 FR 36573), regarding the proposal of the Patent and Trademark Office to amend Title 37 of the Code of Federal Regulations by amending § § 1.21, 1.25, 1.165, and 2.6 dealing with administrative fees. Interested persons were given until October 15, 1975, to submit written comments and suggestions. Full and careful consideration was given to the single written comment received.

Amendment of § § 1.21 and 2.6 is intended to (1) recover increases in material and labor costs for furnishing assignment information, drafting services and classification information, (2) eliminate established fees for drafting services not currently in demand, and (3) establish a new fee. Drafting services for which established fees are eliminated (§ 1.21 (l) and (m)) will be furnished, if requested, at fees based upon actual cost. The new fee is established to recover the cost of servicing deposit accounts. The amendment of § § 1.25 and 1.165 brings these rules into conformity with the amendment of § 1.21.

In consideration of the comment received, and pursuant to the authority contained in Section 6 of the Act of July 1952, as amended (85 Stat. 364, 35 U.S.C. 6), Parts 1 and 2 of Title 37, Code of Federal Regulations, are hereby amended as set forth below.

* * * * *

4. In § 2.6, paragraphs (a), (d) and (e) are revised and a new paragraph (f) is added to read as follows:

§ 2.6 *Trademark fees.*

* * * * *

(a) For each printed copy of a registration with data entered of record as of date of mailing, relating to renewal, cancellation, publication under section 12 (c), of the 1946 Trademark Act and affidavits or declarations under sections 8 and 15 of such act.

Omitting title	1.70
Showing title	3.70

* * * * *

(d) For making drawings, when facilities are available, the cost of making the same,

Rate per hour	12.00
Minimum charge per sheet	10.00

(e) for correcting drawings, the cost of making the correction:

Rate per hour (including a photoprint of the uncorrected drawing)	12.00
Minimum charge	3.00

(f) for abstracts of title to each registration or application:

For the search, one hour or less, and certificate	5.00
Each additional hour or fraction thereof	2.50
For each brief from the digest of assignments, of 200 words or less	2.00
Each additional 100 words or fraction thereof	.20

* * * * *

Effective Date: These revisions shall become effective February 2, 1976.

Dated: Dec. 4, 1975

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

DAVID B. CHANG,
Acting Assistant Secretary for Science and Technology.

Published in 40 F.R. 57358, Dec. 9, 1975

[942 TM 177 (Jan. 6, 1976)]

(345) CERTIFICATE OF MAILING OF CORRESPONDENCE

Increasing problems caused by delays in the delivery of papers to the Office by mail within the time periods set for response by applicants have caused renewed efforts within and outside the Patent and Trademark Office to seek a suitable solution. Helpful suggestions have been received from a number of individuals and bar associations. The following proposal, which is hereby published for comment by all interested parties, appears to provide a simple and effective method of alleviating most of the problems resulting from mail delays and to be within the present statutory authority of the Commissioner.

The proposed practice on which comments are invited would provide that correspondence in pending applications and proceedings would be timely if (1) deposited in the mails within the period or time set by the Office, and (2) accompanied by a suitable declaration.

The present practice of treating a response or other correspondence as effective only upon actual receipt in the Patent and Trademark Office follows a decision by Commissioner Moore in *In re James*, 1913 C.D. 89. At that time the period for response to an Office action was one year, in contrast to the three month shortened statutory period which is usual today. Nothing in the statute appears to prevent the adoption of a different practice which takes into account the difficulties currently arising from shortened periods for response and uncertainties of the mails.

It is proposed that this change in practice be accomplished by Commissioner's notice rather than by changing the Rules of Practice (Title 37 of the Code of Federal Regulations). Comments are, however, also invited as to whether it would be preferable to adopt the proposed practice by rule change.

The proposed practice would not be applicable to the filing of patent or trademark applications. These are excluded because of the priority rights, domestic and international, which are involved.

The proposal contemplates the issuance of an Official Gazette Notice stating that:

Effective ____________________, in any case where a time is set for taking action relative to any pending patent or trademark application or in any patent or trademark proceeding pending before the Patent and Trademark Office, correspondence will be considered as having been timely filed if it is

(1) deposited prior to the expiration of the period set for response (a) with the United States Postal Service as first class mail or (b) outside the United States with a governmental postal service as air mail, in an envelope addressed to the "Commissioner of Patents and Trademarks, Washington, D.C. 20231," and
(2) accompanied by a statement in the form of a declaration under 37 CFR 1.68 indicating the name of the person depositing the correspondence in the mail, the location of the deposit in the mail, and date of deposit in the mail.

In the event that correspondence is mailed and the application is later held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice because such correspondence was not received in the Patent and Trademark Office, the correspondence will be considered timely and the Office action will be vacated if the party who forwarded such correspondence, promptly after becoming aware of the Office action, informs the Office of the previous mailing of the correspondence, supplies an additional copy of the previously mailed correspondence and declaration of mailing, and includes a new declaration which attests again to the previous mailing of the correspondence and declaration.

A suggested format for the declaration under 37 CFR 1.68 to be included on the first page of any correspondence is shown below:

I hereby certify that this correspondence is being deposited with:

☐ the United States Postal Service as first class mail
☐ a governmental postal service other than the United States Postal Service as air mail

in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ______________
Date

from ____
Location of mailing (deposit in the mail)

by ____
Name of person actually depositing the correspondence in the mail

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date ____________ ______________________________
Signature of applicant or assignee, or signature and Registration Number of Registered Representative

* * * * *

Any person wishing to comment upon the proposed practice should address the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Comments should be received by March 16, 1976.

C. MARSHALL DANN,
Dec. 23, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. TM 359 (Jan. 20, 1976)]

(346) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

PART 4—FORMS FOR TRADEMARK CASES

Revised Rules and Procedures

On February 11, 1975, a notice of proposed rulemaking was published in the Federal Register (40 FR 6361) regarding the proposal by the Patent and Trademark Office to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.13, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2.120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187, and 4.2. Interested persons were given until May 1, 1975, to submit written comments and suggestions. Full and careful consideration was given to all written comments submitted and some changes in the original proposal have been made in view thereof.

Amendments are also now being made in sections which were not included in the published proposal, namely, §§ 2.11, 2.14, 2.15, 2.19, 2.93, 2.99, 2.113, 2.119, and 2.161; and section 4.3 is being deleted. Since these amendments are in accord with changes as to related matters in other sections which were contained in the published proposal, notice and public procedures thereon are deemed unnecessary.

The additional amendments, as well as changes from the text of the sections as published in the original proposal, are described below:

Paragraph (b) of § 1.197, paragraph (b) of § 1.256, paragraph (c) of § 2.129 and § 2.144 are being revised to include the name of the Board which may grant extension of time for requesting rehearing or reconsideration of a decision, that is, the Board of Appeals, the Board of Patent Interferences, or the Trademark Trial and Appeal Board.

Paragraph (a) of §1.304 (second sentence) and paragraph (d)(1) of § 2.145 (second sentence) are being revised to state more clearly that the time for filing a request for rehearing or reconsideration is determined under § 1.197(b) or § 1.256(b) in patent cases and § 2.129(c) or section 2.144 in trademark cases. These paragraphs are also being revised to make clear that if a request for rehearing or reconsideration, or modification of a decision, is acted on less than thirty days after the date of the decision, an appeal may still be filed or a civil action commenced within the original sixty-day period.

As to representation and powers of attorney, § 4.2 is being revised to state that individuals must be appointed in a power of attorney in order for the document to be regarded as a power, and §4.3, which is a form for the authorization of an agent, is being cancelled because normally persons who are recognized to practice before the Patent and Trademark Office in trademark cases are not designated as agents (see § 2.12). The form is outmoded and inaccurate, and in view of the relatively small amount of use which will probably be made of a form for authorizing representation by a person who is not an attorney, it is not believed necessary to provide a form for that purpose. In line with this change, the wording as to "agent" where it appears in either existing or proposed §§ 2.11, 2.14(c), 2.15, 2.18, 2.19, 2.93, 2,99(a) and (b), 2.102(a), 2.103, 2.113, 2.119(a) and (b) 2.123(e)(2), and 2.129(b), is being changed to "other authorized representative" or equivalent language, as appropriate.

In § 2.75 the word "effective" is being added to the second sentence in describing the original filing date.

In paragraph (e) of § 2.85, the clause which refers to the fee being less than the required amount because "a multiple class application or registration is" involved, is being reworded, for greater accuracy, to refer to the fee being less than the required amount because "multiple classes in an application or registration are" involved. At the end of the paragraph, the following is being added: ", or if action is sought only for the number of classes equal to the number of fees submitted," the purpose of this addition being to make it clear that action may be taken as to less than all of the classes in a multiple class application or registration. In this connection, see also revised § 2,172. In paragraph (e) of § 2.85 the word "Examiner" is being changed to "Office" because the notification referred to is not necessarily handled by an examiner.

In § 2.101 wording is being added to make it clear that an opposition may be filed within an extension of time for filing opposition as well as within thirty days after publication of the mark. Also, the wording "Two or more persons may be joined" is being changed to "If persons are joined," since whether or not persons are properly joined is subject to review by the Trademark Trial and Appeal Board.

In paragraph (b) of § 2.102, the word "written" is being inserted before "request to extend the time" in the first sentence. Also, reference to a time for filing a showing of cause has been deleted as being superfluous. These modifications accord with Pub. L. 93–600, enacted January 2, 1975.

In § 2.103 the words "such filing" have been modified to read "the filing of such opposition" in order to assure the clarity of the meaning.

In addition, §§ 2.101, 2.102, and 2.103 taken as a unit are being reorganized to place topics in better sequence and to consolidate references to each topic in one place. This reorganization is for the purpose of clarity and does not make any change in substance.

The division of § 2.111 into paragraphs (a) and (b) has been eliminated, proposed paragraph (b) relating to insufficient fees being incorporated in the body of the section. The last sentence in proposed § 2.112 relating to insufficient fees has been deleted as being repetitious of § 2.111.

A sentence is being added at the end of section 2.112 indicating that a fee for each person for each class is required if persons are joined in a petition to cancel.

The pertinent wording in each of §§ 2.101, 2.102, 2.103, 2.111, 2.112, 2.141, 2.161, 2.162, and 2.183 is being changed to indicate more plainly that action may be taken on less than the total number of classes in an application or registration, and that in that event the particular class or classes for action should be specified. The pertinent wording in such sections has also been modified to state that action should "include" the appropriate number of fees rather than "be accompanied by" such fees, in order to accord with the present practice of accepting a fee if it is received within the prescribed period even though it may not physically accompany the action.

Section 2.113 is being revised to change the word "notice" to "notification." In section 2.112 the word "notice" in the first sentence is likewise being changed to "notification." These changes accord with the equivalent change made in § 2.105 in the published proposal. The purpose is to make it clear that the paper which is prepared under these sections is merely a notification of the existence of a cancellation proceeding which commenced when a petition which is correct as to form was filed. The last word of paragraph (b) of § 2.113 is being changed from "registrant" to "respondent party" to agree with cancellation § 2.112.

Paragraph (c) in § 2.120 is being modified to provide that a written statement by the attorney for the moving party, rather than an affidavit or declaration, is sufficient in support of a motion for an order to compel discovery, and that if issues raised by the motion have been subsequently resolved, the attorney should merely advise the Trademark Trial and Appeal Board in writing of the matters which no longer require decision by the Board.

In § 2,162, the wording of paragraph (e) is being modified to indicate that the sixth year affidavit must state that the mark is in use except when there is excusable nonuse under paragraph (f) of such section. The wording of such paragraph also is being expanded to make clear the present practice that the specimen submitted with the sixth year affidavit be a specimen currently in use. In both paragraphs (e) and (f), in the second sentences, the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

In § 2.172, the proposed third sentence is being reworded to simplify the language, and at the end of the próposed fourth sentence the specific number (2.173) of the section referred to in the sentence is being added.

In § 2.183 the wording of paragraph (a) is being modified to indicate that the renewal application must state that the mark is still in use in commerce except when there is excusable nonuse under paragraph (c) of such section. In the last sentence of paragraph (c), the words "in order to show excusable nonuse" are being added after the word "explanation" for greater clarity, and in the same sentence the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

Section 2.187 is being reworded to make clear that not only is it permissible for a certificate of registration to issue to an assignee or in a new name of applicant, but that the certificate will be so issued whenever the Office knows of such situation in time to do so. Section 2.187 is being further reworded to clarify that for a certificate of registration to issue to an assignee or in a new name of applicant, the supporting document must be actually recorded by the time indicated; further, if the document is not actually recorded by such time, a statement placed in the application file by the time specified will accomplish the same result. Also added to § 2.187 is the statement that the address of the assignee may be provided by being placed in the recorded document.

In consideration of the comments received and pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 94–132, 85 Stat. 364) and amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), Parts 1 and 2 of Chapter I of Title 37 of the Code of Federal Regulations are hereby revised or amended, as follows:

1. Section 1.12 is revised to read as follows:

§ 1.12. *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned patent application are not available to the public. Copies of any such patent assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such patent application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

2. In § 1.136, paragraph (b) is revised. As amended, § 1.136 reads as follows:

§ 1.136 *Time less than six months.*

• • • • •

(b) The time for reply, when a time less than six months has been set, will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. Only one extension may be granted by the primary examiner in his discretion; any further extension must be approved by the Commissioner. In no case can any extension carry the date on which response to an action is due beyond six months from the date of the action.

3. In § 1.197, paragraph (b) is revised. As amended, § 1.197 reads as follows:

§ 1.197 *Action following decision.*

• • • • •

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. Such time may be extended by the Board of Appeals upon a showing of sufficient cause.

• • • • •

4. In § 1.244, paragraph (c) is revised. As amended, § 1.244 reads as follows:

§ 1.244 *Motions; miscellaneous provisions.*

• • • • •

(c) Any request for rehearing or reconsideration, or modification of the decision, must be filed within twenty days after the date of the decision, and any reply thereto shall be filed within twenty days from the date of service of the request.

• • • • •

5. In § 1.256, paragraph (b) is revised. As amended, § 1.256 reads as follows:

§ 1.256 *Final hearing.*

• • • • •

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto shall be filed within fifteen days from the date of service of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304.)

6. Section 1.304 is revised to read as follows:

§ 1.304 *Time for appeal or civil action.*

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Customs and Patent Appeals (section 1.302) or for commencing a civil action (section 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 1.197(b) or 1.256(b), or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(b) The times specified herein are calendar days. If the last day of the time specified for appeal or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under 35 U.S.C. 141 that he elects to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141.

7. Section 2.11 is revised to read as follows:

§ 2.11 *Applicants may be represented by an attorney.*

The owner of a trademark may file and prosecute his own application for registration of such trademark, or he may be represented by an attorney or other person authorized to practice in trademark cases. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

8. In § 2.14, paragraph (c) is revised. As amended, § 2.14 reads as follows:

§ 2.14 *Advertising.*

• • • • •

(c) No person not an attorney, solicitor or lawyer shall, in any material specified in paragraph (b) of this section or in papers filed in the Patent and Trademark Office, represent himself to be an attorney, solicitor or lawyer.

9. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or other representative.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent or Trademark Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him, or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

10. Section 2.18 is revised to read as follows:

§ 2.18 *Correspondence, with whom held.*

Correspondence will be sent to the applicant or a party to a proceeding at his address unless papers are transmitted by an attorney at law, or a written power of attorney is filed, or written authorization of other person entitled to be recognized is filed, or the applicant or party designates in writing another address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmiting the papers, or to the attorney at law designated in the power of attorney, or to the other person designated in the written authorization, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney at law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. Double correspondence will not be undertaken by the Patent and Trademark Office, and if more than one attorney at law or other authorized representative appears or signs a paper, the Office reply thereto will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other authorized representative of the applicant or party.

11. Section 2.19 is revised to read as follows:

§ 2.19 *Revocation of power of attorney or of other authorization to represent.*

Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his authorization.

12. Section 2.37 is revised to read as follows:

§ 2.37 *Authorization for representation; U.S. representative.*

The authorization of a qualified person to represent applicant (section 2.17(b)) and the designation of a domestic representative (section 2.24) may be included as a paragraph or paragraphs in the application.

13. Section 2.75 is revised to read as follows:

§ 2.75 *Amendment to change application to different register.*

An application for registration on the Principal Register may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the requirements for registration on the appropriate register, as the case may be. The original filing date may be considered the effective filing date for the purpose of proceedings in the Patent and Trademark Office provided the application as originally filed was sufficient for registration on the register to which amended. Otherwise, the filing date of the amendment will be considered the effective filing date of the application so amended.

14. Section 2.80 is revised to read as follows:

§ 2.80 *Publication for opposition.*

If, on examination or reexamination of an application for registration on the Principal Register, it appears that the applicant is entitled to have his mark registered, the mark will be published in the OFFICIAL GAZETTE for opposition. The mark will also be published in the case of an application to be placed in interference or concurrent use proceedings, if otherwise registrable.

15. In § 2.85, paragraph (e) is revised. As amended, § 2.85 reads as follows:

§ 2.85 *Classification schedules.*

* * * * *

(e) Where the amount of the fee received on filing an appeal in connection with an application or on filing an affidavit under section 8(a) or 8(b) or on an application for renewal or in connection with an opposition or petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or the affidavit or renewal application or opposition or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

* * * * *

16. Section 2.93 is revised to read as follows:

§ 2.93 *Declaration of interference.*

An interference is declared and instituted by the mailing of a notice of interference to the parties. The notice shall be sent to each applicant, in care of his attorney or other representative of reord, if any, and if one of the parties is a registrant, the notice shall be sent to him or his assignee of record. The notice shall give the name and address of the adverse party and of his attorney or other authorized representative, if any, together with the serial number and date of filing and publication, if published, of each of the applications or registrations involved.

17. In § 2.99, paragraphs (a) and (b) are revised. As amended, § 2.99 reads as follows:

§ 2.99 *Application to register as concurrent user.*

(a) An application for registration as a lawful concurrent user will be examined in the same manner as other applications for registration. When it is determined that the mark is ready for publication or allowance, except for questions relating to concurrent registration, the applicant may be required to furnish as many copies of his written application, specimens and drawing, as may be necessary. The Examiner of Trademarks shall prepare notices for the applicant and for each applicant, registrant, or user specified in the application for registration as a concurrent user. Such notices for the specified parties shall give the name and address of the applicant and of his attorney or other authorized representative, if any, together with the serial number and filing date of the application.

(b) The notices shall be sent to each of the parties, in care of their attorneys or other representatives, if they have attorneys or other representatives of record, and if one of the parties is a registrant, a notice shall also be sent to him or his assignee of record. A copy of the application shall be forwarded with the notices to the parties specified in the application. An answer to the notice is not required in the case of an applicant or registrant whose application or registration is specified in the application to register as concurrent user but a statement, if desired, may be filed within forty days after the mailing of the notice; in the case of other parties specified in th application to register as concurrent user, answer must be filed within forty days after the mailing of the notice.

* * * * *

18. Section 2.101 is revised to read as follows:

§ 2.101 *Filing an opposition.*

(a) Any person who believes that he would be damaged by the registration of a mark upon the Principal Register may oppose the same by filing an opposition in the Patent and Trademark Office within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102). The opposition must be verified, or include a declaration in accordance with § 2.20, unless the opposition is filed by an attorney at law or other authorized representative in accordance with § 2.103.

(b) An opposition must include the required fee for each class sought to be opposed in the application. If fees insufficient to cover all classes in the application are submitted, the particular class or classes in which opposition is sought should be specified. If persons are jointed in an opposition, a fee for each class sought to be opposed in the application for each person so joined is required.

19. Section 2.102 is revised to read as follows:

§ 2.102 *Extension of time for filing opposition.*

(a) A request to extend the time for filing an opposition must be made by a person who believes that he would be damaged by the registration of the mark on the Principal Register, but an attorney at law or other person authorized to represent a party may file the request on behalf of a potential opposer. The potential opposer must be identified with reasonable certainty in the request. Any opposition filed during an extension of time should be in the name of the person to whom the extension was granted, but an opposition may be accepted if the person to whom the extension was granted was misidentified through mistake, or an opposition filed in a different name may be accepted if the person filing the opposition is in privity with the person to whom the extension was granted.

(b) A written request to extend the time for filing an opposition must be received in the Patent and Trademark Office before the expiration of thirty days from the date of publication, and should specify the period of extension desired. A first extension of time will be granted upon request if the extension is for not more than thirty days. Other extensions of time may be granted by the Commissioner for good cause.

20. Section 2.103 is revised to read as follows:

§ 2.103 *Opposition filed by attorney at law or other authorized representative.*

An opposition may be filed in the Patent and Trademark Office by an attorney at law or other person authorized to represent a party, either within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102), but the opposition will be null and void unless confirmed by the opposer by verification, or by declaration in accordance with § 2.20, within thirty days after the filing of the opposition, or within such further time as may be fixed by the Commissioner upon request made before the expiration of the thirty days.

21. Section 2.105 is revised to read as follows:

§ 2.105 *Notification of opposition proceedings.*

A notification of an opposition which has been regularly filed shall be prepared, identifying the title and number of the proceeding and the application involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. Copies of this notification shall be forwarded by the Trademark Trial and Appeal Board to the parties in care of their attorneys or other representatives, if they have attorneys or other representatives of record. The duplicate copy of the opposition and exhibits shall be forwarded with the notification to the applicant.

22. Section 2.111 is revised to read as follows:

§ 2.111 *Time for filing petition for cancellation.*

Any person who believes that he is or will be damaged by a registrant may, upon payment of the required fee for each class sought to be cancelled in the registration, apply to the Commissioner to cancel said registration as to the specified class or classes. A petition to cancel which includes insufficient fees to over all classes in the registration should specify the partlular class or classes for which cancellation is sought. Such petition may be made at any time in the case of registrations on the Supplemental Register or under the act of 1920, or registrations under the act of 1881 or the act of 1905 which have not been published under section 12(c) of the act (§ 2.153), and in cases involving the grounds specified in section 14(c), (d) and (e) of the act. In all other cases such petition must be made within five years from the date of registration of the mark under the act of 1946 or from the date of publication under section 12(c) of the act.

23. Section 2.112 is revised to read as follows:

§ 2.112 *Petition for cancellation.*

The petition to cancel, which must be verified, or include a declaration in accordance with § 2.20, must set forth a short and plain statement showing how the petitioner is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition. Applications to cancel different registrations owned by the same party may be joined in one petition when appropriate, but the required fee must be included for each class sought to be cancelled in each registration against which each application to cancel is filed. If persons are joined in a petition to cancel, a fee for each class sought to be cancelled for each person so joined is required.

24. In § 2.113, paragraph (b) and the title are revised. As amended, § 2.113 reads as follows:

§ 2.113 *Notification of filing of petition.*

* * * * *

(b) When the petition is correct as to form, a notification shall be prepared, identifying the title and number of the proceeding and the registration involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. A copy of this notification shall be forwarded to the petitioner in care of his attorney or other representative, if he has an attorney or other representative of record. The duplicate copy of the petition and exhibits shall be forwarded with a copy of such notification to the respondent party.

25. In § 2.119, paragraphs (a) and (b) are revised. As amended, §2.119 reads as follows:

§ 2.119 *Service of papers.*

(a) Every paper filed in the Patent and Trademark Office in inter partes cases, including notice of appeal, must be served upon the other parties except the notice of interference (§ 2.93), the notification of opposition (§ 2.105), the petition for cancellation (§ 2.113), and the notice of a concurrent use proceeding (§ 2.99), which are mailed by the Patent and Trademark Office. Proof of such service must be made before the paper will be considered by the Office. A statement signed by the attorney or other authorized representative, attached to or appearing on he original paper when filed, clearly stating the date and manner in which service was made will be accepted as prima facie proof of service.

(b) Service of papers must be on the attorney or other authorized representative of the party if there be such or on the party if there is no attorney or other authorised representative, and may be made in either of the following ways: (1) By delivering a copy of the paper to the person served; (2) by leaving a copy at the usual place of business of the person served, with someone in his employment; (3) when the person served has no usual place of business, by leaving a copy at his residence, with a member of his family over 14 years of age and of discretion; (4) transmission by first-class mail, which may also be certified or registered. Whenever it shall be satisfactorily shown to the Commissioner that none of the above modes of obtaining service or serving the paper is practicable, service may be by notice published in the OFFICIAL GAZETTE.

* * * * *

26. In § 2.120, paragraph (c) is revised. As amended, § 2.120 reads as follows:

§ 2.120 *Discovery procedure.*

* * * * *

(c) Failure to make discovery: Sanctions.

(1) If any party fails or refuses to answer any proper question in taking discovery depositions or fails or refuses to answer any proper question propounded by interrogatories or fails or refuses to comply with a request to produce and permit the inspection and copying of designated things, the party seeking discovery may file a motion with the Trademark Trial and Appeal Board for an order compelling discovery. Such a motion must be supported by a written statement by the attorney for the moving party that the moving party or its attorney has conferred with the opposing party or its attorney in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by the motion are subsequently resolved between the parties, the attorney for the moving party should advise the Trademark Trial and Appeal Board in writing of the matters in the motion which no longer require decision by the Board.

(2) If a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to obey an order to provide or permit discovery, the Trademark Trial and Appeal Board may strike out all or any part of any pleading of that party, dismiss the action or proceeding, or deny any part thereof, enter judgment as by default against that party or take any such other action as may be deemed appropriate.

27. In § 2.123, paragraph (e)(2) is revised, and paragraph (g)(3) is added. As amended, § 2.123 reads as follows:

§ 2.123 *Trial testimony in inter partes cases.*

* * * * *

(e) * * *

(2) The deposition shall be taken in answer to questions, with the questions and answers recorded in their regular order by the officer, or by some other person (who shall be subject to the provisions of Rule 28 of the Federal Rules of Civil Procedure) in the presence of the officer except when his presence is waived on the record by agreement of the parties. The testimony shall be taken stenographically and transcribed, unless the parties present agree otherwise. In the absence of all opposing parties and their attorneys or other authorized representatives, depositions may be taken in longhand, typewriting, or stenographically.

* * * * *

(g) * * *

(3) Each deposition must contain an index of the names of the witnesses, giving the pages where their examination and cross-examination begin, and an index of the exhibits, briefly describing their nature and giving the pages at which they are introduced and offered in evidence.

* * * * *

28. In § 2.127, paragraph (b) is revised. At amended, § 2.127 reads as follows:

§ 2.127 *Motions.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of a decision, on a motion which is not finally dispositive of the case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request.

* * * * *

29. In § 2.129, paragraphs (b) and (c), and the title, are revised. As amended, § 2.129 reads as follows:

§ 2.129 *Oral argument, and reconsideration.*

* * * * *

(b) Hearings may be advanced or adjourned, as far as is convenient and proper to meet the wishes of the parties and their attorneys or other authorized representatives.

(c) Any request for rehearing or reconsideration, or modification of a decision, including a decision on a motion which is finally dispositive of a case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request. The times specified herein may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

30. Section 2.141 is revised to read as follows:

§ 2.141 *Ex parte appeals from the Examiner of Trademarks.*

Every applicant for the registration of a mark may, upon final refusal by the Examiner of Trademarks, appeal to the Trademark Trial and Appeal Board upon payment of the prescribed fee for each class in the application for which an appeal is taken. An appeal which includes insufficient fees to cover all classes in the application should specify the particular class or classes in which an appeal is taken. A second refusal on the same grounds may be considered as final by the applicant for purpose of appeal.

31. Section 2.144 is revised to read as follows:

§ 2.144 *Reconsideration of decision on ex parte appeal.*

Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

32. In § 2.145, paragraphs (a), (b), and (d) are revised. As amended, § 2.145 reads as follows:

§ 2.145 *Appeal to court and civil action.*

(a) Appeal to U.S. Court of Customs and Patent Appeals. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under Section 8 of the act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Customs and Patent Appeals. The appellant must take the following steps in such an appeal: (1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section); (2) in the court, file a petition of appeal and a certified transcript of the record within a specified time after filing the appeal, and pay the fee for appeal, as provided by the rules of the court. The transcript will be transmitted to the Court by the Patent and Trademark Office on order of and at the expense of the appellant. Such order should be filed with the notice of appeal, but in no case should it be filed later than fifteen days thereafter.

(b) Notice of appeal.

(1) When an appeal is taken to the U.S. Court of Customs and Patent Appeals, the appellant shall give notice thereof in writing to the Commissioner, which notice shall be filed in the Patent and Trademark Office, within the time specified in paragraph (d) of this section. The notice shall specify the party or parties taking the appeal and shall designate the decision or part thereof appealed from.

(2) In inter partes proceedings, the notice must be served as provided in § 2.119.

* * * * *

(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Customs and Patent Appeals (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(2) The times specified herein are calendar days. If the last day of time specified for appeal, or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under section 21(a)(1) of the act that he elects to have all further proceedings conducted under section 21(b) of the act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the act.

33. Section 2.161 is revised to read as follows:

§ 2.161 *Cancellation for failure to file affidavit or declaration during sixth year.*

Any registration under the provisions of the act of 1946 and any registration published under the provisions of section 12(c) of the act (§ 2.153) shall be cancelled as to any class in the registration at the end of six years following the date of registration or the date of such publication, unless within one year next preceding the expiration of such six years the registrant shall file in the Patent and Trademark Office an affidavit or declaration in accordance with § 2.20 showing that said mark is still in use as to such class or showing that its non-use as to such class is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

34. Setion 2.162 is revised to read as follows:

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

The affidavit or declaration required by § 2.161 must:

(a) Be executed by the registrant after expiration of the five-year period following the date of registration or of publication under section 12(c) of the act;

(b) Be filed in the Patent and Trademark Office before the expiration of the sixth year following the date of registration or of publication under section 12(c) of the act;

(c) Identify the certificate of registration by the registration number and date of registration;

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified;

(e) State that the registered mark is in use (except under paragraph (f) of this section). The statement must be supported by evidence which shows that the mark is still in use, and normally such evidence consists of a specimen or a facsimile specimen which is currently in use, or a statement of facts concerning use. The supporting evidence should be submitted with the affidavit or declaration, but if it is not or if the evidence submitted is found to be deficient, the evidence, or further evidence, may be submitted and considered even though filed after the sixth year has expired;

(f) If the registered mark is not still in use, recite facts to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. If the facts recited are found not to be sufficient, further evidence or explanation may be submitted and considered even though filed after the sixth year has expired; and

(g) Contain the statement of use or statement as to nonuse and appropriate evidence in support thereof, as required in paragraphs (e) and (f) of this section, for each class to which the affidavit or declaration pertains in the registration.

35. Section 2.172 is revised to read as follows:

§ 2.172 *Surrender for cancellation.*

Upon application by the registrant, the Commissioner may permit any registration to be surrendered for cancellation. Application for such action must be signed by the registrant and must be accompanied by the original certificate of registration, if not lost or destroyed. When there is more than one class in a registration, one or more entire class but less than the total number of classes may be surrendered as to

the specified class or classes. Deletion of less than all of the goods or services in a single class constitutes amendment of registration as to that class (see § 2.173).

36. In § 2.183, paragraphs (a), (b), and (c) are revised. As amended, § 2.183 reads as follows:

§ 2.183 *Requirements for application for renewal.*

(a) The application for renewal must include a statement which is verified or which includes a declaration in accordance with § 2.20 by the registrant setting forth the goods or services recited in each class for which renewal is sought in the registration on or in connection with which the mark is still in use in commerce, specifying the nature of such commerce (except under paragraph (c) of this section). This statement must be executed not more than six months before the expiration of the registration and must:

(1) Be accompanied by a specimen or facsimile specimen for each class for whih renewal is sought in the registration showing current use of the mark.

(2) Include the required fee for each class for which renewal is sought in the registration, and an additional fee for each class in the case of a delayed application for renewal. If the application for renewal includes insufficient fees to over all classes in the registration, the particular class or classes for which renewal is sought should be specified.

(b) The declaration or verified statement, specimen or facsimile specimen and the fee for each class for which renewal is sought in the registration must be filed within the period prescribed for applying for renewal. If defective or insufficient, they cannot be completed after the period for applying for renewal has passed; if completed after the initial six month period has expired but before the expiration of the three month delay period, the application can be considered only as a delayed application for renewal.

(c) If the mark is not in use in commerce at the time of filing of the declaration or verified statement as to any class for which renewal is sought, facts must be recited to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. There must be a recitation of facts as to nonuse for each class for which renewal is sought or it must be clear that the facts recited apply to each class sought to be renewed. If the facts recited require amplification or explanation in order to show excusable nonuse, further evidence may be submitted and considered even though filed after the period for applying for renewal has passed.

* * * * *

37. In § 2.185, paragraphs (a)(2) and (a)(4) are revised. As amended, § 2.185 reads as follows:

§ 2.185 *Requirements for assignments.*

(a) Assignments under section 10 of the act of registered marks, or marks for which an application for registration has been filed, will be recorded in the Patent and Trademark Office. Other instruments which may relate to such marks may be recorded in the discretion of the Commissioner. No assignment will be recorded, except as may be ordered by the Commissioner, unless it has been executed and unless:

* * * * *

(2) It is in the English Language or, if not in the English language, accompanied by a translation signed by the translator;

* * * * *

(4) A designation of a domestic representative is made in case the assignee is not domiciled in the United States. The designation must be separate from the assignment and there must be a separate designation for each registration or application assigned in one instrument.

38. Section 2.187 is revised to read as follows:

§ 2.187 *Certificate of registration may issue to assignee.*

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, and certificate of registration will be so issued provided an appropriate document is of record in the Assignment Division of the Patent and Trademark Office no later than the time the notice of publication is mailed, or if such document is not of record, then if a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration. The address of the assignee must be made of record in the application file or in the recorded document.

39. Section 4.2 is revised to read as follows:

§ 4.2 *Power of attorney accompanying application.*

Applicant hereby appoints ------------------------- (8)
------------------------- to prosecute this application
(address)
to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual must be appointed. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.3 [*Removed*]

40. Section 4.3 is removed.

Effective date: These amendments become effective on February 1, 1976.

Dated: December 11, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: December 24, 1975.

DAVID B. CHANG,
Deputy Assistant Secretary for Science and Technology.

Published in 41 F.R. 756, Jan. 5, 1976

[943 O.G. TM 2 (Feb. 3, 1976)]

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(347) INTERNATIONAL TRADEMARK CLASSIFICATION

At its November 3–6, 1975 meeting, the Committee of Experts of the Nice Agreement decided to conduct a systematic overall review of the Classification. A working Group will consider all proposals for changes in the Classification submitted by the member countries and certain international and intergovernmental organizations. The entire review is expected to require 2 to 3 years. The Group's recommendations will then be submitted to the Committee of Experts which will determine the actual changes to be made. Concurrently, an Ad Hoc Committee will prepare a revision of the Nice Agreement, particularly with respect to Article 3(3), the unanimity rule.

Suggestions for changes were submitted to the Patent and Trademark Office last year when a general review of the Classification was first contemplated. Additional suggestions will be welcomed by the Office for consideration in the preparation of proposed changes to be submitted to the Committee of Experts. The Committee has requested that proposals be accompanied by an explanation of why the change is warranted. Suggestions should be sent, by March 5, 1976, to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Legislation and International
Affairs, Room 1108, CP-6

BERNARD A. MEANY,
Jan. 16, 1976. *Assistant Commissioner for Trademarks.*

[943 O.G. TM 135 (Feb. 17, 1976)]

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(348) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 4—FORMS FOR TRADEMARK CASES

Revised Trademark Forms

The Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations by revising §§ 4.1, 4.1a, 4.2, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.21 and 4.22, which sections are suggested forms for trademark cases, and also revising the introductory note to the Forms for Trademark Cases.

These revisions conform the language of the forms, where necessary, to the changes in Part 2 of this Chapter which became effective on February 1, 1976, and also alter language in the forms which is incorrect or inconsistent. These revisions do not effect any changes in practice and do not impose a burden on anyone, and therefore procedures for public comment are not deemed necessary.

The major revisions in the forms, aside from conformance of language to the present trademark rules, are described below:

A form of notarial jurat is included or incorporated by reference at the end of all verifications and affidavits. A form of acknowledgement is included at the end of the assignment of application form and the assignment of registration form.

A note is included to indicate where adjustment of a form is necessary to accommodate multiple classes or services.

Wording is included in section 4.2 to indicate that the form is for use only by attorneys at law and that submission of the form by attorneys at law is optional.

Notes to section 4.8 are included to explain how to use the form for collective membership marks in addition to collective trademarks and collective service marks.

The organization of section 4.13 (Application for renewal) has been changed to remove the statement as to use and the goods on which the mark is still in use from the verification portion of the form and to place the statements in the body of the application portion of the form.

A note is included, where appropriate, to indicate that when a domestic representative is required but is not designated when a document is filed, an unrevoked designation if one is already in the file will be regarded as the required designation.

Pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92–132; 85 Stat. 364) and on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), Part 4 of Chapter I of Title 37 of the Code of Federal Regulations is hereby revised, as follows:

NOTE: The following forms illustrate the manner of preparing applications for registration of marks as well as various other papers to be filed in the Patent and Trademark Office in trademark cases. Applicants and other parties will find their business facilitated by following them. These forms should be used in cases to which they are applicable. A sufficient number of representative forms are given which, with the variations indicated by the notes, should take care of all the usual situations. In special situations such alterations as the circumstances rendered necessary may be made provided they do not depart from the requirements of Part 2 of this Chapter or of the trademark statute. Before using any forms, the pertinent requirements of Part 2 of this Chapter and the pertinent sections of the trademark statute should be studied carefully.

In using these forms, the applicant or other party filing the form may, instead of making oath or verification where such is prescribed in the forms, set forth a written declaration that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true, but this may be done only if declarant is warned by wording in the same paper that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and may jeopardize the validity of the application or other document or any registration resulting from the application: See form 4.1a.

Sec.
4.1 Trademark application by an individual; Principal Register with oath.
4.1a Trademark application by an individual; Principal Register with declaration.
4.2 Power of attorney at law (which may accompany application).
4.4 Designation of domestic representative to accompany application.
4.5 Trademark application by a firm; Principal Register.
4.6 Trademark application by a corporation; Principal Register.
4.7 Service mark application; Principal Register.
4.8 Collective mark application (including collective membership mark); Principal Register.
4.9 Certification mark application; Principal Register.
4.10 Application based on concurrent use; Principal Register.
4.11 Application to register on Supplemental Register.
4.13 Application for renewal.
4.14 Affidavit for publication under section 12(c).
4.15 Affidavit required by section 8.
4.16 Affidavit under section 15 (or combined sections 8 and 15).
4.17 Opposition in the United States Patent and Trademark Office.
4.18 Petition to cancel a registration in the United States Patent and Trademark Office.
4.19 Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.
4.21 Assignment of application.
4.22 Assignment of registration.

AUTHORITY: The provisions of this Part 4 issued under secs. 1, 2, 7, 9, 12, 13, 14, 21, 23, 30, 44, 45, 60 Stat. 427, as amended, sec. 41 60 Stat. 440, sec. 6, 66 Stat. 793; 15 U.S.C. 1051, 1052, 1057, 1059, 1062, 1063, 1064, 1071, 1091, 1112, 1123, 1126, 1127; 35 U.S.C. 6, unless otherwise noted.

§ 4.1 *Trademark application by an individual; Principal Register with oath.*

Mark ------------------------------
(Identify the mark)

Class No. ---------------------------
(If known)

To the Commissioner of Patents and Trademarks:

____
(Name of applicant, and trade style, if any)

____
(Business address, including street, city and State)

____
(Residence address, including street, city and State)

____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for

____
(Common, usual or ordinary name of goods)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first use on the goods (2) on -------- (Date); was first used in (3) --------------------- (Type of commerce) commerce on ------------- (Date); and is now in use in such commerce. (4) The mark is used by applying it to (5) ------------------ and five specimens showing the mark as actually used are presented herewith.

(6)

State of ----------------------------- }
County of --------------------------- } ss.

--------------------------, being sworn, states that:
(Name of applicant)

he believes himself to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

____
(Signature of applicant)

Subscribed and sworn to before me, this --------- day of ----------------, 19---.

--------------------------------(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) below.)

NOTES

(1) If registration is sought for a word or numeral mark not depicted in any special form, the drawing may be the mark typed in capital letters on letter-size bond paper; otherwise, the drawing shall comply with section 2.52.

(2) If more than one item in a class is set forth and the dates given for that class apply to only one of the items listed, insert the name of the item to which the dates apply.

(3) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign applicants relying upon use must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) If the mark is other than a coined, arbitrary or fanciful mark, and the mark is believed to have acquired a secondary meaning, insert whichever of the following paragraphs is applicable:

(a) The mark has become distinctive of applicant's goods as a result of substantially exclusive and continuous use in ---------------------- (Type of commerce) commerce for the five years next preceding the date of filing of this application.

(b) The mark has become distinctive of applicant's goods as evidenced by the showing submitted separately.

(5) Insert the manner or method of using the mark with the goods, i.e., "the goods," "the containers for the goods," "displays associated with the goods," "tags or labels affixed to the goods," or other method which may be in use.

(6) The required fee of $35.00 for each class must be submitted.

(7) If the applicant is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

§ 4.1a *Trademark application by an individual; Principal Register with declaration.*

Mark ---------------------------
(Identify the mark)

Class No. ---------------------
(If known)

To the Commissioner of Patents and Trademarks:

____
(Name of applicant, and trade style, if any)

____
(Business address, including street, city and State)

____
(Residence address, including street, city and state)

____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for

____
(Common, usual or ordinary name of goods)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first used on the goods (2) on ------- (Date); was first used in (3) ----------------------- (Type of commerce) commerce on ---------------- (Date); and is now in use in such commerce.

(4) The mark is used by applying it to (5) ------------- and five specimens showing the mark as actually used are presented herewith. (6) The undersigned applicant ------
____
(Name of applicant)

declares: That he believes himself to be the owner of the trademark sought to be registered; that to the best of his knowledge and belief no other person, firm, corporation, or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as may be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

____
(Signature of applicant)

____
(Date)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES: See same numbered Notes under form 4.1.

§ 4.2 *Power of attorney at law (which may accompany application).*

Applicant hereby appoints (8) ------------------------, ------------------------------------ (Address), an attorney at law or attorneys as law, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual attorney at law or individual attorneys at law must be named here. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.4 *Designation of domestic representative to accompany application.* (9)

--,
(Name of representative)

where postal address is --------------------------------.
(Street, city and State)

is hereby designated applicant's representative upon whom notices or process in proceedings affecting the mark may be served.

NOTE: (9) The designation of a domestic representative must be separate from a power of attorney at law or other authorization of representation.

§ 4.5 *Trademark application by a firm; Principal Register.*

Mark ------------------------
(Identify the mark)

Class No. ------------------
(If known)

To the Commissioner of Patents and Trademarks:

____
(Firm name and names of members comprising firm)

____
(Business address, including street, city and State)

____
(Domicile of firm)

____
(Citizenship of members of firm)

(Body of application is same as in form 4.1).

State of ----------------------------- }
County of --------------------------- } ss.

---------------------------------, being sworn.
(Name of member of firm)

states that he is a member of the applicant firm; he believes said firm to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

____
(Signature of member of firm)

Subscribed and sworn to before me, this -------- day of ----------------, 19---.

--------------------------(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

§ 4.6 *Trademark application by a corporation; Principal Register.*

Mark ------------------------
(Identify the mark)

Class No. -------------------
(If known)

To the Commissioner of Patents and Trademarks:

____
(Corporate name and State or country of incorporation) (10)

____
(Business address, including street, city and State)

(Body of application is same as in form 4.1.)

State of ---------- ----------------- }
County of --------------------------- } ss.

---------------------------------, being sworn.
(Name of corporate officer)

states that: he is ------------------------ (Official title) of applicant corporation (10) and is authorized to execute this affidavit on behalf of said corporation; he believes said corporation to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

---------------------------- (Corporate name)
By ---------------------------- (Signature of corporate officer and official title.)

Subscribed to and sworn to before me, this -------- day of ----------------, 19----.

--------------------------(*) Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTE: (10) If applicant is an association or other collective group, the word "association" or other appropriate dsignation should be substituted for "corporation" when referring to applicant.

§ 4.7 *Service mark application; Principal Register.*

Mark ------------------------ (Identify the mark)
Class No. -------------------- (If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

The above identified applicant has adopted and is using the service mark shown in the accompanying drawing (11) for
-- (Common, usual or ordinary name of service)
and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The service mark was first used in connection with the services (2) on -------------------- (Date); was first used in connection with the services rendered in (3) -------------- (Type of commerce) commerce on -------------------- (Date); and is now in use in such commerce. (4)

The mark is used by ------------------------------
-- (State method of using the mark in connection with the services)
and five (12) ---------------- showing the mark as actually used are presented herewith.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, changing the word "trademark" to "service mark" and the word "goods" to "services.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(11) See Note (1) under form 4.1, and if drawing is not practicable, insert description of the mark instead of reference to the drawing.

(12) Insert "specimens," or state the nature of the representation of the mark which is furnished.

§ 4.8 *Collective mark application (including collective membership mark); Principal Register.*

Mark ------------------------ (Identify the mark)
Class No. -------------------- (If known)

To the Commissioner of Patents and Trademarks:

(Insert identification of applicant in accordance with form 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the collective mark shown in the accompanying drawing (1) for (13) ------------ (Common,
-- usual or ordinary name of goods or services)
to indicate (14) ---------------- and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The collective mark was first used on the (2) ----------
-- (Insert "goods" or "services") (15)
by members of applicant on ------------------ (Date); was first used by said members in (3) -------------------------- (Type of commerce) commerce on ------------------ (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (5) ------------ and five specimens of the mark as actually used are presented herewith.

(Insert verification from form 4.6, changing "corporation" to "association" or the like, if necessary.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(13) If the application is for a membership mark, omit the word "for" and the space for the name of the goods or services.

(14) If the application is for a membership mark, insert "membership in applicant organization," or similar appropriate statement. If not for a membership mark, omit the words "to indicate" and the following space.

(15) If the application is for a membership mark, the phrase "on the goods or services" should be omitted.

§ 4.9 *Certification mark application; Principal Register.*

Mark ------------------------ (Identify the mark)
Class No. -------------------- (If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5, or 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the certification mark shown in the accompanying drawing (1) for --------- (Insert
-- illustrative examples of the goods or services)
and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The certification mark, as used by persons authorized by applicant, certifies (16) ----------------; said mark was first used under the authority of applicant on ----------- (Date); was first used in (3) ------------------------------ (Type of commerce) commerce on ---------------- (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (5) --------------, and five specimens showing the mark as actually used are presented herewith.

Applicant is not engaged in the production or marketing of any goods or services to which the mark is applied.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, and add after the word "association" the words "other than those authorized by applicant.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(16) Insert an appropriate statement as to what the mark certifies, relating to regional origin; or material, mode of

manufacture, quality, accuracy or other characteristic of the goods; or that the work or labor on the goods or in the performance of the services was performed by members of applicant.

§ 4.10 *Application based on concurrent use; Principal Register.*

Mark ------------------------ (Identify the mark)
Class No. -------------------- (If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

Use form 4.1, and add at the end of the first paragraph: "for the area comprising --------------------------": (List the states for which registration is sought)
and add as final paragraph of application:

The following exception(s) to applicant's right to exclusive use are:

By ----------------------------, doing business at
----------------------------, who is using the mark
-- (Identify mark and Reg. No. or Ser. No., if any)
for -- (Common, usual, or ordinary name of goods or services)
in the States of ----------------------------------
by applying the mark to (5) ------------------------
from -- (Earliest known date of such use)
to the present."

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than specified in the application.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)
NOTES: See same numbered Notes under form 4.1.

§ 4.11 *Application to register on Supplemental Register.*

Mark ------------------------ (Identify the mark)
Class No. -------------------- (If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

For the body of an application for a trademark registration (17), use form 4.1, 4.5 or 4.6, whichever is appropriate, changing the word "Principal" to "Supplemental," and adding a final paragraph to the application as follows:

"The mark sought to be registered has been in lawful use in
-- (Type of commerce)
commerce in connection with the goods for the year preceding the date of filing of this application." (18)

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

(17) For the body of service mark, collective mark or certification mark applications on the Supplemental Register, use form 4.7, 4.8 or 4.9, whichever is applicable, with the change and addition indicated in this form.

(18) If the mark has not been in use for the year next preceding the filing date, and registration in the United States is required as a basis for obtaining foreign protection of the mark, substitute the following statement for the last sentence: The mark sought to be registered is not in use in
-- (Type of commerce)
commerce and domestic registration is required as a basis for foreign protection of the mark.

In this instance applicant will be required to make a showing that U.S. registration is required as a basis of foreign protection of the mark.

§ 4.13 *Application for renewal.*

Mark ------------------------ (Identify the mark)
Reg. No. --------------------
Class No. --------------------

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant for renewal in accordance with form 4.1, 4.5 or 4.6.) (1)

The above identified applicant for renewal requests that the above identified registration, granted to ------------------ (Name of original registrant) ------------------ on ---------------------------- (Date of Issuance)
which applicant for renewal now owns, as shown by records in the Patent and Trademark Office, be renewed in accordance with the provisions of section 9 of the act of July 5, 1946.

The mark shown in said registration is still in use in (2)
-- (Type of commerce)
commerce on each of the following goods (3) recited in the registration: --------------------, the attached specimen (or facsimile) showing the mark as currently used. (4)

(5)

State of ----------------------------} ss.
County of ----------------------------}

--, (Name of renewal applicant or of person authorized to sign for renewal applicant)
being sworn, states that the applicant for renewal owns the above identified registration; and that to the best of his knowledge and belief the facts set forth in this application are true.

---------------------------- (Signature of renewal applicant; if renewal applicant is a corporation or other juristic organization, give the official title of the person who signs for renewal applicant.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) Applicant for renewal must be the present owner of the registration.

(2) Type of commerce should be specified as "interstate," "foreign," "territorial," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state "in connection with each of the following services * * *."

(4) If the mark is not in use in commerce at the time of filing the application for renewal, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances. A specimen (or facsimile) illustrating use, or facts as to nonuse, must be submitted for each class sought to be renewed.

(5) The required fee for renewal sought prior to expiration is $25.00 for each class; and for delayed renewal filed within three months after expiration, an additional $5.00 for each class. If renewal is sought for less than the total number of classes in the registration, the classes for which renewal is sought should be specified.

(6) If applicant for renewal is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.14 *Affidavit for publication under section 12(c).*

Mark ------------------------ (Identify the mark)
Reg. No. --------------------
Date of issue ----------------
To: ------------------------ (Name of original registrant)

State of ----------------------------} ss.
County of ----------------------------}

-- (Name of registrant or of person authorized to sign for a juristic registrant)
being sworn, states that (1) ---------------------------- (Name of registrant)
owns the above identified registration, as shown by records in the Patent and Trademark Office; that said registration is now in force; that the mark shown therein is in use in (2)
-- (Type of commerce)

commerce on each of the following goods (3) recited in the registration ________________ ; and that the benefits of the act of July 5, 1946, are hereby claimed for said registration.
(4)

____
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (5) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state: "in connection with each of the following services."

(4) The required fee of $10.00 must be submitted.

(5) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.15 *Affidavit required by section 8.*

Mark ________________________
(Identify the mark)
Reg. No. ____________________
Class No. ____________________

State of ____________________ } ss.
County of ____________________ }

____
(Name of registrant or of person authorized to sign for a juristic registrant)
being sworn, states that (1) ____________________
(Name of registrant)
owns the above identified registration issued ______________
(Date)
(2), as shown by records in the Patent and Trademark Office; and that the mark shown therein is still in use (3) as evidenced by (4) ________________________.
(5)

____
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ____________________."
(Date)

(3) If the mark is not in use at the time of filing the affidavit, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances.

(4) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use. Specimen illustrating use, or facts as to use or nonuse, are required for each class for which action is sought.

(5) The required fee of $10.00 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(6) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.16 *Affidavit under section 15 (or combined sections 8 and 15).*

Mark ________________________
(Identify the mark)
Reg. No. ____________________
Class No. ____________________

State of ____________________ } ss.
County of ____________________ }

____
(Name of registrant or of person authorized to sign for a juristic registrant)
being sworn, states that (1) ____________________
(Name of registrant)
owns the above identified registration issued ______________
(Date)
(2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3)
____
(Type of commerce)
commerce for five consecutive years from (4) ________ to the
(Date)
present, on each of the following goods (5) recited in the registration: ________________________________ ; that such
(List of Goods)
mark is still in use in (3) ____________________________
(Type of commerce)
commerce; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

____
(Signature: if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See rule 4.2 and Note (6) below.)

NOTES

This form may be used as a combined affidavit under sections 8 and 15 provided it contains matter which will meet the requirements of section 8 as to use or nonuse and fee (see form 4.15, Notes (3), (4) and (5)).

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ________________."
(Date)

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) The date should be the beginning of a five year period of continuous use, all of which five year period falls after the date of registration under the act of 1946 or after the date of publication under section 12(c). A date which would produce a period of continuous use which is longer than five years may be stated provided the period indicated includes five years of continuous use after registration under the act of 1946 or publication under section 12(c).

(5) If a service mark registration, state: "in connection with each of the following services."

(6) If registrant is not domiciled in the United States, a domestic representative must be designated as to the section 8 affidavit. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.17 *Opposition in the United States Patent and Trademark Office.*

In the matter of application Serial No. ________________.
Published in the OFFICIAL GAZETTE on ________________.
(Date)

____
(Name of opposer)
v.
____
(Name of applicant)
Opposition No. ____________________________________
(To be inserted by Patent and Trademark Office)

________________, a(n) (1) ____________________,
(Name of opposer) (Legal entity of opposer)
located and doing business at ________________________,
(Street, city and State)

believes that he will be damaged by registration of the mark shown in the above identified application, and hereby opposes the same.

As grounds of opposition, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why opposer believes he will be damaged.)
(2)

____
(Signature of opposer: if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

State of ____________________ } ss.
County of ____________________ }

____
(Name of opposer or of person authorized to sign for opposer)
being sworn, states that he is the opposer named in the foregoing opposition, or is the person authorized to sign for the opposer named in the foregoing opposition; that he has read and signed the opposition and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

____
(Signature of opposer: if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

(JURAT) (use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1. For opposers who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic represenjative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as ________________________." if there is a trade style. If a partnership, state: "a partnership composed of ____."
(Names of members)
If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ________________________."
(State or country

(2) The required fee of $25.00 must be submitted for each class to be opposed, and if opposition is sought for less than the total number of classes, the classes sought to be opposed should be specified.

§ 4.18 *Petition to cancel a registration in the United States Patent and Trademark Office.*

In the matter of Registration No. ________________
Date of Issue ____________________

____
(Name of petitioner)
v.
____
(Name of registrant)
Cancellation No. ________________________________,
(To be inserted by Patent and Trademark Office)

________________, a(n) (1) ____________________,
(Name of petitioner) (Legal entity of petitioner)
located and doing business at ________________________,
(Street, city and State)
that he is or will be damaged by the above identified registration, and hereby petitions to cancel the same.

As grounds therefor, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why petitioner believes that he is or will be damaged.)
(2)

____
(Signature of petitioner; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

State of ____________________ } ss.
County of ____________________ }

____
(Name of petitioner or of person authorized to sign for petitioner)
being sworn, states that he is the petitioner named in the foregoing petition to cancel, or is the person authorized to sign for the petitioner named in the foregoing petition to cancel; that he has read and signed the petition to cancel and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

____
(Signature of petitioner to cancel: if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

See form 4.2 and Note (7) under form 4.1. For petitioners who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as ________________________." if there is a trade style. If a partnership, state: "a partnership composed of ________________________________." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ________________________."
(Names of members)
(State or country)

(2) The required fee of $25.00 must be submitted for each class sought to be cancelled, and if cancellation is sought for less than the total number of classes, the classes sought to be cancelled should be specified.

§ 4.19 *Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.*

____
(Name of applicant)
____
(Serial number of application)

To the Trademark Trial and Appeal Board:

Applicant hereby appeals to the Trademark Trial and Appeal Board from the decision of the Examiner of Trademarks refusing registration.

____
(Signature of applicant: if applicant is a corporation or other juristic organization, give the official title of the person who signs for applicant.)

§ 4.21 *Assignment of application.*

Whereas ____, of
(Name of assignor)
____
(Street, city, and State)
has adopted and is using a mark for which he has filed application in the United States Patent and Trademark Office for registration, Serial No. ________________ ; and

Whereas ____, of
(Name of assignee)
(1) ____,
(Street, city, and State)
is desirous of acquiring said mark;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ____________________
(Name of assignor)
does hereby assign unto the said ________________________
(Name of assignee)
all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified application for registration of said mark.

The Commissioner of Patents and Trademarks is requested to issue the certificate of registration to said assignee.

____
(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ____________________ } ss.
County of ____________________ }

On this ______ day of ________________, 19____, before me appeared ________________________, the person who signed this instrument on his own behalf, or who was authorized to sign on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

---------------------------(*)
(Notary Public)

(*) (The acknowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument or in an accompanying paper, registration to the assignee may be delayed.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See Form 4.4.

§ 4.22 *Assignment of registration.*

Whereas --, of
(Name of assignor)

(Street, city, and State)
has adopted, used and is using a mark which is registered in the United States Patent and Trademark Office, Registration No. ----------------, dated ---------------------; and
Whereas --, of
(Name of assignee)
(1) --,
(Street, city, and State)
is desirous of acquiring said mark and the registration thereof;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ------------------
(Name of assignor)
does hereby assign unto the said ------------------------
(Name of assignee)
all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified registration thereof.

(2)

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ------------------------------} ss.
County of -----------------------------}

On this ------ day of ---------------, 19----, before me appeared ----------------------------, the person who signed this instrument on his own behalf, or who was authorized to sign this instrument on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

---------------------------(*)
(Notary Public)

(*) (The acknowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction or execution, must be affixed.)

NOTES

(1) If the postal address of the asignee is not given either in the instrument or in an accompanying paper, recording may be delayed pending receipt of such address.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

Effective date: These revisions become effective on May 1, 1976.

Dated: April 6, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: April 22, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

Published in 41 F.R. 17726, Apr. 28, 1976

[946 O.G. TM 222 (May 25, 1976)]

(349) TRADEMARK MANUAL OF EXAMINING PROCEDURE (REVISED PAGES)

The first set of revised pages for insertion in the Trademark Manual of Examining Procedure (TMEP) is now being distributed to subscribers of the Manual by the Superintendent of Documents, United States Government Printing Office. These pages are identified as "Rev. 1, Jan. 1976."

This announcement is being made as a service to subscribers so that they will be aware that a revision of the Manual has been published. Inquiries concerning subscriptions, or the delivery of revision material, should be sent to the Superintendent of Documents, United States Government Printing Office, Customer Service Section SSOS, Washington, D.C. 20402.

The availability of the Trademark Manual of Examining Procedure, with instructions for ordering, was announced in the OFFICIAL GAZETTE of June 25, 1974 (923 O.G. TM 204). It continues to be available as described in that notice.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Apr. 26, 1976.

[947 O.G. TM 2 (June 1, 1976)]

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(350) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92–463), announcement is made of the following committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. to 5 p.m. on June 15, 1976 at the United States Trademark Association, 6 East 45th Street, New York, N.Y. 10017.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuous source of knowledge from the private sector to the government in the field.

The agenda for the meeting is:

(1) Establishment of an agenda and plans for a meeting of the committee in the Fall of 1976.

(2) Discussion of expanding the committee membership.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. Any comments or suggestions relating to the agenda items should be submitted in writing before June 7. Further, comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request 60 days after the meeting.

Inquiries may be addressed to Patricia M. Davis, Room 11C17, Crystal Plaza Building 3, Telephone: 703–557–3881.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: May 12, 1976.

DAVID B. CHANG,
Acting Assistant Secretary for
Science & Technology.

Published in 41 F.R. 20728, Apr. 28, 1976

[947 O.G. TM 114 (June 15, 1976)]

(351) SPECIAL BICENTENNIAL GRANT COVERS

The Patent and Trademark Office will use special grant covers with a bicentennial motif on patents issued and trademarks registered, beginning July 6, 1976 and continuing through the last six months of 1976.

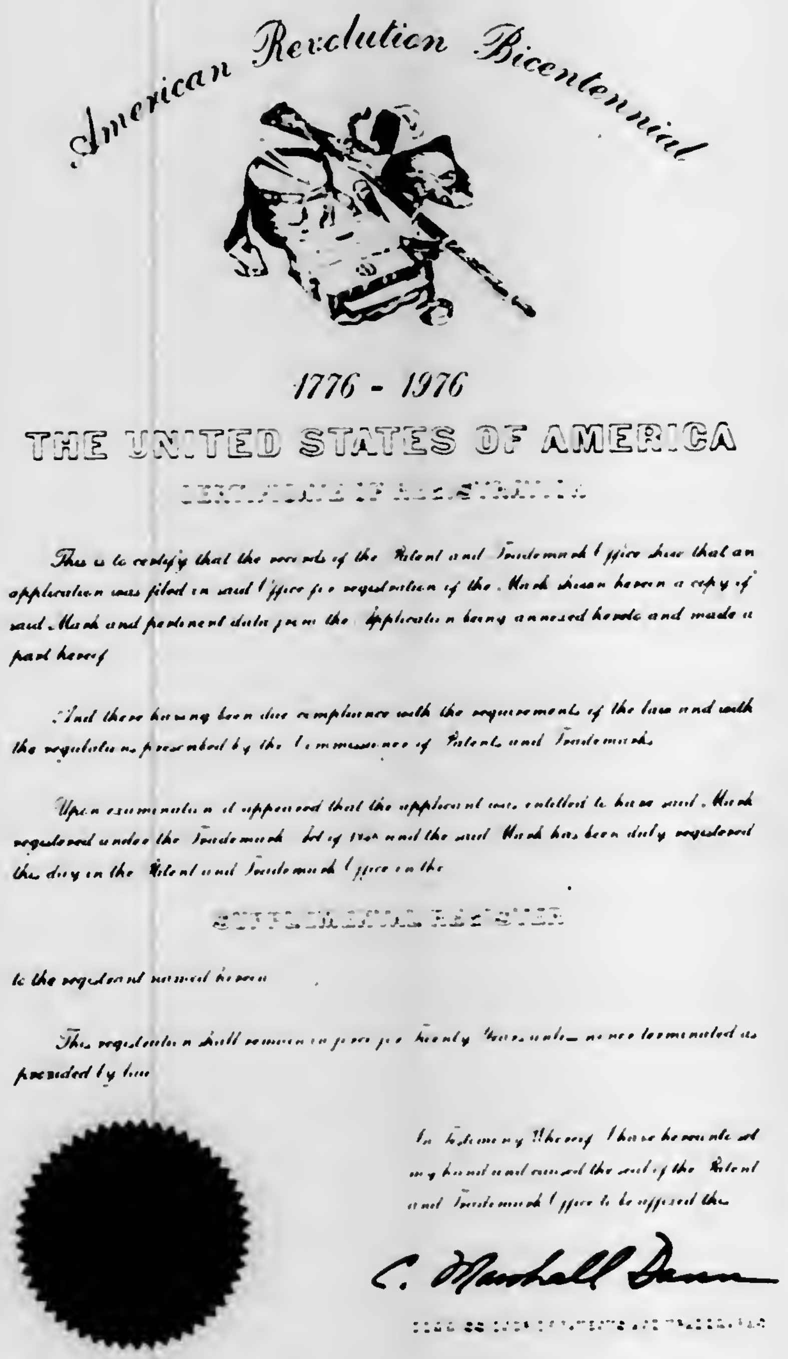
The patent covers will be printed in blue on white paper, with a bicentennial motif, bound with red ribbon and sealed with a gold seal.

The trademark certificate of registration on the Principal Register covers will be printed in blue on white paper with a gold bicentennial motif and sealed with a gold seal. The trademark Certificate of Renewal will be printed in blue on buff paper with a red bicentennial motif and sealed with a red seal. The trademark certificate of registration on the Supplemental Register will be printed in blue on white paper with a blue bicentennial motif and sealed with a blue seal.

Reduced size samples of these special covers are illustrated below.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

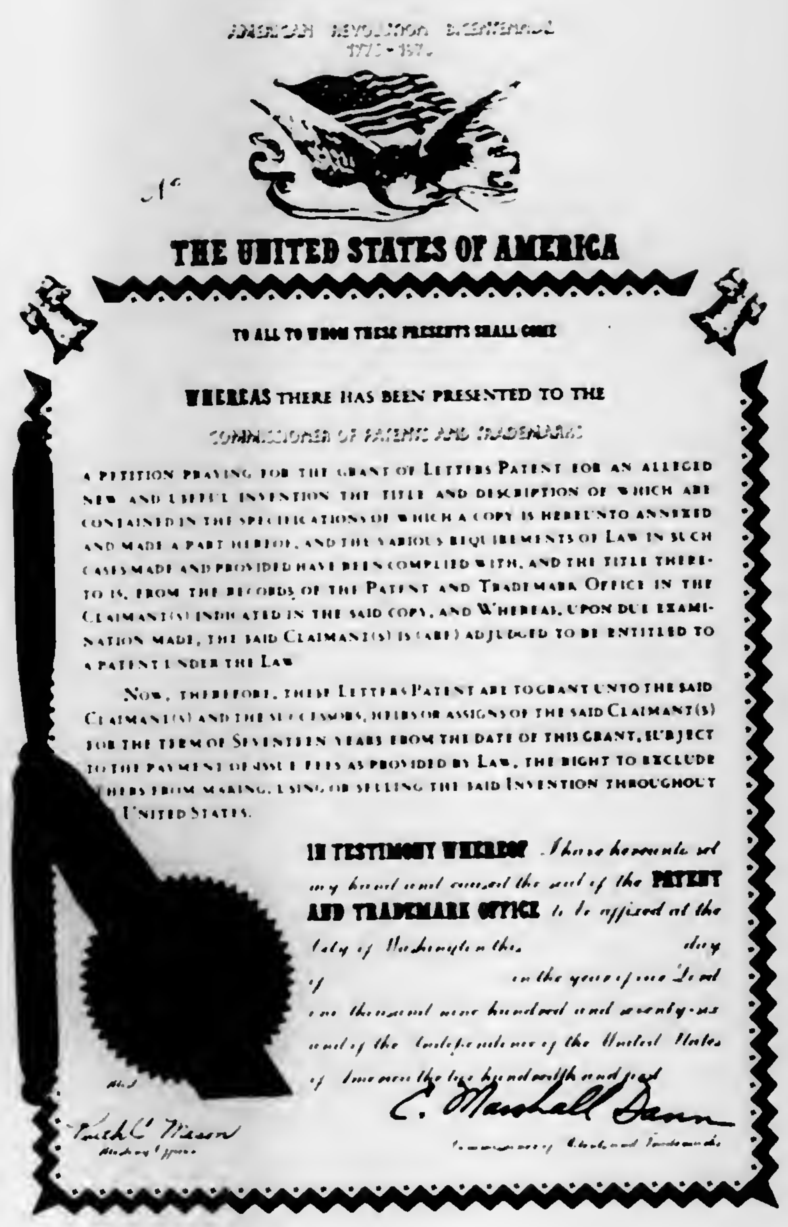
May 25, 1976.



American Revolution Bicentennial

1776 - 1976

THE UNITED STATES OF AMERICA



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME

WHEREAS THERE HAS BEEN PRESENTED TO THE

COMMISSIONER OF PATENTS AND TRADEMARKS

A PETITION PRAYING FOR THE GRANT OF LETTERS PATENT FOR AN ALLEGED NEW AND USEFUL INVENTION THE TITLE AND DESCRIPTION OF WHICH ARE CONTAINED IN THE SPECIFICATIONS OF WHICH A COPY IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PATENT AND TRADEMARK OFFICE IN THE CLAIMANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID CLAIMANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A PATENT UNDER THE LAW.

NOW, THEREFORE, THESE LETTERS PATENT ARE TO GRANT UNTO THE SAID CLAIMANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID CLAIMANT(S) FOR THE TERM OF SEVENTEEN YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF ISSUE FEES AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM MAKING, USING OR SELLING THE SAID INVENTION THROUGHOUT THE UNITED STATES.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the PATENT AND TRADEMARK OFFICE to be affixed at the City of Washington this day of in the year of our Lord one thousand nine hundred and seventy-six and of the Independence of the United States of America the two hundredth and first.

C. Marshall Dann

[947 O.G. TM 167,223 (June 22, 29, 1976)]

(352) CERTIFICATE OF MAILING OF CORRESPONDENCE

[37 CFR Parts 1, 3 and 4]

Delays in Mail Delivery

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Public Law 92–132, 85 Stat. 364), and in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by adding §§ 1.8, 3.55 and 4.23.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. A procedure similar to this proposal, dated December 23, 1975 was published in the OFFICIAL GAZETTE on January 20, 1976 at 942 O.G. 1073 for comment. Comments received in response to this proposal have been considered in the preparation of this proposed rule change and will be given further consideration before the promulgation of any rule. A number of changes have been made in the earlier proposal as a result of these comments.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes in writing to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before August 20, 1976. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

Comments previously submitted relating to the notice of December 23, 1975 need not be resubmitted since they will again be evaluated along with any comments received directed to these proposed rules.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

The promulgation of the proposed rule change is within the authority granted the Commissioner under 35 U.S.C. 6 since it is "not inconsistent with law" and since it is "for the conduct of proceedings in the Patent and Trademark Office."

Under the proposed rules, generally, where a time is set for taking action in any pending patent or trademark application or in most patent or trademark proceedings pending before the Patent and Trademark Office, correspondence or fees will be considered as being timely filed if (1) deposited with the United States Postal Service within the time set for response, and (2) accompanied by a certificate indicating when the correspondence or fee was so deposited. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated.

The proposed procedure would relate to all actions taken before the Patent and Trademark Office except:

(1) The filing of patent and trademark applications;

(2) The filing of agreements between parties to an interference under 35 U.S.C. 135(c); and

(3) The following requirements of the Trademark Act applying to the registration of a mark;

(i) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c);

(ii) The filing of an application for renewal of a registration under Section 9;

(iii) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b); and

(iv) The filing of an affidavit under Section 15, subsection (3).

The date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The proposed addition of a new section 1.8(a) would establish the Certificate of Mailing procedure. Proposed new § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Proposed form § 3.55 is designed for use in patent cases and proposed form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

It is therefore proposed to amend 37 CFR, Chapter 1, as follows:

PART 1.—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 which reads as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms §§ 3.55 and 4.23). The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of original or reissue patent applications;

(ii) The filing of trademark application;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act;

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act; and

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act.

(b) In the event that correspondence or fees are timely mailed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under 37 CFR 1.68 or 2.20 which attests to the previous timely mailing.

PART 3—FORMS IN PATENT CASES

2. By adding a new § 3.55 which reads as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

- -

Date

- -

Name of applicant, assignee, or Registered Representative

- -

Signature

- -

Date

PART 4—FORMS IN TRADEMARK CASES

3. By adding a new § 4.23 which reads as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

- -

Date

- -

Name of applicant, assignee, or applicant's attorney

- -

Signature

- -

Date

Dated: June 3, 1976.

C. MARSHALL DANN,
Commissioner of
Patents and Trademarks.

Approved: June 10, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

[948 O.G. TM 154 (July 20, 1976)]

(353) INTERNATIONAL PROTECTION OF GOVERNMENT EMBLEMS AND SEALS

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114 (Sept. 21, 1976)]

(354) AVAILABILITY OF 1976 EDITIONS OF PATENT LAWS AND TITLE 37 CODE OF FEDERAL REGULATIONS

The July, 1976, edition of Title 37, Code of Federal Regulations, entitled "Patents, Trademarks, and Copyrights," is now for sale by the Superintendent of Documents for $2.20 per copy. The format of this booklet has been restructured to allow parts pertaining to patent regulations and trademark regulations to be grouped separately. This booklet is published by the Office of the Federal Register and contains all patent rules and forms, trademark rules and forms as well as the copyright rules. The stock number is 022–003–93248–0.

A revised edition of the "Patent Laws" booklet dated August, 1976, is also available from the Superintendent of Documents at a cost of $2.10 per copy. The stock number for the "Patent Laws" is 003–004–00535–1.

Orders for both booklets should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

RENE D. TEGTMEYER,
Sept. 24, 1976. *Assistant Commissioner for Patents.*

[951 O.G. TM 140 (Oct. 19, 1976)]

(355) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92–463), announcement is made of the following committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:00 a.m. to 5:00 p.m. on October 20–21, 1976 at the National Lawyers Club, 1815 H Street, NW., Washington, D.C.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuous source of knowledge from the private sector to the government in the field. The agenda for the meeting is:

(1) Opening remarks.

(2) Report and discussion of a study conducted on the Post Registration Section including:

a. Suspension of an application for one year due to non-use.
b. Mailing of two cancellation notices.
c. Cancellation of one class in a multiple class application by failure to file a Section 8 for that class.
d. Authority of the Director to revoke Section 8 acceptances.
e. Forms, procedures and policies in Post Registration Section.

(3) Report and discussion of the Patent and Trademark Office plans for applying ADP techniques in the Trademark Operation.

(4) Report and discussion of the Patent and Trademark Office policy on length of time for retention of files in the Office.

(5) Report and discussion of various aspects of discovery practice including:

a. Pretrial conferences.
b. Protective orders.
c. Amendment to Rule 2.122(b).
d. How to introduce discovery depositions including who submits the deposition, how many copies of the deposition, and who is the party offering the deposition under Rule 120(a)(3).

(6) Report and discussion of the international classification system.

(7) Report and discussion on the possibility of establishing guidelines as to matters which are the proper subject for a petition to the Commissioner and those which are properly appealable to the Trademark Trial and Appeal Board.

(8) Report and discussion on the possibility of naming of firms as attorneys of record.

(9) Report and discussion on current practice regarding restoration of jurisdiction over trademark applications.

(10) Report and discussion of the Patent and Trademark Office mail room study.

(11) Report and discussion on implementation of the Committee's previous recommendations.

(12) Closing remarks.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. Any comments or suggestions relating to the agenda items should be submitted in writing before October 13, 1976. Further, comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request 60 days after the meeting.

Inquiries may be addressed to Patricia M. Davis, Room 11C17 Crystal Plaza Building 3, Telephone: 703–557–3881.

LUTRELLE F. PARKER,
Sept. 23, 1976. *Deputy Commissioner of*
Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[951 O.G. TM 143 (Oct. 19, 1976)]

(356) INDICATION OF CHANGES IN RULES

The Office of the Federal Register now accepts for publication rule change proposals in which additions are enclosed between arrows (►◄) and deletions are enclosed in brackets ([ ]). This format will be used by the Patent and Trademark Office whenever appropriate since it permits an easy determination of what changes are proposed without the need for making a side-by-side comparison with the current rule language.

Although the Federal Register permits the use of arrows and brackets only in rule change proposals because a clean copy of the promulgation is desired for use in printing the Code of Federal Regulations, the Publication in the OFFICIAL GAZETTE of both the proposal and the promulgation of rule changes will contain the arrows and brackets whenever changes are made in current rules. If a rule change substantially rewrites, adds, or deletes entire rules, arrows and brackets will not be used.

Arrows are used rather than underlining to show additional subject matter since underlining and italics are to be used in rules for items such as scientific terms and paragraph headings.

Dated: Oct. 5, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[951 O.G. TM 210 (Oct. 26, 1976)]

(357) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Certificate of Mailing of Correspondence

On June 21, 1976, notice was published in the Federal Register (41 FR 24895) of a proposal to amend Title 37, Code of Federal Regulations by adding new §§ 1.8, 3.55 and 4.23. Interested persons were invited to comment on the proposal on or before August 20, 1976. Twenty-two comments were submitted. Nineteen were favorable to the proposal and two were neutral. One adverse comment was received. Consideration was given to these comments, as well as to 147 comments received in response to an earlier notice published in the OFFICIAL GAZETTE of the Patent and Trademark Office on January 20, 1976 (942 O.G. 1073). Of these 147 comments, 131 were in favor of a certificate of mailing procedure, 11 were opposed and 5 were neutral. Both sets of comments, and a summary and analysis of each set, are available for public inspection in Room 11E10 of Crystal Plaza Building 3 at 2021 Jefferson Davis Highway in Arlington, Virginia.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. Except in those cases spelled out in new § 1.8, papers and fees will be considered as being timely filed if they are deposited with the U.S. Postal Service on or before the expiration of the period set for response. However, the date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The exceptions spelled out in new § 1.8 are intended to exclude from the new procedure those cases where filing in the Office, or with the Commissioner, is a requirement of statute. In view of five comments questioning the authority of the Commissioner to adopt the new procedure, two further exceptions have been included in § 1.8. In all other cases, the new procedure would not be inconsistent with statute, and therefore would be within the authority of the Commissioner to adopt. The suggestion, advanced in eight comments, that there should be no exceptions, was not adopted.

One comment suggested that attestation be made on a personal knowledge basis and this suggestion has been adopted. In response to another comment, the text of § 1.8 has been amended to indicate more clearly who may sign the certificate. Finally, several comments expressed concern about the possibility of fraud. However, the use of a post card receipt (see Notice dated November 21, 1968) would seem to minimize this possibility.

The addition of a new § 1.8(a) establishes a Certificate of Mailing procedure. New § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Form § 3.55 is designed for use in patent cases and form § 4.23 is designed for use in trademark cases when making a certificate under § 1.8(a).

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are hereby amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of patent applications;

(ii) The filing of trademark applications;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act, 15 U.S.C. 1059;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act, 15 U.S.C. 1064(a), 1064(b);

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or Section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Customs and Patent Appeals;

(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under Section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2); and

(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

(b) In the event that correspondence or fees are timely filed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under § 1.68 or § 2.20 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing.

PART 3—FORMS FOR PATENT CASES

2. By adding a new § 3.55 as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ______________________.
Date

____
Name of applicant, assignee, or
Registered Representative

____
Signature

____
Date

PART 4—FORMS FOR TRADEMARK CASES

3. By adding a new § 4.23 as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ______________________.
Date

____
Name of applicant, assignee, or
applicant's attorney

____
Signature

____
Date

Effective date: These amendments shall become effective on November 1, 1976.

Dated: September 28, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: September 17, 1976.
BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

[FR Doc. 76-28915; Filed 10-1-76; 8:45 am]

[951 O.G. TM 210 (Oct. 26, 1976)]

(358) CERTIFICATE OF MAILING PROCEDURES

The Patent and Trademark Office has promulgated new Rules 1.8 and forms 3.55 and 4.23 which establish a new Certificate of Mailing Procedure, effective November 1, 1976.

In order to assist the Patent and Trademark Office in the effective handling of these certificates, the following guidelines are suggested.

Location of Certificate

The preferred location for the Certificate of Mailing is at the end of any correspondence mailed to the Office. In those situations where the certificate accompanies a fee or other form such as the issue fee transmittal form PTO-85, which does not have space for a certificate, the certificate should appear on a separate cover letter which refers to the accompanying paper. When a separate cover letter is used, a clear identification of the type of correspondence should be included.

Although not specifically required by the rule, it is preferred that the certificate be signed by the applicant, assignee, or attorney. The certificate should be signed separately from the correspondence itself. Suggested wording of the certificate is set forth in form 3.55 for patent cases and form 4.23 for trademark cases.

A separate certificate should be made for papers filed in each individual application, if papers for several different applications are mailed in a single envelope.

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period.

WILLIAM FELDMAN,
Oct. 26, 1976. *Deputy Assistant Commissioner for Patents.*

[952 O.G. TM 174 (Nov. 16, 1976)]

PATENT NOTICES WHICH ALSO PERTAIN TO TRADEMARKS

REVISION OF "DISCONTINUANCE OF DEPOSIT ACCOUNT SERVICE FOR SALE OF PATENT COPIES"

In view of the difficulties experienced by many of its customers, the Patent Office is revising the Notice appearing in the December 1, 1964 issue of the *Official Gazette of the U.S. Patent Office.* This Notice—Discontinuance of Deposit Account Service for Sale of Patent Copies—is revised to except certain types of patent copy orders.

The Patent Office will now accept lists of fifty (50) or more numbers arranged in numerical sequence to be charged to Deposit Accounts. Service charges, such as Special Handling and Air Mail postage for these orders, may also be charged to Deposit Accounts.

C. A. KALK,
July 15, 1965. *Director of Administration.*

[818 O.G. 1207]

ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts only of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Dec. 15, 1965. *Commissioner.*

[822 O.G. 769]

DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

Telephone Numbers on Amendments and Other Papers

In view of the increased use of telephone interviews regarding matter which can be readily cleared up by a telephone call to applicant or his representative, it is again recommended that amendments and other papers, such as letters of transmittal, include the complete telephone number with area code and extension, preferably near the signature of the writer.

RICHARD A. WAHL,
Mar. 11, 1966. *Assistant Commissioner.*

[825 O.G. 1]

ZIP Code Reminder

By Executive Memorandum of June 18, 1965, President Johnson directed all Federal Agencies to take the lead in adopting the ZIP Code system and instructed the Postmaster General to issue regulations governing the use of ZIP Codes by such agencies.

Pursuant to this directive, Section 137.26 has been added to the Postal Manual requiring compliance by Federal Agencies as follows:

1. Effective January 1, 1966, official mailings containing typed or handwritten addresses must include the ZIP Code.
2. Effective January 1, 1967, all Federal Agencies must use the ZIP Code in the addresses on *all* official mail and are required to presort quantity mailings by ZIP code.

TO THIS END, ALL FUTURE LETTERS, COUPONS, AND OTHER PAPERS BEARING THE SENDERS'S ADDRESS WHICH ARE MAILED TO THE PATENT OFFICE MUST SHOW THE ZIP CODE DESIGNATION OF BOTH THE SENDER AND THE PATENT OFFICE.

The Patent Office ZIP Code is 20231. This designation should be used when writing to the Patent Office for any matter. In addition, the sender's own ZIP Code designation should be given. The benefits to be gained by the immediate use of ZIP Code are many: positive identification of areas; faster delivery of mail by reducing the number of handlings from point of origin to destination; and easier identification of post office address.

C. A. KALK,
Mar. 22, 1966. *Director of Administration.*

[825 O.G. 428]

Practice in the Use of Accounts for Payment of Statutory Fees

In the Official Gazettes of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

Deposit Accounts

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

Recording of Instruments

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer

oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. TM 145 (Mar. 28, 1967)]

Official Patent Office Mailing Address Remains Washington, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

[860 O.G. 662]

Change in Legal Holidays

Those doing business before the Patent Office are hereby reminded that by Public Law 90–363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
  New Year's Day, January 1.
  Washington's Birthday, the third Monday in February.
  Memorial Day, the last Monday in May.
  Independence Day, July 4.
  Labor Day, the first Monday in September.
  Columbus Day, the second Monday in October.
  Veterans Day, the fourth Monday in October.
  Thanksgiving Day, the fourth Thursday in November.
  Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, Jr.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

Editorial Note: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

Patent Office Business Hours

This procedure is being published to bring to the attention of the public security provisions concerning the Patent Office premises and Patent Office files.

The public is reminded that the Patent Office working hours are 8:30 a.m. to 5:00 p.m. Monday through Friday, excluding legal holiday in the District of Columbia. Outside these hours, only Patent Office employees are authorized to be in areas of the Patent Office other than the Public Search Rooms. Of course, a member of the public engaged in a discussion of business with an Office employee may be invited by the employee to stay beyond Office hours to conclude the discussion.

The hours for the Public Search Room are 8:00 a.m. to 8:00 p.m., and the hours for the Trademark Search Room are 8:00 a.m. to 6:00 p.m. Monday through Friday, excluding legal holidays in the District of Columbia.

During working hours, all applicants, attorneys, and other members of the public should announce their presence to the Office personnel in the area of their visit. In the Examining Groups, visitors should inform the group receptionist of their presence before visiting other areas of the Group.

RENE D. TEGTMEYER,
Sept. 27, 1973. *Acting Commissioner of Patents.*

[915 O.G. 1164]

Termination of the "Rules of Practice in Patent Cases" Booklet

The Superintendent of Documents has informed the Patent Office that the basic rule book entitled "Rules of Practice in Patent Cases" is out of print and no longer available. Furthermore, Revision 3, dated July 1973, is the last revision covered by the current subscriptions. A booklet entitled "37 Code of Federal Regulations," published by the Office of the Federal Register, contains all patent rules and forms, as well as trademark rules and forms and copyright rules. Inasmuch as this publication is revised annually and is more economical to both the public and the Patent Office even if repurchased annually, the Patent Rules of Practice booket will not be reprinted, thereby terminating this duplication of printing. Consequently, it is suggested that persons desiring a copy of the patent rules order a copy of "37 Code of Federal Regulations" from the Superintendent of Documents. The price for the most recent issue, dated July 1, 1973, is $1.75.

The Patent Office will supply all patent examiners and other appropriate employees with a copy of "37 Code of Federal Regulations" annually beginning with the July 1974 edition.

Since the inventory of the Trademark Rules of Practice booklet is in large supply, it will continue to be offered for sale by subscription from the Superintendent of Documents and updatings will continue to be published periodically.

C. MARSHALL DANN,
Mar. 18, 1974. *Commissioner of Patents.*

[921 O.G. 860]

Change in Name of the Patent Office

(Public Law 93–596)

On January 2, 1975, President Ford signed into law H.R. 7599, a bill changing the name of the Patent Office to the "Patent and Trademark Office" and the title of the Commissioner of Patents to the "Commissioner of Patents and Trademarks." This change reflects the dual role of the Patent Office in administering both the patent law (Title 35, United States Code) and the Trademark Act of 1946 (60 Stat. 427, 15 U.S.C. 1051, et seq.).

In order to minimize the cost of implementing this law (P.L. 93--596) and because of the similarity of the old and new names, existing stationery, printed forms, publications, etc. will continue in use until such supplies are exhausted. During the interim, the terms "Patent Office" and "Commissioner of Patents," appearing on patent grants and other official documents issued or dated on and after January 2, 1975, shall be construed to mean "Patent and Trademark Office" and "Commissioner of Patents and Trademarks." This same interpretation shall apply to the use of these terms in the patent and trademark rules of practice, 37 CFR, Parts 1 and 2, until such time as the Code of Federal Regulations is revised and new rules of practice are published.

In addition, the public is encouraged to minimize its costs in complying with this new law by exhausting reasonable quantities of existing stationery and forms which contain printed reference to the Patent and Trademark Office as the Patent Office and the Commissioner of Patents and Trademarks as the Commessioner of Patents. In preparing other written matter for submission to the Patent and Trademark Office, the public should use the new designations.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: Jan. 27, 1975.

Betsy Ancker-Johnson, Ph.D.,
Assistant Secretary for Science and Technology.

Public Law 93-596
93rd Congress, H. R. 7599
January 2, 1975

An Act

88 STAT. 1949

To amend the Trademark Act of 1946 and title 35 of the United States Code to change the name of the Patent Office to the "Patent and Trademark Office".

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Patent Office. Name change.

SECTION 1. The Trademark Act of 1946, 60 Stat. 427, as amended (15 U.S.C. sec. 1051 et seq. (1970)), and title 35 of the United States Code, entitled "Patents", are amended by striking out each time they appear "Patent Office" and "Commissioner of Patents" and inserting in lieu thereof "Patent and Trademark Office" and "Commissioner of Patents and Trademarks", respectively.

35 USC 1 et seq.

SEC. 2. Section 29 of the Trademark Act of 1946 is further amended by striking out "Reg. U.S. Pat. Off." and inserting in lieu thereof "Reg. U.S. Pat. & Tm. Off."

15 USC 1111.

SEC. 3. The terms "Patent Office" and "Commissioner of Patents" in all laws of the United States shall mean "Patent and Trademark Office" and "Commissioner of Patents and Trademarks", respectively.

35 USC 1 note.

SEC. 4. This Act shall become effective upon enactment. However, any registrant may continue to give notice of his registration in accordance with section 29 of the Trademark Act of 1946 (60 Stat. 427), as amended Oct. 9, 1962 (76 Stat. 769), as an alternative to notice in accordance with section 29 of the Trademark Act as amended by section 2 of this Act, regardless of whether his mark was registered before or after the effective date of this Act.

Effective date. 15 USC 1111 note.

Approved January 2, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 93-523 (Comm. on the Judiciary).
SENATE REPORT No. 93-1399 (Comm. on the Judiciary).
CONGRESSIONAL RECORD:
Vol. 119 (1973): Oct. 15, considered and passed House.
Vol. 120 (1974): Dec. 18, considered and passed Senate.

[931 O.G. 491]

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Name Change

Pursuant to authority contained in 35 U.S.C. 6, as amended (85 Stat. 364), Chapter I of Title 37 of the Code of Federal Regulations is amended as follows:

The heading of Chapter I is changed to read as set forth above.

Wherever the name "Patent Office," and the title "Commissioner of Patents," appear in Chapter I, they are changed to read, respectively, "Patent and Trademark Office" and "Commissioner of Patents and Trademarks."

Public Law 93-596, 88 Stat. 1949, changed the name of the Patent Office to "Patent and Trademark Office," and the title of the Commissioner of Patents to "Commissioner of Patents and Trademarks."

It is the general policy of the Patent and Trademark Office to afford interested members of the public an opportunity to participate in the rulemaking process. However, this amendment is entirely editorial in nature. Therefore, the public rulemaking procedure is waived and this amendment will become effective on February 4, 1975.

C. MARSHALL DANN,
Commissioner of Patents.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 40 F.R. 5158, Feb. 4, 1975

[932 O.G. 2 (Mar. 4, 1975)]

EXPRESS MAIL

The Patent and Trademark Office has made an arrangement with the U.S. Postal Service for the delivery of "Express Mail." This arrangement provides for the delivery of "Express Mail" to a Patent and Trademark Office employee in the Department of Commerce Building in Washington, D.C., thus guaranteeing delivery to us in the same manner as "Express Mail" is delivered to any other addressee in the city of Washington. "Exress Mail" requires the recipient to indicate both the time and date of delivery. The date which our employee in the Department of Commerce Building receives the mail will be the Official Office Receipt Date.

The address which should be used for "Express Mail" is:

Commissioner of Patents and Trademarks
Washington, D.C. 20231.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Feb. 11, 1975.

[932 O.G. 340]

EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

[936 O.G. 1554]

POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.
ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.
ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.
BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.
BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.
BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.
BUFFALO, N.Y. 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.
CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.
CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.
CHICAGO, 60603. Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.
CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.
CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.
COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.
DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.
DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.
DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.
DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.
GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St. P.O. Box 1950. (919) 275–9111, Ext. 345.
HARTFORD, CONN., 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.
HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.
HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.
INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.
KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.
LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.
MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.
MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.
MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.
MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.
NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.
NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.
NEWARK, N.J., 07102, Gateway Bldg., (4th Floor) (201) 645–6214.
PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.
PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.
PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221-3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784-5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782-2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622-4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524-5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave. (415) 556-5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723-4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125-29 Bull St. (912) 232-4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave., North (206) 442-5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 386]

NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announce a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Bania, Director, Office of Publications (Room 2-5C26), Patent and Trademark Office, Washington, D.C. 20231. Attention: Shirley A. Hammel (Telephone 703/557-3794), or Lillie M. Harrison (Telephone 703/557-1985).

This notice is effective with the publication date and supersedes the notice published on this subject in 934 O.G. 886, dated April 25, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

[939 O.G. 3]

CUSTOMER RELATIONS CENTER

A Customer Relations Center, located in Crystal Plaza adjacent to the Public Search Room, Building 4, Rooms A102 and A103, has been established to provide a central customer complaint and inquiry service. The Center is staffed with six highly experienced employees who process inquiries concerning copies of U.S. patent documents previously ordered but not received. This Center handles not only walk-in but telephonic, and written requests for assistance as well. In addition to improving customer relations, this service is intended to relieve the primary customer service areas (Patent Copy Sales, Document Services, and Reference Order Branch), and Patent Office officials, or interruptions and irregular demands on their time.

The telephone number for this service is (703) 557-2003.

ROBERT GOTTSCHALK,
Acting Commissioner of Patents.

Nov. 26, 1971.

[893 O.G. 807]

(NOTE.—In the trademark area, this service pertains only to applications and file wrapper contexts of applications.)

RELOCATION OF CUSTOMER RELATIONS CENTER

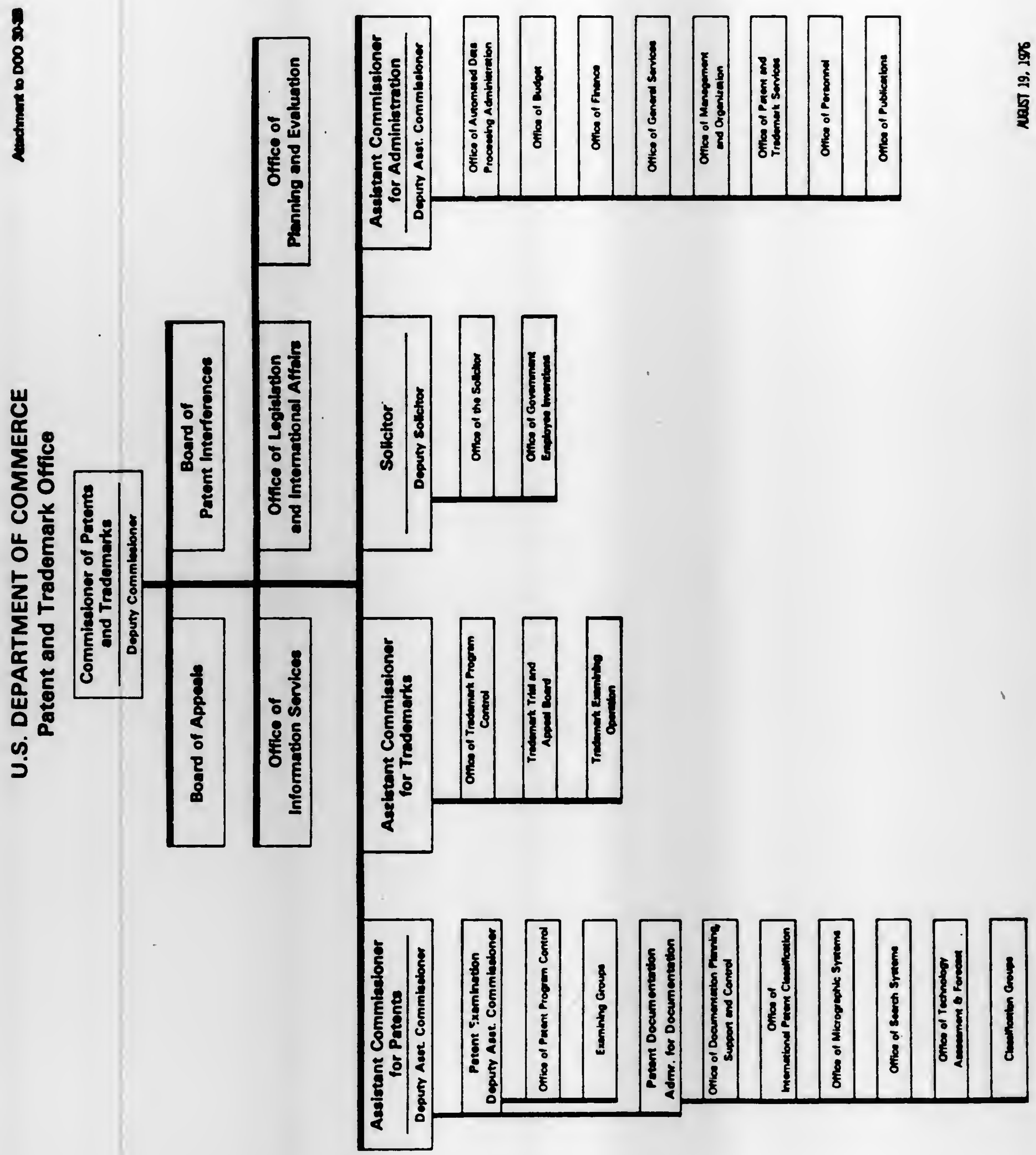
In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557-2003.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

January 1976.

[943 O.G. TM 61 (Feb. 10, 1976)]


U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

Attachment to DOO 30-3B

AUGUST 19, 1976

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Deputy Commissioner
Board of Patent Interferences
Board of Appeals
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Office of Legislation and International Affairs
Office of Information Services
Assistant Commissioner for Administration
Deputy Asst. Commissioner
Office of Automated Data Processing Administration
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Trademark Trial and Appeal Board
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Group 110, Director, Samih Zaharna	3610
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Group 140, Director, Arthur P. Kent	3800
Group 160, Director, Rueben Friedman	3547
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Div. II, Supervisor, F. Henry Wetherbee	3277
Div. III, Supervisor, C. Raymond Fowler	9560
Div. IV, Supervisor, Betty Vertiz	9550
Div. V, Supervisor, Lenore D. Lady	5380
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Editor, Katharine I. Hancock	5380
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Gilbert Pence	5381
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Head, Harold I. Pitta	3281
Post-Registration (Trademark Affidavits and Renewals)	
Supervisor, William Berkeley	3334
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Director, Patricia M. Davis	3881

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Deputy Assistant Commissioner, Bradford R. Huther	2290
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Director, Stanley J. Bania	3794
Patent Issue Division	
Head, Ruth Mason	3283

PATENT AND TRADEMARK OFFICE NOTICES

Interference Practice

[37 CFR Part 1]

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92–132, 85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 1.205, 1.207, 1.215, 1.216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45 and 5.3 and by adding § 1.246.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before January 21, 1977. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

This proposal has been reviewed and determined to have no major inflationary impact.

These rule changes are intended to improve the practice before the Board of Patent Interferences and to correct some inconsistencies in the rules. The rule changes (1) provide a patentee with notice as soon as a claim is copied from the patent so that the patentee can preserve the invention records from the moment he receives said notice until the time, in some instances many years later, when an interference is ultimately declared between the patentee and the copier, (2) bring § 1.207(b) in confirmity with § 1.207(a), (3) simplify the rules relating to preliminary statements in view of the decisions, *Reddy* v. *Davis,* 187 USPQ 386 (Comm. Dec. 1975) and *Reddy* v. *Dann*, 188 USPQ 644 (CCPA 1976), (4) fill a void now existing in § 1.225, (5) make minor changes in §§ 1.245 and 1.247 and create new § 1.246 and (6) make § 1.217 consistent with § 1.215.

> **ATTENTION**
>
> The texts of the following proposed amendments are using ▶ ◀ arrows to indicate additions and [ ] brackets to indicate deletions.

It is proposed to amend 37 CFR, Parts 1, 3 and 5 as follows:

1. Revising § 1.205 by adding paragraph (c) thereto as follows:

§ 1.205 *Interference with a patent; copying claims from patent.*

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▶(c) A notice that one or more claims of a patent have been copied, or substantially copied by an applicant(s), will be placed in the file wrapper of the patent and a copy of said notice will be sent to the patentee. However, the identity of the applicant(s) will not be disclosed to the patentee unless an interference is declared.◀

2. By revising § 1.207(b) to read as follows:

§ 1.207. *Preparation of interference papers and declaration of interference.*

• • • • •

(b) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filling date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or continuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ▶If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◀ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.

(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.

(3) For filing motions under § 1.231, not less than 4 months from declaration.

• • • • •

3. By revising § 1.215(b) to read as follows:

§ 1.215 *Preliminary statement required.*

• • • • •

(b) A party who files a preliminary statement shall at the same time notify all opposing parties of that fact and by the time set for that purpose he shall serve a copy of his preliminary statement [and all attached documents on every opposing party from whom he has received notification of the filing of a statement.] ▶on every opposing party from whom he has received notification of the filing of a statement.◀

• • • • •

4. By revising § 1.216 to read as follows:

§ 1.216 *Contents of the preliminary statement.*

(a) The preliminary statement must state that the party made the invention set forth by each count of the interference, and whether the invention was made in the United States or abroad. When the invention was made in the United States the preliminary statement must set forth as to the invention defined by each count the following facts:

(1) The date upon which the [first drawing of the invention was made; if a drawing of the invention has not been made prior to the filing date of the application, it must be so stated.] ▶invention of each count was conceived.◀

(2) The date [upon which the first written description of the invention was made; if a written description of the invention has not been made prior to the filing date of the application, it must be so stated.] ▶after conception of said invention when active exercise of reasonable diligence toward reducing the invention to practice began.◀

(3) The date [upon which the invention was first disclosed to another person; if the invention was not disclosed to another person prior to the filing date of the application, it must be so stated.] ▶of the actual reduction to practice of the invention; if the invention has not actually been reduced to practice before the filing date of the involved application, it must be so stated.◀

[(4) The date of the first act or acts susceptible of proof (other than making a drawing or written description or disclosing the invention to another person) which, if proven, would establish conception of the invention, and a brief description of such act or acts; if there have been no such acts, it must be so stated.

(5) The date of the actual reduction to practice of the invention; if the invention has not been actually reduced to practice before the filing date of the application, it must be so stated.

(6) The date after conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.]

Paragraph (b) is deleted and present paragraph (c) is substituted as new paragraph (b) as follows:

[(b) When an allegation as to the first drawing (paragraph (a)(1) of this section) and/or as to the first written description (paragraph (a)(2) of this section) is made, a copy of such drawing and/or written description must be attached to the statement. (See § 1.223(c).)]

[(c)] ►(b)◄ If a party intends to rely solely on a prior application, domestic or foreign, and on no other evidence, the preliminary statement may so state and need not be signed or sworn to or declaration made by the inventor.

5. By revising § 1.217 to read as follows:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a)(1) to [(6)] ►(3)◄ are not required, and in lieu thereof there should be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a)(1) to [(6)] ►(3).◄ [and documentary attachments if the allegations relate to a drawing or written description.] ►Such statement may be signed and sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄

(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.215(a) (1) to [(6)] (3).

6. By revising § 1.222 to read as follows:

§ 1.222 *Correction of statement on motion.*

In case of material error arising through inadvertence or mistake, the statement [or attachments] may be corrected [or omitted attachments may be supplied on motion] (see § 1.243), upon a satisfactory showing that such action is essential to the ends of justice. The motion must be made, if possible, before the taking of any testimony, and as soon as practicable after the discovery of the error.

7. By revising § 1.223(c) to read as follows:

§ 1.223 *Effect of statement.*

* * * * *

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. [If a party alleges in his statement a date of first drawing or first written description but does not attach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222.]

* * * * *

8. By revising § 1.225 to read as follows:

§ 1.225. *Failure of junior party to file statements or to overcome filing date of senior party.*

If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. ►If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225.◄ Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a), (2), (3), (4), or (5) which was granted over his opposition. Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

9. Revising § 1.245 by deleting the second sentence thereof so as to read as follows:

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extention. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

10. By adding new rule § 1.246 as followa:

►§ 1.246. *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

11. Revising the format of § 1.247 so as to read as follows:

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following:

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c).

[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.

[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served (§ 1.253(a)).

[(d)] ►(4)◄ Statutory disclaimers under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not expected above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as prima facie proof of service.

12. By revising § 3.44 to read as follows:

§ 3.44 *Interference; preliminary statement of domestic inventor.*

Preliminary statement --------------------------------

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v. } Interference No. ----------
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-------------------------- } ss
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--------------------------, being duly sworn (or affimed), deposes and says that he is a party to the above identified interference, that he made the invention set forth by [the counts] ►each count◄ of the interference in the United States; that

(1) [The first drawing of the invention was made] ►The invention of each count was conceived◄ on --------, 19----. [A copy is attached.[1]]

(2) [The first written description of the invention was made] ► Active exercise of reasonable diligence toward reducing the invention to practice began◄ on --------, 19----. [A copy is attached.[1]]

(3) The invention was [first disclosed to others] ►actually reduced to practice◄ on --------, 19----.[1]

[(4) The date of the first act or acts susceptible of proof, other than acts of the character specified in (1), (2), and (3) which, if proven, would establish conception of the invention, and a brief description of such act or acts are (e.g. the making of a non-operating model on --------, 19----).

(5) The invention was actually reduced to practice on --------, 19----.

(6) Active exercise of reasonable diligence toward reducing the invention to practice began on --------, 19----.[1]]

(Signature of inventor)

Subscribed and sworn to (or affirmed) before me this ----date of --------, 19----.

[SEAL]

(Signature of notary public officer)

(Official character)

13. Revising § 3.45 by changing line 3 of the last paragraph of the section.

§ 3.45 *Interference; preliminary statement of foreign inventor.*

* * * * *

* * * When acts were performed in the United States corresponding to the allegations (1) through [(6)] ►(3)◄ in the preliminary statement of a domestic inventor (§ 3.44) these acts should be included by appropriate allegations in the preliminary statement of a foreign inventor.

14. Revising § 5.3(b) by adding a third sentence as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

(b) * * * An interference will not be declared involving applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent. ►See § 1.205(c).◄

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C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: November 19, 1976.
Approved:
BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.76–35049; Filed 11–29–76; 8:45 am]

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[1] If there were no act corresponding to this allegation prior to the filing date of the application, it must be so stated. [Note, however, date of completion of application drawing and specification, date of disclosure to person preparing the application, and diligence in preparing the application.]

Extension of Deadline for Comments on Proposed Interference Rules

The deadline for comments on the proposed rules relating to patent interferences announced in the Federal Register of November 30, 1976 (41 F.R. 52486) and reproduced in this issue of the OFFICIAL GAZETTE is being extended through March 4, 1977.

C. MARSHALL DANN.
Dec. 13, 1976. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,611,813, Sharpless and Eichert, Jr., MAGNETIC DATA STORAGE SYSTEM, **filed** Nov. 20, 1976, D.C., N.D. Ill. (Chicago) Doc. 70c2916, *Technitrol, Inc.* v. *Digital Equipment Corporation.* Above entitled cause of action is dismissed without prejudice, July 26, 1976.

2,891,375, Vandamme, and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH-BULK YARN; **3,012,397,** H. Sarvage, METHOD OF MAKING HIGH-BULK YARNS; **3,165,881,** De Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** H. Crouzet, FALSE-TWIST SPINDLE; **3,584,450,** same, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Aug. 24, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–441–G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *American Textured Yarn Company and Carolina American Textiles, Inc.* **Same, filed** Sept. 16, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–492–G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *J. P. Stevens & Company, Inc.*

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH-BULK YARNS; **3,165,881,** De Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** H. Crouzet, FALSE-TWIST SPINDLE; **3,584,450,** same, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Sept. 9, 1976, D.C., M.D.N.C. (Greensboro) Doc. C76–478–G, *Deering Milliken Research Corporation and Chavanoz, S.A.* v. *Spray Textured Yarns, Inc.*

2,897,641, Simon and Thomas, PACKAGING METHODS, **filed** Mar. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c0770, *Instapak Corporation* v. *Haeger Potteries, Inc.* Enter order by stipulation that causes are dismissed with prejudice, Aug. 23, 1976.

2,985,245, R. P. Maloof, PROPELLER FAN; **Reg. No. 788,738** (TROPIC-BREEZE), National Frost Protection, Inc., now SSP Agricultural Equipment, Inc., **filed** Apr. 4, 1974, D.C., E.D. Wash. (Spokane) Doc. C–74–86, *SSP Agricultural Equipment, Inc.* v. *Orchard-Rite Ltd.* Plaintiff's third proposed findings of fact and conclusions of law and judgment entered Aug. 18, 1976.

3,012,397. (See 2,891,375.)

3,014,994, S. Posen, EYEGLASS HEARING AID CONSTRUCTION; **3,209,080,** Guttner, Starke and Sapara, ELECTRICAL HEARING AID, **filed** Feb. 2, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c296, *Siemens Aktiengesellschaft* v. *Sonotone Corporation.* On stipulation cause dismissed with prejudice, Apr. 6, 1976.

3,039,670, F. T. Hardon, COLLAPSIBLE CONTAINER, **filed** Dec. 9, 1975, D.C., S.D.N.Y., Doc. 75–C–6178 RO, *Packaging Corporation of America* v. *Lionel Industries Company, Inc.* Consent judgment entered permanently enjoining defendants from further infringing on plaintiff's said patent, Sept. 3, 1976.

3,086,529, Munz and Kelson, CONSTRICTORS, **filed** July 13, 1976, D.C.N.J. (Newark) Doc. 76–1370, *Propper Manufacturing Co., Inc.* v. *FJR Company.* Action dismissed by plaintiff, Aug. 27, 1976.

3,165,881. (See 2,891,375.)

3,174,688, V. H. Chatten, ORNAMENTAL DEVICE USING LIQUID DROPLETS, **filed** Sept. 27, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c2796, *Creators, Inc.* v. *Montgomery Ward & Co., Incorporated and The Wickes Corporation.* Complete case file transferred to Central District of California, July 11, 1975.

3,176,491, Mau and Nagy, THREAD AND OTHER FORM ROLLING DIES; **Re. 26,518,** same, **filed** Sept. 1, 1976, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75–2010, *The National Rolled Thread Die Company* v. *E. W. Ferry Screw Products, Inc. et al.* The decision of the District Court is affirmed, Sept. 1, 1976. **Same, filed** Sept. 1, 1976, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75–2011, *The National Rolled Thread Die Company* v. *E. W. Ferry Screw Products, Inc. et al.* The decision of the District Court is affirmed.

3,219,026, Curlett and Gurries, CONSTRUCTION MACHINES, **filed** Jan. 13, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c106, *CMI Corp.* v. *Lakeland Construction Co. et al.* Cause dismissed, Jan. 23, 1975; appealed, Feb. 21, 1975; appeal affirmed, Apr. 16, 1976.

3,208,339, H. I. Henderson, APPARATUS FOR DRILLING WELLS, **filed** Sept. 3, 1976, D.C. Colo. (Denver) Doc. 76–M–872, *Walker-Neer Manufacturing Company, Inc.* v. *Drill Systems, Inc. et al.*

3,209,080. (See 3,014,994.)

3,232,037. (See 2,891,375.)

3,400,038, C. D. Burgess, SEAMING TAPE; **3,533,876,** same, PROCESS FOR FACE SEAMING CARPETING; **3,563,830,** C. D. Burgess, PROCESS FOR PREPARING SEAMING TAPE, **filed** Aug. 31, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–2802–LTL, *Carpet Seaming Tape Licensing Corp.* v. *H. B. Fuller Company.*

3,400,038, C. D. Burgess, SEAMING TAPE; **3,533,876**, same, PROCESS FOR FACE SEAMING CARPETING; **3,563,830**, C. D. Burgess, PROCESS FOR PREPARING SEAMING TAPE; **3,755,058**, A. Winkler, CARPET SEAMING TAPE, **filed** Aug. 5, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–2494–R, *Carpet Seaming Tape Licensing Corp.* v. *Vectron Industries, Inc.*

3,486,283, R. W. Arnett, SOFFIT MOLDING; **3,606,714**, same, MOLDING STRIP FOR USE AS QUIRK OR REVEAL, **filed** June 8, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–992A, *Fry Reglet Corporation and R. W. Arnett* v. *R. G. Barnett Corporation, R. G. Barnett and Elaine Barnett.* Consent dismissal entered by clerk dismissing action, Sept. 17, 1976.

3,533,876. (See 3,400,038.)

3,563,830. (See 3,400,038.)

3,584,450. (See 2,891,375.)

3,586,794, E. Michaelis, EARPHONE HAVING SOUND DETOUR PATH, **filed** July 24, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c1880, *Sennheiser Electronic Corp.* v. *Allied Radio Shack et al.* Judgment by consent, complaint against Tandy Corp. is dismissed without prejudice; Tandy Corp's counterclaim against Sennheiser Electronic Corp. is dismissed without prejudice. Said patent is valid and belongs to plaintiff, Mar. 27, 1975.

3,602,181, G. H. Harris, OUTBOARD MOTOR STEERING CONTROL, **filed** Aug. 30, 1976, D.C., W.D. La. (Shreveport) Doc. 760916–S, *Garrett W. Harris and Arnold Industries, Inc.* v. *T. Lloyd Co. et al.*

3,606,714. (See 3,486,283.)

3,669,499, Semplonius and Kolk, CHAIR, **filed** May 10, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c1207, *Steelcase, Inc.* v. *All-Steel Equipment Inc.* Plaintiff's voluntary dismissal, June 4, 1973.

3,713,926, L. Speer, METHOD FOR PATCHING MATERIALS, **filed** Mar. 18, 1976, D.C., N.D. Ohio (Toledo) Doc. 76–129, *Vyna-Chem (Canada), Ltd.* v. *Lawrence L. Speer et al.* Case dismissed for want of prosecution without prejudice, Sept. 13, 1976.

3,727,949, Kleykamp, Neroni and Holden, HOSE CONSTRUCTION, **filed** Sept. 14, 1976, D.C., E.D. Mo. (St. Louis) Doc. 76–834C(3), *Arundale, Inc.* v. *Dayco Corporation.*

3,732,419, Kulberg and Muehllehner, SCINTILLATION CAMERA WITH IMPROVED RESOLUTION, **filed** Nov. 18, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3327, *Searle Analytic, Inc.* v. *Ohio Nuclear, Inc.* Plaintiff's voluntary dismissal on Mar. 20, 1975.

3,733,211, F. R. Anderson, RIBBON-INKING METHOD, **filed** June 23, 1976, D.C.N.J. (Newark) Doc. 76–1209, *Henry Bridgman* v. *Berkeley Bio-Engineering, Inc.* Plaintiff's notice of voluntary dismissal of action, Sept. 14, 1976.

3,739,653, D. Bogosh, SPEEDOMETER DRIVES, **filed** May 29, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c1467, *Donald Bogosh* v. *Stewart-Warner Corporation.* Enter consent order, cause hereby dismissed without prejudice, Oct. 29, 1974.

3,742,908, D. H. Merino, ANIMAL HABITAT, **filed** Apr. 1, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c1037, *Mattel, Inc.* v. *Pets International Ltd. Inc. and Genyk Products Limited.* Stipulated dismissal on Mar. 4, 1976.

3,754,279, Valenti and Follett, THERMAL RECORDER HAVING ANALOGUE STYLUS AND PRINT HEAD, **filed** May 17, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c1350, *General Electric Co.* v. *Gulton Industries.* By stipulation, order complaint dismissed with prejudice and counterclaim dismissed without prejudice, Nov. 26, 1974.

3,755,058. (See 3,400,038.)

3,854,910, P. A. Hammerquist, APPARATUS FOR REMOVING PARTICLES FROM AN AIRSTREAM, **filed** Aug. 31, 1976, D.C. Oreg. (Portland) Doc. C–76–766, *American Sheet Metal, Inc. and Peter A. Hammerquist* v. *Clarke's Sheet Metal, Inc.*

3,901,396, C. E. Rhodes, POWER CONTROL HAND TRUCK, **filed** Sept. 7, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C–399, *Woodward Mfg. & Sales Co., Inc.* v. *Anthony Fox, The Tony Team, Inc. and Qwik-Lift, Inc.*

3,914,493, Graber and Tischer, IRON-IN STIFFENING INSERT, **filed** Sept. 15, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1520A, *Pelton Corporation* v. *Staflex Co.*

3,955,609, M. I. Stiegel, HANDBAG, **filed** Aug. 26, 1976, D.C., S.D. Calif. (Los Angeles) Doc. CV76–2766–WPG, *AMBA Marketing Systems, Inc.* v. *United States Sales Corp.*

Re. 26,518. (See 3,176,491.)

Reg. No. 788,738. (See 2,985,245.)

PATENT NOTICES

Certificates of Correction for the Week of Jan. 4, 1977

Re. 28,805
Re. 28,907
Re. 28,962
Re. 28,972
3,792,334
3,809,930
3,817,809
3,824,517
3,831,753
3,833,476
3,850,202
3,851,500
3,856,817
3,868,075
3,871,852
3,875,917
3,879,367
3,898,435
3,907,834
3,909,652
3,912,687
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3,915,135
3,919,722
3,921,862
3,927,358
3,927,503
3,927,692
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3,943,099
3,944,393
3,945,968
3,947,380
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3,954,125
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3,962,086
3,962,361
3,962,364
3,963,633
3,964,313
3,964,488
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3,965,748
3,966,418
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3,968,469
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3,970,245
3,971,145
3,971,398
3,971,520
3,971,826
3,972,027
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Errata

All reference to Patent No. 3,994,393 to Billy N. Nilson of Sweden for Two Chamber Package appearing in the OFFICIAL GAZETTE of November 30, 1976 should be deleted since no patent was granted.

All reference to Patent No. 3,995,511 to Arthur E. Bishop of Australia for Improvements in or Relating to Rack and Pinion Steering Gear Automotive Vehicles appearing in the OFFICIAL GAZETTE of December 7, 1976 should be deleted since no patent was granted.

All reference to Patent No. 3,995,854 to Jack S. Gasaway of California for Coin Controlled Support for Game Net appearing in the OFFICIAL GAZETTE of December 7, 1976 should be deleted since no patent was granted.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for U.S. and possibly foreign licensing, in accordance with the policies of the agency sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications, either-paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 687,283, Ejector Rack. Filed May 17, 1976. PC $4.00/MF $3.00.

Patent 3,957,356, System for Simulating Missile Target Motion Using Steering Mirrors. Filed Mar. 28, 1975. Patented May 18, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 689,895, Internal Calibration System. Filed May 25, 1976. PC $4.00/MF $3.00.

Patent 3,881,968, Incendiary Comprising Naphthalene and MG-Tetrafluoroethylene. Filed June 22, 1973. Patented May 6, 1975. Not available NTIS.

Patent 3,900,872, Radar Data Converter and Display System. Filed June 27, 1967. Patented Aug. 19, 1975. Not available NTIS.

Patent 3,903,521, Simulator of Radar Return Signals From an Accelerating Target. Filed July 9, 1964. Patented Sept. 2, 1975. Not available NTIS.

Patent 3,904,964, Parametric Amplifier Alignment System. Filed Mar 7, 1974. Patented Sept. 9, 1975. Not available NTIS.

Patent 3,904,966, Synchronized Turn-Off of VLF Antennae. Filed Jan. 31, 1972. Patented Sept. 9, 1975. Not available NTIS.

Patent 3,917,927, Automatic Ranging Frequency Counter. Filed Apr. 15, 1974. Patented Nov. 4, 1975. Not available NTIS.

Patent 3,921,014, Bounce Drive System. Filed Oct. 23, 1973. Patented Nov. 18, 1975. Not available NTIS.

Patent 3,927,552, Underwater Strain Sensor. Filed Nov. 20, 1974. Patented Dec. 23, 1975. Not available NTIS.

Patent 3,935,440, Catapult Breakaway Load Simulator Circuit. Filed Jan. 30, 1975. Patented Jan. 27, 1976. Not available NTIS.

Patent 3,936,834, High Powered Ferrite Loaded Helicopter Antenna. Filed June 21, 1972. Patented Feb. 3, 1976. Not available NTIS.

Patent 3,938,183, Magnetic Tape Signature Signal Injection Device. Filed Oct. 3, 1974. Patented Feb. 10, 1976. Not available NTIS.

Patent 3,940,455, Hydrocarbon Polymers. Filed Aug. 31, 1970. Patented Feb. 24, 1976. Not available NTIS.

Patent 3,942,010, Joule-Thomson Cryostat Cooled Infrared Cell Having a Built-In Thermostat Sensing Element. Filed May 9, 1966. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,942,150, Correction of Spatial Non-Uniformities in Sonar, Radar, and Holographic Acoustic Imaging Systems. Filed Aug. 12, 1974. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,942,447, Fuzing System. Filed Apr. 18, 1967. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,510, Pulse-Repetition Frequency Discriminator (PRFD) for Tracking Radar Signals. Filed Oct. 2, 1964. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,515, Counter-Countermeasure Guidance System. Filed Apr. 24, 1962. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,952,664. Rocket Nozzle Multi Function. Filed June 10, 1974. Patented Apr. 27, 1976. Not available NTIS.

Patent 3,956,453. Process for Fabricating One-Piece Rocket Motor Heat Barrier. Filed Dec. 3, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,956.711. Traveling Wave Transverse Electron Beam for Laser Pumping. Filed Nov. 23, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,956,749. Bearing Measurement Device for a Portable Attack Warning Radar. Filed Apr. 16, 1973. Patented May 11, 1976. Not available NTIS.

Patent 3,957,294. Rotary Gas Joint. Filed June 6, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,964,696. Method for Controlling the Spin Rate of Tube Launched Rockets. Filed Oct. 30, 1974. Patented June 22, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 700,673. A Method for Measuring Biaxial Stress in a Body Subjected to Stress Inducing Loads. Filed June 28, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent 3,940.892. Self-Erecting Aircraft Structure. Filed May 23, 1974. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,954.293. Self-Protecting Latch. Filed Apr. 29, 1974. Patented May 4, 1976. Not available NTIS.

Patent 3,957,107. Thermal Switch. Filed Feb. 27, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,959,446. Synthesis of High Purity, Alpha Phase Silicon Nitride Powder. Filed Mar. 1, 1974. Patented May 25, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg. Agricultural Research Service, Hyattsville, Md. 20782

Patent application 697.174. Methanol Treated Activated Sludge as an Agricultural Chemical Carrier. Filed June 17. 1976. PC $4.00/MF $3.00.

Patent application 698,632. Veterinary Ocular Ring Device for Sustained Drug Release. Filed June 22, 1976. PC $3.50/MF $3.00.

Patent application 699,920. Acetoxymethyl Derivatives of Polyunsaturated Fatty Triglycerides as Primary Plasticizers for Polyvinylchloride. Filed June 25, 1976. PC $4.00/MF $3.00.

Patent application 701,057. Lubricant Compositions. Filed June 30, 1976. PC $3.50/MF $3.00.

Patent 3.959,312. Synthesis of Antitumor Alkaloid Deoxyharringtonine and Its Precursor 3′-O-(5-Methyl 2-Oxohexanoyl)-Cephalotaxine. Filed Dec. 20, 1974. Patented May 25, 1976. Not available NTIS.

Patent 3.959.468. Antibiotic Equisetin and Method of Production. Filed May 6, 1974. Patented May 25, 1976. Not available NTIS.

Patent 3.968.094. Photodegradable Plastics Containing Halo-olefins. Filed Nov. 26, 1974. Patented July 6, 1976. Not available NTIS.

Patent 3,968,095. Photodegradable Plastics Containing an N-Palo Amide. Filed May 30, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3.968.096. Photodegradable Polyolefins Containing and Halogenated Nitrile. Filed Aug. 8, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,968.234. Cinnamyl-Sesamol Derivatives as Insect Chemosterilants. Filed Mar. 5. 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,973.040. Certain Cinnamyl Phenols as Growth Inhibitors for Mosquito Larvae. Filed July 8. 1975. Patented Aug. 3, 1976. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 571,502. Assay Medium and Method for Identification of Non-Fermentative Gram-Negative Bacteria (NFB). Filed Apr. 25, 1975. PC $3.50/MF $3.00.

Patent application 701,190. Large Unilamellar Vesicles (LUV). Filed June 30, 1976. PC $3.50/MF $3.00.

Patent application 707,759. Display Enhancement Technique for Video Moving Trace Display. Filed July 22, 1976. PC $3.50/MF $3.00.

Patent 3,969.240. Polysiloxane Membrane Lung. Filed Feb. 3, 1975. Patented July 13, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington. Va. 22217

Patent application 680.840. Satellite Up Link Diversity Switch. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

Patent application 685.964. Protective Paint for Application Underwater. Filed May 13, 1976. PC $3.50/MF $3.00.

Patent 3,870,906. Ramp/Hold Circuit. Filed June 21, 1973. Patented Mar. 11, 1975. Not available NTIS.

Patent 3,893.120. Omnidirectional Ring Antenna for EW Amplitude Comparison Direction Finding. Filed Aug. 13, 1970. Patented July 1, 1975. Not available NTIS.

Patent 3,898,636. Solid State Control and Display Board. Filed May 2, 1974. Patented Aug. 5, 1975. Not available NTIS.

Patent 3,904,891. Logic Circuit for True and Complement Digital Data Transfer. Filed June 25, 1971. Patented Sept. 9. 1975. Not available NTIS.

Patent 3,907,947. Method for Shaped Charge Bomblet Production. Filed Nov. 12, 1973. Patented Sept. 23, 1975. Not available NTIS.

Patent 3,925,558. Use of Obtusaquinone as a Fungicide to Control Wood-Inhabiting Marine Fungi. Filed Oct. 25, 1974. Patented Dec. 9, 1975. Not available NTIS.

Patent 3,940,970. Eyeletting Attachment for Drill Presses. Filed May 12, 1975. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,947,127. Optical Component Functional Tester. Filed Nov. 11, 1974. Patented Mar. 30, 1976. Not available NTIS.

Patent 3,956,801. Adjustable Staking Tool. Filed Feb. 7, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,957,340. Electrooptical Amplitude Modulator. Filed Feb. 25, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,957,341. Passive Frequency-Selective Optical Coupler. Filed Sept. 3, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,965,448. Waveguide Isolator With Damping Means. Filed May 7. 1975. Patented June 22, 1976. Not available NTIS.

TENNESSEE VALLEY AUTHORITY

Division of Law
Muscle Shoals, Ala. 35660

Patent 3,975,178. Purification of Wet-Process Phosphoric Acid With Methanol and Ammonia. Filed May 28, 1974. Patented Aug. 17, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 619,471. Method of Producing I–123. Filed Oct. 3, 1975. PC $3.50/MF $3.00.

Patent application 681,017. Three-Dimensional Tracking Solar Energy Concentrator and Method for Making Same. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,624 772. Reading and Writing Machine Using Raised Patterns. Patented Nov. 30, 1971. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 4, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-30-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-4-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-14-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-22-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-22-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-2-76

Expiration of patents: The patents within the range of numbers indicated below expire during December 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents .... Numbers 2,914,768 to 2,919,442 inclusive
Plant Patents .... Numbers 1,882 to 1,892, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 4, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T954,001

FLUID CIRCULATION SYSTEM FOR HEAT EXCHANGERS

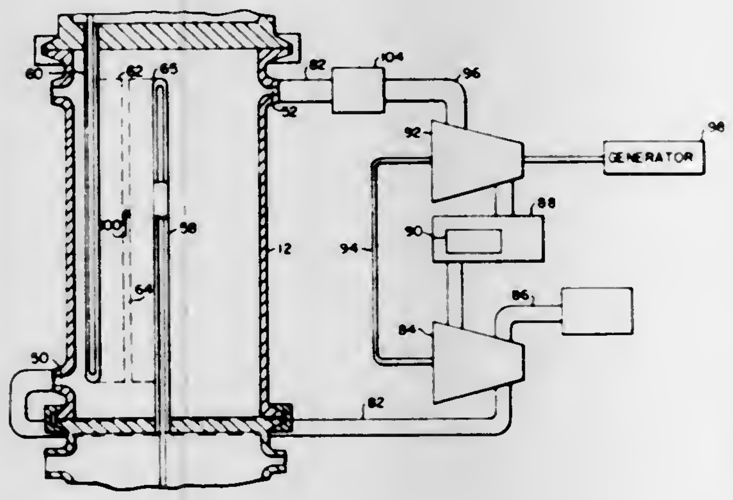
James D. Mangus, Hemfield Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1975, Ser. No. 603,076

Int. Cl.² F01K *25/08;* **F28D** *15/00*

U.S. Cl. 60—682

5 Sheets Drawing. 16 Pages Specification



A fluid circulation system for heat exchangers having two groups of tubes through which primary and secondary fluids flow, the tubes of one group being interdigitated with the tubes of the other group, and a heat transfer material interposed between the two groups of tubes, whereby heat is transferred from the primary fluid through the heat transfer material to the secondary fluid. A shell forms a closure around the tubes of the heat transfer material, and the shell has tertiary fluid inlet and outlet means. Openings in the heat transfer material form passageways through which the tertiary fluid can flow from the inlet means, through the heat exchanger, to the outlet means. Piping connects the tertiary fluid outlet means to the tertiary fluid inlet means, forming a complete cycle. Installed in this piping is a heat removal system. If the secondary fluid flow is interrupted, the tertiary fluid provides a redundant means by which the heat of the primary fluid can be removed from the heat exchanger. Monitoring means can be inserted into the piping, to detect any leakages which may occur in the primary and secondary tubes. Condensers or desiccating material can be installed in the heat removal means to remove any liquids which may leak into the tertiary fluid. Additionally, if the tertiary fluid is a gas or vapor, a turbine can be inserted into the piping and the tertiary fluid's power utilized to provide energy to power the compressor or pump which is circulating the tertiary fluid. In an emergency, this turbine can be connected to an electrical generator and provide emergency power to the rest of the plant.

T954,002

PROCESS FOR INCREASING MASK LIFE

Paul P. Castrucci; Robert H. Collins, both of Poughkeepsie, and Frank T. Deverse, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 436,320, Jan. 24, 1974, abandoned, which is a continuation of Ser. No. 195,876, Nov. 4, 1971, abandoned, which is a continuation of Ser. No. 699,268, Jan. 19, 1968, abandoned. This application Feb. 17, 1976, Ser. No. 659,177

Int. Cl.² G03C *5/00*

U.S. Cl. 96—38.3

1 Sheet Drawing. 16 Pages Specification

A method for semiconductor device manufacture comprising the steps of, (a) repetitively aligning photomasks over a surface of a semiconductor substrate, said substrate having a layer of opaque material on said surface, said opaque material being adapted to receive and retain a photographic pattern; and (b) at least one of said steps employing a photomask of a particular construction, said particularly constructed photomask being placed in physical contact with said opaque material, said particularly constructed photomask essentially consisting of a planar glass substrate having a thickness of approximately 0.25 inches, one surface of said glass substrate having a thin film of chrome thereon, said thin film of chrome having a thickness of approximately 0.1 microns, said thin film of chrome having a photographic pattern formed therein, a layer of SiO_2 fully covering said thin film of chrome and said surface of said glass substrate, said SiO_2 layer having a thickness of approximately 3,000 angstroms, whereby the useful life of said particularly constructed photomask is materially extended and said method for semiconductor device manufacture is rendered less costly and more efficient.

T954,003

REACTIVITY CONTROL SYSTEM FOR NUCLEAR REACTORS BY MAGNETIC MEANS

Demetrios L. Basdekas, Rockville, Md., and George I. Bell, Los Alamos, N. Mex., assignors to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

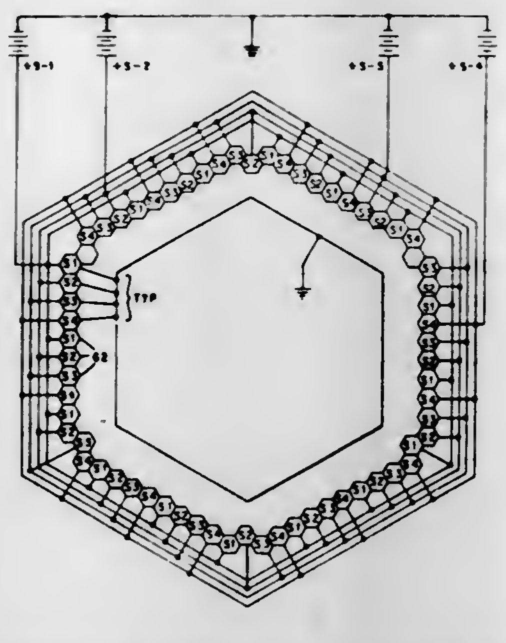
Continuation of Ser. No. 439,791, Feb. 5, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,438

Int. Cl.² G21C *7/10*

U.S. Cl. 176—86 R

6 Sheets Drawing. 13 Pages Specification

A reactor control system comprising stationary control elements placed at the periphery of the reactor core is utilized to provide reactivity control of the reactor. The stationary control elements comprise electromagnets with a magnetic core surrounded by a plurality of windings which may readily be magnetized by electric current. The magnetic field generated therein has the effect of altering the neutron polarization in its vicinity, thereby changing the neutron diffusion coefficient and thus reflectivity of the magnetic control elements. The net effect is a change in the core reactivity proportional to the magnetic field strength. In addition to reactor control this system is intended to provide a protective function by reactor shutdown.



T954,004
PROCESS FOR PREPARING CONTAINERS USING POLYESTERS

William C. Dickason, 2005 Green Lane; Winston J. Jackson, Jr., 4408 Green Springs Circle, both of Kingsport, Tenn. 37664, and Willis C. Wooten, Jr., 521 Lakewood Road, Kingsport, Tenn. 37660
Filed June 7, 1976, Ser. No. 693,450
Int. Cl.^{2} B29C *17/07*
U.S. Cl. 264—98
No Drawing. 5 Pages Specification

Disclosed is a process for preparing containers, such as bottles, using a polyester of terephthalic acid, ethylene glycol, and 1,4-cyclohexanedimethanol, wherein the 1,4-cyclohexanedimethanol is from 25 to 40 mole percent of the diol. A molten parison of such polyester is extruded and then expanded in a mold to form the desired container.

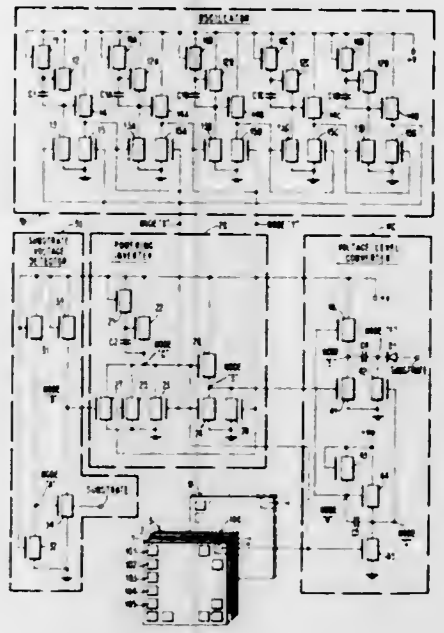
T954,005
PROCESS FOR PREPARING CONTAINERS USING BRANCHED POLYESTERS

Burns Davis, 2019 Bruce St., Kingsport, Tenn. 37664; James R. Overton, 840 Ridgefields Road, and Roger M. Schulken, Jr., 2113 Heatherly Road, both of Kingsport, Tenn. 37660
Filed May 24, 1976, Ser. No. 689,224
Int. Cl.^{2} B29C *17/07*
U.S. Cl. 264—98
No Drawing. 9 Pages Specification

Disclosed is a process for preparing containers, such as bottles, using a branched polyester of terephthalic acid, a combination of ethylene glycol and 1,4-cyclohexanedimethanol and a small amount of a polyfunctional branching compound. A molten parison of such polyester is extruded and then expanded in a container mold to form the desired container.

T954,006
ON-CHIP SUBSTRATE VOLTAGE GENERATOR

James M. Lee, Wappingers Falls, and George Sonoda, Poughkeepsie, both of N.Y., assignors to International Business Machines, Armonk, N.Y.
Continuation of Ser. No. 567,213, April 11, 1975, abandoned, which is a continuation of Ser. No. 375,271, June 29, 1973, abandoned. This application Apr. 2, 1976, Ser. No. 672,898
Int. Cl.^{2} H03K *3/353*
U.S. Cl. 307—304
3 Sheets Drawing. 17 Pages Specification

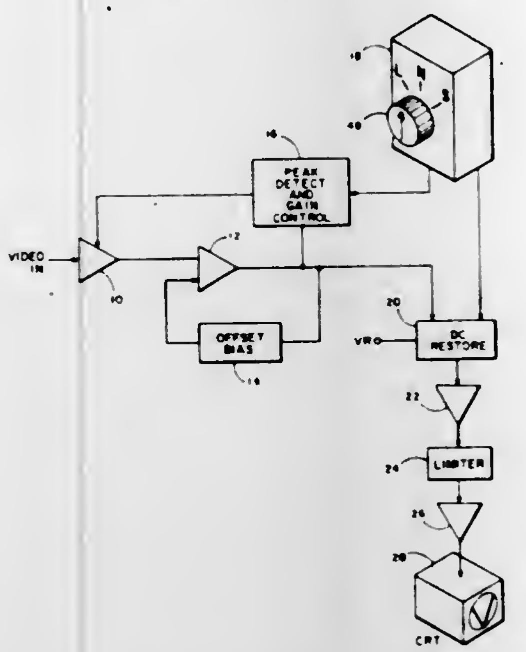


Disclosed is an apparatus for generating and controlling a desired substrate potential level or a semiconductor chip. A pulse source, such as an oscillator, provides a pulse train which, in combination with a control signal from the substrate voltage detector, selectively discharges a capacitor in a voltage level converter for obtaining a desired level of substrate potential. A feedback path through the substrate regulates the conductivity of a reference transistor in the substrate voltage detector providing the required control signal.

T954,007
SIGNAL ENHANCEMENT SYSTEM FOR RADAR DISPLAY

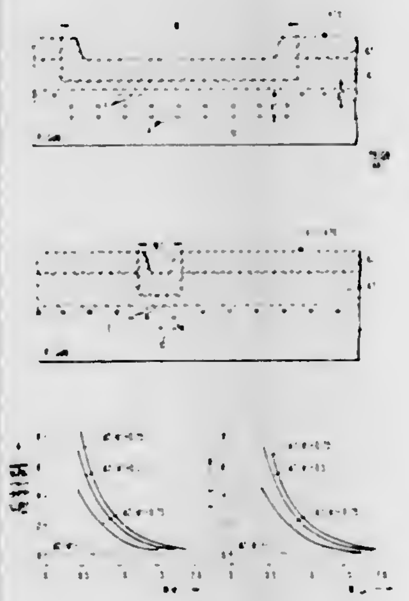
Robert Y. Nevin, New Hartford, N.Y., and James Allen Scheer, Stone Mountain, Ga., assignors to General Electric Company
Filed Dec. 2, 1975, Ser. No. 636,890
Int. Cl.^{2} G01S *7/06*; H01J *29/52*
U.S. Cl. 343—17
5 Sheets Drawing. 15 Pages Specification

A system is provided for matching the dynamic range of a radar signal to the dynamic range of the CRT on which it is displayed. A variable gain amplifier 10 receives the radar video signal which it supplies to buffer amplifier 12 and offset bias circuit 14 which maintain the most negative portions of the video signal at the zero volt level, corresponding to black on the CRT display. The most positive portion of the video signal at the output of amplifier 12 is compared by peak-detect and gain control circuit 16 against a reference level, manually set by control unit 18, and the error between the two is used to adjust the gain of amplifier 10. The zero-based peak-controlled signal is presented to DC restore circuit 20 which includes an analog switch that is controlled by control unit 18. Buffer amplifier 22 passes the output from circuit 20 to a limiter circuit 24 which passes only those portions of the signal existing between zero and the reference level. The output from limiter circuit 24 is passed by an output buffer amplifier 26 to the CRT 28 for display. Weak portions of the video signal (small targets) are thus enhanced by passing the signal directly through circuit 20, and the resolution is increased for strong signal portions (large targets) by switching such signals through the DC restore network.



T954,008
NARROW CHANNEL FIELD EFFECT TRANSISTOR

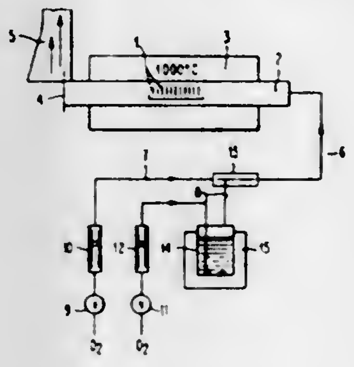
Utz G. Baitinger, Stuttgart; Otto G. Folberth; Werner O. Haug, both of Boeblingen, and Karl E. Kroell, Stuttgart, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 481,016, June 20, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,251
Claims priority, application Germany, July 28, 1973, 2338388
Int. Cl.^{2} H01L *29/78*
U.S. Cl. 357—23
4 Sheets Drawing. 21 Pages Specification



A field effect transistor having a channel width of such small dimension that threshold voltage becomes inversely related to channel width allowing the fabrication of field effect transistors of differing threshold voltages while using the same process steps. Reduced threshold voltage due to prior art "short channel length" effect may be offset by the presently disclosed narrow channel width effect. Desired chanel impedance values are achieved independently of threshold voltage influence due to narrow channel width effect by the provision of parallel-connected field effect transistors of the same channel length whose total channel widths yield a desired net width-to-length ratio.

T954,009
METHOD FOR THE THERMAL OXIDATION OF SILICON WITH ADDED CHLORINE

Konrad Malin, Dettenhausen, and Dietrich Seybold, Boeblingen, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 439,491, Feb. 4, 1974. This application July 16, 1975, Ser. No. 596,498
Claims priority, application Germany, Mar. 24, 1973, 2314746
Int. Cl.^{2} B05D *5/12*
U.S. Cl. 427—93
1 Sheet Drawing. 11 Pages Specification



The dry thermal oxidation of silicon semiconductor material to produce an oxide layer, such as the gate oxide of a field effect transistor, is carried out by flowing oxygen over the surface of the semiconductor at an elevated temperature to form a layer of silicon oxide. The electrical properties of the layer are improved by adding chlorine to the oxygen in the form of between 0.2 and 5.0 mol % of carbon tetrachloride in order to introduce chlorine into the growing oxide layer

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T954,010
METHOD OF COATING OXIDIZED INORGANIC SUBSTRATES WITH POLYIMIDE

Friedrich C. Brunner, Sindelfingen; Peter U. Frasch; Friedrich W. Schwerdt, both of Boeblingen, and Theodor P. Vogtmann, Holzgerlingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 492,319, July 26, 1974, abandoned. This application May 19, 1976, Ser. No. 687,965
Claims priority, application Germany, Aug. 24, 1973, 2342801
Int. Cl.^{2} B05D *3/04, 3/10*
U.S. Cl. 427—335
No Drawing. 12 Pages Specification

Substrates with oxidized surfaces, as e.g. SiO_2 layers on silicon semiconductors and aluminum surfaces, are wetted with an organic silicon compound, for example, γ-aminopropyltriethoxysilane dissolved in an organic solvent such as trichlorotrifluoro ethane. The solvent is then removed in a dry atmosphere. The evaporation step can be carried out by suspending the substrate in volvent vapor over a supply of refluxing solvent while cooling the solvent vapor such that fresh, dry solvent vapor continuously passes along the substrate and absorbs traces of moisture. Subsequently, a coating is applied from a solution of a polyamido carbon acid formed of pyromellitic acid anhydride and an aromatic amino component and the polyamido carbon acid is heated to form an adherent layer of polyimide.

T954,011

METHOD AND APPARATUS FOR OPERATING COMPUTER APPARATUS IN RESPONSE TO PROGRAM STATEMENTS

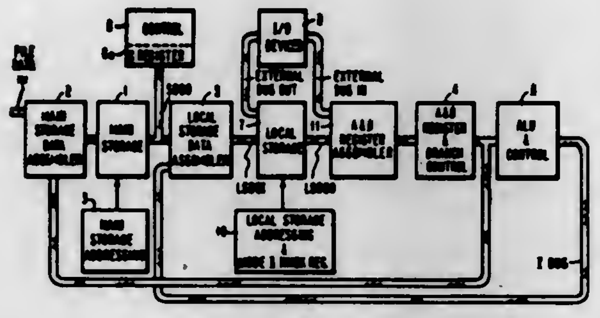
Anthony Hassitt, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 129,739, March 31, 1971. This application Feb. 18, 1975, Ser. No. 550,387

Int. Cl.^{2} G06F *9/06*

U.S. Cl. 444—1

2 Sheets Drawing. 51 Pages Specification



Method and apparatus for directly translating higher-level language program statements into machine readable form, the translation including syntax information for each item of each statement and having type bits included therein to indicate its type. The types include names, operators and literals. The translated items are then sequentially scanned and the type bits analyzed to partially process the machine readable items and supply the partially processed information to a stack. The top two items on the stack are analyzed in accordance with a syntax decision table to operate computer apparatus to conduct operations identified by the partially processed information. Thus, the computer apparatus accomplishes the syntax analysis rather than by means of a compiler.

T954,012

TRANSPARENT IMPACT POLYSTYRENE PLASTICS

Robert C. Smith, Warren, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio

Continuation of Ser. No. 431,532, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 237,591, March 15, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 630,060

Int. Cl.^{2} C08F *236/10*

U.S. Cl. 526—340

1 Sheet Drawing. 12 Pages Specification

Butadiene and styrene (and like monomers) are copolymerized with modifiers to produce linear, randomized copolymers with a block styrene content of about 40 to 80 weight per cent and a bound styrene content of about 70 to 95 per cent. They are sufficiently free of block butadiene to be transparent. Such copolymers are plastic rather than elastomeric, and have high elongations as compared with those usually associated with copolymers of such high styrene content. Also, they have very high impact resistance.

REISSUE PATENTS

GRANTED JANUARY 4, 1977

ERRATA

For CLASS	See PATENT NO.
526-022	29,100

REISSUES

JANUARY 4, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

Re. 29,095
TAKE-UP SPOOL LATCH

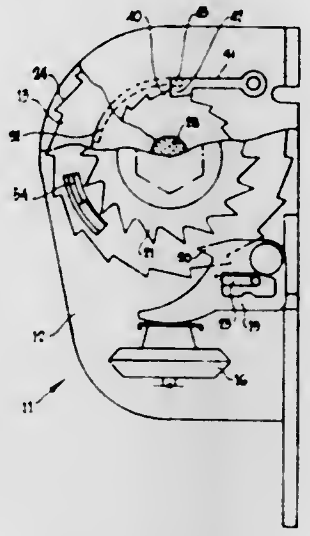
Robert Boyson Heath, St. Marys, Australia, assignor to Rainsfords Metal Products Proprietary Ltd., Australia

Original No. 3,834,646, dated Sept. 10, 1974, Ser. No. 303,965, Nov. 6, 1972. Application for reissue May 5, 1975, Ser. No. 574,708

Claims priority, application Australia, Nov. 9, 1971, 6940/71

Int. Cl.^{2} A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.7 **19 Claims**



17. In a seat belt retractor having a seat belt carried upon a take-up spool, a spool retracting spring for normally biasing said spool in a belt retracting direction and thereby normally imparting tension to the seat belt when it is placed in use, and a spool locking means for locking the spool against belt withdrawal under emergency conditions, the improvement comprising the provision of:

pawl and ratchet means associated with said spool independent of said spool locking means for preventing retraction of said belt under urging of said spring; and

means driven by rotation of said spool for operating said pawl and ratchet means to prevent belt retraction under urging of said spring in response to spool rotation imparted by a retraction movement of a withdrawn belt followed by a subsequent further limited withdrawal movement of said belt, said driven means including means for de-activating said pawl and ratchet means to allow retraction of said spool under the urging of said spring in response to a still further withdrawal movement of said belt beyond said limited withdrawal of said belt.

Re. 29,096
BRAKE SYSTEMS

Roger D. Jones, Ramsey, N.J., assignor to Abex Corporation, New York, N.Y.

Original No. 3,844,624, dated Oct. 29, 1974, Ser. No. 391,850, Aug. 27, 1973. Application for reissue Jan. 22, 1976, Ser. No. 651,477

Int. Cl.^{2} B60T *8/18*

U.S. Cl. 303—100 **30 Claims**

1. In a braking system where brake pressure is applied by fluid-operated pistons in related brake cylinders:

an accumulator for storing fluid under pressure;

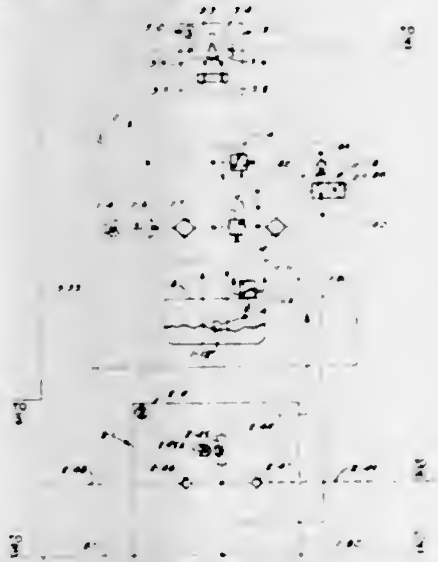
a reservoir for storing fluid not under pressure;

a pump means communicating with said accumulator and said reservoir for delivering fluid from said reservoir to charge said accumulator with fluid;

a continuously variable directional valve interposed between said brake cylinders, said accumulator, and said reservoir, said directional valve being settable in a first position allowing fluid from said accumulator to communicate with said brake cylinders, and being settable in a second position allowing fluid from said brake cylinders to communicate with said reservoir, and a null position blocking flow between the accumulator and brake cylinders and between the brake cylinders and the reservoir;

a control system line communicating with said accumulator, said reservoir and with said directional valve, capable of providing a first pilot pressure urging said directional valve to said first position, and capable of allowing flow of fluid from said accumulator to said reservoir;

a main control valve interposed in said control system line to variably restrict or enlarge flow through said control system line from said accumulator to said reservoir to vary said first pilot pressure;



[an orifice interposed between said directional valve and said brake cylinders;]

a release means capable of providing a second force in opposition to the force of said first pilot pressure, and urging said directional valve to said second position;

a control means which controls said main control valve so that when brake pressure is to be applied, said main control valve restricts flow through said control system line thereby increasing the force from said first pilot pressure above the force from said release means causing said directional valve to be set in said first position, and so that when brake pressure is to be released, said main control valve enlarges flow through said control system line thereby decreasing the force from said first pilot pressure below the force from said release means causing said directional valve to be set in said second position.

Re. 29,097
GLASS PLATE EDGE GRINDING MACHINE

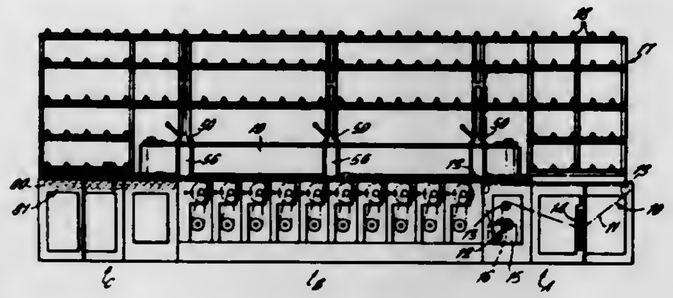
Shigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan

Original No. 3,841,027, dated Oct. 15, 1974, Ser. No. 430,689, Jan. 4, 1974. Application for reissue Jan. 16, 1976, Ser. No. 649,903

Int. Cl.^{2} B24B *9/00*

U.S. Cl. 51—110 **6 Claims**

6. A glass plate edge grinding machine for grinding the lower edge of a glass plate by means of a plural number of grinding wheels arranged in a series, with said glass plate being held between and transported in a horizontal direction by a pair of *belt conveyors each comprising an endless belt in such a manner that the glass plate is slightly inclined with respect to a vertical plane and supported at said inclined surface by a plural number of backing-up rollers, the belt of one belt conveyor being supported by a plural number of pressing members arranged in a series inside said belt while the belt of the conveyor which is disposed on the opposite side of the glass plate from the grinding wheel is supported by a rigid backing-up plate disposed inside said belt, the pressing members pressing against the belt of said one belt-conveyor and the glass plate to force the glass plate against the belt of the other belt-conveyor and the backing-up plate and to maintain the portion of the glass plate adjacent the grinding wheel in a smooth curve extending away from the pressing members, and the spindle of each grinder holding a grinding wheel being supported by a spindle supporting assembly which enables said spindle to move substantially in the radial and axial directions.*



Re. 29,098
PREPARATION OF ALIPHATIC PHOSPHATES

Ingenuin Hechenbleikner, and William Palmer Enlow, both of Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Original No. 3,923,620, dated Dec. 2, 1975, Ser. No. 507,632, Sept. 20, 1974. Application for reissue Feb. 6, 1976, Ser. No. 655,648

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **7 Claims**

1. A process for preparing aliphatic phosphates comprising introducing oxygen into a mixture of a trialkenyl or trialkyl phosphite and a source of free radicals, at a temperature below about 80° C and in the presence of light of wavelength of 2000–4000A°.

Re. 29,099
HEAT STABILITY OF ASBESTOS-FILLED POLYPROPYLENE

John H. Kietzman, Golden, and Mario P. Tocci, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Original No. 3,799,906, dated Mar. 26, 1974, Ser. No. 197,508, Nov. 10, 1971. Application for reissue Apr. 16, 1976, Ser. No. 677,594

Int. Cl.² C08K *9/04*

U.S. Cl. 260—42.45 **10 Claims**

1. A process of producing an asbestos reinforced, heat-stabilized polypropylene article comprising:

(a) admixing at a temperature above about 400° F. a mixture comprising, in parts by weight [per 100 parts by weight of polypropylene], 1 to 2 parts of polyester forming organic acid of acid anhydride having a melting point of 250°–550° F.; 1 to 2 parts of a polyhydric alcohol having a melting point of from 250°–550° F.; 10 to 40 parts of asbestos fiber; and *sufficient* polypropylene resin *to make a total of 100 parts of admixture*; and

(b) molding the admixture to produce a heat-stabilized article.

Re. 29,100
SELECTIVE HYDROPEROXIDATION OF POLYOLEFINS IN AN AQUEOUS SLURRY

Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Original No. 3,870,692, dated Mar. 11, 1975, Ser. No. 161,819, July 12, 1971. Continuation-in-part of Ser. No. 633,789, April 26, 1967, abandoned. Application for reissue Sept. 2, 1975, Ser. No. 609,284

Int. Cl.² C08F *110/06, 8/06*

U.S. Cl. 526—22 **14 Claims**

1. A process for selective hydroperoxidation of finely divided solid polypropylene particles, which consists essentially of:

contacting a cationic surfactant-free, slurry of said polypropylene, having a particle size of about 30 to 1,000 microns in water with a 50 to 90 mg. of ozone per liter of air mixture as the sole free radical initiator, at a temperature within the range of from 75° C. to 95° C.,

and for a time sufficient to obtain a hydroperoxide concentration in said polypropylene between 0.014 and 0.050 weight percent,

whereby formation of higher oxidation products than hydroperoxides is significantly less than said formation at temperatures outside said 75° C. to 95° C. range.

Re. 29,101
METHOD FOR THE PREPARATION OF CARBON MOLDINGS AND ACTIVATED CARBON MOULDING THEREFROM

Yasuo Amagi; Yasushi Nishimura, and Yasuo Uehara, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Toyo Boseki Kabushiki Kaisha, both of Tokyo, Japan

Original No. 3,917,806, dated Nov. 4, 1975, Ser. No. 401,160, Sept. 27, 1973. Application for reissue Mar. 18, 1976, Ser. No. 668,202

Claims priority, application Japan, Sept. 30, 1972, 47-97650

Int. Cl.² C01B *31/02, 31/10;* **B01J** *21/18*

U.S. Cl. 423—449 **10 Claims**

1. A method of converting pitch into a formed porous carbon material, including the steps of forming pitch into shapes, oxidizing the formed shapes at a temperature of room temperature to 400° C to make the pitch infusible, and carbonizing the infusibilized shaped pitch in an inert atmosphere at a temperature higher than 600° C, wherein the improvement comprises the combination of steps of:

a. selecting a hydrocarbon pitch starting material having a softening point of 50°–350° C., a carbon content of 80–97, a hydrogen/carbon ratio of 0.3–2.5, and a nitrobenzene-insoluble fraction of less than 60%;

b. mixing said pitch starting material prior to said forming step with from 5 to 50 parts by weight of aromatic hydrocarbon per 100 parts of said pitch, said aromatic hydrocarbon being those having a boiling point of at least 200° C. and containing from 2 to 3 aromatic rings, said mixing being carried out with sufficient heating to form a fluidized mix which is subjected to said forming step to obtain said formed shapes; and

c. contacting the thus-produced formed shapes with a liquid organic solvent in which said aromatic hydrocarbon is soluble, said solvent being further characterized by the property that said pitch is substantially insoluble therein, said contacting extracting said aromatic hydrocarbon to increase the porosity of said formed shapes prior to said steps of oxidizing and carbonizing thereof.

Re. 29,102
CONTRACEPTION AGENT

Arthur Scherm, Bad Hamburg, Germany, assignor to Merz & Co., Frankfurt, Germany

Original No. 3,876,757, dated Apr. 8, 1975, Ser. No. 341,877, Mar. 16, 1973. Application for reissue Apr. 2, 1976, Ser. No. 672,881

Claims priority, application Germany, Mar. 21, 1972, 2213604

Int. Cl.² A61F *15/00;* **A61K** *11/02, 9/02*

U.S. Cl. 424—44 **12 Claims**

1. In a spermicidally active vaginal suppository consisting essentially of spermicide, a suppository base comprising a water-soluble polyethylene glycol, foaming agent, and foam-stabilizing agent, wherein the spermicide is an alkylphenoxypolyethoxyethanol, the improvement which comprises (1) the employment of about 65 to 85 percent by weight of a water-soluble polyethylene glycol which is meltable at body temperature as the suppository base and (2) about 10 to 20 percent by weight of a mixture of tartaric acid and sodium bicarbonate as the foaming agent.

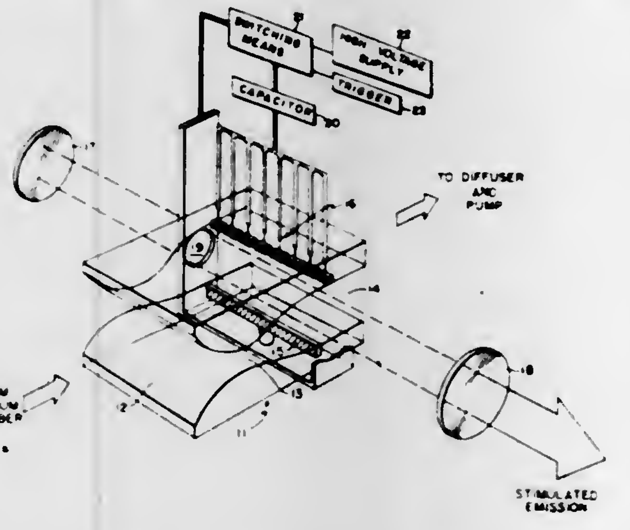
Re. 29,103
NITROGEN LASER ACTION WITH SUPERSONIC FLOW

Jack Wilson, Aix-en-Provence, France, and Arthur R. Kantrowitz, Cambridge, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Original No. 3,543,179, dated Nov. 24, 1970, Ser. No. 613,236, Feb. 1, 1967. Application for reissue Nov. 24, 1972, Ser. No. 309,126

Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 PE **7 Claims**



1. The method of light generation by stimulated emission of radiation in an optical cavity which comprises the steps of.

first, passing a supersonic flow of the working medium in a direction orthogonal to the axis of the cavity, and

second, electrically pumping the medium to induce lasing action.

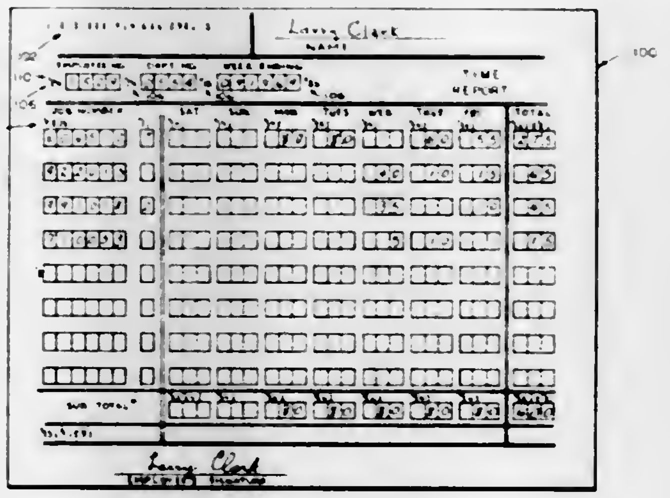
Re. 29,104
METHOD OF SCANNING DOCUMENTS TO READ CHARACTERS THEREON WITHOUT INTERFERENCE FROM VISIBLE MARKS ON THE DOCUMENT WHICH ARE NOT TO BE READ BY THE SCANNER

David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Stamford, Conn.

Original No. 3,820,067, dated June 25, 1974, Ser. No. 172,924, Aug. 18, 1971. Continuation of Ser. No. 876,694, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 701,670, Jan. 30, 1968, Pat. No. 3,582,884, which is a continuation-in-part of Ser. No. 523,367, Jan. 27, 1966, abandoned. Application for reissue Nov. 11, 1974, Ser. No. 522,686

Int. Cl.² G06K *7/14*

U.S. Cl. 340—146.3 B **2 Claims**



1. The method of machine reading of characters placed on a document form having pre-printed thereon markings visible to the eye but which are not to be read by the character reading machine, said method comprising the steps of:

producing by means of a laser small-diameter beam of monochromatic light, the width of said beam being small relative to the size of said characters;

presenting to said beam of monochromatic light a document form having said characters in place on a reflective background and carrying said pre-printed markings in a color related to said monochromatic light such that said beam produces from said markings a reflected light intensity equal to the intensity of reflected light said beam produces from said background, whereby said markings and said background are not distinguishable with respect to the light reflected from said document form in response to impingement of said monochromatic light beam,

scanning said document by sweeping said narrow beam [at] along a series of consecutive, adjacent paths intersecting said character and said markings;

developing signals representing the amount of light reflected from said document at evenly-spaced points along the scan path throughout the regions of said document containing said characters; and

analyzing said developed signals to determine the nature of the characters on said document.

PLANT PATENTS

GRANTED JANUARY 4, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,001
CHRYSANTHEMUM PLANT NAMED IMPROVED YELLOW DIGNITY

Robert E. Danielson, West Chicago, Ill., assignor to Pan American Plant Company, West Chicago, Ill.
Filed Aug. 18, 1975, Ser. No. 605,557
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of chrysanthemum morifolium substantially as herein shown and described, characterized by the more intense yellow color if its blooms when compared to the cultivar "Yellow Dignity".

4,002
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Jan. 28, 1976, Ser. No. 653,019
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of impatiens plant known by the cultivar name Fanfare and particularly characterized by the combined characteristics of distinctive deep green foliage with a very clean cut interior yellow variegation; self-branching habit presenting many points of flowering; flower diameter of 3 cm. to 4 cm.; medium red flower color in winter, with the interior of the petals being light red to pink, with the summer flower color being light red with the interior fading to nearly white; superior outdoor growth habit in full sunlight; normal rooting habit; good durability, and above average production of number of cuttings at each node.

4,003
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761
Filed Feb. 9, 1976, Ser. No. 656,654
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous, upright and very symmetrical habit of growth; large-leafed and waxy foliage; very large and many-petaled flowers; a distinctive and attractive soft pink flower color; and an extraordinary flower fragrance in the nature of a heavy permeating perfume.

4,004
CHRYSANTHEMUM PLANT

Grace H. Mack, New Canaan, Conn.; William E. Duffett, Akron, and Walter H. Jessel, Jr., Doylestown, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Feb. 18, 1976, Ser. No. 658,851
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar chrysanthemum known by the cultivar name Nuggets and characterized particularly as to uniqueness by the combined characteristics of flat inflorescence form; pompon inflorescence type; golden yellow inflorescence color; diameter across face of inflorescence from 1.25 to 1.5 inches; permanence of inflorescence ranging from 14 to 21 days; medium plant height; semi-spreading branching pattern; average natural season flowering date of Oct. 5; and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

4,005
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Feb. 18, 1976, Ser. No. 658,852
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of chrysanthemum known by the cultivar name Revere and characterized particularly as to uniqueness by the combined characteristics of flat inflorescence form, reflexing slightly at maturity; pompon inflorescence type; two-toned red bronze and yellow bronze inflorescence color; diameter across face of inflorescence up to 2.75 inches; permanence of inflorescence ranging from 14 to 21 days; medium plant height; semi-upright branching pattern; average natural season flowering date of September 30 and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

4,006
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761
Filed Mar. 22, 1976, Ser. No. 668,975
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth which promotes repeat blooming cycles; constancy of bloom throughout the year; a carnation-like full flower form; and a distinctive and attractive flower color of many shadings, ranging from an almost pure pale yellow color, at times, to a definite "freckled" effect at other times.

4,007
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761
Filed Mar. 29, 1976, Ser. No. 671,273
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of strong, extremely thorny stems carrying a great many thorns, flowers or large, many petaled and excellent substance, with vivid red and yellow bi-coloring.

4,008
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761
Filed Mar. 29, 1976, Ser. No. 671,272
Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth; production of large flowers of exhibition form and which are mostly borne singly on exceptionally long stems; a distincitive and attractive pink and white flower color blend; and a strong flower fragrance.

PATENTS

GRANTED JANUARY 4, 1977

ERRATA

For CLASS	See PATENT NO.
308-035	4,000,559
427-022	4,000,957
427-389	4,000,958
029-115	4,000,979
106-054	4,001,019
429-067	4,001,036
429-188	4,001,037
429-046	4,001,039
429-015	4,001,040
429-019	4,001,041
427-115	4,001,042
429-206	4,001,043
429-166	4,001,044
200-061.45 R	4,001,185
526-026	4,001,193
526-240	4,001,194
526-348	4,001,195
526-348	4,001,196
536-017	4,001,208
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536-084	4,001,210
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148-187	4,001,465
358-283	4,001,492
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358-127	4,001,494
358-294	4,001,495
358-127	4,001,496
358-101	4,001,497
358-160	4,001,498
358-093	4,001,499
358-282	4,001,500
358-160	4,001,501
358-165	4,001,502
358-243	4,001,503
235-070 A	4,001,551
270-053	4,001,596
310-009.5	4,001,767

PATENTS

GRANTED JANUARY 4, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number

GENERAL AND MECHANICAL

4,000,520

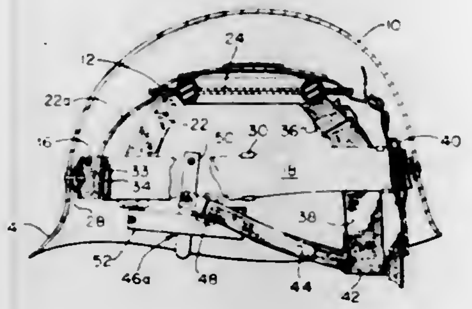
HEADGEAR SUPPORT SYSTEM

Noel A. Svendsen, Bedford, and Willard G. Sylvester, Concord, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 21, 1975, Ser. No. 561,008

Int. Cl.² A42B *3/00*

U.S. Cl. 2—418 **5 Claims**



1. In a rigid headpiece having an internal suspension for supporting the headpiece in spaced relation to a wearer's head the improvement comprising:

an elongated nape strap disposed adjacent the rear portion of said headpiece for contacting the nape of the wearer's neck, the ends of said strap being disposed adjacent respective sides of said headpiece; and

means coupling at least one end of said nape strap to a corresponding side of said headpiece, and comprising variable tension means including at least one lever arm cooperative with a ratchet bar and movable between a first position wherein said nape strap is tensioned and locked in a tensioned state so that said wearer's head can be locked within said headpiece between said suspension and said nape strap and a second position wherein said nape strap is relaxed so that said wearer's head can be easily positioned in and removed from said suspension.

4,000,521

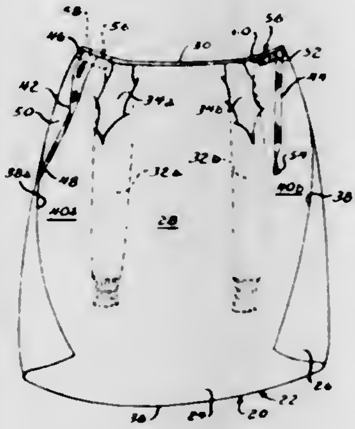
DISPOSABLE GARMENT AND METHOD

Richard L. Zoephel, Lake Villa, and James H. Bolker, Barrington, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 5, 1975, Ser. No. 628,852

Int. Cl.² A41D *9/00*

U.S. Cl. 2—114 **30 Claims**



1. A sterile disposable garment comprising, a gown having a back, a front, a pair of side margins adjacent side edges of the gown, a pair of sleeves, and strap means extending from the gown adjacent one of said side margins and defining an opening to receive the wearer's arm and retain said one side margin in position on the wearer while passing the remainder of the gown around the wearer.

4,000,522

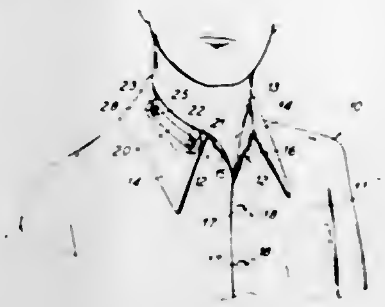
SHIRT COLLAR STRAP

Arthur P. Swanson, 1454 Estate Lane, Glenview, Ill. 60025

Filed Feb. 25, 1976, Ser. No. 661,357

Int. Cl.² A41B *3/02*

U.S. Cl. 2—141 R **6 Claims**



1. A front-button shirt having a discrete upstanding neck band with an attached, turned-down collar on the top end of the neck band adapted to be worn in a closed-collar position with a necktie and in an open-collar position without exposing a button, a fastening attachment for the button, or a buttonhole at the neck band, said neck band being free from a button and buttonhole at its ends, an elongated tab having a first end rotatably mounted on the neck band near but spaced sufficiently from one end of the neck band to be covered by the collar, said tab having a buttonhole in a second opposite end thereof, a first button on the same end of the neck band spaced from the rotatably mounted end of the tab a sufficient distance to be seated in the buttonhole of the tab to hold the tab flat against the neck band under the collar to be completely hidden in the open-collar position, and a second button on the opposite end of the neck band but spaced from said end to be covered by said collar, whereby said tab is adapted to be unbuttoned from said first button, rotated to extend over the opposite end of the neck band and receive the second button in the buttonhole thereof to hold the ends of the neck band in overlapped, closed-collar position.

4,000,523

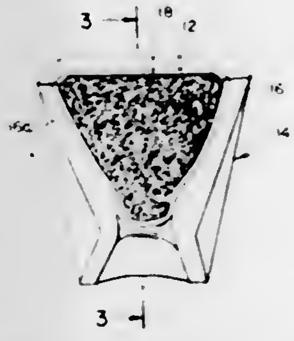
NECKTIE AND KNOT ARTICLE

Walter Woods, New York, N.Y., assignor to Lawrene Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 17, 1976, Ser. No. 667,569

Int. Cl.² A41D *25/02*

U.S. Cl. 2—150 **4 Claims**



1. A necktie supporting attachment comprising an inverted frusto-conical shaped member having an inner and outer surface, said member being rigid and including a pair of lateral flanges, each member of said pair defining two converging planes, a median wall communicating between said planes at the point of convergence thereof, said inner surface on one side of said median wall including a plurality of hooked pile fabric members, said fabric members defining projecting adjacent, barbed splines having hooked end portions adapted to engage said necktie.

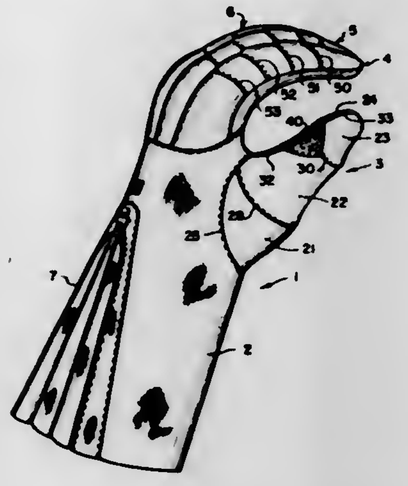
4,000,524
ARTICULATED GLOVE CONSTRUCTION

Dixie L. Rinehart, Aspen, Colo., assignor to Comfort Products, Inc., Aspen, Colo.

Filed Aug. 14, 1975, Ser. No. 604,711

Int. Cl.^{2} A41D *19/00*

U.S. Cl. 2—161 R **5 Claims**



1. A glove construction having a conformal thumb portion, said glove construction comprising a gauntlet portion adapted to fit the palm of the wearer and having an aperture therein for receiving a thumb of the wearer, a metacarpal thumb portion joined to said gauntlet portion around a part of the periphery of said aperture and adapted to engage the front of the thumb of the wearer extending along the thumb metacarpal bone, a first phalanx portion joined to said metacarpal portion and joined to said gauntlet portion along a part of the periphery of said aperture and adapted to engage the front of the thumb of the wearer along the first thumb phalanx, a second phalanx portion joined to said first phalanx portion and adapted to engage the front of the thumb of the wearer along the thumbnail portion, and a front thumb portion joined at one end to said gauntlet around a part of said aperture and at another end to said second phalanx portion.

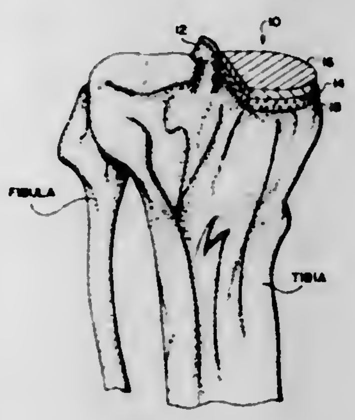
4,000,525
CERAMIC PROSTHETIC IMPLANT SUITABLE FOR A KNEE JOINT PLATEAU

Jerome J. Klawitter, Clemson, S.C., and Nazir A. Bhatti, Augusta, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1975, Ser. No. 606,630

Int. Cl.^{2} A61F *1/24*

U.S. Cl. 3—1.911 **7 Claims**



7. A completely ceramic prosthesis for use as a bone implant in a joint comprising:

- a. a layer of high aluminum oxide material having a porosity in the range of 40–60% with interconnecting pores;
- b. said layer having a planar surface; and
- c. a dense layer of high aluminum oxide material having a porosity not greater than 1% laminated to said first porous layer at said planar surface;
- d. the outer surface of said dense layer being smooth to act as an articulate surface in said joint.

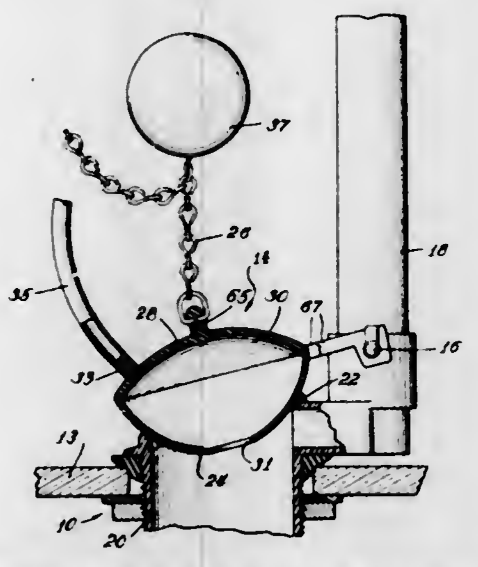
4,000,526
TOILET FLUSHING APPARATUS

John A. Biela, 9296 Callero Drive, Niles, Ill. 60648, and H. Paul Weirich, Box 164 Rte. 1, Libertyville, Ill. 60048

Filed Mar. 26, 1975, Ser. No. 562,311

Int. Cl.^{2} E03D *1/34, 1/14, 3/12*

U.S. Cl. 4—57 P **10 Claims**



1. In toilet flushing apparatus including a toilet tank drain valve seat, a flush valve assembly comprising:

floating means for sealing the drain valve seat, said means including a float chamber for trapping air therein to delay for a given time delay interval the closing of said floating means over the drain valve seat, said means further including an inlet mounted in fluid communication with said chamber, said inlet being disposed within an area surrounded by the valve seat engaging portion of said floating means when it engages said drain valve seat; and

means defining at least one vent opening mounted in fluid communication with said chamber and disposed within said area for releasing trapped air from said chamber to decrease the time for closing of said floating means over the drain valve seat when said floating means is moved away from said valve seat, said floating means being adapted to be mounted pivotally at one end portion thereof, said vent opening being disposed outwardly from said one end portion at the opposite outer end portion thereof spaced outwardly from said inlet, said means defining at least one vent opening being free of any connections therewith.

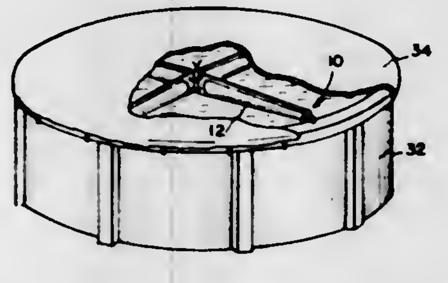
4,000,527
SWIMMING POOL COVER FLOATING SUPPORT

Peter F. Gannon, Sterling Heights, Mich., assignor to Vinyl-Fab Industries, Inc., Ferndale, Mich.

Filed Aug. 26, 1975, Ser. No. 607,767

Int. Cl.^{2} E04H *3/16, 3/18*

U.S. Cl. 4—172.12 **6 Claims**



1. A swimming pool cover support floating frame comprising a plurality of separate elongated floating elements disposed below said cover and fastening means at each end of said elongated floating elements for pivotally and removably attaching juxtaposed ends of at least two of said elongated floating elements together and for attaching each free end of said elongated floating elements proximate the edge of the pool, some of said elongated floating elements extending from proximate the edge of the pool towards the center of said pool.

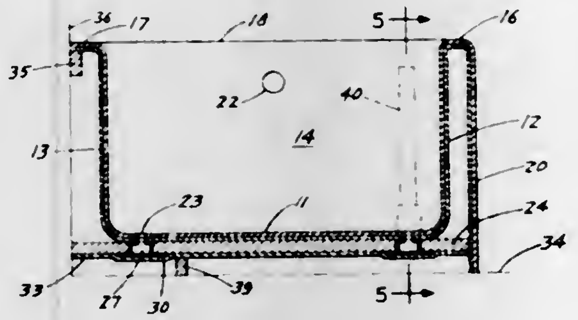
4,000,528
WHIRLPOOL TUB AND METHOD OF MAKING SAME

Irving H. Posnick, c/o Aqualand Pool Co., Inc. 3400 Dakota Ave. South, Minneapolis, Minn. 55416

Filed Mar. 10, 1975, Ser. No. 556,684

Int. Cl.^{2} A61H *33/02*

U.S. Cl. 4—180 **11 Claims**



1. A whirlpool tub comprising:

- A. an open topped synthetic resinous cavity shell having a bottom wall and side walls and adapted to contain liquid,
- B. a rigid backing board adhesively affixed in air- and water-tight sealed relation to the bottom outside wall of said shell;
- C. an elongated air distribution channel extending tnrough the thickness of said backing board underlying said bottom wall,
- D. an enclosing cover over the bottommost edges of said channel air- and water-tight sealed relation thereto;
- E. a plurality of spaced apart apertures extending through the bottom wall of said shell and communicating with said channel, and
- F. an air inlet in communication with said channel for transmission of air to said apertures.

6. A method of making a whirlpool tub from a formed open topped synthetic resinous cavity shell having a bottom wall and side walls, which method comprises:

- A. applying a backup synthetic resinous reinforcing coating to the outer surface of said shell;
- B. Adhesively adhering a rigid backing board in air- and water-tight sealed relation to the outside bottom wall of said tub, said backing board having an elongated air distribution channel extending through the thickness of said board;
- C. applying an enclosing cover over the bottommost edges of said channel in air- and water-tight sealed relation thereto;
- D. forming a plurality of apertures through the bottom wall of said shell and said resinous coating, said apertures communicating with said channel; and
- E. affixing an air inlet in sealed relation in communication with said channel.

4,000,529
RECLINING CHAIR

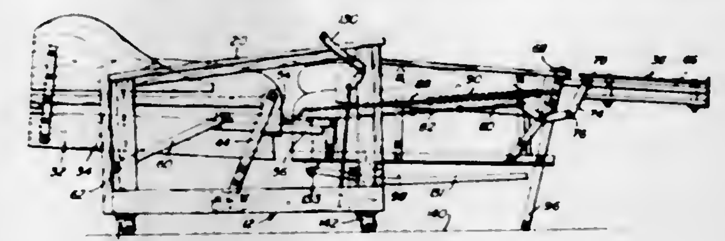
Carmine De Maria, 39 E. Madison Ave., Collingswood, N.J. 08908

Filed Sept. 2, 1975, Ser. No. 609,737

Int. Cl.^{2} A47C *17/14*

U.S. Cl. 5—37 R **7 Claims**

1. A seat construction including a main frame having front and rear portions, a first seat section, first means supporting said first section from said frame for shifting between a first rear position vertically registered with said main frame and a second forwardly displaced position with a majority of said first section projecting forwardly of said main frame, a second back rest section, second means pivotally supporting said second back rest portion from said frame and said first section and establishing a supportive link connection with said frame for automatic movement of said second section from a first raised upstanding position at the rear portion of said frame to a lowered second horizontal position disposed immediately to the rear of and in horizontal alignment with said first section and with a major portion of said second section disposed forward of the rear portion of said frame movement of said first section to second second position thereof, and a third leg rest section, third means pivotally supporting said third section from said first section for automatice movement from a first position depending downwardly from the forward portion of said first section and a second horizontal position projecting forwardly from said first section upon movement of said first and second sections from the first positions thereof to said second positions thereof, said second means including swingable suspension link means operative to suspend substantially the entire load represented by the rear portion of said first section therefrom during movement of said first section between its first and second positions.



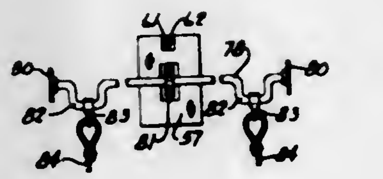
4,000,530
INVALID HANDLING DEVICE

Booker Green, 1600 Westmoreland Ave., Pittsburgh, Pa. 15206

Filed June 25, 1975, Ser. No. 590,383

Int. Cl.^{2} A47B *83/04*, **A61G** *01/02*

U.S. Cl. 5—87 **7 Claims**



1. Invalid handling apparatus for lifting invalid patients from a bed and for transporting them from one place to another comprising an elongated frame unit, an elongated shaft rotatably supported in said frame unit and provided with a series of guide spools thereon, a pair of lifting belts for each of said guide spools with one end of each of said belts attached within each of said spools and the other ends thereof provided with connectors, motor drive means supported in said frame and including a reversible motor and gear reducer adapted to drive said shaft, downwardly disposed sockets quadrangularly positioned on the bottom of said frame unit, a carriage for supporting said frame unit for purposes of transport comprising four quadrangularly positioned legs with casters secured to their lower ends and their upper ends adapted to be received

in said frame unit sockets, longitudinal bracing members secured between pairs of said carriage legs, hinge locking means in each of said legs between the upper ends thereof and the point of connection of said bracing members to said legs to permit said legs to swing inwardly of said frame unit, an elongated invalid carrier comprising a series of parallel and normally aligned strap members securely stitched at their points of crossing to provide a flexible mat for supporting an invalid, a series of loops formed in the ends of selective of said straps termination along each of the longest sides of said mat, said loops adapted to receive a ridged support bar along each of said longest sides of said mat an end support bar connected at its ends to one end of said support bars to form a three-piece U-shaped frame to effect rigidity to said mat when in use, a series of second connectors secured to selective of said strap loops and adapted to be detachably connected to said first-mentioned belt connectors.

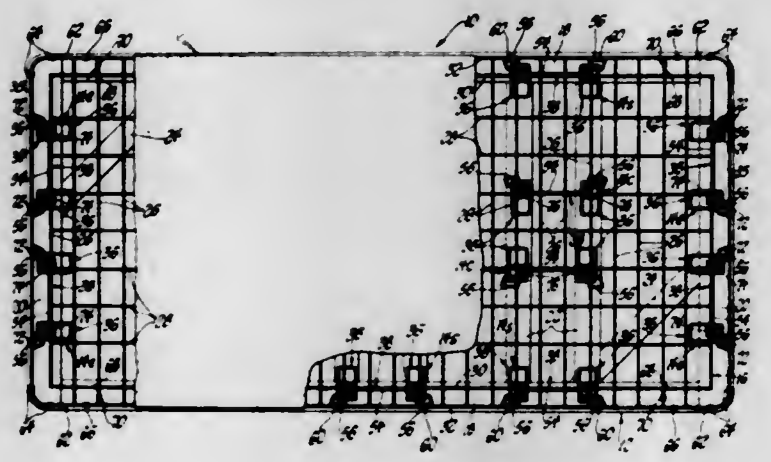
4,000,531
BOX SPRING ASSEMBLY AND GRID

Harold W. Inman, Birmingham, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 17, 1976, Ser. No. 658,558

Int. Cl.² A47C *23/02*

U.S. Cl. 5—267 12 Claims



1. A box spring assembly comprising: a lower frame having lateral side members and longitudinal end members forming a rectangular configuration; a plurality of formed wire side springs mounted on the frame adjacent each lateral side member thereof; each of said side springs including a pair of fishmouth sections extending upwardly from the frame and a connecting section that interconnects the fishmouth sections above the frame; said connecting section of each spring having an inboard main portion and outboard end portions connected to opposite ends of the main portion; a grid of laterally and longitudinally extending wires that cross each other and are supported on the frame by said springs; said grid including lateral edges which each have a pair of longitudinally extending wires of a heavier gauge than the other wires of the grid; each heavier gauge wire being laterally spaced from the other adjacent heavier gauge wire so these wires assume inboard and outboard positions; and means securing one of the heavier gauge wires of each lateral grid edge to the connecting sections of the formed wire side springs mounted on the frame.

4,000,532
FENDING DEVICE FOR OIL CONTAINMENT BOOM

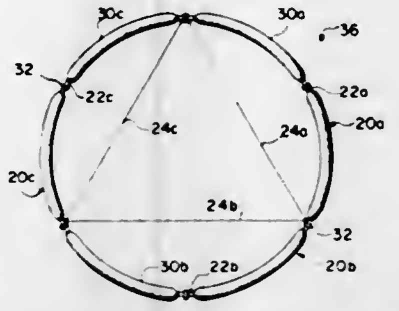
Erik C. Nielsen, R.D. 3 Box 360-K, Toms River, N.J. 08753

Filed Mar. 5, 1975, Ser. No. 555,366

Int. Cl.² B63B *35/00;* **E02B** *15/04*

U.S. Cl. 9—8 R 10 Claims

1. A fending device for floating contaminent barriers comprising: an open planar structure; buoyant means associated with said structure to provide floatation thereof on water substantially coplanar to the surface of the water; and fender means extending transversely of the plane of said structure and extending above and below the waterline thereof to engage said barrier and block passage thereby.



4,000,533
ANCHORING DEVICE FOR BUOYANT LIFE SAVING EQUIPMENT

William York Higgs, Gibsons, Canada, assignor to Intercontinental Marine Limited, Vancouver, Canada

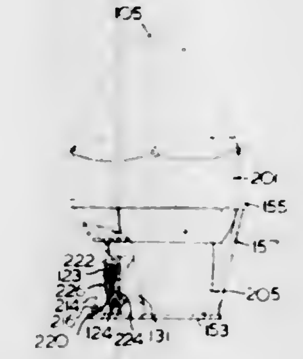
Continuation-in-part of Ser. No. 465,661, April 30, 1974, Pat. No. 3,905,060, which is a continuation of Ser. No. 280,418, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,312, June 18, 1970, Pat. No. 3,703,736. This application Aug. 12, 1974, Ser. No. 496,711

Claims priority, application United Kingdom, Apr. 22, 1974, 17516/74

The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.

Int. Cl.² B63C *9/22*

U.S. Cl. 9—9 26 Claims



1. In an anchoring device for buoyant equipment comprising a buoy suitable for being carried by a vessel in a manner permitting release and flotation of the buoy should the vessel sink, said buoy including sufficient buoyancy to cause the buoy and parts carried thereby to float free from the sinking vessel, a cable normally stowed in a manner allowing said cable to be pulled out to its full length, said cable being of adequate strength to act as an anchor cable, said cable being connected with the buoy and for connection with the vessel so as to maintain connection between the floating buoy and the vessel after the vessel has sunk: the improvement comprising a buoyant lifeboat mooring line of adequate strength to hold a life raft or boat in position relative to the buoy, said mooring line being permanently secured at one end to the buoy and being at least several times greater in length than the largest dimension of the buoy, said mooring line being normally stowed with the buoy in such manner as to be released automatically from the stowed position when the buoy separates from the vessel to permit said line to stream out in the water, whereby if the vessel sinks the buoy is released and remains on the surface of the water and said mooring line is released from said stowed position and streams out on the water to provide securement for buoyant equipment to hold this in position relative to the buoy.

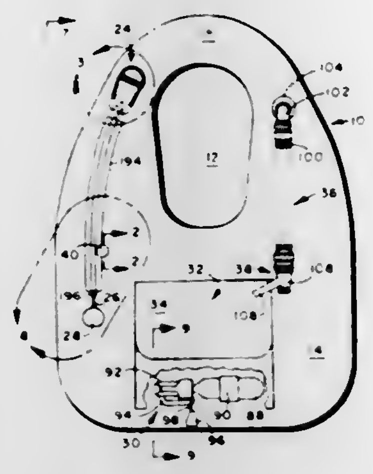
4,000,534
BUOYANCY COMPENSATOR

Leon A. Cerniway, Mission Viejo, and Donald W. Entrikin, Newport Beach, both of Calif., assignors to U. S. Divers Company, Santa Ana, Calif.

Continuation of Ser. No. 427,545, Dec. 26, 1973, abandoned. This application June 13, 1975, Ser. No. 586,616

Int. Cl.² B63C *9/18*

U.S. Cl. 9—342 10 Claims



1. A buoyancy compensator for providing a diver with buoyancy gas comprising:
- a vest having a collar and an opening through which a user's head can pass made of an outer textile material which has a limited degree of stretchability with a substantially freely implaced plastic inner bladder having a communicating void therein which conforms to the outer material substantially throughout the entirety of the outer material and is controlled in its expansion to the limits of the outer material expansion;
- straps attached to the vest for maintaining the vest on a user's body;
- an oral filling means comprising a flexible tube connected to the interior of said vest at one end of said tube, with an oral inflation valve assembly at the other end of said tube having a mouthpiece connected to a valve housing, with a spring biased hand operated valve member for sealing against the interior of said housing to prevent the escape of gas therethrough connected to an operating member at least partially exposed extrinsically to said housing, so that when said valve member is moved from the valve housing by said operating member, it will permit oral inflation of said vest; and,
- a relief valve connected to the vest for release of pressure within the cavity of said vest.

4,000,535
SHOE MACHINE SHOE SIZE AND SIDE SENSING ARRANGEMENTS

George Clifford Barton, deceased, late of Leicester, England (by Margaret Ellen Barton, executrix), assignor to USM Corporation, Boston, Mass.

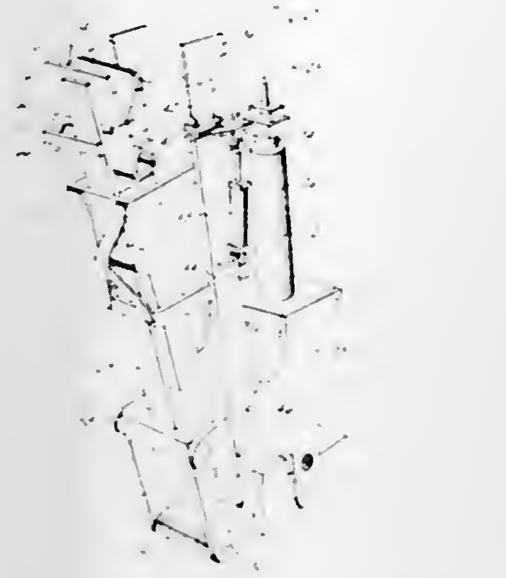
Filed June 5, 1975, Ser. No. 583,951

Claims priority, application United Kingdom, June 5, 1974, 24866/74

Int. Cl.² A43D *3/00, 23/00*

U.S. Cl. 12—126 5 Claims

1. A machine for lasting shoes, including:
- a shoe assembly supporting arrangement;
- a last engaging member for supporting a heel end portion to a last;
- a shoe assembly aligning arrangement comprising at least two gauges, one on each side of said shoe, said gauges being movable toward and away from the sides of said shoe assembly comprising means for moving said shoe assembly upon a signal from a movable sensor; and
- means for moving said shoe assembly alignment arrangement in a sequential manner;



- said movable sensor comprising a pivotal finger member connected with a control circuit movable about an axis on an actuating member, said pivotal member having means for activating a circuit control switch.

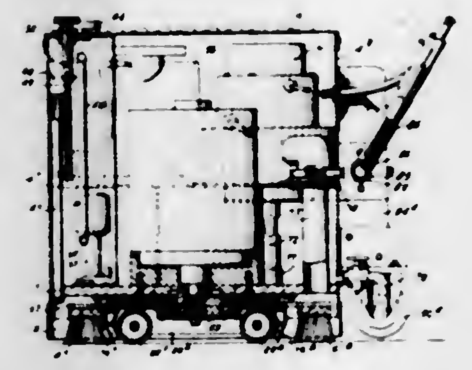
4,000,536
FLOOR CLEANING MACHINE WITH FOAM DISPENSING SYSTEM

James E. Nayfa, 5015 Sharp St., Dallas, Tex. 75247, and Andrew D. Stanley, 2306 Cedar Way Drive, Dallas, Tex. 75241

Division of Ser. No. 390,023, Aug. 20, 1973, Pat. No. 3,931,662, which is a division of Ser. No. 147,866, May 28, 1971, Pat. No. 3,761,987. This application Jan. 8, 1976, Ser. No. 647,503

Int. Cl.² A47L *11/284, 11/30, 11/34*

U.S. Cl. 15—50 A 8 Claims

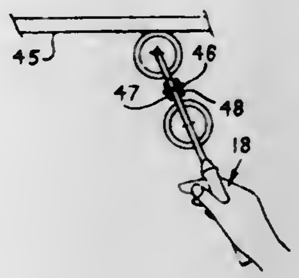


1. A machine for treating floor surfaces comprising
- a housing having front and rear ends in relation to normal movement over a floor surface in one direction;
- means mounted on said housing for supporting said housing for movement along the floor surface;
- supply means in said housing for supplying a cleaning foam; brush means mounted under said housing; power means in said housing for producing movement of said brush means in the floor plane, relative to said housing;
- said cleaning foam supply means including; a supply tank in said housing having a main chamber for containing a liquid solution, means in said main chamber for producing a foam of the solution therein, including a source of compressed air communicating with said tank main chamber for pressurizing said tank and for aerating said solution to produce said foam, elongated transverse

trough means in said tank defining a dispensing chamber, adjustable gate means for regulating the flow of solution foam from said supply tank main chamber into said dispensing chamber and dispensing means disposed at the front end of said housing communicating with said dispensing chamber for dispensing cleaning foam onto said floor surface.

4,000,537
PAINT ROLLER DEVICE HAVING JUXTA-POSED ROLLERS

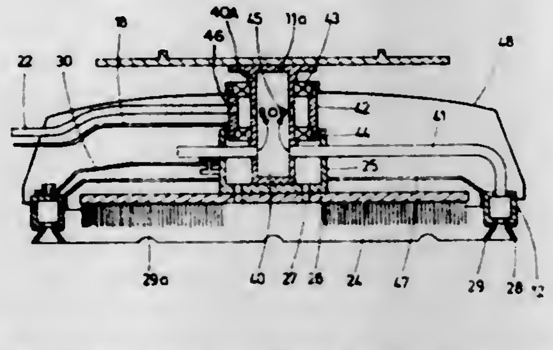
Yen Kong Woo, 1545 Geary St. Apt. No. 1, San Francisco, Calif. 94115
Filed Oct. 23, 1975, Ser. No. 625,310
Int. Cl.^{2} B05C *17/02*; **B25G** *1/04*
U.S. Cl. 15—230.11 **4 Claims**



1. A drip proof paint roller device comprising a planar axle frame comprising a pair of juxta-posed roller axles arranged in parallel relation, a lead paint roller mounted for rotation on one of said pair of juxta-posed roller axles, a follower roller mounted for rotation on the other of said pair of juxta-posed axles, an actuating handle pivotally mounted on said axle frame for moving both said lead roller and said follower roller in simultaneous rolling engagement with a paint receiving surface, (as well as) and means engaging the frame and handle for locking said handle only in the plane of said axle frame for moving said lead roller about an overhead surface while simultaneously maintaining said follower roller in a drip-catching relation to said lead roller away from said overhead surface.

4,000,538
CLEANING DEVICE

Jacques Tissier, 26 bis, rue de la Galte, 94 Villejuif, France
Filed Mar. 10, 1975, Ser. No. 556,960
Claims priority, application France, Mar. 8, 1974, 74.07898
Int. Cl.^{2} A47L *11/30*, *11/293*
U.S. Cl. 15—320 **13 Claims**

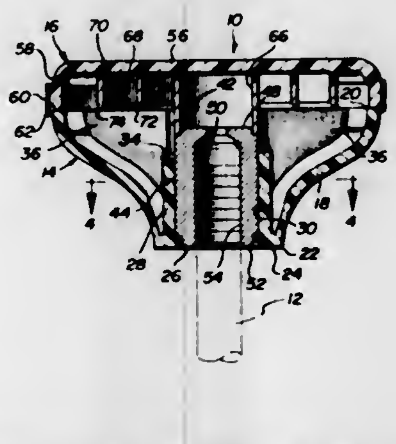


1. A cleaning device for cleaning a floor or other surface, said device including a cleaning disc having a vertical axis of rotation, a reservoir feeding cleaning liquid to the disc and means to control the flow of cleaning liquid, the improvement which comprises:

A. a rotatable hollow hub concentric with the axis of rotation of the cleaning disc and mounting said disc;
B. a circular ring having an interior compartment and a passageway communicating the interior compartment with the surface to be cleaned, said ring surrounding the cleaning disc for defining the area to be cleaned and including downwardly directed flexible skirts forming said passageway;
C. floatable mounting means connecting the cleaning disc to the circular ring for permitting floating movement of the ring relative to the disc, whereby the flexible skirts can be maintained in contact with the surface being cleaned under all conditions of use;
D. a flexible conduit interconnecting the interior compartment of the circular ring with the interior of the hollow hub; and
E. suction means applies to the hollow hub, whereby dirty cleaning liquid can be removed from the surface being cleaned through the circular ring and the flexible conduit connecting the interior compartment of the ring with the interior of the hollow hub.

4,000,539
HOLLOW KNOB

James U. Neyer, Lake Bluff, Ill., assignor to Arens Controls, Inc., Evanston, Ill.
Filed Jan. 29, 1976, Ser. No. 653,358
Int. Cl.^{2} E05B *1/00*
U.S. Cl. 16—121 **8 Claims**

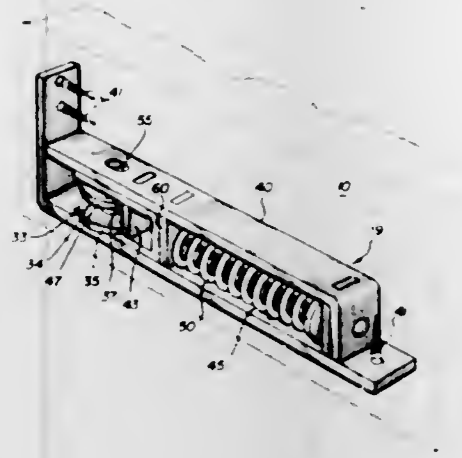


1. A hollow plastic knob comprising a lower portion having a downwardly opening recess therein, a metallic insert in said recess for receiving a member to be moved by said knob, said lower portion having retaining means adjacent said recess for trapping said insert in said recess, and a top portion secured to said bottom portion and having a part thereof bearing against said insert adjacent the upper end to hold said insert against said retaining means and for bracing said upper portion, said portions having relatively transverse ribs reinforcing the respective portions and having cross-overs at which said ribs are secured to one another.

4,000,540
SPRING LOADED, ADJUSTABLE WALKING DOOR HINGE

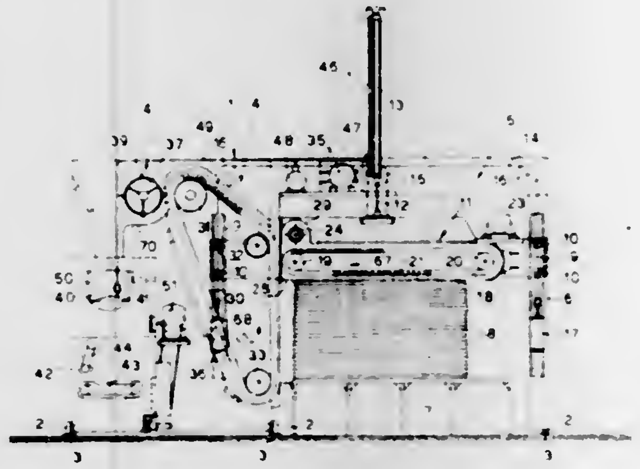
Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers Inc., Sterling, Ill.
Filed Apr. 19, 1976, Ser. No. 678,139
Int. Cl.^{2} E05D *7/08*
U.S. Cl. 16—151 **29 Claims**

1. Door pivot mechanism for use with a door structure sized to fit within a space defined by a fixed floor and frame structure, the door structure having a vertical edge in relatively juxtaposed relation to a vertical portion of the fixed frame structure when the door structure is in a closed position and in a relatively spaced apart relation to the frame vertical portion when the door structure is in an open position, said door pivot mechanism including first and second units mounted at top and bottom inner door structure corners and adjacent frame and floor structure, the first unit comprising a pintle, means for affixing the pintle to one of the structures in nonmoving relationship, a cam affixed to the pintle in nonmoving relationship therewith, the cam being at least partially defined by a curved cam surface generated by a genetrix which moves radially outwardly from the pintle as a directrix moves angularly away from the door structure closed position, a cam follower carried by the other structure, positive force biasing means urging the cam follower into abuttive contact with the cam such that upon opening movement, relative movement is produced between said cam and said cam follower, for increasing the positive force of the biasing means to urge the door structure toward its closed position throughout a range of door structure partially opened positions and also to space said door structure from the frame, and the second unit comprising a pintle, means for affixing the pintle to one of the structures in nonmoving relationship, a cam affixed to the pintle in non-moving relationship, the cam including a plurality of lobes, and a cam follower affixed to the other structure in nonmoving relationship, the cam and cam follower having mutually engaging surfaces such that movement of the door structure from the fully closed position through its partially opened positions produces radially outward motion of the cam and pintle and relative to the cam follower and corresponding motion of the door structure relative to the frame and floor structure, the first and second units thus causing the door structure vertical edge to displace from the relatively juxtaposed position adjacent the frame structure vertical portion when the door is in its closed position to it relatively spaced apart position relative to the frame structure vertical portion when the door is in its open position.



4,000,541
INSTALLATION FOR METERING TEXTILE FIBERS

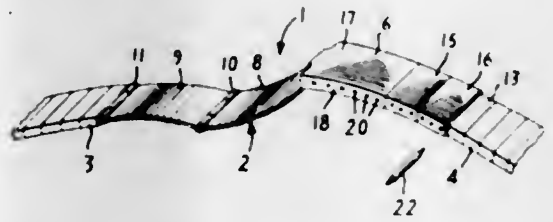
Angelo Marzoli, Bergamo, Italy, assignor to F. Lli Marzoli & C. S.p.A., Bergamo, Italy
Filed Apr. 4, 1975, Ser. No. 565,252
Claims priority, application Italy, Apr. 10, 1974, 21222/74
Int. Cl.^{2} D01G *7/00*
U.S. Cl. 19—81 **7 Claims**



1. An arrangement for feeding metered amounts of textile fibers, comprising at least one machine for grasping and metering the fibers, a guideway including support means for longitudinally spaced bales of fibers, driving means for moving said grasping and metering machine step by step along said guideway to successively position it over different bales of fibers and at least one discharging and dispensing machine arranged in a predetermind position along the guideway so as to be operatively engaged by the grasping and metering machine at the end of an operating movement of the latter along the guideway, said grasping and metering comprising a bridge-like portion transversally arranged over the guideway so as to be successively superimposed to the spaced bales, a rotary spiked apron horizontally arranged and vertically displaceable in said bridge portion so as to engage the top of a bale below to grasp and horizontally displace the upper fibers thereof, conveying means arranged to receive the fibers displaced by the spiked apron and to convey them towards a metering device, means to actuate said metering device to dump the metered fibers into a container when a predetermined amount of conveyed fibers is metered, spiked apron lifting means operable when said predetermined amount of conveyed fibers is metered to disengage the spiked apron from the bale and further conveying means associated with the container to receive the fiber dumped by the metering device and to subsequently transfer them to the discharging and dispensing machine at the end of an operating movement of the grasping and metering machine along the guideway.

4,000,542
DEVICE FOR ADJUSTING THE LENGTH OF A WATCHBAND

Tokio Omichi, Tokyo, Japan, assignor to Kabushiki Kaisha Bambi and Kabushiki Kaisha Hattori, both of, Japan
Filed Mar. 21, 1975, Ser. No. 560,701
Claims priority, application Japan, Apr. 4, 1974, 49-37796[U]
Int. Cl.^{2} A43C *11/00*, **A44B** *21/00*
U.S. Cl. 24—71 J **4 Claims**



1. A device for adjusting the length of a watchband comprising, a three-element fitting connectable intermediate two opposite ends of a watchband comprising a main link on one end of said fitting longer than other links of a watchband to which said three-element fitting is attached and two-foldable elements foldable over one another and positionable underlying the main link to jointly therewith define a closure for the watchband, means pivotally connecting the two-foldable elements, means for pivotally connecting an end one of said two-foldable elements to an end of a watchband, means for pivotally connecting the other of the two-foldable elements to said main link, said main link having a top the length of the main link and two parallel sidewalls opposite one another extending along the side of said top, said sidewalls having two opposed openings for receiving a spring-loaded pin from the underside of said main link, at least one length-adjusting link shorter in length than said main link, said length-adjusting link having a top of equal width to the top of said main link and two opposed sidewalls similar in configuration to the walls of said main link and having axially spaced openings for receiving a spring-loaded pin extending between the two sidewalls on an underside of said top, a spring-loaded pin positionable in use extending between said two sidewalls underneath said top, said end of said watchband to which said length-adjusting link is connected in use comprising an end link having an end loop through which said spring-loaded pin extends and is received in opposed openings on said sidewalls releasably linking said end link and said length-adjusting link, said length-adjusting

link having a connection extension extending offset from said top for underlying said top of said main link when in assembled state therewith, said extension having two laterally spaced loops positionable in alignment with opposed openings in the sidewalls of said main link, a second spring-loaded pin for extending through the last-mentioned loops and releasably received in use in said last-mentioned opposed openings thereby for releasably connecting said main link and said length-adjusting link, said extension having a tongue extending forwardly of said loops for underlying said main link and disposed in said assembled state between the underside of the top of said main link and said second spring-loaded pin to preclude relative pivotal movement therebetween, and said offset being dimensioned so that said top of said main link overlies said extension and the top of said main link and said top of said length-adjusting link are flush in said assembled state, whereby in said assembled state said sidewalls of said length-adjusting link and said main link are aligned and abutting and said length adjusting link is a rigid extension of said main link.

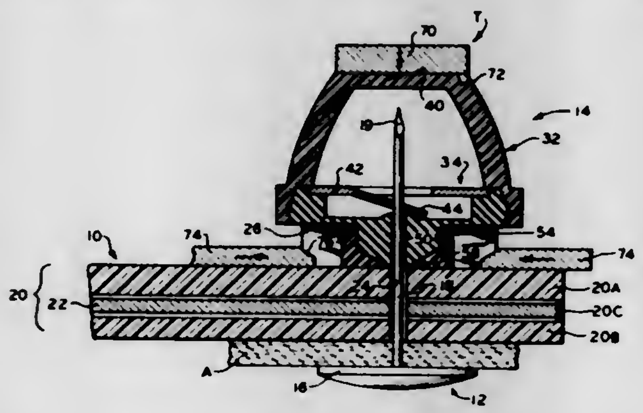
4,000,543
MONITOR ACTUATING DEVICE AND REUSABLE FASTENER THEREFOR

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 2, 1975, Ser. No. 636,867

Int. Cl.² A44B *9/00*

U.S. Cl. 24—150 R **27 Claims**



1. A reusable fastener for attachment to the end of a shaft, said fastener comprising:

a generally hollow body having an upper generally dome shaped portion and a lower portion, said lower portion defining a bore opening to the bottom surface of said lower portion for receipt of the shaft, said lower portion including a generally tubular member at least partially defining the bore adjacent the opening thereto axially movable relative to the dome shaped portion, said tubular member having an outer cam surface tapered radially inwardly and towards the opening to the bore, radially inwardly directed force on said cam surface being effective to move said member towards said dome shaped portion; and

a resilient one-piece spring steel clip mounted within said body, said clip having a base axially fixed and freely rotatable relative to said dome shaped portion, said base being generally annular in cross-section and the axis of rotation of the base being substantially coaxial with the axis of the bore, said clip having an aperture therethrough sized to receive said shaft, said clip having a first non-deformed position in which said aperture will not register with said bore and a second resiliently deformed position in which said aperture will substantially register with said bore, said axially movable tubular member being engageable with said clip to urge said clip towards said second position when said tubular member is moved axially towards said dome shaped portion.

4,000,544
CLASP

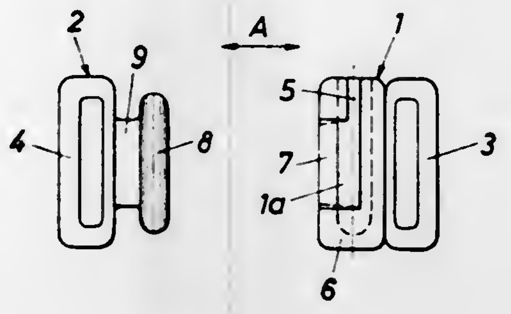
Gerhard Fildan, 31 Kriehubergasse, A-1050 Vienna, Austria

Filed Sept. 16, 1975, Ser. No. 614,029

Claims priority, application Austria, Sept. 19, 1974, 7533/74; Jan. 13, 1975, 197/75; Feb. 6, 1975, 918/75; May 26, 1975, 3988/75; Aug. 14, 1975, 6349/75

Int. Cl.² A44B *11/25, 17/00*

U.S. Cl. 24—201 CF **10 Claims**



1. Clasp for items of clothing, particularly brassieres, comprising at least two clasp members which can be joined together in articulated manner and also detached from one another, whereby the said clasp members can be connected to the ends of the items to be connected at the end thereof remote from the joint, whereby the latter is formed from a longitudinally slotted member having a cylindrical bore disposed on one of said clasp members at right angles to the connecting line between said clasp members and by a roll insertable in the said cylindrical bore, said roll connected to the other of said clasp members by a web, wherein the slot is arranged in a plane at an angle of 60° to 90° to the clasp plane, so that the two joint portions are inserted into one another in an angular position and are brought into an extended position corresponding to the clasp position by swivelling, whereby in the area of said slot is provided a space laterally communicating with said slot for receiving the web on swivelling the clasp portions from the angular position into the extended position, said one clasp portion including a protrusion acting in a snap fastener like manner and disposed in the path of the other clasp portion on reciprocal rotation of the two portions with respect to each other.

4,000,545
SLIDE FASTENER WITH EMERGENCY OPENING MEANS

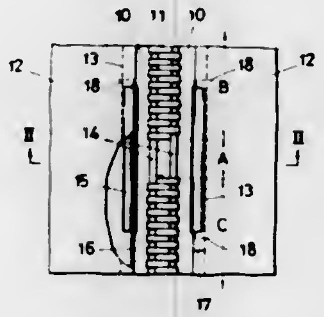
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 16, 1975, Ser. No. 623,262

Claims priority, application Japan, Oct. 22, 1974, 49-121742

Int. Cl.² A44G *19/00*

U.S. Cl. 24—205 R **4 Claims**



1. In a slide fastener for use with an article wherein the slide fastener includes a pair of stringer tapes which carry interlockable rows of scoops along their opposed longitudinal edges and which are attached to the edges of the article bounding an opening therein, the combination thereof with an emergency opening zone which is located intermediate both ends of said rows of scoops and in which said rows of scoops are incapable of interlocking engagement when the slide fastener is closed, said tapes extending throughout said emergency opening zone to accommodate disengagement of said rows of scoops by forces applied to the tapes in said emergency opening zone, and a pair of reinforcements of relatively rigid material fixedly arranged along and on the opposite sides of said emergency opening zone and spaced from said longitudinal edges, each reinforcement being longer than said emergency opening zone and extending substantially beyond both extremities thereof and in longitudinally overlapping relation with interlockable scoops of said rows.

4,000,546
SLIDER FOR CONCEALED SLIDE FASTENERS

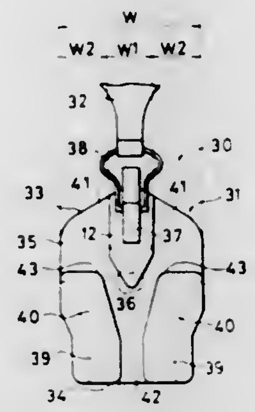
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 23, 1975, Ser. No. 615,844

Claims priority, application Japan, Sept. 30, 1974, 49-118759[U]

Int. Cl.² A44B *19/32*

U.S. Cl. 24—205.1 R **2 Claims**



1. In a concealed slide fastener of the type wherein a pair of stringer tapes have rearward folds formed along their confronting longitudinal edges to support respective rows of scoops thereon, a slider movable along said rows of scoops for coupling and uncoupling the same, said slider comprising, in combination: a rear wall having a separator formed centrally at its upper end, said separator having a pair of inner lips formed at its inboard end and a pull tab pivotally coupled thereto; a pair of side walls extending along the respective marginal edges of said rear wall from its lower end and terminating short of its upper end; and a pair of outer lips extending toward each other from said side walls, respectively, and having upper ends arranged slightly upwardly of the inboard end of said separator, said upper end of each outer lip having an inside corner opposed to one of said inner lips and spaced therefrom a distance slightly in excess of the thickness of each stringer tape to engage the stringer tape at the rearward folding line thereof in overlying relation to the rearward fold portion of the stringer tape.

4,000,547
SNAP FASTENER

Marvin L. Eisenpresser, 4 Willow Lane, Hewlett Harbor, N.Y. 11557

Filed July 25, 1975, Ser. No. 598,741

Int. Cl.² A44B *17/00*

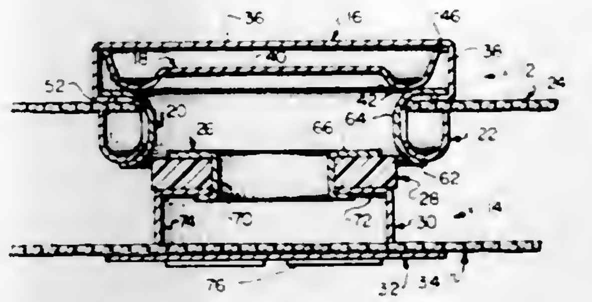
U.S. Cl. 24—214 **9 Claims**

1. A snap fastener stud attachable to a support comprising the combination of:

a generally circular base member having a central opening;

a continuous annular resilient washer having a central opening substantially aligned with said central opening of said base member and having an outer diameter larger than the outer diameter of said base member, one face of said resilient washer being adjacent said base member;

an eyelet having a substantially flat annular portion adjacent the other face of said resilient washer, and a tubular portion extending through said central openings in said resilient washer and said base member.



said tubular portion having an enlarged portion at the distal edge thereof for engaging said base member,

said annular portion having an outer diameter smaller than the outer diameter of said resilient washer; and

means for connecting said stud to a support.

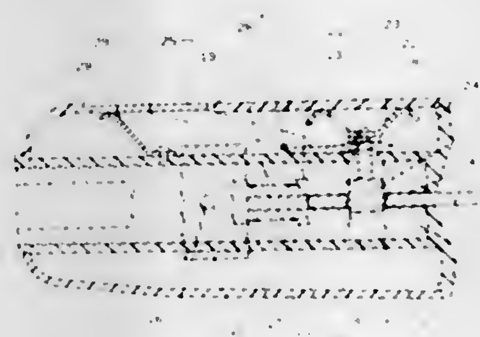
4,000,548
SEPARABLE FASTENER WITH PIN LATCH

Robert L. Stephenson, Sterling Heights, and Jerome W. Schotthoefer, New Baltimore, both of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 4, 1976, Ser. No. 663,943

Int. Cl.² A44B *11/26*

U.S. Cl. 24—230 AL **18 Claims**



1. A seat buckle and tongue in combination comprising

a ferrule having a passenger restraint fixed to one end, a through slot at the other for engaging the tongue, and an opening extending at least into the slot from the surface of the ferrule above the slot; a pin, positioned for motion within the opening and biased for engaging an opening in the tongue when said tongue is inserted into the slot, means for raising the pin in opposition to its bias to a position above the slot; and a tongue ejection member having a flat portion for longitudinal sliding action within the slot, said tongue ejection member being biased outwardly to the point in the slot directly beneath the pin

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4,000,549
STABILIZER

Ralph E. Brumley; Mathew B. Riordan, and Richard H. Bentley, all of Houston, Tex., assignors to Eastman-Whipstock, Inc., Houston, Tex.

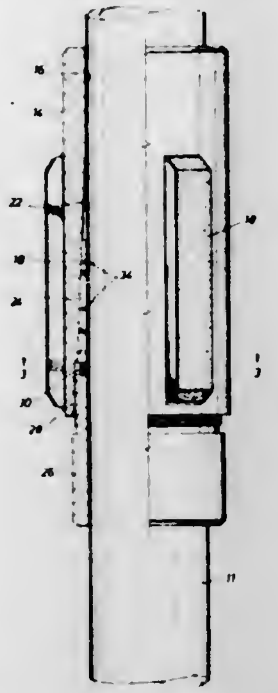
Filed July 14, 1975, Ser. No. 595,891

Int. Cl.² F16C *1/26, 29/00*

U.S. Cl. 24—263 KS **2 Claims**

1. A stabilizer for mounting on a drill string for limiting the lateral movement of the drill string during drilling operations comprising a tubular body for positioning on the drill string in the desired location and having a bore with a locking taper that increases in diameter toward one end thereof at an angle of about 3°, a plurality of spaced parallel slip fingers for posi-

tioning between the tapered bore and the drill string and parallel to the longitudinal axis of the bore, each finger having a tapered outer surface to engage the tapered bore of the body, means for holding the fingers in said parallel relationship, and means for forcing the fingers longitudinally of the body to cause the tapered outer surface of the fingers to move along the tapered bore and be forced inwardly into frictional engagement with the drill string sufficiently to hold the body from movement longitudinally in either direction from the desired position on the drill string while the drill string is used in a drilling operation.



4,000,550

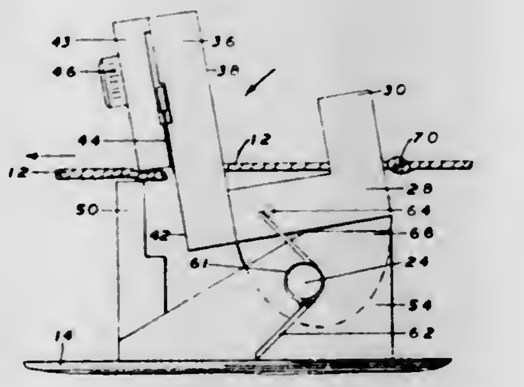
APPARATUS FOR CUTTING KNOTS AND SLUBS OUT OF CONTINUOUS YARN LENGTHS

Richard William Karpluk, Ballston Lake, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,962

Int. Cl.² D01H *13/32*

U.S. Cl. 28—64 **3 Claims**



1. An apparatus for severing a continuous length of yarn or monofilament containing knots, kinks, or slubs, to prevent take-up of said knots, kinks or slubs into yarn and monofilament processing machinery, which comprises:

a. a base support;
b. a pivot axle support attached to said base support;
c. a stationary pivot axle supported by said axle support;
d. a pivot block mounted on said axle so as to pivot freely between a first and second position, said block having a lead end and a trail end;
e. first stop means;
f. an open, straight, yarn traveling path through said block, between said lead end and said trail end, the entry to said path being of a dimension permitting the passage of said yarn and monofilament but denying passage of knots, kinks and slubs in said yarns and monofilaments;
g. spring means for yieldingly urging said block in said first position against said first stop means when yarn and monofilament lengths entering the entry to said path are free of knots, kinks and slubs, said spring means being overcomeable by a predetermined pressure on said lead end, said spring means being supported by said base support;
h. blade holder means attached to said pivot block;
i. blade means supported by said blade holder means and disposed adjacent said path when said block is in said first position, said blade means being moveable with said pivot block to enter said path and sever a yarn or monofilament disposed therein upon transfer of said block from said first position to said second position;
j. second stop means against which said blade holder abuts in said second position, said second stop means and said blade holder cooperating in abutment to hold said yarn or monofilament as it is severed by said blade means upon a knot, kink or slub in said yarn or monofilament being denied entry to said path and causing pressure to overcome said spring means to transfer said block from said first position to said second position;
k. and said spring means returning said block to said first position upon release of pressure of the knot, kink or slub upon severance of said yarn or monofilament intermediate said second stop means and the entry of said path.

4,000,551

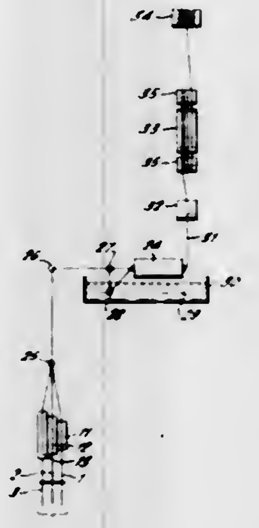
PRODUCTION OF BULKY YARNS

Gordon Alan Holden, Bargoed, Wales, assignor to Crimpfil Limited, Bargoed, Wales

Filed Jan. 15, 1975, Ser. No. 541,355

Int. Cl.² D02G *1/16*

U.S. Cl. 28—72.12 **7 Claims**



1. A method of producing bulky, continuous filament yarn in which primary continuous multi-filament yarns of polymeric material comprising at least 20% of the total filaments are substantially straight and free from crunodal ring-like loops and secondary continuous multi-filament yarns of polymeric material comprising up to 80% of the total filaments are formed at randomly spaced longitudinal intervals with crunodal ring-like loops separated by relatively straight portions and are intermingled with each other and with the substantially straight filaments of the primary yarns so that, when a gradually increasing tensile load is imposed on the bulky yarn, the filaments of both the primary and secondary yarns break simultaneously; the method including the steps of:

pre-treating at least one of the primary and secondary continuous multi-filament yarns by the application of water;

feeding the primary and secondary yarns into a treatment zone so that at least one of the primary and secondary yarns is fed into the treatment zone along a path which is colinearly aligned with a rectilinear path along which the yarn passes through the treatment zone and so that each

yarn to which water has been applied enters the treatment zone while still wet;

providing within the treatment zone a fluid flow of sufficient turbulence to separate the individual filaments of the yarns, to form crunodal ring-like loops and other convolutions at randomly spaced intervals along the lengths of the individual filaments of each secondary yarn, and to cause the individual filaments of each secondary yarn to intermingle with each other and with the individual filaments of each primary yarn to form a single bulky yarn,

withdrawing the intermingled filaments from the treatment zone at a rate such that each primary yarn is fed into the treatment zone at a rate between 4% and 26% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone and each secondary yarn is fed in to the treatment zone at a rate which is at least 2.5% higher than the rate of feed of each primary yarn and up to 30% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone.

4,000,552

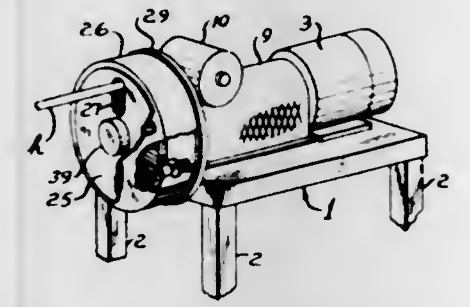
HYDRAULIC HOSE SKIVING MACHINE

Duane R. Pleis, Brandon, S. Dak., assignor to Dakota Iron, Inc., Sioux Falls, S. Dak.

Filed Nov. 10, 1975, Ser. No. 630,169

Int. Cl.² B23D *67/00*

U.S. Cl. 29—76 R **6 Claims**



1. A hydraulic hose skiving machine for preparing hose to receive couplings, comprising:

a frame .

a high speed rotary motor driven skiving tool mounted on the frame for rotation about a fixed axis,

a mandrel support rotatable about the skiving tool,

a mandrel secured to said support and cantilevered past said skiving tool for receiving a hose end telescoped thereover, said mandrel carried in predetermined desired spacing from said tool,

and power means for turning said support to carry the mandrel about the periphery of said skiving tool for removing a desired thickness layer of material from a hose end on the mandrel.

4,000,553

ROLLER OR ROLL ASSEMBLY

Ronald Spannlang, Linz, and Franz Kagerhuber, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 20, 1975, Ser. No. 624,064

Claims priority, application Austria, Oct. 22, 1974, 8480/74

Int. Cl.² B21B *13/02*

U.S. Cl. 29—115 **8 Claims**

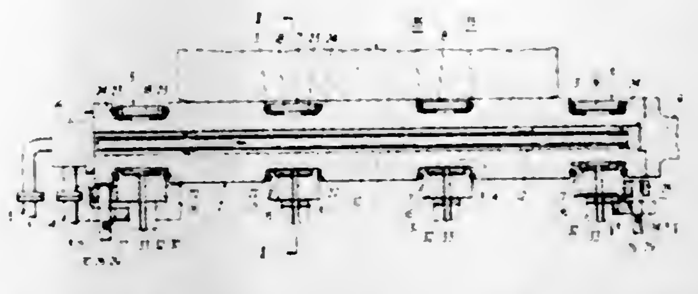
1. A roller or roll assembly for supporting, guiding, bending, straightening or deforming a continuously cast strand of relatively great width, in particular a steel slab of a width exceeding 1,000 mm, in a continuous casting plant having a supporting construction, which roller or roll comprises annular recesses distributed over its longitudinal extension to form bearing pins of a substantially cylindrical shape, which assembly further comprises

an outer fixed bearing having a bearing housing and accommodating one of said bearing pins, which outer fixed bearing is supported on the supporting construction,

an abutment secured to the supporting construction and axially holding the bearing housing of said outer fixed bearing,

an outer expansion bearing having a bearing housing and accommodating one of said bearing pins, which bearing is supported on the supporting construction and arranged for axial displacement thereon and held perpendicularly to the direction of displacement,

at least one inner expansion bearing having a bearing housing and accommodating one of said bearing pins, which at least one inner expansion bearing is arranged between said outer fixed bearing and said outer expansion bearing and rests loosely on said supporting construction.



4,000,554

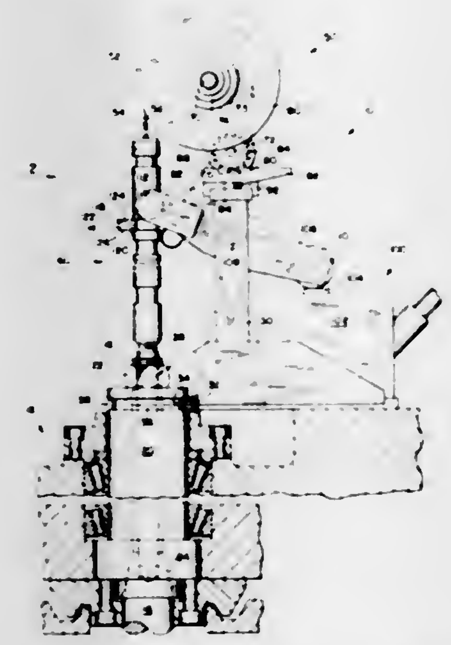
SCREW REMOVING APPARATUS FOR VERTICAL EXTRUDERS

Alden W. Nelson, West Mystic, Conn., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Dec. 22, 1975, Ser. No. 643,070

Int. Cl.² B23P *19/06*

U.S. Cl. 29—252 **8 Claims**



1. Screw removing apparatus for removing a screw from the barrel of a vertical extruder in which the screw is removable through the bottom of said barrel, said apparatus comprising:

a. an adaptor for fastening to the upper end of said screw and which contains at least one surface which is horizontal when said adaptor is fastened to said screw from which a downward force may be transmitted through said adaptor to said screw;
b. a winch adapted for fastening to said adaptor and which includes yieldable locking means for enabling said winch to support the weight of said screw and which is yieldable for allowing downward movement of said screw upon application of a predetermined downward force against said horizontal surface; and
c. power means adapted for engaging said horizontal sur-

face for transmission of a downward force which is sufficient to overcome said yeildable locking means and cause downward movement of said screw.

4,000,555
PROCESS FOR PRODUCING STRAW-BOTTOMED CHAIRS

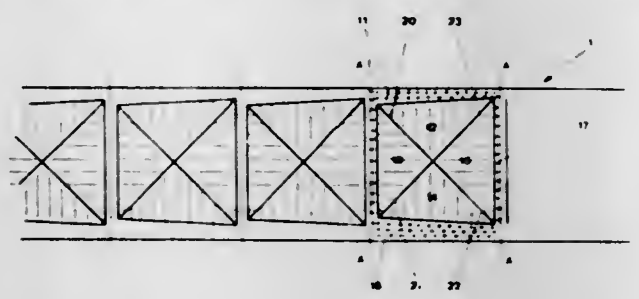
Pierre Bruniaux, 8, rue des Bouchers, Cambrai (Nord), France

Filed Nov. 26, 1974, Ser. No. 527,511

Claims priority, application France, Nov. 30, 1973, 73.42900; July 16, 1974, 74.24751; Nov. 13, 1974, 74.37452

Int. Cl.² B23P *17/04*

U.S. Cl. 29—417 **6 Claims**



1. A process for producing straw-bottomed chairs comprising the steps of weaving a piece of fabric from a straw-like material, simultaneously securing said straw-like material with threads of a non-straw-like material and then securing and tensioning said woven straw-like material secured by said non-straw-like material onto a support means to form the seat of a chair.

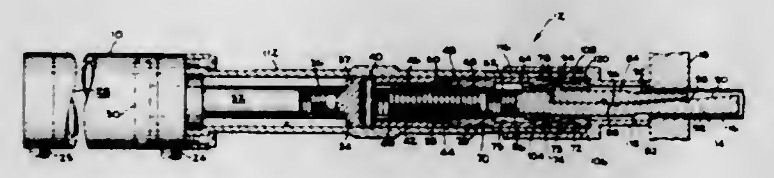
4,000,556
METHOD AND APPARATUS FOR PULLING TUBES

Anthony S. Ciminero, 115-½ Chenery St., San Francisco, Calif. 94131

Filed Nov. 17, 1975, Ser. No. 632,317

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **9 Claims**



1. Method of pulling tubes from a tube sheet, comprising the steps of:

a. inserting two tube grabbing members into the tube being pulled, said tube grabbing members having a plurality of teeth disposed for engagement with the interior side wall of said tube;

b. rotating relatively one tube grabbing member about the lonitudinal axis of the apparatus to cause relative longitudinal motion between both said members and to cause variation in the lateral dimension between the members so that adjustment to the size of the tube being pulled can be effected;

c. translating the tube grabbing members relatively and longitudinally by withdrawing slightly one tube grabbing member from the tube while maintaining the other grabbing member stationary, said tube grabbing members being mated to form a wedge so that said relative translational motion provides lateral dimensional variation that causes the tube grabbing members to engage the interior side wall of the tube;-

d. compensating for misalignment between the tube grabbing members and the side wall of the tube during the step of relative translation;

e. translating both tube grabbing members together and thereby extracting the tube from the tube sheet; and

f. releasing the tube grabbing members from engagement with the interior side wall of the tube by relatively translating in a longitudinal direction one of said tube grabbing members with respect to the other.

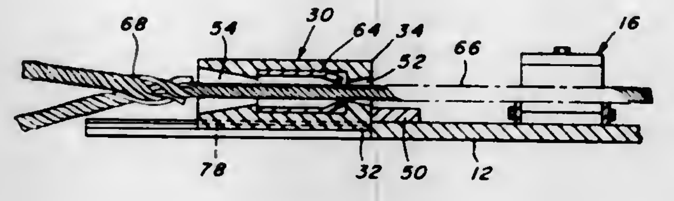
4,000,557
METHOD AND APPARATUS FOR SECURING SWAGE SLEEVES UPON A WIRE ROPE SPLICE

Orval C. Bawden, Orem, and Leonard F. Harris, Provo, both of Utah, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1975, Ser. No. 630,385

Int. Cl.² B23P *19/02*

U.S. Cl. 29—525 **9 Claims**



1. Apparatus for securing swage sleeves upon a wire rope having a splice thereon configured to form a sling at the end of such wire rope, said apparatus comprising:

a supporting structure;

means movably mounted on said supporting structure for securing and capturing a swage sleeve, said securing and capturing means being configured to permit the passage of an end of wire rope therethrough such that such end of such wire rope may be passed through such swage sleeve to be spliced and formed into a sling loop;

means positioned on said supporting structure for clamping a portion of such wire rope on the other side of said securing and capturing means from such wire rope sling loop; and

means for automatically forcibly moving said securing and capturing means, and such swage sleeve contained therein, in a direction away from said clamping means and toward such sling loop on such end of the wire rope for forcing the spliced portion into such swage sleeve such that a stronger splice is realized when such swage sleeve is swaged.

9. A method of automatically securing swage sleeves on wire rope sling splices, said method comprising:

fitting a swage sleeve within a holder complementarily configured relative to the swage sleeve;

threading the end of a wire rope, intended to be spliced into a sling, into the holder and through the swage sleeve contained therein;

forming the wire rope end into a spliced sling;

clamping the wire rope at a point on the opposite side of the holder from the spliced sling;

automatically moving the holder, and the swage sleeve contained therein, in a direction away from the point at which the wire rope is clamped and toward the splice formed on the sling, thereby forcing the swage sleeve onto the splice of the wire rope; and

releasing the swage sleeve from the holder and unclamping the wire rope in preparation for a swaging operation.

4,000,558
PROCESS OF FABRICATING WIRING HARNESS

Robert Francis Cahill, Westport, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 189,174, Oct. 14, 1971, abandoned. This application June 12, 1973, Ser. No. 369,322

Int. Cl.² B41M *3/08*

U.S. Cl. 29—625 **5 Claims**

1. A method of forming flexible wiring harnesses comprising placing an adhesive coated first flexible plastic sheet, adhesive side up, in contact with a positioning jig and a platen,

applying a vacuum through hold-down tubes to temporarily maintain said flexible plastic sheet in contact with the positioning jig and platen,

unreeling a conductive wire from a spool under control of an actuator,

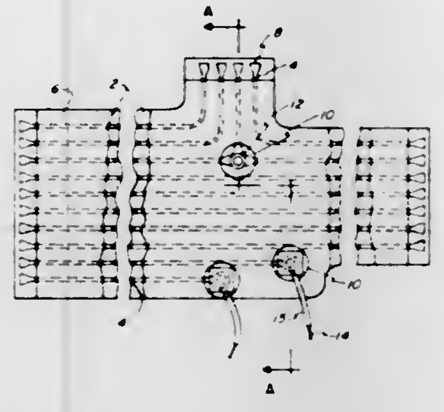
feeding said wire under control of a controller to a cut-off actuator,

cutting said wire after a prescribed length of wire has passed said cut-off actuator,

feeding said wire under controls of the controller between a flattening actuator and an anvil,

flattening said wire on said anvil at prescribed places,

feeding said wire under a press-down wheel onto the adhesive coated plastic sheet,



positioning the press-down wheel, under control of the controller, to guide said wire and to press it down continuously in a chosen pattern onto the adhesive coated plastic sheet,

moving the platen relative to X and Y axes in accordance with a pre-determined program to locate the conductive wire on the first plastic sheet in accordance with the desired pattern,

placing a second flexible plastic sheet over the adhesive surface to cover the wire and the first flexible plastic sheet,

feeding the second flexible plastic sheet, the wire and first flexible plastic sheet under a roller, and

pressing the second flexible plastic sheet into position under the roller and against the wire and the first flexible sheet to form a flexible wiring harness.

4,000,559
COMBINED BEARING

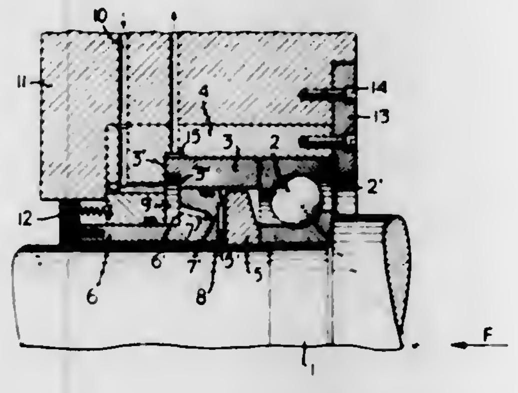
Heinz Korrenn, Obbach, and Horst Voll, Hassfurt, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Germany

Filed Oct. 8, 1975, Ser. No. 620,765

Claims priority, application Germany, Oct. 12, 1974, 2448785

Int. Cl.² F16C *32/00*

U.S. Cl. 308—35 **8 Claims**



1. In a combination bearing including a rolling bearing assembly mounted in a housing and capable of transmitting axial loads to the housing through an axially displaceable outer ring and an hydrostatic thrust bearing mounted in the housing in tandem with the rolling bearing assembly and having an axially displaceable piston forming, with a wall of the housing, an oil pressure chamber capable of receiving a constant quantity of externally produced oil supplied under pressure to the hydrostatic thrust bearing, the improvement comprising hydrostatic control bearing means positioned in the housing in abutment with the outer ring of the rolling bearing assembly and the wall of the housing, said hydrostatic control bearing means being axially displaceable from the wall of the housing in response to oil pressure within the pressure chamber for controlling flow-off of oil from the pressure chamber in such a manner that axial loads are transmitted through the rolling bearing assembly and hydrostatic thrust bearing in constant proportions, despite variations in axial loading.

4,000,560
ELECTRIC SHAVER

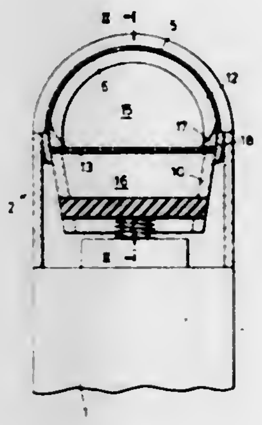
Gert Gutjahr, Neckarhauserstrasse 61, 6800 Mannheim, New Edingen, Germany

Filed Feb. 19, 1976, Ser. No. 659,468

Claims priority, application Germany, Apr. 24, 1975, 2518140

Int. Cl.² B26B *19/38*

U.S. Cl. 30—41.6 **6 Claims**



1. An electric shaver comprising,

a. body member;

b. a head member including a guard of sheet material formed with perforations therethrough;

c. securing means for releasably securing said members to each other in a position in which the secured members jointly define a cavity;

d. a partition in said cavity dividing the cavity into a first compartment adjacent said guard and directly communicating with said perforations and a second compartment remote from said perforations, said partition being formed with a multiplicity of apertures connecting said compartments;

e. blade means mounted in said first compartment on one of said members and engaging said guard; and

f. electrically operated drive means in said body member connected to said blade means and to said partition for moving the blade means and the partition relative to said guard and for thereby shearing hair projecting into said first compartment through said perforations, and for removing the sheared hair from said first compartment to said second compartment.

4,000,561

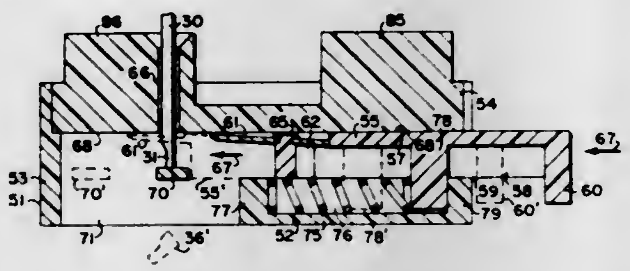
DEVICE FOR SEVERING TUBULAR MEMBERS

Horst K. Wieder, 1207 Riverview Lane, Watertown, Wis. 53094, and Klaus A. Wieder, Rte. No. 1, Helenville, Wis. 53137

Filed July 14, 1975, Ser. No. 595,719

Int. Cl.² B26B *13/22*

U.S. Cl. 30—124 **7 Claims**



1. In a device for transversely severing a polymeric synthetic resinous artificial insemination tube,
  - a first housing member having a bottom and side walls,
  - an elongated slide member having two ends,
  - a second housing member,
  - a spring, and
  - a cutting blade,
  - said slide member:
    - slidably received in a portion of said first housing member, and
    - having at one of its ends a handle portion which extends outside said first housing member, and
    - having said blade attached to it at its other end,
  - said first housing member:
    - having means for attaching it to said second housing member, and
    - having means to slidably receive said slide member, and
    - having an aperture in a sidewall to receive said handle portion of said slide member, and
    - having abutting means to abut a portion of said slide member adjacent to said handle portion to prevent sliding removal of said slide member through said sidewall, and
    - having means to receive said spring,
  - said spring disposed in said first housing member to bias said slide member against said abutting means,
  - said second housing member:
    - having means to attach it to said first housing member, and
    - abuttable to a surface of said slide member to retain said slide member in said portion of said first housing member in which it is slidably received, and
    - having an aperture to guide a tube to be severed into the path of said blade,
  - wherein said first and second housing members are attached by resiliently deformable interlocking portions of said attaching means which are provided as part of one of said housing members being interlocked with corresponding interlocking portions provided as attaching means as part of the other of said housing members.

4,000,562

VACUUM HAIRCUTTING APPARATUS AND METHOD

Constantino J. Alevras, 542 Gruman Court, Riverdale, N.J. 07675

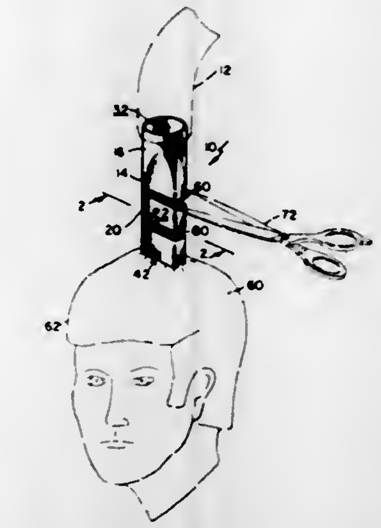
Filed May 29, 1975, Ser. No. 581,843

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B26B *19/20, 19/44*

U.S. Cl. 30—133 **6 Claims**

1. Vacuum haircutting apparatus comprising an elongated hollow tapered body having an open upper end and an open bottom end and forming an elongated chamber, said tapered body being provided with additional opening means at graduated intervals along its length communicating with said chamber, so that the application of a source of vacuum suction to said open upper end while said open bottom end is applied to a subject's hair results in said hair being drawn up through said chamber whereby said hair will be cuttable through said additional opening means.



4,000,563

APPARATUS FOR DRYING OR COOLING PARTICULATE MATERIAL WITH A GAS

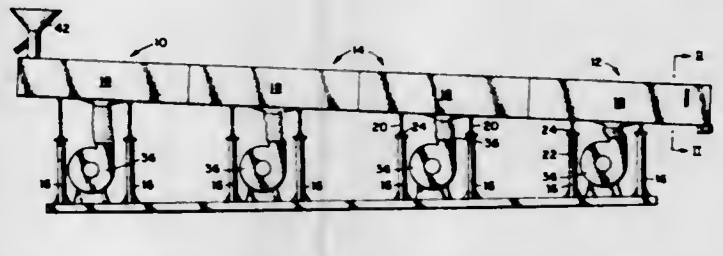
John A. Cubitt, Mossley via Ashton-under-Lyne, and Henry Ellwood, Rochdale, both of England, assignors to USM Corporation, Boston, Mass.

Filed Feb. 13, 1975, Ser. No. 549,834

Claims priority, application United Kingdom, Feb. 16, 1974, 7167/74

Int. Cl.² F26B *3/08*

U.S. Cl. 34—10 **1 Claim**



1. Apparatus for treating particulate material with a gas comprising:
  - a. a body unit having upper and lower interior sections;
  - b. a chamber for receiving particulate material formed in the upper interior section of the body unit;
  - c. a trough constructed in the receiving chamber and having an elongated opening extending along its bottom; said trough being formed by two pairs of opposing imperforate side walls, an upper pair sloping downward at a first angle and a lower pair sloping downward at a second angle, said first angle being greater when compared to a horizontal than said second angle, the juncture of upper and lower walls having a slot constructed therein for the direction of incoming gas towards the bottom of the receiving chamber;
  - d. a pressure chamber formed in the lower interior section of the body member, said chamber communicating directly with the slot in the trough;
  - e. a barrier constructed of perforate material located between the pressure chamber and the receiving chamber to prevent the particulate material from entering the pressure chamber but to allow the flow of gas therethrough;
  - f. a source of pressurized gas connected to the pressure chamber to supply gas to said chamber, said gas being under sufficient pressure to cause a flow of gas through the slot into the receiving chamber and cause circulation of the particulate material in the receiving chamber; and
  - g. means for supporting the body unit to allow the trough to be inclined, thereby providing a generally downward path for the particulate material.

4,000,564

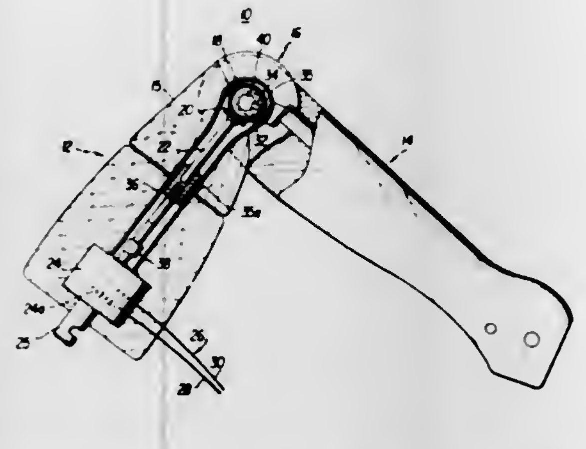
PROGRAMMABLE ANTHROPOMORPHIC ARTICULATION

Mark P. Haffner, New Carrollton, Md., and Robert S. Pizer, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Jan. 7, 1976, Ser. No. 647,317

Int. Cl.² G09B *23/32*

U.S. Cl. 35—17 **7 Claims**



1. A joint, two limb portions joined by said joint, and a magnetic particle brake having a braking torque responsive to current, positioned on one of said portions, a mechanically coupled to said joint, whereby the resistance of the limb portions about said joint is responsive to the brake current.

4,000,565

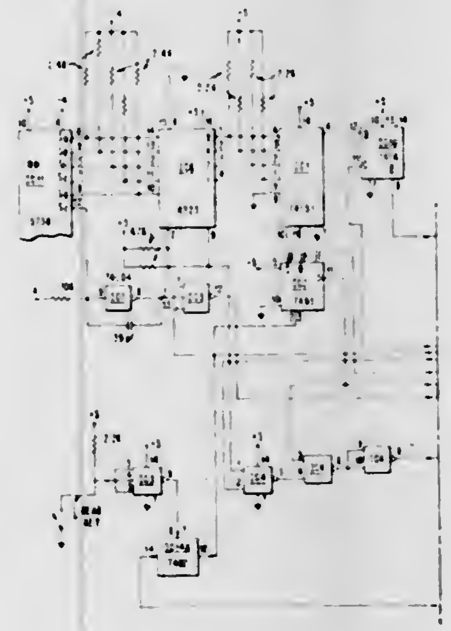
DIGITAL AUDIO OUTPUT DEVICE

Albert W. Overby, and Donald P. Parks, both of Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1975, Ser. No. 574,828

Int. Cl.² G06K *9/00;* **H04M** *1/00;* **G06F** *7/38*

U.S. Cl. 35—35 A **5 Claims**



1. Apparatus for converting silently displayed visual data characters into serially sequenced, tone coded audible data signals, at a rate of presentation between and duration of said serially sequenced tones to be auditorially intelligible to humans, comprising,
  - a source of first electrical drive signals of the type for operating a visual data display means;
  - converting means connected to said source of first electrical drive signals for converting said first electrical drive signals into serially sequenced and tone coded second electrical drive signals;
  - tone signal rate control means and tone signal duration control means connected to said converting means for controlling the rate and duration of said second electrical drive signals to produce a rate of presentation and duration of said signals to be auditorially intelligible to humans; and
  - transducer means connected to said converting means to receive said serially sequenced and tone coded second electrical drive signals for audibly and serially producing tones corresponding in frequency, rate and duration to said sequenced and tone coded second electrical drive signals.

4,000,566

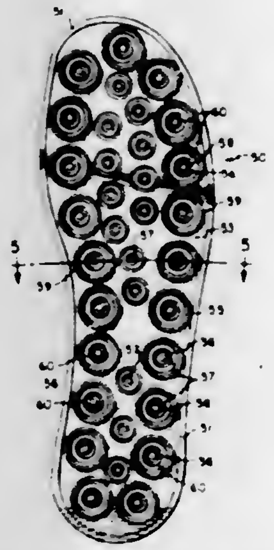
SHOCK ABSORBING ATHLETIC SHOE WITH AIR COOLED INSOLE

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Apr. 22, 1975, Ser. No. 570,438

Int. Cl.² A43B *13/18, 7/06, 13/04*

U.S. Cl. 36—28 **4 Claims**



1. A homogeneous unit sole construction comprising
  - a. a one-piece molded sole of resilient elastomeric material having a bottom tread surface and an upper foot supporting surface;
  - b. the lowermost portion of said sole is specifically contoured to define a continuous peripheral rim and a plurality of primary shock absorbing cylindrical means disposed inwardly thereof and spaced thereform and from one another by first recessed annular portions;
  - c. the bottom surfaces of said shock absorbing cylindrical means being disposed in a common plane with the bottom surfaces of said peripheral rim means,
  - d. each of said cylindrical shock absorbing means containing a secondary mini-cylindrical shock absorbing means concentric therewith;
  - e. said mini-shock absorbing means being defined by second annular recess portions defined in the lowermost portions of said aforementioned primary cylindrical shock absorbing means, said first annular recess portions being deeper than said second annular recess portions with respect to the bottommost surfaces of said unit sole;
  - f. annular tread means disposed concentrically with a predetermined number of said aforementioned primary shock absorbing means and said secondary mini-shock absorb-

ing means; the bottom surfaces of said primary shock absorbing means, said secondary shock absorbing means, and said tread means being disposed in a common plane with said bottom surfaces of said peripheral rim means;

g. said primary and secondary shock absorbing means being of sufficient depth so as to be compressible and laterally flexible in a manner whereby shock absorption is accommodated in three dimensions, along the X, Y and Z-axes of each of said shock absorbing means;

h. said sole being of non-uniform thickness along its length from heel portion to shank portion to toe portion, said heel portion having a thickness substantially greater than said toe portion and said shank portion being thicker than said heel portion; and

i. said toe portion being substantially elevated with respect to said shank portion.

4,000,567

SKI BOOT

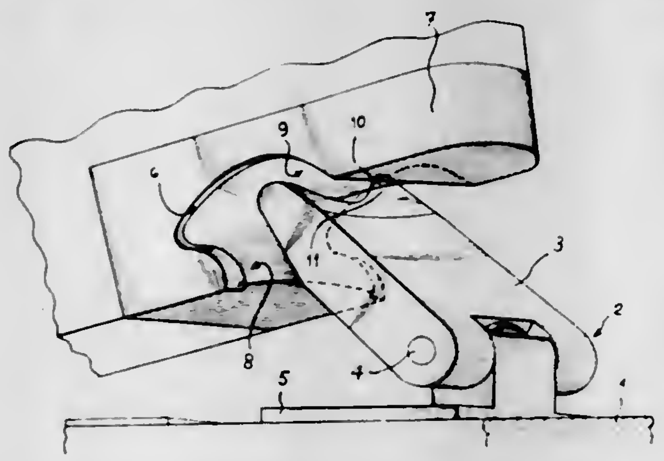
Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 555,866, March 6, 1975, Pat. No. 3,942,811. This application Dec. 29, 1975, Ser. No. 644,452

Claims priority, application France, Mar. 6, 1974, 74.07643

Int. Cl.^{2} A43B *5/04;* **A63C** *9/00*

U.S. Cl. 36—117 **9 Claims**



1. A ski boot providing automatic recentering of the boot on the longitudinal axis of a ski binding comprising a mobile catch; said ski boot including, at one end thereof, underneath and in the sole, a ramp adapted to cooperate with said mobile catch, said ski boot comprising, above said ramp, a downwardly-oriented sliding surface adapted to engage at least partly, during the boot fitting operation, a corresponding shape arranged in said mobile catch.

4,000,568

BUCKET DREDGER

Jacobus M. Donkers, Zaandam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

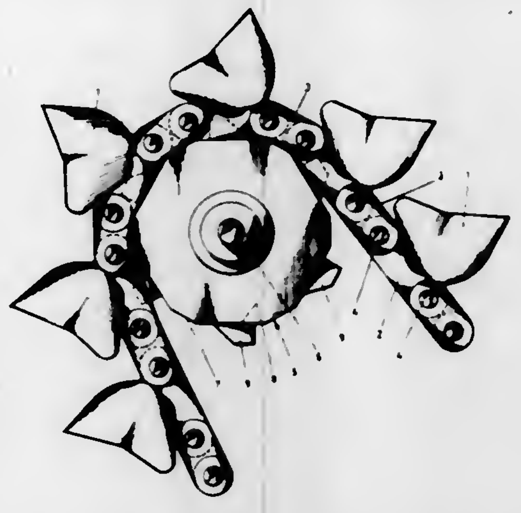
Filed July 14, 1975, Ser. No. 595,432

Claims priority, application Netherlands, July 18, 1974, 7409757

Int. Cl.^{2} E02F *3/14*

U.S. Cl. 37—69 **3 Claims**

1. A bucket dredger having a bucket chain guided over a rocker, said bucket chain comprising a plurality of buckets pivotally interconnected by pins to form an endless chain, the rocker having the shape of a polygon with sides having a length corresponding to the length of the frame members of the buckets, the buckets being interconnected by links arranged between each two buckets, said links being pivotally connected to the buckets by means of said pins and having a length which is substantially shorter than the length of the frame member of the buckets, the polygonal sides of the rocker having alternately a length corresponding to the length of the frame members of the buckets and to the length of the links situated between the buckets, each link comprising an elongated opening with rounded ends in which a pressure member is accommodated pressing the end portions of two pivot pins projecting through said opening against opposite ends of said opening.



4,000,569

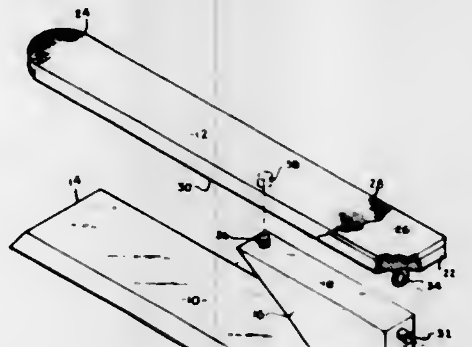
IRONING TABLE

Monte A. Carson, 18144 Cherry, Hisperia, Calif. 92345

Filed May 27, 1975, Ser. No. 581,286

Int. Cl.^{2} D06F *81/00*

U.S. Cl. 38—135 **5 Claims**



1. An iron table assembly comprising:

a. a platform;

b. an upright standard mounted to one end thereon with a substantially flat, planar upper surface and an outboard edge surface;

c. at least one elongated member having a substantially flat, planar undersurface for opposed resting on the upper surface of said standard and an upper iron-working surface;

d. first clamping means to interlock said member to said standard comprising dowel means carried on the upper end of said outboard edge surface of said standard and cooperative eyelet means carried at one end of said elongated member on the undersurface thereof to be slipped over the free end of said dowel means and thereby engage said dowel means when said elongated member is placed with its undersurface resting on the upper surface of said standard; and

e. second clamping means to interlock said member to said standard comprising key means carried at the inboard end and on said upper surface of said standard and cooperative keyway means carried at an intermediate position on the undersurface of said elongated member to engage said key means when said elongated member is placed with its undersurface resting on the upper surface of said standard.

4,000,570

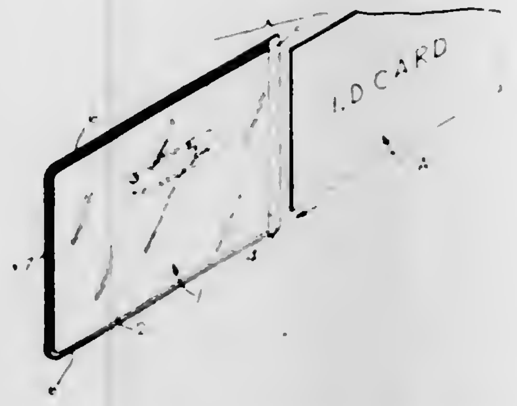
IDENTIFICATION CARD HOLDER

Norman Carmen, 4101 Powder Mill Road, Beltsville, Md. 20705

Filed Sept. 9, 1975, Ser. No. 611,714

Int. Cl.^{2} A44C *3/00*

U.S. Cl. 40—1.5 **4 Claims**



1. An identification card holder comprising an envelope having a transparent front, a back partially attached to said front along corresponding edges thereof with an opening between said front and back for receiving a card therethrough, said back having a pair of openings in an internal portion and a flap portion extending from said openings to an edge of said back, said flap having an outer edge affixed to an edge of said front, and a safety pin having one leg thereof extending through said back openings.

4,000,571

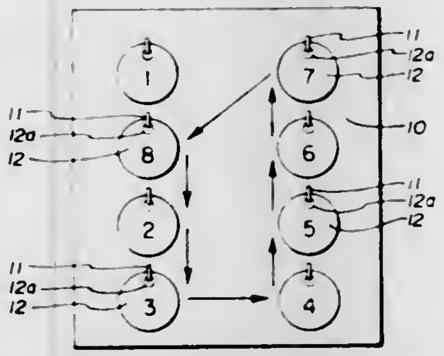
SCHEDULING BOARD AND METHOD OF USE THEREOF

Jack M. Harrison, 49 W. Malvern Ave., Salt Lake City, Utah 84115

Filed Mar. 10, 1975, Ser. No. 556,789

Int. Cl.^{2} G09F *3/18*

U.S. Cl. 40—19.5 **4 Claims**



1. Apparatus for scheduling competitive events comprising a backing member;

participant identification means arranged in paired first and second rows on the backing member and

means allowing rotating of the participant identification means such that the relative position of one fixed participant identification means at one end of the first row does not change while the participant identification means at the other end of the first row moves to the corresponding other end of the second row, the participant identification means at the one end of the second row is moved to the first row next to the fixed participant identification means, each other participant identification means in the first row is moved to the position of the next adjacent participant identification means in the direction of the other end of the row and each other participant identification means in the second row is moved to the position of the next adjacent participant means in the direction of the one end of the other row.

4,000,572

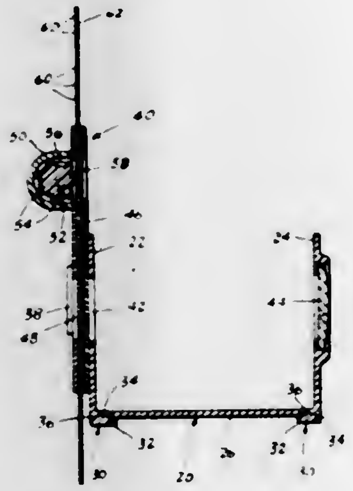
MAILING VIEWER FOR SLIDES AND THE LIKE

Paul G. Kiehl, St. Louis, Mo., assignor to Visual Data Corporation, Chesterfield, Mo.

Continuation of Ser. No. 404,019, Oct. 5, 1973, abandoned, which is a division of Ser. No. 307,107, Nov. 16, 1967, Pat. No. 3,800,452, which is a continuation of Ser. No. 57,179, July 22, 1970, abandoned. This application Apr. 15, 1976, Ser. No. 677,017

Int. Cl.^{2} G02G *27/22,* **G09F** *11/30*

U.S. Cl. 40—63 A **11 Claims**



8. A collapsible flat mailing viewer and advance mechanism for viewing film strips comprising in combination a central panel, a lens panel, a film receiving panel, hinge means for joining the lens and film panels along opposite ends of said central panel with said central panel directly therebetween and for folding said lens and film panels about the hinge means relative to said central panel to an opposed generally parallel relation, and means for releasably maintaining said lens and film panels in opposed parallel relation for viewing of a film strip, an advance mechanism, means for removably mounting said advance mechanism to said film receiving panel, and slot means for receiving and holding a film strip at said film receiving panel with said film strip generally straight and parallel to said film receiving panel as it moves thereover for sliding movement of the film strip within the slot means for successively viewing picture frames, said slot means being unobstructed at opposite ends to permit movement of the film strip past opposite ends of the film receiving panel said slot means is oriented for movement of the film strip past top and bottom ends of the film receiving panel, said advance mechanism including means for moving the film strip within the slot means for successively viewing picture frames and a rotatable sprocket adapted to engage with feed apertures of the film strip, said sprocket being mounted with the axis normal to the direction of movement of the film strip.

4,000,573

MARQUEE LETTERS

Sy Cohen, Los Angeles, Calif., assignor to Visual Components, Inc., Canoga Park, Calif.

Filed Oct. 30, 1975, Ser. No. 627,441

Int. Cl.^{2} G09F *7/02*

U.S. Cl. 40—142 R **6 Claims**

1. A letter for use on a lighted marquee, comprising:

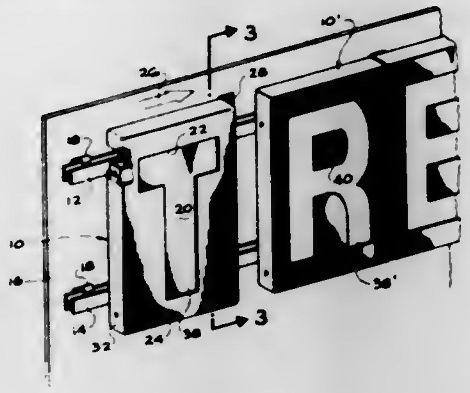
an opaque tray-like member having a front panel, first and second side walls and top and bottom walls integral therewith, each of said walls extending at least a predetermined distance rearwardly from said front panel whereby to project said front panel from said marquee, said front panel being formed with an indicia opening therethrough, said top bottom, first and second side walls defining a substantially continuous rim for said front panel whereby the escape of light from said marquee in the direction of a viewer is substantially precluded;

Flexible translucent color panel interchangeably secured subadjacently of said front panel for providing color for said indicia opening whereby one can selectively highlight said indicia;

a lip integrally coextensive with said first side wall and extending laterally outwardly and parallel to said front panel for a substantial distance therefrom so as to overlap with the second side of a letter of like construction placed immediately adjacent thereto;

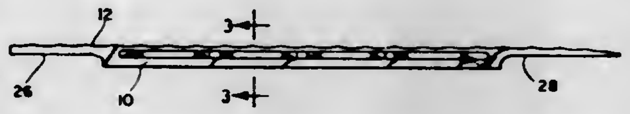
brackets connected to said letter, at least one adjacent each of said first and second side walls, each having a portion formed with means to engage said marquee, each said portion projecting rearwardly of said front panel a distance greater than said predetermined distance of said side walls, the bracket adjacent said second side wall being spaced therefrom, towards said first side wall, a distance sufficient to permit substantial overlap with the lip of a letter of like construction placed adjacent thereto, and

framing means including flange means on at least one major portion of a pair of opposed walls whereby said panel may be slid between said flange means and said front pane.



4,000,574
RIB FOR HANDGUN

Richard F. Grant, South Windsor, Conn., assignor to The Poly-Choke Company, Incorporated, East Hartford, Conn.
Filed Aug. 8, 1975, Ser. No. 603,006
Int. Cl.² F41G *1/46*
U.S. Cl. 42—1 S **3 Claims**



1. A gun sight rib for mounting on a barrel of a handgun, the handgun barrel having a sight extending upwardly therefrom adjacent the muzzle end thereof, said rib including:

an elongated rib body, said rib body having a central portion and oppositely disposed end portions, said end portions being of reduced thickness when compared to said central portion, the upper surfaces of said end and central portions cooperating to form said rib body upper surface, said rib body central portion having a curved lower surface contour to conform with the shape of the upper surface of the barrel of a handgun, said reduced thickness end portions respectively defining muzzle and chamber ends of said rib body;

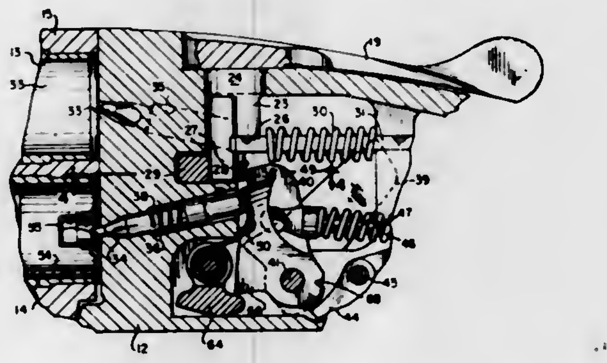
a central serrated portion on said rib body upper surface, said central serrated portion extending from said chamber end to said muzzle end of said rib body to provide a sight plane;

smooth edge portions on each side of said central serrated portion on said upper surface; and

a notch extending through said rib body end portion at the muzzle end thereof, said notch communicating with the muzzle end of said rib body and having a depth and width sufficient to accept the front sight of a handgun whereby the front sight will be surrounded by said rib on three sides.

4,000,575
MEANS FOR RETRACTION OF LOWER FIRING PIN OF OVER-AND-UNDER FIREARM

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, both of Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.
Filed May 8, 1975, Ser. No. 575,804
Int. Cl.² F41C *11/10*
U.S. Cl. 42—44 **4 Claims**

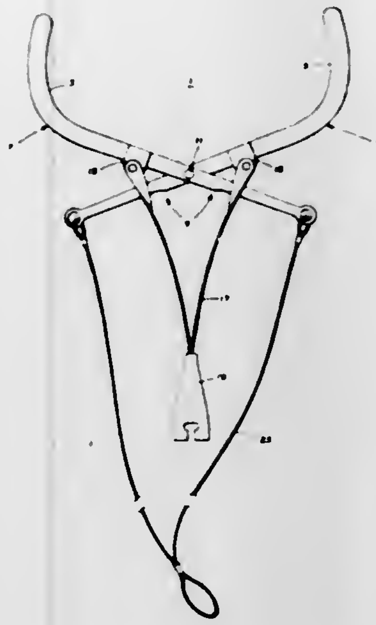


1. In an over-and-under break-open fire-arm having a frame; upper and lower barrels secured together and pivotally mounted on the frame for rotation from their closed ready-to-fire position to their open loading-and-unloading position; upper and lower firing pins mounted for longitudinal movement on the frame, the forward ends of said upper and lower firing pins extending, respectively, into the rearward ends of the upper and lower barrels at the longitudinal axes thereof when said firing pins are at their forwardmost positions, said firing pins being withdrawn from the rearward ends of said upper and lower barrels when said firing pins are at their rearwardmost positions; upper and lower firing pin springs urging said firing pins toward their rearwardmost positions; upper and lower hammers pivotally mounted on the frame, said hammers contacting and pressing the upper and lower firing pins to their forwardmost positions when said hammers are at their forward positions; upper and lower hammer springs urging said hammers toward their forward positions; and a top lever pivotally mounted on the frame for rotation about its vertical axis from a barrel locking position to a barrel unlocking position, said barrels being retained at their closed position when the top lever is at its barrel locking position and being rotatable to their open position when the top lever is at its barrel unlocking position; the improvement in means for retracting the lower firing pin from contact with a cartridge contained in the lower barrel which comprises:

a hammer and firing pin retracting cam disposed on the top lever at the lower end thereof, said retracting cam being radially offset with respect to the vertical axis of the top lever and being positioned to permit the lower hammer to contact and press the lower firing pin forwardly when the top lever is at its barrel locking position and being positioned to contact the lower hammer and to move it rearwardly when the top lever is rotated from its barrel locking position to its barrel unlocking position, thereby permitting the lower firing pin spring to move the lower firing pin rearwardly and thus withdraw it from the rearward end of the lower barrel.

4,000,576
CLAMPING APPARATUS

Claude Elmer Jones, 1406 W. 9th St., Freeport, Tex. 77541
Filed Oct. 2, 1975, Ser. No. 618,862
Int. Cl.² A01K *97/14*
U.S. Cl. 43—5 **5 Claims**



1. A clamping apparatus comprising:

a clamping device operable between opened and closed positions, said clamping device including first and second clamping members, each of said clamping members having a clamping section with a blunt clamping surface and an extended section, said clamping members being pivotally connected together at a common point between said clamping and extended sections thereof, said clamping sections being arranged to cross over one another when said clamping device is in the closed position;

a biasing device connected to each clamping member at a point between said common point and each clamping section, said biasing device being operable to exert a force on said clamping device tending to hold said clamping device in said closed position;

handle means having first and second ends, said first end of said handle means being connected to said biasing device, said second end of said handle means being remote from said clamping device, said clamping device and said biasing device together further including holding means operable to hold said clamping device in said opened position; and

actuating means comprising a resilient line connected to the end of each extended section of each clamping member, said resilient line being extendible therefrom to said remote end of said handle means, said actuating means being selectively operable from an actuating point remote from said second end of said handle means, for releasing said holding means whereupon said clamping device is allowed to return to said closed position.

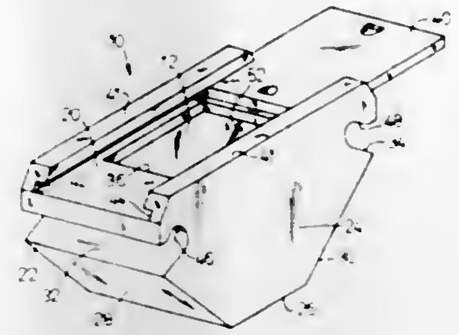
4,000,577
FISH BAIT BOX

O. W. Kelley, Mequon, Wis., assignor to Oxbow Products, Inc., Mequon, Wis.
Filed Dec. 29, 1975, Ser. No. 644,713
Int. Cl.² A01K *97/04*
U.S. Cl. 43—55 **13 Claims**

1. In a fish bait box having an upper wall and having a chamber therein live bait and a shiftable medium for said live bait;

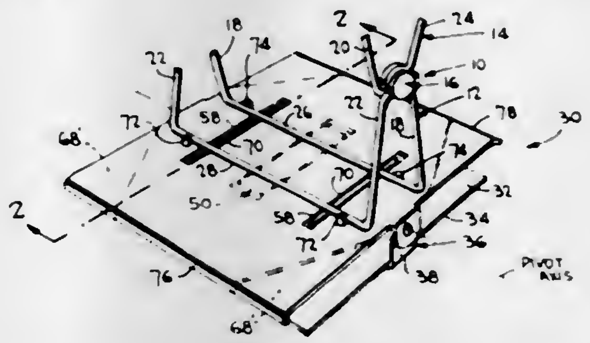
an opening in said upper wall of said box affording access to said chamber and from which bait is withdrawn; and

means on the exterior of said box to enable said box to rest in and be tilted between an upright position and at least one other tilted position, whrerby during tilting the medium is shifted from one end of said compartment toward the other, said means on the exterior of said box comprising a first surface on which said box rests when in said upright position, said first surface being opposite said upper wall, and a second surface slanting upwardly at an angle from one end of said first surface and on which said box rests when in said one other tilted position, said angle being such that said upper wall is non-vertical when said box is in upright position and in tilted position.



4,000,578
TRIGGER-ASSEMBLY FOR ROTATING-FRAME TYPE ANIMAL TRAPS

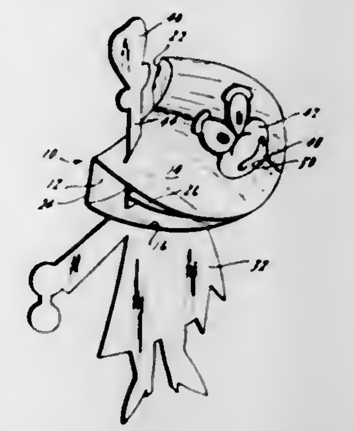
Anthony J. Souza, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Feb. 3, 1976, Ser. No. 654,768
Int. Cl.² A01M *23/26*
U.S. Cl. 43—92 **8 Claims**



1. A treadle assembly for use in combination with a rotating frame type in which pairs of opposed jaw bars are disposed in adjacent relationship when the trap is cocked and in which the jaw bars are forcibly urged toward each other when the trap is uncocked, comprising base means for resting on a support surface and including portions for defining opposite runs from which animals to be trapped may approach the trap; treadle-lever means comprising a generally plate-like element overlying said base means and normally spaced thereabove, fulcrum means between said base and treadle-lever means defining above said base means a pivot axis for said treadle lever means transversely between the portions defining the opposite runs for the animals, said treadle-lever means comprising opposite operating-lever portions for the treadle assembly, said base means having vertically-extending abutment means thereon extending toward said operating-lever portions for dislodging at least one jaw bar of a cocked trap off the treadle-lever means when the trap is actuated, said treadle-lever means including orienting means for opposed jaw bars of the cocked rotating-frame type trap for retaining the trap jaws in a cocked condition until the vertically-extending abutment means dislodges the one jaw bar off the orienting means when the trap is actuated.

4,000,579
ANIMATED CLACKER

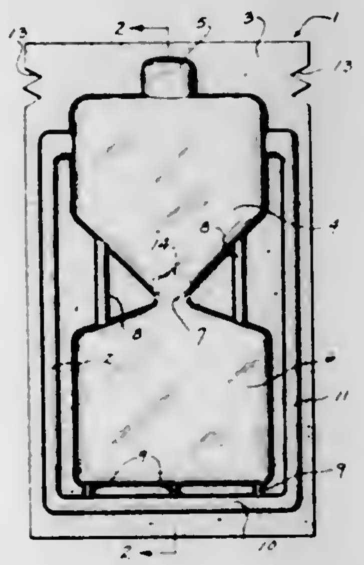
Victor Joseph Gornall, 11423 Nashville, Detroit, Mich. 48205
Filed June 13, 1975, Ser. No. 586,531
Int. Cl.² A63H *5/00*
U.S. Cl. 46—154 **3 Claims**



1. A device comprising
an elongate one-piece clacker element of essentially stiff but flexible sheet material having a middle member and end flap members joined to said middle member along spaced score lines which diverge substantially uniformly from the opposite ends of said middle member,
said middle member having relatively long, free, gripping edges at the ends thereof of sufficient length to receive and comfortably accommodate the thumb and finger of one hand,
whereby alternate endwise compression and release of said middle member causes the latter alternately to arch and straighten and said flap members to swing toward and from each other about said score lines and the edge portions of said flap members to strike each other with force,
said clacker element having in combination therewith animation parts attached to said members so that movement of the latter in use causes said parts to move relative to said members in simulated animation,
at least one of said animation parts being attached to said middle member and supported by at least one of said flap members, whereby flexure of said middle member in use causes said one part to move in and out between said flap members.

4,000,580
SEED GERMINATOR

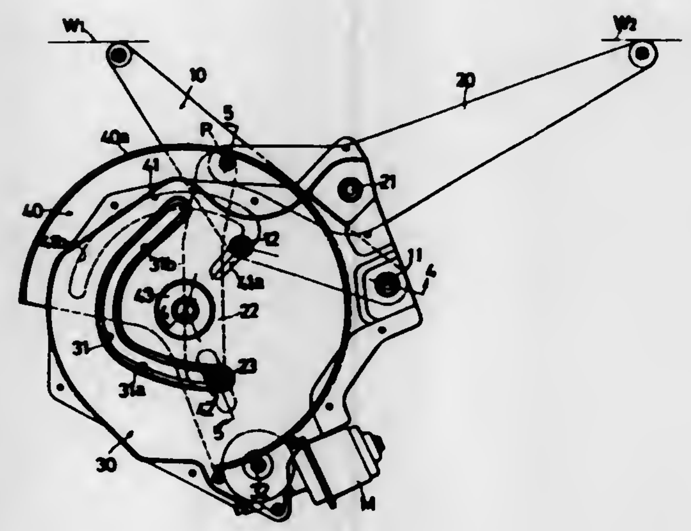
Roy A. Biehl, 2934 N. Murray St., Milwaukee, Wis. 53211
Filed Oct. 24, 1975, Ser. No. 625,493
Int. Cl.² A01C *1/02;* **A01G** *9/02;* **B65D** *25/54, 73/00*
U.S. Cl. 47—14 **8 Claims**



1. A seed germinator for observing the germination of a seed and performing botanical experiments comprises a unitary closed body formed by sealing a flat back sheet and a thermo-formed front sheet about their top, bottom and side edges, said body having a germination chamber, a nutrient chamber positioned below the germination chamber and connected thereto by a narrow throat, a closed water reservoir located adjacent said nutrient chamber, at least one channel connecting the nutrient chamber to the water reservoir, and at least one recycling channel connecting the water reservoir to the germination chamber so that excess water can be returned to the germination chamber.

4,000,581
VEHICLE WINDOW REGULATOR MECHANISM

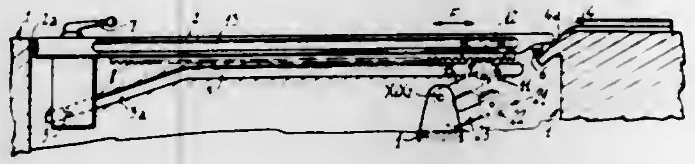
Ryoichi Fukumoto, Nagoya, and Masatoshi Fujita, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed July 21, 1975, Ser. No. 597,736
Claims priority, application Japan, July 23, 1974, 49-84391; July 24, 1974, 49-84916; July 30, 1974, 49-87226
Int. Cl.² E05F *5/12*
U.S. Cl. 49—103 **5 Claims**



1. A vehicle window regulator mechanism comprising:
a base plate secured to a vehicle door;
a sector gear pivotally mounted upon said base plate;
a drive pinion gear for rotating said sector gear about the pivot axis thereof;
a first regulator arm pivotally mounted upon said base plate and supporting a first window glass section;
a second regulator arm pivotally mounted upon said base plate and supporting a second window glass section;
a plurality of cam slots provided in said base plate and said sector gear comprising a first cam slot provided in said sector gear and having a straight inclined section radially directed toward the pivot axis of said sector gear and an arcuate section continuous with said straight inclined section and being concentric to the pivot axis of said sector gear, a second cam slot provided in said sector gear and a third cam slot provided in said base plate;
first and second cam followers, a link member having one end pivotally mounted on one end of said second regulator arm;
said first cam follower secured to said first regulator arm intermediate the ends of the first regulator arm and movably disposed in said first cam slot;
said second cam follower secured to the other end of said link member and movably disposed in said second and third cam sots, said second cam slot having an arcuate section concentric with the pivot axis of said sector gear and said third cam slot having a curved section circumferentially provided in said base plate and extending toward the pivot axis of said link member whereby upon rotation of said sector gear said first cam follower rotates said first regulator arm by travelling in said first cam slot to raise or lower said first window glass supported on said first regulator arm while said second cam follower will traverse the entire length of said second cam slot during the initial rotation of said sector gear in opposite directions so that upon rotation in the window lowering direction said second cam follower will not be moved along the third cam slot to lower said second window glass section until said first window glass section is lowered by movement of said first cam follower along the straight section of said first cam slot and upon rotation in the window raising direction said second cam follower will not be moved along said third cam slot to raise said second window glass section until said second cam follower traverses the entire length of said second cam slot so that after partial movement of said second cam follower along said third cam slot said first cam follower will enter said straight section of said first cam slot to thereafter raise both window glasses simultaneously.

4,000,582
OBLIQUE-DISPLACEMENT SLIDING DOOR

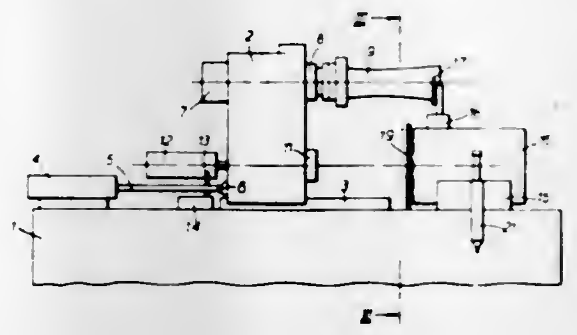
Bernard Monot, Aubervilliers, France, assignor to Faiveley S.A., Saint-Ouen, France
Filed July 7, 1975, Ser. No. 593,457
Claims priority, application France, July 18, 1974, 74.24987
Int. Cl.² E05D *15/10*
U.S. Cl. 49—218 **6 Claims**



1. An oblique-displacement sliding door comprising a stationary frame and at least one sliding leaf associated with guiding means connected to the door-frame for engaging the leaf transversely within said frame in the position of closure and for disengaging said leaf from said frame in the opposite direction at the commencement of the opening movement, operating means being provided for producing action on the leaf in the direction of sliding motion, the door being additionally equipped with a leaf-stabilizing system in which provision is made on the leaf for two separate toothed racks which are parallel to the direction of sliding motion and each associated with a pinion supported by a carriage retained by a guide which is parallel to said toothed rack, the two pinions aforementioned being coupled by means of a coordinating shaft which is transverse to said guides, two pivotally mounted stabilizing crank-arms each having one end connected to a carriage and the other end connected to the door-frame, the axes on which the two crank-arms are pivoted to the frame being in substantially coincident and parallel relation to the coordinating shaft, the operating means being such as to comprising a reversible motor and a mechanism for driving the pinions of the leaf-stabilizing system in rotation, wherein the motor aforementioned and the drive mechanism are rigidly fixed to at least one of the two crank-arms which are pivotally mounted on said door-frame, said motor and drive mechanism being located on the same side as the stabilizing pinions with respect to the axis on which the crank-arms are privoted to the door-frame, thereby to apply opposite orientation torques on the crank-arms with the opposite directions of action of the motor, for the transverse engagement of the door-leaf and for maintaining the door-leaf in the door-frame in one direction of action of the motor, and for the disengagement of the door-leaf from the door frame in the other direction of action of the motor.

4,000,583
BELT-TYPE ABRADER WITH MEANS TO COMPENSATE FOR TOOL WEAR

Arthur Royden Stevens, Torquay, England, assignor to Centrax Limited, England
Filed Jan. 9, 1975, Ser. No. 539,846
Claims priority, application United Kingdom, Jan. 15, 1974, 1830/74
Int. Cl.² B24B *21/18, 49/00*
U.S. Cl. 51—135 R **14 Claims**



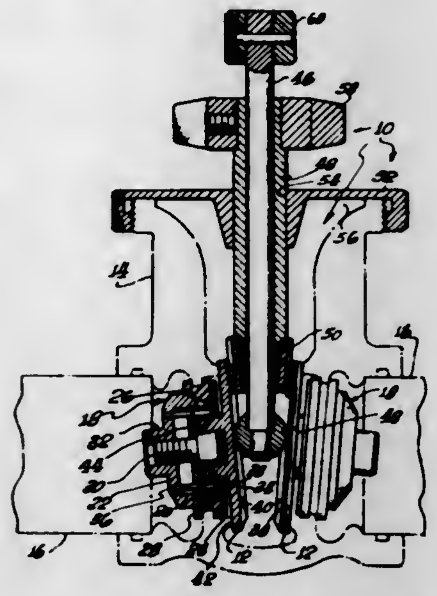
1. In a copying machine tool comprising a base, a first mounting supported by said base for carrying a workpiece and a master cam, a second mounting supported by said base, a cam follower mounted on said second mounting, a plurality of pulleys, a flexible abrasive belt supported by said pulleys, one of said pulleys being mounted on said second mounting in a position to press said belt against said workpiece to remove material from the surface thereof, a motor for driving another of said pulleys, at least one of said first and second mountings being movable relative to said base, and means for moving said movable mounting or mountings to move said one of said pulleys towards said surface of said workpiece, said movement being limited by engagement of said cam follower with said master cam, whereby the position of said abrasive belt relative to said workpiece is determined by the configuration of said master cam, so that said workpiece is brought to a predetermined configuration, the improvement comprising,
compensating means having a body portion and an output member, said output member being arranged for progressive compensating movement at a predetermined rate relative to said body portion, and
transmission means for transmitting said compensating movement to one of said workpiece and said one of said pulleys to produce a relative movement of said abrasive belt toward said surface of said workpiece, whereby wear of said abrasive belt is at least partially offset.

4,000,584
IN-SITU LAPPING APPARATUS FOR GATE VALVES

Tadao Uyetake, Honolulu; Teikichi Higa, Pearl City; Stephen Orillo, Jr., Wahiawa, and Gregory Nakano, Pearl City, all of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 1, 1976, Ser. No. 672,579
Int. Cl.² B24B *19/00*
U.S. Cl. 51—241 VS **10 Claims**

1. A lapping apparatus for in-situ grinding of valve body seats of a gate valve comprising:
plug means expandable within the inlet and outlet openings of the gate valve for retention therein;
means rotatably mounted on the plug means with freedom of reciprocable movement along the axes of rotation for grinding the valve body seats;
means extendable into the valve body for engaging the

grinding means and biasing the grinding means along the axes of rotation against the valve body seats, and



means extendable into the valve body for engaging and driving the grinding means about said axes of rotation.

4,000,585

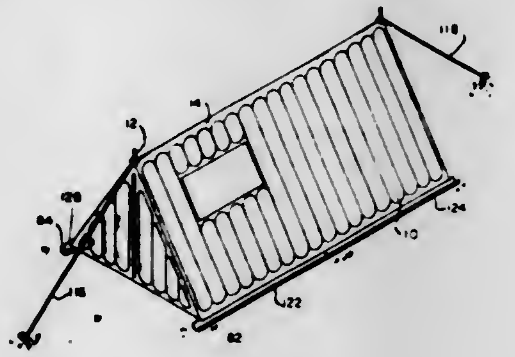
INFLATABLE COLLAPSIBLE TENT

Salvatore Denaro, 133 Westmont Ave., Toronto, Ontario, Canada

Division of Ser. No. 565,399, April 7, 1975, Pat. No. 3,957,069. This application Mar. 4, 1976, Ser. No. 664,009

Int. Cl.² E04B *1/345*; A45F *1/16*

U.S. Cl. 52—2 **10 Claims**



1. A collapsible tent comprising:

a tent frame comprising cooperating tubular support pieces adapted to form a triangular tent-style configuration;

a one-piece inflatable tent covering comprising a pair of side wall panels, a floor panel, four end panels, each of said panels comprising two sheets of pliable material joined together in parallel seal lines thus delineating parallel inflatable tubular cells, said tent covering adapted to cover said tent frame and be secured thereto;

expandible plugs adapted to secure the frame to the ground at each of the corners and at the mid-point of the width support pieces and the length support pieces, said plugs at each of the corners comprising:

a lower plug means consisting of two symmetrical semi-circular portions, the inside surfaces of which are screw-threaded, and the outer diameter of said lower plug means being reduced towards the lowermost part and terminating in a point, the inner diameter of said lower plug means tapering inwardly to the point where the outer diameter diminishes, said lower plug means having a fixed ring circumferentially affixed to the upper portion of said plug means and an expandible ring circumferentially affixed to the upper portion of said plug means and an expandible ring circumferentially affixed to the lower portion of said plug means;

a screw means consisting of a uniform cylindrical screw complementary to said screw-threading of said lower plug means;

a handle means adapted to screw said screw means into said lower plug means whereby the lower portion of said lower plug means expands when said screw means is inserted into said lower plug means;

means adapted to secure the frame of the tent to said expandible plug comprising a base plate with a hole therethrough through which the screw means is inserted into said lower plug means, and three short hollow tubes affixed to said base plate adapted to receive respective portions of the tent frame.

4,000,586

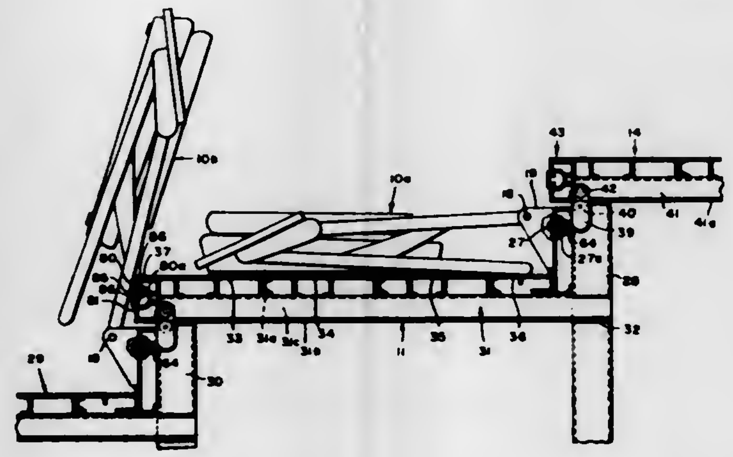
SYSTEM FOR MOUNTING ARTICLES TO TELESCOPIC STRUCTURES

Richard A. Vance, and Robert S. Walworth, both of Champaign, Ill., assignors to American Seating Company, Grand Rapids, Mich.

Filed Apr. 11, 1973, Ser. No. 349,959

Int. Cl.² E04H *3/12*

U.S. Cl. 52—9 **13 Claims**



1. In a telescoping seating system including a plurality of telescoping platform sections, the improvement comprising: an elongated metal extrusion forming a lateral beam of said platform sections, said beam including a vertical web defining an elongated horizontal slot; a channel housing providing upper and lower horizontal members extending rearwardly of said vertical web adjacent said horizontal slot, said channel housing being located in the upper third of the vertical center web of said beam, and a vertical back portion in interconnecting the distal ends of said upper and lower horizontal members of said housing; upper and lower horizontal web portions extending rearwardly from said vertical back portion of said housing, said housing shape providing greater beam strength to resist horizontal and vertical deflection; a plurality of folding chairs; and means for pivotally mounting the lower leg portions of said chairs to said beam in said slot, whereby said chairs may be adjusted laterally within said slot.

4,000,587

GUTTER STRUCTURE

William H. Weber, 8182 Clifton Court, Mentor, Ohio 44060

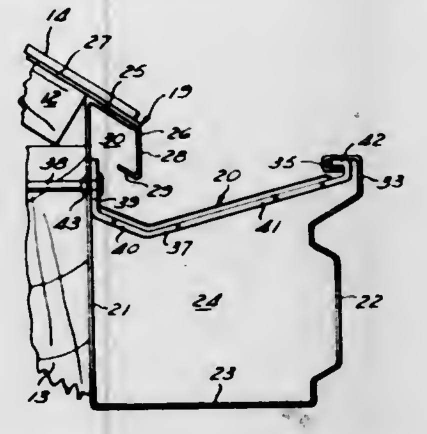
Filed Feb. 5, 1975, Ser. No. 547,121

Int. Cl.² E04D *13/06*

U.S. Cl. 52—16 **11 Claims**

1. A gutter assembly comprising a gutter member and a roof plate, and a building structure having a roof board and a facia board; said roof board being a part of a roof of said building and having a predetermined angular slope relative to said facia board; said gutter member including a generally vertically extending back wall and a generally vertically extending front wall and a generally horizontally extending bottom wall, said back wall and front wall and bottom wall defining an open cavity adapted to receive run off water from said roof, said back wall being secured to said facia board and said back wall having at its upper end a pitching flange extending a predetermined distance in a direction toward said front wall; said roof

plate including a generally flat one-piece roof wall secured to said roof board and extending laterally in a straight line parallel to said slope of said roof board over said roof board and beyond said facia board and beyond said back wall of said gutter member and beyond said gutter member pitching flange, said roof wall terminating at an edge over said bottom wall, a connecting wall extending generally vertically downwardly from said termination edge of said roof wall a predetermined distance in a direction toward said gutter member bottom wall, said connecting wall terminating at an edge over



said gutter member bottom wall, and a cavity flange extending a predetermined distance from said termination edge of said connecting wall in a direction toward said back wall, said roof wall and connecting wall and cavity flange defining an open pitching cavity; said pitching cavity receiving said gutter member pitching flange, said gutter member pitching flange being adjacent said roof plate roof wall at one end of said gutter member, and the vertical disposition of said gutter member pitching flange in said pitching cavity varying along the axial length of said gutter member for pitching said gutter member.

4,000,588

SPACE-BOUNDING SECTIONS FOR FORMING A BUILDING OR PART THEREOF, AND METHODS OF ERECTING SUCH A BUILDING

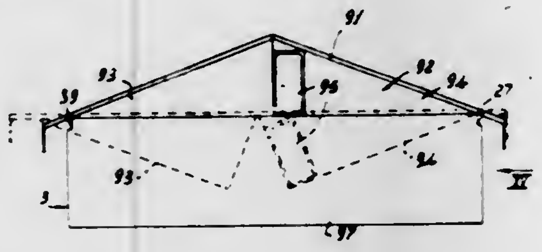
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 336,731, Feb. 28, 1973. This application Dec. 26, 1974, Ser. No. 536,467

Claims priority, application Netherlands, Feb. 28, 1972, 7202542

Int. Cl.² E04B *1/346*

U.S. Cl. 52—71 **47 Claims**



1. A prefabricated parallelpiped space-bounding section for forming at least part of a building of a type which is adapted to be transported as a unit from a factory to the building site, the section comprising a plurality of boundary faces which define at least one parallelepiped shaped space of the section, a wall for defining a substantially complete side which extends along one-half or more of a further space of the building immediately above and adjacent to said one space, said wall being displaceably arranged on the section whereby for transport purposes it is arranged near one of said boundary faces of the section and is movable with respect to the section into a final position in the completed building, said wall in said final position being vertically disposed, having a vertical dimension at least one-half the height of said one space and defining a side of at least approximately one-half of said further space which is situated immediately above and adjacent said first mentioned space defined by said boundary faces, a further wall for defining another side of said further space which is disposed vertically at a right angle to said first mentioned wall in the completed building, said further wall being arranged for transport purposes near one of said boundary faces of the section and being movable with respect to the section into its final position in the completed building.

4,000,589

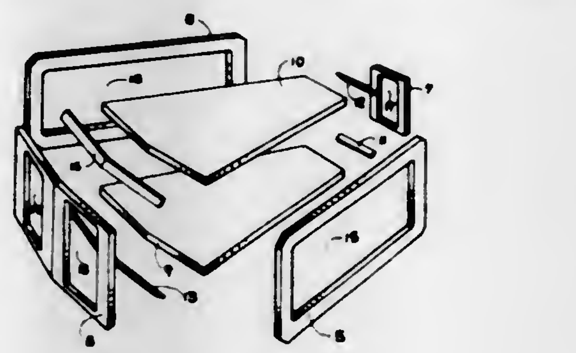
CONGRUENT MODULAR BUILDING SEGMENTS

Antonio Bianchini, 1821 Alexander Ave., Cheyenne, Wyo. 82001

Filed Feb. 13, 1976, Ser. No. 658,128

Int. Cl.² E04B *1/348*

U.S. Cl. 52—79.5 **5 Claims**



1. A building structure comprising a plurality of congruent, sector-like modular building segments joined to each other in side to side relationship, each building segment comprising in combination.

a. a roof sector and a vertically spaced congruent floor sector each having a first V-shaped end, a second narrower straight end and a pair of converging side edges extending between the first and second ends;

b. a V-shaped end wall extending between the V-shaped ends of the roof and floor sectors;

c. a straight end wall extending between the straight ends of the floor and roof sectors; and

d. a pair of congruent opposing and converging rib-frames which join the roof, floor and end walls to form an independent self-supporting building segment, each rib-frame being symmetrical about both a vertical and horizontal axis so that frames of adjacent building segments may be joined to form portions of curved or linear building arrangements.

4,000,590

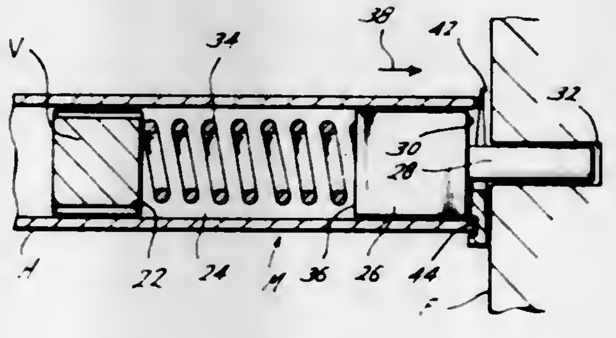
SECURITY GRILLE

Carl Kordewick, 490 Coronado Blvd., Universal City, Tex. 78148

Filed Aug. 4, 1975, Ser. No. 601,499

Int. Cl.² E04H *3/08*, E04C *2/42*

U.S. Cl. 52—106 **7 Claims**



3. The structure set forth in claim 1, further including:

a key mounted with one of said vertical bars and extending laterally therefrom a sufficient distance to prevent a portion of said vertical bar from passing through said vertical openings in said horizontal members when said key engages said horizontal members.

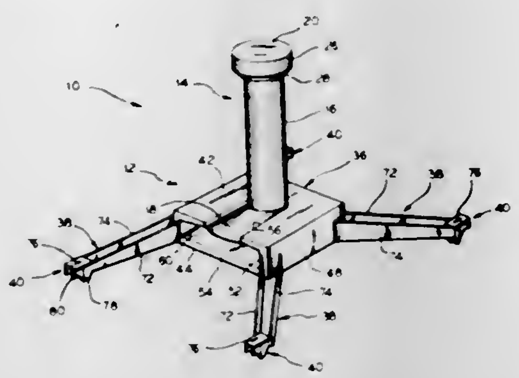
4,000,591
HOLDER ADAPTED FOR SUPPORTING AN ANCHOR INSERT TO BE EMBEDDED IN A CONCRETE SLAB

Peter D. Courtois, Oceanside, Calif., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Filed Aug. 4, 1975, Ser. No. 601,301

Int. Cl.² E04B *1/38, 1/60*

U.S. Cl. 52—125 5 Claims



1. A holder adapted for supporting an anchor insert to be embedded in a concrete slab, said insert including a shank having an enlarged disc-like foot on one end thereof, said holder comprising, in combination:

a box-like enclosure,

a plurality of legs extending laterally outwardly from said enclosure, and

a foot at the outer end of each leg and adapted with the remaining feet to support the enclosure in spaced relation above the floor of a concrete form,

said enclosure including

a. top and bottom walls rigidly joined together by side walls, said bottom wall being adapted for supporting said insert with the foot of the insert seated thereon,

b. means defining an entrance opening for lateral insertion of said foot into the enclosure to seat on said bottom wall,

c. a ledge on said bottom wall extending across said entrance opening for retaining said foot within said enclosure,

d. means in said enclosure forming a pocket opposite to said entrance opening and substantially conforming to the configuration of said foot, said pocket-forming means serving to limit tilting movement of the insert relative to the holder, and

e. means defining a slot in said top wall communicating with said entrance opening to accommodate the shank of said insert as said foot is inserted in said enclosure, said slot having a width less than the width of said foot.

4,000,592
WALL SUPPORTING STRUCTURE

Thomas M. Kelly, 7551 N. Oakley, Chicago, Ill. 60645

Filed June 4, 1975, Ser. No. 583,599

Int. Cl.² E04H *12/20*

U.S. Cl. 52—149 6 Claims

1. A temporary wall supporting device for supporting a wall in an upright position above the ground, comprising:

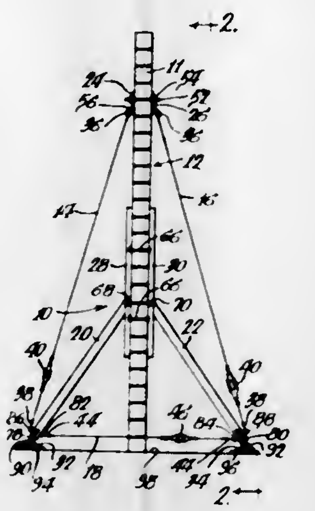
a pair of ground anchoring means disposed on opposite sides of the wall;

upper and lower pairs of wall-engaging members secured on opposite sides of the wall;

first and second collapsible triangular structures having a common base member extending through an opening in the wall adjacent its lower end;

said first triangular structure further including a pair of rigid strut members having their lower ends connected to said pair of ground anchoring means and their upper ends connected to one of said pairs of wall-engaging members; and

said second triangular structure further including a pair of longitudinally flexible members under tension having their upper ends connected to the other of said pairs of said wall-engaging members and having their lower ends connected to the lower end of said rigid strut members.



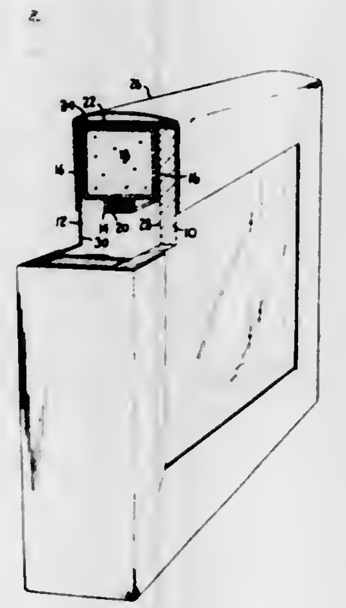
4,000,593
INSULATING SPANDREL GLAZING UNIT

James H. Cypher, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 65,813, Aug. 21, 1970, abandoned. This application Oct. 10, 1972, Ser. No. 296,478

Int. Cl.² E06B *7/12;* **E04B** *2/28*

U.S. Cl. 52—172 11 Claims



1. An insulating spandrel glazing unit comprising no more than one transparent, strengthened, glass panel and no more than one metal disposed in opposed, spaced relation to each other, said metal panel having a thickness substantially less than the thickness of said glass panel and being visible through said glass panel, the entire inner visible surface of said metal panel being provided with a uniform, continuous finish so as to present a uniform, continuous appearance through said glass panel, and marginal edge spacer means defining with said panels a closed, hermetically sealed space therebetween, wherein said glass panel has a transparent coating on its inner surface and said metal panel has a coating on its inner surface.

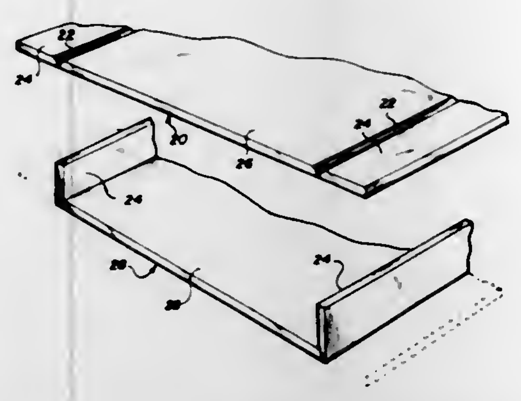
4,000,594
BUILDING CONSTRUCTION MEMBER

James D. Kirk, Jr., 40 N. Tower Road, Apt. 14L, Oak Brook, Ill. 60521

Filed Jan. 13, 1975, Ser. No. 540,420

Int. Cl.² E04B *2/00*

U.S. Cl. 52—241 16 Claims



1. A building construction member which may be shipped to the jobsite in flat condition and formed at the jobsite into a wide, shallow, channel-shaped member with a central panel portion and having flanges extending equally and perpendicularly in the same direction from one face of the panel at opposite long edges thereof, comprising a rectangular panel of gypsum board having face laminae and a core layer of gypsum therebetween, said board having on one face thereof two V-grooves consisting of one V-groove set inwardly from each long edge for the full length of the gypsum board which penetrate the gypsum core substantially for the entire depth of said core leaving intact a sufficient thickness of the lamina of the face opposite the grooved face to act as a hinge, said grooves having adhesive means therein and defining between them a central panel portion with flanking flanges outwardly of said grooves when said flanges are hinged perpendicularly to said central panel portion and retained in that position by the adhesive means in said grooves.

4,000,595
INSULATION STRUCTURE FOR PRESSURE VESSEL CAVITY

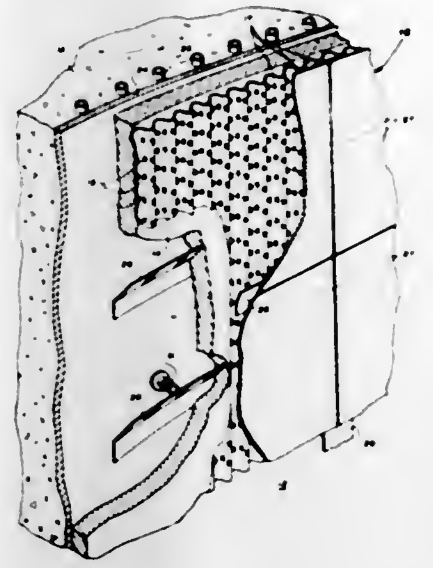
Peter Fortescue, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Feb. 8, 1974, Ser. No. 440,649

Int. Cl.² E04F *17/00;* **E04B** *2/02*

U.S. Cl. 52—302 8 Claims

1. In a pressure vessel cavity wherein there is a possibility of rapid depressurization, an insulation structure comprising, a layer of fibrous insulation adjacent the cavity wall, retaining means for said layer comprising a wall extending in contact therewith on the side of said layer opposite the cavity wall, said retaining means having a plurality of fluid passages therethrough communicating with said layer, isolation means for preventing circulation of fluid in said layer, said isolation means comprising a pressure barrier spaced from said layer and said retaining means on the opposite side of said retaining means from said layer to define a gas flow space between said isolation means and said retaining means for venting said layer through said fluid passages upon depressurization of the cavity, and support means secured to the pressure vessel and supporting said layer, retaining means and isolation means.



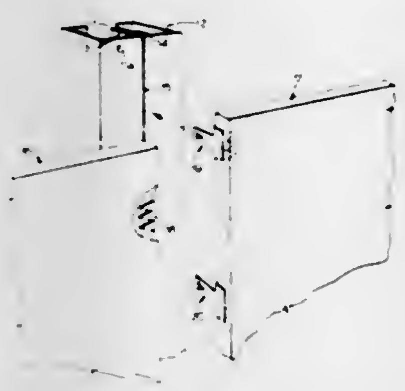
4,000,596
WALL PARTITION SYSTEM AND COMPONENTS THEREOF

Hugh Magill, No. 1 Goswell Road, Islington, Ontario, Canada, and John Alfred Herwynen, Box 364, King City, Ontario, Canada (L0G 1K0)

Filed Aug. 7, 1975, Ser. No. 602,748

Int. Cl.² E04B *5/52*

U.S. Cl. 52—481 6 Claims



1. A wall system including a pair of adjacent panels each secured to a frame member by a clip,

each panel having a front surface, a rear surface and a side surface extending between said front and rear surfaces, the side surfaces of the panels being adjacent one another;

each clip having a flat body portion extending partway along the side face of a respective panel from the rear face thereof so as to be spaced from the front face of the panel, said clip body portion being secured to said panel;

each clip also having a leg integral with said body portion and extending beyond the rear face of the panel in a direction perpendicular thereto;

said frame member having a clip-receiving channel into which said clip legs extend in vertically staggered relationship;

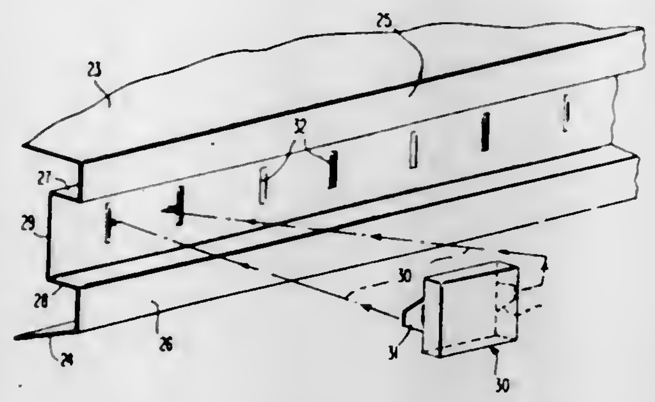
each clip leg having a pointed tang projecting therefrom with its point directed generally towards the respective panel; and

said channel having opposed walls respectively engaged by each clip leg and pointed tang to retain the panels in assembly with the frame member.

4,000,597
DECORATIVE TRIM FOR BUILDINGS

Richard Burton, Philadelphia, Pa., assignor to Burton Aluminum Classics, Inc., Philadelphia, Pa.

Filed Mar. 4, 1975, Ser. No. 555,152
Int. Cl.² E04C *2/40;* E04F *19/02*
U.S. Cl. 52—716 **7 Claims**

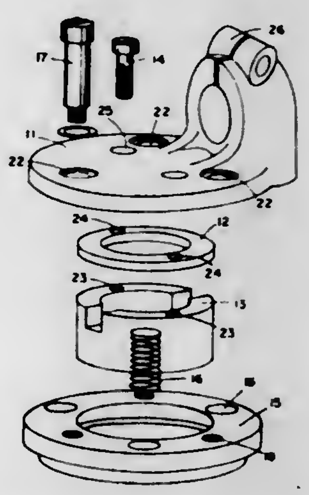


1. A building trim formed of sheet material, the trim having a shaped cross sectional profile with an elongated flat strip inset from an adjoining part of the profile and having a series of slits spaced from each other lengthwise of the strip, and decorative means comprising a plurality of elements overlying said strip and of contrasting appearance as compared with the strip, said elements being spaced from each other lengthwise of the strip and each having spaced mounting parts extended into spaced slits and interconnecting the elements with the sectional profile, thereby providing a decorative visual contrast between said elements and said strip in areas spaced lengthwise of the strip.

4,000,598
SHEAR TOPPER FOR PACKING VEGETABLES

Ralph Carl Mierke, and Joseph James Busco, both of Lyons, N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 21, 1975, Ser. No. 606,390
Int. Cl.² B65B *63/00*
U.S. Cl. 53—123 **3 Claims**

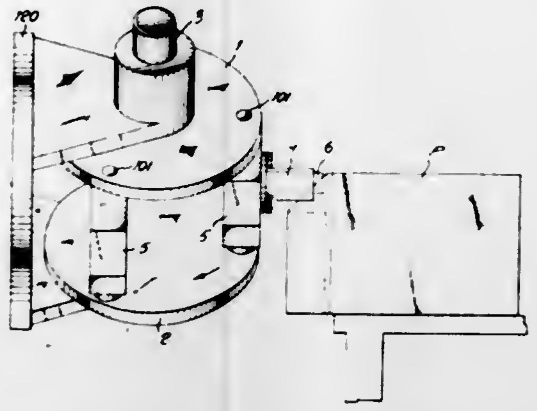


1. A device for packing elongated material in a can including a generally horizontal pad member, secured to the bottom of the pad member a generally cylindrical plunger suitable for insertion into the open end of a can, the plunger and a height-adjusting spacer being secured to the pad by suitable screws, said plunger having a vent opening to allow passage of liquid and gas therethrough, and concentric with and surrounding said plunger and on the underside of said horizontal pad member a cylindrical shearing ring spring mounted to the horizontal pad member, said shearing ring being adapted for cooperatively engaging the top flange of a open-end can to provide a cutting action when the pad member and the attached shearing ring is lowered.

4,000,599
FOLDER

Claudio Ferrozzi, Ferrara, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,295
Claims priority, application Italy, July 3, 1975, 12503/75
Int. Cl.² B65B *7/04*
U.S. Cl. 53—378 **4 Claims**



1. A folding mechanism for folding a flap of a wrapper against a face of a body of right parallelepiped form which has been already partially enclosed by the wrapper as in a tube on at least other four faces, while the partially wrapped body is translated at a uniform speed along a conveying path in a direction parallel to the said face, said folding mechanism comprising:

a. a pair of rotatable discs which face each other and are suitably spaced apart, said discs having their axes of rotation parallel to and eccentrically arranged with respect to each other, said axes of said discs being further inclined of a predetermined oblique angle with respect to the said conveying path;
b. at least one connecting rod for connecting a crank pin provided eccentrically on one of said discs with a respective crank pin provided eccentrically on the other facing disc, in such a manner that the distance between the said crank pins is equal to the distance between the axes of rotation of the two discs, whereby rotation of one of the discs causes a concurrent rotation of the other disc;
c. a folder element provided onto one of the said connecting rods,

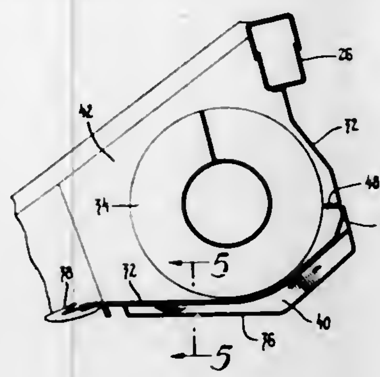
whereby upon operation of the mechanism consequent to rotation of one of the discs in correct time relationship with the speed of translation of the body along the conveying path, the folder element engages the flap to be folded in a direction which is transverse to the direction of translation, while simultaneously accompanying the body in its translatory movement, and at the same time moving cyclically to-and-fro perpendicularly with respect to the said face of the body.

4,000,600
COMBINE HEADER WITH BOTTOM SUPPORT BEAM

James G. Butler, Islington, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Apr. 14, 1975, Ser. No. 568,087
Int. Cl.² A01D *47/00*
U.S. Cl. 56—220 **9 Claims**

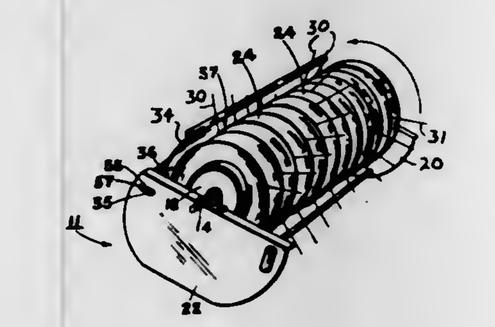
1. A crop table construction for a combine harvester comprising a main horizontal spar at the top rear and extending from side to side, a plurality of ribs attached to the spar and extending downwardly at the rear of the table and thence forwardly at the bottom of the table, a front and top skin attached to the front and top faces of the ribs, a bottom stiffener plate with a front portion attached to the front and top skin, a center portion adjacent to the bottom of the ribs, and a rear portion attached to the front and top skin to form a horizontal hollow tubular beam extending substantially the length of the table, and end walls connecting the spar, the skin, and the stiffener plate.



4,000,601
FRUIT HARVESTING MACHINE

Richard A. St. Petery, Jr., P.O. Box 74, Mount Royal, N.J. 08061

Filed Apr. 9, 1974, Ser. No. 459,297
Int. Cl.² A01D *46/00*
U.S. Cl. 56—328 R **11 Claims**



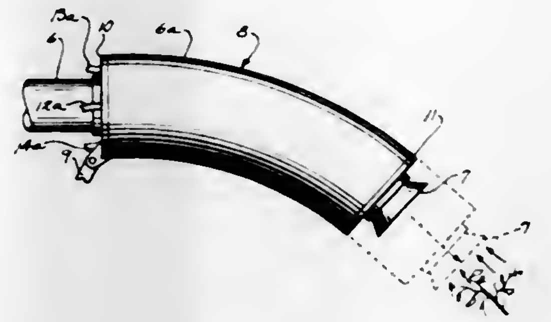
1. A fruit harvesting machine comprising:
a frame;
a round body mounted within the frame and having a generally soft outer surface;
a picking plate having a first portion thereof secured to the frame and having a second portion mounted adjacent to said round body and spaced therefrom a distance corresponding approximately to the diameter of fruit to be harvested;
said round body being mounted within the frame for rotation about an axis relative to the picking plate, means for rotating said body relative to the frame and the picking plate to engage said fruit between said outer surface and the picking plate to remove said fruit from its stem;
and combing means extending outwardly from the outer surface for combing through fruit laden branches upon rotation of said body for moving said fruit into the space between said round body and the picking plate, the combing means extending outwardly a distance at least equal to the diameter of the fruit.

4,000,602
VACUUM CONDUIT PICK-UP DEVICE WITH IMPROVED CONTROL

Daniel E. Cardinal, Jr., 1352 Estate Lane, Lake Forest, Ill. 60045

Filed Sept. 29, 1975, Ser. No. 617,517
Int. Cl.² A01D *46/24*
U.S. Cl. 56—328 R **6 Claims**

1. A pick-up device for leaves or other materials comprising, in combination:
a. a frame,
b. an elongated longitudinally expandable flexible conduit mounted on said frame and with said conduit having an outer end mouth portion for engaging said materials,
c. means for vacuumizing said conduit so that the said materials will flow through said conduit from said mouth,
d. a plurality of tubular flexible longitudinally expandable members disposed along and generally parallel to the outer end portion of said conduit,

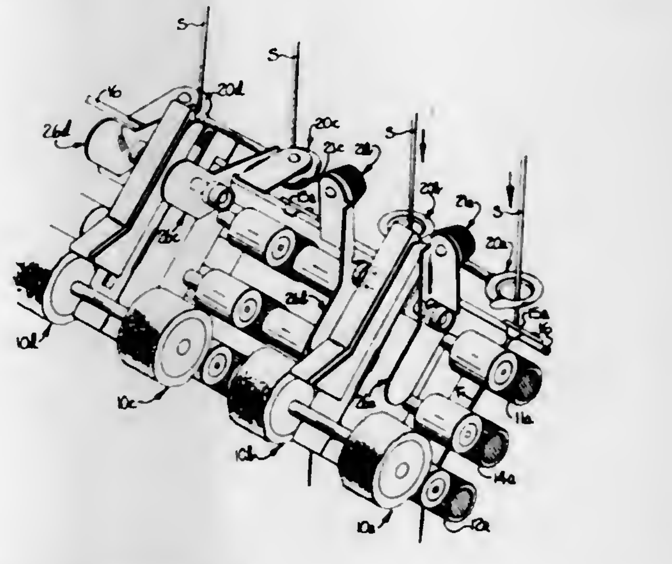


e. means to expand said plurality of members selectively different amounts to thereby flexingly tilt said conduit to a desired angle of disposition while supporting the conduit wall and holding it in relatively rigid position,
f. and means to selectively vary the length of said tilted conduit without changing its angle of disposition.

4,000,603
TEXTILE YARN SPINNING MACHINE WITH SUPPLY STRAND INTERRUPTION

Charles D. Lee, Jr., Charlotte, N.C., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Feb. 27, 1975, Ser. No. 553,795
Int. Cl.² D01H *13/18*
U.S. Cl. 57—87 **5 Claims**



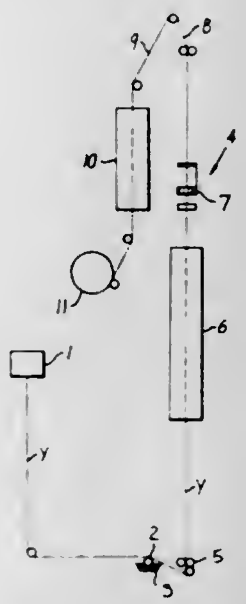
1. In the combination of
a textile yarn spinning machine having a plurality of drafting systems arranged in a series, a plurality of supply strand packages each normally delivering a corresponding supply strand to a corresponding drafting system for producing a corresponding attenuated strand and a plurality of trumpet means each mounted adjacent a corresponding drafting system for directing the corresponding supply strand thereinto,
means movable along the spinning machine and having detector means for monitoring production of attenuated strands and actuator means for responding to breakage of an attenuated strand, and
means mounted on the spinning machine and selectively remotely actuable by the actuator means for interrupting feeding of the corresponding supply strand at a point in advance of introduction thereof into the corresponding trumpet means.

an improvement in the interrupting means which assures positive interruption of supply strand feeding, the improvement comprising:
a plurality of ring means arranged in a series adjacent the series of drafting systems, each said ring means being interposed between a corresponding supply package and the corresponding trumpet means for threadingly receiving the corresponding supply strand, and
a plurality of plug means for cooperating with said ring means, each said plug means being mounted for movement relative to a corresponding ring means between a strand feeding position withdrawn from said corresponding ring means and a strand interruption position penetrating said corresponding ring means,
said cooperating plug means and ring means positively entrapping a threadingly received supply strand upon movement of said plug means to the strand interruption position.

4,000,604
TEXTURIZED ACETATE YARN AND METHOD OF MANUFACTURE

Sung In Lee, 256-30, Seonsan, Seodaemoon, Seoul, South Korea

Filed Mar. 19, 1974, Ser. No. 452,705
Int. Cl.² D02G *3/02, 3/36*
U.S. Cl. 57—153 **8 Claims**

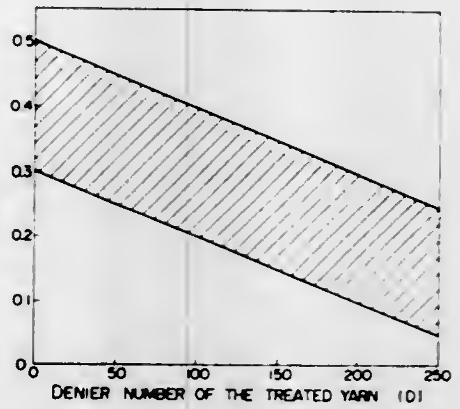


7. A bulky elastic texturized acetate yarn having good elasticity, good tensile strength and good durability of elasticity and tensile strength in wasing washing dry cleaning which comprises a yarn composed of acetate filaments, said filaments being in substantially twisted orientation along their length whereby said filaments have different surface textures along their lengths formed by bends, loops, folds, spirals and the like deorientations about the longitudinal axis of said filaments, said twisted orientation of said filaments being an imparted and set false twist, said false twist being imparted and set by wet heat set in the presence of coning oil twist wet heat set agent, and a cured crosslinked synthetic resin integral with said filaments, said cured crosslinked synthetic resin being from the group of a melamine, urea, ethylene vinyl acetate, vinyl acetate and acrylic resin.

4,000,605
METHOD FOR PRODUCING A CRIMPED YARN

Kazuya Chimura; Takashi Kaneko; Ryuichi Nakazono; Kenichi Sakunaga, all of Ohtake, and Eiji Umemura, Nishinomiya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Osaka, Japan

Filed Sept. 19, 1972, Ser. No. 290,318
Claims priority, application Japan, Sept. 20, 1971, 46-73113; July 19, 1972, 47-72377
Int. Cl.² D02G *1/02*
U.S. Cl. 57—157 TS **1 Claim**



1. Method for producing a crimped yarn in which thermoplastic synthetic undrawn polyester yarn having birefringence of at least 15×10^{-3} is passed at a speed exceeding .300 m/min. through a twisting tube having a twisting friction surface of wear-resistant material of high frictional coefficient to apply false twisting to the yarn simultaneously with drawing at an underfeed ratio less than 200 per cent, characterized by the fact that the false twisting is performed under the condition meeting the requirements of the following equations,

$$(300-D)/10^3 \leqq V/S \leqq (500-D)/10^3 \qquad (I)$$

$$T_2/T_1 \leqq 2 \qquad (II)$$

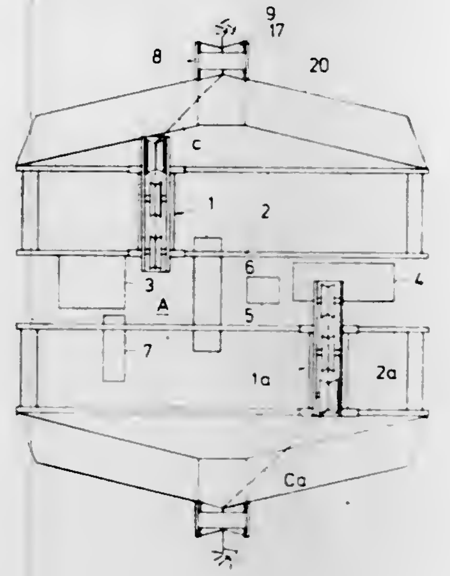
where:
V= yarn speed in m/min. at the friction twisting surface,
S= surface speed in m/min. at the center of the yarn engaging portion of the friction twisting surface;
D= denier of the treated yarn;
T_1= tension of yarn is grams at the inlet side of the twisting tube; and,
T_2= tension of yarn is grams at the outlet side of the twisting tube.

4,000,606
CHAIN MAKING APPARATUS

Sven-Erik Lindén, Laxa, and Nils Gunnar Krister Forsberg, Ornskoldsvik, both of Sweden, assignors to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Filed Feb. 9, 1976, Ser. No. 656,628
Claims priority, application Sweden, Feb. 10, 1975, 7501415
Int. Cl.² B21L *7/00*
U.S. Cl. 59—16 **4 Claims**

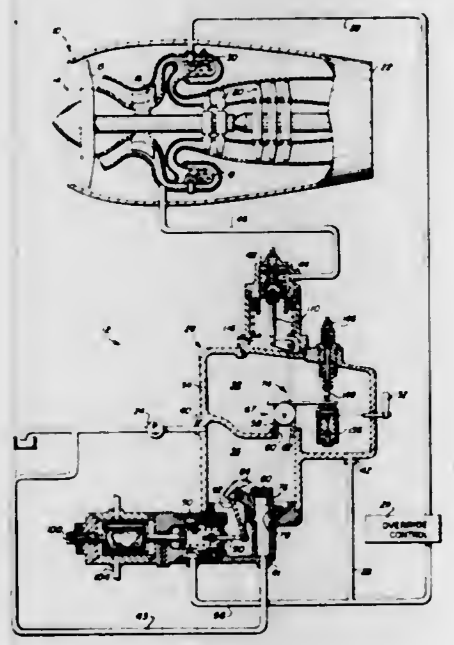
1. In a plant for the manufacture of two chains at a time comprising a pair of substantially parallel straight tracks at either side of a course, a first carriage running on one of said tracks for moving a depending end portion of one chain previously formed along said course to be presented successively to a plurality of operating stations provided in said course for performing a succession of operations including inserting a heated piece of bar into the lowest link of said depending portion and bending said piece of bar to form a link, flash butt welding the joint of said link and trimming the joint to remove the welding burr or bulge, and a second carriage running on the other track for moving a depending end portion of the other chain along said course to be presented to said operating stations, and motor-driven conveyor means supported by each of said carriages for advancing the chain outwards in the transverse direction from said course, said conveyor means including a delivery member from which the chain is paid out, the improvement comprising, for each of the tracks, a stationary supporting structure arranged outside of the middle portion of the track, said structure including a chain supporting member arranged at such a height and such a transverse distance with respect to said delivery member as to allow a sagging portion of the chain supported at one end by said delivery member and at the other end by said chain supporting member to turn freely about said supporting member during displacement of the carriage along its track.



4,000,607
FLUID CONTROL VALVE AND METHOD

Frederic E. Bolliger, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 7, 1975, Ser. No. 629,737
Int. Cl.² F02C *9/10, 9/08*
U.S. Cl. 60—39.03 **15 Claims**

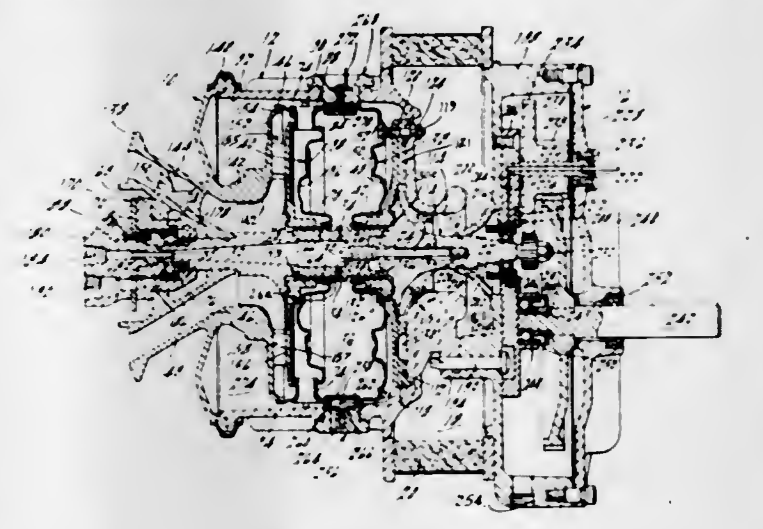


3. A method of controlling fluid flow from a source of pressurized fluid to a fluid outlet port, comprising the steps of:
directing fluid flow from said source through a first pair of opposed metering openings to said outlet port;
adjustably covering and uncovering said first metering openings while providing balanced flow therethrough;
directing flow from said source through a second pair of opposed metering openings to an exhaust port in parallel flow arrangement to said flow through said first metering openings;
sensing the fluid pressure differential across said first metering openings; and
automatically adjustably covering and uncovering the second metering openings in response to the magnitude of said sensed fluid pressure differential to control fluid flow from said source to said exhaust port in a manner maintaining a substantially constant pressure differential across said first metering openings, while providing balanced flow through said second metering openings.

4,000,608
GAS TURBINE ENGINE COMBUSTION CHAMBER

Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 214,703, Jan. 3, 1972. This application June 24, 1974, Ser. No. 482,809
Int. Cl.² F02C *3/08*
U.S. Cl. 60—39.36 **8 Claims**

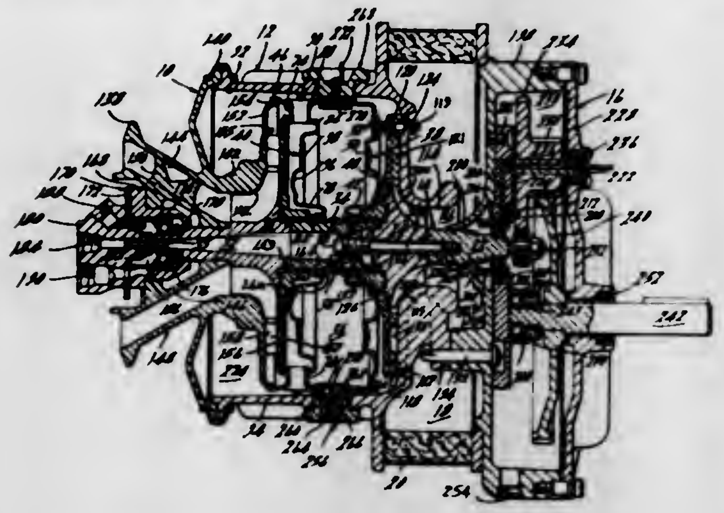


1. A gas turbine engine comprising:
A. a shaft assembly having a central axis and including
  1. a turbine rotor having radial blades, and
  2. a compressor rotor having radial blades, said rotors being axially spaced from one another;
B. a housing assembly enclosing at least a portion of said shaft assembly and including
  1. a unitary annular intake housing having an annular axial extending portion terminating at an end and a radially extending portion having a section conforming to and enclosing a portion of said blades of said compressor rotor and defining an inlet to said compressor rotor, and
  2. a unitary annular exhaust housing having an end in abutting engagement with said end of said axially extending portion of said intake housing and having a radially extending portion having a section conforming to and enclosing a portion of said blades of said turbine rotor and defining an outlet from said turbine rotor;
C. an annular liner defining a combustion chamber located between and in fluid communication with said compressor rotor, said liner being spaced from said turbine rotor and defining together with said turbine rotor an annular air space, said liner further defining an annular axially extending outlet passage in fluid communication with said combustion chamber and said turbine rotor; and
D. a plurality of circumferentially spaced radially extending tubes traversing said outlet passage from said combustion chamber, each of said tubes having a passage in fluid communication with said compressor rotor and with said annular air space between said liner and said turbine rotor, said tubes being slip fit within openings within said liner and having radially outwardly extending tabs adapted to contact one of said housings and axially extending lips adapted to contact said liner to retain said

tubes relative to said outlet passage from said combustion chamber.

4,000,609
RADIAL FLOW GAS TURBINE ENGINE WITH ANNULAR COMBUSTOR LINER

Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 214,703, Jan. 3, 1972. This application June 24, 1974, Ser. No. 482,808
Int. Cl.² F02C *3/08, 7/06, 7/22*
U.S. Cl. 60—39.36 **2 Claims**

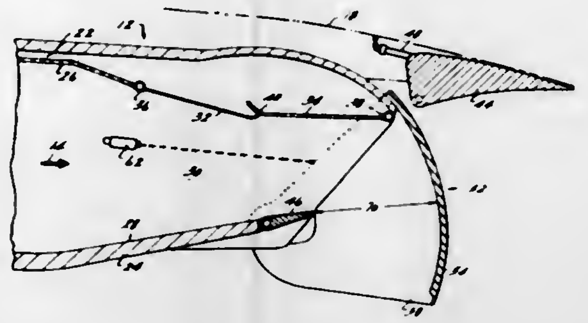


1. A gas turbine engine comprising:
- A. a shaft assembly having a central axis and including
  - 1. a turbine having radial blades, and
  - 2. a compressor having radial blades and being axially spaced from said turbine;
- B. a housing enclosing at least a portion of said shaft assembly;
- C. an annular nozzle plate supported by said housing and encircling said shaft assembly intermediate said turbine and said compressor, said nozzle plate having
  - 1. an annular one piece radially extending nozzle portion having cantilever vanes at least partially defining a plurality of radially extending nozzle passages in fluid communication with said turbine, and
  - 2. an annular axially extending hub portion projecting axially away from said turbine toward said compressor in juxtaposition to said shaft assembly; and
- D. an annular liner defining a combustion chamber located between said compressor and said nozzle plate in fluid communication with said compressor and said nozzle passages, said liner including
  - 1. an annular radially extending portion spaced from said radially extending nozzle portion and defining therewith an annular radially extending space, and
  - 2. an annular axially extending portion generally encircling said hub portion and defining therewith an annular space in fluid communication with said radially extending space, said axially extending portion projecting axially away from said turbine toward said compressor and into contact wih said hub portion.

4,000,610
FLIGHT MANEUVERABLE NOZZLE FOR GAS TURBINE ENGINES

Dudley O. Nash, Forest Park; Robert G. Beavers, Mason; Joseph C. Burge, Cincinnati; Onofre T. M. Castells, Sharonville, and Alan I. Parker, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Apr. 28, 1975, Ser. No. 572,340
Int. Cl.² F02K *1/12, 1/20*
U.S. Cl. 60—230 **13 Claims**

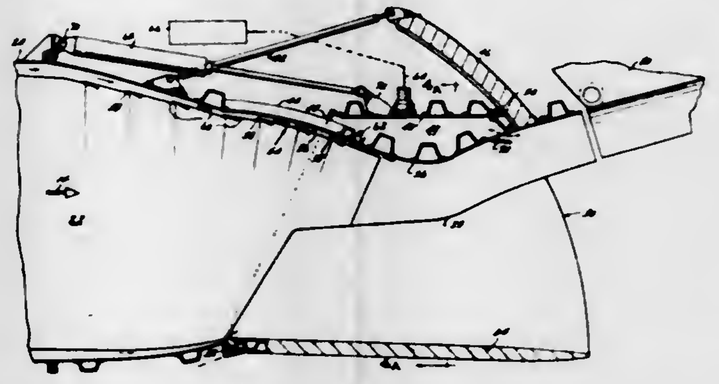
1. A flight maneuverable exhaust device for a gas turbine engine including:
- a plurality of substantially opposed walls partially defining an exhaust stream flow path;
- variable position convergent-divergent means partially defining a first of said walls;
- deflector means positionable between a stowed position external to said exhaust stream flow path and a deployed position further defining said exhaust stream flow path; and
- variable position first flap means partially defining a second of said walls, and wherein:



- said convergent-divergent means and said second wall cooperate to define a variable area throat therebetween when said deflector is stowed;
- said convergent-divergent means and said first flap means provide variable exhaust stream expansion control downstream of the throat when said deflector is stowed; and
- said first flap means cooperates with said deflector means to provide the variable area throat therebetween when said deflector means is in said deployed position.

4,000,611
VARIABLE AREA, LOAD BALANCING NOZZLE

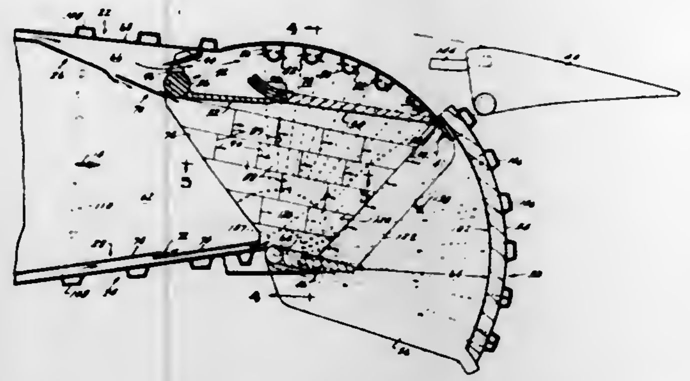
Arthur McCardle, Jr., Greenhills; John J. Wright, Monroe, both of Ohio, and Jarod L. Baugh, Waco, Tex., assignors to General Electric Company, Cincinnati, Ohio
Filed July 1, 1975, Ser. No. 592,107
Int. Cl.² F02K *1/12*
U.S. Cl. 60—230 **24 Claims**



1. An exhaust device for a gas turbine engine comprising:
- a casing defining, to its interior, an exhaust fluid flow path and, partially defining, to its exterior, pressure plenum means;
- a variable position flap spaced from said casing to define said exhaust fluid flow path therebetween to control flow path area; and
- piston means operatively connected to the flap, said piston means partially defining the plenum means and exterior to the flow path; wherein said plenum means and said piston means comprise a first actuation means to at least partially balance exhaust pressure loads on the flap.

4,000,612
COOLING SYSTEM FOR A THRUST VECTORING GAS TURBINE ENGINE EXHAUST SYSTEM

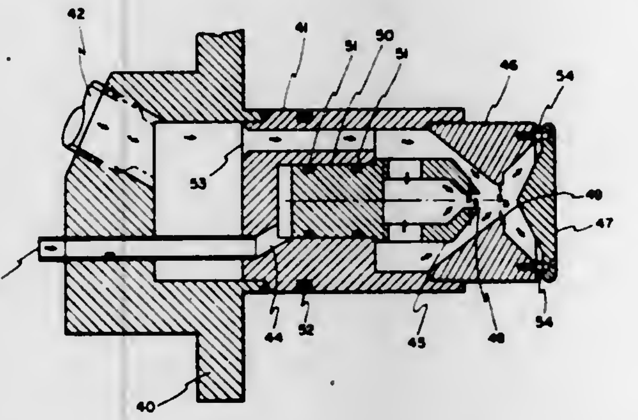
Thomas G. Wakeman, West Chester, and Dudley O. Nash, Forest Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed July 28, 1975, Ser. No. 599,644
Int. Cl.² F02K *1/12, 1/20, 11/04*
U.S. Cl. 60—230 **16 Claims**



1. A cooling system for a gas turbine engine exhaust nozzle having a variable position flap partially defining an exhaust stream flow path, a fixed wall further defining the flow path, and actuating means for positioning the flap, the cooling system comprising:
- a plenum partially defined by the flap and external to the flow path;
- first passage means for introducing cooling fluid into said plenum;
- means for exhausting the cooling fluid from said plenum; and
- first means connected to the actuating means for regulating the cooling fluid pressure level entering said plenum, wherein the first regulating means comprises a first valve which is held closed by the pressure of the cooling fluid when the actuating means is in a first operative position, and means to override the cooling fluid pressure and open the first valve when the actuating means is in a second operative position.

4,000,613
DUAL MODE FLUID MANAGEMENT SYSTEM

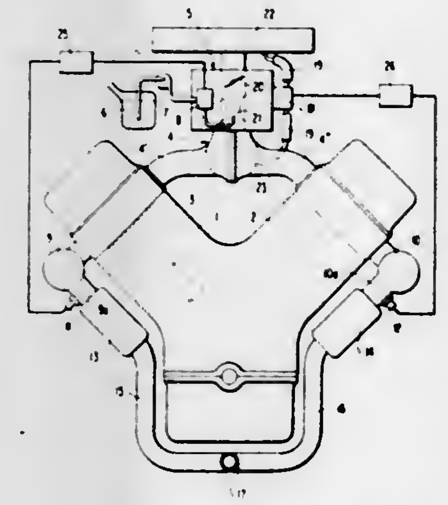
Akiharu Fukumoto, Milpitas, and Phil D. La Force, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 13, 1975, Ser. No. 550,103
Int. Cl.² F02K *9/06;* **B05B** *7/12*
U.S. Cl. 60—251 **3 Claims**



1. A dual orifice injector assembly for use in a hybrid rocket motor having a boost and sustain mode comprising:
- said assembly having an inlet housing and manifold housing;
- said manifold housing having an inner bore;
- a sustain injector poppet slideably mounted within said bore;
- a sustain injector orifice at one end of said poppet;
- a boost injector seat mounted on one end of said manifold housing;
- a boost injector orifice contained in said seat;
- an inlet manifold in said inlet housing in open communication with said sustain injector and boost injector in the boost mode of said rocket motor;
- actuating means acting on said poppet to cause the poppet to seat against said boost injector seat in the sustain mode of said rocket motor; and
- flow deflector means in flow communication with said boost injector and sustain injector to cause fluid from said injectors to be dispersed in a fan like pattern at substantially right angles to the axis of said manifold housing.

4,000,614
MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINE WITH TWO CYLINDER ROWS AND EXHAUST GAS TREATMENT

Jörg Abthoff, Pluderhausen, and Dag-Harald Hüttebräucker, Endersbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Jan. 23, 1976, Ser. No. 651,817
Claims priority, application Germany, Feb. 8, 1975, 2505339
Int. Cl.² F01N *3/15;* **F02B** *75/10*
U.S. Cl. 60—276 **16 Claims**



1. A mixture-producing reciprocating-piston internal combustion engine which comprises at least two cylinder rows each having at least one working cylinder means, a mixture-producing means common to both cylinder rows having a controllable fuel supply means and operatively connected with the working cylinder means of the two rows by way of suction channel means, exhaust gas catalyst means for the after-burning of the exhaust gases arranged in exhaust gas line means of the engine, and a separate exhaust gas manifold means for each cylinder row, characterized in that an oxygen probe means is arranged in the exhaust gas manifold means of each cylinder row and is operable to produce an electrical signal dependent in its magnitude from the value of the air/fuel ratio, one of the oxygen probe means being at least indirectly operatively connected with the controllable fuel supply means of the mixture-producing means in such a manner that the air/fuel ratio supplied to one cylinder row is maintained substantially constant within given limits, and in that the other oxygen probe means is operatively connected at least indirectly with a controllable additional air supply means which is arranged in a by-pass line means conducting additional air and terminating downstream of the mixture-producing means in the corresponding part of the suction channel means, the operative connection of said other oxygen probe means with the additional air supply means being such that the air/fuel mixture conducted to the other cylinder row belonging to said other oxygen probe means is also held substantially constant within the given tolerances.

4,000,615

CONTROL INSTALLATION FOR THE PROPORTIONING OF A SECONDARY AIR QUANTITY FOR IMPROVEMENT OF THE COMBUSTION IN INTERNAL COMBUSTION ENGINES OR THE AFTERBURNING OF THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

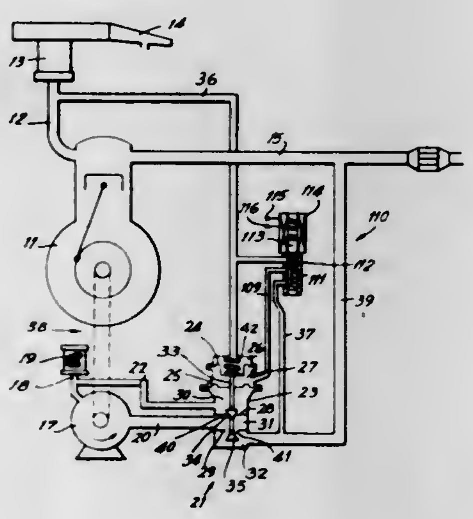
Wilfried Bockelmann, Buttgen; Hans Grözinger, Neuss, and Peter Ulrich Wöbky, Nievenheim, all of Germany, assignors to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft, Neuss, Germany

Filed Jan. 22, 1975, Ser. No. 543,052

Claims priority, application Germany, Jan. 23, 1974, 2401313

Int. Cl.^{2} F01N *3/10*; **F02B** *75/10*

U.S. Cl. 60—277 **3 Claims**



1. In a control installation for the proportioning of a quantity of secondary air for improving the combustion in an internal combustion engine or the afterburning of the exhaust gases of the internal combustion engine, including a plurality of external measuring parameters being transmitted to said control installation; an air pump driven by said engine adapted to dose the air quantity flowing into said control installation dependent upon the rotational speed of said engine forming a measuring parameter; and an arrangement operatively connected with said control installation for withdrawing and reconveying a portion of the air flowing into said control installation dependent upon at least one of the measuring parameters, the improvement comprising: an auxiliary arrangement associated with said control arrangement for the instantaneous shutting-off of the flow of said secondary air responsive to a generated emergency signal; conduit means for conveying said secondary air flow, said auxiliary arrangement comprising a reversing valve located in the flow path of said conduit means adapted to permit free air flow therethrough during undisturbed operation and, upon receipt of a generated emergency signal, to instantaneously divert the flow of air to atmosphere or back to said air pump; said reversing valve being pneumatically actuated through an actuating conduit thereof; and a smaller-proportioned electromagnetically-actuated valve being located in the flow path of said actuating conduit and being responsive to said emergency signal; said pneumatically actuated reversing valve being an integral element of said control installation, said installation including a control pressure chamber, said electromagnetically-actuated valve connecting said control pressure chamber with the exhaust gas manifold of said engine through a conduit during the undisturbed operation of said engine and, in response to an emergency signal during disrupted operation, with a conduit connected to the suction side of the engine.

4,000,616

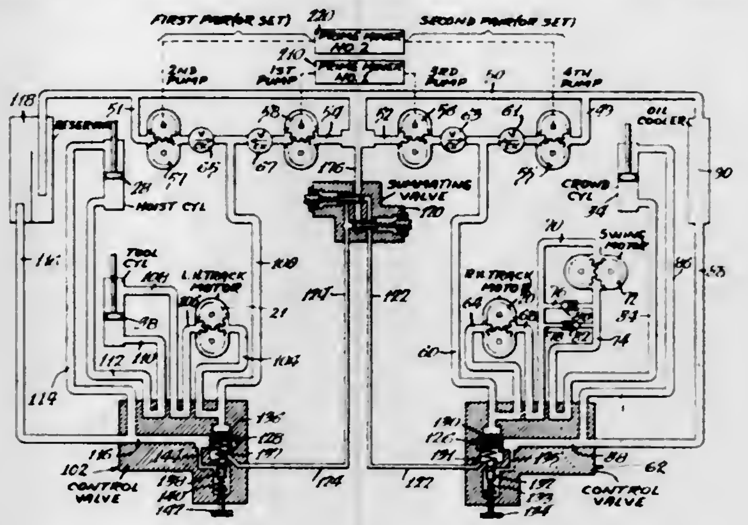
MULTI-ENGINE MULTI-PUMP HYDRAULIC SUMMATING SYSTEM

William D. Symmank, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 15, 1976, Ser. No. 666,897

Int. Cl.^{2} F15B *13/09*

U.S. Cl. 60—420 **10 Claims**



1. A plurality of prime movers each of which is connected to a group of interconnected fixed displacement pumps to drive same in cooperation with a summating system for controlling the fluid under pressure in a plurality of hydraulic systems, each of said hydraulic systems being supplied by a set of pumps connected in parallel, each set comprising at least one pump of each said driven group, and including a relief valve for each of said set of pumps, which valves are responsible to the fluid under pressure emanating from all of said sets of pumps, said valves controlling the flow of fluid between the outlet and inlet of said sets of pumps to relieve the pressure in the systems when the summated outlet pressures of said sets of pumps exceed the maximum allowable pressure.

4,000,617

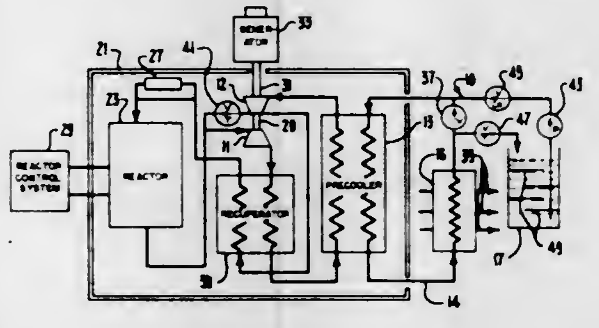
CLOSED CYCLE GAS TURBINE SYSTEM

Peter Fortescue, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jan. 27, 1975, Ser. No. 544,130

Int. Cl.^{2} F01K *25/10*; **F02C** *7/12, 9/00*

U.S. Cl. 60—644 **10 Claims**



1. A closed cycle gas turbine system comprising, turbine means, compressor means, means for circulating a gas for expansion in said turbine means and compression in said compressor means, a precooler for cooling the gas prior to compression in said compressor means, a closed loop coolant circuit for circulating a coolant through said precooler, said coolant circuit including a heat exchanger for cooling the coolant therein, a storage tank for storing a supply of coolant at a temperature substantially lower than the temperature of coolant in said coolant circuit at the discharge side of said heat exchanger, and means for selectively circulating the coolant in said storage tank through said precooler to provide a power increase in said gas turbine system.

4,000,618

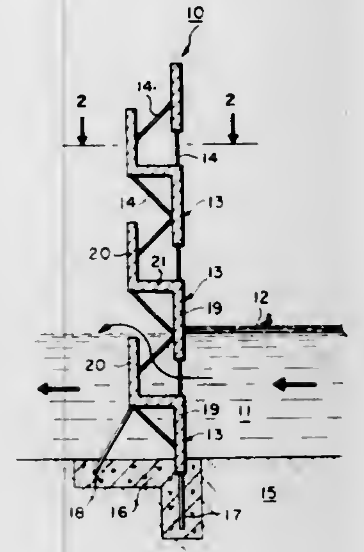
SKIMMER FENCE

Leland F. Stovall, Corpus Christi, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Apr. 28, 1975, Ser. No. 572,556

Int. Cl.^{2} E02B *3/00*

U.S. Cl. 61—1 F **3 Claims**



1. Apparatus for removing a layer of oil floating on a substantially level unidirectional flowing stream of water from said stream comprising:

a plurality of water impervious baffles connected together in a vertical arrangement; each baffle overlapping in a vertical plane a selected portion of an adjacent baffle to form a plurality of flow passageways between each baffle, each passageway defining a selected overflow space across the length of said baffle, and each baffle extending completely across said stream and comprising two parallel spaced apart vertically extending baffle members connected together by a horizontally extending baffle member perpendicular thereto.

4,000,619

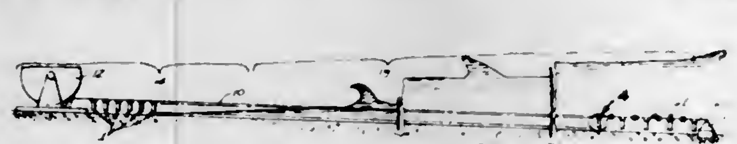
MEANS AND METHOD FOR CONTROLLING BEACH AND SANDBAR EROSION

Charles T. Ziegler, 9842 13th St., Santa Ana, Calif. 92703

Filed Mar. 19, 1976, Ser. No. 668,619

Int. Cl.^{2} E02B *3/04*

U.S. Cl. 61—3 **6 Claims**



1. A means for controlling a sandbar erosion comprising:

a. a feeder line;
b. means for anchoring one end thereof underneath a wave area, the line extending therefrom to an adjacent shore area;
c. means for movably securing the other end thereof to a structure on the adjacent shore;
d. a plurality of porous bags secured to said feeder line each having an open end for receiving sand;
e. the feeder line and bags being progressively movable by wave action into the wave area, the bags progressively receiving moving sand present in the wave area causing the bags to settle to the bottom of the wave area, and resist erosion.

4,000,620

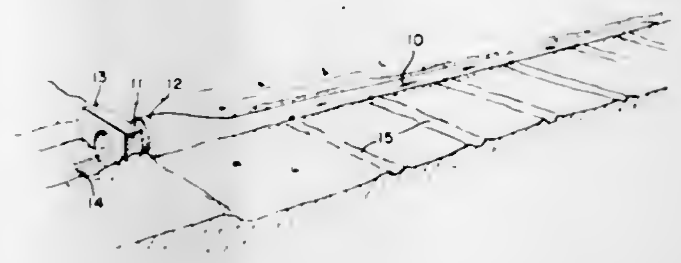
GRAVITATIONAL IRRIGATION SYSTEM AND METHOD OF INSTALLING

Merle M. Burge, Box 1123, Kittitas, Wash. 98934

Filed Nov. 6, 1974, Ser. No. 521,294

Int. Cl.^{2} E02B *13/00*

U.S. Cl. 61—12 **5 Claims**



1. A gravity-flow irrigation system for irrigating a field of arbitrarily spaced furrows, comprising,

water-impervious, flexible, preformed tubing extending along the ground at arbitrary angles with respect to said furrows adjacent the area to be irrigated, one end of the tubing being secured to a source of water and the other end being restricted to control exit of water,

a plurality of longitudinally spaced apertures cut in the tubing after the tubing has been laid along the ground, each of said aperatures being positioned adjacent one of said furrows, and

open-ended, annular, laterally disposed outlet spigots in each of the cut apertures.

4,000,621

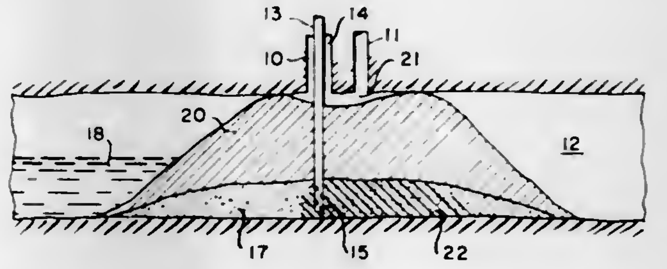
REMOTE SEALING OF MINE PASSAGES CONTAINING FLOWING WATER

Kenneth R. Maser, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,549

Int. Cl.^{2} E02D *3/12*

U.S. Cl. 61—35 **10 Claims**



1. A remote method for constructing a seal in an underground passage through which water is flowing which comprises,

drilling at least one borehole, but no more than two boreholes, from the surface to intersect the passage,

distributing a layer of relatively coarse aggregate over the floor of the passage to a depth sufficient to allow percolation of the flowing water through the aggregate layer without water flow over the top of said layer;

pneumatically injecting a particulate material consisting essentially of fly ash, fly ash admixed with a swelling clay or fly ash admixed with cement down the borehole until said passage is completely filled with the particulate material along a substantial length thereof to form a water impervious plug atop the aggregate layer, and

injecting a cementitious grout into said aggregate layer to seal off water flow through the aggregate.

4,000,622

SHORING STRUCTURE FOR EMBANKMENTS

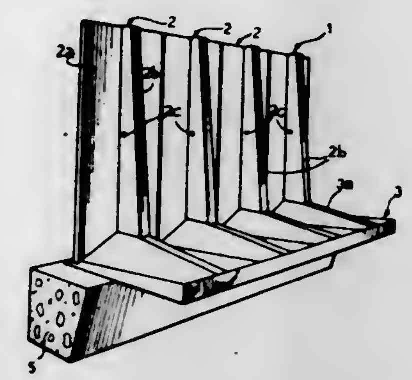
Carlo Chiaves, Piazza Adriano, 6 Turin, Italy

Filed May 14, 1975, Ser. No. 577,369

Claims priority, application Italy, May 20, 1974, 68577/74

Int. Cl.² E02D *5/20*; E04B *1/344*

U.S. Cl. 61—39 **2 Claims**



1. A shoring structure for embankments, of the type comprising a number of substantially vertical prefabricated panels of reinforced concrete arranged side-by-side so as to form a shoring wall, each panel having on its surface which faces the material to be supported, at least one stiffening rib extending substantially from the bottom to the top of each panel, a foundation for said panels, said foundation being cast on site, and a bed of cast reinforced concrete which encloses the lower ends of the panels and anchors the latter to said foundation, said bed being eventually covered by the supported material, wherein the improvement consists in the lower end of each stiffening rib of each prefabricated panel being delimited by an inclined face extending for the whole width of the rib, starting from the bottom of the panel, which inclined face when in place faces the material to be supported; said inclined face forming, in the shoring structure, an angle to the horizontal between 25° and 60°, and reinforcing elements connecting the bed to the respective stiffening rib passing through said inclined face in a direction perpendicular thereto.

4,000,623

ANCHOR ROD FOR WALLS, BULKHEADS AND THE LIKE

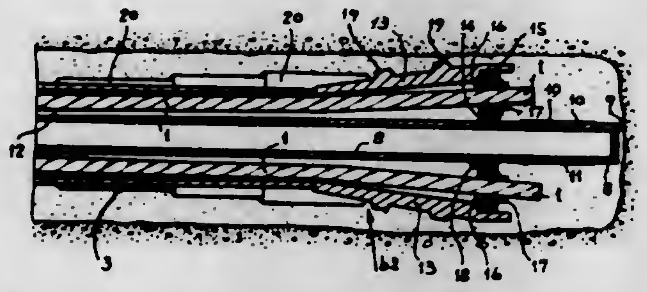
Pietro Meardi, Via Battistotti Sassi, 29, 20133 Milan, Italy

Filed June 2, 1975, Ser. No. 582,785

Claims priority, application Italy, May 31, 1974, 23420/74

Int. Cl.² E02D *5/38*, *5/54*

U.S. Cl. 61—39 **9 Claims**



1. An anchor rod for supporting walls, bulkheads, and the like, and adapted to extend into an elongated hole in the ground and to be anchored in said hole, said rod comprising a central pipe that extends into the hole for feeding cement into the hole, a plurality of cables extending lengthwise of the hole and surrounding said central pipe, a pair of telescoping pipes surrounding said cables, one of said telescoping pipes being disposed adjacent the inner end of the hole and the other adjacent the outer end of the hole, an inflatable plugging sleeve on said other pipe, the ends of said cables within said hole being secured to said one telescoping pipe, said one telescoping pipe carrying a frustoconical element whose small end points in a direction out of the hole, and a headpiece fixed to the wall or the like to be supported, the other ends of said cables being connected to the headpiece for tightening the cables to draw said frusto-conical element in a direction out of the hole thereby to compress cement between said frusto-conical element and the inflatable sleeve.

4,000,624

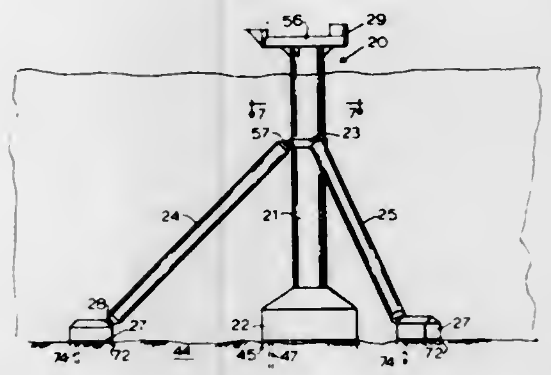
MULTI-COMPONENT OFFSHORE PLATFORM

Philip Y. Chow, Orinda, Calif., assignor to Lin Offshore Engineering, Inc., San Francisco, Calif.

Filed June 10, 1975, Ser. No. 585,501

Int. Cl.² L02B *17/00*

U.S. Cl. 61—88 **15 Claims**



1. A multi-component offshore platform, including in combination:

an inherently self-floatable central column having an enlarged base adapted to rest on the bottom of the sea and having ballast chambers with water inlet means, some of said chambers being close to said base and others distant therefrom, said central column being towed to its site while floating generally horizontally and then upended by ballasting said chambers that are close to said base and then further ballasted by filling chambers distant from said base to sink its base to a final resting site on the bottom of the sea,

a hitch collar slidably arranged around said central column with means for securing it immovably to said column at a desired location on said column, well above said base and well below the top of said column,

at least three inclined legs that are each separately self-floatable for towing to the site and ballastable for sinking, each said leg having a foot member hinged to one extremity thereof, for resting on the bottom of the sea, each said leg being detachably hingedly connected at its other extremity to said hitch collar, and

superstructure secured atop said column and supported solely by said column, said column, in turn, being partly supported to said legs wherein said hitch collar has a plurality of extensions, one for each said leg, each having guide channel means extending upwardly at an angle to said central column, and wherein said hinged connection includes a hinge block slideably mounted in each said guide channel with hinge means rotatably attached thereto and secured to said leg.

4,000,625

METHOD OF COOLING A MOVING STRAND OF HOT MATERIAL

Hugo Beerens, Meerbusch; Hugo Feldmann, Hoengen, and Claus Georg Schlanzke, Ratingen-Tiefenbroich, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

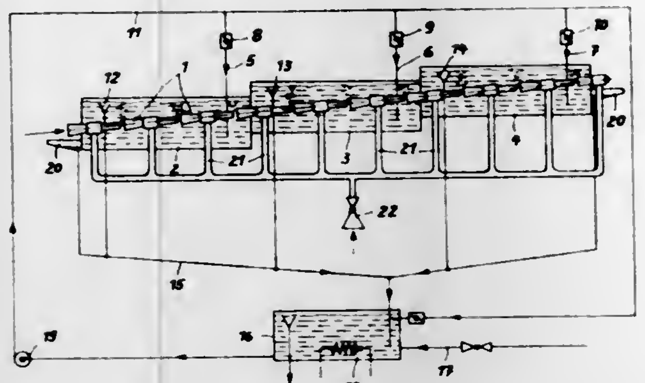
Filed Dec. 3, 1974, Ser. No. 529,233

Claims priority, application Germany, Dec. 7, 1973, 2361042

Int. Cl.² F25D *13/06*

U.S. Cl. 62—63 **5 Claims**

1. In a method of cooling a moving strand of hot material, comprising the steps of: passing the strand through a plurality of aligned cooling tubes in at least one container containing water in which the tubes are immersed; and water-cooling the strand while the strand passes through the tubes, the improvement comprising the step of: expelling at least a part of the water present in the tubes before the leading end of the strand passes through the tubes by blowing air into the tubes.



4,000,626

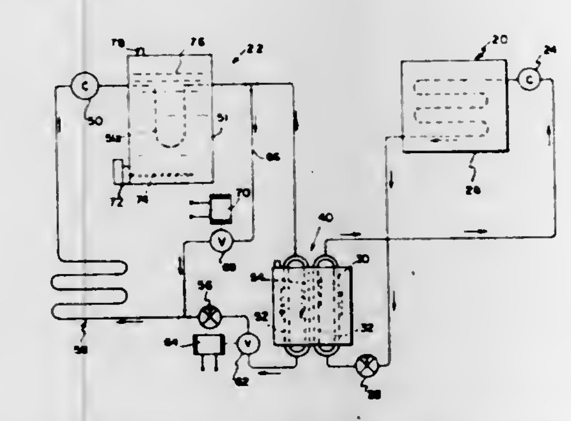
LIQUID CONVECTION FLUID HEAT EXCHANGER FOR REFRIGERATION CIRCUIT

Robert C. Webber, 13 Bay Colony Lane, Ft. Lauderdale, Fla. 33308

Filed Feb. 27, 1975, Ser. No. 553,559

Int. Cl.² F25B *7/00*, *41/00*

U.S. Cl. 62—175 **10 Claims**



1. In a phase-change refrigeration circuit including a compressor, condenser and evaporator and connecting conduit means charged with a phase-change refrigerant, each of said compressor, condenser and evaporator having an output and input, the improvement comprising a heat exchanger, said heat exchanger including container means filled with a liquid convection fluid, said container means enclosing a portion of said circuit such that said convection fluid is in heat-conducting relation to the system refigerant flowing through said portion, said container means being disposed between the compressor output and condenser input to enclose a portion of the conduit means extending therebetween, and additional conduit means providing a connection between the condenser output and compressor input to by-pass said evaporator, a portion of said additional conduit means being enclosed by said container means to have the refrigerant flowing therethrough in heat-conducting relation to said convection fluid, and valve means for controlling the flow of refrigerant through said conduit means and said additional conduit means.

4,000,627

PENDANT JEWEL CHAIN

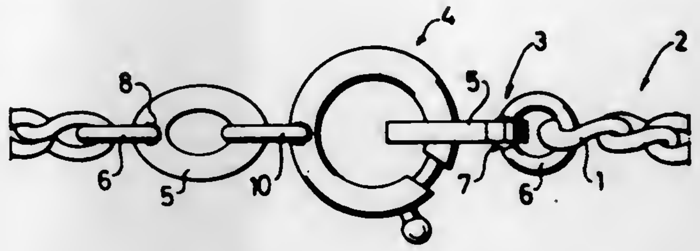
Hans Gustav Erik Wahlbeck, Nybble, 150 32, Stallarholmen, Sweden

Filed Nov. 11, 1974, Ser. No. 522,876

Claims priority, application Sweden, Nov. 16, 1973, 7315541; Jan. 24, 1974, 7400918

Int. Cl.² A44C *25/00*

U.S. Cl. 63—2 **2 Claims**



1. A pendant jewel chain comprising a link chain part, a connection means mounted thereto at at least one end thereof; and an openable clasp means for providing opening and closure of said pendant jewel chain, characterized in that said connection means is composed of two parts and comprises a first, relatively large control mark loop part connected to the clasp means and a second, connection ring part which forms a unit with the control mark loop part and which is small enough to be connected to the outermost chain link, one end of said connection ring part being rigidly connected to said control mark loop part and another end of said connection ring part being separate from said control mark loop part but in proximate relationship thereto so as to complete the connection ring part through an open connection which permits deflection of said another end of said connection ring part when the forces in tension on said chain part exceed the level which is less than the critical forces required to break the chain part to thereby provide release of said chain part from said connection means, said control loop part including parallel planar side surfaces, one end of said connection ring part projecting from one of said planar side surfaces of said control mark loop part and the opposite end of said connection ring part being disposed adjacent to the opposite planar surface of said control mark loop part.

4,000,628

DEVICE FOR FIXING A BEARING CUP IN A HOOKE'S TYPE UNIVERSAL JOINT

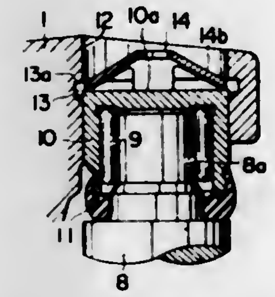
Kiyoshi Funatani, Nagoya; Ryosuke Ozaki, and Kazuhiro Mizuno, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 15, 1974, Ser. No. 514,908

Claims priority, application Japan, June 5, 1974, 49-62811

Int. Cl.² F16D *3/26*

U.S. Cl. 64—17 A **2 Claims**



1. A universal joint assembly comprising, in combination, a pair of pivotally interconnected bifurcated yoke members, joint means including a cruciform spider and needle bearings operatively engaged thereabout interconnecting said yoke members, a bearing cup including a closed end wall enclosing said spider and needle bearings, wall means in one of said yoke

members defining a receiving hole therein for enabling insertion into said joint means of said bearing cup, an annular recess formed in said wall means adjacent said closed end wall of said bearing cup, and a fixing plate extending across said closed end wall and engaged within said recess means to hold said bearing cup in place within said assembly, said fixing plate consisting essentially of a resilient member shaped to enable said member to be deformed with a spring-like snap action between a truncated conical configuration and a flat planar configuration, said fixing plate comprising an inner smaller diameter portion having means defining a central opening extending through said inner smaller diameter portion and a plurality of radial legs extending in a straight linear configuration radially outwardly from said inner smaller diameter portion and including radially outermost ends extending into engagement within said annular recess, each of said radial legs comprising an arcuate cross-sectional configuration to provide a resilient mounting force between said bearing cup and said yoke member when said radially outermost ends of said arcuate radial legs are engaged within said annular recess to hold said bearing cup in place.

4,000,629

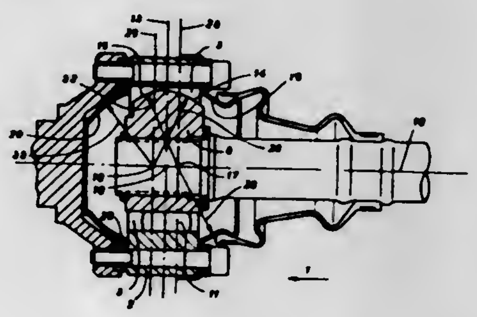
HOMOKINETIC JOINT

Andrea Bellomo, Str. S.Anna 82/6, Torino, Italy 10131

Filed July 11, 1975, Ser. No. 595,012

Int. Cl.^{2} F16D *3/30*

U.S. Cl. 64—21 **5 Claims**



1. A homokinetic universal joint comprising an inner element, an outer element and an even number of driving balls, each ball being engaged and guided solely by two opposite grooves symmetrically crossing on the bisector plane of the angle between the axes of the shafts connected by the joint, one groove formed on the inner element and the other groove on the outer element, characterized by the fact that portions of two spherical surfaces (14, 15) are formed on the ends of the inner element with their spherical centers (16, 17) on the axis of the inner element, each spaced towards the opposite spherical surface, and two cups are connected to the ends of the outer element, portions of two spherical surfaces (19, 20) being formed on the said cups with their spherical centers (17, 16) on the axis of the outer element, each spaced towards the respective cup, the axial relative sliding of the two elements being limited by the contact and the mating of the said spherical surfaces formed on the inner element with the said spherical surfaces formed on the cups connected to the outer element.

4,000,630

SEAMLESS PANTY HOSE AND METHOD

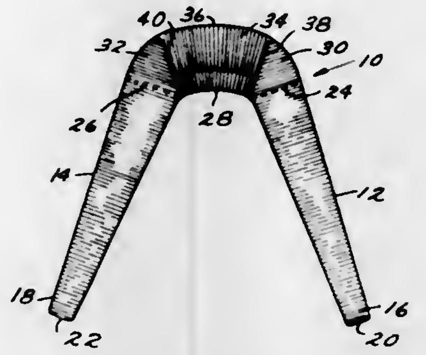
Walter H. Imboden, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 22, 1973, Ser. No. 362,923

Int. Cl.^{2} A41B *9/00, 11/00*

U.S. Cl. 66—177 **10 Claims**

1. In a seamless lower body garment comprising a pair of seamless tubular legs and a rotary knitted tubular body portion knit so as to extend between said legs and defining a crotch area therebetween, said body portion including a walewise slit along at least a portion thereof so as to define a waist opening opposite said crotch area, the improvement comprising reciprocatorily knitted fashioned portions between each of said two leg portions and said body portion, wherein one of said fashioned portions is formed solely of narrowed partial courses and the other of said fashioned portions is formed solely of widened partial courses.



4,000,631

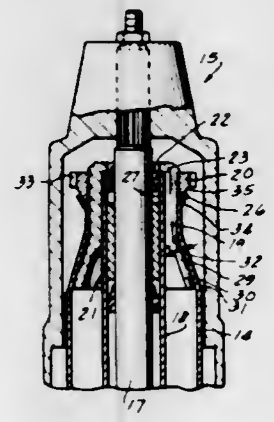
RECEPTACLE DRIVE COUPLING FOR AN AUTOMATIC WASHER

Reinhold Alvin Drews, and Frank Robert Burgener, Jr., both of Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 30, 1975, Ser. No. 545,261

Int. Cl.^{2} D06F *23/04*

U.S. Cl. 68—23.7 **8 Claims**



2. In an automatic washing machine of the vertical axis type, the improvement of a receptacle coupling device, comprising

a cylindrical drive body having an axis, an upper part, a flared lower part, and a projecting, circumferentially-extending contact surface about the outer periphery of said flared lower part, and

a hollow receptacle center post outwardly flared downwardly below its top to correspond to the flare of said lower part of said drive body,

to facilitate accurate alignment of the receptacle center post with respect to said axis of said drive body.

4,000,632

LOCKING GAS CAP

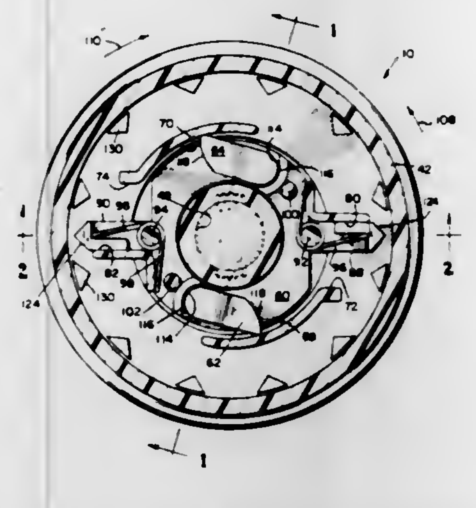
Dennis J. Summan, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Aug. 4, 1975, Ser. No. 601,264

Int. Cl.^{2} B65D *55/14*

U.S. Cl. 70—165 **8 Claims**

1. A threaded cap for a threaded filler neck, said cap comprising a closure member threaded to engage and close said filler neck and an outer shell member mounted on said closure member to provide a hand grip, in which the improvement comprises means for connecting said outer shell member for rotation on said closure member, and means for establishing a driving connection between said members, said driving connection means including a plurality of peripherally spaced apart abutments rigidly attached to one of said members and at least one drive finger attached to the other of said members for movement between a first position which engages said abutments and a second position out of engagement with said abutments, means for yieldably urging said drive finger to said first position, a first rigid stop for preventing movement of said finger away from said first position when said shell member is rotated in one direction to advance said closure member onto the filler neck, said rigid stop being stationary with respect to said shell member, second stop means including a stop cam movable into an operative position for preventing movement of said finger away from said first position when said shell member is rotated in the opposite direction, and lock means for moving said second stop means to said operative position to permit removal of said cap, said lock means being operatively connected to said second stop means.



4,000,633

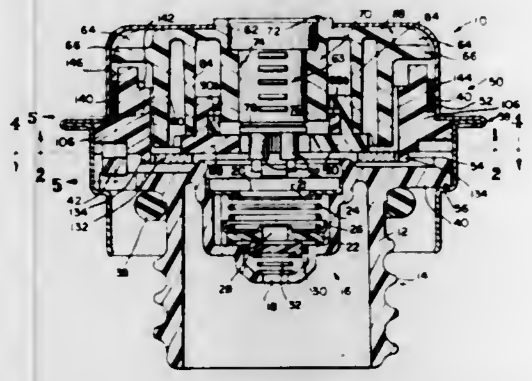
LOCKING GAS CAP WITH TORQUE OVERRIDE FEATURE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sept. 8, 1975, Ser. No. 611,219

Int. Cl.^{2} B65D *51/16, 55/14*

U.S. Cl. 70—165 **17 Claims**



1. A locking gas cap for a threaded filler neck having an axis and a sealing lip extending peripherally about said axis, said cap comprising a closure member threaded to engage and close said filler neck, gasket means on said closure member for engaging and sealing against said lip, an outer shell providing a hand grip secured to said closure member for rotation thereon about said axis, a key-operated lock and at least one locking member moved by said lock, said lock and locking member being connected to said shell for rotation therewith, in which the improvement comprises a race disposed for rotation in said shell, means for drivingly connecting said race and said closure member for rotation together about said axis, said connecting means being torque limited in the direction which advances said closure member on said filler neck to protect said gasket means against overtightening and positive in the opposite direction to permit removal of said cap from said filler neck, said locking member being movable into and out of engagement with said race selectively to provide a driving connection between said shell and said race.

4,000,634

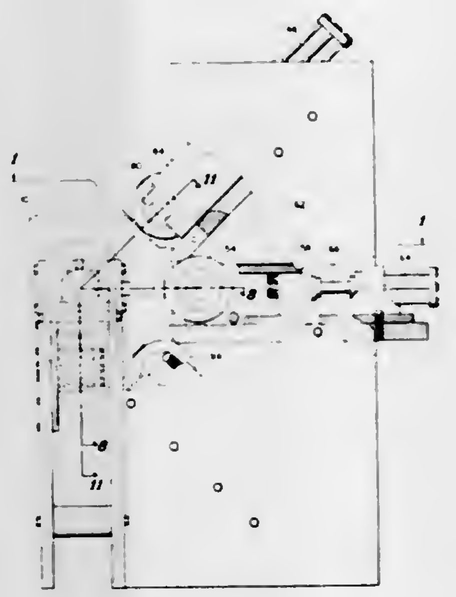
METHOD AND APPARATUS FOR FORMING A SHEAVE FROM A FLAT DISC OF METAL

Claude M. Hixson, Tulsa, Okla., assignor to Don R. Hinderliter, Inc., Tulsa, Okla.

Filed May 5, 1975, Ser. No. 574,592

Int. Cl.^{2} B21H *1/04*

U.S. Cl. 72—69 **10 Claims**



1. Apparatus for forming a flat circular disc of metal into a sheave having an annular peripheral groove for receiving a wire line therein, the size and shape of said groove corresponding to the diameter of said wire line, said disc having two flat side portions separated by the width of said disc and having an outer diameter slightly larger than the outer diameter of the sheave to be produced; comprising a pair of rotatable holding members for engaging said disc therebetween, said rotatable holding members engaging said disc adjacent the center thereof with the periphery of said disc extending outwardly beyond said holding members, means for rotating said holders and said disc about a given horizontal axis, a rotatable forming roller rotatable on an axis substantially parallel with said given horizontal axis and movable in a direction substantially at right angles to said given horizontal axis and into contact with the outer periphery of said disc, the portion of said forming roller contacting said disc having a convex shape corresponding to the size and shape of the groove desired for the wire line and contacting said disc on the outer periphery thereof at a position substantially equidistant from the flat side portions of said disc, means for heating the flat side portions of said disc adjacent said periphery, means for urging said roller continuously against said periphery of said disc during the heating thereof until said roller forms said groove in the periphery of said disc.

4,000,635

STRIP DEFLECTOR UNIT

Werner W. Eibe, McCandless Township, Allegheny County, PA, assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

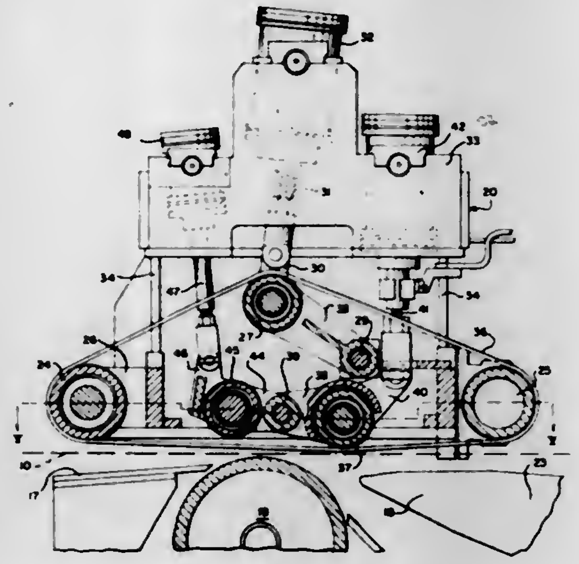
Filed Mar. 18, 1976, Ser. No. 668,059

Int. Cl.^{2} B21C *47/04, 47/14*

U.S. Cl. 72—148 **11 Claims**

1. Apparatus for directing traveling metal strip along a pass

line with respect to a downcoiler comprising a deflector roll positioned below the pass line of the strip tangent thereto, a pair of belt training rolls positioned above the pass line and spaced therefrom, the first belt training roll being positioned in advance of the deflector roll and the second belt training roll being positioned on the exit side of the deflector roll, a belt trained around the first and second belt training rolls in a loop and having a lower flight extending between the first and second belt training rolls, means for tensioning the belt, a persuader roll positioned within the belt loop intermediate the deflector roll and the second belt training roll, said persuader roll being mounted for vertical movement, means for causing the belt to travel around the belt training rolls, means for rotating the deflector roll, and means for moving the persuader roll downwardly to depress below the pass line and around a portion of the deflector roll surface the lower flight of the belt trained around that roll, thereby imparting a downward curl to the leading end of strip passing thereunder and over the deflector roll so as to direct it into the downcoiler.



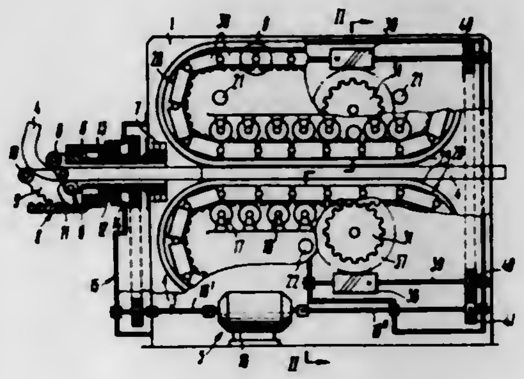
4,000,636
PIPE BENDING MACHINE

Vladimir Nikolaevich Shubin, Pervomaiskaya ulitsa, 1, kv. 103; Viktor Sergeevich Silantiev, Kastanaevskaya ulitsa, 57, korpus 1, kv. 58; Alexandr Sergeevich Khlyntsev, Kolenchataya ulitsa, 4a, kv. 8; Antonina Petrovna Barsova, Sheremetievskaya ulitsa, 67, korpus 2, kv. 5, and Galina Alexeevna Rodionova, 5 Parkovaya ulitsa, 40, korpus 1, kv. 65, all of Moscow, U.S.S.R.

Filed May 1, 1975, Ser. No. 573,404

Int. Cl.² B21D *7/024*

U.S. Cl. 72—173 **8 Claims**



1. A pipe bending machine comprising a bed plate; a bending head mounted on said bed plate; a mechanism for feeding pipes to be treated into said bending head, with said mechanism installed on said bed plate; a drive serving to actuate said bending head and said feeding mechanism, with said drive installed on said bed plate; two parallel rows of rollers of said feeding mechanism arranged symmetrically relative to the axis of the pipe being treated; two cages, each incorporating one of said rows of rollers, with the first said cage rigidly fixed to said bed plate and with the second said cage installed on said bed plate, allowed to turn in the plane normal to the axis of said rollers and spring-loaded in the direction toward said first cage; two closed-loop hauling chains, each embracing the rollers of one of said rows in assembly with said cage, with each said hauling chain provided on the inner side for coupling with said drive used to displace said chain toward said bending head; and two closedloop strips made of elastic friction material, each strip being formed of two belts which cooperate to clamp the pipe, each strip being provided on the outside of one of said hauling chains, and with the pipe clamped in the gap between said chains which feed said pipe into the bending head when said chains are displaced.

4,000,637
ROLLING MILLS

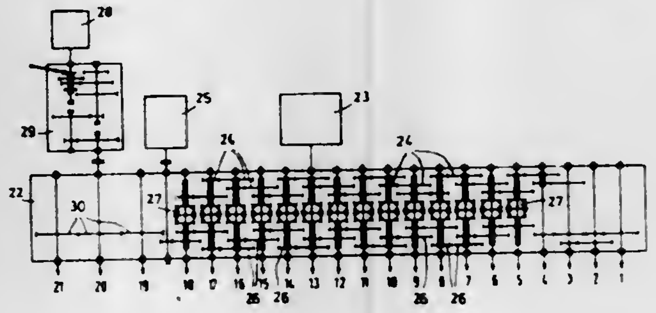
Hans-Dieter Gerhards, Solingen-Grafrath, and Hermann Möltner, Dusseldorf-Oberkassel, all of Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany

Filed Apr. 16, 1976, Ser. No. 677,662

Claims priority, application Germany, Apr. 21, 1975, 2517536

Int. Cl.² B21B *17/00, 23/00*

U.S. Cl. 72—226 **10 Claims**



1. A stretch-reducing rolling mill for optionally producing tubes having a final circular or angular cross-sectional configuration, comprising a plurality of driven roll stands arranged in stand holders one behind the other in the rolling direction, said roll stands and holders being divided into a first and a second group in which rolling mill the second stand holders are last in the rolling directions and are spaced sufficiently apart for them to be selectively equipped with three-roller or four-roller stands, and in which the first or front stand holders cannot be selectively so equipped but are equipped exclusively with three-roller stands, said front stand holders being spaced at distances apart too close for four-roller stands but adapted to the three-roller stands, said front holders being provided with a group drive, and said last stand holders, which may be equipped selectively with three-roller or four-roller stands, being provided with a separate drive independent of the group drive of the front stand holders.

4,000,638
PLATE MILL FINISHING STAND ROLL LATCH RING

McKinley B. Thomas, Orem, Utah, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,932

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B21B *31/08*

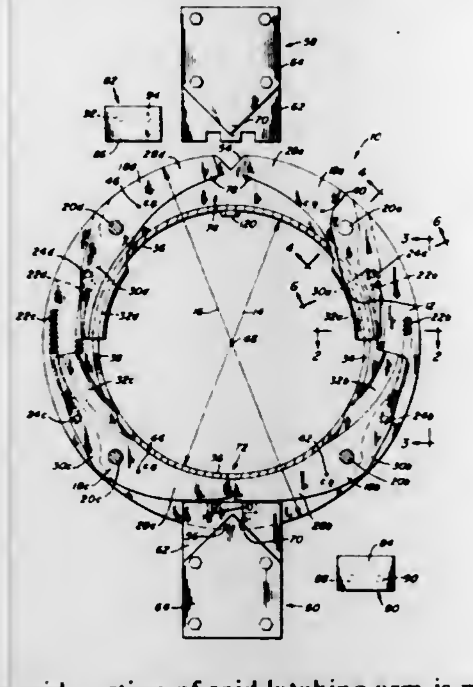
U.S. Cl. 72—238 **9 Claims**

1. A latch ring chock retainer assembly for a roll having a circumferal groove formed therein, said latch ring assembly comprising:

a housing including means defining an aperture formed through the center thereof, said aperture having a diameter such that said housing is capable of fitting over an end of such roll;

a plurality of latching arms mounted to said housing, said latching arms being movable between a latched position, in which a portion of said latching arm engages such circumferal groove in such roll, and an unlatched position in which said portion of said latching arm is moved out of engagement with such roll groove; and

means for biasing said latching arms toward their said latched positions.



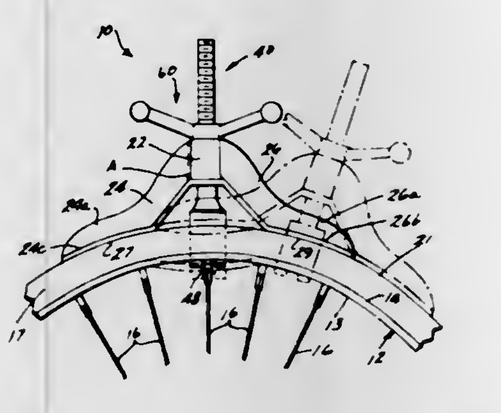
4,000,639
TOOL AND METHOD FOR TRUEING WHEEL RIMS

Leonard F. Postema, 2785 Northville Drive NE., Grand Rapids, Mich. 49505

Filed Apr. 8, 1975, Ser. No. 566,051

Int. Cl.² B21D *3/10*

U.S. Cl. 72—316 **26 Claims**



1. A tool for trueing circular and other curvilinear rims such as wheel rims, such rims being generally of the type including inside and outside circumferential surfaces, said tool comprising extending means for engaging generally the inside circumferential surface of a damaged, bent area of such a rim when said tool is mounted on such a rim; support means for supporting at least a portion of the rim adjacent the damaged, bent area of the rim, said support means including contact means for engaging a portion of generally the outer circumferential surface of at least one of a rim and any tire supported on the outer circumference of such a rim; and position changing means for moving at least a portion of at least one of said exchanging means and support means relative to the other whereby said damaged, bent area is trued with respect to the supported area of the rim; said extending means including a rim engaging portion having aperture means therethrough for receiving a spoke of a wheel rim such that said rim engaging portion will simultaneously engage the inside circumferential surface of a wheel rim on either side of the spoke.

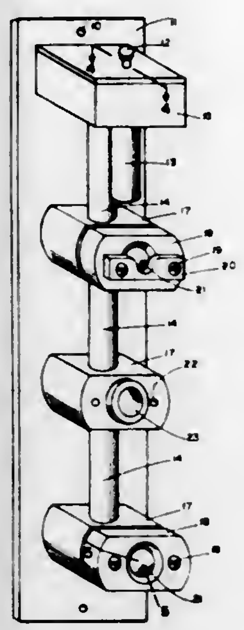
4,000,640
TONOMETER TESTER

Donald Orrie Kocmich, Hillsborough, Calif., assignor to Opti Products Incorporated, Reno, Nev.

Filed Aug. 8, 1975, Ser. No. 603,192

Int. Cl.² G01L *25/00*

U.S. Cl. 73—1 B **1 Claim**



1. A device to provide multiple simultaneously known pressures and multiple pressurized test surfaces for the measurement of force comprising a vertical liquid filled column, a reservoir mounted on top of said column, means for providing a constant liquid level in said reservoir, multiple spaced housings, along the length of said column, each said housing having an internal cavity in fluid communication with said column and a flexible membrane lining at least a portion of said cavity, and having an exposed surface whereby said membrane, when subject to liquid pressure when within said cavity, forms a bulbous shape approximating the contour of the cornea of the human eye.

4,000,641
FRICTION MEASURING APPARATUS

William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1975, Ser. No. 573,994

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G01N *19/02*

U.S. Cl. 73—9 **5 Claims**

1. An apparatus for measuring friction between a yarn and a cylindrical surface comprising:

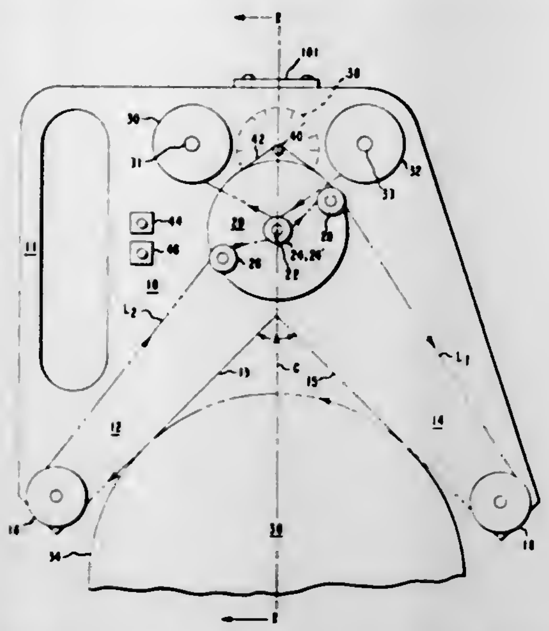
a frame having two arms extending outwardly at a fixed included angle from a common central location on a line bisecting the angle, said arms each having an inner surface for resting on said cylindrical surface;

a pulley rotatably mounted at the end of each of said arms, each pulley having a peripheral surface tangent to said inner surface of its associated arm;

a disc rotatably mounted at its center on a fixed pivot on said frame at a location above said arms on said line bisecting said angle, said disc having at least one yarn pulley rotatably mounted thereon at said pivot and two other yarn pulleys mounted rotatably thereon near the periphery of said disc, said two other yarn pulleys being separated by substantially one-half the circumference of said disc;

two driven yarn supply reels mounted on said frame above said fixed pivot on opposite sides of said line bisecting said angle;

means for driving said reels; and



means for sensing the angular position of said disc with respect to said frame when yarn is passed across said cylindrical surface in a prescribed path around said pulleys from one supply reel to the other.

4,000,642
PROCESS AND DEVICE FOR TESTING THE THERMOSTABILITY OF SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

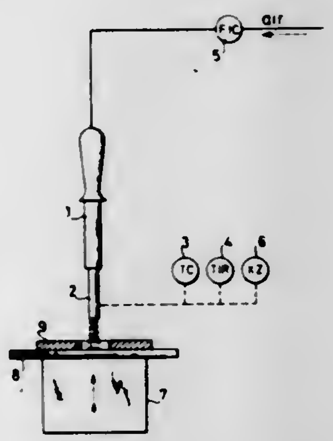
Hans Vowinkel, Florsheim, (Main), and Hans Röber, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 24, 1975, Ser. No. 598,627

Claims priority, application Germany, July 26, 1974, 2435999

Int. Cl.² G01N *25/00*

U.S. Cl. 73—15 R **4 Claims**



1. A process for testing the thermostability of shaped articles of thermoplastic material which comprises blowing a focused jet of hot gas at a temperature of 200° to 500° C. onto the surface of a shaped article and determining the time that elapses before the surface is visibly altered by the hot gas, said gas jet being delivered from a cylindrical nozzle having a diameter of from 2 to 10 mm. at a flow rate of 10 to 100 liters per minute.

4,000,643
APPARATUS FOR PRODUCING A COMPENSATING VOLTAGE

Robert P. Pearson, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1976, Ser. No. 671,650

Int. Cl.² G01B *7/00*; G01L *9/00*

U.S. Cl. 73—88.5 R **9 Claims**

1. Apparatus for producing a compensating voltage in response to changes in a parameter comprising in combination:

a first operational amplifier comprising a first non-inverting input, a first inverting input, and a first output;

means responsive to a parameter for producing an output voltage indicative of changes in the parameter;

connection means for applying said output voltage to said first inverting input;

means connecting said first non-inverting input to a current sink having a predetermined voltage;

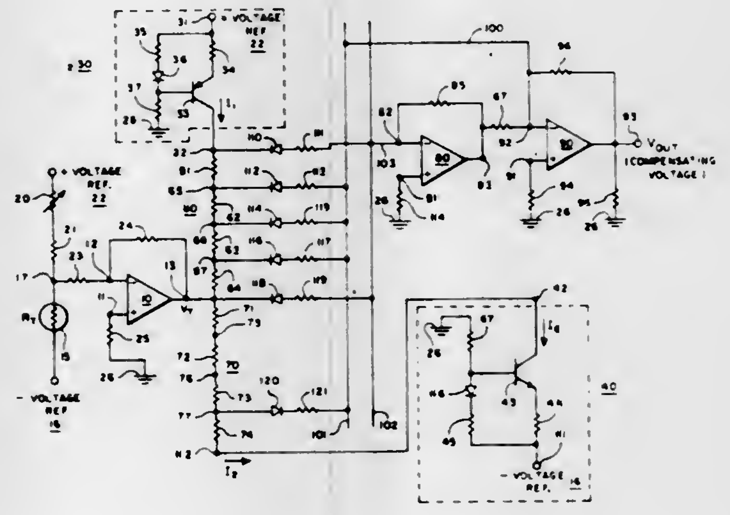
a first source of constant current having an input and an output;

a first plurality of series connected resistors, junctions being defined between said resistors;

means connecting said first plurality of resistors between said output of said first source of constant current and said first output, said first source of constant current having a reference voltage applied to the input thereof so that the constant current output thereof flows from the output of said first source toward said first output,

a second source of constant current having an input and an output;

a second plurality of series connected resistors, junctions being defined between said resistors;



means connecting said second plurality of said resistors between said first output and said output of said second source of constant current, said second source of constant current having a reference voltage applied to the input thereof so that the constant current output thereof flows from said first output toward said output of said second source;

a second operational amplifier comprising a second non-inverting input, a second inverting input and a second output;

a third operational amplifier comprising a third non-inverting input, a third inverting input, and a third output;

resistance means connecting said second output to said third inverting input;

resistance means connecting said second output to said second inverting input;

resistance means connected between said third output and said third inverting input;

a resistor and a diode connected in series between said second inverting input and one of said junctions;

a resistor and a diode connected in series between said third inverting input and another of said junctions; and

means connecting said second and third noninverting inputs to said current sink.

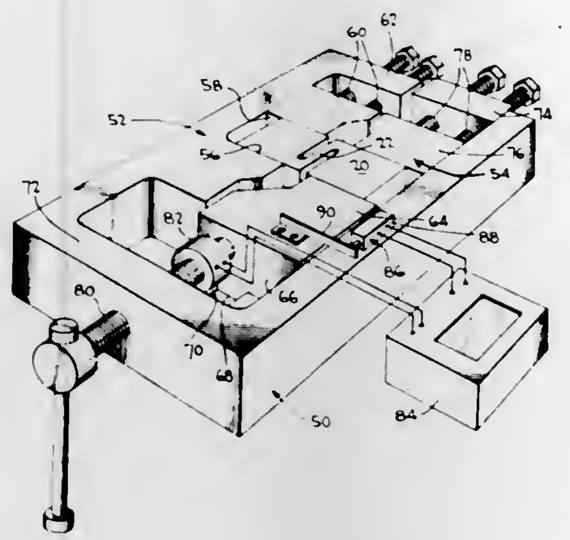
4,000,644
METHOD AND APPARATUS FOR TESTING TENSILE PROPERTIES

Edgar D. Oppenheimer, 527 Shore Acres Drive, Mamaroneck, N.Y. 10543

Filed Aug. 20, 1975, Ser. No. 605,986

Int. Cl.² G01N *3/08*

U.S. Cl. 73—95 **11 Claims**



1. A method of testing the tensile properties of a metal body in the short transverse direction comprising the steps of

cutting a specimen bar from the metal body;

forming a single ligament extending in the short transverse direction of the specimen bar by forming a first slot in one surface of the specimen bar and forming a second slot in the opposite surface of the specimen bar;

clamping the slotted specimen bar on one side of the ligament with a stationary clamp positioned outwardly adjacent to said first slot and against the surface in which the first slot is formed so as to apply a force against said surface outwardly of the first slot;

clamping the slotted specimen bar on the opposite side of the ligament with a movable clamp positioned outwardly adjacent to said second slot and against said opposite surface in which the second slot is formed so as to apply a force against said opposite surface outwardly of the second slot; and

applying a force to the movable clamp relative to the stationary clamp to elongate the single ligament.

7. Apparatus for testing the tensile properties of a specimen of metal plate having first and second sides separated by a ligament having a slot on one side and a slot on the opposite side of said ligament comprising

a fixture including stationary clamp means for gripping the specimen adjacent one of the slots for holding the first side of the specimen stationary;

movable clamp means movably associated with said fixture relative to said stationary clamp means for gripping the second side of the specimen adjacent to the other of said slots;

force applying means for applying a force to said movable clamp means to move said movable clamp means relative to said stationary clamp means and elongate the ligament of the specimen; and means for measuring the force applied by said force applying means and the displacement of said movable clamp means relative to said stationary clamp means.

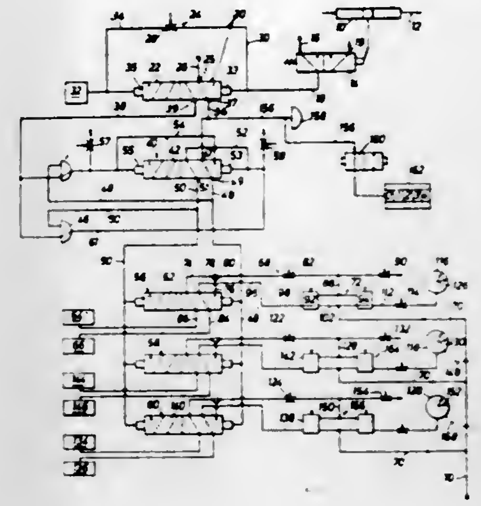
4,000,645
APPARATUS FOR PNEUMATICALLY MONITORING CONDITIONS OF A WELL CIRCULATING SYSTEM

Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Co., Houston, Tex.

Filed June 6, 1975, Ser. No. 584,613

Int. Cl.² E21B *47/10*

U.S. Cl. 73—155 **26 Claims**



6. Pneumatic apparatus for producing pneumatic signals having equal on and off times which are representative of a first on-off pneumatic signal having equal periods composed of unequal on and off times, comprising:

a repeater valve assembly adapted for receiving said first pneumatic signal and generating in response thereto a pair of substantially similar pneumatic signals; and

a frequency divider connected to said repeater assembly, for converting said pair of substantially similar pneumatic signals into a second pair of pneumatic signals, said second pair of pneumatic signals haivng equal on and off times.

4,000,646
WAVE HEIGHT MEASURING DEVICE

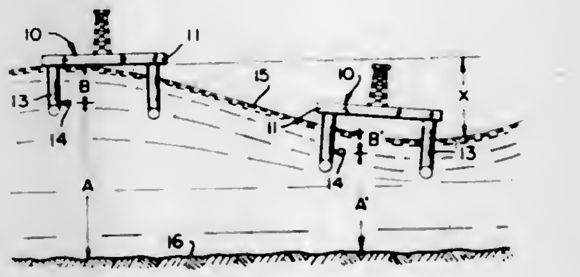
George Edward Mott, and Robert Lee Skaggs, both of Metairie, La., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 248,995, May 1, 1972, Pat. No. 3,910,111. This application July 14, 1975, Ser. No. 595,454

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.² G01B *17/00*

U.S. Cl. 73—170 A **2 Claims**



1. Method for measuring wave height in a body of water from a marine structure floatably positioned in said body of water and subjected to vertical heaving resulting from movement of said water, said method comprising the steps of:

measuring a first distance between a reference point on said floating structure and the floor of said body of water,

simultaneously measuring a second distance between said reference point to the interface of the water and the atmosphere above said reference point,

repeating the above steps when said structure is at the crest and trough respectively of a wave to be measured.

correlating the distances obtained when the structure is at the wave trough and crest whereby to determine the height of said wave and the period of time which elapses between successive wave height measurements whereby to establish the period of time which occurs between successive waves.

4,000,647
HEATING DEVICE FOR FLOW SONDES

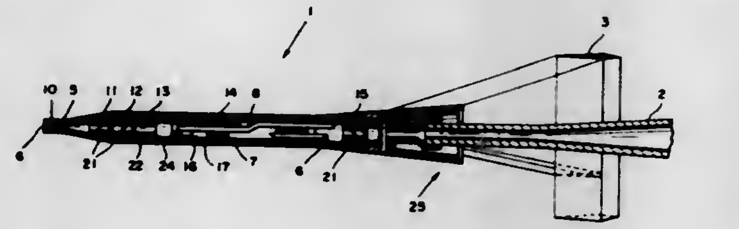
Reinhard Tauchmann, Steinebach, Germany, assignor to Dornier GmbH, Germany

Filed June 29, 1972, Ser. No. 267,500

Claims priority, application Germany, July 31, 1971, 2138495

Int. Cl.² G01F *21/00, 1/46*

U.S. Cl. 73—181 **1 Claim**



1. In a flow sonde particularly for measuring aerodynamic values in aircraft such as the total pressure, the static pressure, and the total temperature,

the improvement which comprises a plurality of thermally controlled resistor means in the sonde body, said means having a low increase of resistance within a specific temperature range below the Curie temperature and a high increase of resistance in an adjacent range above the Curie temperature,

said resistor means having an annular configuration and resting with the circumferential surface area thereof against the inner wall of said sonde body at points subject to ice deposits, and being electrically connected in parallel,

whereby there is obtained a high heating power at low ambient temperature and a limitation of the power absorption when a predetermined temperature is reached.

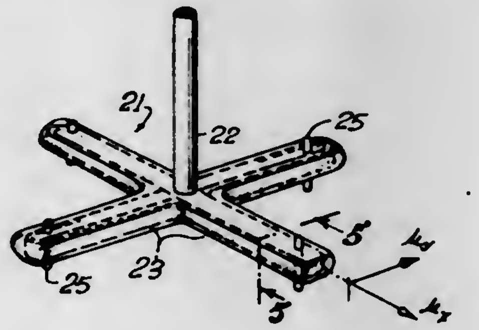
4,000,648
HIGH SENSITIVITY FLOWMETER

Jack R. Olson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,304

Int. Cl.² G01F *1/58*

U.S. Cl. 73—189 **13 Claims**



1. An oceanographic flow sensor of the electromagnetic type comprising:

elongated conductive coil means having a major and a minor axis, relatively configured for defining a relatively small central area for creating a magnetic field therein in response to electrical currents flowing in said conductive coil means having a field strength of approximately five times the strength of a circular coil of the same diameter as the major axis;

spaced electrode means located within said small central area and configured and structurally adapted to interact with ocean currents for effectively sensing fluid flow thereacross;

encasing means enclosing said elongated conductive coil means for providing a protective cover therefor and for supporting said spaced electrode means in a fixed position with respect to said elongated conductive coil means and making a unitary assembly therewith; and

support means effectively connected to said encasing means for positioning said elongated conductive coil means and spaced electrode means assembly in a predetermined spatial relationship within the oceanographic environment.

4,000,649
URINE METERING AND COLLECTION SYSTEM

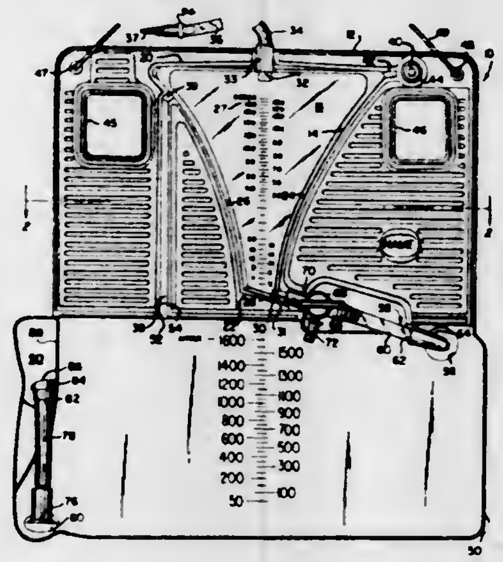
Paul Hanifl, Warwick, R.I., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 387,011, Aug. 9, 1973, Pat. No. 3,961,529. This application June 23, 1975, Ser. No. 589,581

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² A61B *5/00;* G01F *11/28*

U.S. Cl. 73—219 **7 Claims**



1. A urine metering and collection system comprising:

a. a stiff head member including a closed volume calibrated chamber having a substantially flat front wall, a substantially flat rear wall, a top wall, and first and second sidewalls, at least a section of one of said walls having volumetric calibrations thereon, said one of said walls having the calibrations thereon or adjacent thereto being transparent, the sidewalls continuously converging downwardly towards each other throughout at least a major portion of the length of chamber, such that each horizontal section of the chamber within said major portion is substantially rectangular and has a smaller volume per unit of height than does the next adjacent upper horizontal section of the chamber, an outlet passageway at the bottom of said chamber, an inlet passageway communicating with the chamber adjacent to the top of the chamber, and an overflow passageway having one end in fluid-flow communication with said chamber adjacent to the top thereof;

b. an inlet tube attached at one end to said head member and in fluid-flow communication with said inlet passageway, the other end of said inlet tube being adapted for connection to a catheter; and

c. a collection bag fixedly secured to the head member below said chamber and having a first opening in fluid-flow communication with the other end of said overflow passageway, and a second opening in fluid-flow communication with said outlet passageway.

said head member being formed of two unitary plastic sheets molded to form said chamber, said outlet passageway, and said overflow passageway, said sheets being sealed together along the perimeter thereof, along the periphery of the chamber, along the length of said overflow, and along the periphery of the outlet passageway, said overflow passageway being formed as an integral part of the head member.

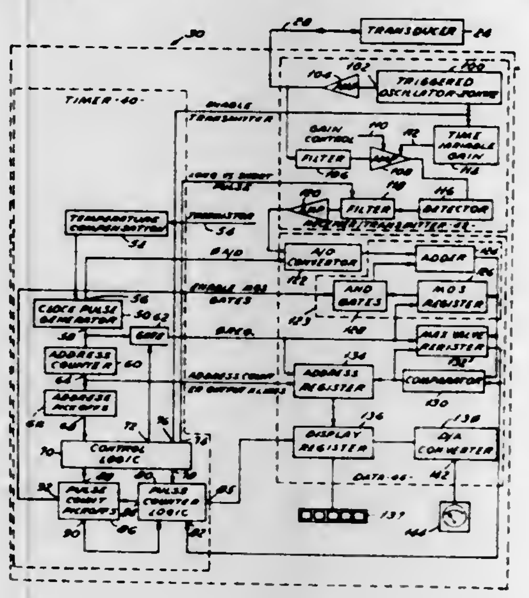
4,000,650
METHOD AND APPARATUS FOR ULTRASONIC MATERIAL LEVEL MEASUREMENT

Ellery P. Snyder, Norwalk, Conn., assignor to Bindicator Company, Port Huron, Mich.

Filed Mar. 20, 1975, Ser. No. 560,244

Int. Cl.² G01F *23/28*

U.S. Cl. 73—290 V **46 Claims**



1. In a control system for use in monitoring the level of material in a storage tank, the combination comprising,

transducer means directing ultrasonic pulses toward and receiving echo response pulses reflected from the upper surface of said material,

means operatively connected to said transducer means to sample said echo response pulses at preselected intervals which are a function of distance,

means converting each of said sampled response pulses to digital signals having a numerical value indicative of the intensity of each said echo pulse relative to one another,

means integrating said sampled and digitizesd response pulses from successively transmitted pulses over a preselected pulse sequence according to apparent distance of said transducer means from said material surface,

means storing said integrated response pulses serially according to apparent distance, and

means monitoring said integrated pulses to provide an indication of actual distance, which is a function of material level, upon completion of said pulse sequence.

4,000,651
LIQUID LEVEL INDICATOR

Frank Christiansen, Oslo, Norway, assignor to Norapp A/S, Oslo, Norway

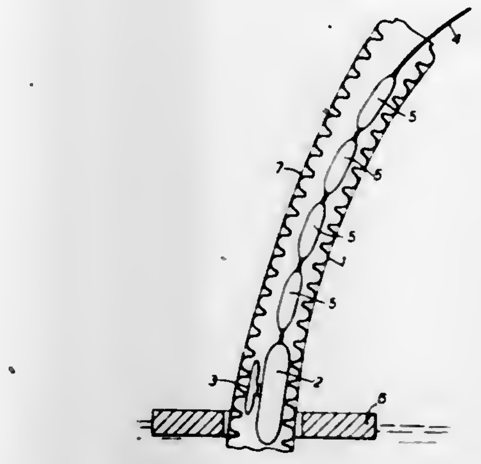
Filed Jan. 15, 1976, Ser. No. 649,353

Claims priority, application Norway, Jan. 20, 1975, 165/75

Int. Cl.² G01F *23/12*

U.S. Cl. 73—314 **4 Claims**

1. Liquid level indicator which comprises a float which is movable along the exterior of a tube which extends substantially vertically in the liquid container, and within which tube is movable up and down a sensor which reacts magnetically on the float and thereby controls the direction of rotation of an electric motor exterior the liquid container, for moving the sensor by means of a rigid flexible metal band which is perforated in the longitudinal direction and coated with an electrically insulating material and acts as one electric conductor between the sensor and the control means for the motor.



characterized in that the tube is a flexible metal tube with a bellowslike wall the interior side of which by means of a sliding contact on the sensor, acts as the second electric conductor between the sensor and the control means.

4,000,652
METHOD AND DEVICE FOR MEASURING THE CORRECTION FACTOR

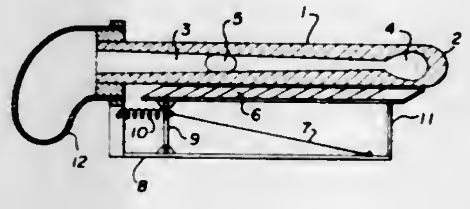
Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

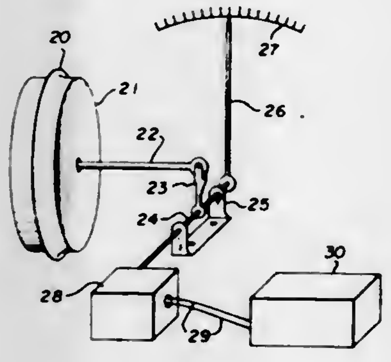
Filed May 4, 1973, Ser. No. 357,492

Claims priority, application Sweden, May 10, 1972, 6173/72

Int. Cl.² G01N *9/26*

U.S. Cl. 73—336 **2 Claims**





1. A device for measuring a correction factor for the velocity of electromagnetic radiation in air; said device including:

a pressure responsive vessel having a gas-tight chamber therein and an outer surface for providing an enclosed volume in said gas-type chamber whose size changes in response to the pressure of gas in said gas-tight chamber and on said outer surface;

a predetermined quantity of gas sealed into said gas-tight chamber; said pressure responsive vessel including thermal conductor means for varying the temperature of said predetermined quantity of gas in response to the temperature of said outer surface;

means for sensing the size of said enclosed volume to provide a measurement of said correction factor;

the device being characterized in that said pressure-responsive vessel includes a tube having a hollow therein, sealed at one end, and said predetermined volume of gas is shut in said hollow by a liquid drop arranged in said hollow;

the hollow has a conical shape, so that the cross-section of the hollow increases with increasing volume, as a result of which the change in position of the liquid drop becomes a linear measure of the factor wanted; and

a scale, mounted adjacent to said tube, for direct reading of said device based upon the position of said liquid drop.

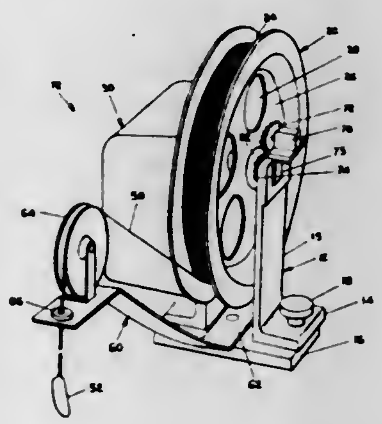
4,000,653
TROLLING APPARATUS

William M. Booth, Grand Haven, and James E. Rieth, Grand Rapids, both of Mich., assignors to James E. Reith, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 274,505, July 24, 1972, Pat. No. 3,916,555. This application Oct. 20, 1975, Ser. No. 623,732

Int. Cl.² G01K *7/00*

U.S. Cl. 73—343 R **12 Claims**



1. A trolling apparatus adapted for mounting to a boat to pay out and retrieve a line in the water comprising.

a reel frame;

a line reel and a reel shaft coupled between said reel frame and said line reel for rotatably mounting said line reel to said reel frame, said line reel having a peripheral channel for holding a line therein;

line guide means coupled at one end to said reel frame and extending therefrom;

a line anchored at one end to said reel and guidably supported by said guide means as it is extended and retracted to and from said reel;

drive means coupled to said line reel for extending and retracting said line from said line reel; a line comprising an electrical cable having a pair of conductors wherein one end of said line has temperature sensing means coupled thereto and the end of said line anchored to said reel is coupled to a slip ring assembly positioned on said reel frame to provide fixed electrical contacts communicating with said temperature sensing means wherein said slip ring assembly includes a disc of insulating material having a pair of spaced annular electrical contacts on one face thereof, said disc positioned on one end of said rotatable reel shaft and having said annular contacts coupled to said conductors of said electrical cable;

a pair of fixed contact arms each positioned to continuously contact one of said annular contacts as said reel shaft rotates; and

temperature indicating means coupled to said fixed contacts to provide a reading of the temperature of the sensing means.

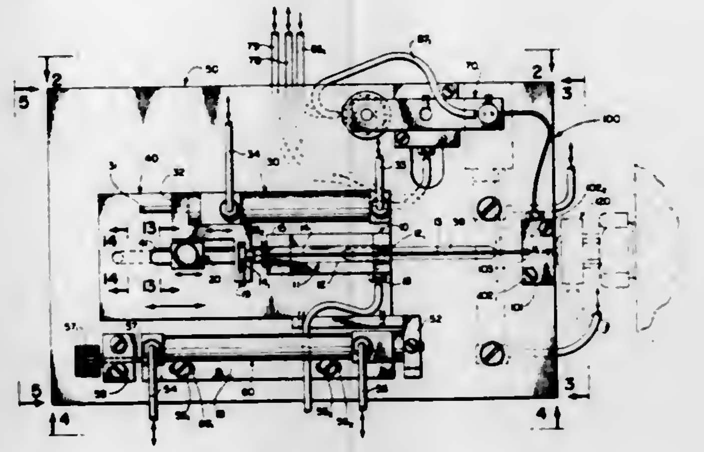
4,000,654
AUTOMATIC FLUID INJECTOR

Rano J. Harris, Jr., 4423 S. Park Drive, Baton Rouge, La. 70816

Filed Oct. 1, 1975, Ser. No. 618,374

Int. Cl.² G01N *1/02*

U.S. Cl. 73—422 GC **10 Claims**



1. In apparatus for repetitively measuring and injecting preselected quantities of fluid specimens into a media such as an inlet to an analytical instrument, the combination comprising

a base plate, constituting a portion of a housing, which can be mounted adjacent the inlet leading into the analytical instrument,

a syringe sub-assembly inclusive of

a tubular member mounted upon said base plate, said member being provided with an opening which contains a tubular seal, the axial opening within said tubular seal being aligned upon said inlet leading into the analytical instrument and being communicated with a lateral opening which extends through said tubular member and seal,

a slide plate mounted upon said base plate, movable in the direction of said tubular member,

a needle syringe mounted upon said slide plate, said syringe including a barrel within the forward end of which is mounted a hollow needle provided with a forward opening, the needle being extendable into the axial opening of the seal within said tubular member on movement of said syringe, and within the rearward end of which syringe is mounted a reciprocable plunger,

a means mounted upon said slide plate for actuating and driving the plunger of said syringe,

a means mounted on said base plate operatively engaged with said slide plate for reciprocal movement thereof, a magazine

inclusive of means for transporting a fluid specimen contained in a vial, with a resilient, puncturable closure,

an injector feed sub-assembly inclusive of

a probe assembly comprised of a cylinder piston unit, the piston end of which is projected upwardly and affixed via connecting means to the probe assembly, the probe assembly being comprised of one or more downwardly directed hollow probes which are projectable for penetration of said puncturable closure of a fluid specimen containing vial delivered into position below and in the path of a hollow probe by the magazine which is located below the base plate, an upper opening within a probe being communicated with a pressurized gas source for conveyance of pressurized gas via the lower opening within said probe into the vial, an upper opening of a probe being communicated with the lateral opening within the tubular member of the syringe sub-assembly for conveyance of the fluid specimen from the vial via the lower opening within said probe to the dispensing end of the needle of the syringe, and an on-off valve which can be actuated to initiate the flow of pressurized input gas to the probe used for pressurizing the vial, whereby, on thrust of the dispensing end of the needle into said tubular member of the syringe sub-assembly via activation of the actuation and drive means which produce movement of the slide plate, and on penetration of the puncturable closure of a vial by a probe, a pressurized fluid can be injected through a probe into the vial to pressurize the fluid specimen contained therein, the fluid specimen then transferred from the vial via a hollow probe to the lateral opening within said tubular member to the opening within the dispensing end of the needle, to purge, clean and fill the syringe with a preselected quantity of the fluid specimen for subsequent injection.

4,000,655
MEASURING DEVICES FOR BORES AND DUCTS

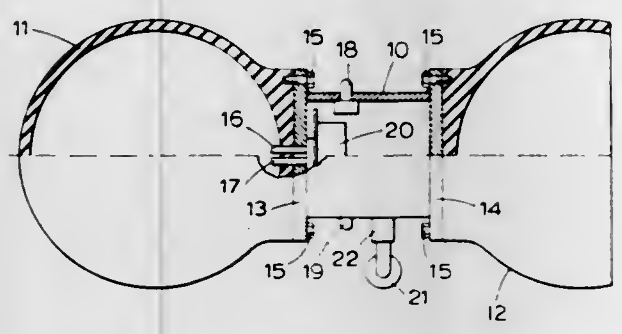
Trevor Clifford Jones, Stroud, England, assignor to Underground Location Services Limited, England

Filed May 7, 1975, Ser. No. 575,223

Claims priority, application United Kingdom, May 8, 1974, 20303/74

Int. Cl.² G01B *5/00;* G01M *3/02*

U.S. Cl. 73—432 R **9 Claims**



1. A measuring device for detecting surface irregularities on the internal walls of an elongated duct which reduce the nominal internal cross-section of the duct by more than a predetermined amount, said duct containing a fluid flowable therethrough, said measuring device comprising:

a sealed envelope containing fluid which is isolated from the fluid in the duct, said envelope having an external dimension less by said predetermined amount than the nominal internal cross-section of the duct and having a wall deformable upon contact with said irregularities for altering the fluid pressure within said envelope;

means responsive to the flow of fluid through the duct for moving said envelope along the duct; and

means for comparing the pressure of the fluid in the envelope with the pressure of the fluid in the duct for ascertaining pressure alterations within the envelope resulting from deformation of said flexible envelope wall by contact with the irregularities as an envelope is moved along the duct.

4,000,656
APPARATUS FOR DESIGNING AND TESTING PROPER VALUES OF PARAMETERS RELATING TO SUPPORTING HYDRODYNAMICALLY LUBRICATED BEARING JOURNALS

Alessandro Moioli, Via Fornaci, 2, Nembro (Bergamo), Italy (24027)

Filed Dec. 24, 1975, Ser. No. 644,298

Claims priority, application Italy, Jan. 10, 1975, 2902/75

Int. Cl.² G01N *19/08*

U.S. Cl. 73—432 R **7 Claims**

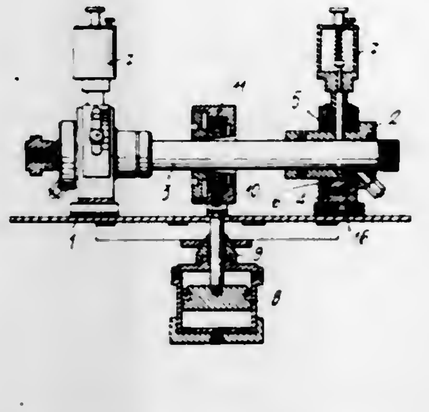
1. An apparatus for designing and testing the proper values of parameters relating to supporting hydrodynamically lubricated bearing journals, comprising:

a base;

two independent bushings mounted on said base;

a shaft mounted in said bushings;

a device coupled to said shaft between said bushings for load application to said shaft, said shaft and bushings being electrically insulated from the remainder of the apparatus;



ball joints and bearings rockably mounting said bushings for self-alignment with said shaft; and

at least one detecting device associated with each of the bushings and said shaft, said detecting device being adapted to indicate the value of a selected parameter.

4,000,657
APPARATUS FOR MEASURING THE APPARENT WEIGHT OF A SLUDGE CHARGING A LIQUID

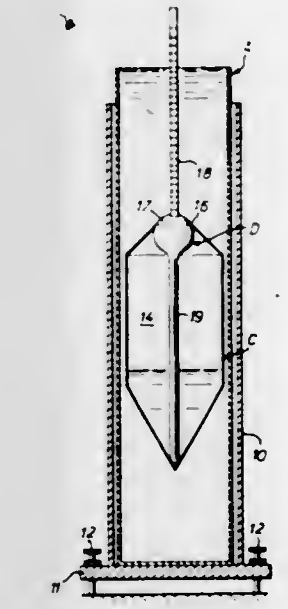
Yves Marie Ponsar, 6 avenue Marcelin Berthelot, 93250 Villemonble, France

Filed Sept. 2, 1975, Ser. No. 609,820

Claims priority, application France, Sept. 9, 1974, 74.30429

Int. Cl.² B01L *3/00;* G01N *9/12*

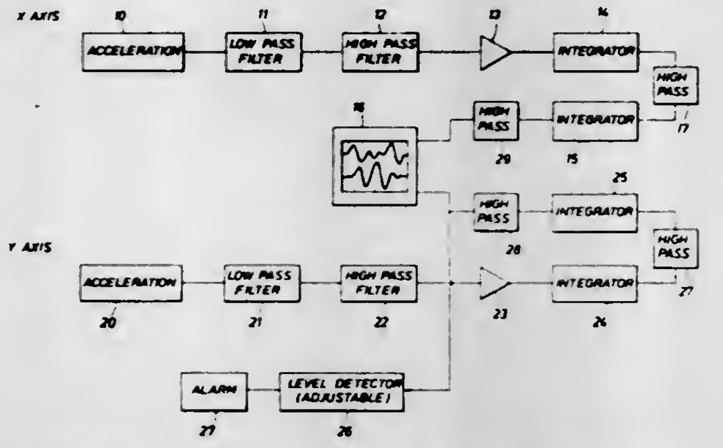
U.S. Cl. 73—448 **8 Claims**



1. Apparatus for measuring the apparent weight of sludge charging a liquid, comprising a thermally insulated container having an open end, a bag shaped to fit into the said container for immersion in liquid in the said container, said bag being starshaped when empty and collapsed and expanding to a triangular cross-section when full, said bag having an upper opening, a buoyant ball engaged within said bag beneath said opening thereof for supporting said bag, and a graduated rod surmounting the ball for measuring the level of the bag and ball assembly.

4,000,658
METHOD AND APPARATUS FOR MEASURING DISPLACEMENT OF FIXED STRUCTURES

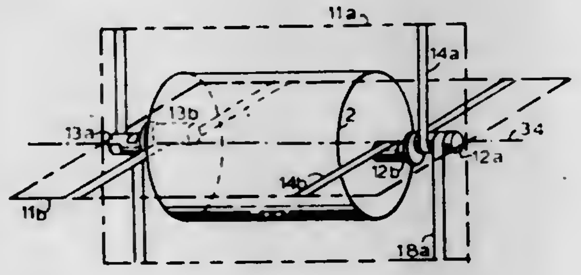
Thomas R. Schmidt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Nov. 21, 1975, Ser. No. 634,089
Int. Cl.² G01P *15/02*
U.S. Cl. 73—490 **10 Claims**



1. A method for measuring the displacement of the free end of a fixed structure comprising:
positioning a pair of force balance accelerometers on said free ends to measure the acceleration of the structure along two axes at right angles;
converting the measured acceleration along the two axes to related electrical signals;
filtering the related electrical signals a first time to remove the frequencies above the desired frequency of the structure;
filtering the related electrical signals a second time to remove the low frequency components produced by drift of the electronic circuits, velocity and displacement of the inertial reference device; and
integrating each of the filtered signals twice to produce a signal related to velocity and displacement along each of the axes.

4,000,659
ZERO STIFFNESS TAUT RIBBON ROTARY SUSPENSION SYSTEMS

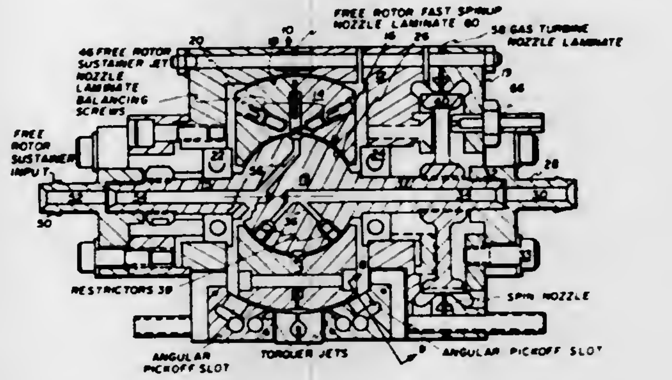
Yao Tzu Li, Huckleberry Hill, Lincoln, Mass. 01773
Filed Feb. 25, 1975, Ser. No. 552,877
Int. Cl.² G01P *15/00*
U.S. Cl. 73—514 **20 Claims**



1. A rotary suspension system comprised of a first member, a second member, a pivot axis representing the desirable rotary mode of freedom of the second member with respect to the first member, at least one ribbon plane containing the pivot axis, at least one set of straight rod segments attached to the said second member and tangent to each ribbon plane along the pivot axis, a set of ribbons for each rod segment each with one end attached to and wrapped around over the said rod segment for a small arc and then departing from the rod at the pivot axis to fan out along the said ribbon plane in various directions with respect to the pivot axis; all ribbons being stretched and attached to the first member at the outer ends of the said ribbons while remaining within the associated ribbon plane whereby said second member is supported for rotation about the pivot axis for rotation with minimum uncertainty.

4,000,660
DRIFT-COMPENSATED FREE-ROTOR GYRO

Rolf K. Brodersen, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 31, 1975, Ser. No. 627,637
Int. Cl.² G01C *19/30*
U.S. Cl. 74—5.43 **4 Claims**


FREE ROTOR FAST SPINUP NOZZLE LAMINATE 60
58 GAS TURBINE NOZZLE LAMINATE
46 FREE ROTOR SUSTAINER JET NOZZLE LAMINATE
BALANCING SCREWS
FREE ROTOR SUSTAINER INPUT
RESTRICTORS 38
SPIN NOZZLE
ANGULAR PICKOFF SLOT
TORQUER JETS
ANGULAR PICKOFF SLOT

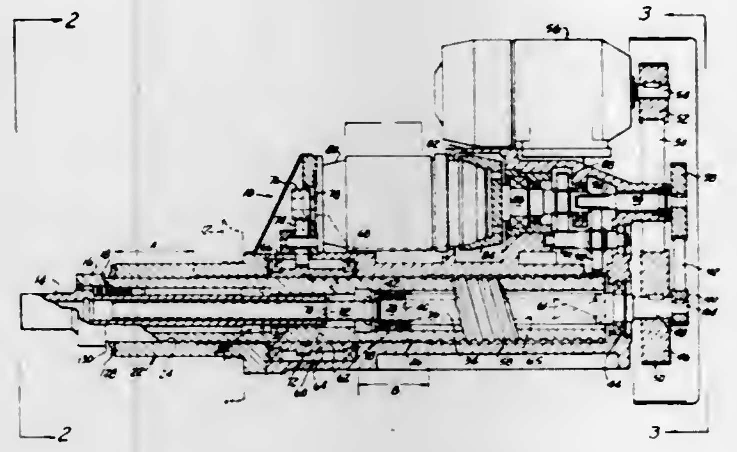
1. A fluidic/pneumatic two-axis free-rotor gyro of the rotating spherical gas-bearing type comprising:
a. a casing having an annular curved inner surface;
b. a bearing rotor having oppositely extending spindles and a central spherically surfaced bearing portion;
c. bearing means for rotatably supporting said bearing rotor in said casing;
d. a free enertia rotor having a hollow interior portion containing said spherical portion of said bearing rotor with the interposition of a gap forming a gas bearing for said free rotor and a curved portion mating with, but spaced from, said casing curved inner surface to form a windage air gap;
e. a gas turbine mounted on one of said spindles for rotating said bearing rotor;
f. said gas turbine and said free rotor having spin-up buckets for bringing said turbine and rotor up to speed and reaction jets for sustaining desired speed when connected to a source of pneumatic power; and
g. a pneumatic spin monitor pickoff system connected to provide control signals representative of the free rotor frequency and bearing rotor frequency.

4,000,661
TWO-SPEED MECHANICAL QUILL FEED AND SPINDLE DRIVE MECHANISM FOR A MACHINE TOOL

Klaus Menzel, Orchard Lake, Mich., assignor to Bendix Machine Tool Corporation, Warren, Mich.
Division of Ser. No. 462,286, April 19, 1974, Pat. No. 3,885,635. This application Feb. 3, 1975, Ser. No. 546,567
Int. Cl.² F16J *15/50;* **F16H** *1/18, 35/00*
U.S. Cl. 74—89.15 **4 Claims**

1. A quill drive comprising:
a housing;
a hollow quill shaft;
a drive member rotatably mounted in said housing surrounding said quill shaft and fixed against axial movement;
means mounting said quill shaft in said housing for slidable longitudinal movement along its axis including spaced bearing surfaces on either side of said drive member;
cam means drivingly connecting said quill shaft and said drive member producing said longitudinal movement of said quill shaft upon rotation of said drive member in said housing;
drive means for rotating said drive member;

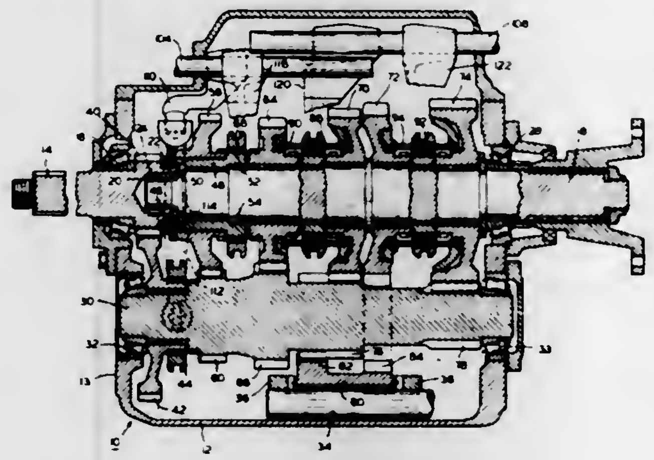
a spindle shaft rotatably mounted within said quill shaft and adapted to be carried by said quill shaft with said longitudinal movement; and



means for rotating said spindle shaft in said quill shaft while said quill shaft is undergoing said longitudinal movement in said housing.

4,000,662
MULTIPLE INPUT TRANSMISSION

Robert W. Wolfe, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Sept. 5, 1975, Ser. No. 610,584
Int. Cl.² F16H *3/08, 3/02, 37/00*
U.S. Cl. 74—331 **30 Claims**

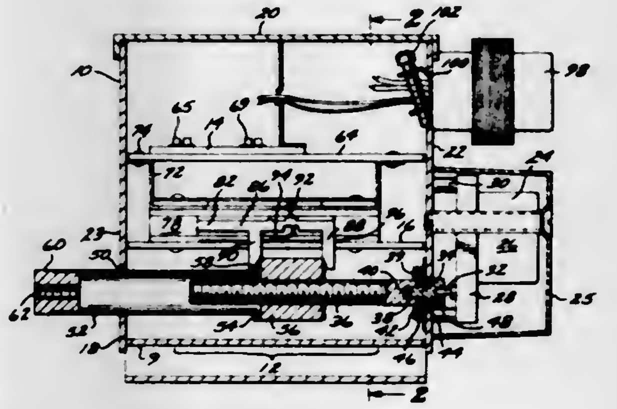


1. A multiple input transmission comprising:
a. a transmission housing;
b. a power input shaft having a tubular extension;
c. a power output shaft axially aligned with said input shaft;
d. a countershaft parallel to said output shaft;
e. a first input gear affixed to said input shaft;
f. a second input gear journalled for rotation on said tubular extension;
g. a third input gear journalled for rotation on said output shaft;
h. clutch means for drivably connecting said second input gear to said input shaft and, alternatively, for drivably connecting said third input gear to said input shaft;
i. a first driven gear journalled for rotation on said countershaft and in constant mesh with said first input gear;
j. clutch means for drivably connecting said first driven gear to said countershaft;
k. a second driven gear affixed to said countershaft and in constant mesh with said second input gear;
l. a third driven gear affixed to said countershaft and in constant mesh with said third input gear;
m. at least one output shaft gear journalled for rotation on said output shaft;
n. at least one driving gear affixed to said countershaft and in constant mesh with said at least one output shaft gear; and
o. at least one clutch means for drivably connecting said at least one output shaft gear to said output shaft, said first, second and third input gears, by having mutually different pitch circle diameters, permitting three different ratio inputs to said countershaft.

30. A multiple input and output power transmission comprising:
a. axially aligned input and output shafts;
b. a single countershaft aligned with said output shaft;
c. first, second and third input gears, said third input gear being journalled on said output shaft;
d. first, second and third driven countershaft gears in constant mesh with respective ones of said input gears, said third driven countershaft gear being affixed to said countershaft; with at least two of said first and second input and said first and second driven countershaft gears being journalled relative to said input shaft and countershaft respectively and any remaining ones of said aforesaid gears being affixed relative said input shaft and countershaft;
e. a plurality of output shaft gears, with one of said output shaft gears also being capable of serving as one of said input gears;
f. a plurality of driving countershaft gears, with each of said driving countershaft gears being intermeshable with a separate one of said output shaft gears, with one of said driving countershaft gears also being capable of serving as one of said driven countershaft gears; with at least one gear of each pair of intermeshable output shaft gears and driving countershaft gears being journalled relative to its respective shaft and any remaining gears of said pairs of intermeshable gears being affixed relative to their respective shafts; and
g. multiple clutch means for selectively drivably connecting one of said driven countershaft gears with one of said input gears and selectively drivably connecting one of said output shaft gears with said driving countershaft gears.

4,000,663
DAMPER ACTUATOR

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Aug. 22, 1974, Ser. No. 499,786
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² F16K *31/04*
U.S. Cl. 74—424.8 VA **10 Claims**



1. A mechanical transducer comprising:
a housing having parallel side walls and end walls;
a motor drive unit with a rotary shaft output carried on one end wall thereof;
a lead screw rotatably carried by thrust bearing means on said end wall and in driven connection to said rotary shaft;
track means defined by channels on opposite side walls parallel to and coextensive with said lead screw;

- a traveling nut member engaged on said lead screw and bearing opposite, radially extending side flanges with outboard bulbous edges engaged in said channels;
- a tubular member carried by said traveling nut member generally coaxially with said lead screw and extending through the opposite end wall of said housing; and

said tubular member having a closed outboard end bearing work receiving means.

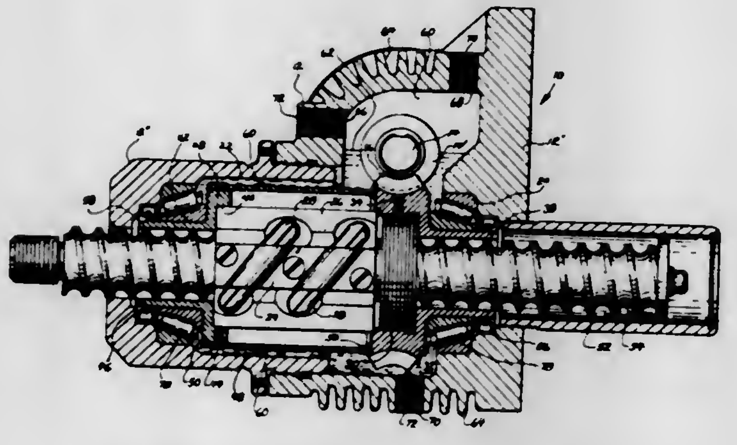
4,000,664
MECHANICAL ACTUATOR

John D. Christensen, Charlotte, N.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Sept. 8, 1975, Ser. No. 611,211

Int. Cl.² F16H *1/18, 57/04*

U.S. Cl. 74—424.8 R **8 Claims**



1. A mechanical actuator comprising:

a. a housing,

b. a drive shaft extending into said housing through an aperture therein and being rotatably disposed therein with gear means fixed thereon,

c. a gear-nut assembly rotatably mounted in said housing and including:

   i. a gear component in driven engagement with said drive shaft gear means;

   ii. a ball nut component fixed for rotation at one end thereof with said gear component, said ball nut component having ball return means exposed exteriorly thereon; and

   iii. a tubular shield member mounted on said ball nut component in covering relation to said ball return means and defining with said housing a space therebetween, said shield member having an end adjacent said gear component sealingly secured to said gear-nut assembly,

d. a screw member extending through said housing and gear-nut assembly in driven engagement with said ball nut component,

e. sealing means disposed at said drive shaft aperture and between said gear-nut assembly and said housing, said sealing means in combination with said tubular shield member cooperating to seal oil within the space between said shield member and said housing including the space in which said drive shaft gear means and said gear-nut assembly are disposed and to seal oil from said ball return means and screw member, and

f. oil contained in said sealed space to lubricate said gear means and gear-nut assembly and dissipate heat therefrom to said housing.

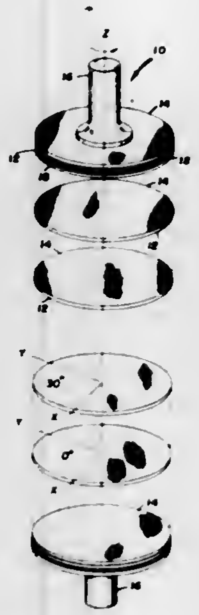
4,000,665
WOVEN FILAMENT ROTOR STRUCTURE

David W. Rabenhorst, Clarksville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 26, 1975, Ser. No. 607,919

Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **13 Claims**



1. An energy storage structure rotatable about an axis of rotation extending transversely therethrough, the structure comprising a plurality of substantially identical anisotropic filament-like members, the members being formed into a disc shape and being interwoven within the structure to produce bi-axial resistance to the radial and tangential stress pattern acting on the structure.

4,000,666
MEANS FOR ACTUATING BALANCER OF ENGINE

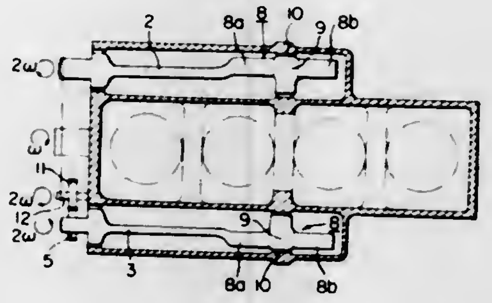
Tadahiko Ito, Nagaokakyo; Yoshinori Shiomi, Kameoka, and Seizo Iwasa, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1975, Ser. No. 553,465

Claims priority, application Japan, July 24, 1974, 49-85453

Int. Cl.² F16F *15/10*

U.S. Cl. 74—604 **5 Claims**



1. Means for actuating a balancer of an engine, comprising at least one pair of balancer shafts located on opposite sides of a crankshaft of the engine at given distances from an axis of the crankshaft and driven by the crankshaft at a speed twice the speed thereof, the axes of said balancer shafts being substantially parallel to said axis of the crankshaft and being situated at different heights relative thereto, and reversing mechanism for rotating the lower one of said balancer shafts in a direction opposite to that of the crankshaft, said reversing mechanism including a first gear mounted on a rotatable shaft of a subsidiary device driven by said crankshaft and a second gear mounted on said lower balancer shaft and engaged with said first gear to rotate it in said opposite direction.

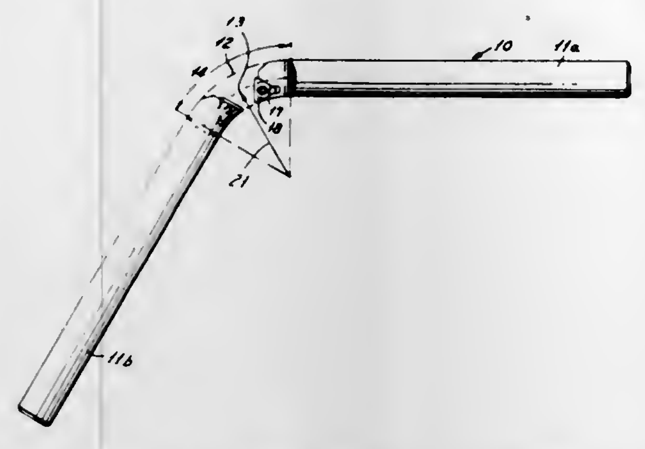
4,000,667
BENDING BAR CONSTRUCTED BY BENDING

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,964

Int. Cl.² B21K *21/00*

U.S. Cl. 76—101 R **8 Claims**



1. The method for manufacturing a boring bar comprising the steps of bending a straight bar to provide an intermediate curved portion and an obtuse included angle relationship between the remaining straight portions, cutting the curved portion of said bar to provide a curved end portion on each of two straight portions, machining a chip clearance path and an insert pocket with an offset portion resulting from said bend providing a support surface for an offset cutting point of an insert.

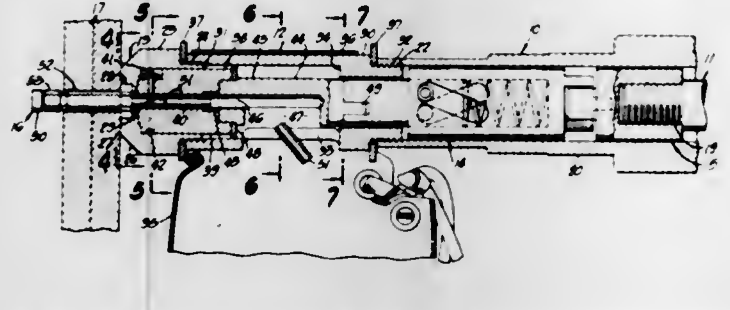
4,000,668
BLIND BOLT FASTENER INSTALLATION TOOL WITH AN APPARATUS FOR RETRIEVING SEVERED BLIND BOLT FASTENER STEMS

Ben C. Keasler, 864 W. 16th St., Newport Beach, Calif. 92660

Filed Nov. 3, 1975, Ser. No. 628,049

Int. Cl.² B25B *13/06*

U.S. Cl. 81—55 **6 Claims**



1. An apparatus for retrieving the severed stems of blind bolt fasteners to be used in conjunction with a blind bolt fastener installation tool, which comprises:

a. means for retaining a plurality of severed stems;

b. means for directing a severed stem into said retaining means;

c. means for restraining a severed stem from falling from the installation tool until disengaged from said restraining means into said directing means, said restraining means being in communication with said retaining means, said directing means comprises:

d. a housing operably connected to the installation tool said housing being further defined as having a first aperture adapted to pass severed stems therethrough; and

e. a rotatable member positioned substantially within said housing, said rotatable member having a passageway therethrough substantially along its axis of rotation for receiving severed stems, said rotatable member being further defined as having a second aperture adapted to pass severed stems therethrough.

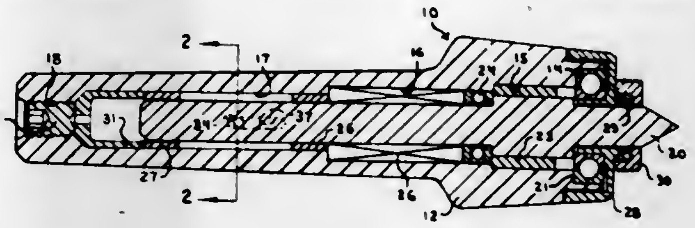
4,000,669
CENTER DEVICE

Ernest E. Krupp, 19916 Thousand Oaks, Clemens, Mich. 48043

Filed Jan. 26, 1976, Ser. No. 652,423

Int. Cl.² B23B *23/04*

U.S. Cl. 82—33 R **4 Claims**



1. Improvement in a machine tool center device having a hollow body and a center shaft therein, said shaft having a conical front end, bearing means between said body and shaft for moveably supporting the latter, said improvement comprising a center device which has means for converting the same from a live center to a dead center and vice versa, means for supporting said shaft in said body for both rotation and reciprocation in respect thereto, said converting means preventing rotation of said shaft while permitting reciprocation thereof, said converting means being accessible from the exterior of said body for insertion or removal in respect thereto, yieldable means in said body operative upon said shaft for urging said front end outwardly of said body, a thrust cap rotatably carried on the front end of said body having an aperture therein through which said front end projects, said thrust cap being held fast against reciprocative movement relative to said body, a nose cap carried on said thrust cap, said nose cap having an aperture therein through which said front end projects, said shaft, in use of said center device, being yieldably retracted in respect to said body by said workpiece so that the latter abuts said nose cap, said nose cap serving as a locator for said workpiece and rotating therewith.

4,000,670
METHOD AND APPARATUS FOR NOISE SUPPRESSION

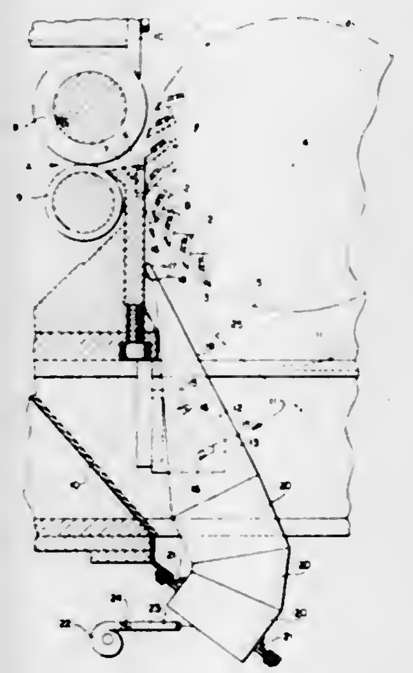
William Fleetwood, St. Helens, England, assignor to Leesona Plastics Machinery Ltd., Warrington, England

Filed June 3, 1974, Ser. No. 476,195

Claims priority, application United Kingdom, July 10, 1973, 32923/73; Nov. 2, 1973, 51088/73; Feb. 7, 1974, 5586/74

Int. Cl.² B26D *7/00*

U.S. Cl. 83—42 **19 Claims**



16. A method for reducing the noise level in apparatus having movable means and second means arranged in close proximity to said movable means with said second means

defining an approaching zone for said movable means and a receding zone for said movable means wherein the movable means and second means coact to produce noise, comprising the steps of, driving said movable means, and directing a substantially continuous positive pressure proximate to said receding zone and said movable means to thereby reduce the level of said noise.

4,000,671

TRANSPORT GUIDE FOR PLIABLE SHEET MATERIAL

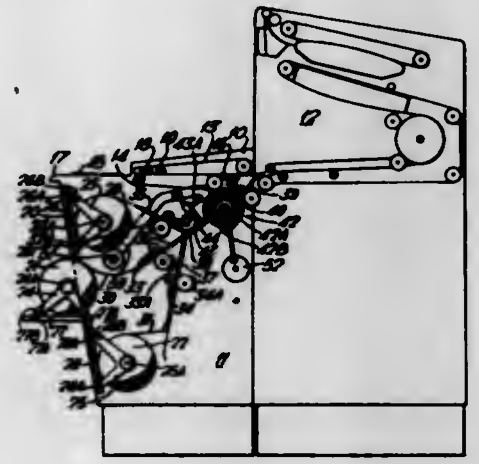
Adi Kaikhushiroo Ashburner, Hargrave, England, assignor to Harper & Tunstall Limited, Wellingborough, United Kingdom

Division of Ser. No. 368,665, June 11, 1973, Pat. No. 3,951,023. This application Nov. 21, 1974, Ser. No. 525,890

Claims priority, application United Kingdom, June 12, 1972, 27419/72

Int. Cl.² B26D *1/12*

U.S. Cl. 83—42 **7 Claims**



1. A method of cutting a rear portion of pliable sheet material so as to allow a forward portion of the sheet material to be continuously fed forward while the rear portion of the sheet material is stationary during cutting, said method comprising the steps of:

guiding the forward portion of the sheet material through a transport guide having first and second guide members which define opposed adjacent guide surfaces for defining a first nonlinear path therebetween, said transport guide resulting in the formation of a loop in an intermediate portion of said sheet material;

positively bodily displacing one of said guide members, independently of the tension in said sheet material, in a transverse direction away from the other guide member for permitting a reduction in the size of the loop so that the intermediate portion of said sheet material follows a second shorter path while the rear portion of the sheet material is held stationary;

concurrently moving a first blade element, which is directly connected to and movable with said one guide member, relative to a stationarily positioned blade element with which the first blade element cooperates to cut the stationary rear portion of the sheet material; and

continuously maintaining said other guide member in a position so that the guide surface thereon is always disposed in a position wherein it is adapted for guiding engagement with the sheet material, even when said one guide member is being bodily moved away from the other guide member.

4,000,672

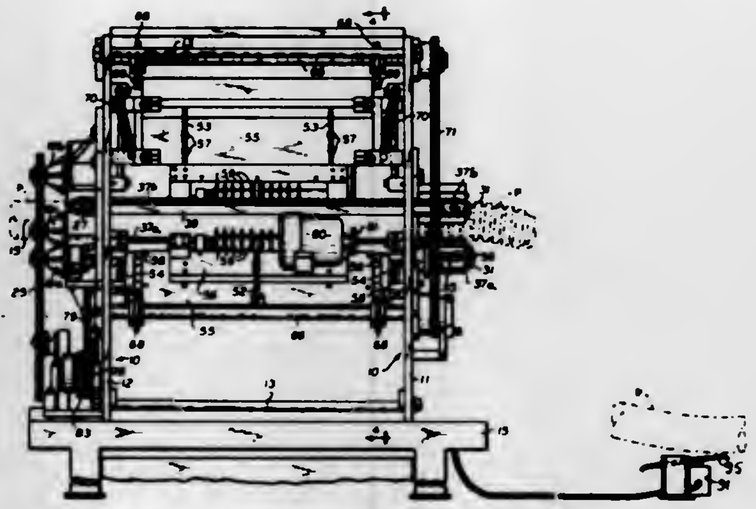
SLITTING MACHINE FOR CORRUGATED PIPE

Theodor K. Sitterer, Glen Cove, N.Y., and Siegfried Valentin, Chester, N.J., assignors to Altair National Corporation, Central Islip, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,644

Int. Cl.² B26D *5/20*

U.S. Cl. 83—203 **23 Claims**



1. A slitting machine for a corrugated pipe with the machine and pipe having the same axis comprising a frame, transporting means including at least two endless transporters, spaced mounting means carried by the frame and mounting each transporter uniformly spaced angularly with respect to each other and with reference to the axis, each transporter having an inner span with at least a major portion of the length thereof parallel to each other and the axis and straight, the straight span of each transporter being spaced from the axis a distance to engage the periphery of the pipe to support the same, each transporter having projecting means directly inwardly towards the axis for the inner span and spaced apart so as to enter an inwardly directed corrugation of the pipe, transporter operating means operatively connected with the transporters to drive the same in the same direction and at the same speed, slitting means positioned between each pair of transporters and directed radially inwardly with respect to the axis including slide means carried by the frame uniformly positioned angularly with respect to each other, a saw carrier mounted on each slide means for radial movement toward and away from the machine axis and having an inner edge and an outer edge, a plurality of circular saws forming a set mounted in alignment on each carrier at the inner edge thereof and spaced apart to cut into a separate corrugation of the pipe, saw motor means for each set of saws carried on its saw carrier and connected with its saws to rotate the same, carrier operating means connected with its saws to rotate the same, carrier operating means connected with each of the carriers to move the same radially inwardly towards the axis to sawing position and outwardly to retracted position with respect to the axis, transporter control means connected with the transporter operating means to operate the same, and slitting control means connected with the carrier operating means to operate the same.

4,000,673

PUNCHING MACHINE

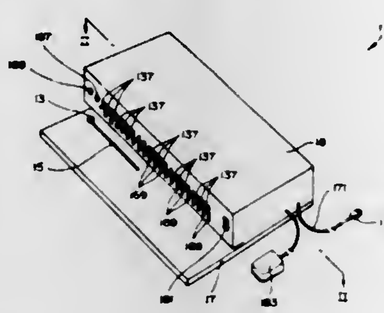
John W. Lyon, Hot Springs, Ark., assignor to Nineteen Sixties Corporation, Hot Springs, Ark.

Filed June 21, 1972, Ser. No. 264,834

Int. Cl.² B26F *1/06*

U.S. Cl. 83—526 **15 Claims**

1. A gang punch comprising a base, a pressure bar, means for slidably supporting said pressure bar a distance above said base to guidingly constrain the movement thereof along a vertical plane, a plurality of punch and coacting die means arranged in a row and attached to said base, said punch means having stock loading and stock piercing positions thereto, downward movement of said pressure bar being effective to drive the lower portions of selected ones of said punch means into said die means to said stock piercing position and upward movement of said pressure bar being effective to carry said selected ones of said plurality of punch means to said stock loading position to constitute one complete cycle thereof, lever arm means, lever arm support means attached to said base, means for pivotally attaching said lever arm means to said lever arm support means, means for coupling one end of said lever arm means to said pressure bar, power drive means including clutch means operably coupled to said lever arm means for causing reciprocating movement thereof, switching means for selectively causing said clutch means to be engaged, said means for coupling one end of said lever arm means to said pressure bar including shaft means, said one end of said lever arm means being provided with a bore for slidably receiving said shaft means, said bore extending substantially parallel with the longitudinal axis of said arm means and said shaft means protruding outwardly from said one end of said arm means towards said pressure bar, spring means for urging said shaft means towards said pressure bar, and ball means attached to the protruding end of said shaft means, said pressure bar being provided with a socket for receiving said ball means.



4,000,674

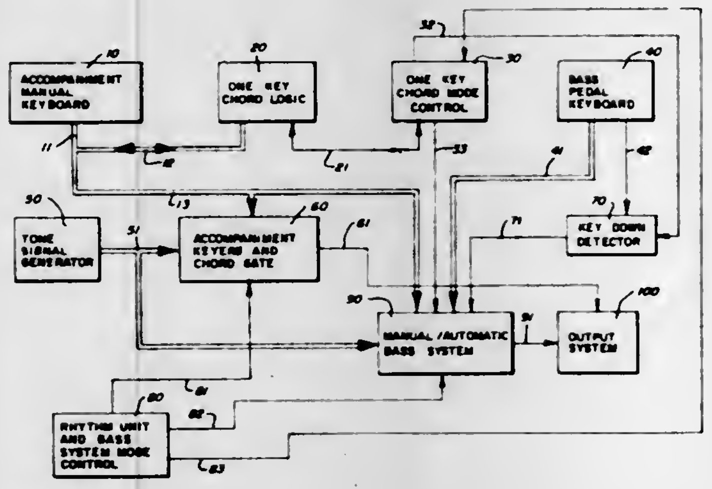
ONE KEY CHORDING SYSTEM FOR AN ELECTRONIC KEYBOARD INSTRUMENT

Wilford Rayburn Schreier, Bensenville, Ill., assignor to Hammond Corporation, Chicago, Ill.

. Filed June 18, 1975, Ser. No. 587,905

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **2 Claims**


ACCOMPANIMENT MANUAL KEYBOARD
ONE KEY CHORD LOGIC
ONE KEY CHORD MODE CONTROL
BASS PEDAL KEYBOARD
TONE SIGNAL GENERATOR
ACCOMPANIMENT KEYERS AND CHORD GATE
KEY DOWN DETECTOR
MANUAL/AUTOMATIC BASS SYSTEM
OUTPUT SYSTEM
RHYTHM UNIT AND BASS SYSTEM MODE CONTROL

1. In an electronic keyboard instrument which includes:

a tone signal generating system for generating tone signals corresponding to notes in the musical scale;

an output system for translating tone signals into audible musical tones;

a set of tone signal keyers, each receiving one of said tone signals and being responsive to a keying signal on an input keying signal lead to key said tone signal to said output system; and

a keyboard having a plurality of control elements, each of said control elements being identified in standard musical keyboard terms with a particular note of the musical scale and being selectively operable to apply a primary keying signal on an input keying signal lead of an associated keyer;

a one key chording system comprising:

a set of chord gates, each coupled to one of said keying signal leads and operative in response to a primary keying signal thereon to produce an output chord keying signal;

a set of chord logic units, each coupled to one of said chord gates and operative in response to a chord keying signal to supply a plurality of secondary keying signals to keying signal leads of a preselected group of keyers such that said primary and secondary keying signals will operate a group of keyers associated with notes comprising a musical chord; and

inhibit means coupled to said chord gates for inhibiting operation of said chord gates in response to secondary keying signals.

4,000,675

ELECTRONIC MUSICAL INSTRUMENT

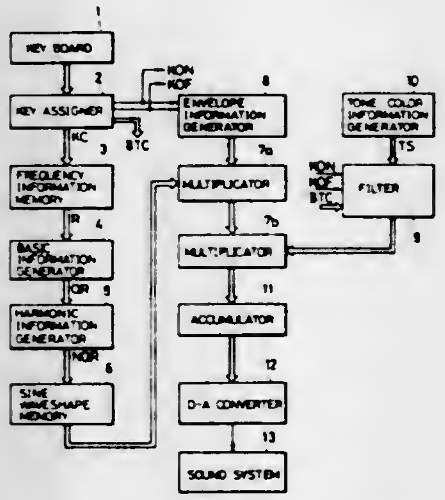
Tsuyoshi Futamase, and Masanobu Chibana, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 21, 1975, Ser. No. 634,306

Claims priority, application Japan, Nov. 25, 1974, 49-135728

Int. Cl.² G10H *1/00*; G10F *1/00*; G10H *1/02*

U.S. Cl. 84—1.01 **5 Claims**


KEY BOARD
KEY ASSIGNER
KON
KOF
BTC
FREQUENCY INFORMATION MEMORY
BASIC INFORMATION GENERATOR
HARMONIC INFORMATION GENERATOR
SINE WAVESHAPE MEMORY
ENVELOPE INFORMATION GENERATOR
TONE COLOR INFORMATION GENERATOR
TS
FILTER
MULTIPLICATOR
MULTIPLICATOR
ACCUMULATOR
D-A CONVERTER
SOUND SYSTEM

1. An electronic musical instrument of a type wherein harmonic components are combined to produce a musical tone waveshape comprising:

memory means for storing constant information corresponding to a desired frequency filter characteristic; and

calculation means for calculating level information of the particular frequency in said filter characteristic in response to the constant information read from said memory means and information of respective harmonic frequencies;

levels of harmonic components of a musical tone waveshape being controlled in accordance with said level information calculated by said calculation means.

4,000,676

ELECTRONIC VIBRATO SYSTEM

David A. Love, 600 Langsdorf Drive, Apt. B-22, Fullerton, Calif. 92631

Filed Sept. 20, 1974, Ser. No. 507,890

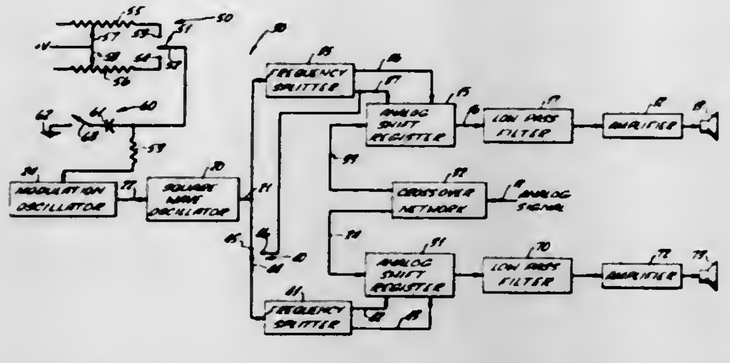
Int. Cl.² G10H *1/04*; H03H *7/30*

U.S. Cl. 84—1.25 **9 Claims**

1. A method of modulating the frequency of an analog signal comprising:

dividing said analog signal into upper and lower frequency bands;

separately conducting said upper and lower frequency bands through parallel first and second analog delay lines under control of a digital clock signal; and



varying the frequency of said digital clock signal at a rate equal to the desired rate of modulation of said analog signal.

4,000,677

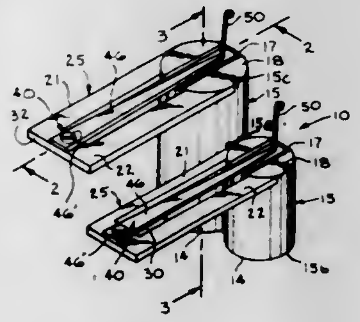
MOUTH ORGAN

Teddy W. Rabb, P.O. Box 838, Olla, La. 71465

Filed Sept. 4, 1975, Ser. No. 610,136

Int. Cl.² G10D *11/00*

U.S. Cl. 84—375 **12 Claims**



1. A mouth organ comprising:
a. a body;
b. an opening extending longitudinally of said body and intersecting one end thereof;
c. a hollow tubular member having one end closed with a slot extending thereacross and the other end open;
d. said closed end of said hollow tubular member being secured to said body so that the slot in said closed end communicates with and forms an axial extension of the longitudinal opening in said body;
e. said hollow tubular member extending laterally from said body to position said other open end of said hollow tubular member in spaced relation to said body for contact with the mouth;
f. reed means secured at one end to said body and having a longitudinal portion extending longitudinally of the opening in said body and the slot in said closed end; and
g. said reed means having a portion extending laterally therefrom adjacent said hollow tubular member for manual vibration of the longitudinal portion of said reed means within the opening in said body and slot in said closed end to create sound.

4,000,678

COVER FOR A MUSICAL INSTRUMENT

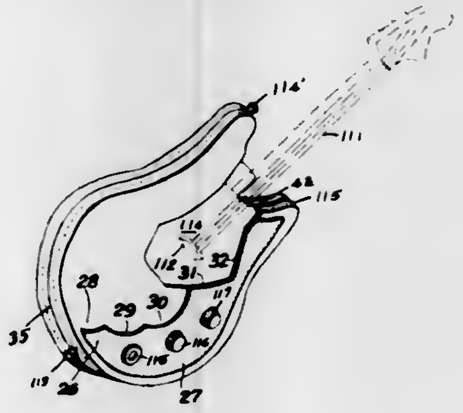
Richard A. Messina, 181 Barrows, Jamestown, N.Y. 14701

Continuation-in-part of Ser. No. 515,587, Nov. 29, 1974. This application Mar. 31, 1976, Ser. No. 672,403

Int. Cl.² G10G *7/00*

U.S. Cl. 84—453 **1 Claim**

1. A cover for a musical instrument having a sound box, a neck attached to one side of said sound box and extending therefrom and a bridge supported on another side of said soundbox,
a first means on said sound box for attaching a strap on the end thereof remote from said neck, and
a second means for attaching a strap on a corner adjacent said neck remote from said first mentioned means,
said sound box having a second corner on the end thereof adjacent said neck at the side thereof remote from said first mentioned corner,
a plurality of control buttons on one side of said sound box spaced from said bridge,
said cover comprising a front sheet and a back sheet, each having a fold line generally in the shape of the edges of said sound box of said instrument,
a marginal edge extending outward from said fold line, and adapted to be folded back at said fold line and to be stitched in place,
said back sheet having a wider flap on one side thereof than said front sheet whereby when said rear sheet is folded back and sewn said flap can swing outwardly beyond said fold line,



said front sheet and said back sheet each having a notch cut therein to receive said first mentioned means for attaching a strap and a second notch cut in said flaps to receive said second mentioned means to attach a strap,
said front sheet being notched to receive said bridge and a plurality of openings in said front sheet for receiving said control buttons,
a control cover attached to said front sheet,
said control cover having openings registering with said holes in said front sheet and being generally crescent shaped and having a side cut out forming an edge to lie along the top of said front sheet,
said crescent shaped side of said cover registering with the marginal edge of said cover.

4,000,679

FOUR-CHANNEL COLOR ORGAN

Richard E. Norman, Rte. 8, Box 173, Easley, S.C. 29640

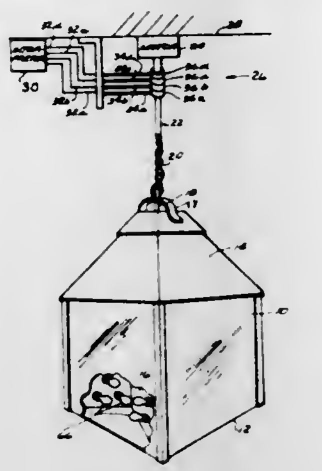
Filed July 7, 1975, Ser. No. 593,794

Int. Cl.² A63J *17/00;* **G09B** *15/02*

U.S. Cl. 84—464 **6 Claims**

1. A color organ device for producing a visual display responsive to electrical signals produced on respective output channels of a four channel stereo system, said color organ device including:
A. a housing having display panels therein,
B. a plurality of banks of lights located behind said panels for illuminating said panels upon being energized,
C. an electric motor having a rotating output shaft connected to said housing for rotating said housing,
D. an interpreter means connected to said output channels of said stereo for producing a plurality of signals responsive to various frequency ranges produced on said output channels of said stereo,
E. a plurality of electrically conductive slip rings carried by said output shaft of said motor for providing an electrical path between said interpreter means and said banks of lights for energizing said lights responsive to respective signals produced by said interpreter means.

whereby said banks of lights are energized according to the frequency ranges contained in the electrical signals produced by said stereo.



4,000,680

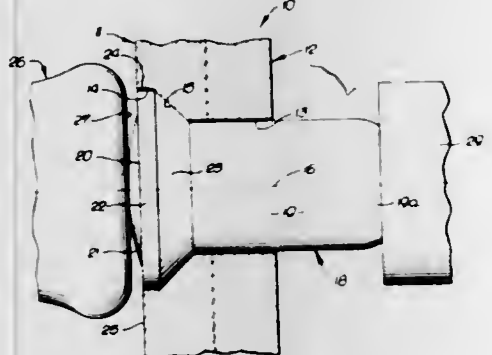
EXPANDING HEAD RIVETING METHOD AND SYSTEM

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625

Continuation-in-part of Ser. No. 621,826, Oct. 14, 1975. This application Dec. 29, 1975, Ser. No. 645,242

Int. Cl.² F16B *19/06*

U.S. Cl. 85—37 **11 Claims**



1. In combination with a workpiece having a bore, a first substantially cylindrical counterbore of substantial length, and a second counterbore which is frusto-conical and tapers forwardly between the first counterbore and the bore and toward the bore,
2. a rivet having an axially extending shank received in the workbore and defining an axis, one end of said shank projecting beyond said bore and being adapted to be upset,
b. the rivet including a head having a rearwardly protruding dome and defining an end face, a first section located forwardly of said end face and dome, and a second and forwardly tapered frusto-conical section located forwardly of the first section and engaging said second counterbore throughout substantially the frusto-conical extent of said second section,
c. the first section having an undeformed substantially cylindrical outer surface of substantial length which interrupts the second section forward taper and extends at an angle thereto and which is of a diameter less than but about the same as the diameter of the first counterbore to provide clearance therebetween, said clearance having substantially the same radial dimension along the length of the first section, the length of the first section and of the first counterbore being approximately equal, the rivet first section being radially expandable into peripheral engagement with the first counterbore,
d. the dome adapted to be flattened so as to cause said radial expansion of the rivet first section so that said head end face becomes substantially flush with the work surface and said first section expands into said peripheral engagement with said first counterbore.

4,000,681

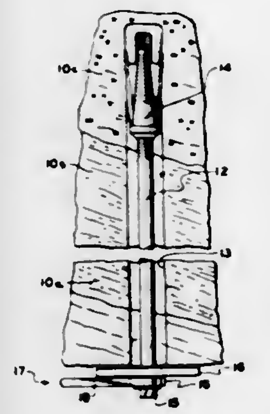
MINE BOLT TENSION INDICATOR

Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1975, Ser. No. 576,416

Int. Cl.² F16B *31/02*

U.S. Cl. 85—62 **17 Claims**



1. A mechanical device for visually indicating the tension in a monitored bolt or the like, said device comprising:
a helical spring washer inserted inbetween the head of the bolt and the surface against which the bolt head bears substantially resilient compression therebetween, said washer being fully compressed between the head of the bolt and the surface when tension in the bolt exceeds a predetermined maximum and being at least somewhat compressed between the head of the bolt and the surface when tension in the bolt equals a predetermined acceptable minimum, said washer having a pivot member on a radially outer surface thereof, said pivot member being spaced from the surface against which the bolt head bears by a first distance when said washer is fully compressed and spaced from said surface against which the bolt bears by a second distance, greater than said first distance, when the washer is compressed between the bolt head and the surface by the tension in the monitored bolt equalling a predetermined acceptable minimum; and
an elongated indicating member pivotally mounted at one end thereof to said washer, said indicating member having a pivot mount for cooperation with said pivot member to mount said indicating member to said washer, said indicating member having a face for engagement with said surface, said face being spaced from said pivot mount by a distance generally equal to said first distance, said face having an outer extremity at said one end thereof spaced from said pivot mount by a distance generally equal to said second distance.

4,000,682

SOLID PROPELLANT ROCKET MOTOR AND METHOD OF MAKING SAME

Joseph G. Thibodaux, Jr., Newport News, and Donald J. Lewis, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

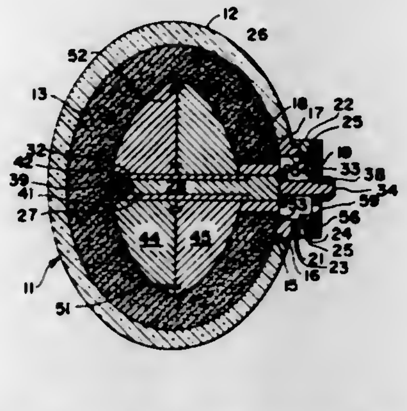
Division of Ser. No. 54,552, Sept. 7, 1960, Pat. No. 3,193,883. This application Jan. 16, 1963, Ser. No. 256,493

Int. Cl.² F42B *33/10, 3/00*

U.S. Cl. 86—1 R **8 Claims**

1. A method of making a solid propellant rocket motor having a shaped fuel charge which comprises the steps of: forming a one piece motor casing having an aperture therein, assembling within said one piece casing a mandrel having an

overall diameter larger than the diameter of said aperture, casting a solidifiable propellant within said casing above said mandrel, curing said propellant and thereafter removing said mandrel from said motor.



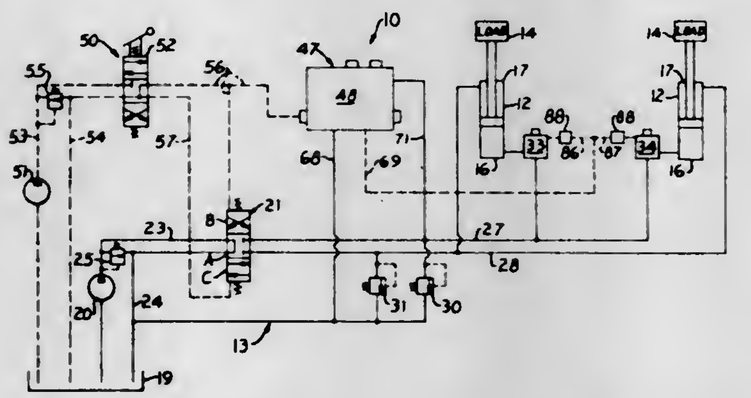
4,000,683
HYDRAULIC LOAD LIFTING SYSTEM

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 27, 1975, Ser. No. 581,297

Int. Cl.² F15B *11/16, 13/042, 13/06*

U.S. Cl. 91—411 R **12 Claims**



1. In a hydraulic load lifting system including hydraulic motor means having a load supporting end, a source of pressurized fluid, a main control valve having load raising, lowering and holding positions, and a main control line for communicating fluid between the control valve and the load supporting end of the motor means, the improvement comprising:

vented load check valve means disposed within said main control line adjacent said hydraulic motor means to freely admit fluid to the load supporting end of the hydraulic motor means when the control valve is in its load raising position and to block fluid flow therefrom when the control valve is in its load holding position;

venting means for selectively venting the load check valve means when the control valve is in its load lowering position to allow fluid to escape from the load supporting end of the motor means; and

means for selectively prepressurizing the main control line between said control valve and the load check valve means to a pressure substantially equal to the pressure at the load supporting end of the motor means immediately prior to the venting of the load check valve means so that a fluid pressure balance exists on the opposite sides of the load check valve means when said valve means opens so as to prevent momentary load drop and hydraulic hammering.

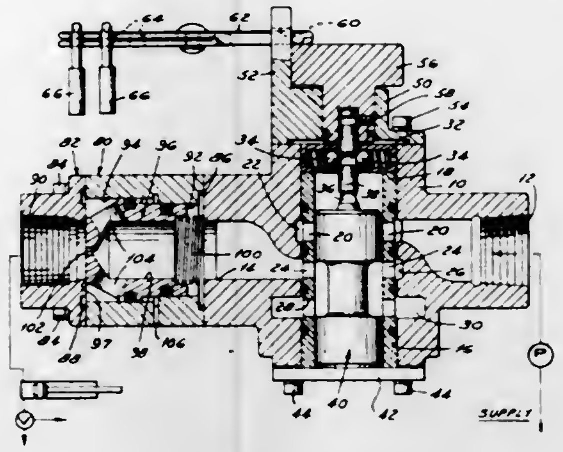
4,000,684
SAFETY LOCK-OUT VALVE

Douglas W. Ruffley, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.

Filed Mar. 27, 1975, Ser. No. 562,496

Int. Cl.² F15B *20/00*

U.S. Cl. 91—447 **1 Claim**



1. A safety system for fluid operated motors receiving pressure from an upstream fluid pressure source which comprises:

a. a fluid passage leading from an upstream pressure source to a downstream fluid operated motor,

b. a cut-off valve in said passage movable from a position closing said passage to a position opening said passage,

c. a safety valve structure in said passage between said cut-off valve and said fluid operated motor comprising:

d. a housing having a cylindrical recess open at both ends to said passage, said recess having a first bore at the upstream end and a larger concentric bore at the downstream end terminating at an annular wall around an outlet opening,

e. a valve plug in said recess comprising a cup-shaped element having a restricted opening in the bottom to register with said outlet opening, and a larger, relatively-unrestricted, opening off center from said outlet opening and open to said annular wall, said element having stepped diameters to have a sliding seal fit with the respective bores of said cylindrical recess and to provide differential effective pressure areas at opposite ends of said element within said bores, and

f. means biasing said valve plug toward said annular wall wherein said valve plug will permit an initial minimal flow of fluid under pressure to said outlet opening through said restricted opening and wherein said valve plug will be shifted by action of differential pressure on the effective end areas of said element to open said larger opening to said outlet opening when pressure is developed downstream of said safety valve sufficient to safely operate said fluid motor.

4,000,685
PUSH/PULL VALVE FOR TWO OR THREE WAY OPERATION

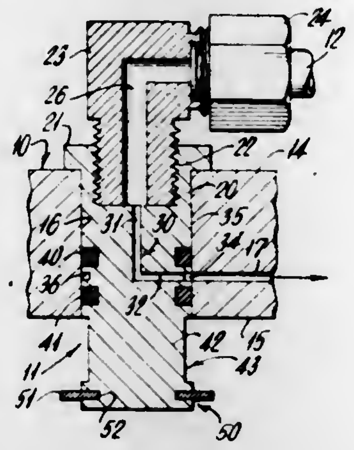
Edwin J. Montalvo, Jr., 283 Anderson St., Hackensack, N.J. 07601

Filed May 5, 1975, Ser. No. 574,464

Int. Cl.² F16K *11/07*

U.S. Cl. 91—469 **10 Claims**

1. A push-pull valve having a generally cylindrical body, an L-shaped passage within the body, a fitting in an axial socket at one end of said body for admitting fluid under pressure to an axially extending leg of said L-shaped passage and outlet means through a side wall of said body for delivery of fluid from a radially extending leg of said L-shaped passage, said body being formed with a circumferential groove at the outlet end of said radially extending leg, said body having a cylindrical portion of reduced diameter spaced from an end of said body opposite said one end, a retaining lip integrally formed with said body at said one end extending circumferentially outward from said body and a retaining ring member, fitted in a groove encircling said body adjacent said opposite end.



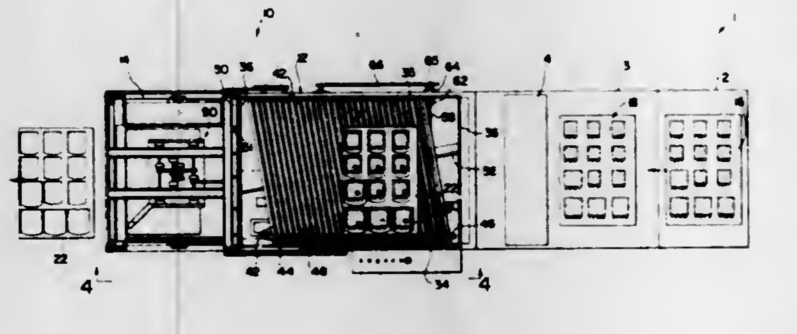
4,000,686
SEPARATING MACHINE AND METHOD OF SEPARATING

William G. Young, 79 Atterbury Blvd., Suite 201C, Hudson, Ohio 44236

Filed Nov. 15, 1974, Ser. No. 524,251

Int. Cl.² B31B *1/20;* B26D *7/18*

U.S. Cl. 93—36 A **15 Claims**



13. A method for separating a plurality of cards from the scrap of paperboard sheets from which they have been die cut except for small integral connecting tangs comprising the steps of:

feeding the sheet to and positioning the sheet between a pair of opposing dies;

moving the opposing dies in a direction transversely of the sheet feed direction into mutual contact with the sheet adjacent said tangs in a progression of locations across the sheet to separate the cards from the scrap;

moving the opposing dies to the open position so as to allow the scrap portion of the sheet to be removed from between the opposing dies; and,

receiving the cards after they are severed from the sheet.

4,000,687
METHOD FOR ERECTING CARTONS

Charles W. Adams, Walton, Ky., assignor to R. A. Jones & Company, Inc., Covington, Ky.

Filed Mar. 3, 1975, Ser. No. 554,767

Int. Cl.² B31B *1/78*

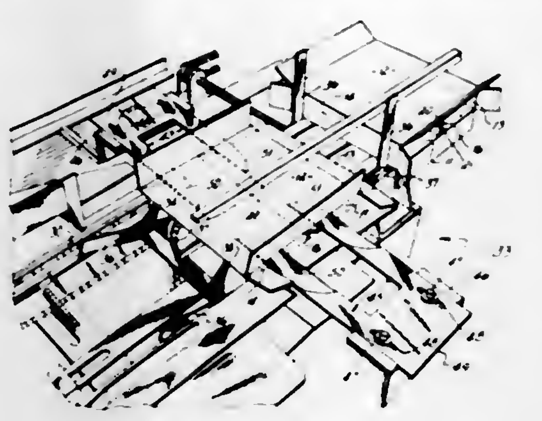
U.S. Cl. 93—53 M **1 Claim**

1. The method of erecting tubular cartons each having top and bottom walls, a leading upwardly facing side wall, a trailing downwardly facing side wall and a central divider secured along score lines to said top and bottom walls, comprising the steps of,

engaging said bottom wall adjacent said trailing wall to provide a fulcrum about which to swing said trailing wall,

simultaneously engaging said bottom wall adjacent said divider to partially break the score line adjacent said bottom wall,

and pivoting said trailing side wall upwardly about its juncture with said bottom wall to effect simultaneous vertical orienting of said side walls and said central divider.



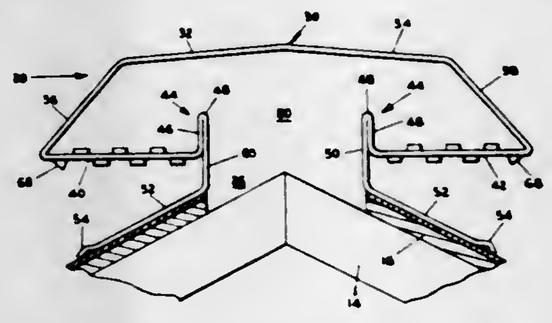
4,000,688
VENTILATOR FOR ROOF RIDGE

Richard C. Malott, Spring Lake, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed July 18, 1975, Ser. No. 597,029

Int. Cl.² F24F *13/08*

U.S. Cl. 98—42 A **9 Claims**



1. A ridge vent for a roof having a cover portion and a pair of generally inwardly extending panels beneath and vertically spaced from said cover and means for securing said vent to a roof with said panels above and spaced from the roof, said ridge vent characterized in that said panels each have a plurality of elongated ventilation openings therein; said openings being arranged in tandem in a plurality of laterally spaced rows; each of said openings having an elongated strap overlying the same, integral with said panel; each of said straps having a center portion in a plane offset from and parallel to the plane of said panel for defining a pair of laterally opening air flow passages one on each side of said strap, and said straps in alternate rows being offset in opposite directions from the plane of said panel.

4,000,689
TRASH COMPACTOR

Charles B. Weeks, Boston, and Paul V. Choate, Milton, both of Mass., assignors to Norris Industries, Inc., Los Angeles, Calif.

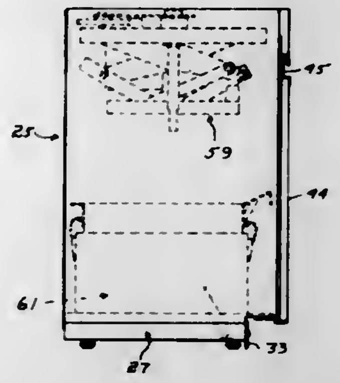
Division of Ser. No. 515,675, Oct. 17, 1974, abandoned. This application May 27, 1975, Ser. No. 580,579

Int. Cl.² B30B *1/18*

U.S. Cl. 100—229 A **9 Claims**

1. A compactor for compacting trash in a bag, said trash compactor comprising a housing including supporting structure in its upper end, a base, and a door hingedly connected to one side thereof, a trash compacting head, and means operable to reciprocate said head between an upper inoperative position and lower compacting positions, said housing including an outwardly opening, trash-receiving throat located and dimensioned to receive said head and to define a subjacent chamber with the base at the bottom thereof, the lowermost position of the head being within the chamber, said throat

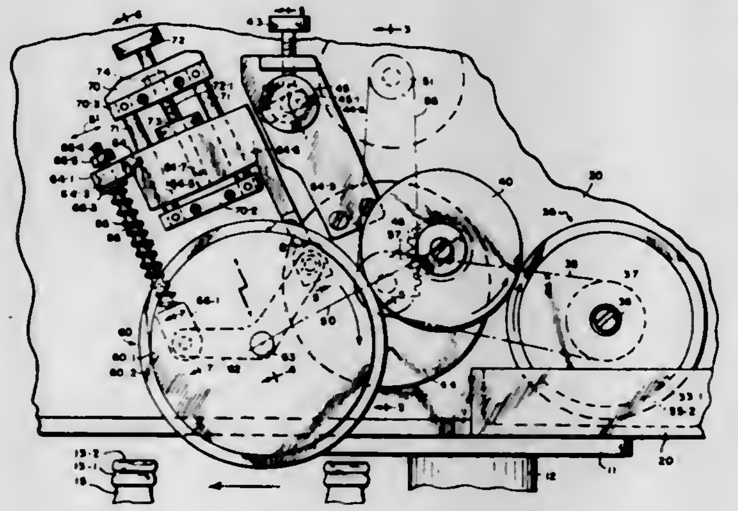
including side and rear walls spaced inwardly from the housing with the upper margin of each disposed towards and in contact with the corresponding wall of the housing, and bag holding means operable to hold a bag open to receive trash and to protect the bag while trash is being compacted therein, said bag holding means shaped and dimensioned to be slid into the chamber without contact with the walls thereof and to be supported by the base, said bag holding means including a bag receiving and supporting pan the side walls of which are of a



flexible and resilient material having a low coefficient of friction, and an open-ended container dimensioned to fit within a bag and be supported by said pan, said container including walls of a flexible resilient material extending above the pan and a frame of spring steel to which the upper ends of the walls are secured and which is dimensioned to be a free fit within said chamber and to underlie and be shielded by said throat, said throat capable of withstanding pressure attendant the compacting of trash if extending upwardly from the container into the throat.

4,000,690
PRINTING CODER

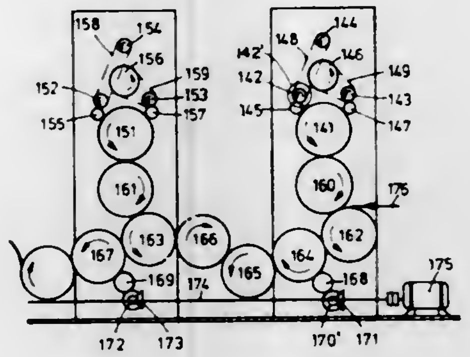
Friedrich Henri Herman Geurtsen, Holliston, and Maurice Désiré Pichel, Milford, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.
Filed May 1, 1975, Ser. No. 573,725
Int. Cl.² B41F *17/00*
U.S. Cl. 101—36 **16 Claims**



1. In a coder for imprinting on containers or the like, said coder including a metering roll and a printing roll supported for rotation, and said metering roll providing ink to said print roll, characterized in the improvement of said print roll being free wheeling and being supported for rotation between the ends of a lever, said print roll supported on a center shaft and said center shaft is supported by said lever, one end of said lever being pivotally supported in a fixed position, the other end of said lever being resiliently biased to urge said print roll towards said metering roll and said print roll being raisable against said resilient biasing means away from said metering roll in which rod means is pivotally coupled to said resiliently biased end of said lever and in which the rod means is supported for sideway and vertical movement and, in which a block is supported by a support bracket, said block including an arm for pivotally supporting said lever and in which said rod means is positioned in a bore of said block.

4,000,691
ROTARY PRINTING PRESS WITH IMPROVED INKING SYSTEM

Hermann Fischer, Augsburg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany
Continuation of Ser. No. 441,747, Feb. 12, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,909
Claims priority, application Germany, Feb. 28, 1974, 2309850
Int. Cl.² B41F *31/00, 5/16*
U.S. Cl. 101—136 **9 Claims**

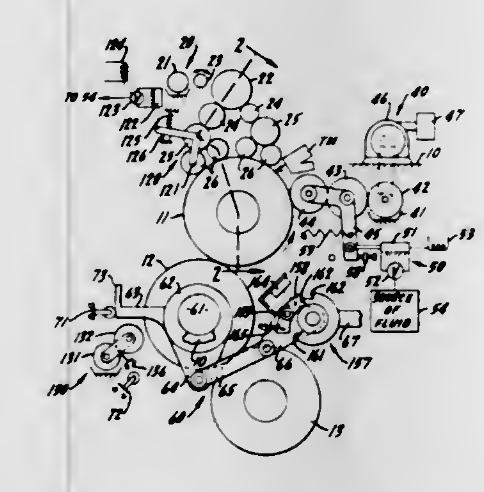


1. Rotary offset printing press having a drive motor (**175**) and a plurality of serially - in the direction of feed of the material to be printed - arranged printing systems, each printing system comprising

a plate cylinder (**1**, **31**);
gear means (**170′**, **171**, **168**, **164**, **162**, **160**, **141**; **172 173**, **169**, **167**, **163**, **161**, **151**) driven by the motor (**175**) driving the plate cylinders (**1**, **31**) of the systems;
a wetting system (**23**, **24**);
an inking system including an ink supply (**2**,**3**; **32**, **33**) and an inking roller train having ink transport and application rollers for each system transporting ink from said supply to the plate cylinder including a driven ink supply friction roller (**4**,**34**) and ink friction roller drive means (**145**, **142**, **148**, **144**; **155**, **152**, **158**, **154**) positively driving said driven ink friction roller independently of the plate cylinder,
at least one driven intermediate friction roller (**6**, **36**) and intermediate friction roller drive means (**147**, **143**, **149**, **146**; **157**, **153**, **159**, **156**) positively driving said at least one driven intermediate friction roller (**6**, **36**),
and at least one ink application roller (**11**, **12**, **13**, **14**, **15**, **16**; **41**, **42**, **43**, **44**, **45**, **46**) in frictional force-transmitting engagement with the plate cylinder (**1**), and drive means (**147**, **143**, **145**, **147**; **152**, **153**, **155**, **156**) in engagement with the gear means (**141**, **151**) driving the plate cylinders (**1**, **31**),
wherein
the ink friction roller drive means driving said ink friction roller (**41**, **34**) have a transmission ratio which drives the ink friction roller at a circumferential speed which is less than the circumferential speed of the plate cylinder (**1**),
the intermediate drive means driving said intermediate friction roller (**6**, **36**) have a transmission ratio which drives the intermediate roller at the circumferential speed which is less than the circumferential speed of the plate cylinder (**1**) but higher than the circumferential speed of the ink friction roller (**4**, **34**) so that the friction roller (**4**, **34**) adjacent the ink supply has the lowest circumferential speed of said friction rollers to apply, by said friction rollers, a braking torque to the plate cylinder;
and wherein the friction roller (**4**, **34**; **70**, **80**; **170**, **180**) of the serially arranged printing systems are driven by their respective drive means at such relative speeds that the ink friction rollers downstream in the direction of feed of material have a speed which is less than that of the respective ink friction rollers of the printing system next adjacent thereto and located upstream with respect thereto.

4,000,692
THROW-OFF SYSTEM FOR ROTARY OFFSET PRINTING PRESS

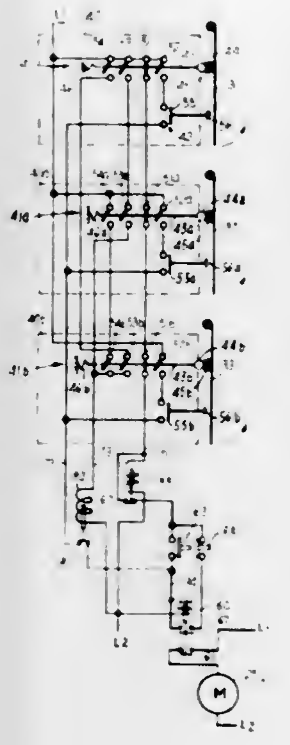
Burkhardt Wirz; Peter Decker, both of Munich; Valentin Gensheimer, Mulheim (Main), and Alfred Dorn, Offenbach (Main), all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany
Filed Dec. 1, 1975, Ser. No. 636,375
Claims priority, application Germany, Dec. 3, 1974, 2456985
Int. Cl.² B41F *7/06, 7/40, 13/28, 31/30*
U.S. Cl. 101—144 **17 Claims**



1. In a lithographic press, the combination comprising a press drive, a plate cylinder, blanket cylinder and impression cylinder, means including a series of ink feed rolls clutched to the press drive for applying a film of ink to the plate on the plate cylinder, a water feed system for applying a film of water to the plate on the plate cylinder, means for constantly monitoring the thickness of the water film and for producing an output signal in accordance therewith, the water feed system including a fountain and a water form roller with at least one water feed roller interposed therebetween, means for throwing off the blanket cylinder to interrupt normal printing, first flow control means in the form of means responsive to the monitoring means for correctively adjusting the fountain to control the rate of water feed to the form roller and plate during normal printing, the fountain being sufficiently upstream in the water feed path so that there is a delay between the making of an adjustment at the fountain and a resulting change in film thickkness at the plate, second water flow control means in the form of means responsive to the monitoring means for cyclically engaging and disengaging the water form roller from the plate to control the feeding of water to the plate, means operated incident to throw-off of the blanket cylinder for energizing the second flow control means, with the relatively rapid response of the second flow control means as compared to the first flow control means serving to promptly limit and maintain a film of predetermined thickness on the plate, means operated incident to throw-off of the blanket cylinder for declutching the ink feed rolls, and means operated incident to reengagement of the blanket cylinder for disabling the second flow control means and for reclutching the ink feed rolls.

4,000,693
SAFE ACCESS ARRANGEMENT FOR DRIVEN MECHANISMS IN A PRINTING PRESS

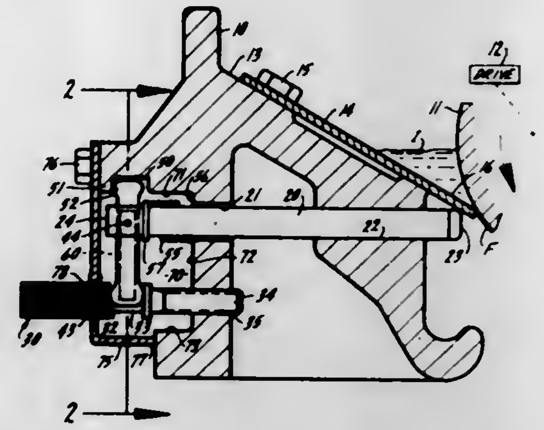
Werner Kaiser, Offenbach-Rumpenheim, and Paul Abendroth, Offenbach (Main), both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany
Filed June 23, 1975, Ser. No. 589,009
Claims priority, application Germany, June 26, 1974, 2430536
Int. Cl.² B41F *33/12*
U.S. Cl. 101—183 **10 Claims**



1. In a printing press having a drive motor and remotely located driven mechanisms as well as a main switch for the drive motor, the combination comprising access covers for safely covering the driven mechanisms but removable to provide access for servicing and adjustment, remote control modules located under the respective access covers, each remote control module having a motor remote control switch including an enabling circuit exclusive of said main switch and effective to energize the drive motor, each remote control module further having a shiftable interlock switch, said interlock switch being mechanically coupled to the associated access cover for movement from a normal position when the cover is closed to a shifted position when the cover is open, means including a motor disabling relay having a normally closed contact effectively connected in series with the motor so the motor is disabled when the relay is energized, the interlock switches each including first and second contact means for shifting control of said motor from said main switch to said means including said motor disabling relay when a single cover is open, said first contact means effectively in series with the main switch for disabling the main switch when the associated cover is open, said second contact means connected to the associated motor remote control switch for enabling the latter when the associated cover is open, said interlock switches further including contacts connected in paired relation with corresponding contacts on each of the other ones of the interlock switches for energizing the motor disabling relay so that the motor is disabled whenever two or more covers are open simultaneously.

4,000,694
INK FOUNTAIN IN AN INKING SYSTEM FOR PRINTING PRESSES

Peter Schroder, Offenbach, Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber Schleicher AG, Germany
Filed June 26, 1975, Ser. No. 590,846
Claims priority, application Germany, June 26, 1974, 2430643
Int. Cl.² B41F *31/04*
U.S. Cl. 101—365 7 Claims



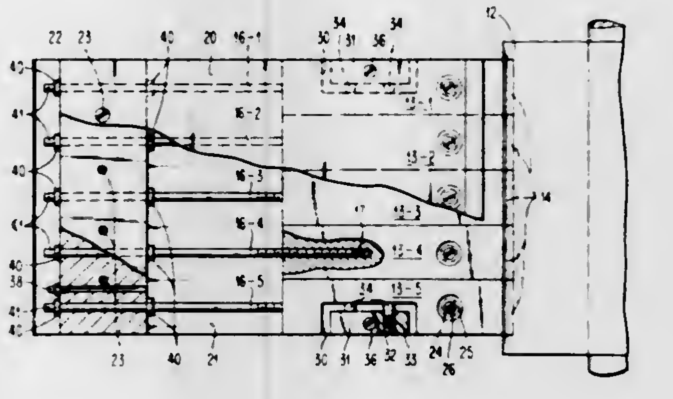
1. In an ink fountain for a printing press, the combination comprising a fountain roller having means for rotating the same, a frame extending parallel to the fountain roller and mounting a fountain blade confining a body of ink, the blade extending at an angle to the surface of the roller and (with the) having a free edge thereof in proximity to the surface to define a film of ink thereon as the roller rotates, a series of adjusting pins extending slidably through registering parallel openings in the frame and engaging the free edge of the blade at spaced points thereby to position the blade with respect to the surface, each pin having its inner end in engagement with the blade and having a presented outer end, a vertically extending lever arranged transversely with respect to each pin, with the central portion of the lever being connected to the presented outer end of the pin, a manually rotatable key for each pin threaded with respect to the frame along an axis parallel to the pin and laterally spaced from the pin, an abutting surface on the frame adjacent one end of the lever to provide a fulcrum, the other end of the lever being engaged by the key, and a return spring for urging the pin outwardly with respect to the frame so that when the key is rotated the lever rocks about its fulcrum to move the pin inwardly against the blade with positive action against the restoring force of the return spring, each lever and associated pin being manually rotatable as a unit about the pin axis for simultaneous disengagement of the one end of the lever from the abutting surface on the frame and disengagement of the other end from the associated key thereby to permit withdrawal of the lever and pin for purposes of cleaning and maintenance while leaving the key in adjusted condition.

4,000,695
INK FOUNTAIN BLADE ASSEMBLY

Frank Perretta, Aux. Rte. 2, Marlboro, N.Y. 12542
Filed Oct. 16, 1975, Ser. No. 622,871
Int. Cl.² B41F *31/02*
U.S. Cl. 101—365 5 Claims

1. An ink fountain blade assembly adapted to be detachably mounted in a printing press for regulating the flow of ink onto a roller, said assembly having a generally flat rectangular shape and being bounded by flat parallel rectangular upper and lower surfaces, front and back edges and lateral sides, said assembly comprising:

first and second flat, rigid rectangular plates forming said upper and lower surface having forward and rearward edges;
a spacer bar fixedly attached between said plates along said plate rearward edges running along said back edge of said assembly and spacing said plates in a parallel relationship;
a plurality of rigid ink blades slidably mounted between said plates in an abutting, side-by-side, sliding relationship with each other, said blades having first and second ends, said first ends projecting beyond said forward edges of said plates and being spaced relatively close to said plates to retard the flow of ink into said assembly, said first blade ends being aligned for engagement with said roller and extending along said front edge of said assembly, said blades having arcuate faces conforming to the curvature of said roller, said blades having thicknesses slightly less than the distance between said plates allowing sliding movement of said blades between said plates;
a plurality of rotatable rods extending through said spacer bar and between said plates, each of said rods having a first end threadedly attached to a different one of said blades at said second end thereof, each of said rods further having a second end projecting beyond said spacer bar and said first edges thereby exposing said second ends along said back edge of said assembly whereby such second ends may be grasped and rotated;
means connecting said rods to said spacer bar and operative to allow said rods to be rotated relative to said spacer bar while preventing any longitudinal movement relative thereto, whereby rotation of said rods causes said blades to move linearly towards and away from said roller such that the positions of said blades are selectively adjustable relative to said roller in response to selective rotation of said rods; and,
spacer means fixedly connected between said plates adjacent to said forward edges and operative to hold said plates in a rigid fixed spaced relationship along said forward edge while allowing movement of said blades between said plates means mounted adjacent said sides of said assembly for resiliently biasing said blades against each other.



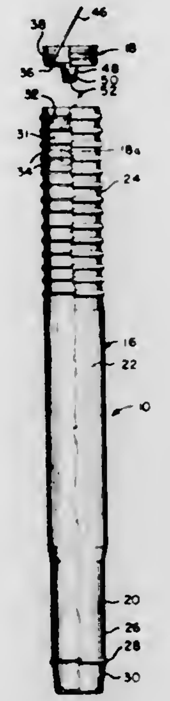
4,000,696
CARTRIDGE FOR TWO COMPONENT FIELD MIXED EXPLOSIVE

James E. Friant; William J. Bruton, both of Renton; Viggo C. Bertelsen, Jr., Bellevue, all of Wash., and Patrick A. Yates, Ridgecrest, Calif., assignors to Excoa, Inc., Redmond, Wash.
Filed Sept. 5, 1975, Ser. No. 610,674
Int. Cl.² F42B *3/02*
U.S. Cl. 102—24 R 7 Claims

1. An explosive cartridge particularly adaptable to a field mix two component explosive composition, which cartridge is arranged to be coupled with other like cartridges to form an explosive column train by end to end coupling of the cartridges, said cartridge comprising:

a. a cylindrical containing shell to contain a first solid component of said explosive composition, said shell having:
   1. an open tail end portion defining a substantially non-tapering cylindrical recess,
   2. a closed front nose portion having a substantially non-tapering cylindrical outer surface portion adapted to slide axially into a tail end portion of an adjacent forwardly located cartridge,

   3. said end portions being provided with circumferential matching ridge and groove means to provide mechanical interconnection of a pair of adjacent cartridges,
b. a cylindrical end closure plug adapted to fit within the non-tapering recess of its related cartridge in sealing relationship therewith, and moveable axially in snug sliding relationship a substantial axial length of the tail portion of its related shell from a rearward pre-mix position to a forward post-mix position,

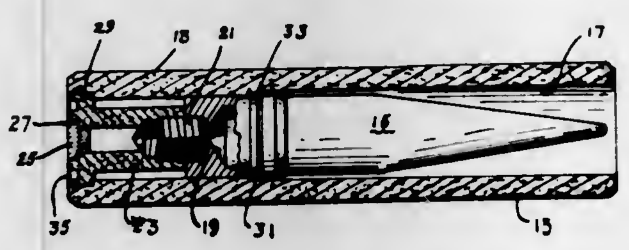


c. said plug and tail end having non-matching ridge and groove means so as to provide a mechanical interconnection therebetween by at least one engaging ridge and groove, and providing a seal therebetween by means of a non-matching portion of the ridge and groove means,

whereby said plug and shell form a watertight seal in both post-mix and pre-mix conditions, and said plug can be moved axially in said shell while maintaining a proper seal to accomodate post-mix slump of the explosive composition.

4,000,697
MECHANICAL RETENTION SYSTEM FOR USE WITH CASELESS AMMUNITION

Seymour Levine, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 10, 1972, Ser. No. 279,415
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² F42B *5/02*
U.S. Cl. 102—38 3 Claims

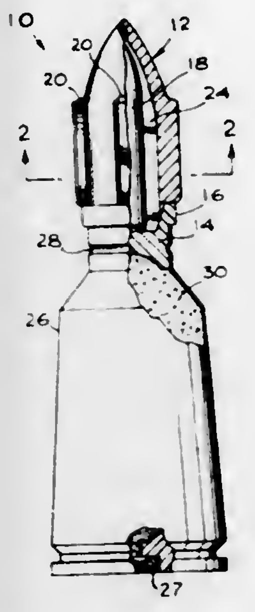


1. A telescoped round of caseless ammunition comprising, a propellant charge of substantially cylindrical configuration and having an axial bore therethrough, said propellant charge having a forward portion and a rearward portion,

a projectile positioned in the forward portion of and completely within the bore of said propellant charge,
a tubular igniter positioned in the rearward portion of said propellant charge immediately aft of said projectile,
means for threadably connecting said tubular igniter to the base of said projectile, and
a primer disposed within the rearwardmost portion of said igniter, said primer being in operative engagement with a shoulder on said igniter to support and effectively prevent forward movement of said primer upon firing pin impact.

4,000,698
SELF-SEPARATING SABOT

Martin Corney, Glendora, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.
Filed Oct. 29, 1974, Ser. No. 518,689
Int. Cl.² F42B *13/16*
U.S. Cl. 102—93 7 Claims

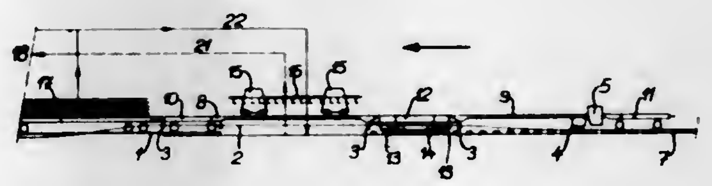


1. A self-separating sabot for use in launching a projectile from launching means, including:

a base portion;
a frangible sabot body enclosing said projectile and secured to said base portion, said sabot body having a longitudinal axis therein; and
mechanical application pressure means projecting from the outer surface of said sabot body, said frangible sabot body being responsive to said mechanical application pressure means to generate fracturing stresses within said sabot body.

4,000,699
APPARATUS FOR REPLACEMENT OF RAIL TRACKS

Frédy Scheuchzer, Lausanne; Fritz Bühler, Ecublens, and Alfred Chiesa, Lucerne, all of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Switzerland
Filed Jan. 24, 1975, Ser. No. 543,863
Claims priority, application Switzerland, Jan. 29, 1974, 1158/74; May 27, 1974, 7207/74
Int. Cl.² E01B *29/02*
U.S. Cl. 104—2 11 Claims



1. An apparatus for replacement of an old rail track disposed on an underlying bed surface by a new rail track, comprising a train assembly including a first train section having means for moving on old rail track, a second train section having means for moving on a new rail track, an intermediate train section linking the first and second train sections, means for removing panels of the old track from the bed surface, means for laying new cross-ties on the bed surface cleared of the old'track to support rails of a new track, and means for

placing and securing new rail sections longer than said removed track rails on said new cross-ties to form the new track, said intermediate train section comprising an open-frame wagon having means defining therein an opening through which said track panels can be lifted, said intermediate train section having an undercarriage including a retractable bogie able to run on the old rail track and auxiliary support means for supporting the intermediate train section at least indirectly on the underlying bed surface independently of the old track and of the secured new track during movement of said intermediate train section over parts of said bed surface from which panels of the old track have been removed.

4,000,700

RAILWAY VEHICLE AND SWITCHING MECHANISM THEREFOR

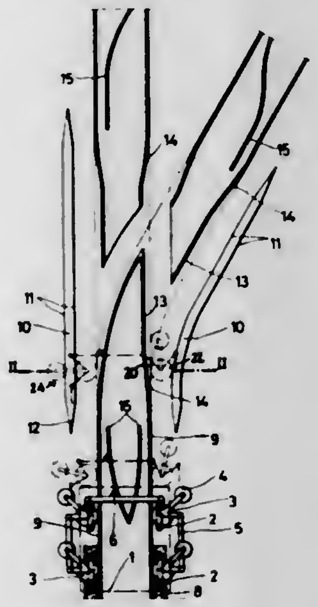
Hans-Otto Hannover, Herdecke, and Johannes Gerhard Spöler, Hagen, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed Mar. 6, 1975, Ser. No. 556,004

Claims priority, application Germany, Mar. 12, 1974, 2411686

Int. Cl.^{2} E01B *25/12*

U.S. Cl. 104—130 **5 Claims**



1. In a railway system comprising a support for said system, said support including horizontal main rail surfaces, first vertical main guide rail surfaces and second vertical surfaces being on an auxiliary rail disposed adjacent branch intersections of said system; at least one vehicle mounting traction wheels on opposite sides thereof adjacent each corner for rotation about horizontal axes and mounting guide wheels on opposite sides thereof adjacent each corner for rotation about vertical axes; said traction wheels being adapted to engage said horizontal main rail surfaces for propulsion of said vehicle therealong, and said guide wheels being adapted to engage said first vertical main guide rail surfaces for guiding said vehicle; a control wheel pivoted on the axis of each of said guide wheels and mounted for rotation about a vertical axis, each of said control wheels being adapted to engage said second vertical auxiliary directional rail in said branch intersections of said system; and lever means interconnecting each of said control wheels with one of said guide wheels, said lever means being adapted selectively to pivot each of said control wheels about the axis of one of said guide wheels for selective engagement with said second vertical auxiliary directional rail; the improvement comrising

a. said second vertical auxiliary directional rail having a vertical auxiliary directonal engaging surface on each side thereof,

b. each guide wheel and its associated control wheel on one side of said vehicle engages one side of said auxiliary vertical directional rail in opposed relation in said branch intersections of said system and

c. said first vertical main rail guide surfaces being recessed on the side of said support opposite said opposed second vertical surfaces whereby said guide wheels on that side are spaced from said first vertical surfaces in said branch intersections.

4,000,701

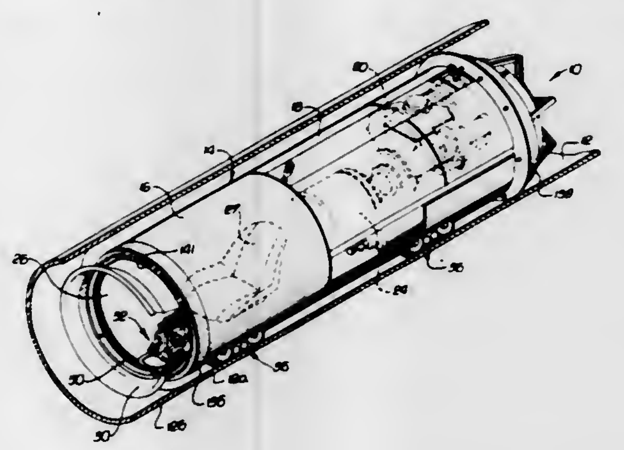
MANNED WELDING AND INSPECTION VEHICLE

John T. Ostgaard, 7855 Vicksburg Ave., Los Angeles, Calif. 90045; James M. Doornbos, 412 S. Locust, Compton, Calif. 90221; John E. Bartley, 216 Lake Drive, Aptos, Calif. 95003, and Cor de Lange, Yacht Haven, Berth 202, Wilmington, Calif. 90744

Filed July 3, 1975, Ser. No. 592,984

Int. Cl.^{2} B65G *51/04*

U.S. Cl. 104—138 R **26 Claims**



1. A manned welding and inspection vehicle for movement through the interior of large-diameter pipes for welding said pipes end to end quickly and efficiently, said vehicle comprising:

a frame;
a housing extending about said frame;
a power source mounted to said frame and located within said housing at a rearward portion thereof; .
a generator coupled to said power source within said housing;
an operator's chamber located within said housing at a forward portion thereof;
a welding system, a portion of which is connected to said housing at the forward end thereof in front of said operator's chamber; and
a driving system connected to said housing for moving said vehicle through said pipes.

4,000,702

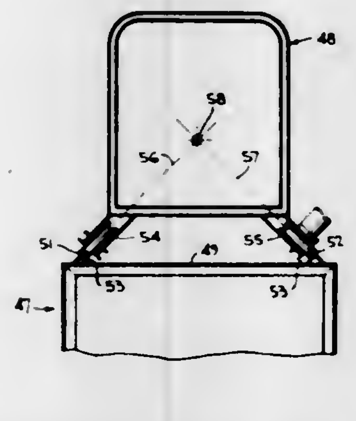
TRANSPORTATION SYSTEM

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed July 24, 1975, Ser. No. 598,875

Int. Cl.^{2} B61B *12/02*

U.S. Cl. 104—244 **20 Claims**



1. In a transportation system, comprising:

an elongated track having a pair of rails mounted thereon, said rails being spaced apart transversely of said track, in combination with an elongated car adapted for travel along said track, first and second wheel means mounted along a side of said car and respectively engaging said rails, said first and second wheel means including a plurality of first and second wheels respectively lying in planes intersecting at the center of gravity of said car, said first and second wheel means being spaced apart a distance of at least one-half said side of said car, said wheels of said respective wheel means thereby being parallel to the resultants of force acting on said rails while said car travels along other than straight paths, whereby direct stresses on said wheels of one of said wheel means increases while direct stresses on said wheels of the other of said wheel means decreases during travel of said car along other than straight paths.

4,000,703

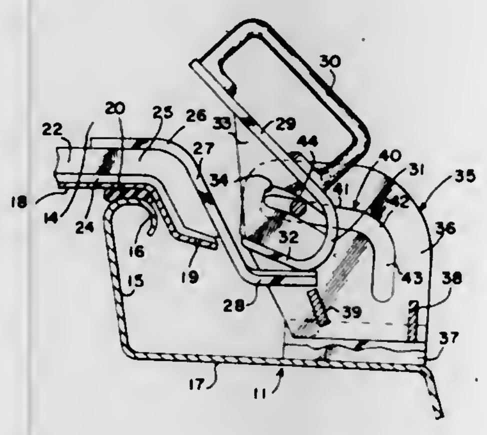
TROUGH HATCH LOCKING DEVICE

William R. Halliar, Whiting, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 11, 1975, Ser. No. 585,985

Int. Cl.^{2} B61D *39/00*

U.S. Cl. 105—377 **9 Claims**



1. A hopper hatch structure including a roof having a coaming defining a hatch opening,

a hatch cover hingedly connected to said roof for movement between open and closed positions relative to said opening,
a hold down arm supported on said roof including portions engaging said hatch cover in said closed position,
said hold down arm having a locking portion extension projecting horizontally outwardly relative to said coaming in the engaging position of said arm, the improvement comprising:
a latch mechanism releasably locking said hatch cover in the closed position including,
latch support means mounted on said roof to one side of said coaming including,
an upstanding pedestal having guide means thereon,
a manually operative latch member on said pedestal confined by said guide means for sliding movement from a lowered non-operative position longitudinally outwardly of said arm to a locking position,
said latch member comprising a lever,
a latch element connected to said lever and extending codirectionally with said lever in overlapping relation,
operator engageable means on said lever whereupon an operator may move said latch member from said non-operative position slidingly along said guide means upwardly and inwardly over said locking extension, said latch element including means initially engaging and forcing said extension downwardly,
said latch member being thereupon rotatable on said guide means whereupon said latch element engages said extension in locking relation and said lever overlies said hold down arm, and
said means initially engaging said extension during locking movement of said latch member including an arcuate cam portion connecting said latch element to said lever.

4,000,704

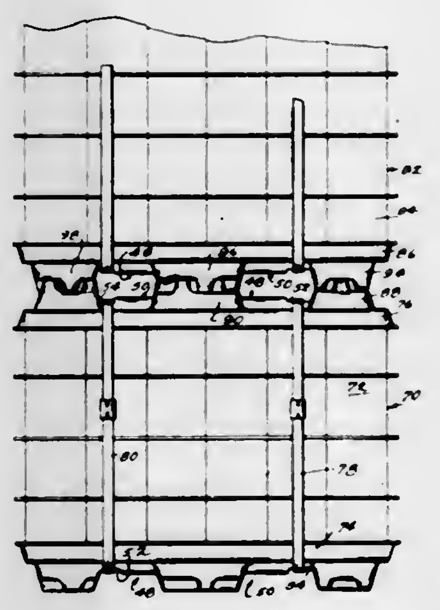
SHIPPING PALLET

Charles E. Griffin, Jr., High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 18, 1974, Ser. No. 516,202

Int. Cl.^{2} B65D *19/38, 21/02*

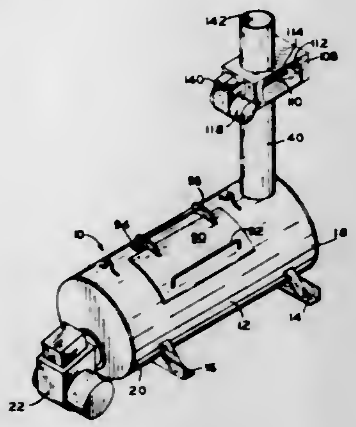
U.S. Cl. 108—53.1 **4 Claims**



4. A shipping container for securing and transporting a load, said container comprising identical top and bottom shipping pallets and strapping means for securing the top and bottom pallets to said load wherein each said top and bottom pallet comprises a generally planar deck having an upwardly extending exterior wall portion, said wall portion being adapted to locate said load, a network of reinforcing rib members extending away from said deck, a first portion of said reinforcing rib members defining at least two channels within said pallet adapted to permit entry of the forks of a lift truck under said pallet, a plurality of foot means extending away from said first portion for supporting said pallet, each of said foot means having complimentary suporting surfaces formed from a second portion of reinforcing rib members comprising a plurality of alternating male and female sections within each said foot means, wherein said supporting surfaces are formed into an interlocking herringbone pattern substantially across the entire area of said surfaces, said male and female sections being located in planes other than the plane of said deck, said male sections in said bottom pallet providing support for said container when not in a stacked orientation, said male and female sections of said top pallet being adapted to interlock with complimentary foot means of an inverted similarly designed pallet comprising the bottom pallet of a second container when the second container is placed in a stacked orientation on the first container whereby the mating surfaces of the male and female sections provide substantially the sole supporting surfaces between the containers and prevent lateral shifting of the containers when in that stacked orientation.

4,000,705
PROCESS FOR DISPOSING OF ANIMAL CARCASSES

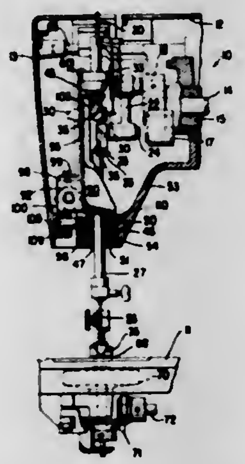
J. Wayne Raber, Huntington, Ind., assignor to Phillip Kaehr, Decatur, Ind., a part interest
Continuation of Ser. No. 494,079, Aug. 2, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 623,949
Int. Cl.² F23G *1/00*
U.S. Cl. 110—3 **12 Claims**



1. A process for burning dead animals comprising the steps of: disposing the animal at the base of a cylindrical chamber with a curvilinear support surface of said chamber providing a resting surface for said animal, heating the chamber and therefore the animal from the burner flame located at one end of said cylindrical chamber by a spirally directed flame which substantially engulfs the entirety of the chamber, circulating the heated air throughout the cylindrical chamber and the combustion products generated within said chamber for a period of up to 0.8 seconds to effect pyrolytic decomposition of the organic product and reduce the balance of the animal product to irreducible ash, and venting the gaseous combustion product from within said chamber through a ventilator stack disposed at the extreme end of said incinerator remotely from said burner.

4,000,706
SKIP STITCH MECHANISM FOR SEWING MACHINES

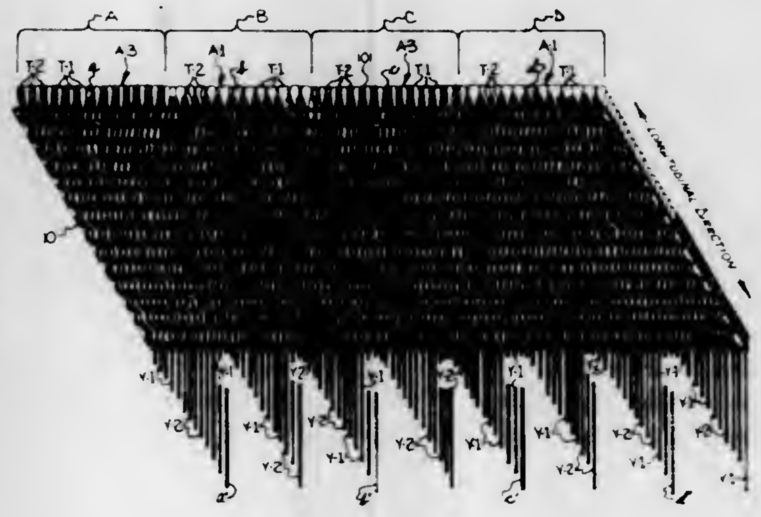
Ernst Kreissl, Karlsruhe; Erwin Vahle, Stutensee, and Hans Uhlig, Karlsruhe, all of Germany, assignors to The Singer Company, Elizabeth, N.J.
Filed May 6, 1976, Ser. No. 683,866
Int. Cl.² D05B *55/16*
U.S. Cl. 112—221 **7 Claims**



1. A skip stitch mechanism in a sewing machine having a frame, a needle bar, means supporting said needle bar for endwise reciprocation in said frame, a latch mechanism carried on said needle bar, actuating means for imparting forces through said latch mechanism for reciprocating said needle bar endwise, unlatching means supported by said means supporting said needle bar and selectively movable about said supporting means to a first position into cooperative relation with said latch mechanism to disconnect said needle bar from said means for imparting endwise reciprocation to said needle bar and to a second position out of cooperative relation with said latch mechanism, and actuating means for moving said unlatching means selectively to said first and second positions.

4,000,707
TUFTED PILE FABRIC AND METHOD OF MAKING SAME

Peter R. Spirer, Coral Gables, Fla., assignor to Horizon Industries, Inc., Dalton, Ga.
Filed Dec. 16, 1974, Ser. No. 532,766
Int. Cl.² D05C *17/02*
U.S. Cl. 112—410 **14 Claims**

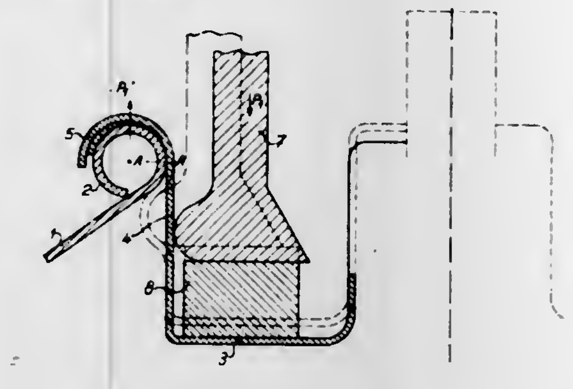


1. A tufted pile fabric having groups of longitudinally extending zig-zag rows of yarn pile tufts disposed in parallel relation to each other, each group of rows comprising a plurality of alternate and intervening rows of pile tufts and defining longitudinally arranged pile areas, with the pile areas presenting different color and pattern effects within each group and among the various groups, substantially all the yarns being high bulk space dyed yarns having varying color characteristics along their length and wherein the pile yarns of alternate rows of pile tufts in each group have color characteristics differing from substantially all of the pile yarns of intervening rows therein, substantially all the intervening rows of pile tufts in at least one of the groups in each pattern repeat being of color characteristics differing from substantially all the intervening rows of pile tufts in the other groups of the pattern repeat, said pile areas being of different types and including
- a. a first pile area having high cut pile tufts in the alternate rows and low pile tufts in the intervening rows such that the high cut pile tufts substantially conceal the low pile tufts,
- b. a second pile area having high cut pile tufts in the intervening rows and low pile tufts in the alternate rows such that the high cut pile tufts substantially conceal the low pile tufts, and
- c. a third pile area having cut pile tufts in alternate and intervening rows of substantially common height, and said first, second and third pile areas being arranged

in a predetermined pattern of visually distinct areas within each group and among the various groups, and wherein the pattern arrangment of said different types of pile areas of certain groups is different from that of other groups to present different color and pattern effects as well as different types of said pile areas both longitudinally and transversely of the pile fabric.

4,000,708
APPARATUS FOR CAPPING RECEPTACLES

Jean Hardt, Neuhausen am Rheinfall, Switzerland, assignor to Aluminium Suisse S.A., Switzerland
Continuation of Ser. No. 252,896, May 12, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,283
Claims priority, application Switzerland, May 17, 1971, 7247/71
Int. Cl.² B21D *37/00, 51/26*
U.S. Cl. 113—18 R **10 Claims**

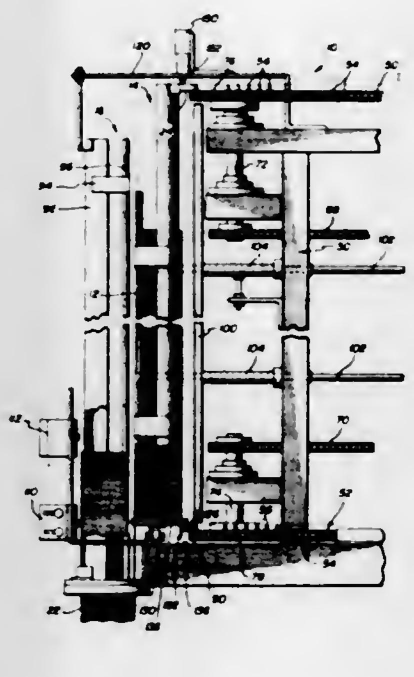


1. A swaging device for securing a cup-shaped metal cap having a skirt, a bottom and an outwardly projecting circumferential flange about a mouth thereof to a receptacle having a conically converging neck at one end and having an opening defined by an edge of said receptacle provided in said neck for receiving said cap, said swaging device comprising:
- a. loading means for axially stressing said skirt when the cup-shaped metal cap is disposed in the mouth of a receptacle with the skirt extending into the receptacle and the flange disposed on the edge defining the receptacle opening thereby developing stresses in the flange to stress the flange in a direction to effect a seal between the mouth of the receptacle and the flange; and
- b. clinching means for circumferentially extending a portion of the cap skirt while the cap skirt is axially stressed to form by plastic deformation a circumferential bulge therein permanently set to secure the cap to the converging neck of the receptacle and permanently maintain the flange in a stressed condition to form a permanent seal between the flange and the mouth of the receptacle, said clinching means comprising a plurality of radially displaceable clinching jaws symmetrically disposed about a common axis, each of said clinching jaws being provided with a bulged portion on an outer surface thereof for forming said circumferential bulge on said cap skirt when said jaws are radially outwardly displaced, said plurality of jaws having an outer diameter in a region opposite said flange of said cup less than an inner diameter of said cup when said clinching jaws are outwardly displaced so that said clinching jaws do not contact said flange or said cup skirt in an area around said flange, and means for radially displacing said clinching jaws outwardly for forming said circumferential bulge and inwardly for releasing said cap skirt from said clinching jaws.

4,000,709
CAROUSEL CAN END FEED UNIT

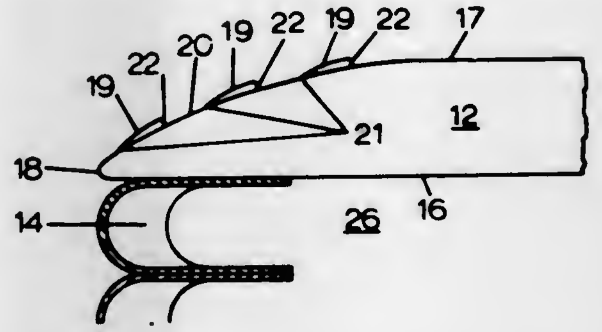
Wallace W. Mojden, Hinsdale, Ill., assignor to Fleetwood Systems, Inc., Countryside, Ill.
Filed July 3, 1975, Ser. No. 593,030
Int. Cl.² B21D *43/12*
U.S. Cl. 113—114 BG **4 Claims**

1. Apparatus for supplying can ends and the like, comprising a frame, endless upper and lower multi-link, roller drive chains mounted for cyclic motion on the frame, drive means for driving the upper and lower roller chains, a plurality of carrier members for supporting a stack of can ends or the like, carried by said roller chains, and ejector means for transferring a stack of ends from said carrier member to a receiving station, an improved mounting arrangement for said carrier members, comprising releasable interconnector means for connecting each carrier member to the upper and lower roller drive chains, which interconnector means includes first and second spaced extensions on each carrier member extending toward the respectively adjacent upper and lower roller chains, and vertically projecting pin means on said roller chains, said first and second extensions providing aperture means receiving said pin means to attach the carrier members to the roller chains for motion therewith, said interconnecting means enabling the positions of the carrier members on the chain to be altered and also providing for ease in the interchanging of carrier members of different size; and support means for said carrier members, comprising an upper, substantially planar frame surface, roller means journalled to the bottom of each carrier member in a position to roll over said frame surface to facilitate movement of said carrier member about the apparatus frame and to support the carrier members and any can ends carried therein so that the weight of said carrier members and can ends need not be supported by said drive structure or said interconnector means.



4,000,710
AIR CUSHION VEHICLES

William Arthur Crago, Cowes, England, assignor to British Hovercraft Corporation Limited, Yeovil, England
Filed July 18, 1974, Ser. No. 489,550
Claims priority, application United Kingdom, July 19, 1973, 34462/73
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² B60V *1/04*
U.S. Cl. 114—67 A **5 Claims**



1. An air cushion vehicle for travelling over water and which, in operation, is supported above the water, at least in

part, by a cushion of pressurised air formed beneath the vehicle body, the sides of the cushion being contained by a pair of rigid sidewall structures rigid with the vehicle body and extending longitudinally along the sides of the vehicle body and depending downwardly therefrom so as to dip into the water to a depth such that under normal operation they are always immersed in the water and provide a cushion seal along the sides of the vehicle, each sidewall having inner and outer surfaces with respect to the cushion, the outer surface inclining inwardly when viewed in plan to meet with the inner surface thereof at the forward end of each sidewall, said inner surface at the forward end, when viewed in plan, being substantially straight and substantially parallel to the center line of the vehicle body, a flexible cushion seal extending across the front of the vehicle and of a height which permits water to flow thereunder such that under normal operation water flows along both the inner and outer surfaces of each sidewall, and a cushion seal extending across the rear of the vehicle between said rigid sidewalls, wherein wedge shaped members are provided on the inclined parts of the outer surfaces at the forward end of the sidewalls, the wedge shaped members being arranged on those portions of the inclined outer surfaces which dip into the water and constituting means for reducing the net differential force exerted on the front ends of each sidewall in a direction normal to the direction of motion of the vehicle by breaking up the flow of water over said inclined parts of the outer surfaces as the vehicle travels over the water.

4,000,711

TANK SUPPORTING STRUCTURE FOR SHIPS

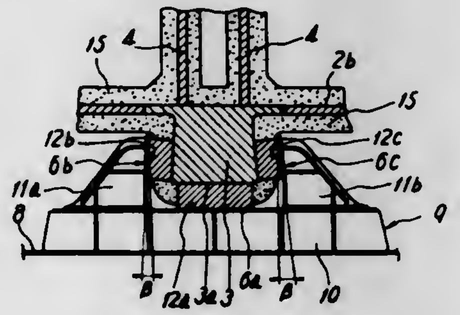
Tomiyasu Okamoto; Tsunanori Nishimoto; Koji Harada, and Seiichiro Murata, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Apr. 16, 1975, Ser. No. 568,628

Claims priority, application Japan, Apr. 19, 1974, 49-44693; Apr. 19, 1974, 49-44694

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 A **5 Claims**



1. Structure for supporting a tank on a support deck of a ship comprising:

- a plurality of chocks secured to the tank and spaced apart from each other around the outer periphery of the tank adjacent said support deck;
- a plurality of pairs of opposed chock holding members mounted on said tank support deck, each pair of said chock holding members being disposed peripherally of the tank on opposite sides of one of said chocks;
- pressure resistant heat insulating pads positioned between each chock and the pair of chock holding members associated therewith, said pads, said chock and said pair of chock holding members being arranged so as to provide opposed pairs of relatively slidable vertical abutment surfaces which permit relative movement radially of the tank between each chock and associated pair of chock holding members, said opposed pairs of relatively slidable vertical abutment surfaces converging as they extend upwardly to prevent upward movement of the tank relative to the support deck; and
- means disposed between the outer periphery of the tank and said tank support deck for supporting vertical loads on the tank by abutting horizontal surfaces which permit relative sliding movement between the tank and the tank support deck.

4,000,712

BOAT HULL CONSTRUCTION

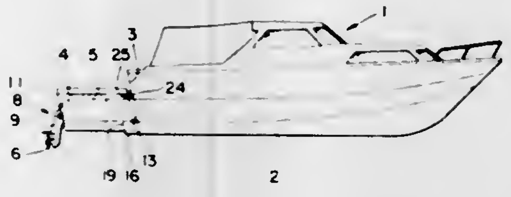
Ernst G. Erikson, and K. Hakan Lindström, both of Kvarngatan 8, 931 00 Skelleftea, Sweden

Filed Sept. 23, 1975, Ser. No. 615,963

Claims priority, application Sweden, Sept. 23, 1974, 7411901

Int. Cl.² B63B *3/02, 1/38*

U.S. Cl. 114—77 R **5 Claims**



1. In a boat with propulsion machinery and a boat hull construction comprising a main hull defined by bottom and side walls, an additional hull attached to the stern of the main hull, and means for adjusting the additional hull relative to the main hull, said additional hull having located therein the propulsion machinery, the main hull being provided with an extension member which is in overlapping relationship with the additional hull thereby to provide an air space between the two hulls and below an initial forward portion of the additional hull, the improvement comprising as said extension member, a member extending rearwardly from the main hull in the same plane as the bottom and side walls of the main hull so as to extend in a continuum in overlapping relationship with the additional hull, and as said means for adjusting the additional hull relative to the main hull, means for pivoting said additional hull about a fixed horizontal and transverse axis with respect to said main hull during operation of the boat.

4,000,713

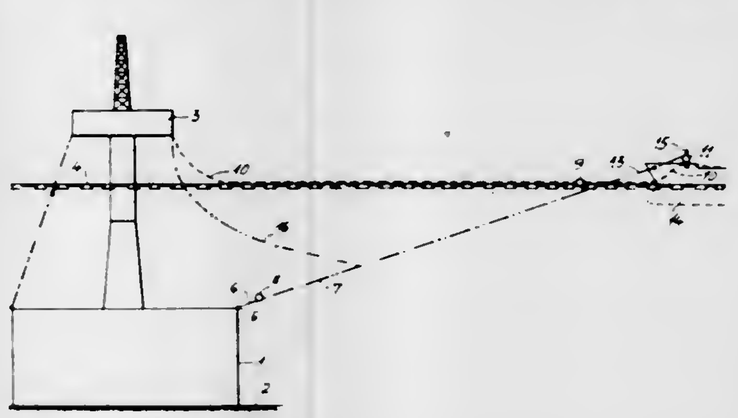
COMBINED MOORING AND TRANSFER MEANS FOR OIL AND OTHER LIQUID

Sigurd Heien, Aslokkveien 82, 1362 Billingstad, Norway

Filed May 1, 1975, Ser. No. 573,618

Int. Cl.² B63B *21/00*

U.S. Cl. 114—294 **4 Claims**



1. Combined mooring and transfer means for oil and other liquid which is to be transferred to a ship from an off-shore production platform, storage tank, pipeline and other installation which rests on the sea bed and partly extends above sea level, comprising a floating mooring hawser which may be hauled toward that part of the installation which extends above sea level and a floating hose which may be hauled aboard that part of the installation which extends above sea level, wherein the one end of the mooring hawser is connected to that part of the installation which rests on the sea bed and the other end is connected to a buoy which also is connected to the transfer hose, said buoy having a hanger on the underside for support of that end of the transfer hose which is to be connected to the ship, one end of the transfer hose being connected to that part of the installation which extends above sea level, and means for hauling said mooring hawser toward that part of the installation which extends above sea level.

4,000,714

SYSTEM FOR INTERCONNECTING A BARGE AND A PUSHER TUG

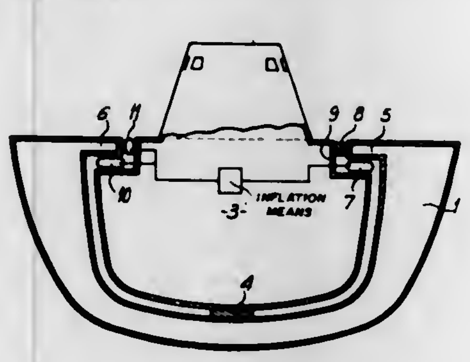
Jean Paul Colin, Nantes, France, assignor to Ateliers et Chantiers de Bretagne - A.C.B., France

Continuation of Ser. No. 385,577, Aug. 3, 1973, abandoned. This application May 7, 1975, Ser. No. 575,234

Claims priority, application France, Aug. 9, 1972, 72.28708

Int. Cl.² B63B *21/56*

U.S. Cl. 114—248 **14 Claims**



14. The method of interconnecting a barge and a pusher tug, said barge having a recess in the stern thereof to which the bow of said pusher tug conforms with clearance when the tug and barge are brought together, said method comprising the steps of

- positioning said pusher tug within the recess in the stern of said barge with clearance between said tug and barge,
- attaching one end of a rigid thrust transmitting passive member to said tug and the other end of said member to the stern of said barge, and
- inflating inflatable means fixed in position within the clearance between said tug and said barge, said rigid thrust transmitting passive member transmitting forces directed along the longitudinal axis of the combined barge and pusher tug but not being subjected to any component of the forces substantially at right-angles to said longitudinal axis, and said inflatable means when inflated exerting forces at right-angles to the major surfaces of said pusher tug and barge, said thrust transmitting member and inflated inflatable means maintaining said pusher tug and barge interconnected to one another as they move

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4,000,715

ACOUSTIC ALARM DEVICE WITH SOUND ATTENUATOR

Bertrand A. Warnod, Courbevoie, France, assignor to Klaxon, France

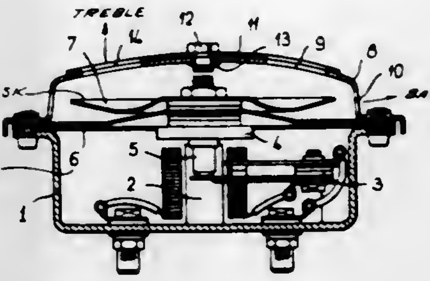
Filed May 29, 1975, Ser. No. 583,542

Claims priority, application France, May 31, 1974, 74.18951

Int. Cl.² G10K *9/22, 11/062*

U.S. Cl. 116—137 R **1 Claim**

1. An electromagnetic acoustic alarm device of the resonance disk type having a membrane comprising, in combination, a case, a bell-shaped rigid wall having a front portion and a side case in enclosing relationship with the membrane and the resonance disk with the membrane and said bell-shaped wall defining a chamber, said wall front portion having at least one opening, a shutter plate of a configuration matching that of said wall front portion rotatably mounted in overlying relationship with the outer surface of said wall front portion, said shutter plate having at least one opening and being movable between a plurality of selected rotary positions to position said shutter plate opening in uncovering relationship with said wall opening to a selected extent and a covering position with said wall front portion opening with respect to detent-positioning means on the shutter plate to thereby adjustably attenuate the treble sounds generated by the resonance disk, said detent-positioning means having coacting means on said shutter plate and said wall front portion for indexing the selected rotary position of said shutter plate.



4,000,716

EPITAXIAL GROWTH DEVICE

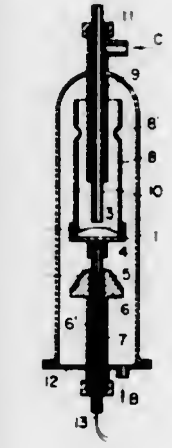
Kazuhiro Kurata, Hachioji; Kozi Honma; Masahiko Ogirima, both of Tokyo; Yuichi Ono, Kokubungi, and Yoshiteru Keikoin, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Co., Ltd., both of, Japan

Filed Aug. 12, 1971, Ser. No. 171,250

Claims priority, application Japan, Aug. 12, 1970, 45-70073

Int. Cl.² B05C *11/00;* **B01J** *17/32,* **C23C** *13/08*

U.S. Cl. 118—5 **17 Claims**



1. An epitaxial growth device for making either a IIIb–Vb group compound semiconductor or a mixed crystal semiconductor of Group IIIb–Vb, comprising

- a substantially vertically supported reaction tube,
- a crucible-shaped cylindrical metal holder disposed in said reaction tube and having a vertical axial length extending in said reaction tube;
- means for maintaining a substantially isothermal temperature distribution in said reaction tube along the vertical axial extension of said cylindrical metal holder, wherein metal contained in a lower portion of said metal holder is in a fused condition, and for establishing a temperature gradient from approximately the lower portion of said metal holder to a lower portion of said reaction tube;
- gas guide tube means inserted from an upper part of said reaction tube and extending inside said cylindrical metal holder to near the metal contained by said holder for introducing all reaction gases adjacent to the metal, said cylindrical metal holder providing a reaction zone and a mixing zone for all the reaction gases such that the reaction gases are mixed in the isothermal portion of the reaction tube inside said cylindrical metal holder, wherein said cylinder and guide tube means are coextensive with one another over a substantial part of the axial length of the reaction tube; and

wherein said substantial part approximates at least one half of the axial length of the reaction tube;

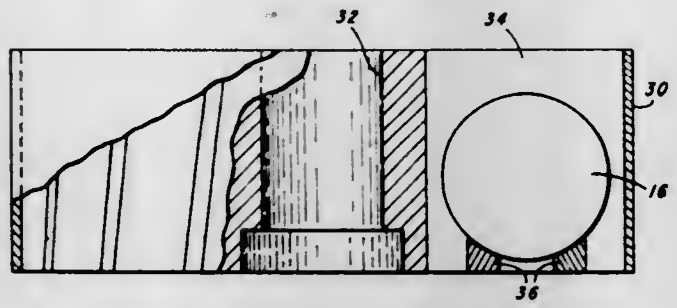
substrate crystal holder means disposed below said cylindrical metal holder in said lower portion of said reaction tube; and

means for causing gas to flow past said crystal holder means, whereby the mixed reaction gases subsequently pass over a top portion of said cylindrical metal holder down to said crystal holder means.

4,000,717
APPARATUS FOR EPITAXIAL DEPOSITION

Philip Leroy Anderson, Richardson, and William Wesley Gartman, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1974, Ser. No. 531,933
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49 **12 Claims**



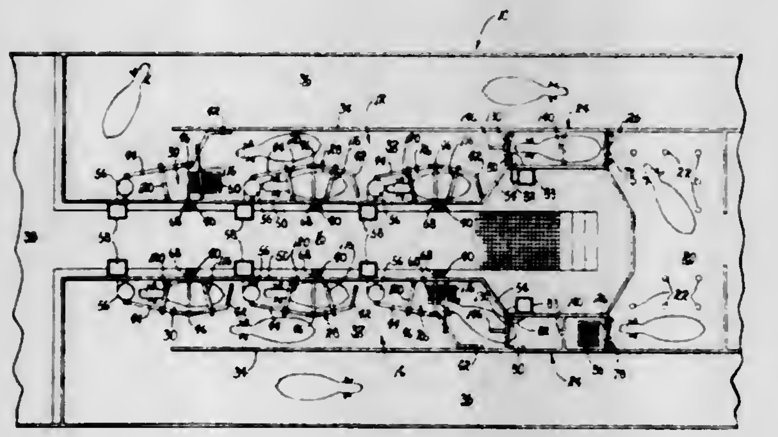
1. Apparatus for epitaxial deposition wherein the epitaxial layer is prepared by chemical vapor deposition or by physcial vapor deposition which comprises:

a. a vertical reaction chember;
b. carrousel horizontally disposed in said reaction chamber;
c. means to pass gases through said carrousel;
and
d. said carrousel comprising a central region, a plurality of walls extending radially outward from said central region said walls being slightly inclined from the vertical for positioning each slice at a slight angle with respect to the direction of gas flow, and means to support slices between a pair of adjacent walls.

4,000,718
PNEUMATIC AUTOMATED MILKING PARLOR

Michael J. Brown, 9955 9¼ Ave., Hanford, Calif. 93230

Filed Apr. 14, 1975, Ser. No. 567,727
Int. Cl.² A01J *7/00*
U.S. Cl. 119—14.03 **21 Claims**



1. An automated milking parlor comprising:

a barn having a pair of milk stall banks disposed in spaced parallel relationship, each with an entry end and an exit end, and an operator's pit disposed between said banks;

a plurality of milk stalls in each of said stall banks, said milk stalls in each bank being disposed to align cows positioned therein in head to tail alignment parallel to and adjacent said pit, with their heads directed toward the exit end of said stall bank;

a cow flow passage in each of said banks disposed parallel to said milk stalls and on the opposite side thereof from said pit, said passage having an entry at the entry end of each stall bank and an exit at the exit end of each stall bank;

a prep stall at the entry end of each stall bank disposed to receive cows, contain them and release them into said passage for travel therealong to a selected one of said milk stalls;

milk stall gate means operatively associated with each of said milk stalls for receiving, containing and releasing cows;

milk stall gate actuating means operatively associated with each of said milk stall gate means and interconnected with said milk stall gate means and disposed, upon activation thereof, to operate said milk stall gate means;

prep stall gate means operatively associated with said prep stall for receiving, containing and releasing cows;

prep stall actuating means operatively associated with said prep stall and interconnected with said prep stall gate means, and disposed, upon activation thereof, to operate said prep stall gate means;

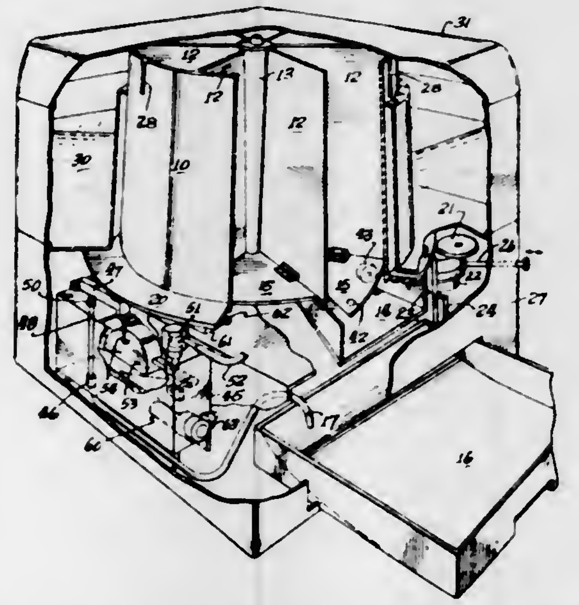
power means interconnected with said milk stall gate actuating means and said prep stall gate actuating means and disposed to power the mechanical operation thereof, said power means includes a source of pressurized gas and conduits interconnecting said source with said milk stall gate actuating means and said prep stall gate actuating means; and

control means interconnected with said power means and disposed to control the activation of said milk stall gate actuating means and said prep stall gate actuating means, said control means includes a source of pressurized gas and a plurality of pneumatically responsive control and logic elements interconnected by pneumatic conduits.

4,000,719
AUTOMATIC PET FEED DISPENSER

Gary H. Richards, 3204 Palm Ave., Manhattan Beach, Calif. 90266

Filed Apr. 30, 1975, Ser. No. 572,963
Int. Cl.² A01K *5/02*
U.S. Cl. 119—51.13 **4 Claims**



1. Apparatus for automatically dispensing pet feed through a chute into a tray on a predetermined schedule from a feed storage drum supported on an elevated plate, to turn on a vertical axis said drum having internal radial panels vertically disposed for dividing the feed storage volume thereof into sectors, each sector being closed at the bottom by a sector-shaped panel to form a storage bin, each sector-shaped panel being hinged on a leading side to open downwardly under

gravity for dispensing pet feed into said chute, said chute being connected to said horizontal support plate and having its lower end positioned to empty into said tray, said plate having a sector-shaped opening over said chute of sufficient size to permit each sector-shaped panel to drop in turn into said chute as said drum is rotated, said sector-shaped opening in said support plate having sides spaced to permit only one sector-shaped panel to drop at one time, whereby a sector-shaped panel drops as its trailing side passes into said opening, and thereafter is raised back to its horizontal position as its hinged leading side moves past said opening and over said support plate, and means for continually rotating said drum on said support plate about a vertical axis so as to bring said sector-shaped panels into position over said plate opening in succession, said rotating means being comprised of an annular flange concentrically secured to said drum, a wheel, an electric motor connected to drive said wheel and means for biasing said wheel against the rim of said flange to permit setting the position of said drum, and whereby upon running said motor to turn said drum, each sector-shaped panel drops in turn into said chute when in position over said sector-shaped opening in said panel and each dropped panel is gradually raised into a horizontal position as said drum continues to rotate and thereby force the sector-shaped panel against the far side of the sector-shaped opening

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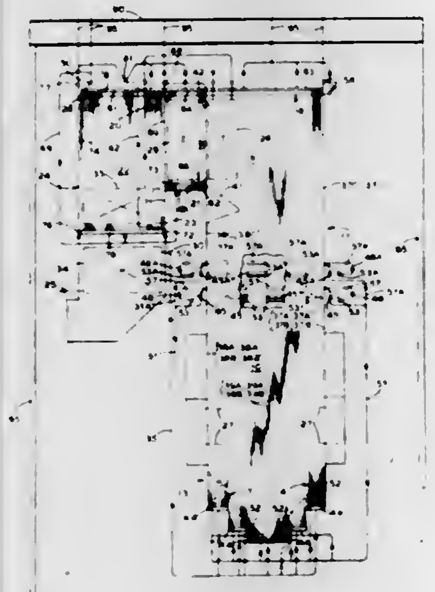
4,000,720
VAPOR GENERATOR

Carl Lieb, Norton, and Edward J. Piaskowski, Massillon, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,564
Int. Cl.² F22B *29/06, 37/24*
U.S. Cl. 122—510 **4 Claims**



1. In a forced circulation fluid heating unit, upright walls forming a furnace chamber, at least one of the walls including upper and lower panels, each of said panels being comprised of a multiplicity of upwardly extending laterally spaced tubes rigidly united throughout most of their length, mixing header means receiving fluid from the lower panels and discharging the mixed fluid to the upper panels, some of said upper and lower panels being bent out of the plane of the wall at first and second levels, respectively, for connection to the header means and interlaced with and laterally spaced from each other in the plane of the wall between the first and second levels, the first level being subjacent the second level, the remaining upper and lower panels being bent out of the plane of the wall at about the first and second levels, respectively, for connection to the header means, and means for supporting said one wall including metallic webs weld uniting the interlaced upper and lower panels and transmitting the load of the lower panels to the upper panels, and means for top supporting said upper panels.

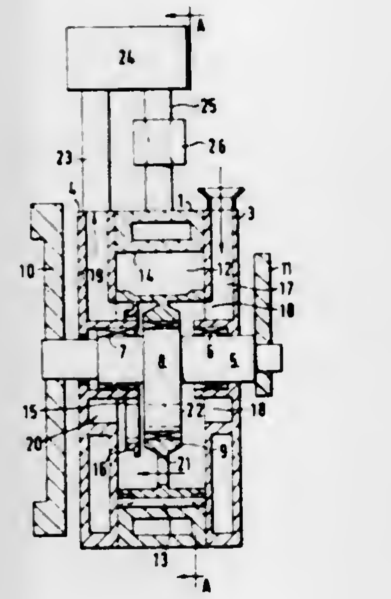
4,000,721
ROTARY INTERNAL COMBUSTION ENGINES

David Walker Carside, Solihull, England, assignor to Birmingham Small Arms Company Limited, Birmingham, England

Continuation of Ser. No. 529,085, Dec. 3, 1974, abandoned, which is a continuation of Ser. No. 271,813, July 14, 1972, abandoned. This application Feb. 11, 1976, Ser. No. 657,044

Claims priority, application United Kingdom, July 17, 1971, 33676/71; Apr. 29, 1972, 19988/72

Int. Cl.² F02B *55/06*
U.S. Cl. 123—8.01 **1 Claim**

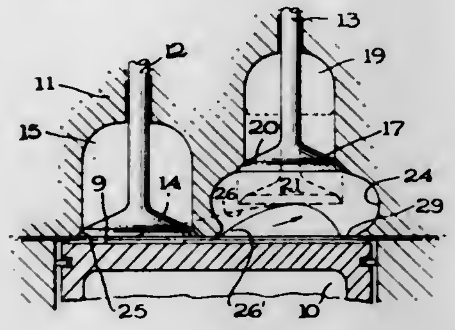


1. A rotary piston internal combustion engine comprising a housing having a two lobed epitrochoidal bore therethrough, a mainshaft mounted axially within said bore, a rotor of generally equilateral triangular shape mounted on an eccentric journal of the mainshaft for planetary rotation within the bore such that its apices maintain sliding contact with the wall of the bore and thereby form three working chambers which vary in volume as the rotor rotates, said housing having an inlet port leading to said working chambers, means providing axial cooling passages through said rotor, end plates secured to the housing and forming axially spaced end walls closing the bore, a first cooling air induction port in one of the end plates positioned to communicate with said axial cooling passages in the rotor, a second port formed in the outer end plate also positioned to communicate with said axial cooling passages in the rotor, a conduit having a portion external of said engine connecting the second port to said inlet port, air inducted into the working chambers thereby flowing successively through the first port, said rotor cooling passages, the second port and said conduit, a heat exchanger interposed in said external conduit portion so arranged that the induction air flowing through the conduit constitutes substantially the sole heat input to the heat exchanger, said heat exchanger being adapted to dissipate heat from the induction air flowing through said conduit whereby the temperature difference between the induction air flowing through said conduit and ambient air may be reduced, a bypass whereby the induction air flowing through the conduit can bypass the heat exchanger means for selectively opening and closing the bypass passage and means responsive to engine load for operating said bypass passage opening and closing means.

4,000,722

EXTERNALLY IGNITED FOUR CYCLE INTERNAL COMBUSTION ENGINE

Michael G. May, Bel Air, CH-1180 Rolle, Switzerland
Filed Jan. 29, 1975, Ser. No. 545,023
Claims priority, application Germany, Jan. 30, 1974, 2404395
Int. Cl.² F02B *3/00*
U.S. Cl. 123—30 D **17 Claims**



1. A four-cycle, externally ignited internal combustion engine comprising:

cylinder means;

cylinder head means attached to said cylinder means;

a piston moving reciprocatingly within said cylinder, thereby defining a combustion chamber of varying geometry;

an overhead intake valve for closing an inlet opening having a valve seat and which admits a substantially homogeneous combustible charge and is the only inlet means for said engine;

a chamber in said cylinder head extending said combustion chamber into said cylinder head, said chamber having a depth of penetration into said cylinder head which is less than the lateral extent of said chamber and said chamber having continuous curved walls defining the lateral extent thereof;

an overhead exhaust valve whose valve disc defines the vertical extent of said chamber in said cylinder head and whose valve seat lies in a plane which is displaced from the plane which includes the seat of said inlet valve;

and said piston and said cylinder head are disposed to cooperate so that, at top dead center of said piston, said piston head and said inlet valve disc are substantially parallel and so near each other that, during the end of the compression stroke, the top of said piston and said cylinder head cooperate to define a guide channel originating in the vicinity of said inlet valve disc and leading to said chamber and terminating in said chamber in a substantially tangential manner; whereby gaseous charge is accelerated through said guide channel to thereby enter said chamber substantially tangentially and induce therein a substantially unique vortex flow whose axis of rotation is substantially parallel to the longitudinal cylinder axis;

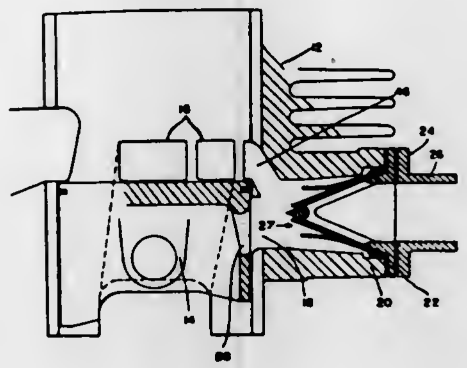
said piston and said cylinder head further cooperating in such a manner that, at top dead center, the combustible charge is substantially confined to said chamber and to said guide channel only.

4,000,723

ENGINE VALVE MEANS AND PORTING

Eyvind Boyesen, Huntingdon Valley, Pa., assignor to Performance Industries, Inc., Huntingdon Valley, Pa.
Division of Ser. No. 375,065, June 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 8, 1973, abandoned. This application Nov. 15, 1973, Ser. No. 416,213
Int. Cl.² F02B *33/00*
U.S. Cl. 123—73 AA **1 Claim**

1. A variable speed two cycle crankcase compression internal combustion engine comprising a cylinder, a piston movable in the cylinder, a fuel intake system including an intake tract at one side of the cylinder and having reed valve means for controlling the flow through the intake tract, and said intake system including porting in the cylinder wall and in the piston located at the same side of the cylinder as the intake tract, the piston and the cylinder and piston porting being located and proportioned axially of the cylinder to provide flow channel means of substantial cross sectional flow area between the intake tract and the crankcase of the engine throughout the entire cycle of the engine including the bottom dead center position of the piston and thereby provide uninterrupted fuel intake during the stroke of the piston from bottom dead center to top dead center position, and a fuel transfer system for transferring fuel from the crankcase of the engine to the combustion side of the piston including a transfer passage communicating with the crankcase and having a transfer port through the cylinder wall and axially positioned to be closed by the piston in the region of top dead center position of the piston, said transfer port being offset from the cylinder and piston intake porting circumferentially of the cylinder so that a fuel flow path is provided in the transfer system from the crankcase to the cylinder at the combustion side of the piston independently of the intake tract



4,000,724

IGNITION ARRANGEMENTS FOR INTERNAL COMBUSTION ENGINES

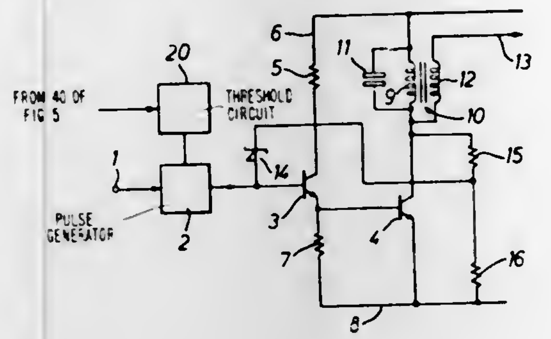
Albert Lewis Fowler, Kirkcaldy, Scotland, assignor to Hughes Microelectronics Limited, Culver City, Calif.
Filed July 15, 1974, Ser. No. 488,411
Claims priority, application United Kingdom, July 14, 1973, 33667/73
Int. Cl.² F02P *1/00*
U.S. Cl. 123—117 R **6 Claims**

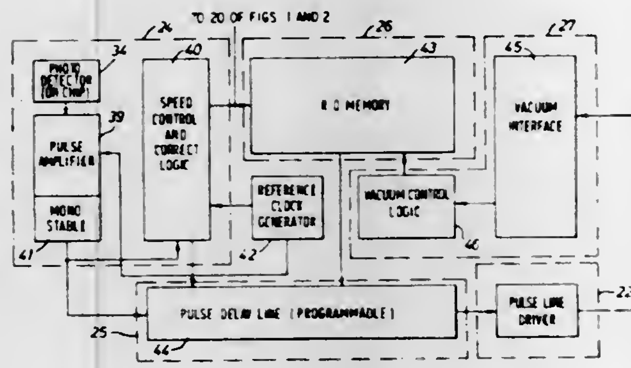
1. An ignition system for an internal combustion engine having a voltage generator for producing a high ignition voltage on discharge comprising:

first means for generating a pulse of a duration which is substantially independent of engine speed within at least a predetermined speed range,

second means for utilizing the beginnning and end of said pulse to initiate charging and discharging, respectively, of said generator; and

third means for varying the timing of the beginning of said pulse in response to at least engine speed so that the end of said pulse occurs at an angle in the engine cycle selected according to said speed, said third means including a memory for storing signals representing different angles in the engine cycle as a function of at least engine speed, fourth means for selecting an angle signal from said memory in dependence on at least engine speed, and fifth means for converting the selected angle signal into the appropriate time delay from a reference time to the beginning of said pulse, said fifth means including a clocked time delay device, responsive to said angle signal, for providing the number of clock pulse intervals of delay which correspond to said angle signal, and sixth means for clocking said delay device at a frequency dependent on the engine speed

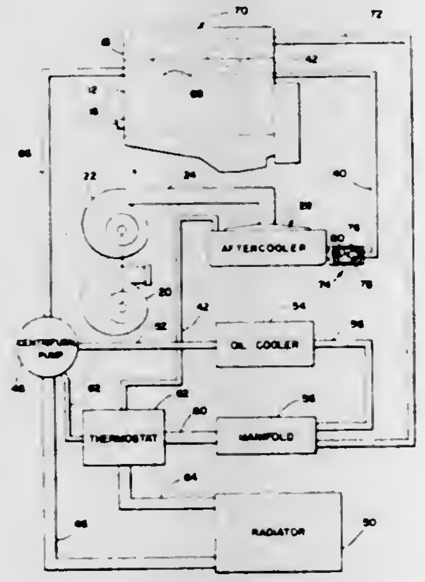




4,000,725

AFTERCOOLER COOLANT FLOW CONTROL FOR INTERNAL COMBUSTION ENGINE

Dallas R. Harris, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Mar. 24, 1975, Ser. No. 561,420
Int. Cl.² F02B *33/44*
U.S. Cl. 123—119 CD **7 Claims**



1. In an air breathing liquid cooled internal combustion engine operable between a relatively low idle RPM and at a higher RPM, the combination comprising:

an engine cooling system including means defining a plurality of liquid coolant flow paths,

an engine driven pump pressurizing liquid coolant for flow through said plurality of flow paths at a level increasing generally with increasing engine RPM,

a compressor for pressurizing engine intake air, said compressor having an outlet,

means responsive to operation of said engine for rotating said compressor,

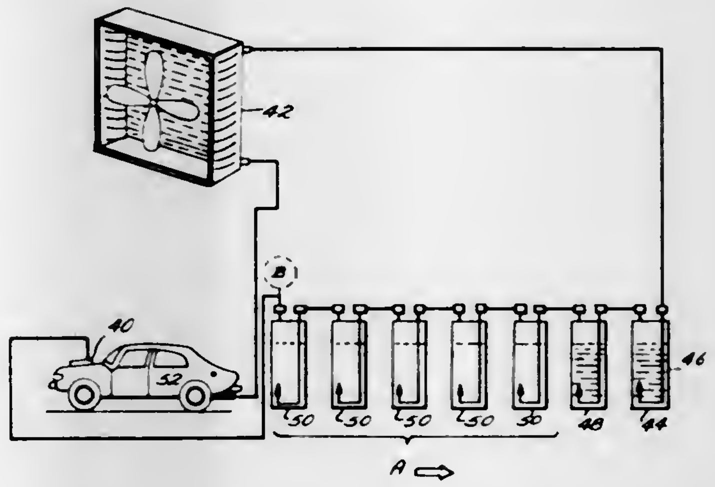
a heat exchanger having a first set of passages receiving air from said compressor outlet for delivery to said engine and a second set of passages in heat exchange relation to said first set of passages, said second set of passages connected to and receiving liquid coolant from said engine cooling system for flow therethrough; and

a pressure responsive flow control valve permitting coolant flow through said second set of heat exchanger passages in response to liquid pressure differentials across said heat exchanger exceeding a predetermined level, said pressure differential corresponding to a condition when said engine is operating above said idle RPM.

4,000,726

SAFETY TANK SYSTEM

Sydney Simon, 936 Oranmore St., Pittsburgh, Pa. 15201
Filed Feb. 18, 1975, Ser. No. 550,589
Int. Cl.² F02M *17/22*
U.S. Cl. 123—134 **2 Claims**



1. An internal combustion engine of the type having fuel mixing means prior to ignition and an exhaust waste discharge means comprising conduit means secured to said exhaust waste discharge means and radiator means, said radiator means being adapted to cool waste discharge gas carried by said conduit means from said exhaust waste discharge means, a second conduit means connected to said radiator means and gas filtration means, said gas filtration means being adapted to clean gas carried by said second conduit means which was cooled by said radiator means, a plurality of fuel tanks in series connected to said filtration means and adapted to receive clean filtered gas from said filtration means, each said fuel tank comprising a body having inlet means and outlet means, a transfer conduit connected to said inlet means and extending into said tank body, an explodable liquid contained within said tank body with the level of said liquid being above one end of said transfer conduit so that gas can bubble upward into said tank to form a gaseous vapor in the top of said tank, richer in fuel composition than it was in the previous tank, said outlet means being positioned above said gasoline level in said tank, a third conduit means secured to the outlet means of the last tank of said series and connecting said outlet means with said fuel mixing means of said internal combustion engine, said internal combustion engine being adapted to ignite and explode said gaseous vapors from said fuel tank to propel moving parts of said engine.

4,000,727

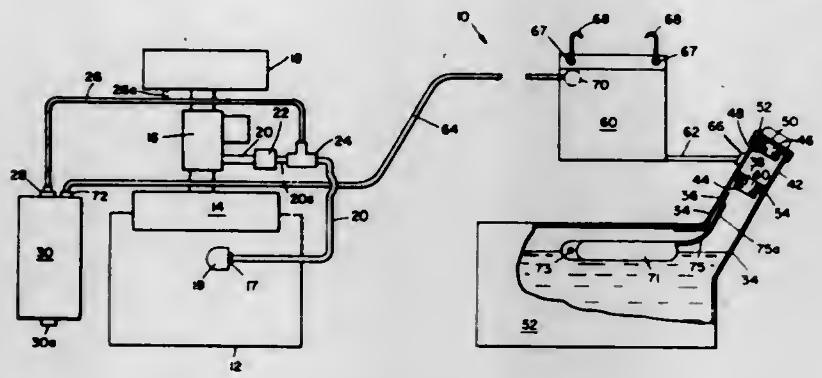
VEHICLE RETROFIT GASOLINE EVAPORATION CONTROL DEVICE

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Sept. 14, 1973, Ser. No. 397,174

Int. Cl.² F02M *21/02*; B65D *25/14*

U.S. Cl. 123—136 13 Claims



1. A device for controlling fuel evaporation and overflow expansion out of an automobile fuel tank filler neck and comprising,

an automobile fuel tank having a filler neck,

an automobile luggage compartment adjacent to and at least partly above said fuel tank,

container means including a flexible and expandable and substantially completely collapsible bag located in said luggage compartment and positioned with its lower end above said neck for receiving both fuel vapors and liquid fuel overflow from the fuel tank filler neck,

a vapor storage element,

first conduit means for connecting the lower end of the flexible bag to the fuel tank through the filler neck to transmit both the fuel vapors and liquid fuel overflow back and forth between the flexible bag and the filler neck,

second conduit means for connecting the upper end of the flexible bag to the vapor storage element to conduct only fuel vapor from the container means to the vapor storage element, and

valve means at the upper end of said bag for passing vapor therethrough but preventing passage of liquid therethrough into said second conduit means.

4,000,728

FUEL INJECTION GOVERNOR

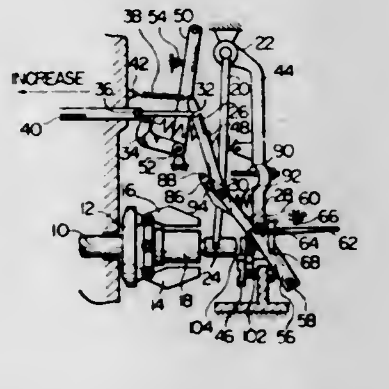
Fumlnori Kurokawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,741

Claims priority, application Japan, Aug. 15, 1974, 49-93547

Int. Cl.² F02D *1/04*

U.S. Cl. 123—140 R 13 Claims



1. A fuel injection pump governor, comprising:

a fuel control member;

a movable pin;

flyweights connected to move the movable pin in dependence on a flyweight rotational speed;

a first link pivotal about the movable pin, the first link being pivotally connected to the fuel control member at a point spaced from the movable pin;

a second link pivotal about the movable pin;

a movable load control means pivotally connected to the second link at a point spaced from the movable pin;

a third link pivotal about the movable pin;

an engaging pin fixed to the third link and being engageable with the first link;

a stopper, the third link being engageable with the stopper at a point between the engaging pin and the movable pin;

biasing means urging the third link so that the engaging pin is urged to engage with the first link and the third link is urged to engage with the stopper; and

means operative to connect the first link to the second link for unitary pivotal movement about the point of pivotal connection between the second link and the load control means at a position of the movable pin which is dependent on the position of the load control means.

4,000,729

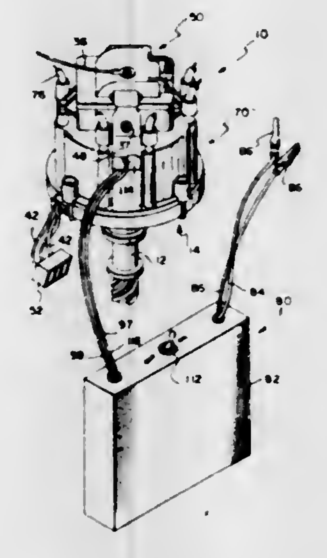
IGNITION SYSTEM BYPASS UNIT

Jack Clark, Jr., Box 122, Milan, Ind. 47445

Filed Apr. 23, 1975, Ser. No. 570,841

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 DS 6 Claims



1. In an internal combustion engine having an ignition coil with a primary and a secondary winding, electronic means for supplying ignition pulses in accordance with engine speed to the primary winding to induce relatively high voltage pulses in the secondary winding for distribution to engine spark plugs, and a storage battery for supplying power to said electronic means, an ignition system bypass unit for bypassing the electronic means when a malfunction occurs therein comprising a relatively high frequency pulse generating means having a magnetic coil and a pair of normally closed contacts electrically connected in series therewith, a pair of first leads for electrically connecting said pulse generating means across the storage battery to energize said generating means, and a pair of second leads for electrically connecting said magnetic coil in parallel with the ignition coil primary winding and said contacts in series with the ignition coil primary winding, said magnetic coil being operative to alternately magnetically open said contacts to cause collapse of a magnetic field and to allow said contacts to return to a normally closed position whereby a relatively high frequency string of ignition pulses is applied to the primary winding to induce a corresponding frequency string of relatively high voltage pulses in the secondary winding for distribution of the engine spark plugs to allow at least temporary operation of the engine.

4,000,730

VALVE CAGE STRUCTURE FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY ADAPTED FOR FLUID COOLING

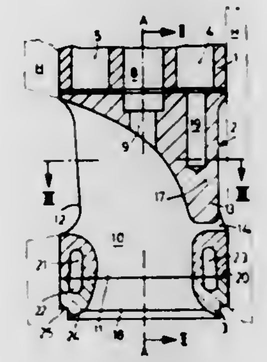
Adolf Öttl, Stadtbergen; Fredy Dost, and Otto Breindl, both of Augsburg, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Feb. 21, 1975, Ser. No. 551,619

Claims priority, application Germany, Mar. 7, 1974, 2410893

Int. Cl.² F01L *3/00*

U.S. Cl. 123—189 19 Claims



1. A valve cage (1, 2, 3) for combination with the cylinder of the engine, particularly for insertion in the cylinder head structure (H) thereof, said cage being formed with a valve seat (24) located centrally therein, and a charge exchange passage (10) extending along the longitudinal axis (A—A) of the cage and leading from the valve seat (24) to a lateral opening (12) to effect communication of gases between a manifold and an internal combustion engine cylinder, said cage having a back wall (13) located opposite the lateral opening (12) to delimit said passage (10),

characterized by an arrangement to equalize the stresses placed on the cage during operation of the engine due to non-symmetrical location of the lateral opening (12) of the charge exchange passage with respect to the longitudinal axis (A—A) of the cage comprising

a transverse slit (14,30) formed in said back wall (13) located with respect to said longitudinal axis (A—A) opposite said lateral opening (12) and extending at least in part transversely to the longitudinal axis (A—A) of the valve cage.

4,000,731

INTERNAL COMBUSTON ENGINES

Masaaki Noguchi, Nagoya, and Shougo Sanda, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

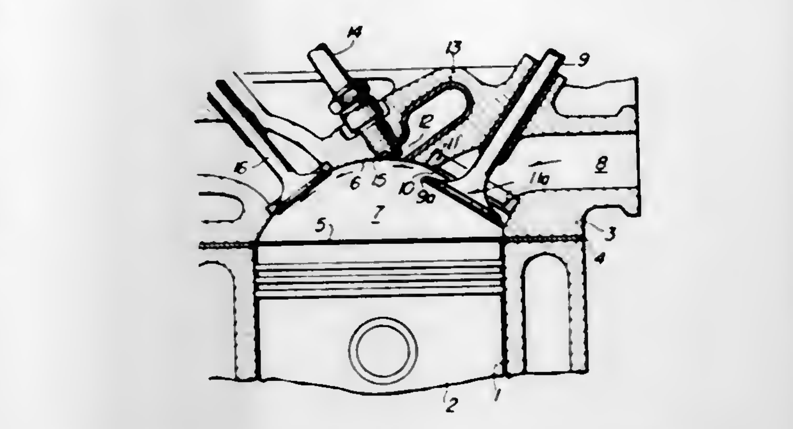
Filed Feb. 28, 1975, Ser. No. 554,236

Claims priority, application Japan, Sept. 17, 1974, 49-107337

Int. Cl.² F02B *17/00*, *19/18*

U.S. Cl. 123—191 S 9 Claims

1. An internal combustion engine comprising: cylinder means, piston means slidably disposed within said cylinder means, cylinder head means having a semispherical inner surface, a main combustion chamber defined by said semispherical surface of said cylinder head means and the top surface of said piston means, intake port means through which a homogeneous and relatively lean mixture flows into said main combustion chamber, an auxiliary combustion chamber confined in said cylinder head means, passage means communicating both said main and auxiliary chambers, an intake valve having a valve face for adjusting the opening degree of said intake port means, an axis of said intake valve means and a center line of said intake port means close to said intake valve being directed substantially toward the central portion of said cylinder means when extended, said valve face being inclined, at a portion near an apex of said semispherical surface, nearly tangential to said semispherical surface so as to permit a main stream of the mixture to flow along said semispherical surface, said passage means being opened to said main combustion chamber at a portion deviated from a central axis of said cylinder means by a distance less than a radius of said valve face, and an ignition plug having electrodes disposed near said opening portion of said passage means.



4,000,732

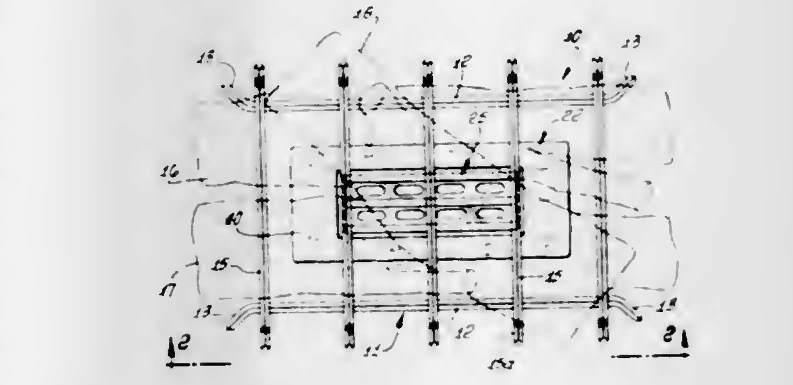
SOLID WICK LIGHTER

William S. White, Pasadena, Calif., assignor to Robert H. Peterson Company, Chicago, Ill.

Filed May 27, 1975, Ser. No. 580,543

Int. Cl.² F24B *1/18*

U.S. Cl. 126—92 R 5 Claims



1. In a two-piece lighter,

a. a solid, one-piece, refractory, fire-resistant receptacle, and

b. a fire-resistant, one-piece solid porous wick freely downwardly received in the receptacle and seated thereon below the wick to adsorb liquid fuel poured into the receptacle and over the wick, the wick defining at least one longitudinally extending carburetion channel which has open ends and also opens upwardly, and a plurality of vertical through openings located directly below said channel and being spaced lengthwise thereof to receive said liquid fuel and to support combustion in said channel, the width of the channel exceeding the widths of said openings,

c. whereby controlled combustion of said fuel takes place on and over said wick.

4,000,733

SOLAR FURNACE

Lou Allen Pauly, c/o Nels Welch 25568 Wolf Creek Road, Veneta, Oreg. 97487

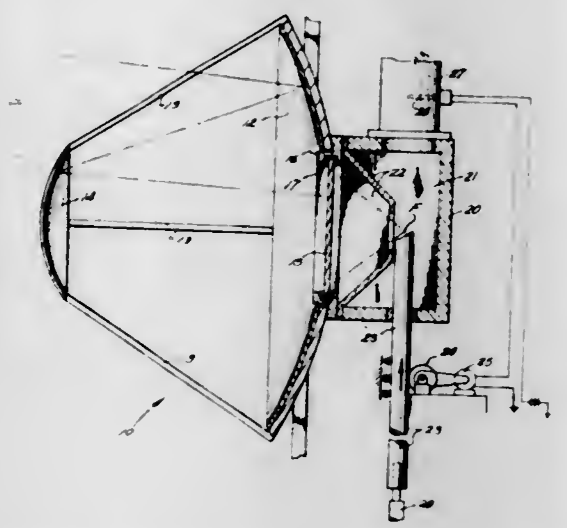
Filed Oct. 31, 1975, Ser. No. 627,600

Int. Cl.² F24J *3/02*

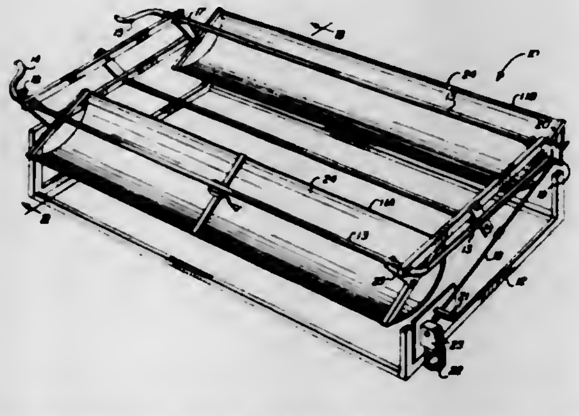
U.S. Cl. 126—270 4 Claims

1. In a system for concentrating radiant energy including multiple positionable mirrors remotely located from and re-

flecting radiant energy toward a solar furnace, the improvement embodied in a solar furnace, comprising
  a primary reflector receiving radiant energy from said positionable mirrors,
  a secondary reflector axially offset from said primary reflector redirecting radiant energy towards said primary reflector,
  a Fresnel lens disposed normal to the aligned axes of said primary and secondary reflectors and receiving radiant energy from said secondary reflector, and
  a chamber defined by furnace structure within which the focal point of the Fresnel lens is located, said chamber adapted to receive conduit means carrying an oxygen and hydrogen flow and having a discharge end in close proximity to the focal point of the Fresnel lens whereby the conduit and conduit flow are heated by concentrated radiant energy.

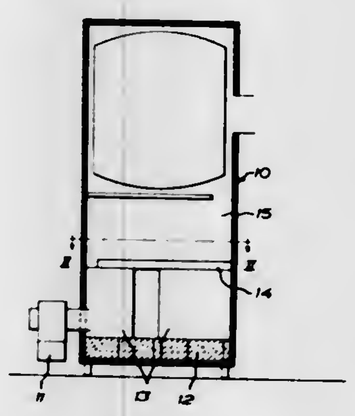


4,000,734
SOLAR ENERGY CONVERTER
William C. Matlock, 2123 S. Priest, and Patricia K. Somlo, 2045 E. Broadway, both of Tempe, Ariz. 85282
Filed Nov. 6, 1975, Ser. No. 629,518
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



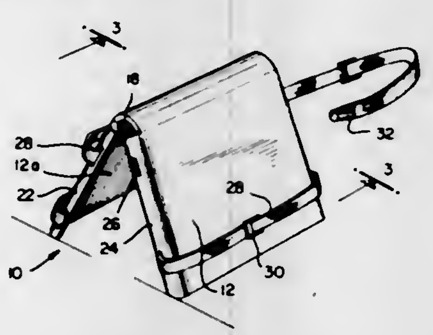
1. An improved heat exchange means comprising:
a frame,
at least a pair of juxtapositioned reflectors,
each of said reflectors comprises a trough having a reflecting surface of a parabolic configuration,
means for pivotally mounting each of said reflectors in a parallel arrangement on said frame,
a fluid bearing tube a portion of which is fixedly mounted on said frame longitudinally of each of said reflectors on said frame and approximately disposed with the axis of the portion in the focal zone of an associated reflector outside of its periphery,
electrical means for moving said reflectors in unison through a similar arc partially around the portion of the tube associated with said reflectors for maintaining said reflectors with the axis of their curvature approximately in a plane containing the sun's center, and
means for sensing the position of the sun for energizing said electric means for orienting and maintaining said reflectors with their axes of curvature of their inner surfaces approximately in a plane containing the sun's center,
whereby the reflection of the sun's rays are concentrated by said reflectors in a line image along said portions of said tubes.

4,000,735
INSERT FOR THE FURNACES OF BOILERS
Sten Rune Ljung, Barnstensgatan 6,, 263 00 Hoganas, Sweden
Filed May 5, 1975, Ser. No. 574,281
Int. Cl.² F24H *1/34*
U.S. Cl. 126—361 **2 Claims**



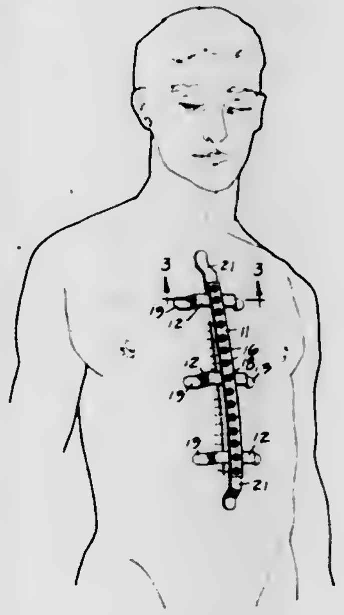
1. In a boiler, particularly an oil-fired boiler, for intermittent operation, an intermittently fired oil burner, an insert placed in the furnace of said boiler, said insert comprising an assembly of elements of heat radiating fire-resisting glass of slight thickness in relation to their total surface area, said assembly being so located in association with the burner of said boiler that heat accumulation occurs at the same time as full use is made of the property of the glass to transmit the flame radiation.

4,000,736
POSTURE DEVICE
Frank Bruscemi, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Sept. 26, 1975, Ser. No. 616,915
Int. Cl.² A61F *3/00*
U.S. Cl. 128—80 R **7 Claims**



1. A posture improvement device adapted to contact the leg adjacent the thighs and calves of an individual's body, comprising a substantially rigid U shaped member having at least two converging substantially planar surfaces adapted to contact said leg, said member defining an angle of less than about 90° therebetween, at least one strap member integral with each of said planar surfaces of U shaped member and communicating by both distal ends therewith, said strap adapted to contact said leg and firmly engage the same to contact with said surface, at least one surface of said member including cushioning means, said U shaped member comprised of a single sheet forming a pair of substantially planar members having an arcuate shape therebetween thereby forming said U shape.

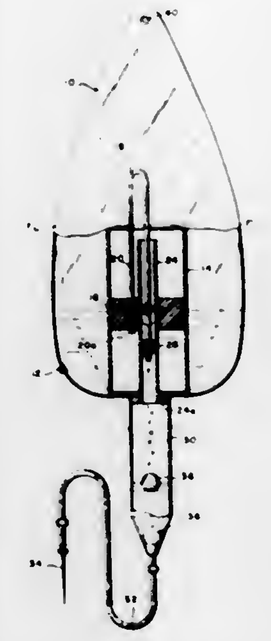
4,000,737
SURGICAL INCISION SHIELD
Clifford V. Horn, 457 Lakeview Way, Redwood City, Calif. 94062
Filed Oct. 14, 1975, Ser. No. 621,959
Int. Cl.² A61F *13/00*
U.S. Cl. 128—154 **10 Claims**



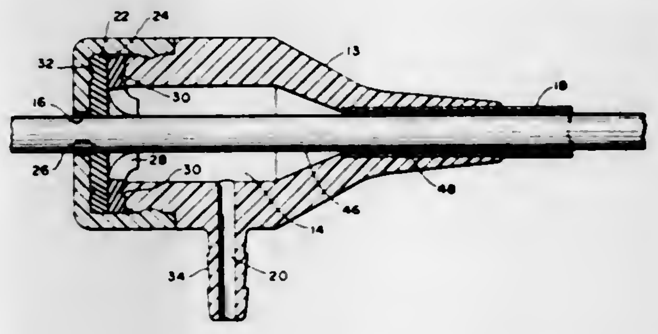
1. A shield for recent surgical incision sites comprising in combination,
  a longitudinal strip composed of a relatively rigid material,
  a plurality of U-shaped support elements each composed of a relatively rigid material oriented perpendicularly with respect to said longitudinal strip adapted to support said strip above and parallel said incision site, said U-shaped support elements bridging the incision site,
  an end support leg extending from at least one end of said longitudinal strip adapted to support the end of said strip,
  means for securing the distal ends of said U-shaped support elements to the skin surface on each side of the incision site and for securing the distal end of said support leg to the skin surface beyond the end of said incision.

4,000,738
PARENTERAL FLUID ADMINISTRATION SET
(PLASTIC-BAG TYPE)
William L. Howell, 3615 Macomb St. NW., Washington, D.C. 20016
Filed Dec. 19, 1975, Ser. No. 642,365
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 D **7 Claims**

1. A parenteral fluid administration set comprising a plastic bag adapted to be filled with a parenteral fluid to be administered intravenously up to the approximate level of a fold-over line extending transversly across the bag, said bag having an outlet opening and a tubing line extending therefrom to an infusion needle, a floating siphon in said bag adapted to be immersed in said fluid when the bag is so filled, said siphon having fluid inlet and fluid outlet legs, said outlet leg having an end extending through said outlet opening and providing a fluid outlet from said bag, means including a receiving reservoir affixed to said bag outlet and depending from said bag and being connected to said tubing line which in turn is connected to said infusion needle, means for conditioning the floating siphon for operation, and means for rendering said floating siphon operative to dispense said fluid through said extending end of said siphon outlet leg to said receiving reservoir at a controllable constant rate.



4,000,739
HEMOSTASIS CANNULA
Robert C. Stevens, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed July 9, 1975, Ser. No. 594,521
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214.4 **4 Claims**

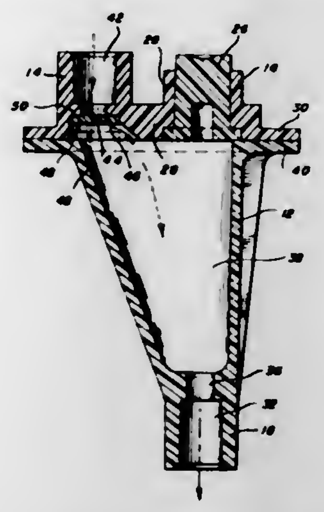


1. A hemostasis cannula comprising a body having a passage therethrough adapted to receive a catheter, a first disc-like gasket having a round hole disposed therein mounted in said passage, and a second disc-like gasket having a Y-slit located therein, said second gasket being mounted in said passage in face-to-face contact with said first gasket, said first gasket being operable to maintain a seal around and to allow manipulation of a catheter contained in said passage, the face-to-face relationship of said gaskets serving to support said second gasket in its closed position when a catheter is absent from said passage.

4,000,740
INJECTION SITE
Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Continuation of Ser. No. 475,215, May 31, 1974, abandoned.
This application Aug. 15, 1975, Ser. No. 605,170
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 R **18 Claims**

1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet to which a conduit from a first liquid container is adapted to be connected; a second inlet adapted to receive needle-injected

medication; an outlet through which the combined first liquid and injected medication can flow with said outlet adapted for coupling to a conduit; a main body portion defining a single chamber that communicates with said first and second inlets and said outlet, said chamber having a sloped wall between said first inlet and said outlet, said chamber having a cross-sectional area adjacent said first and second inlets that is greater than the cross-sectional area of said chamber adjacent said



outlet, said chamber having a cross-sectional area that is substantially greater than the cross-sectional area of said first inlet; said second inlet and said outlet being substantially coaxial, whereby the needle is substantially prevented from piercing the chamber, and said chamber being constructed to provide unobstructed flow of the first liquid and medication to said outlet; and a check valve located in said first inlet and adjacent said chamber.

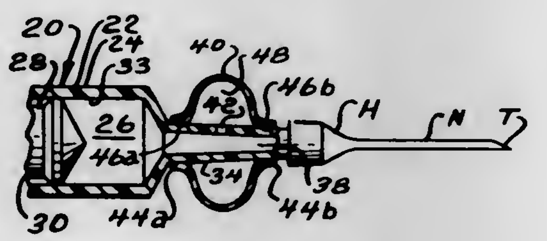
4,000,741
SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 509,757, Sept. 27, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 627,982

Int. Cl.² A61M *5/00*

U.S. Cl. 128—218 NV **8 Claims**



1. A syringe, comprising:

a barrel having a chamber for retaining fluid;

an extension member defining a tip of the syringe for attachment to a fluid receiving device, said extension member extending between said barrel and tip and defining passageway means communicating between the syringe chamber and tip, said extension member having opening means communicating between the passageway means and the outside of the extension member;

a plunger having one end received in said chamber for pumping fluid from the chamber into the passageway means; and

a flexible balloon secured to the extension member over said opening means and defining a cavity communicating with the passageway means through the opening means, said balloon inflating above a predetermined pressure to relieve pressure generated by the syringe.

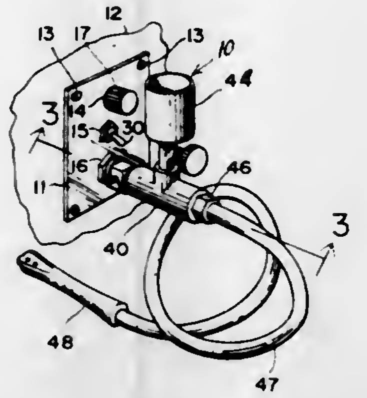
4,000,742
WALL MOUNTED HYGIENIC DEVICE

Edward F. DiGiacomo, 6930 NW. 186th St., Apt. 302, Hialeah, Fla. 33015

Filed Oct. 20, 1975, Ser. No. 623,768

Int. Cl.² A61M *3/00*

U.S. Cl. 128—229 **1 Claim**



1. A hygienic device adapted to be mounted on a wall and the like comprising a plate member, a plurality of fittings mounted on said plate, first tubing for cold water connected to one of said fittings, second tubing for hot water connected to the second of said fittings, first valve means mounted in the said second of said fittings for controlling the rate of flow of hot water therethrough, third tubing connecting said second of said fittings with said one of said fittings permitting the mixing of said hot and cold water, said one of said fittings having a first outlet, second valve means mounted in said one of said fittings controlling the discharge of mixed hot and cold water through said first outlet, fourth tubing connecting said first outlet and the third of said fittings, said third of said fittings having a second outlet, a slide valve mounted in said third of said fittings, spring means yieldingly maintaining said slide valve in a closed position and quick coupler means received by said third of said fittings at said second outlet engaging and sliding said slide valve to an open position for discharging said mixture of hot and cold water through said quick coupler means, said quick coupler means having an inlet, a discharge outlet, and a venturi connecting said inlet and said discharge outlet, an open receptacle mounted on said quick coupler means, a passageway connecting said receptacle and said venturi and needle valve means controlling the flow of fluid from said receptacle into said venturi, flexible hose means connected to said discharge outlet at one end and a nozzle connected to the free end of said flexible hose.

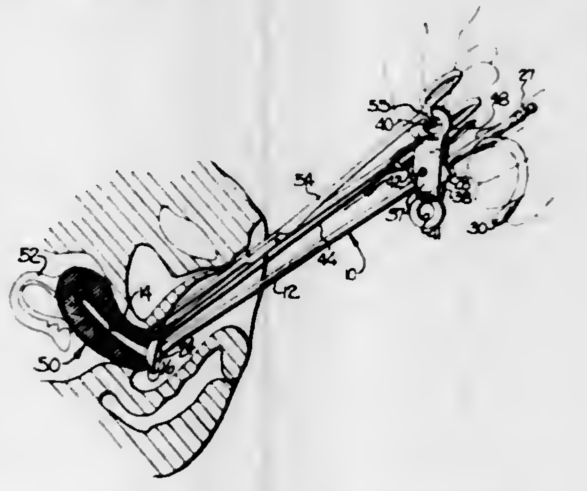
4,000,743
UTERINE ANTEVERTER

Kenneth Weaver, 1511 N. Main, Waynesville, N.C. 28786

Filed July 9, 1975, Ser. No. 594,203

Int. Cl.² A61B *17/42;* **A61M** *25/02*

U.S. Cl. 128—303 R **9 Claims**



1. An apparatus for moving a retroverted uterus to an anterior position to facilitate visualization of the uterus during a laparoscopic procedure or the like, and characterized by the ability to be self-retained in its operative position so as to avoid the need for further attention from the physician during the course of the procedure, said apparatus comprising

an elongate rod having a forward end and a rearward end,

a manipulating arm having one end pivotally mounted immediately adjacent said forward end of said rod, said arm having a length sufficient to extend a substantial distance into the uterine cavity and including a shield coaxially disposed about said one end of said arm so as to lie closely adjacent the pivotal connection between said arm and rod to limit the distance which said arm may be inserted into the uterine cavity and to effectively preclude contact between the pivotal connection and the body of the patient during use,

means carried at said rearward end of said rod and operatively connected to said arm for selectively pivoting said arm between a first position substantially coaxial with said rod and a second generally upright position which is angularly disposed with respect to said rod,

means for releasably holding said arm in said upright position, and

means for releasably attaching the apparatus to a tenaculum such that the apparatus may be retained in an operative position within the uterine cavity by attaching the tenaculum to the anterior or posterior lip of the uterus and attaching the apparatus to the tenaculum.

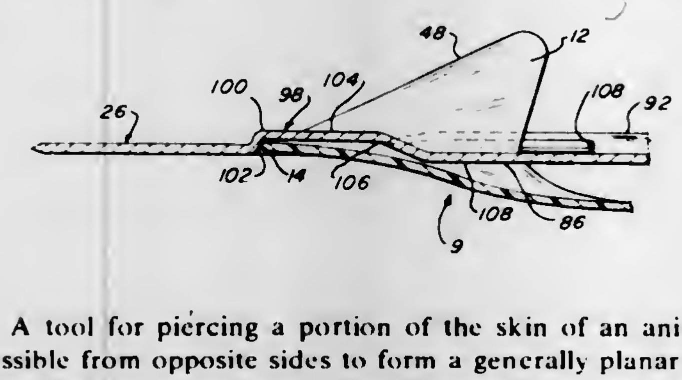
4,000,744
EAR TAG APPLYING TOOL

Eugene B. Ritchey, Rte. 3, Box 58, Brighton, Colo. 80601

Continuation-in-part of Ser. No. 513,655, Oct. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,604, Aug. 5, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,249

Int. Cl.² A61B *17/00*

U.S. Cl. 128—330 **13 Claims**



1. A tool for piercing a portion of the skin of an animal accessible from opposite sides to form a generally planar slit for inserting a loopless animal identification tag having a pair of flexible laterally extending foldable securing ledges, a tag portion, and a relatively narrower skin traversing portion joining said laterally extending securing ledges and said tag portion, said tool being characterized in that it is removable from the portion of the animal's skin from either side, said tool comprising an elongated rigid member having:

a handle portion;

an integral portion, pointed, flattened, generally planar and sharpened skin piercing end portion to pierce the portion of the animal's skin and form a slit for passage of said securing ledges therethrough; and

an intermediate integral tag holding portion joining said handle portion and said sharpened end portion including longitudinally extending slot means near said pointed end portion lying in a plane parallel to that of said flattened end portion for releasably holding the pair of laterally extending securing ledges of said identification tag in a folded attitude generally perpendicular to the plane of said flattened end portion prior to insertion through the slit.

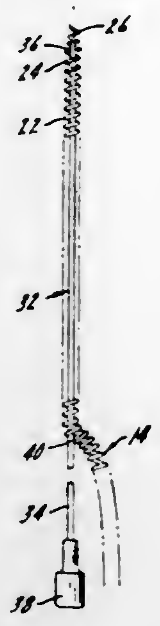
4,000,745
ELECTRICAL LEADS FOR CARDIAC STIMULATORS AND RELATED METHODS AND MEANS

Edward M. Goldberg, 26 Crescent Drive, Glencoe, Ill. 60022

Filed Aug. 5, 1968, Ser. No. 750,218

Int. Cl.² A61N *1/04*

U.S. Cl. 128—418 **25 Claims**



1. An electrical lead that may be screwed into an organ which comprises an insulated electrical conducting section and a lead-in securing section with a longitudinally rigid helical member which may be screwed into the organ.

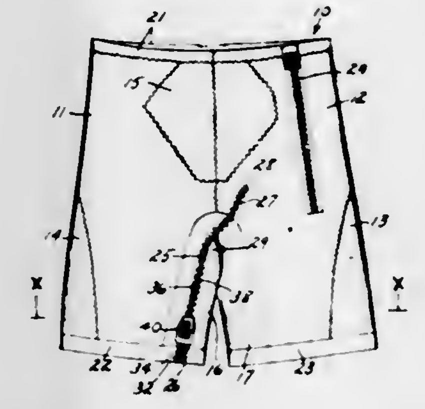
4,000,746
PANTY GIRDLE CONSTRUCTION

Jeannette I. Fierst, 2 Weybridge Road, Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 275,738, July 27, 1972, abandoned. This application June 4, 1975, Ser. No. 584,021

Int. Cl.² A41C *1/00*

U.S. Cl. 128—526 **10 Claims**



1. In a panty girdle of a type including a pair of leg portions normally enclosing at least partially the thighs of a wearer, and including a pair of front panels and a permanently attached crotch member interconnecting said front panels, the improvement comprising: detachably attachable fastener closure means having first and second edges and extending upwardly from a lower edge of one of said legs of said girdle across a forwardly disposed portion of said crotch member and terminating at a point substantially above said crotch member on a front panel forming a part of the other of said legs; whereby, when said fastener closure means is separated the said edges may be separated and the parts of said girdle forming said first mentioned leg may be folded upwardly along a substantially horizontal line disposed substantially above the crotch of the wearer to be maintained in such condition by tension imparted by the shape of the body of the wearer and the remaining parts of the girdle.

4,000,747
FEED MECHANISM FOR PEANUT COMBINE

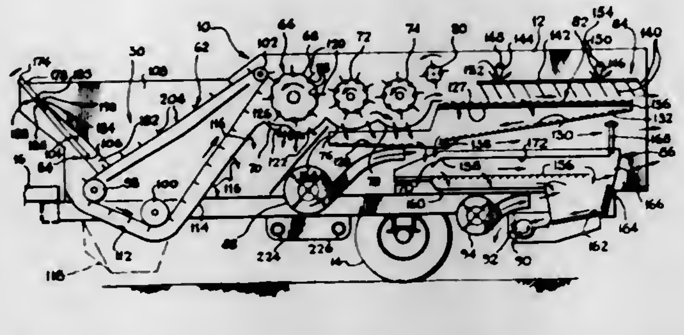
Alexander J. Rodger, Potgietersrus, South Africa, assignor to Slattery Manufacturing (Proprietary) Ltd., Potgietersrus, South Africa

Filed Mar. 12, 1975, Ser. No. 557,729

Claims priority, application South Africa, Mar. 18, 1974, 74/1747

Int. Cl.² A01D *29/00*

U.S. Cl. 130—30 C **3 Claims**



1. A peanut combine including a frame; peanut picking, separating and cleaning means mounted on the frame; a hopper for receiving peanuts and peanut vines mounted on the frame adjacent to the peanut picking means; and a chain and slat conveyor for conveying peanuts and peanut vines from the hopper to the peanut picking means characterized by said hopper including a lower exit opening positioned below and forward of the peanut picking means and said chain and slat conveyor including an upper run which forms a portion of the hopper and conveys peanuts and peanut vines down and through the lower exit opening and a lower run and an associated crop support plate for conveying peanuts and peanut vines from the lower exit opening to the peanut picking means.

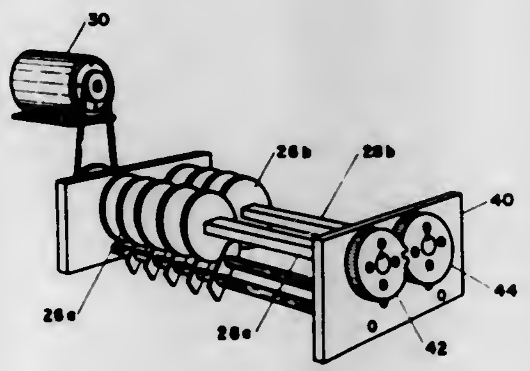
4,000,748
APPARATUS AND PROCESS FOR SHREDDING AND CRIMPING SMOKING MATERIALS

Thomas Wade Summers, Fern Creek, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 459,497, April 10, 1974, abandoned. This application Jan. 30, 1975, Ser. No. 545,442

Int. Cl.² A24B *3/18;* **B02C** *7/04*

U.S. Cl. 131—140 C **7 Claims**



1. A process for simultaneously shredding and crimping a sheet of tobacco material comprising the steps of:

a. maintaining the moisture level of the sheet between about 15 to 30% by weight and

b. moving the sheet between a pair of rotating and intermeshing stacks of disks having a predetermined overlap ratio and spacing between opposing disks such that the sheet is shredded into a plurality of strips about 0.65 to 1.55 mm in width and the forward motion of each strip is retarded by engagement with the facing surfaces of neighboring disks causing buckling to occur across each strip, thereby resulting in each strip attaining a crimped configuration.

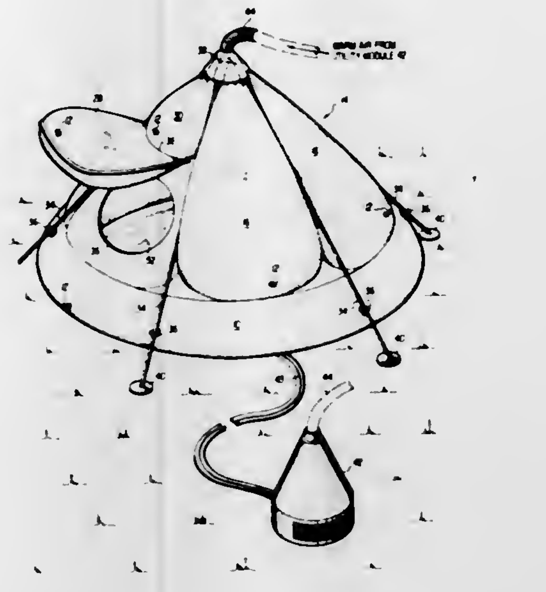
4,000,749
ISOLATION MODULE

Francis J. Busco, Big Sur, Calif., assignor to Float, Big Sur, Calif.

Filed May 30, 1975, Ser. No. 582,448

Int. Cl.² A45F *1/02*

U.S. Cl. 135—1 R **16 Claims**



1. A portable isolation module for reducing ordinary levels of stimulation comprising:

an inflatable enclosure of sufficient size to accommodate at least one adult;

inflatable containing means at the base of said inflatable enclosure containing a pool of a high density liquid of sufficient size for supporting at least one adult in a state of floatation;

said inflatable containing means including an inflatable bottom portion supporting said liquid on a cushion of contained gas for minimizing the transmission of external stimuli of an accoustic nature into said liquid;

air supply means coupled to said inflatable enclosure for supplying fresh air to the interior of said enclosure, and

temperature control means coupled to said inflatable containing means for maintaining the temperature of said high density liquid near normal body temperature.

4,000,750
LARGE SHELTER UMBRELLA

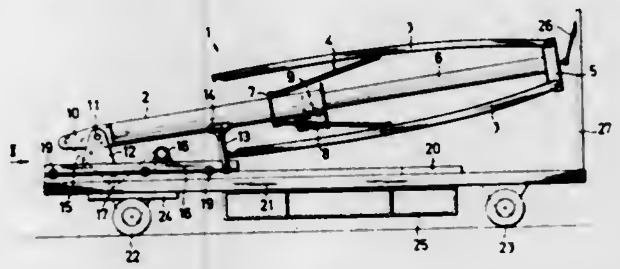
Klaus Becher, Gummersbach, Germany, assignor to Carl Becher OHG Planen- und Zelte-Fabrik, Gummersbach, Germany

Filed Aug. 28, 1975, Ser. No. 608,512

Claims priority, application Germany, Aug. 31, 1974, 2441816

Int. Cl.² A45B *3/00, 17/00*

U.S. Cl. 135—16 **8 Claims**



5. A large shelter umbrella comprising a base, an umbrella including a supporting post having first and second opposite terminal end portions, first pivot means mounting said supporting post adjacent a terminal end of said first terminal end portion for pivotal movement about a generally horizontal axis for pivotal movement of said supporting post between generally horizontal and vertical positions, cable means connected to said first terminal end portions, means for forcefully drawing said cable means to pivot said support post about said horizontal axis from said horizontal position to said vertical position, said base being a platform mounted for sliding movement upon a carriage, said first pivot means is carried by said platform, said drawing means is carried by said platform, and means carried by said carriage about which said cable means is at least partially entrained.

4,000,751
HYDRAULIC POWER SYSTEM WITH AUTOMATIC PRIORITY-DEMAND FLOW CONTROL MEANS

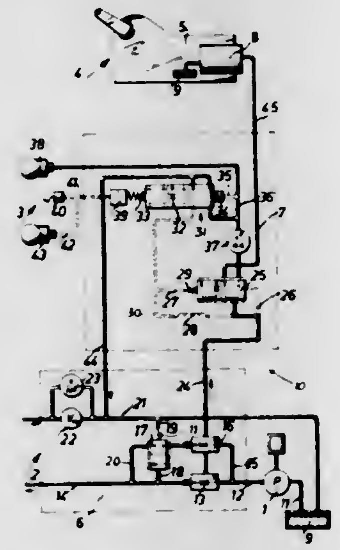
Franz Henninghaus, Dormagen, Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Dec. 12, 1975, Ser. No. 640,140

Claims priority, application Germany, Dec. 12, 1974, 2458897

Int. Cl.² G05D *11/02*

U.S. Cl. 137—101 **7 Claims**



1. A hydraulic power system with automatic priority-demand flow control means, comprising:

first, second, and third hydraulic power circuits wherein at least the first circuit has priority over the other two circuits;

a single fluid source means for supplying hydraulic fluid to the three circuits; and

a flow control valve means in the first circuit for receiving the flow of hydraulic fluid from the source means and apportioning it between the three circuits, the control valve means including a priority-demand flow control valve means for diverting a portion of the apportioned flow to the second and the third circuits and combining the portion with the apportioned flow to the first circuit upon demand of additional hydraulic fluid by the first circuit;

a second flow control valve means in the second circuit for receiving the apportioned flow for the second and third circuits and re-apportioning it between the aforementioned two circuits, and including a second priority-demand flow control valve means for diverting a portion of the re-apportioned flow to the third circuit and combining the portion with the re-apportioned flow to the second circuit upon demand of additional hydraulic fluid by the second circuit.

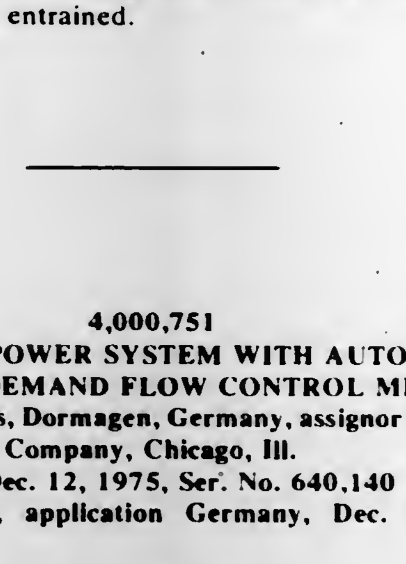
4,000,752
DOUBLE-JET ACTING TRAP PRIMER

Louis M. Miller, Haverhill, and Rand H. Ackroyd, Methuen, both of Mass., assignors to Watts Regulator Company, Lawrence, Mass.

Filed June 9, 1975, Ser. No. 584,737

Int. Cl.² F16K *31/143*

U.S. Cl. 137—118 **12 Claims**



1. A trap primer having, in combination,

a body forming a main flow passage with a partition separating inlet and outlet chambers therein respectively adapted for connection to a supply line and fixture, the partition having an aperture, the body having a primer flow passage for connection to a trap and communicating with the inlet chamber through a valve seat,

a stem having a trap disc and a reaction disc and movable to a position in which the trap disc closes the valve seat with the reaction disc located with annular clearance substantially in the aperture, the stem being extended through the valve seat in the direction of the trap by a first portion of reduced diameter and a second portion of relatively larger diameter,

and annular sealing means in the primer flow passage, said first portion having clearance with the sealing means in said position and said second portion entering through and in annular sealing relation to said sealing means upon movement of the stem to and beyond a predetermined distance from said position.

4,000,753
MEANS FOR LOCKING REPLACEABLE NOZZLES TO FIRE HYDRANTS

Daniel A. Ellis, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed July 29, 1975, Ser. No. 600,191

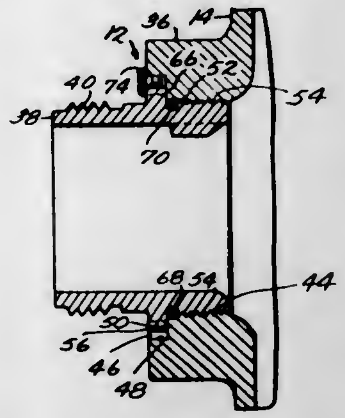
Int. Cl.² E03B *9/04*

U.S. Cl. 137—296 **10 Claims**

1. In a fire hydrant:

a barrel having an outwardly extending boss, said boss having a bore therethrough terminating at its outer end portion in a counterbore having a peripheral wall and an outwardly facing radial wall, said bore having interior threads on its inner end portion terminating short of said counterbore;

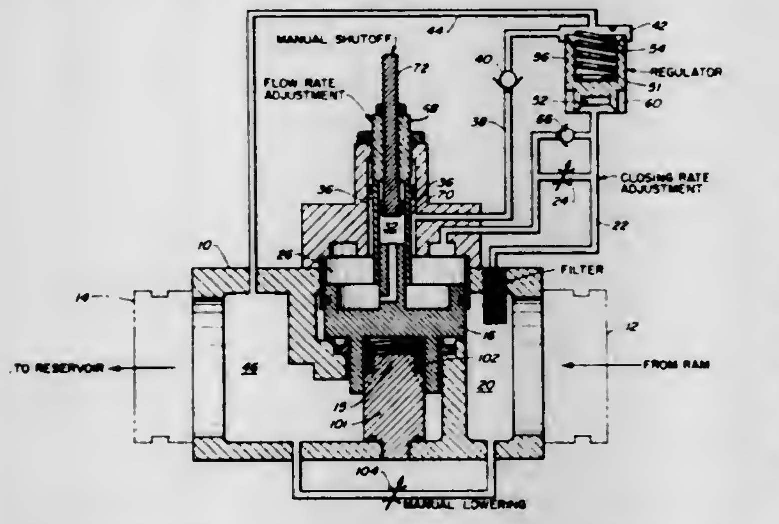
a replaceable nozzle having an outwardly and radially extending flange intermediate its outer and inner end portions and arranged to be received in said counterbore, said flange having at least a portion of its peripheral surface spaced radially inwardly a predetermined distance from the peripheral wall of said counterbore, said nozzle having exterior threads on its inner end portion for receiving the interior threads of said boss; and,



a self-tapping screw inserted between the peripheral wall of said counterbore and the portion of the peripheral surface of said flange spaced a predetermined distance from the peripheral wall for locking said nozzle to said boss.

4,000,754
AUTOMATIC CONTROL VALVE FOR A FLUID SYSTEM

Daniel W. Risk, Whittier, Calif., assignor to Maxton Manufacturing Company, Los Angeles, Calif.
Filed June 11, 1974, Ser. No. 463,933
Int. Cl.² G05D *7/01*
U.S. Cl. 137—487 **26 Claims**



22. An automatic control valve for a fluid system comprising:

a valve body,

first and second chambers in said valve body in fluid communication with the fluid system,

a port in said valve body interconnecting said first and second chambers for the passage of a fluid therethrough,

adjustable valve means for controlling the flow of fluid through said port,

fluid responsive valve actuator means for positioning said valve means in relationship to said port to control the passage of the fluid therethrough,

first bypass conduit means for interconnecting said first chamber and said valve actuator means in fluid communication,

second bypass conduit means for interconnecting said second chamber and said valve actuator means in fluid communication,

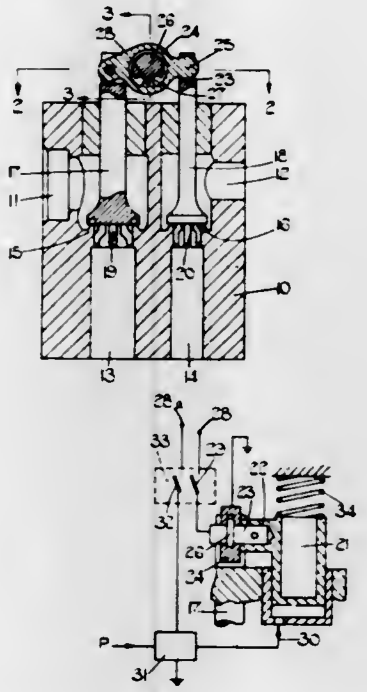
control valve means connected across said first and second bypass conduit means for porting fluid flow through said second bypass conduit,

means responsive to pressure differential between said first and second chambers for closing said control valve means when said pressure differential exceeds a predetermined value,

thereby to build up pressure on said valve actuator means and close said port.

4,000,755
FLUID FLOW CONTROL VALVES

George Orloff, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Feb. 26, 1976, Ser. No. 661,418
Claims priority, application United Kingdom, Mar. 7, 1975, 9512/75
Int. Cl.² F16K *11/14*
U.S. Cl. 137—595 **12 Claims**



1. A fluid flow control valve comprising a body having first and second inlets and first and second outlets, first and second control elements respectively movable to control flow between said first inlet and outlet, and between said second inlet and outlet, a linkage element interconnecting said control elements, a part movable in response to an external control signal and pivotally connected to said linkage element, and locking means, responsive to an electrical operating signal, for restraining said linkage element from pivotal movement relative to said part, so as to prevent relative movement between said control elements.

4,000,756
HIGH SPEED ENGINE VALVE ACTUATOR

Louis A. Ule, 27 Mustang Road, Rolling Hills, Calif. 90274, and Gunnar P. Michelson, 7416½ Sepulveda Blvd., Van Nuys, Calif. 91405
Division of Ser. No. 454,683, March 25, 1974, Pat. No. 3,926,159. This application Oct. 6, 1975, Ser. No. 619,648
Int. Cl.² F16K *31/12*
U.S. Cl. 137—596.17 **4 Claims**

1. An electro-hydraulic actuator comprising:

a housing having an open-ended cylindrical cavity formed therein, wherein said cavity has a bottom;

a piston having a bottom end and being slidably disposed within said cylindrical cavity with said bottom end disposed adjacent to the bottom of said cavity;

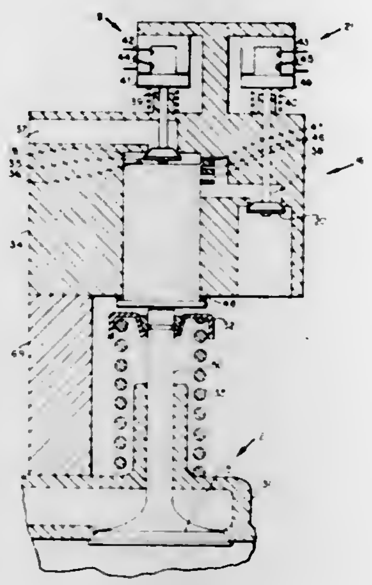
said housing having an inlet passage which communicates with said cavity through said bottom thereof forming an annular valve seat;

an inlet valve having a head and a stem with said head disposed within said cavity and said stem passing through said inlet passage so that said head is disposed to seal against said valve seat;

said housing having an outlet passage communicating with said cavity, substantially near the bottom thereof;

said housing having a duct communicating with said outlet passage and said duct having an annular valve seat formed at its end facing away from said cavity;

an outlet valve having a head and a stem, with said head thereof disposed to make contact with said valve seat of said duct and said stem thereof passing through said seat and through the wall of said duct to extend outside of said housing in journaled relationship therewith;



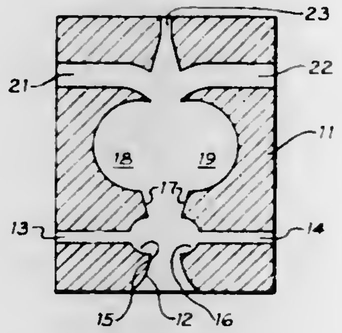
an inlet solenoid and an outlet solenoid mounted onto said housing;

said inlet solenoid, when energized, being disposed to urge said inlet valve against its respective valve seat: and

said outlet solenoid, when energized, being disposed to urge the outlet valve against its respective valve seat.

4,000,757
HIGH GAIN FLUID AMPLIFIER

Peter A. Freeman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 4, 1975, Ser. No. 637,809
Int. Cl.² F15C *1/10*
U.S. Cl. 137—834 **2 Claims**



1. A high gain fluid amplifier comprising,

an inlet for supplying power fluid,

a centrally located output vent,

a pair of differential flow outlets disposed one each on each side of said output vent,

a pair of opposed lobe-shaped feedback cavities positioned between said inlet and said outlets for alternately switching fluid to said differential flow outlets,

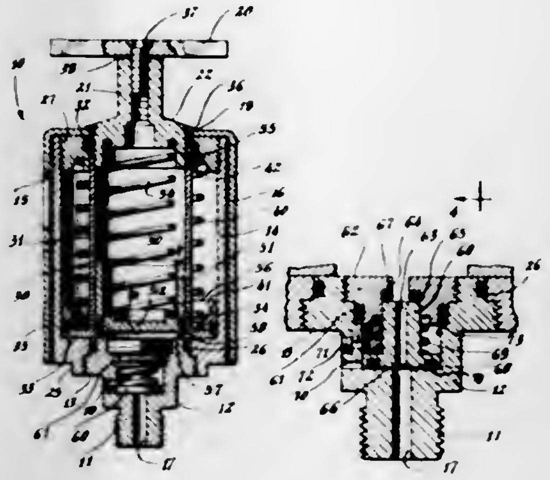
a pair of opposed lobe-shaped control cavities,

a pair of control inlets connected one each into said opposed lobe-shaped control cavities for supplying control fluid for controlling movement of power fluid into said output vent and said differential flow outlets, and

short angularly disposed sidewalls positioned between said control cavities and said feedback cavities.

4,000,758
FLUID RESERVOIR DEVICE WITH FILL MEANS, LEVEL INDICATOR MEANS AND PRESSURE RELIEF MEANS

Daniel T. Meisenheimer, Jr., 404 Longmeadow Road, Orange, Conn. 06477
Filed Oct. 21, 1974, Ser. No. 516,727
Int. Cl.² F16L *55/04*
U.S. Cl. 138—31 **12 Claims**



1. A fluid reservoir device for connection to and use in conjunction with a fluid-filled system, the fluid reservoir device comprising:

A. means defining a chamber having a volume, said means also defining an inlet opening into said chamber, a fluid bleed passage connecting with the inlet opening into said chamber, and a first piston-receiving opening in said chamber, said means being adapted for attachment to a fluid-filled system with the inlet opening in communication with fluid in said fluid-filled system,

B. a first piston slideably mounted in and closing said first piston-receiving opening in said chamber, said first piston slideable between (1) a first position displacing a maximum first piston volume and thereby decreasing the volume of the chamber by said maximum first piston volume, and (2) a second position displacing a minimum first piston volume thereby decreasing the volume of said chamber by a minimum first piston volume;

C. spring biasing means for sliding said first piston from said first position to said second position to decrease the volume of said chamber; and

D. pressure responsive means normally blocking said fluid bleed passage and unblocking said fluid bleed passage in response to excessive fluid pressure, thereby relieving excessive pressure in said fluid-filled system and said fluid reservoir device by bleeding fluid from said chamber through said fluid bleed passage, said pressure responsive means comprising

  1. a piston slideably mounted in the inlet opening to said chamber, the piston defining an opening therethrough to permit passage of fluid from the fluid-filled system to the chamber, and

  2. spring biasing means normally maintaining said piston in a position blocking said fluid bleed passage, said piston having a working surface exposed to the fluid such that excessive pressure of the fluid lifts the piston against its spring biasing means to permit fluid to escape through the fluid bleed passage,

whereby when said chamber is filled with fluid with the first piston in a position such that it displaces less than its maximum volume, the spring biasing means slides the first piston towards its first position to supply fluid from the chamber to the fluid-filled system when extra fluid is required to maintain the fluid-filled system in a full condition.

8. A fluid reservoir device for connection to and use in conjunction with a fluid-filled system, the fluid reservoir device comprising:

A. A cylindrical chamber wall having an upper end and a lower end;

B. a bottom chamber wall disposed across the lower end of the cylindrical chamber wall, said bottom chamber wall including a mounting shank for attachment to a fluid-filled system and defining an inlet opening through said mounting shank and bottom chamber wall, thereby providing fluid communication from the fluid-filled system through said mounting shank and bottom chamber wall;

C. A first piston slideably mounted between an uppermost position and a lowermost position within said cylindrical chamber wall opposite said bottom chamber wall, said first piston having an annular bottom working surface, said annular bottom working surface having an outer periphery and an inner periphery, the outer periphery being slideably engaged against the cylindrical chamber wall and the inner periphery defining an opening, and a cylindrical wall extending upwardly from the inner periphery of the annular bottom working surface;

D. spring means biasing said first piston downwardly in the cylindrical chamber wall;

E. A second piston slideably mounted between an uppermost position and a lowermost position in the cylindrical wall of the first piston, said second piston having a circular bottom working surface having a outer periphery slideably engaged against the cylindrical wall upstanding from the inner periphery of the annular bottom working surface of the first piston; and

F. Spring means biasing said second piston downwardly in said cylindrical wall of said first piston, said spring means having a higher spring load than the spring means biasing said first piston downwardly within the cylindrical chamber wall.

said cylindrical chamber wall, bottom chamber wall and said first and second pistons defining a chamber closed except for the inlet opening, said chamber having a volume varying according to the positions of the slideably mounted first and second pistons, whereby when the chamber is filled with fluid when the first piston is in its uppermost position, the fluid reservoir device supplies fluid from the chamber to the fluid-filled system as required to maintain the system in full condition by means of spring biased downward movement of the first piston and the second piston mounted therein within the cylindrical chamber wall, and whereby additional fluid forced from the fluid-filled system is accommodated within the chamber by driving the second piston upwardly against its spring biasing means to enlarge the volume of the chamber.

4,000,759
HOSE

Charles D. Higbee, Wheatridge, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Dec. 11, 1974, Ser. No. 531,660

Int. Cl.² F16L *11/12*

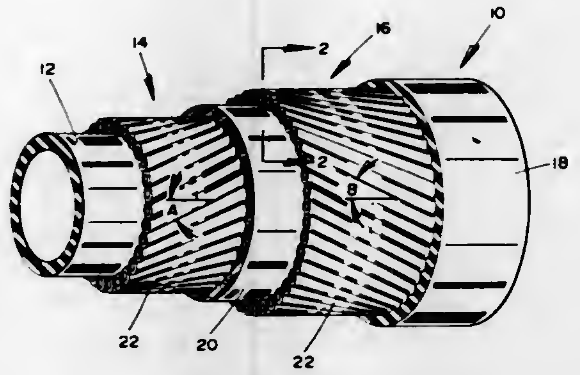
U.S. Cl. 138—130 **19 Claims**

1. A hose comprising:

a first tube;

a first ply of tubing comprising a plurality of individual tubes spiralled around the first tube, the first ply of tubing defining a first reinforcement ply;

a second ply of tubing comprising a plurality of individual tubes oppositely spiralled radially of and over the first ply



of tubing and defining a second reinforcement ply; and a cover disposed over the second reinforcement ply.

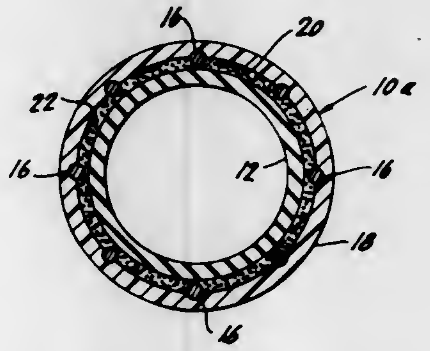
4,000,760
PLASTIC HOSE HAVING EMBEDDED REINFORCING BRAID

William C. Heller, Jr., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Division of Ser. No. 404,095, Nov. 5, 1973, Pat. No. 3,945,867. This application Jan. 26, 1976, Ser. No. 652,205

Int. Cl.² F16L *9/12*

U.S. Cl. 138—141 **10 Claims**



1. A composite plastic hose article comprising:

a generally dimensionally stable hollow plastic core suitable for receiving and conveying an internal pressure producing fluid;

a tubular fabric net surrounding the core for reinforcing the core against the pressure of the fluid; and

a layer of thermally softenable material interposed between said core and said net, said material being bondable to the core by thermal fusion but possessing substantial bonding incompatability with said net, said layer being bonded to the core by a thermal fusion bond and having said net at least partially embedded therein for mechanical retention in said layer, said material having uniformly dispersed therein a particulate susceptor having a size range of submicron to 20 microns and heatable upon exposure to a selected form of indirectly applied energy, said layer being applied to said core in a thickness no greater than that which obtains a restraining partial embedment of the net in said layer.

4,000,761
DEVICE FOR CONTROLLING THE SEQUENCE OF MOVEMENT OF INDIVIDUAL HEDDLE FRAMES OF A WEAVING MACHINE

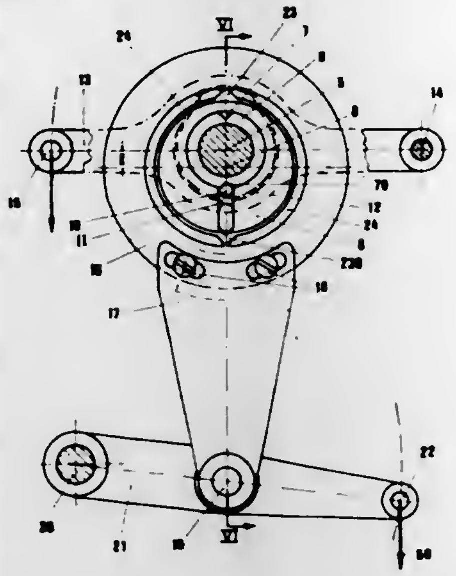
Walter Kleiner, Zurich, Switzerland, assignor to Staeubli Ltd., Horgen-Zurich, Switzerland

Filed June 26, 1975, Ser. No. 590,435

Claims priority, application Switzerland, July 1, 1974, 9016/74

Int. Cl.² D03C *1/00*

U.S. Cl. 139—66 R **9 Claims**



1. In a coupling device for controlling the sequential movement of the individual heddle frames of a weaving machine having a rotatable drive shaft, an eccentric ring mounted for free rotation relative to said drive shaft, catch ring means mounted on said rotatable shaft and for rotation therewith, connecting rod means having means defining an opening therein and adapted to rotatably receive said eccentric ring means therein, catch means radially movable toward and away from said catch ring means for effecting a selective connecting of said eccentric ring to said drive shaft and effecting a rotation of said eccentric ring with said drive shaft and a movement of said connecting rod in response to a driven rotation of said eccentric ring, the improvement comprising adjusting means for adjusting the moment in time in a cycle of operation of said machine that said connecting rod is moved.

4,000,762
YARN DRAWING AND MEASURING DEVICE OF A WEAVING LOOM

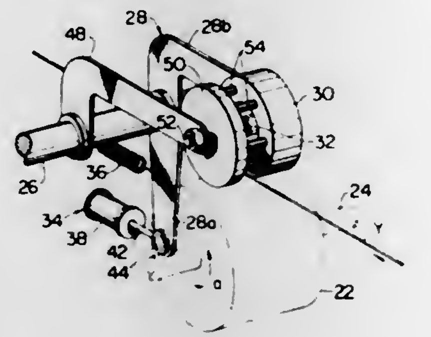
Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Mar. 3, 1975, Ser. No. 555,027

Claims priority, application Japan, May 15, 1974, 49-54205; May 15, 1974, 49-54206

Int. Cl.² D03D *47/34*

U.S. Cl. 139—452 **20 Claims**



1. A yarn drawing and measuring device for use in a weaving loom, comprising; a measuring roller rotatable about a substantially horizontal axis; pressing means comprising a pressing roller rotatable about an axis substantially parallel to the axis of rotation of the measuring roller, the pressing roller being movable between a first relative position thereof disengaged from said measuring roller and a second relative position thereof in rolling contact with the measuring roller; positioning means for selectively moving said pressing roller into said first and second relative positions, said positioning means having a first condition holding said pressing roller in said first relative position and a second condition holding the pressing roller in said second relative position; and driving means for driving the pressing roller in a direction of rotation opposite to the direction of rotation of the measuring roller at a circumferential speed substantially equal to the circumferential speed of rotation of the measuring roller in either of the relative positions of the pressing roller, said driving means including self-adjustable torque transmission means having at least one deformable member constantly engaging said pressing roller and elastically deformable responsive to the movement of the pressing roller between said first and second relative positions.

4,000,763
METHOD FOR THE PRODUCTION OF CLIPS

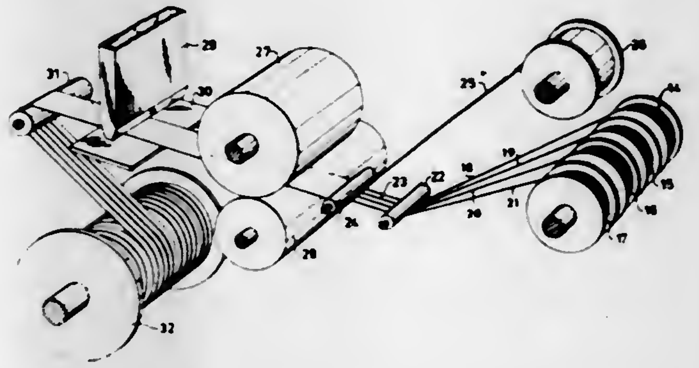
Olof T. Jansson, Skinnskatteberg, Sweden, assignor to Clama Industri Aktiebolag, Skinnskatteberg, Sweden

Filed Apr. 7, 1975, Ser. No. 565,359

Claims priority, application Sweden, May 24, 1974, 7406894

Int. Cl.² B21F *45/24*

U.S. Cl. 140—82 **6 Claims**



1. A method for the production of clips in the form of piles of U-shaped clips releasably connected to each other, which clips are made of wire of circular cross-section which includes a curved upper part and a pair of straight shanks extending therefrom, comprising the steps of; feeding a plurality of lengths of wire in parallel to each other, to a banding apparatus, and arranging the wires thereat into a wire band wherein the wires are tight and adjacent and parallel to each other, introducing a layer of material such as paper or the like against the wire band thus formed, the layer of material being covered with plastic on its side which faces the wires, said plastic being a thermo-plastic having a melting point which is lower than the temperature at which the layer of material will burn or lose observably its strength, thereafter quickly heating the surface of the wire band turned toward the layer along with the layer of material and the thermo-plastic material up to a temperature at or slightly above the melting temperature of the plastic, and immediately thereafter cooling the wire band and layer of material, cutting the wire/material band into cakes and bending these cakes into clips shape.

4,000,764
STATOR LEAD TERMINATION APPARATUS

Arthur C. Reiger, Jr., Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

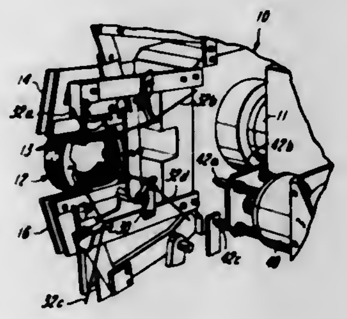
Filed Mar. 27, 1975, Ser. No. 562,861

Int. Cl.² B21F *15/00, 3/02*

U.S. Cl. 140—113 **4 Claims**

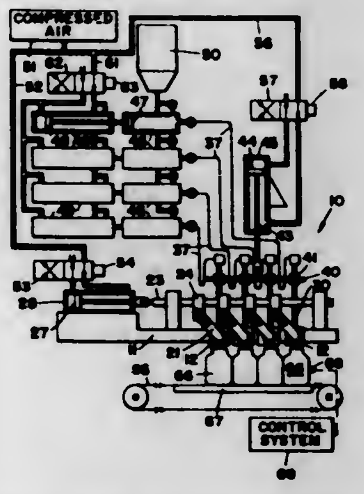
1. Apparatus for terminating a wire extending from a coil

wound about a flux-carrying member on post means projecting outwardly from a wire retainer mounted on said flux-carrying member, said apparatus comprising, in combination, clamp means disposed remotely from said coil for yieldably supporting said wire, said wire extending from said clamp means and alongside said post means to said coil, hook means disposed adajacent said post means for hooking said wire, and means for rotating said hook means about the axis of said post means to engage said hook means with said wire and with continued rotation to cause said hook means to wind said wire about said post means, said means for rotating said hook means causing said hook means to hook wire between said clamp means and said coil, said means for rotating said hook means moving said hook means in a direction which tends to increase the tension in said wire along its length between said coil and said clamp means, said clamp means adapted to yield to such increased tension.



4,000,765
BOTTOM-UP CONTAINER-FILLING MACHINE

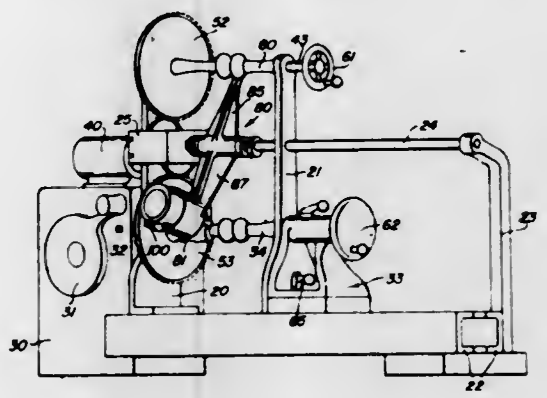
George C. Lydiksen, Pleasanton, Calif., assignor to Simplex Filler Co., Hayward, Calif.
Filed Jan. 8, 1976, Ser. No. 647,587
Int. Cl.² B67C *3/02*
U.S. Cl. 141—181 **10 Claims**



1. A container-filling machine comprising:
a. conveyor means for moving an open-topped container horizontally to and away from a filling station at said filling machine and for holding said container against horizontal or vertical movement while at said filling station and during a filling operation,
b. a housing member mounted at said filling station a fixed distance above said conveyor means, said housing member having aligned upper and lower openings,
c. a valve member having a fill opening therethrough and being operatively associated with said housing member and movable relative thereto between a first position wherein said lower housing member opening is unobstructed and a second position wherein said lower housing member opening is blocked,
d. a vertically disposed and vertically movable elongated tubular spout extending downwardly into said upper housing member opening, said spout being vertically movable between a first position wherein the lower end of said spout is above said lower housing member opening and a second position wherein the lower end of said spout extends through said valve fill opening and substantially below said lower housing member opening,
e. means for moving said valve member between its first and second positions when said spout is in its first position,
f means for moving said spout between its first and second position when said valve member is in its first position,
g. means for forcing a measured quantity of fluid through said spout when said valve member is in its first position.

4,000,766
LATHE DUPLICATOR

Brian L. Sutcliffe, 800 E. Center, No. 11, Provo, Utah 84601
Filed Oct. 10, 1975, Ser. No. 621,388
Int. Cl.² B23C *1/18*
U.S. Cl. 144—144 R **10 Claims**



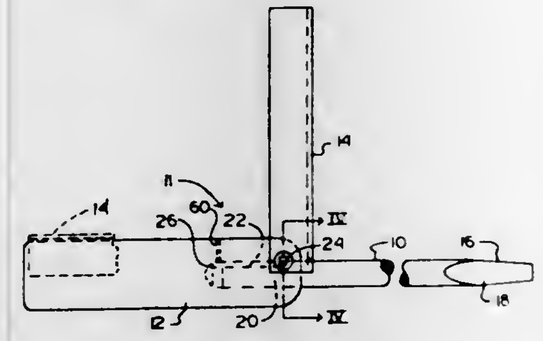
1. A duplicator comprising:
first chucking means including a head stock and a tail stock arranged to hold a work piece for rotation around an axis joining said head stock and said tail stock;
second chucking means arranged to mount for rotation around a reference axis a template with a selected surface configuration, the reference axis of said template being parallel the axis of rotation of said work piece;
a guide rail mounted parallel to said axes of rotation and extending substantially the entire work piece capacity of said first chucking means;
a carriage assembly mounted on said guide rail to slide longitudinally along substantially its entire length and to pivot around its axis, said assembly including:
  a first arm carrying a sensing probe located to contact said template surface when said assembly is caused to pivot on said guide rail and thereby to limit the degree of pivot of said assembly in accordance with the configuration of said template's surface;
  a second arm carrying a router bit and associated drive means to spin said bit around an axis approximately normal to the axis of rotation of said work piece, said bit extending from said second arm in a direction opposite the direction that said sensing probe extends from said first arm and being located to contact said work piece at a site determined by the location of said assembly longitudinally on said guide rail and the degree of pivot of said assembly as defined by said probe; and
means for rotating a said work piece held in said first chucking means around said axis of rotation while said router bit is caused to spin.

4,000,767
LEVERAGE SCREWDRIVER

Jerome F. Geng, 94 Hillside Court, Fox Lake, Ill. 60020
Filed Oct. 9, 1975, Ser. No. 621,009
Int. Cl.² B25G *1/00, 1/12*
U.S. Cl. 145—61 L **12 Claims**

1. A hand tool assembly for turning rotary fasteners, comprising:

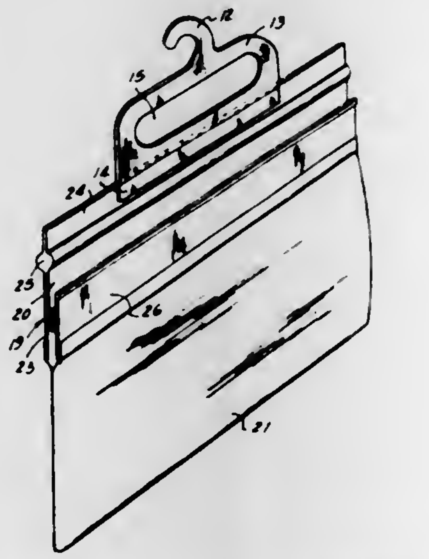
a tool having a fastener-engaging end, an end opposite the fastener-engaging end, and an exterior bearing surface extending from said opposite end toward the fastener-engaging end; and
a handle assembly including
  an elongate gripping handle with an axial hole at one end thereof receiving therewithin the opposite end of the tool,
  an elongate leverage handle, and



  a pivot member extending transversely into the axial hole through at least a portion of the gripping handle between one side thereof and the axial hole,
  said pivot member being in coupling engagement outside of the axial hole with the leverage handle to secure it and the gripping handle together for relative pivotal movement therebetween and
  being in engagement with the bearing surface of the tool within the hole to prevent axial rotary movement of the tool relative to the gripping handle while releasably restraining the tool against separation from the handle.

4,000,768
HANDLE PACKAGE

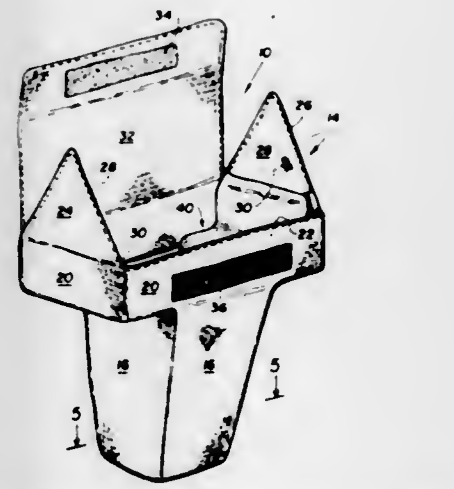
Karl-Heinz Siegel, Nurnberg, Germany, assignor to Minigrip, Inc., Orangeburg, N.Y.
Filed Apr. 16, 1974, Ser. No. 461,250
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² A45C *13/26;* **B65D** *33/06, 33/24*
U.S. Cl. 150—3 **4 Claims**



1. A closeable hand-up container including a separable extruded two strip fastener secured to thermoplastic film bag sidewall panels, each fastener strip having separable fastener means to engage closingly with the other, one of the fastener strips including an attachment web secured to one of the bag wall panels and having a carrying web area extending in the opposite direction from juncture of the attachment web and fastener strip, with a one piece handle part welded onto the carrying web area:
  said handle part having a horizontally elongated handhole with an overlying hand grip portion provided with a central hanger-bar-receiving hook notch opening downwardly into the handhole;
  an entry slot extending from the top of said grip portion to the bottom of said grip portion and generally aligned with the notch opening;
  said hand grip portion having grip sections thereof at each side of said notch and said carrying web area having a extruded reinforcement bead rib integral therewith and extending therealong throughout its width adjacently above said juncture and below said handle part.

4,000,769
BELT-SUPPORTED CAMERA CARRYING CASE

Bruce J. Katz, 315 E. 86th St., New York, N.Y. 10028
Filed Dec. 3, 1975, Ser. No. 637,166
Int. Cl.² B65D *65/08*
U.S. Cl. 150—52 J **4 Claims**



1. A belt-supported camera carrying case comprising an outer fabric enclosure member including walls cooperating to bound a T-shaped storage compartment for said camera having an upper access opening into said storage compartment, a pair of triangular-shaped side flaps formed with pockets therein located for opening and closing movement along opposite sides of said compartment opening, a rear flap located for opening and closing movement over said side flaps along the rear edge of said compartment opening, and a plastic foam insert for said enclosure member including a depending portion having an operative position located about said storage compartment effective to cushion a camera positioned therein against shock, and having triangular-shaped upper portions thereon located to be projected within said pockets of said side flaps, whereby said plastic foam insert is maintained in place within said fabric enclosure member to contribute an external shaping thereto which defines said storage compartment and facilitates the placement of said camera therein.

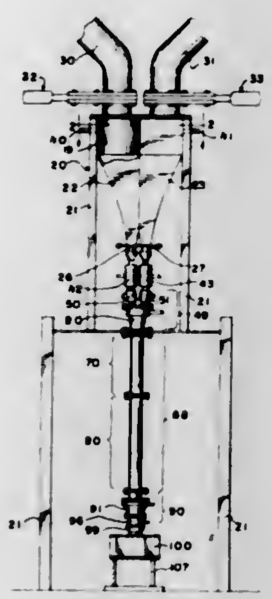
4,000,770
APPARATUS AND METHOD FOR MANUFACTURING CORES AND MOLDS

Lloyd H. Brown, Crystal Lake; Daniel S. P. Eftax, Barrington, and Joseph N. Kopp, Chicago, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 569,827

Int. Cl.² B22C *15/24*

U.S. Cl. 164—21 **18 Claims**



1. Apparatus for forming from a first mass of particulate matter coated with a catalyst-polymerizable resin film and a second mass of particulate matter coated with a catalyst film for polymerizing said resin, a hardened core or mold, said apparatus comprising, in combination:

- means including a first staging hopper for storing a quantity of said first mass of particulate matter;
- means including a second staging hopper for storing a quantity of said second mass particulate matter;
- a core box having an interior void defining said core or mold;
- continuous conduit, means, including a conduit, for establishing a continuous, confined flow path for said particulate masses from said first and second staging hoppers to said core box, said conduit means including a mixing section comprising a static mixer for mixing said masses as they pass through said conduit; and
- air injection means for establishing a continuous stream-like flow of said particles along said flow path whereby said first and second masses are thoroughly and rapidly intermingled and said films are at least partially integrated to form a catalyzed polymerizable resin-coated particulate mix for deposit directly in said core box.

4,000,771
METHOD OF AND APPARATUS FOR CONTINUOUS CASTING

Calvin C. Williamson, 2083 Mandarin Drive, Costa Mesa, Calif. 92626

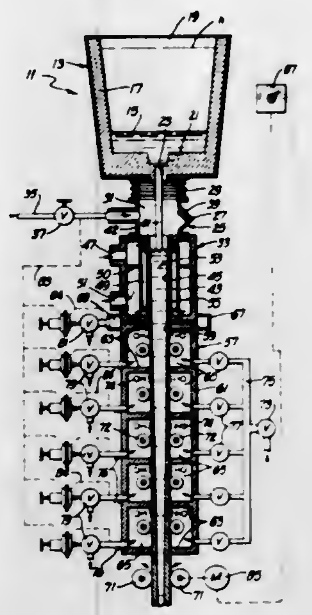
Filed July 27, 1973, Ser. No. 383,089

Int. Cl.² B22D *11/00*

U.S. Cl. 164—64 **12 Claims**

1. A method of continuously casting metal comprising:

- pouring molten metal through a nozzle into a pouring chamber;
- flowing the molten metal in a stream through the pouring chamber and into an open-ended mold to form a billet;
- controlling the pressure in the pouring chamber to thereby control the flow rate through the nozzle;
- cooling the metal in the mold to form a solidified skin on a peripheral region of the billet;
- withdrawing the billet from the mold with the metal within the solidified skin being molten; and



- applying external fluid pressure to at least a portion of the billet withdrawn from the mold to prevent the molten metal of such portion of the billet from breaking through the skin.

4,000,772
APPARATUS FOR PRODUCING CASTING MOLDS

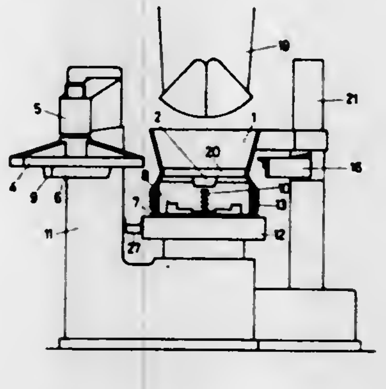
Erich Kettler, Mettmann, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jan. 30, 1976, Ser. No. 653,961

Claims priority, application Switzerland, Feb. 5, 1975, 1476/75

Int. Cl.² B22C *15/02*

U.S. Cl. 164—194 **10 Claims**



1. Apparatus for the production of the upper part of a casting mold comprising: a mold box; feed hopper means for feeding mold forming material into said mold box; a presser board and a mold table adapted to press said mold forming material therebetween; a pattern plate including pattern means arranged on said mold table; sink pattern means arranged on said presser board for forming a sink in the surface of said mold forming material; at least one premolding member provided on said feed hopper means for forming a depression in said casting mold having a location and dimensions generally corresponding to said sink formed by said sink pattern means on said pattern plate; and sprue pattern means extending to form a sprue communicating said sink with said pattern means, said sprue pattern means including spring means extending substantially perpendicularly to said premolding member and said sink pattern means.

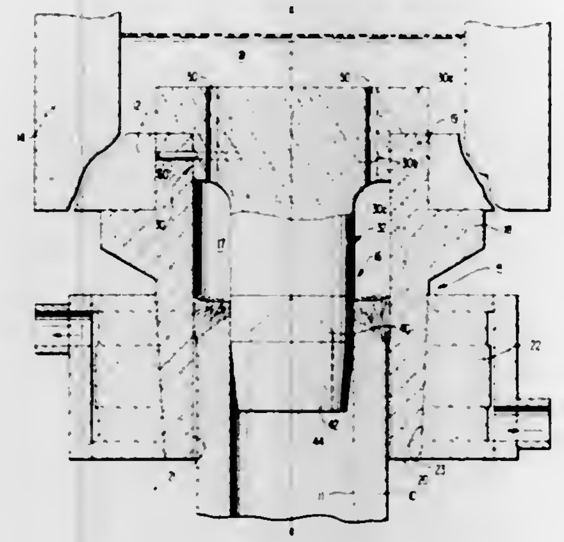
4,000,773
DIE ASSEMBLY FOR CONTINUOUS VERTICAL CASTING OF TUBULAR METALLIC PRODUCTS

Gus Sevastakis, 5645 Angola Road, Toledo, Ohio 43615

Filed Feb. 9, 1976, Ser. No. 656,341

Int. Cl.² B22D *11/10*

U.S. Cl. 164—281 R **7 Claims**



1. For use in the process of vertical continuous casting of metallic tubular products; a die assembly including an outer tubular sleeve having opposite open ends and adapted to be fixed in an opening in a bottom wall of a crucible with one of the ends of the sleeve lying substantially flush with the upper surface of the bottom wall of the crucible, an inner mandrel adapted to be received axially in the sleeve, said mandrel including an upper section for aligning and securing the mandrel in the sleeve and a lower section including a forming section having a transverse dimension less than the transverse dimension of the upper section to provide a mold cavity between the lower section and the sleeve, said upper section having an enlarged head adapted to abut against the upper end of the sleeve to limit the axial position of the mandrel in the sleeve, said upper section below the head including a reduced width section having a width less than said head but greater than said lower section and forming a flange section partially defining the mold cavity, said flange section below the head being dimensioned to form a snug fit within the sleeve, said upper section including a plurality of elongated pouring passages extending longitudinally through said flange section of the upper section and spaced angularly about the longitudinal axis of the mandrel, said passages respectively having inlets at the surface of said head and outlets in the flange section opening into the mold cavity when the mandrel is assembled in the sleeve for permitting molten metal to be fed by gravity through the upper section downwardly into the mold cavity, said sleeve having intermediate sections completely enclosing the mold cavity below the upper section and the forming section of the lower section, and wherein the lower section terminates at a lower free end having an axial cooling recess therein for receiving air to cool the mandrel and the casting during a casting operation.

4,000,774
REGENERATIVE AIR PREHEATER WITH AUTOMATICALLY ADJUSTABLE SEALING DEVICE

Ernst Puritz, Dahlbruch, and Erich Kraft, Huettseifen, both of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany

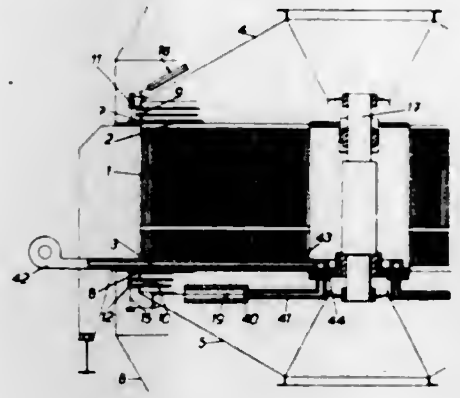
Filed Jan. 30, 1973, Ser. No. 328,116

Claims priority, application Germany, Feb. 8, 1972, 2205838

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² F28D *17/00*

U.S. Cl. 165—4 **12 Claims**



1. Rotary regenerative air preheater with a cylindrical regenerative mass having a central axis and end faces, sealing elements adjacent, respectively, the end faces of the regenerative mass, the sealing elements being operatively linked to spring loaded pin means adapted for travel in the axial direction of the mass and respective stops defining a limit to the travel of the respective pin means, a temperature responsive device at each end face of the mass, each stop being operatively linked to a respective temperature responsive device through a lever linkage including a crank means, the crank means being borne on a support for pivoting about a pivot axis, the temperature responsive devices being attachable to the crank at any one of a plurality of distances from the pivot axis, and being responsive to alter its length will alteration in temperature to adjust axially the position of said stop, the device at one end of the mass being arranged to cause said stop for the sealing element at the end to move in a given axial direction upon temperature rise and that at the other end of the mass being arranged to cause said stop for the sealing element at the end to move in the same axial direction on temperature rise, both stops being moved in the opposite direction on temperature fall, the directiions bein appropriate to the axial movement of the mass with temperature change

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4,000,775
HEAT EXCHANGER STRUCTURE

Albert Eisenstein, Akron, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

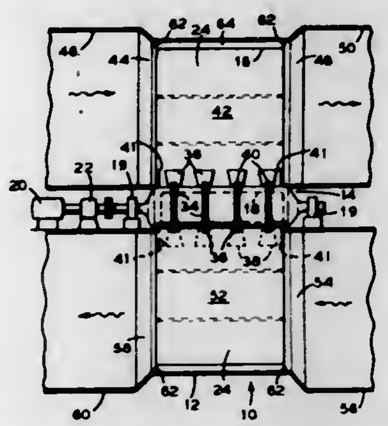
Filed Apr. 24, 1975, Ser. No. 571,138

Int. Cl.² F28D *19/04*

U.S. Cl. 165—8 **3 Claims**

1. A regenerative heat exchanger comprising a rotatable shaft, a rotor concentrically disposed about said shaft, the rotor having radial partitions forming a plurality of sector shaped compartments and including regenerative heat exchange material disposed within said compartments, a housing surrounding the rotor and having inlet and outlet openings for directing the separate flow of a heating fluid and a fluid to be heated over said heat exchange material, the improvement including said shaft extending through a plurality of annular members rigidly fixed thereto, said members being spaced

from one another and from the ends of the shaft, and notched plates straddling said members and being rigidly fixed thereto



and to said partitions thereby connecting the rotor to said shaft.

4,000,776
HEAT PIPE SYSTEM

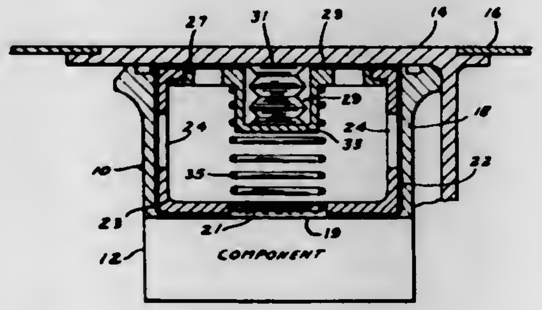
Helmut L. Kroebig, Rolling Hills, and Frank J. Riha, III, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1974, Ser. No. 529,194

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F28D *15/00*

U.S. Cl. 165—32 **2 Claims**



1. A heat pipe diode device for transferring heat from a heat source component to a heat sink wall comprising: a heat pipe body member attached to said component; said component having a wall forming at least a portion of the normal evaporator section of the heat pipe diode device; a working fluid within said body member; a cover for said heat pipe diode device forming at least a portion of the said heat sink wall; said cover forming the normal condenser for said heat pipe diode device; a wick connected between the condenser and the evaporator of said heat pipe diode device; means for retaining the wick adjacent the heat pipe wall; a wick support plate adjacent said cover; said wick being attached to said support plate; means for holding said wick in contact with said cover; means, responsive to excessive temperatures at said heat sink wall, for moving said support plate and a portion of said wick away from said cover to thereby substantially reduce heat flow in the reverse direction through said heat pipe diode device.

4,000,777
ROTARY HEAT EXCHANGER

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Continuation-in-part of Ser. No. 418,550, Nov. 23, 1973, abandoned. This application Sept. 10, 1974, Ser. No. 504,769

Claims priority, application Austria, Nov. 23, 1972, 9968/72

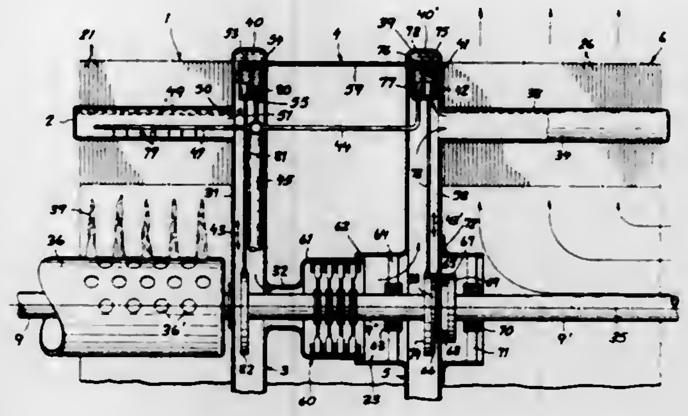
Int. Cl.² F28F *5/00;* **F22B** *5/00;* **F25B** *3/00*

U.S. Cl. 165—86 **11 Claims**

1. In a heat exchanger for a thermodynamic machine, comprising a rotary unit with an evaporator section, a condenser section and conduit means establishing a closed circuit for the passage of a working fluid in a vaporized state from said evaporator section via a thermo-mechanical energy converter to said condenser section and in a liquefied state from said condenser section to said evaporator section, said evaporator section including an array of tubes parallel to the axis of rotation of said unit, the improvement wherein said rotary unit further includes:

an annular collector centered on said axis, said collector forming a receptacle disposed radially outwardly of said array of tubes;

a reservoir for working-fluid condensate communicating via a first part of said conduit means with said condenser section, a second part of said conduit means extending from said reservoir to said tubes;



circulation means in said conduit means for driving condensate from said reservoir into said tubes at a mass-flow rate exceeding the mass-flow rate of the evolving working-fluid vapors, said tubes having entrance ends partially obstructed by barriers located adjacent peripheral sectors thereof remote from said axis, said barriers defining storage areas for centrifugally retaining excess condensate, said collector communicating with said entrance ends for receiving an overflow of said excess condensate from said storage areas and transmitting said overflow to said receptacle by centrifugal action; and

return means for delivering said overflow from said receptacle to said second part of said conduit means for recirculation to said tubes together with fresh condensate from said condenser section.

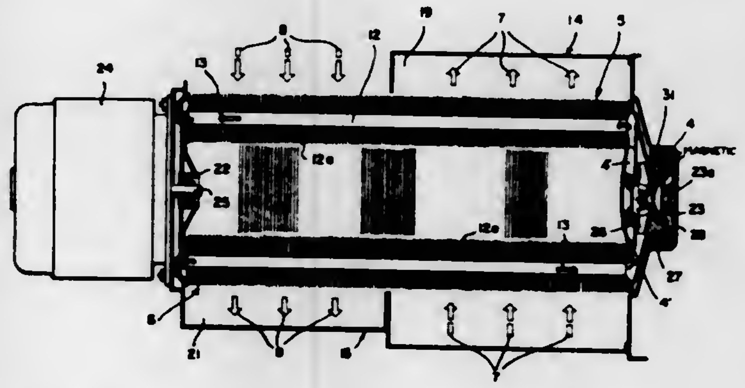
4,000,778
TEMPERATURE-CONTROL SYSTEM WITH ROTARY HEAT EXCHANGERS

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen, Germany

Division of Ser. No. 286,569, Sept. 5, 1972, Pat. No. 3,877,515, and a continuation-in-part of Ser. No. 847,771, June 17, 1969, abandoned. This application Feb. 10, 1975, Ser. No. 548,674

Int. Cl.² F28D *11/04*

U.S. Cl. 165—86 **6 Claims**



1. A temperature-control system for ventilating a room equipped with means for maintaining the air therein at a

temperature differing substantially from that of the outer atmosphere, comprising:

stationary support means including a housing divided into a first compartment and a second compartment, said first compartment having a first inlet open to the outer atmosphere and a first outlet open to said room, said second compartment having a second inlet open to said room and a second outlet open to the outer atmosphere;

a rotary structure in said housing comprising a first and a second heat exchanger mounted for joint rotation about a common axis in said first and said second compartment, respectively, said first heat exchange being a radial-flow blower driving an incoming airstream from said first inlet to said first outlet, said second heat exchanger being a radial-flow blower driving an outgoing airstream from said second inlet to said second outlet;

drive means for rotating said structure about said axis;

hermetically sealed conduit means in said structure interlinking said heat exchangers and forming at least one closed path for a heat-carrier medium abstracting heat from the warmer one of said airstreams and giving off heat to the colder one of said airstreams; and

forced-circulation means in said path for driving said medium therethrough under a pressure maintaining a continuous uninterrupted flow of said medium at substantially uniform speed between said heat exchangers.

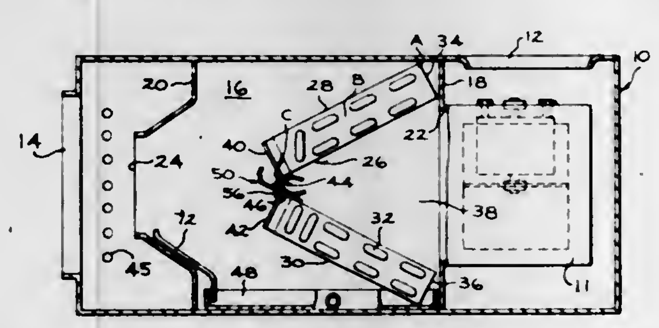
4,000,779
BLOWOFF BAFFLE

John W. Irwin, Trenton, N.J., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 28, 1975, Ser. No. 635,859

Int. Cl.² F25D *21/14*

U.S. Cl. 165—111 **7 Claims**



1. An air handling structure including a housing having a heat exchanger arranged in the path of a flow of air, a drip pan means in said housing arranged below said heat exchanger for receiving condensate from said heat exchanger, comprising:

said heat exchanger including a pair of generally horizontally extending slab heat exchangers arranged one above the other, each having a first upstream and a second downstream axial ends;

said first ends being substantially parallel and spaced from each other to define an opening therebetween to allow movement of air therethrough, and converging axially toward said second ends so that substantially all of the air moving through the opening contacts the heat exchangers;

air deflector means of substantially diamond shape connecting said second ends of said heat exchanger and extending laterally relative to the air flow path substantially the full width of said heat exchangers;

a condensate guide means extending substantially the full width of said air deflector means including a condensate collecting portion and a tab portion formed along one edge, said tab portion being arranged between said deflecting means and the second end of the lower heat exchanger so that said collecting portion projects axially upstream from said heat exchanger;

baffle means on said collecting portion formed along the other edge of said air guide means extending upwardly into the path of air passing through the lower portion of the upper heat exchanger so that when condensate in said lower portion of the upper heat exchanger is sufficient to be carried by said air flow through said heat exchanger, it impinges on said baffle means and said collecting portion and is directed to said drip pan thereby preventing said condensate from being carried out of said housing by said air flow.

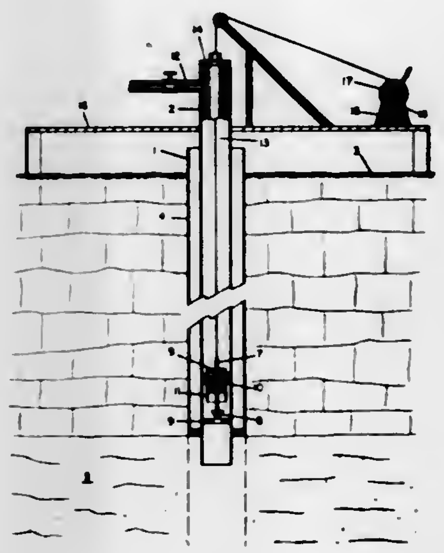
4,000,780
STORM CHOKE

Gary W. Rosenwald, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Oct. 3, 1972, Ser. No. 294,743

Int. Cl.² E21B *43/12*

U.S. Cl. 166—72 **9 Claims**



1. In a producing well having a production tubing which extends below the surface to a producing reservoir, apparatus for controlling flow of fluid through the production tubing which comprises:

a. a valve seat located within the production tubing,

b. an operable valve disc located within the tubing, the disc being adapted to engage and mate with the valve seat,

c. operating means for continuously urging the valve disc to move toward a position which is opposite from normal with regard to engagement of the disc with the valve seat, and

d. mechanical means for selectively securing the valve disc in a normal position with regard to engagement with the seat and for releasing the disc for movement by the operating means, and wherein said mechanical means comprises a mechanical linkage attached to the disc and which extends up through and out of the production tubing and is adapted for movement within the tubing, and further comprising means at the surface for selectively securing and moving the mechanical linkage within the tubing.

4,000,781
WELL TREATING PROCESS FOR CONSOLIDATING PARTICLES WITH AQUEOUS EMULSIONS OF EPOXY RESIN COMPONENTS

Randolph H. Knapp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 571,195, April 24, 1975, abandoned. This application Nov. 13, 1975, Ser. No. 631,774

Int. Cl.² E21B *33/138, 43/04*

U.S. Cl. 166—276 **21 Claims**

15. The process for coating solid surfaces with a solution of epoxy resin-forming components which become converted to

a solid resin while those surfaces are disposed within a relatively remote and relatively hot subterranean location which process comprises:

compounding an oil-phase liquid solution of a polymerizable polyepoxide and a relatively water-soluble tertiary amine that is capable of both catalyzing the polyepoxide polymerization and oil-wetting a solid surface;

dispersing said solution in an aqueous liquid to form an oil-in-water cationic emulsion that is capable of wetting solid surfaces with a resin-forming solution that will subsequently form a solid resin;

contacting the solid surfaces to be treated with said emulsion so that they are wetted with the resin-forming solution; and

disposing the so-wetted solid surfaces within said relatively remote and relatively hot subterranean until the solid resin is formed.

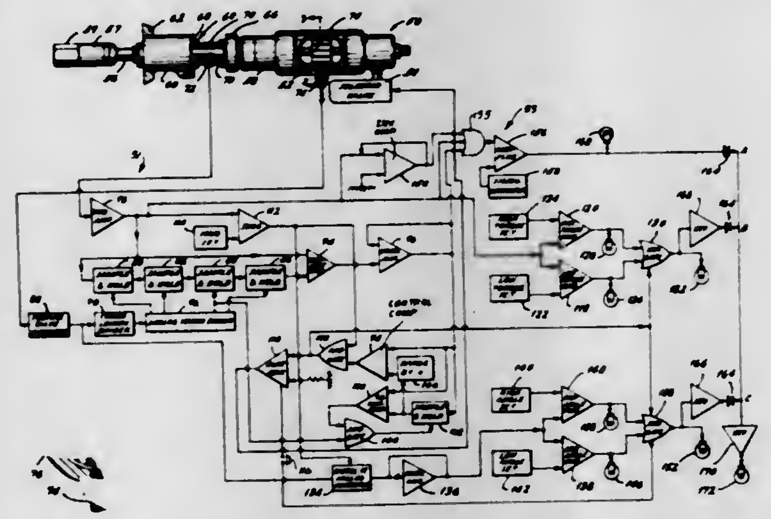
4,000,782
TIGHTENING SYSTEM WITH QUALITY CONTROL APPARATUS

Robert J. Finkelston, Hatboro, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Sept. 19, 1974, Ser. No. 507,546

Int. Cl.² B25B *23/14*

U.S. Cl. 173—12 **15 Claims**



1. A tightening system for tightening a fastener to a predetermined tightened condition including wrench means for imparting input tightening characteristics to said fastener, control means operatively associated with said wrench means for shutting off said wrench means at said predetermined tightened condition, means associated with said wrench means for measuring said input tightening characteristics and providing first signals indicative of the instantaneous values thereof, means for providing second signals representative of desired instantaneous values of said input tightening characteristics at said predetermined tightened condition, means for providing a third signal representative of a desired operating characteristic of said system when said wrench means and said control means are functioning properly, and quality control means for continuously checking said first signals with respect to said second signals and for continuously checking sad operating characteristic of said system with respect to said third signal.

4,000,783
CONICAL BORING TOOL

Hans Albert Hug, Weston, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Oct. 20, 1975, Ser. No. 623,807

Int. Cl.² E21B *9/10*

U.S. Cl. 175—346 **11 Claims**

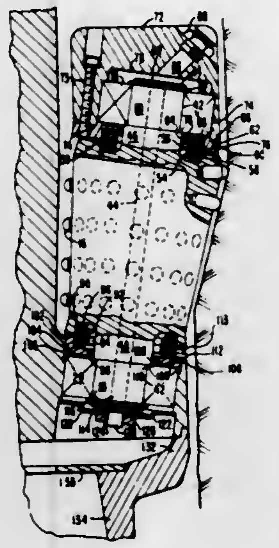
1. A self-advancing conical boring tool comprising:

a. a tapered frame formed with a plurality of circumferentially disposed recesses;

b. a pair of self-aligning spherical roller bearing mounted within each of said recesses;

c. a roller cutter supported in each said pair of spherical roller bearings, each said roller cutter having a wide upper portion and a narrow lower portion constituting a frusto-conical body and a shaft, a longitudinal axis of said body coaxial with a longitudinal axis of said shaft, one end of said shaft received in one of said pair of spherical roller bearings and an opposite end of said shaft received in the other of said pair of spherical roller bearings;

d. a thrust plate interposed between said wide upper portion of each said roller cutter and said one of said pair of spherical roller bearing, said spherical roller bearings constituting primary bearings, said thrust plate constituting a secondary bearing when said one of said pair of spherical roller bearings fails; and



e. a plurality of teeth projecting outwardly from the periphery of each said roller cutter;

f. each said roller cutter constrained within each said pair of spherical roller bearings for free rotation about an axis that is both oblique and skewed relative to a longitudinal axis of said frame.

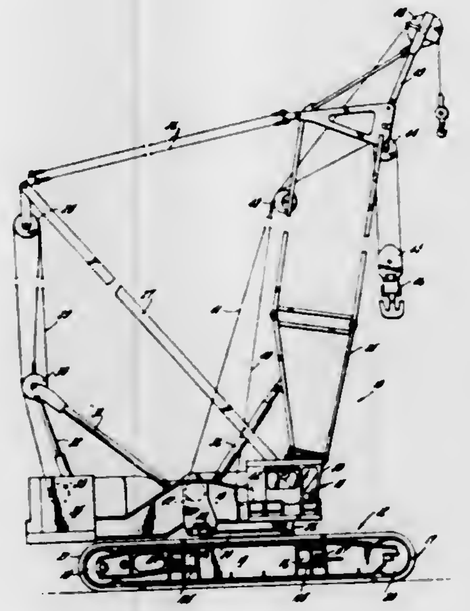
4,000,784
DEMOUNTABLE SELF-PROPELLED CRANE TRANSPORT ASSEMBLY

James G. Morrow, Sr.; David J. Pech, and Norman J. Kutz, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Apr. 24, 1975, Ser. No. 571,303

Int. Cl.² B62D *55/00*

U.S. Cl. 180—9.48 **7 Claims**



1. A demountable self-propelled transport assembly for a load handling vehicle comprising, in combination, a central body portion, a pair of transverse beams connected respectively to the front and rear of said body portion and extending laterally from the sides thereof, said connection between said body portion and each of said beams including at least one hydraulically actuated lock pin selectively connected to a hydraulic supply means for selective actuation thereby, a pair of side frames each coupled to the projecting ends of said beams in load bearing relation on opposite sides of said body portion, means for detachably connecting said frames to said beams, a crawler assembly mounted on each of said side frames, jack means mounted on said transverse beams for selectively relieving the load imposed on said side frames by said beams, lateral adjusting means interconnecting said beams and frames for shifting said frames relative to said beams, and means for selectively energizing said jacks and adjusting means to shift said side frames relative to said beams.

4,000,785
POWER STEERING APPARATUS FOR A VEHICLE

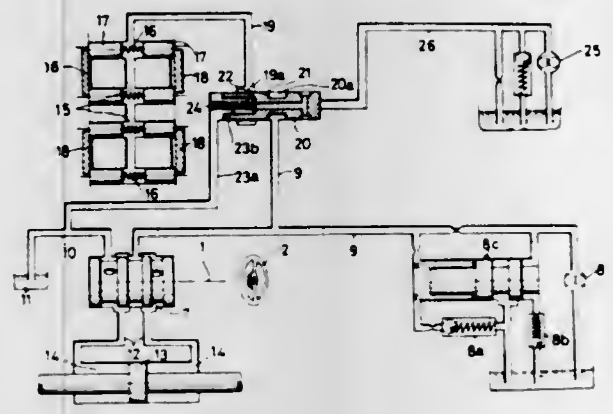
Masao Nishikawa, Niiza; Yoshihiko Toshimitsu, and Takashi Aoki, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,518

Claims priority, application Japan, Aug. 7, 1974, 49-89811

Int. Cl.² B62D *5/08*

U.S. Cl. 180—143 **4 Claims**



1. Power steering apparatus comprising a turnable steering shaft, a pressure fluid source, a power cylinder having left and right chambers, a supply passage connected to said source, movable changeover valve means coupled to said steering shaft for selectively connecting the left and right chambers to said passage and thereby to said source depending on the direction of turning of the steering shaft, at least one fluid pressure reaction chamber, a further passage connecting said reaction chamber to said changeover valve means for opposing displacement of the changeover valve means, first throttle means between said further passage to said fluid pressure reaction chamber and said supply passage, an exterior oil tank, second throttle means between said passage to said fluid pressure reaction chamber and said exterior oil tank, and control means for varying the size of at least one of said throttle means in proportion to vehicle speed thereby to increase the ratio of the size of the opening areas of the first and second throttle means to said further passage according to increase of vehicle speed, said control means comprising a linearly displaceable control valve, one of said throttle means being constituted as a variable area passage formed in said control valve, the other of said throttle means being constituted as a constant area passage formed in said control valve, said control means further comprising a pump having a delivery pressure corresponding to vehicle speed for moving said control valve in accordance with vehicle speed, thereby to vary the ratio of the sizes of said first and second throttle means to said further passage.

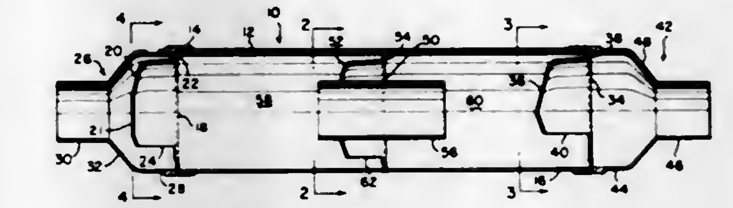
4,000,786
MARINE MUFFLER

John R. Ford, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Nov. 3, 1975, Ser. No. 628,378

Int. Cl.² F01N *1/08*

U.S. Cl. 181—52 **3 Claims**



1. A marine muffler comprising:

an elongated, substantially tubular main body section,

a pair of apertured end caps mounted over opposite ends of said main body section and defining an inlet and an outlet thereto,

a plurality of substantially similar, dome-shaped baffles mounted in said main body section in spaced relationship to each other,

each of said similar, dome-shaped baffles including a dome-shaped central portion having an apex thereof projecting toward said inlet of said main body section and a flange projecting outwardly from said dome-shaped central portion,

a first of said baffles positioned adjacent said inlet to said main body portion having a first opening formed through said dome-shaped central portion thereof and a lower, cut away portion adjacent said flange thereof,

a second of said dome-shaped baffles being positioned adjacent said outlet from said main body section and having cut away portion adjacent said flange thereof,

a third one of said dome-shaped baffles being mounted in said main body section intermediate said first and second dome-shaped baffles and dividing said main body section into upstream and downstream expansion chambers,

means defining an opening through the apex of said third dome-shaped baffle and a cut away portion adjacent the flange thereof, and

a substantially cylindrical connecting tube mounted within said opening in said third one of said dome-shaped baffles and projecting into said upstream and downstream expansion chambers.

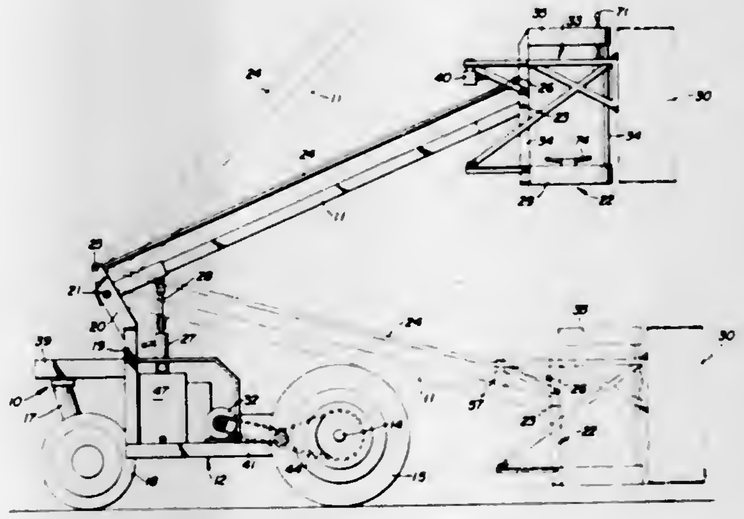
4,000,787
VEHICLE FOR PICKING FRUIT

Robert E. Groenig, 8505 Tieton Drive, Yakima, Wash. 98902

Filed Sept. 16, 1974, Ser. No. 506,273

Int. Cl.² B66F *11/04*

U.S. Cl. 182—2 **6 Claims**



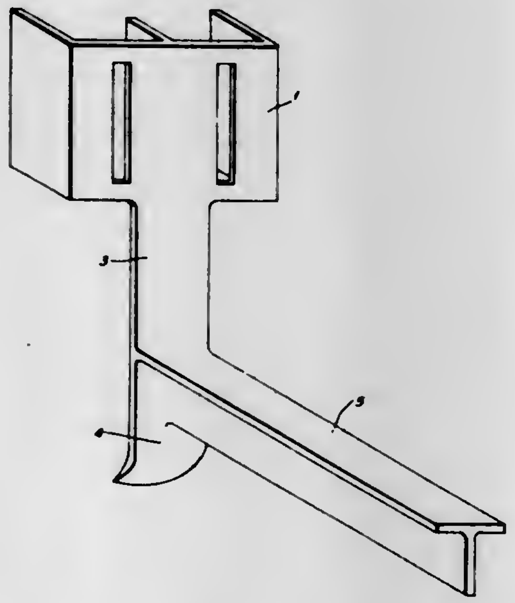
1. A machine comprising a frame, said frame having an intermediate part and two spaced rearwardly extending rear parts,

a caster wheel fixed to said forwardly extending part.

rear wheels fixed to said rearwardly extending parts,
a boom pivoted to said frame above said caster wheel and extending rearwardly therefrom,
a cage fixed to the distal end of said boom,
link means disposed generally parallel to said boom connected to said frame and to said cage whereby said cage is held to move in a vertical direction,
means for swinging said boom up and down,
and means accessible to a person in said cage for driving said wheels and steering said vehicle,
and an auxiliary boom is supported on said boom to swing about a vertical axis,
wherein said auxiliary boom is swingably supported on said cage,
a picking bucket is supported on said auxiliary boom.

4,000,788
BELT-ON TREE STEP (BOTS)

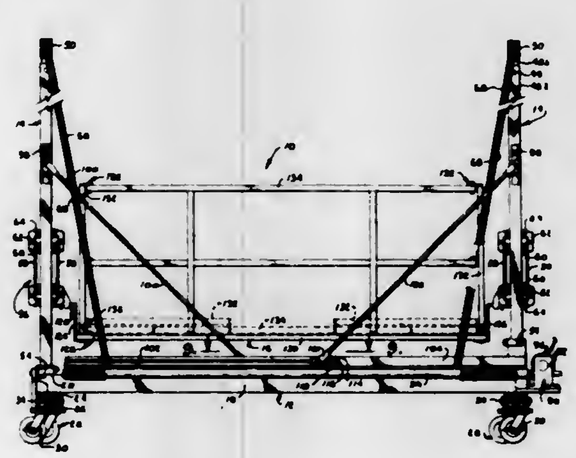
John Alwyn Burgess, 114 Moore Ave., and Zeb Douglas Schofield, III, 273 Champion Drive, both of Opp, Ala. 36467
Filed Nov. 11, 1975, Ser. No. 630,153
Int. Cl.² B60R *3/00*
U.S. Cl. 182—92 **1 Claim**



1. A portable step for climbing up and down elongated objects such as trees and poles, comprising,
  a one-piece member formed as an integral casting and having
    a first vertical leg portion which is T-shaped in cross-section with the leg of the T forming an abutment edge to abut against the adjoining surface of the elongated object to be climbed and with the cross arms of the T spaced outwardly thereof,
    said cross arms of the T at an upper portion of said vertical leg portion being enlarged to form an anchoring means and having formed therein a pair of spaced apart elongated slots through which may be passed a belt-type fastening means,
thereby to anchor the member to the elongated object when the belt-type fastening means is encircled therearound,
  said anchoring means having offset flanges extending inwardly towards the elongated object and being disposed generally parallel to but spaced outwardly from the leg of the T and forming abutment edges engageable with the adjoining surface of the elongated object at spaced apart points to stabilize the member by multi-point engagement with the elongated object,
    said leg portion at the lower extremity thereof being offset and shaped and arranged to form a sharp spike extending inwardly beyond said abutment edge to embed itself into the adjoining surface of the elongated object,
  said one-piece member having a second generally horizontal leg portion which is also T-shaped in cross-section with the leg of the T extending downwardly and the cross arms of the T forming a flat step to support the foot of the user,
  said horizontal leg portion being inclined angularly upwardly sufficiently to prevent inadvertent foot slippage of the user,
  said horizontal leg portion being connected to said vertical leg portion immediately superjacent the level of said spike and well below the level of said anchoring means,
whereby the step will not twist to the side when the user places his weight thereon.

4,000,789
PORTABLE SCAFFOLD

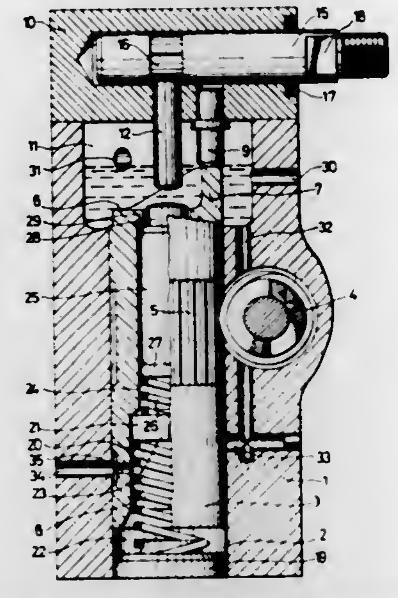
Louis J. Zahner, Kansas City, Kans., assignor to Edward Engel, Kansas City, Kans., a part interest
Filed Feb. 18, 1976, Ser. No. 659,097
Int. Cl.² E04G *1/18, 1/34*
U.S. Cl. 182—152 **14 Claims**



1. A lifting device comprising:
a base framework;
first and second elongated upright supports pivotally coupled with said framework in spaced apart relationship,
each of said supports being movable from a collapsed position in generally horizontal disposition to an extended position in generally vertical disposition;
first and second platform supporting means for raising and lowering an object,
said means being mounted on said first and second upright supports, respectively, for movement longitudinally therealong between raised and lowered positions when said supports are in their extended positions;
a platform member substantially spanning the distance between said supports and adapted to be coupled therewith;
means for mounting one end of said member on each of said platform supporting means,
each of said mounting means comprising a bracket presenting a coupling with said supporting means for accommodating pivotal movement of said supporting means relative to said platform mounting means for approximately 90°, an elongate section extending away from said pivotal coupling and means coupled with said elongate section for coupling with said platform member whereby the latter may be lowered to a plane lying below the plane of the pivotal point of one of said supports a distance at least equal to the width of the other of said upright supports; and
means coupled with said platform supporting means for moving the platform member up and down along said upright supports.

4,000,790
LUBRICANT PROPORTIONING PUMP

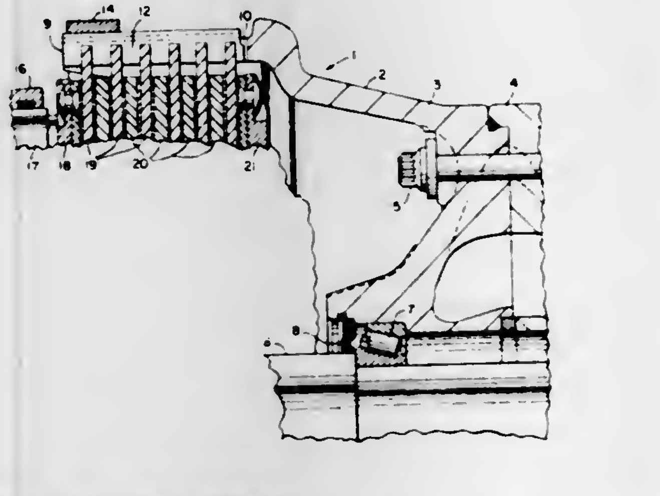
Theo Seufer, Bad Wimpfen, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany
Filed Dec. 11, 1974, Ser. No. 531,545
Claims priority, application Germany, Dec. 14, 1973, 2362194
Int. Cl.² F16N *7/40, 13/04*
U.S. Cl. 184—27 R **6 Claims**



1. A lubricant proportioning pump comprising a housing, a bore in said housing, a delivery piston mounted in said bore for reciprocating and rotary motion, said bore having a closed end, a working chamber between said closed end and an endface of the piston, said working chamber having an inlet port controlled by the piston and an outlet port, a step-down transmission for rotating the piston about its longitudinal axis, cam means for reciprocating the piston during its rotary motion, said cam means comprising a cam track member cooperating with a guide member, one of said members being on the piston and the other on the housing, spring means for urging the piston longitudinally towards the member on the housing, an adjustable stop in the housing for limiting the stroke of the piston, and a temperature-responsive expansion element arranged in the piston for cooperation with said stop at the end of the piston stroke, said expansion element being expandible towards said stop on increasing temperature of the lubricant for reducing the piston stroke.

4,000,791
DISK BRAKE FOR REINFORCED DRIVE KEY MEMBER

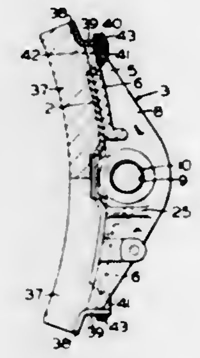
James J. Kovac, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed Apr. 21, 1976, Ser. No. 678,837
Int. Cl.² F16D *55/36*
U.S. Cl. 188—71.5 **11 Claims**



1. A disk brake comprising:
A. A circular flange having a plurality of axially extending keyslots therein;
B. said keyslots being open at one end thereof;
C. a plurality of stationary disks;
D. a plurality of rotatable disks interleaved between the stationary disks;
E. each rotatable disk having a plurality of radially directed keys mating with the keyslots in the flange in such manner that the sides of the keyslots take torque exerted thereon by the rotatable brake disks upon brake application;
F. means to move the disks axially into frictional engagement with each other; and
G. bridge means spanning the open end of the keyslots to provide added hoop strength to the circular flange and prevent the flange from bending radially outwardly when it is subjected to high temperatures and torque loads during braking or rolling loads while the brake is hot.

4,000,792
BRAKE SHOE AND HEAD ASSEMBLY

David R. Guldin, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Aug. 28, 1975, Ser. No. 608,561
Int. Cl.² F16D *65/06*
U.S. Cl. 188—242 **2 Claims**



1. A brake head and brake shoe assemblage for use in a railway vehicle brake apparatus, said assemblage comprising:
  a. a brake head having a concave brake-shoe-receiving surface, a back and a pair of parallel spaced-apart webs integral with and extending outward from said back,
  b. a brake shoe, and
  c. a backing plate having said brake shoe secured thereto, wherein the improvement comprises locking means for locking said backing plate to said brake head, said locking means comprising:
  d. a pair of apertured tabs formed integral with the respective opposite ends of said backing plate,
  e. a pair of internally-threaded locking elements each separately secured to one of the opposite ends of said back of said brake head, and
  f. a pair of cap screws each extending through the aperture in one of said tabs and having screw-threaded engagement with the internal screw threads in the corresponding locking element whereby said pair of cap screws releasably secure said brake shoe to said brake head.

4,000,793
DRY FLUID DRIVE

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.
Filed Apr. 30, 1975, Ser. No. 573,316
Int. Cl.² F16D *37/00*
U.S. Cl. 192—105 A **11 Claims**

1. A dry fluid drive comprising a housing having a center axis about which said housing rotates and a cavity therein concentric with said housing, a dry fluid in said cavity, a rotor assembly disposed in said cavity having a hub in alignment with the center axis of said housing and extending axially from the housing, said rotor having two sections in axially spaced relation at the periphery, and a reaction vane of generally

4,000,790

LUBRICANT PROPORTIONING PUMP

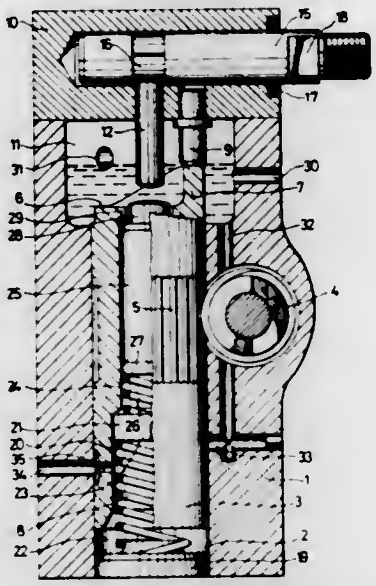
Theo Seufer, Bad Wimpfen, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Dec. 11, 1974, Ser. No. 531,545

Claims priority, application Germany, Dec. 14, 1973, 2362194

Int. Cl.^{2} F16N *7/40, 13/04*

U.S. Cl. 184—27 R **6 Claims**



1. A lubricant proportioning pump comprising a housing, a bore in said housing, a delivery piston mounted in said bore for reciprocating and rotary motion, said bore having a closed end, a working chamber between said closed end and an endface of the piston, said working chamber having an inlet port controlled by the piston and an outlet port, a step-down transmission for rotating the piston about its longitudinal axis, cam means for reciprocating the piston during its rotary motion, said cam means comprising a cam track member cooperating with a guide member, one of said members being on the piston and the other on the housing, spring means for urging the piston longitudinally towards the member on the housing, an adjustable stop in the housing for limiting the stroke of the piston, and a temperature-responsive expansion element arranged in the piston for cooperation with said stop at the end of the piston stroke, said expansion element being expandible towards said stop on increasing temperature of the lubricant for reducing the piston stroke.

4,000,791

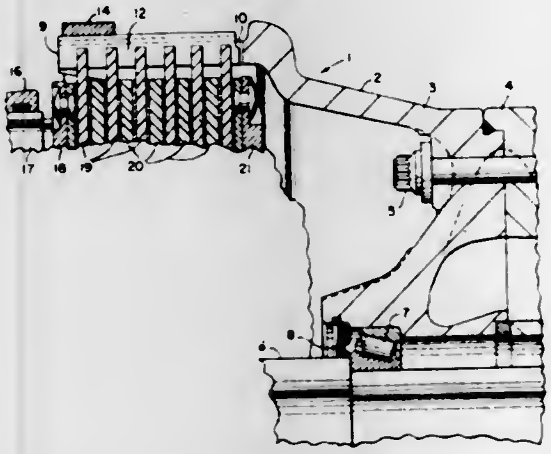
DISK BRAKE FOR REINFORCED DRIVE KEY MEMBER

James J. Kovac, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 21, 1976, Ser. No. 678,837

Int. Cl.^{2} F16D *55/36*

U.S. Cl. 188—71.5 **11 Claims**



1. A disk brake comprising:

A. A circular flange having a plurality of axially extending keyslots therein;

B. said keyslots being open at one end thereof;

C. a plurality of stationary disks;

D. a plurality of rotatable disks interleaved between the stationary disks;

E. each rotatable disk having a plurality of radially directed keys mating with the keyslots in the flange in such manner that the sides of the keyslots take torque exerted thereon by the rotatable brake disks upon brake application;

F. means to move the disks axially into frictional engagement with each other; and

G. bridge means spanning the open end of the keyslots to provide added hoop strength to the circular flange and prevent the flange from bending radially outwardly when it is subjected to high temperatures and torque loads during braking or rolling loads while the brake is hot.

4,000,792

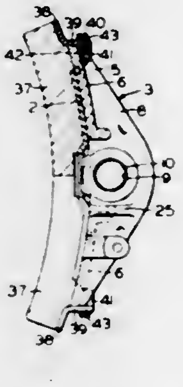
BRAKE SHOE AND HEAD ASSEMBLY

David R. Guldin, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 28, 1975, Ser. No. 608,561

Int. Cl.^{2} F16D *65/06*

U.S. Cl. 188—242 **2 Claims**



1. A brake head and brake shoe assemblage for use in a railway vehicle brake apparatus, said assemblage comprising:

a. a brake head having a concave brake-shoe-receiving surface, a back and a pair of parallel spaced-apart webs integral with and extending outward from said back,

b. a brake shoe, and

c. a backing plate having said brake shoe secured thereto, wherein the improvement comprises locking means for locking said backing plate to said brake head, said locking means comprising:

d. a pair of apertured tabs formed integral with the respective opposite ends of said backing plate,

e. a pair of internally-threaded locking elements each separately secured to one of the opposite ends of said back of said brake head, and

f. a pair of cap screws each extending through the aperture in one of said tabs and having screw-threaded engagement with the internal screw threads in the corresponding locking element whereby said pair of cap screws releasably secure said brake shoe to said brake head.

4,000,793

DRY FLUID DRIVE

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

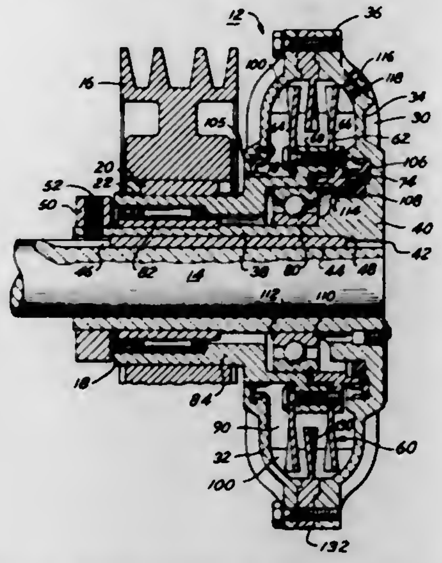
Filed Apr. 30, 1975, Ser. No. 573,316

Int. Cl.^{2} F16D *37/00*

U.S. Cl. 192—105 A **11 Claims**

1. A dry fluid drive comprising a housing having a center axis about which said housing rotates and a cavity therein concentric with said housing, a dry fluid in said cavity, a rotor assembly disposed in said cavity having a hub in alignment with the center axis of said housing and extending axially from the housing, said rotor having two sections in axially spaced relation at the periphery, and a reaction vane of generally

annular configuration disposed between said rotor sections extending inwardly from the periphery of the cavity and having a plurality of spaced slots in the inner edge thereof, producing a series of equally spaced vane segments with openings therebetween for distributing said dry fluid in said cavity between said rotor sections and said vane, said vane having an effective surface of an undulated configuration with the ribs and grooves being generally radially disposed.



4,000,794
CONTROL MEMBER FOR A CLUTCH DISK OF A MOTOR VEHICLE MAIN CLUTCH

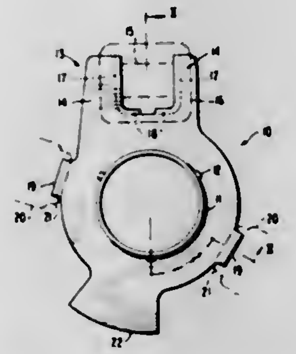
Günter Wörner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 16, 1974, Ser. No. 515,340

Claims priority, application Germany, Oct. 17, 1973, 7337305[U]

Int. Cl.² F16D *69/00, 3/14*

U.S. Cl. 192—106.2 **19 Claims**



1. A control structure for a clutch disk of motor vehicle main clutches in which a disk means carrying friction linings and a lateral member rigidly connected therewith are operatively connected torsionally elastically with a flange of a hub means, and in which several spring means of different characteristics are retained in window means of one of the two parts torsionally elastically connected with each other and engage in window means provided in the other of said two parts, and in which damping means are provided with the start of operation of at least one damping means being determined by a control means, characterized in that the control means includes an approximately radially extending fork-like arm whose two fork ends are bent over at their radial edges as viewed in the axial direction and therewith enclose a control spring, in that the tab means formed by the bent over portions of the fork ends are supported at the radially inner ends with respect to the control means, and in that offset in the direction of rotation with respect thereto are provided axial, angularly bent portions for engagement in corresponding window means of the hub flange means.

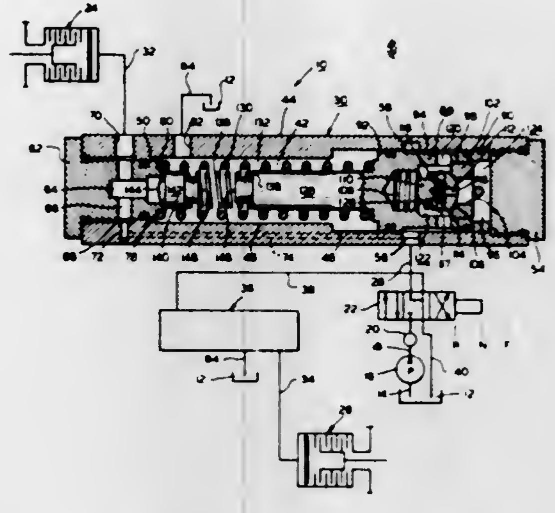
4,000,795
APPARATUS FOR CONTROLLING THE PRESSURE OF A FLUID FED TO A CLUTCH

Jon R. Patton, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 29, 1976, Ser. No. 671,526

Int. Cl.² F16D *25/062;* **F16K** *17/04*

U.S. Cl. 192—109 F **14 Claims**



8. In a hydraulic regulating apparatus, in combination, a reservoir; a source of hydraulic fluid; a hydraulic clutch having driven elements and driving elements operative to transmit torque to driven elements in response to fluid pressure; conduit means connecting said source with said clutch; and valve means interposed between said source and said hydraulic clutch for regulating the pressure which is admitted to said hydraulic clutch so that said pressure rises from a minimum to a maximum value within a predetermined interval of time (1) initially at the same rate as said source pressure; (2) then at a lesser rate than said source pressure; and (3) finally again at the same rate as said source pressure, said valve means comprising:

a. an elongated housing having a through chamber with first and second closed ends, said chamber having at least one inlet port, a discharge port, an outlet port and first restriction means;

b. said first closed end having a first bore in communication with said outlet port, said outlet port communicating via said conduit means with said friction clutch, said first bore also being operatively connected with said first restriction means and in turn via said conduit means with said source of hydraulic fluid, said first closed end also having a second bore in communication with said first bore and said housing chamber;

c. piston means sealingly and slidingly retained within said housing chamber adjacent said second closed end, said piston means including an annular groove portion which is in constant contact with said inlet port and said conduit means regardless of the position of said piston means, said piston means also having a fixed volume chamber in constant communication with said groove portion, said piston means further including a valve seat and a first valve member resiliently biased into engagement therewith, said first valve member having second restriction means in constant communication with said fixed volume chamber and a variable volume chamber in the portion of said housing chamber between said valve seat and said second closed end;

d. resilient means between said first closed end and said piston means for biasing the latter against said second closed end, said piston means having an axial piston rod portion extending toward said first closed end; and

e. a second valve member resiliently biased into sealing engagement with one end of said second bore, whereby fluid pressure flows initially through said first closed end to said hydraulic clutch at the same rate as said source pressure and flows from said fixed volume chamber through said second restriction means into said variable volume chamber so as to begin to advance said piston means against the bias of said resilient means; then, after a predetermined first time at a predetermined first pressure, said pressure fluid translates said second valve member away from said open end, thereby venting some of said pressure fluid passing through said first closed end into said chamber and out through said discharge port, thereby increasing the pressure rise in said hydraulic clutch at a lesser rate than said source pressure; and finally at the end of a second predetermined time at a predetermined second pressure, said piston rod portion has physically translated said second valve member into sealing relationship with said one end of said second bore, thereby increasing the pressure rise in said hydraulic clutch at the same rate as said source pressure.

4,000,796
BRAKING DEVICE

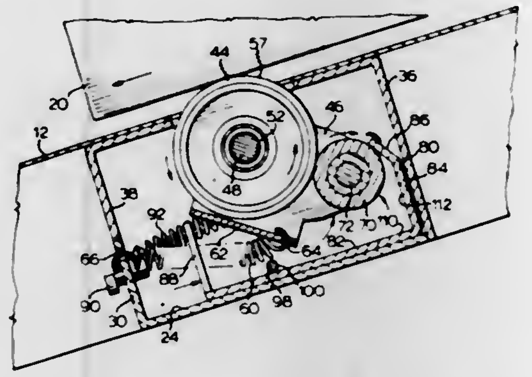
Frederick Arthur Bolton, Hamilton, and James Louis Eckebrecht, Burlington, both of Canada, assignors to Arcan Eastern Limited, Hamilton, Canada

Filed May 23, 1975, Ser. No. 580,379

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² B65G *13/00, 39/00*

U.S. Cl. 193—35 A **13 Claims**



1. A braking device for retarding moving objects comprising, in combination: a housing, a primary roll journalled within said housing having a peripheral surface projecting from said housing adapted to be frictionally engaged by said moving object for rotation of said roll thereby, a secondary roll, means journalling said secondary roll within said housing and means normally biasing said secondary roll journal means in a direction opposite to normal direction of rotation of said primary roll, a pressure plate slidably mounted within said housing for reciprocal travel towards and away from the peripheral surface of said primary roll, means for biasing said pressure plate against said secondary roll in a direction opposite to the normal direction of rotation of said primary roll, said pressure plate having a bevelled surface adapted to receive said secondary roll in wedging engagement between said pressure plate and said primary roll, whereby rotation of said primary roll in the direction of travel of an object thereon rotates said secondary roll in the opposite direction for frictional engagement with said pressure plate bevelled surface and wedging of the secondary roll between said primary roll and said pressure plate bevelled surface for retarding the rotation of said primary roll.

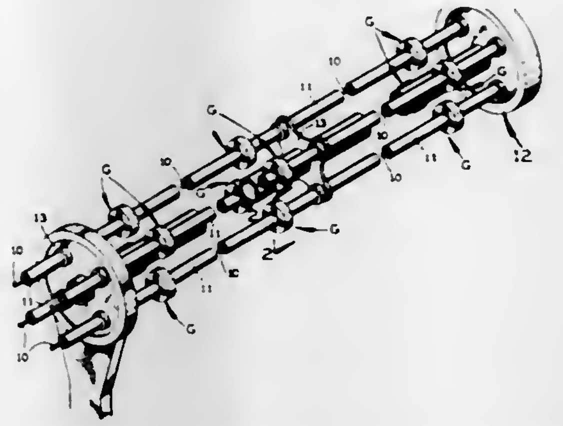
4,000,797
NOISE-ABSORBING BAR STOCK GUIDE FOR SCREW MACHINE

Paul Ducanis, 17401 NW. 2nd Ave., Miami Shores, Fla. 33169

Filed June 2, 1975, Ser. No. 582,678

Int. Cl.² B23B *25/00;* **B23Q** *3/00*

U.S. Cl. 193—38 **9 Claims**



1. In a bar stock feeding arrangement for a screw machine which has an elongated guide tube defining a passageway at the inlet side of the machine for loosely receiving the bar stock, an improved bar stock guide comprising:

a plurality of rollers spaced apart circumferentially around said passageway and each having an axle;

and yieldable, resilient support means of rubber-like material with recesses therein which snugly receive the roller axles and positioning said rollers extending into said passageway for guiding the bar stock between them.

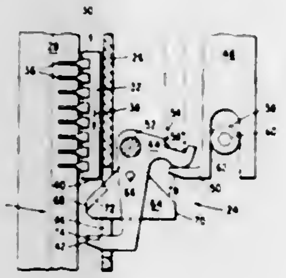
4,000,798
INERTIAL ARRESTING DEVICE FOR FEEDER

Nicholas J. Cedrone, Daymarc Corporation, 40 Bear Hill Road, Waltham, Mass. 02154

Continuation of Ser. No. 457,811, April 4, 1974, abandoned. This application July 16, 1975, Ser. No. 596,304

Int. Cl.² B65G *11/20*

U.S. Cl. 193—40 **4 Claims**



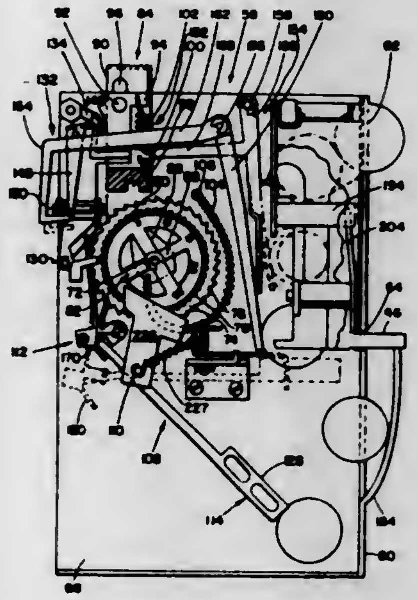
1. In apparatus for successively placing discrete articles in and removing them from a first position on a support without an upward bounce from the support and at a high repetition rate and where the articles successively approach said first position in a substantially free fall from a second position substantially vertically above said first position, the combination comprising,

impact retarding means positioned and adapted for a first, substantially elastic, impact by each falling article, thereby acquiring a kinetic energy variable directly with the mass of said article and a horizontal velocity component that is greater for articles of greater mass than for articles of lesser mass,

friction retarding means having a substantially vertical surface adjacent the path of fall of the articles after impact and positioned so that the impact retarding means upon a second impact with the article as it falls to said first position, causes the article to bear frictionally on said surface with a force directly related to said velocity component, and a fixed abutment that reverses the direction of the horizontal velocity component of the impact retarding means.

4,000,799
COIN TOTALIZER MECHANISM

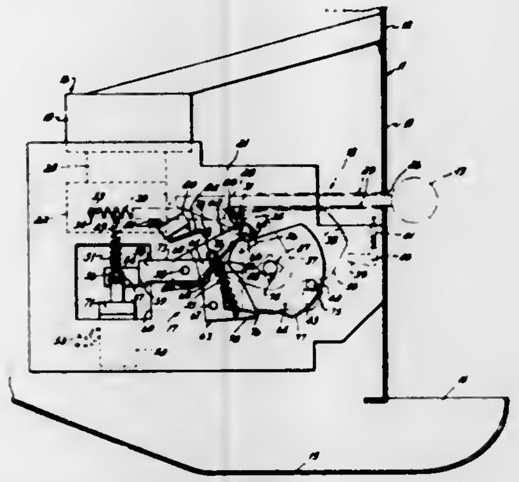
Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595
Filed Jan. 12, 1976, Ser. No. 648,573
Int. Cl.² G07F *5/08*
U.S. Cl. 194—1 L **24 Claims**



1. A coin controlled mechanism including a coin controlled mechanism housing for use in combination with a dispensing machine including an access door having a latch means attached to permit dispensing of products from the dispensing machine upon receipt of a predetermined amount of coins in said coin controlled mechanism, said coin controlled mechanism comprising a totalizer means including a totalizer register means and a coin chute means, said totalizer register means including a dispenser actuator means, said dispenser actuator means and said latch means each movable between a dispensing and non-dispensing position, said totalizer means also including a totalizer operator means operatively interconnected to said totalizer register means, said dispenser actuator means disposed to engage said latch means to control movement of said latch means from said non-dispensing to said dispensing position, said totalizer means including a totalizer actuator means, said totalizer actuator means movable between a first and second position in response to coins passing through said coin chute means, said totalizer actuator means disposed to selectively engage said totalizer operator means to control movement thereof in response to coins passing through said coin chute means and a totalizer control means comprising a first actuator stop means having a first position disposed to engage said totalizer actuator means to control movement thereof, said coin chute means comprising a single coin passage to control the travel of coins inserted therein, said first actuator stop means being disposed to engage said totalizer actuator means when in said first position in response to coins passing through said coin chute means to selectively control the extent of movement of said totalizer operator means and said totalizer register means relative to said dispenser actuator means to control said latch means whereby said totalizer means advances incrementally to permit movement of said latch means to said dispensing position when the proper combination of coins is registered by said totalizer register means.

4,000,800
ELECTROMECHANICAL INTERLOCK DEVICE FOR A VENDING MACHINE

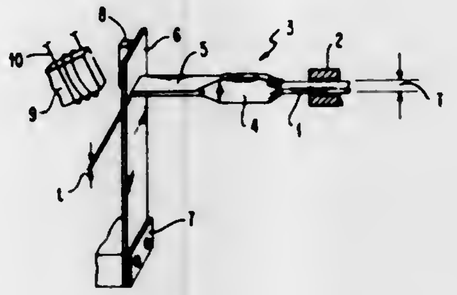
Wesley T. Loucks, Sr., Cincinnati, Ohio, assignor to William F. Shepherd, Inc., Cincinnati, Ohio
Filed Oct. 9, 1975, Ser. No. 621,218
Int. Cl.² G07F *5/10*
U.S. Cl. 194—9 R **6 Claims**



1. An electromechanical interlock device adapted to interconnect an electric credit system with a mechanical product dispenser, said interlock device including
- a drive cam adapted to be moved from a home position to a vend position upon operation of said product dispenser, said drive cam having structure that defines a lock notch,
- a locking arm movable into and out of locking relation with said drive cam's lock notch,
- an electrically operated solenoid interconnected with said electric credit system, said solenoid and said locking arm being connected together in a manner that permits said locking arm to be moved out of locking engagement with said drive cam when said credit system achieves the vend credit position, and that permits said locking arm to be moved into locking engagement with said drive cam when said credit system is not in the vend credit position, and
- latch lever means associated with said locking arm, said latch lever means restraining said locking arm in an unlocked position after said locking arm is moved out of locking engagement with said drive cam by said solenoid, and said latching arm being so restrained until said product dispenser is activated by a customer.

4,000,801
PRINT WIRE ATTACHMENT

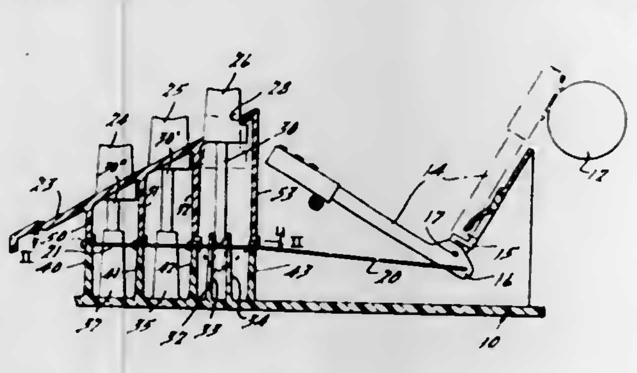
Heard Kilpatrick Baumeister, Durham; Robert Allen Sebrosky, and Walter Rudolph Wagner, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 425,344, Dec. 17, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,225
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **2 Claims**



1. In wire matrix print head apparatus having an electromagnetic wire driving means for reciprocating the wire between an operative print position and a retracted position, said driving means being adapted to move in a slightly arcuate path, thereby producing thrusting and bending movements and further having means connecting said thrusting and bending motions of said driving means to said wire, the improvement comprising:
- said connecting means is a unitary flexible hinge of a single piece of material directly connecting said driving means to said wire means, said connecting means having at least a first portion thereof that is more flexible in the plane of bending induced in said wire by said driving means than said wire alone in said same plane of bending, thereby reducing said bending moment induced in said wire.

4,000,802
TYPE BAR ACTUATING MECHANISM

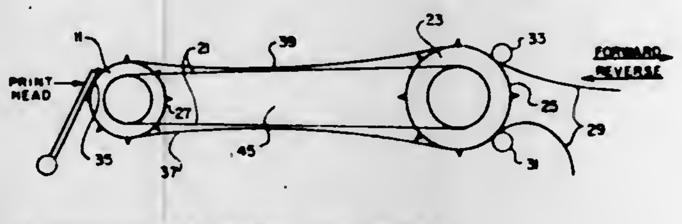
James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.
Filed Apr. 21, 1975, Ser. No. 570,168
Int. Cl.² B41J *7/00*
U.S. Cl. 197—27 **2 Claims**



1. A type bar actuating mechanism for a typewriter of the class having a base, a keyboard with plunger-type keys, a plurality of type bar levers actuatable by means of cords, and a stem extending downwardly toward the base from each key and movable downwardly toward the base by depressing the key, including guide means for each stem carried by the base, the stems being slidably interengaged with the guide means, and anchoring means carried by the base at a position farther from the type lever than is the guide means, characterized by a cord attached to each type bar lever and extending beneath but in rubbing contact with the bottom of one of the stems and extending therebeyond to the anchoring means and attached to the anchoring means, a wall upstanding from the base at a position between the guide means and the type lever and against and over which the cords are pulled by the stems when the stems are depressed by the keys, the guide means comprising a tubular boss extending upwardly from the base in alignment with each stem to a position higher than the cord and in which the stem is slidable, each boss having vertically slotted portions through which one of said cords extends and in which the cord is vertically movable.

4,000,803
VACUUM-BUFFERED BIDIRECTIONAL PAPER DRIVE SYSTEM

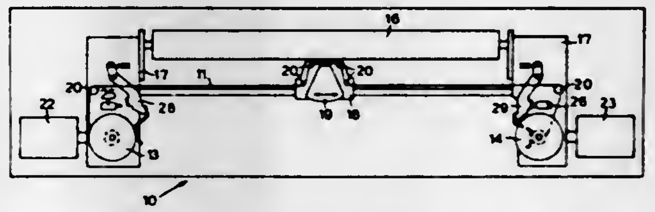
Rick A. Warp, San Diego; John L. Morton, Jr., Escondido, and Majid Azmoon, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 21, 1976, Ser. No. 650,839
Int. Cl.² B65H *23/24*; B65J *15/00*
U.S. Cl. 197—133 R **12 Claims**



1. A web driving system comprising:
- platen means having at least end portions which are rotatable about a common axis and which are disposed to receive a web to be driven with substantial wrap thereabout;
- roller means disposed to rotate about an axis which is spaced from, and which is parallel to, and coplanar with, said common axis for receiving and delivering a web which is wrapped about the platen means and which contacts said roller means on substantially oppositely disposed portions of the circumference of said roller means;
- drive means coupled to said end portions and to said roller means for selective rotation thereof at identical surface velocities;
- a pair of boundary means laterally disposed adjacent opposite ends of the roller means and said end portions to traverse the spacing therebetween for forming boundaries of a chamber; and
- means cooperating with the chamber formed by said pair of boundary means, said platen means, and said roller means and by a web being driven thereby, for producing a fluid pressure differential within said chamber relative to ambient fluid pressure for maintaining tension in said web about said platen means and between said platen means and roller means.

4,000,804
ARRANGEMENT FOR TRANSFERRING A RIBBON FROM A FEED SPOOL TO A TAKE-UP SPOOL

Adriano Zaltieri, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Feb. 6, 1976, Ser. No. 655,645
Claims priority, application Italy, Feb. 10, 1975, 67342/75
Int. Cl.² B41J *33/34*, *33/512*; H02P *7/68*
U.S. Cl. 197—151 **15 Claims**



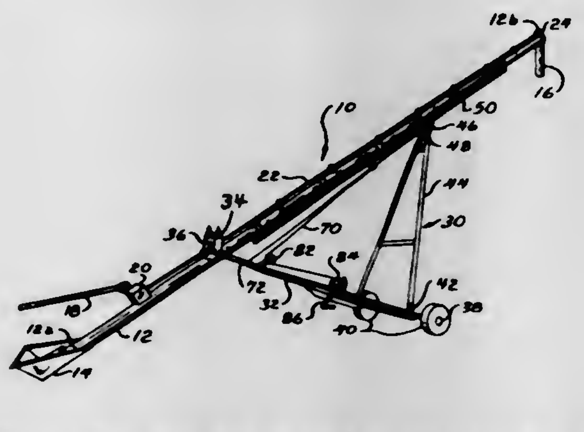
1. An arrangement for transferring a ribbon from a feed spool to a take-up spool comprising a first and a second direct current electric motors connected to said feed spool and to said take-up spool, respectively, for effecting the rotation thereof, and means for both causing one of the two motors to wind-up said ribbon with a minimum torque and said ribbon to be kept taut during the transferring thereof, said means comprising a constant voltage generator supplying the other of the two motors and a constant current generator supplying said one motor.

4,000,805
SAFETY STOP FOR PORTABLE AUGERS AND LIKE ELEVATING MACHINERY

Howard Hadler, Kewanee, Ill., assignor to Chromalloy American Corporation, St. Louis, Mo.
Filed June 6, 1975, Ser. No. 584,505
Int. Cl.² B65G *41/00*
U.S. Cl. 198—320 **11 Claims**

1. In portable crop and materials handling machinery, an inclinable conveyor having a feed end and a discharge end, a track along the underside of the conveyor between said feed and discharge ends having abutments and intervening spaces along the length thereof, a mobile triangular support for said inclinable conveyor having first and second relatively long frames hinged together adjacent their lower ends, the upper end of the first frame being connected to the inclinable conveyor near its feed end and the upper end of the second frame being connected to a carriage movable along said track be-

tween the conveyor discharge end and said connected end of the first frame to vary the separation of the upper ends of the two frames and thereby the altitude of the discharge end of the inclinable conveyor, cable means connected between the carriage and the upper end of the first frame, and a winch carried by one frame on which the cable means is wound and unwound against the resisting weight of the inclinable conveyor tending to separate the two frames so as to maintain pulling tension between the two frames and thereby maintain the altitude of the conveyor discharge end, said machinery including normally inactive latent means in combination therewith which upon failure or sudden loss of tension of the cable means between the frames is automatically activated to stop descent of the conveyor discharge end and total collapse of the conveyor, said latent means comprising a latch rotatably connected intermediate its ends to the carriage, the end of the latch toward the conveyor discharge end being movable on said rotatable connection into said intervening spaces between the abutments of the track, means on the latch to the opposite side of its rotatable connection to the carriage against which the pull of the cable means is continuously directed in the normal elevating and lowering of the conveyor to hold said latch end out of said intervening spaces of the track, and spring means on the carriage which bias said latch end in the direction of the track to locate said latch end within an adjacent one of the intervening spaces when the pull of the cable means on the latch is interrupted to engage the next abutment closer to the conveyor discharge end and as the conveyor starts to fall whereby to halt further fall and total collapse of the conveyor.



4,000,806

APPARATUS FOR DESTACKING A SUBSTANTIALLY SPIRAL-SHAPED FORMED STACK OF PRINTED PRODUCTS

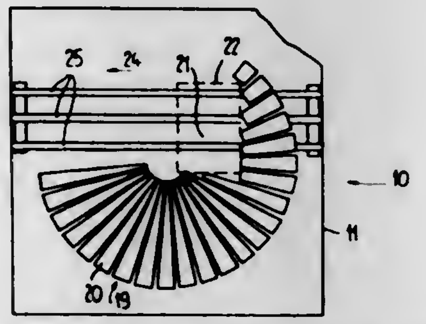
Felix Dietrich, Uster, and Werner Honegger, Ruti, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 16, 1975, Ser. No. 578,040

Claims priority, application Switzerland, May 28, 1974, 7236/74

Int. Cl.² B65G *59/00*

U.S. Cl. 198—443 **9 Claims**



1. An apparatus for destacking a stack of printed products in a substantially spiral-shaped configuration comprising successive contiguous coils of printed products, each coil having neighboring printed products partially overlapping one another, comprising stack support means including support surface means located substantially in a single plane for receiving the spiral-shaped configuration of printed products, said stack support means being provided with a stationary throughpassage opening, rotational drive means for placing into rotation the spiral-shaped configuration of printed products which are supported upon the stack support means about the lengthwise axis of the spiral and for successively feeding the coils from the stack beginning with the lowermost coil from the bottom end of the stack through the stationary throughpassage opening, and outfeed conveyor means arranged subsequently of said stationary throughpassage opening.

4,000,807

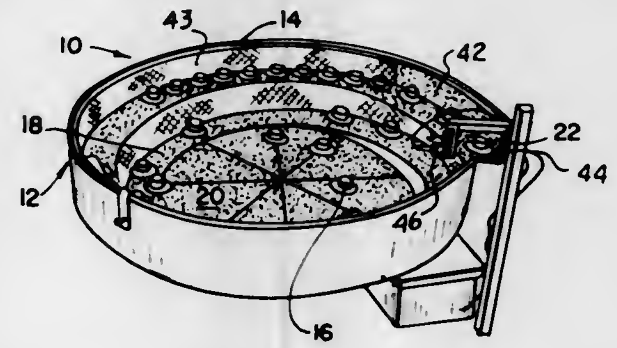
VIBRATORY TROUGH PART FEEDER

Robert S. Molique, Dayton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed May 21, 1975, Ser. No. 579,747

Int. Cl.² B65G *27/00*

U.S. Cl. 198—443 **6 Claims**



1. In a vibratory bowl feeder of the type having a bowl and a spiral trough extending about the periphery of said bowl receiving parts contained in said bowl at a central location and feeding the same to an outlet point, the improvement comprising:

an inclined fiber material disposed along the bottom of said spiral trough with said inclined fiber material oriented with said fibers inclined in the direction of said spiral trough for at least a portion of said spiral trough and wherein said inclined fiber material disposed in said spiral trough includes a segment in a portion of said trough approaching said outlet wherein said segment fibers are inclined towards a wall of said spiral trough to thereby reduce the rate of movement of said parts on said segment, and wherein said inclined fiber material disposed in said spiral trough in a region following said segment and proximate said outlet is disposed with said fibers inclined along the direction of said spiral trough, whereby said parts are separated proximate said outlet by the resulting differing rates of movement of said parts.

4,000,808

DEVICE FOR LOWERING BULK MATERIALS

Jacques Pradon, 19 Avenue des Tourelles, Saint-Maur-des-Fosses, France

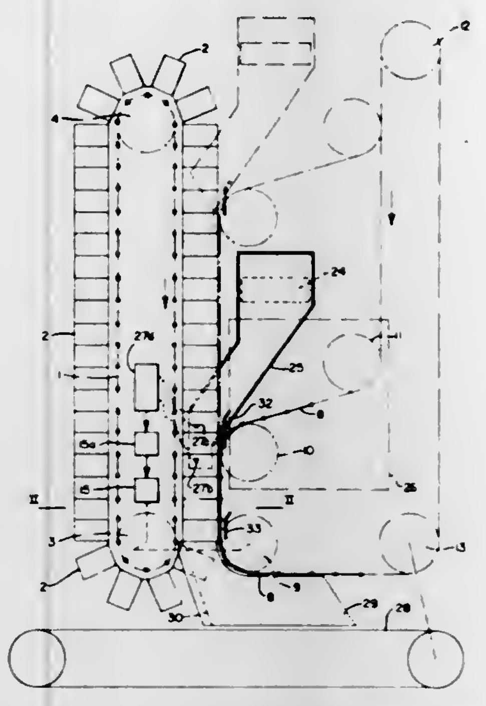
Continuation-in-part of Ser. No. 474,080, May 28, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,320

Claims priority, application France, June 6, 1973, 73.20561

Int. Cl.² B65G *43/08*

U.S. Cl. 198—572 **9 Claims**

1. A device for continuously lowering a supply of bulk material from an upper level and for removal by a discharge conveyor at a lower level, comprising an endless moving conveyor, a vertical rectilinear descending portion for said endless moving conveyor, said endless moving conveyor forming in said descending portion an open channel, rigid sides forming said channel, means for closing said channel in said descending portion between the upper level and the lower level, said means defining with said endless moving conveyor between the two levels a closed chimney having rigid descending walls, means for regulating the speed of movement of said endless moving conveyor as a function of the height of material in said chimney to maintain an upper level of material in said chimney at a constant level when said discharge conveyor receives material from said chimney and means for regulating the speed of movement of said discharge conveyor at a constant ratio to that of said endless moving conveyor whereby the flow from said discharge conveyor is equal to the flow from said endless moving conveyor when said chimney is filled with material.



4,000,809

TUBULAR BELT CONVEYOR

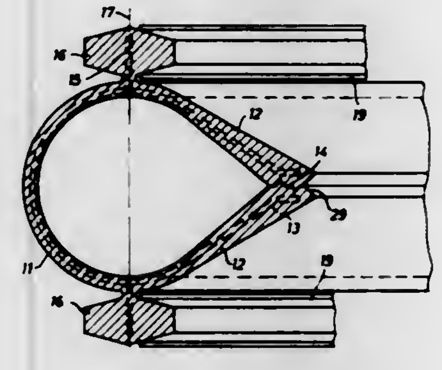
Bo Nils Konrad Lenntoft, Loddekopinge, Sweden, assignor to Sintab Swedinventor AB, Malmo, Sweden

Filed Dec. 10, 1974, Ser. No. 531,672

Claims priority, application Sweden, Dec. 11, 1973, 7316679

Int. Cl.² B65G *15/08*

U.S. Cl. 198—819 **8 Claims**



1. A tubular belt conveyor comprising a plurality of pulleys, an endless conveyor belt running over the pulleys and which is formed to a tubular profile and the longitudinal edges of which converge substantially rectilinearly to one another on the inner run of the endless loop formed by the conveyor belt and are applicable against one another at the longitudinal conveyor belt edges, wherein the conveyor belt is provided with spring clip means to elastically yieldingly load the longitudinal conveyor belt edges into abutting relationship and in which beads having the shape of V-belts are disposed on the sides of the tubular profile to establish engagement of the conveyor belt with the pulleys.

4,000,810

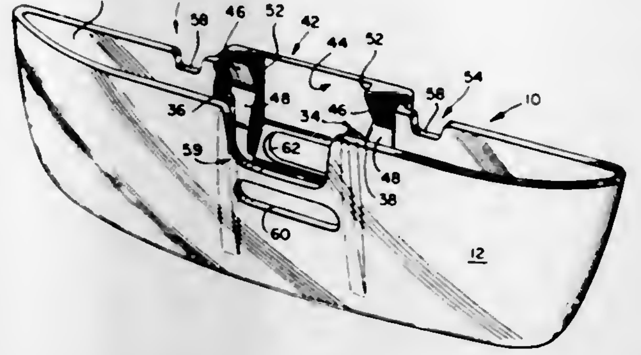
CASE FOR CLIP-ON SUNGLASSES

Conrad L. Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Oct. 3, 1975, Ser. No. 619,430

Int. Cl.² A45C *11/04*

U.S. Cl. 206—5 **7 Claims**



1. A molded rigid plastic case for clip-on sunglasses, said sunglasses including a pair of lenses with front and rear viewing surfaces and a centrally located clip means supporting said lenses for attachment to an optical eyeglass frame, said case comprising:

a substantially pouch shaped one-piece open topped rigid plastic container body for receiving and protectively enclosing the lenses and clip means of the clip-on sunglasses, said body having joined front and rear rigid plastic contoured wall portions such that no portion thereof contacts either the front or rear viewing surfaces of said lenses when said clip-on sunglasses are properly contained in said body;

opposed clip means engaging portions centrally located and inwardly facing on said front and rear wall portions of said body including rib means extending inwardly toward the interior of the case from one of said front and rear wall portions and opposing said rib means on the other of said wall portions, a recess for receiving and engaging a portion of the clip structure, said rib means and recess being spaced apart a distance such as to frictionally hold said clip structure firmly therebetween and serving as a combined means for positively preventing the contact of the front and rear viewing surfaces of the lenses with said front and rear rigid plastic wall portions of said body and to prevent the inadvertent slippage of said clip-on sunglasses from their properly held position in said case.

4,000,811

SHIPPING-DISPLAY CONTAINER

Jerry C. Hardison, Dallas, and Laverne E. Gray, Irving, both of Tex., assignors to Lone Star Container Sales Corporation, Dallas, Tex.

Filed Mar. 12, 1975, Ser. No. 557,528

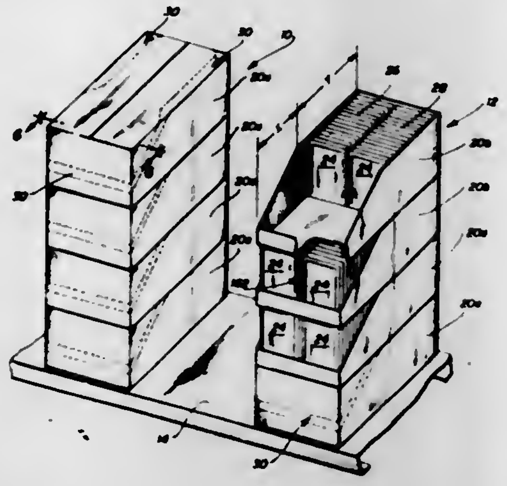
Int. Cl.² B65D *5/54, 5/48*

U.S. Cl. 206—44 R **25 Claims**

11. A device for use in shipping, display and dispensing of a plurality of articles, said device comprising:

front, rear and two side walls of sheet material, flaps extending from said front, rear and side walls forming top and bottom walls, said top, bottom, front, rear, and side walls forming a shipping container for shipping said articles; and

tear strip means formed in said container for removing the top wall, and a portion of the front and of each of the side walls, whereby a portion of said shipping container may be removed to convert said container into a display tray having front, rear, bottom and side walls and wherein said articles are visual and can be removed when said tray is positioned with said bottom wall facing downward and said rear wall facing away from the viewing position, said tear strip means formed by spaced weakened tear lines formed in each of said side wall top flaps, each of said side walls and said front wall, one of said tear lines in each of said side walls top flaps extending along at least a portion of the line between said side wall and said side wall top flap, the other of said tear lines in each side wall top flaps being spaced from said one tear line in said side wall top flap, said two spaced tear lines in each of said side walls

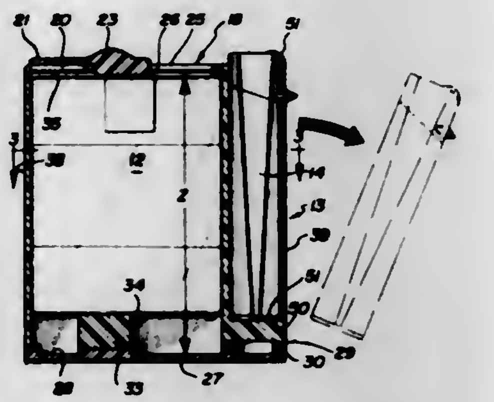


extending from the line separating said side wall and said side wall top flap to the line separating said side wall and said front wall, each of said tear lines in said side walls intersecting one of said tear lines in said side wall top flap, and said two spaced tear lines in said front wall extending between the lines separating said side walls and said front wall, each of said tear lines in said front wall intersecting one of said tear lines in each of said side walls.

4,000,812
CADDY FOR CIGARETTES AND THE LIKE

Arthur J. Pisarski, and Margaret Pisarski, both of c/o MACH II, Oak and Astor Sts., Monee, Ill. 60449

Filed Aug. 20, 1975, Ser. No. 606,169
Int. Cl.² A24F *15/10*
U.S. Cl. 206—87 **7 Claims**

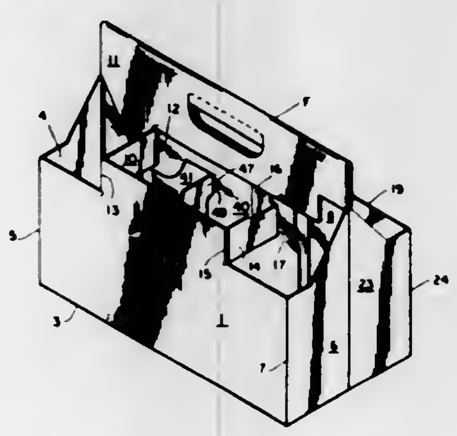


1. A caddy for carrying a package of cigarettes or the like having a predetermined outer size and shape and a cigarette lighter of predetermined outer size and shape, comprising, in combination, an enclosed cigarette package housing having an inner cross sectional area of relatively large length and relatively small width adapted to snugly accommodate the corresponding cross sectional area of a cigarette package, and having a depth sufficient to accommodate the corresponding depth of a cigarette package of extended length, a housing top formed with a hole shaped and located to be superimposed over a standard cigarette package hole, a movable cover carried by the caddy for covering and uncovering the housing top hole, an actuator surface on the cover oriented and adapted for engagement and cover actuation by a digit of a hand holding the caddy, a movable bottom carried by the housing for covering and uncovering the housing bottom to permit a cigarette package to be inserted into or withdrawn from the caddy, a pincer retainer integral with and located at one of the two opposed small housing sides, the retainer including at least two spaced apart resilient pincer arms extending toward one another and having inner surfaces for accommodating and resiliently retaining a cigarette lighter of predetermined shape and size on and in the caddy in a position to permit ignitive operation of the lighter by a digit of the hand holding the caddy fixed retainer bottom means integral with and extending laterally from said one housing side beneath said pincer arms and complementary interconnecting means on said movable bottom and said fixed bottom means for connecting said movable bottom with said housing, wherein said interconnecting means comprises mating, pivotable, detachable surfaces, the surfaces being located at a point below the caddy pincer arms to permit the movable bottom to be pivoted completely out of the way of the caddy cigarette package housing interior.

4,000,813
ARTICLE CARRIER

James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 7, 1975, Ser. No. 629,711
Int. Cl.² B65D *75/00*
U.S. Cl. 206—187 **8 Claims**



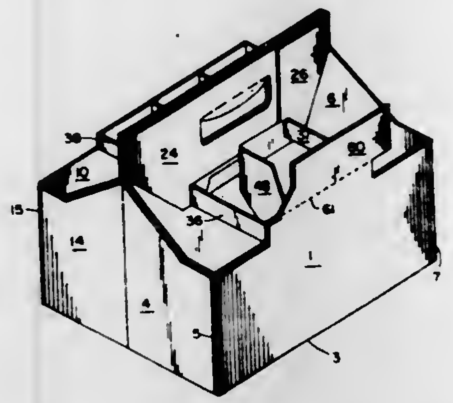
1. An article carrier comprising a bottom panel, side walls foldably joined to the side edges of said bottom panel, end wall panels foldably joined to the end edges of said side walls, riser panels foldably joined to said end wall panels at one end of the carrier and extending medially inward of the carrier, medial partition structure foldably joined to the end wall panels at the other end of the carrier and extending medially inward of the carrier, a pair of outer handle panels secured at one end thereof to the upwardly extending portions of said riser panels and at the other end thereof to the upwardly extending portion of said medial partition structure, a pair of reinforcing panels foldably joined to said outer handle panels along at least one offset fold line which is spaced from an end edge of said outer handle panels and parallel thereto, at least one anchoring tab secured to said medial partition structure, and a partition strip foldably joined at one end thereof to one of said side walls and at the other end to said anchoring tab along a tab fold line which is spaced longitudinally from the offset fold line between said reinforcing panels and said outer handle panels by a distance which is less than the length of said partition strip.

4,000,814
ARTICLE CARRIER

James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 17, 1975, Ser. No. 632,362
Int. Cl.² B65D *75/54, 85/00*
U.S. Cl. 206—187 **3 Claims**

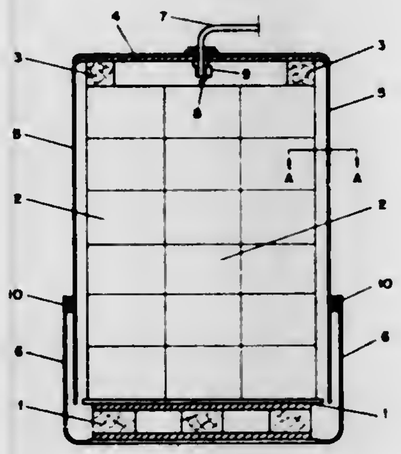
1. An article carrier comprising a bottom wall, side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, a multiple ply handle comprising at least one pair of handle panels, medial partition structure including a pair of medial panels foldably joined respectively to said end wall panels at one end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, riser panels foldably joined respectively to said end wall panels at the other end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, an anchoring flap secured to one of said side walls, an anchoring tab secured to said medial partition structure on one side of said handle, a transverse partition panel foldably joined at one end thereof to said anchoring flap and at the other end thereof to said anchoring tab, a twist interconnecting said anchoring tab and one of said handle panels, a promotional tab foldably joined to the top edge of the other of said side walls, and said side walls respectively comprising high center portions, said promotional tab being foldably joined to the high center portion of said other side wall.



4,000,815
DEVICE FOR STORAGE AND TRANSPORT OF TEMPERATURE SENSITIVE GOODS

Torgny Wingbro, Hisingsbacka; Jan Hjalmarsson, Molndal, and Per August Pettersson, Sodertalje, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Jan. 28, 1976, Ser. No. 653,124
Claims priority, application Sweden, Jan. 28, 1975, 7500863
Int. Cl.² B65D *81/24*
U.S. Cl. 206—205 **8 Claims**

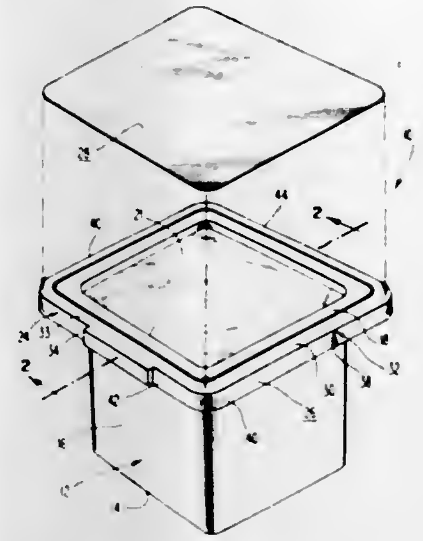


1. Apparatus for storage and transport of temperature sensitive goods, comprising a load carrier pallet for supporting the goods, an upper insulating cover for covering the goods and the upper edge of said pallet, means in said upper cover for supplying a gaseous cooling medium to the interior thereof to control the temperature therein, a lower cover enclosing said pallet and the lower part of said upper cover, means fastening said lower cover to said upper cover, and a sealing member between the facing surfaces of said upper and lower covers, whereby a blocking gas layer of cooling medium is maintainable around the goods.

4,000,816
MOISTURE IMPERVIOUS PACKAGING SYSTEMS

Harry Spruyt, New York, N.Y., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 4, 1976, Ser. No. 663,910
Int. Cl.² B65D *5/54*
U.S. Cl. 206—498 **11 Claims**

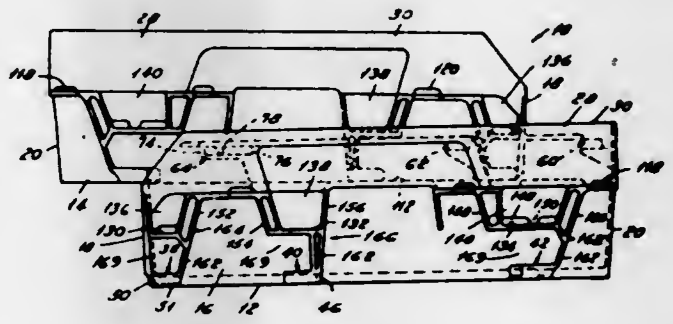


1. A moisture impervious packaging system comprising:
A. a container body having a bottom wall and peripheral walls extending upwardly from the bottom wall and terminating in an upper surface which defines an access opening into an interior compartment of the body; and
B. a closure lid hingedly connected to said container body and including a peripheral frame member and a flexible, moisture impervious sheet, said peripheral frame member disposed exteriorly of the container body and circumscribing the access opening into the interior compartment thereof for providing side margins of said closure lid, said moisture impervious sheet being disposed over the access opening into the container body and being adhered to the upper surface of the container body to provide a moisture impervious seal over the access opening into said body, and being adhered to said frame member to provide a top wall of the closure lid.

4,000,817
THREE LEVEL STACKING CONTAINER

Ellsworth E. Sanders, Sanibel Island, Fla., and Elsmer W. Kreeger, Pontiac, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed May 8, 1974, Ser. No. 467,851
Int. Cl.² B65D *21/04*, **A47F** *1/14*
U.S. Cl. 206—505 **20 Claims**



1. A stacking container comprising a generally rectangular bottom wall, first and second side walls extending upwardly in diverging relation from opposite sides of said bottom wall, stacking means for supporting said container in stacking relation upon a lower container of identical construction at at least two different levels, said stacking means comprises spaced feet on each side wall, said stacking means also comprising a first set of spaced saddles on each side wall and a

second set of spaced saddles on each side wall at a different level than the first set of saddles, the spacing of the saddles of the first set on said first and second side walls corresponding respectively to the spacing of the feet on said second and first side walls, the spacing of the saddles of the second set on said first and second side walls corresponding respectively to the spacing of the feet on the second and first side walls, whereby said feet are adapted to rest upon the saddles of said first set or upon the saddles of said second set of a lower container of identical construction when turned end for end with respect thereto to support said container in stacked relation thereon at either of two different levels.

4,000,818

ARRANGEMENT PERMITTING OF A STORAGE AND REMOVAL OF PROFILED MEMBERS

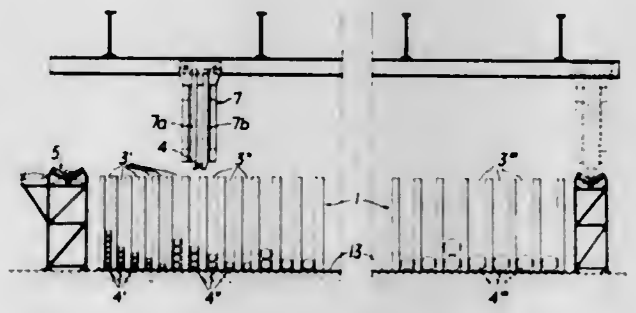
Peter-Jens Schmid, and Viktor Lattmanig, both of Vienna, Austria, assignors to Peter-Jens Schmid, Vienna, Austria

Filed Mar. 13, 1975, Ser. No. 557,937

Claims priority, application Austria, Mar. 13, 1974, 2112/74; Mar. 13, 1974, 2111/74

Int. Cl.² B65G *59/04*

U.S. Cl. 214—1 P **3 Claims**



1. An arrangement permitting of a storage and removal of profiled members, comprising a multiplicity of blocks provided with means for storing said members in vertical rows, each of said blocks being provided with means which form vertical comb tooth spaces, said blocks comprising a base and uprights which protrude upwardly from said base and which are aligned to form at least two spaced apart rows, in which each of said comb tooth spaces is defined by two of said uprights, each comb tooth space in each of said rows being aligned with a comb tooth space of another row so that profiled members can be stored in both said comb tooth spaces, the width of said aligned comb tooth spaces being substantially as large as the width of the profiled members to be stored therein so that the same are constrained to follow a linear path in each row of aligned comb tooth spaces, release means in each of said comb tooth spaces to prevent the downward movement of the profiled members along said linear path and operable to release a lowermost one of the profiled members while retaining succeeding profiled members, exit means disposed under each comb tooth space in line with said linear path and including driven rollers which are rotatable about an axis which is transverse to the longitudinal direction of said members for carrying off members in their longitudinal direction upon release thereof by said release means, and brushes protruding from the sides of said uprights into the comb tooth spaces to brake the profiled members as they fall along said linear path.

4,000,819

CONTROL ARM FOR A POWER MANIPULATOR

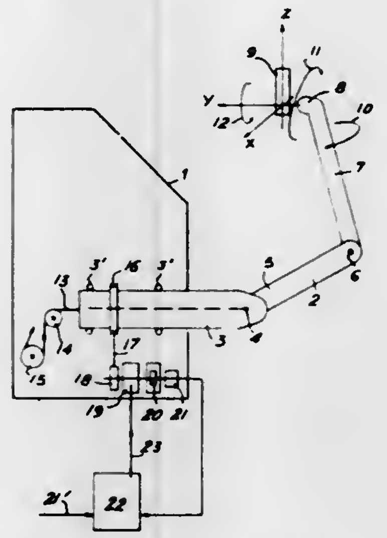
Jean-Claude Germond, Paris; Théodore Le Mouee, Nantes; Paul Marchal, Gif-sur-Yvette; Michel Petit, La Celle St-Cloud, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 20, 1976, Ser. No. 650,657

Claims priority, application France, Jan. 20, 1975, 75.01692

Int. Cl.² B25J *3/04*

U.S. Cl. 214—1 CM **9 Claims**



1. A control arm for a remotely operated power manipulator, comprising an assembly for carrying out a number of movements and position detectors for each movement, wherein the number of possible movements of the control arm is equal to the number of possible movements of the manipulator, wherein the motion-control operations can be interrupted at will and wherein at least one of the portions of the arm is provided with means for interlocking said portion with respect to another portion of the arm independently of the other movements as each position of the manipulator and of the arm are brought into complete concordance, said means for interlocking being releasable when complete concordance is obtained.

4,000,820

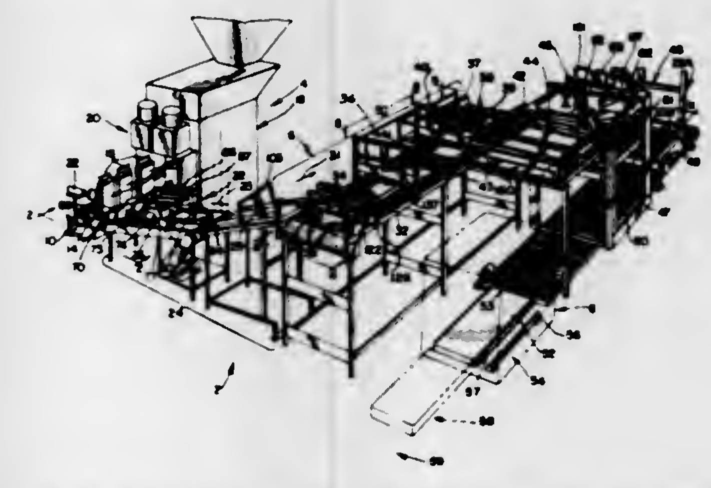
METHOD AND APPARATUS FOR ASSEMBLING LAYERS OF PACKAGES ON A PALLET

Kenneth G. Kurk, and Robert S. Kilbride, both of Quincy, Ill., assignors to Moorman Manufacturing Company, Quincy, Ill.

Division of Ser. No. 249,419, May 1, 1972, Pat. No. 3,827,577, which is a division of Ser. No. 89,658, Nov. 16, 1970, Pat. No. 3,700,127. This application Jan. 21, 1974, Ser. No. 434,807

Int. Cl.² B65G *57/10*

U.S. Cl. 214—6 DK **2 Claims**



1. In an automatic palletizer for assembling layers of elongated packages on a pallet with each package in each layer arranged in a predetermined pattern, said palletizer being of the type which includes a shuttle plate on which said layers are formed, means for moving said shuttle plate over a pallet and means for wiping said layer off of said shuttle plate to deposit said layer over said pallet as said shuttle plate is retracted, each layer on said shuttle plate including two packages arranged end to end in abutting relationship and a plurality of other packages arranged side by side, the longitudinal extent of said two packages abutting each other end to end being less than the lateral extent of said other packages arranged side by side, the improvement comprising separating means for separating said two abutting packages, said separating means being operatively positioned above said pallet and arranged to be lowered into contact with said two abutting packages forming part of one layer at the point of their abutment for separating the abutting ends of said packages while said one layer is wiped off of said shuttle plate and deposited over said pallet whereby the outer ends of said packages arranged end to end on said pallet will be in line with the outer facing sides, respectively, of the outer two packages of said other packages arranged side by side on said pallet.

4,000,821

APPARATUS FOR STORING UNSTACKING AND DELIVERING ARTICLES

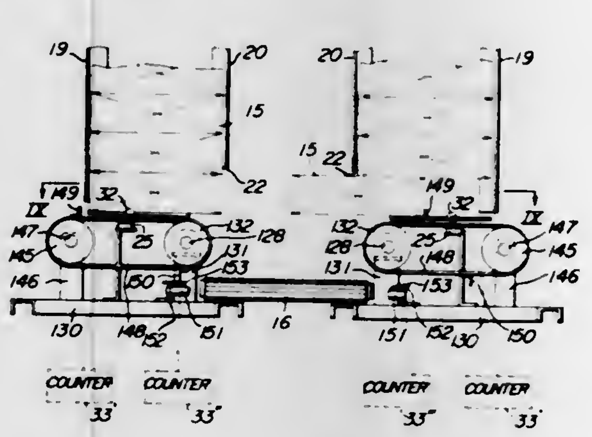
Han-Ichiro Naito; Tsuneo Yamaguchi, both of Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompack Company Ltd., Tokyo, Japan

Continuation of Ser. No. 258,179, May 31, 1972, abandoned. This application July 11, 1975, Ser. No. 595,164

Claims priority, application Japan, June 3, 1971, 46-38936; Oct. 1, 1971, 46-77002

Int. Cl.² B65G *59/00, 47/00*

U.S. Cl. 214—8.5 F **2 Claims**



1. An apparatus for storing and delivering articles, said apparatus comprising (1) storage means divided longitudinally into a plurality of storage compartments each adapted for accommodating a plurality of articles in substantially vertically stacked array and each having an upper portion provided with an article supply opening and a lower portion provided with an article delivery opening wherethrough articles may be delivered sequentially and laterally from the lowermost one of a stack of articles; (2) delivery means provided at each article delivery opening for delivering one article therethrough at a time, said delivering means including (i) a flexible and movable-in-place endless member in the form of an extended, generally horizontally disposed loop, said loop having one end and another end and arranged such that at least one end thereof is located below the storage compartment with which the particular article delivery opening is associated, and (ii) a plurality of extruding members in peripherally spaced relation on the outer surface of said endless member for successively extruding articles through said delivery opening as said endless member is moved; (3) a rotatably shaft member extending longitudinally of said storage means and disposed to have a driving means connected to it whereby it may be rotated; (4) clutch means on said shaft associated with each of said delivery means whereby said rotatable shaft may be engaged with said delivery means to drive all as well as a plurality of or any single one of the endless members thereof selectively; (5)switching means associated with each of said clutch means for controlling the operation thereof disposed to be engaged by said extruding members successively for the delivery means at each article delivery opening, and (6) conveyor means extending longitudinally of said storage means and having one edge and another edge with said edge located below the delivery openings of said storage compartments, said conveyor means being disposed to receive articles delivered from said delivery openings by the delivery means associated therewith and convey those articles to a desired position

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4,000,822

RECLAIMER TO RECLAIM BLENDING BEDS, STORAGE BEDS AND THE LIKE

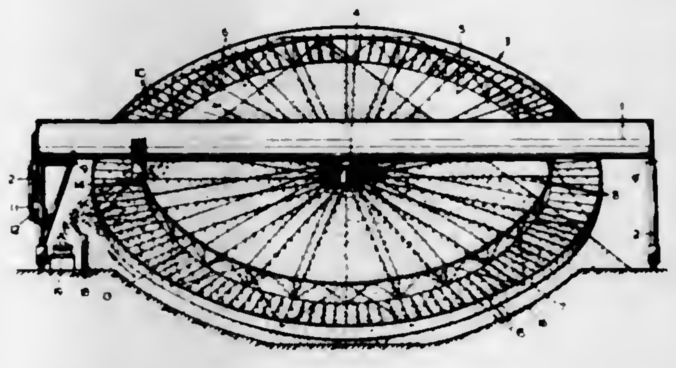
Johann A. Raabe, Badhoevedorp, Netherlands, assignor to International Handling B.V., Amsterdam, Netherlands

Filed Apr. 23, 1975, Ser. No. 570,643

Claims priority, application Netherlands, May 2, 1974, 7405913

Int. Cl.² B65G *61/00*

U.S. Cl. 214—10 **14 Claims**



1. An apparatus for reclaiming blending beds, storage beds and the like, comprising a movable bridge and unitary means for reclaiming material from a bed and discharging the reclaimed material to one side of the bridge, wherein the unitary means consists of a rotatable disc mounted to the bridge and having an axis of rotation the horizontal projection of which is substantially parallel to the direction of movement of the bridge, said rotatable disc being provided with teeth arranged in a pattern and protruding from the plane of the disc for loosening material from a face of the bed, and with an outer ring which projects from the plane of the disc so as to form a surface for collecting the loosened material and moving said material side-ways to one side of the bridge.

4,000,823

COMPACT CRANE

Joseph Aquila, 144-41 231 St., Rosedale, N.Y. 11422

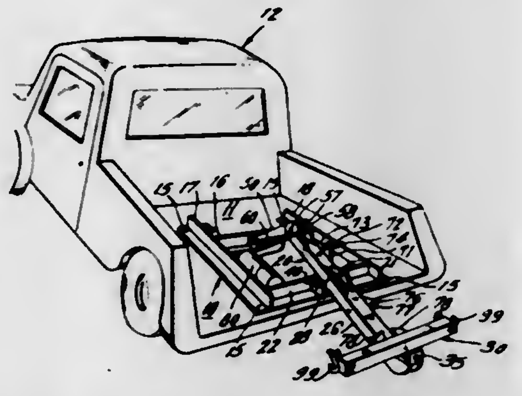
Filed Jan. 31, 1975, Ser. No. 545,930

Int. Cl.² B60D *3/12*

U.S. Cl. 214—86 A **3 Claims**

1. A crane including an elongated boom means; main pivot means supporting said boom means at a point intermediate its front and rear ends; tow bar means mounted to the boom means at said rear end; power operating means connected to said boom means at said front end for moving said front end downward and frontward in a working stroke to raise said tow bar means and a load connected thereto, said power operating means including a fluid operated power device having an extendable operating arm which is retracted in said working stroke; a base having said main pivot means at the rear thereof and said power operating means at the front of said base; said boom means including a front section and a rear section connected to said front section in the vicinity of said main pivot means; said rear section being pivotably movable with respect to said front section between an operating position wherein said tow bar means is below and rearward of said main pivot

means and a storage position wherein said tow bar means is positioned in front of and above said main pivot means; quick release retaining means to hold said rear section in said retracted position; a safety means pivotally mounted to said rear of said base and, when in a holding position, operatively engageable with said front section of said boom means to limit lowering of said tow bar means when a load is connected thereto.



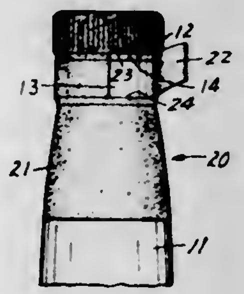
4,000,824
TAPE CLOSURES

Hak Rhim Han, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 24, 1975, Ser. No. 598,820

Int. Cl.^{2} B65D *41/24*

U.S. Cl. 215—232 **6 Claims**



1. In a secondary closure of the type in which a pressure-sensitive adhesive-coated heat-shrunken polymeric film is wrapped around and snugly conformed to the peripheral contours of a primarily sealed container, along and immediately adjoining both sides of the line of primary closure, a tear strip interposed between the film and the container so as to abut or overlie the line of closure, removal of said tear strip serving to rupture the film when it is desired to open the closed container,

the improvement which comprises the film being predominantly longitudinally oriented and formed from a copolymer selected from a class consisting of semi-rigid acrylonitrile:methylacrylate copolymer and semi-rigid styrene:butadiene copolymer,

whereby the tape seal presents a smooth, uniform appearance and removal of the tear strip tears the film along two substantially straight parallel lines, enhancing the appearance of the container in both closed and opened condition.

4,000,825
PRESS-ON TWIST-OFF INFESTATION-PROOF CLOSURE FOR OXYGEN SENSITIVE PRODUCTS

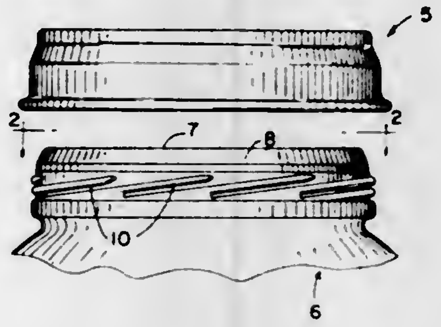
James E. Westfall, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 22, 1974, Ser. No. 472,137

Int. Cl.^{2} B65D *41/04*

U.S. Cl. 215—318 **1 Claim**

1. In a press-on turn-off gasket closure cap of the combination top and side seal type for use in establishing and maintaining a hermetic seal on a glass container of the type in which the upper edge of the rim together with a frusto-conical portion of the side surface thereof provide the hermetic sealing finish and the outer surface of the container neck below said frusto-conical finish has a series of thread formations arranged in a circumferential band therearound, said cap comprising (1) a generally cup-shaped integral shell having a top panel portion having an annular margin which provides a gasketed down-turned channel formation registrable with said upper edge finish and having a stepped skirt portion with the upper inner step thereof being gasketed and depending from the outer wall of said channel formation as a continuation thereof and providing a downwardly and outwardly flared frusto-conical skirt portion embracingly registrable with said frusto-conical finish portion and having an inclination steeper than that of said frusto-conical finish portion and the bottom of which frusto-conical skirt portion joins an outwardly flared shoulder portion the bottom outer periphery of which joins the top of a lower outer cylindrical step terminating at the bottom in a bead, and (2) an upper annular sealing gasket formed of a solid plastisol located generally within the circumferential corner portion of said shell formed by said annular margin and said upper inner step of said stepped skirt portion having its upper and radially inner portion located on the underside of said top panel portion and extending inwardly to at least adjacent the bottom of the inner side wall of said channel formation and with its lower radially outer portion terminating adjacent the bottom of said frusto-conical skirt portion, with said upper annular sealing gasket filling said channel formation and having a downwardly and outwardly tapered gasket portion lining said frusto-conical skirt portion and diminishing radially outwardly in horizontal cross-section below said channel formation, said tapered gasket portion being at least several times longer in a vertical direction than the depth of said channel formation, said channel-filling upper gasket portion sealingly engaging said upper edge finish of a container when said closure cap is hermetically sealed thereon with at least the lower part of said tapered gasket portion being appreciably thinned out by compressed sealing engagement between said frusto-conical finish portion and said frusto-conical skirt portion, the improvement in said closure cap, comprising, a lower generally cylindrical gasket formed of a puffed plastisol capable of taking a cold flow set lining said lower outer cylindrical step and compressingly embracing said series of thread formations of said container neck after being pushed downwardly thereover so as to take a set with respect thereto whereby said closure cap may be removed by rotation with respect to said container.



4,000,826
CRYOGENIC TRANSPORT

Thelmer A. Rogers, P.O. Drawer 1589, Lubbock, Tex. 79408

Filed Oct. 17, 1975, Ser. No. 623,378

Int. Cl.^{2} F17C *1/12*

U.S. Cl. 220—3 **6 Claims**

1. An insulated tank for transporting cryogenic fluids comprising:

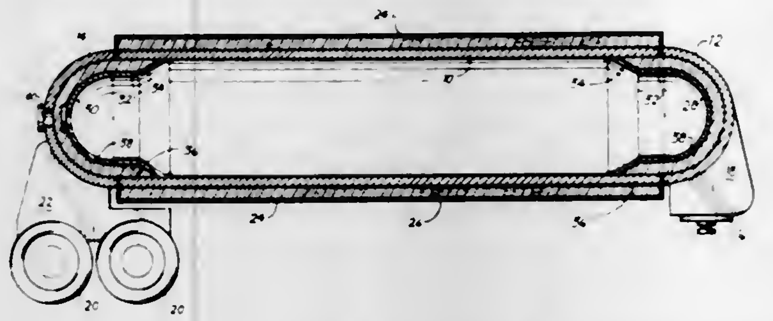
a. a cylindrical support and pressure shell with

b. a support head attached by structure and sealing weld at each end,

c. support structure on each head for mounting said tank for transportation,

d. an outer insulating shell over and spaced from the cylindrical support and pressure shell, and

e. an inner insulating head within and spaced from each support head,



f. the outer insulating shell sealed to the structural and pressure shell to provide an insulation space therebetween, and

g. each of the inner insulating heads sealed to the structural shell to provide insulation spaces between the structural and insulation heads.

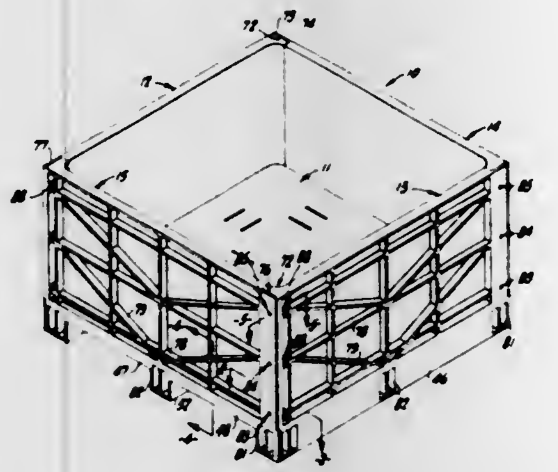
4,000,827
PRODUCE CONTAINER

Anthony Emery, 448 Scenic Ave., San Anselmo, Calif. 94960

Filed Jan. 9, 1976, Ser. No. 647,897

Int. Cl.^{2} B65D *7/00, 9/12;* B65J *1/02*

U.S. Cl. 220—4 F **13 Claims**



1. A produce container comprising the combination of a rectangular planar base, means forming corner mortises on the corners of the base, four planar side panels mounted in upstanding relationship about the periphery of the base to define an upwardly open enclosure, means forming partial tenons projecting from opposite lower corners of each panel, with each partial tenon cooperating with a partial tenon of an adjacent panel to define a corner tenon which interengages with a respective corner mortise of the base, ledge means along the inner lower margin of each panel for supporting the side margins of the base, means forming a vertically elongate side mortise along one edge of each panel, means forming a vertically elongate side tenon along the opposite edge of each panel with the side tenon of each panel interfitting into the side mortise of an adjacent panel at a respective corner of the container, and fastener means for securing together the interfitting side tenons and mortises whereby the base is captured between the side panels.

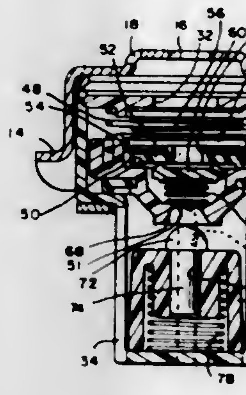
4,000,828
GAS TANK CAP WITH ROLL-OVER VALVING

Billy G. Crute, and John H. Evans, both of Connersville, Ind., assignors to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed June 2, 1975, Ser. No. 582,649

Int. Cl.^{2} B65D *51/16*

U.S. Cl. 220—203 **7 Claims**



3. A cap for closing the filler neck of a vehicle fuel tank, said cap comprising a valve housing providing a passageway extending axially therethrough, means for connecting said housing to a filler neck, said housing being formed to provide an axially outer passageway portion, an axially inner passageway portion, and, intermediate said portions and in the center of said passageway, a valve opening, said housing also providing, about the periphery of said valve opening, an annular and axially outwardly facing first valve seat, said first valve seat having ports extending therethrough to provide communication between the axially outer passageway portion and the filler neck, said ports bypassing said valve opening, an annular first valve member, first spring means for yieldably urging said first valve member axially inwardly against said first valve seat normally to close said ports, pressure-vacuum valve means normally closing said valve opening and venting the tank when the pressure in the filler neck drops below a predetermined subatmospheric level and when the pressure in the filler neck exceeds a first predetermined superatmospheric level, said first spring means being calibrated to provide for movement of said first valve member axially outwardly away from said first valve seat when the pressure in the filler neck exceeds a second and greater superatmospheric level, said valve opening providing an axially inwardly facing second valve seat, and a second valve member disposed in said passageway to move axially outwardly into closing engagement with said second valve seat when said filler neck is tilted.

4,000,829
CONTAINER CLOSURE UNIT

Arthur L. Johnson, Jr., Rockford, and Marlow W. Dodge, Loves Park, both of Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.

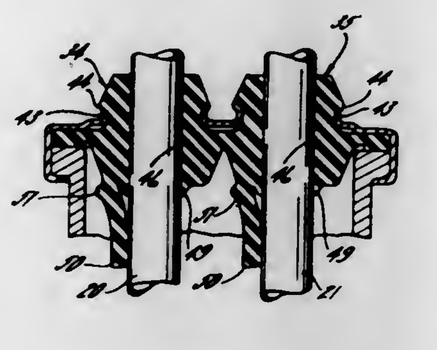
Filed Aug. 16, 1973, Ser. No. 388,982

Int. Cl.^{2} B65D *41/20, 51/16*

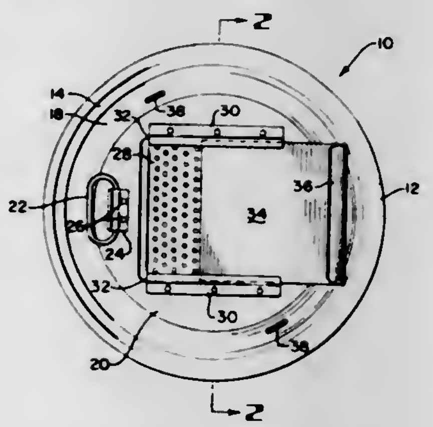
U.S. Cl. 220—265 **1 Claim**

1. A unit for sealing a beverage container having an upwardly projecting neck defining an opening through which a beverage may be introduced into the container and into which the beverage and gas tubes of a tapping device may be inserted for purposes of dispensing the beverage from the container, said unit comprising an overcap having a circular top plate and having a peripheral skirt depending from said top plate, said skirt being of sufficient diameter to telescope over said neck and being sufficiently flexible to be crimped into engagement with the neck to establish a fluid-tight seal between the overcap and the container, first and second diametrically spaced holes formed through said top plate, first and second sealing plugs formed integrally with one another and each having an upper end portion telescoped snugly into and pro-

jecting upwardly from the respective hole, each of said plugs having a lower end portion extending below said top plate, an enlarged washer formed integrally with both of said plugs intermediate the ends of the plugs, said washer being disposed face-to-face with the underside of said top plate and being adapted to seat against the neck to help establish the seal between the container and the overcap, the lower plug portions below said washer being spaced from one another and being spaced inwardly from the wall of said opening, first and second axially extending bores formed in said first and second plugs, respectively, and of sufficient diameter to permit insertion of the tubes into the container through the bores, membranes of resiliently yieldable material extending between the walls of said bores to seal off the latter and being sufficiently thin to be punctured by the tubes as an incident to insertion of the tubes through said bores, and first and second swingable flappers formed integrally with the lower end portions of said plugs and pivotally joined to the latter along first and second hinges disposed radially outwardly of the respective bores.

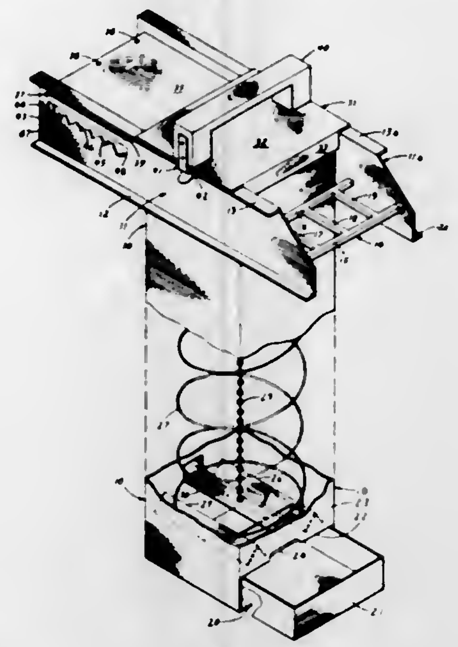


4,000,830
LID FOR A COOKING UTENSIL
Grace Allson French, 1744 17th St., Cuyahoga Falls, Ohio 44223
Filed Dec. 15, 1975, Ser. No. 640,628
Int. Cl.² B65D *51/16*
U.S. Cl. 220—369 **11 Claims**



1. A lid for a cooking container, comprising:
- a substantially flat central section having a recessed rectangular plate suspended therefrom, the plate being characterized by a plurality of venting holes passing therethrough;
- a way connected to the flat central section on each side of the recessed plate;
- a first edge member connected to the central section in angled depending relationship about the periphery thereof;
- a second edge member connected to the first edge member in angled ascending relationship about the periphery thereof; and
- a lip connected about the circumference of the second edge member in substantial parallel planar relationship with the flat central section.

4,000,831
SLICED BREAD DISPENSER
Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company, Miami, Fla.
Filed Dec. 11, 1975, Ser. No. 639,878
Int. Cl.² B65H *3/00*
U.S. Cl. 221—196 **12 Claims**



1. A sliced bread or sandwich dispenser comprising, in combination, a vertically-extending open top container for receiving stacked sliced bread for dispensing, a cover plate, means slidingly supporting said cover plate in spaced relation above the open top of said container for horizontally reciprocative forth-and-back movement, means limiting the extent of said cover plate movement between a backward-most first position of rest and forward-most second position of sliced bread dispensing, and means for resiliently constraining stacked sliced bread in said container in the upward direction so that the uppermost slice contacts the under-side of said cover plate, said cover plate being formed intermediate its length with a downwardly-extending, transverse wall portion serving as abutment means for slidingly pushing said uppermost slice of bread horizontally outwardly of said container as said cover plate is moved from said first position to said second position, said means slidingly supporting said cover plate in spaced relation above the open top of said container comprising a pair of horizontally-extending guide rail members secured, one each, against opposed upper sidewall portions of said container, said guide rail members projecting both forwardly and rearwardly of said container, and a rack extending horizontally between the forwardly-projecting ends of said guide rail members, below the upper end of said container, for the deposit or removal of a slice of bread pushed outwardly of said container during a dispensing operation

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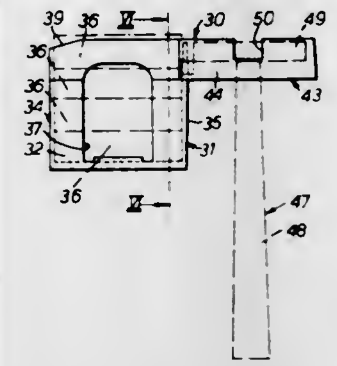
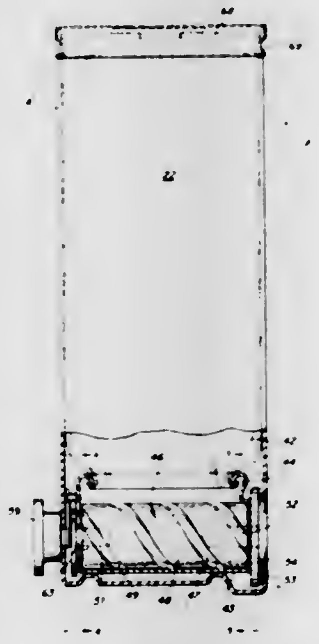
4,000,832
DISPENSING CONTAINERS
Harry Pentney, Reading, England, assignor to The Gillette Company, Boston, Mass.
Filed Apr. 15, 1975, Ser. No. 568,297
Claims priority, application United Kingdom, Apr. 19, 1974, 17365/74
Int. Cl.² B65D *83/10*
U.S. Cl. 221—232 **5 Claims**

1. A dispensing container for shaving units of the type comprising a blade and a member permanently secured thereto which provides a guard surface, the shaving unit being adapted for engagement with and disengagement from a razor handle, said container comprising a storage compartment for retaining a plurality of said shaving units, means for facilitating movement of shaving units retained in said storage compartment, said storage compartment being provided with an

opening through which said shaving units are movable successively, wall structure extending from said storage compartment and including an elongated front wall, an elongated rear wall and an end wall coupled to said front and rear walls at the outer extremities thereof, said front wall having a recess therein and means thereon for receiving and releasably retaining a head portion only of said razor handle, the remainder of said razor handle remaining outside of said container, and means facilitating longitudinal movement of said shaving unit through said opening and into engagement with said razor handle head portion, whereby one of said shaving units may be withdrawn from said container by withdrawal of said razor handle from said recess.

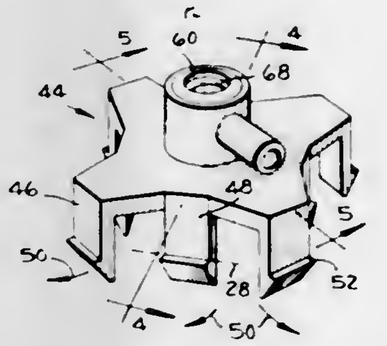


4,000,833
TONER DISPENSING APPARATUS
Robert G. Marks, East Walpole, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Mar. 6, 1975, Ser. No. 555,919
Int. Cl.² B65G *33/14*
U.S. Cl. 222—105 **16 Claims**



1. A toner dispensing apparatus for dispensing toner into the developer housing of an electrophotographic copier comprising:
- A. toner dispensing means for dispensing toner into said developer housing; and,
- B. toner supply means for maintaining a supply of toner to be dispensed by said toner dispenser means, said toner supply means including:
  - a. a container for holding toner, at least a portion of the walls of said container being flexible;
  - b. rotatable conveyor means for conveying toner from said container to said toner dispenser means; and,
  - c. means for deflecting said flexible wall portion for agitating the supply of toner maintained in said container, said deflecting means including:
    1. tub means within which said rotatable conveyor means is supported, said tub means being normally rotatably with and by said conveyor means;
    2. spring means for opposing the normal rotation of said tub means; and,
    3. means for coupling said tub means to said conveyor means, said coupling means periodically releasing said tub means from said conveyor means whereby said tub means will be rapidly rotated by said spring means in the direction opposite that of said conveyor means to deflect said flexible wall portion.

4,000,834
APPARATUS FOR HEATING AND DISPENSING FLOWABLE MATERIAL
Edmond R. Whitley, Knoxville, Tenn., assignor to General Electric Company, Bridgeport, Conn.
Filed Dec. 17, 1975, Ser. No. 641,675
Int. Cl.² B65D *83/14*
U.S. Cl. 222—180 **6 Claims**



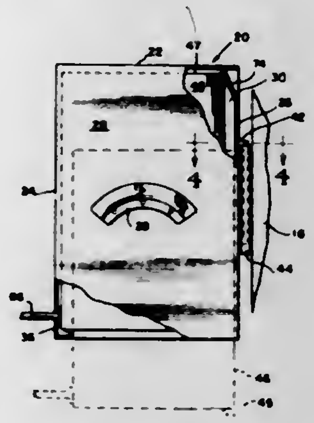
1. In an apparatus for electrically heating and dispensing flowable material from a pressurized container including a housing supporting the container, a heat exchanger connected thereto receiving material dispensed through a valve actuator assembly, and means effecting temperature control of said material, the improvement in the support and valve assembly means comprising,
- said housing having spaced openings,
- a claw-like member means supported in the housing with a first set of spaced projections depending through said housing opening fixedly locking said member therein,
- a second set of spaced projections depending through said housing to lockingly engage and support a container means thereon,
- a tubular passage in said member sealingly and fixedly receiving the container outlet through one end of the passage,
- an actuator stem sealingly and spacedly disposed in the other end of the passage for movement against the container outlet to release and dispense material, and
- a side passage in said member substantially between the stem and outlet and connected to said exchanger,
- whereby said fixed member functions as the container support and valve actuator assembly for selectively dispensing controlled, heated, and measured material.

4,000,835
WINDSHIELD WASHER SERVICE APPARATUS
Walter D. Bassett, 5887 Shimer Ave., Indianapolis, Ind. 46219, and Terry J. Bassett, Rte. No. 3, Monticello, Ind. 47960
Filed Sept. 12, 1975, Ser. No. 612,642
Int. Cl.² B67D *5/60*
U.S. Cl. 222—183 **8 Claims**

1. Apparatus for dispensing automotive windshield wiper fluid, comprising
a cabinet in the form of a box-like structure having side and

top walls forming a weatherproof enclosure and having a bottom opening for insertion and removal from below of a liquid supply container, said cabinet mounted in elevated position at a service island adjacent a service station driveway at which washer-equipped automotive vehicles stop for other service, at a height such that liquid will readily flow by gravity to the washer equipment of such vehicles,

a replaceable multiple-charge supply container of wiper fluid removably mounted in said cabinet through said bottom opening,



means on the cabinet extending within the cabinet and adjacent said opening for supporting the container therein,

an elongated gravity-feed hose connected to said container for dispensing fluid therefrom and having a manually operable flow controller at its free end, said hose being of sufficient length to extend to the washer reservoir of a vehicle stopped on said driveway and being connected to the container adjacent the bottom thereof so as to move into and out of operative position with the container as the container is inserted and removed through said bottom opening.

4,000,836

PRESSURIZED DISPENSERS

Jillian A. Williams, Thorpe, and Ronald James, Hillingdon, both of England, assignors to Wilkinson Sword Limited, Great Britain

Continuation of Ser. No. 432,560, Jan. 11, 1974, abandoned. This application Aug. 12, 1975, Ser. No. 604,046

Claims priority, application United Kingdom, Aug. 8, 1973, 39151/73

Int. Cl.^{2} B65D *83/14*; **C08K** *5/01, 5/05, 5/06*

U.S. Cl. 222—399 **10 Claims**

1. A pressurised dispenser comprising

a container provided with a valve-controlled outlet and containing a concentrate, and

a reservoir holding propellant, the reservoir comprising an extended rubber with which the propellant forms a solution and over which the vapour pressure of the dissolved propellant is less than that of the pure propellant, the rubber being extended by a substance having a low volatility and being compatible with but non-leachable by the propellant or the concentrate, the amount of extender present being at least 20% by weight but less than that which causes break up of the rubber,

the extended rubber being capable of forming a solution with at least 15% of its own weight of propellant at room temperature, and

the reservoir being capable of releasing propellant within the container as the contents of the container are dispensed.

4,000,837

SLIDING GATE VALVES

Ludwig Walther, Dueren-Niederau, Germany, assignor to United States Steel Corporation, Pittsburgh, Pa.

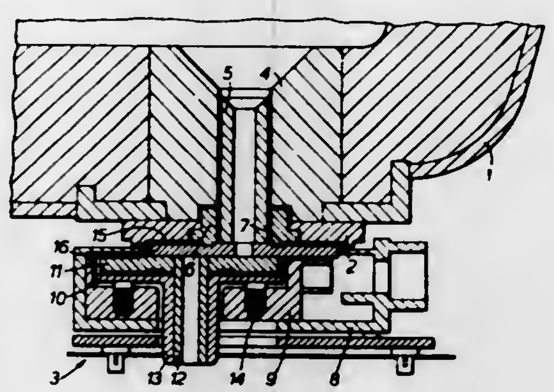
Filed Dec. 16, 1974, Ser. No. 532,976

Claims priority, application Germany, Dec. 21, 1973, 2363824; Dec. 21, 1973, 7345365[U]

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} B22D *37/00, 41/08*

U.S. Cl. 222—512 **14 Claims**



1. In a sliding gate valve for a bottom pour vessel, wherein the valve comprises a replaceable ceramic head plate adapted for rigid, sealed mounting on the vessel, a slideable carriage and a replaceable ceramic slide plate borne thereon and carrying a pouring bushing, whereby said slide plate is movable in contact with said head plate to bring the bushing into and out of registry with the head plate aperture to open and close the valve, the improvement comprising:

first and second frames in which said head plate and said slide plate are respectively mounted,

cooperating sealing means on said bushing and said slide plate,

a collar having an extended top flange and forming a holder for said bushing, said top flange abutting the slide plate,

and spring elements carried by said carriage to engage said top flange and urge same against said slide plate.

4,000,838

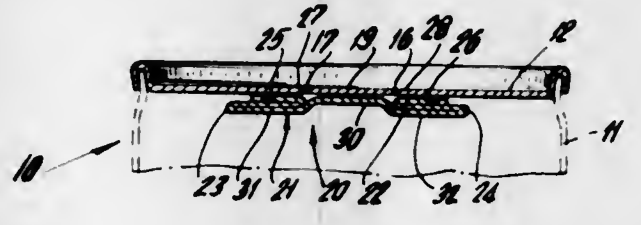
SPOUT FORMING MEANS FOR CONTAINERS

Clayton Bogert, 118 Lowell Road, Glen Rock, N.J. 07452

Continuation of Ser. No. 293,355, Sept. 29, 1972, abandoned. This application June 11, 1975, Ser. No. 585,932

Int. Cl.^{2} B67D *5/12*

U.S. Cl. 222—529 **7 Claims**



1. Container having a substantially rigid lid secured to its walls,

weakened scoring lines formed in a portion of the lid and defining an opening area,

a tab opener disposed inwardly of the edge of the container and secured to the lid within the bounds of the scoring lines to form a lid opening when the tab opener is lifted, and

a substantially fan-folded flexible member disposed within the container and having corresponding lateral edges and a leading edge, and secured at its lateral edges to the underside of the lid outwardly adjacent to the bounds of the scoring lines and secured at its central portion to the

underside of the lid within the bounds of the scoring lines, and having substantially freely disposed fold portions between each of its lateral edges and the central portion, the fold portions being folded in substantially adjacent to the lid, and its leading edge being substantially crosswise between its lateral edges and along the corresponding fold portions thereat to define a spout rim portion,

whereby when the tab opener is lifted to provide the lid opening, the central portion, leading edge and fold portions of the fan-folded flexible member are outwardly drawn therewith and through such opening to form a spout to facilitate the pouring of the contents from the container.

4,000,839

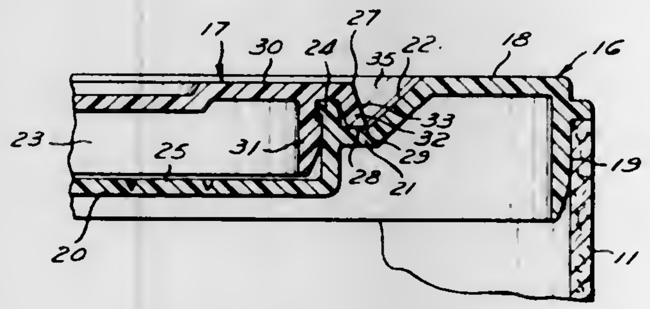
SAFETY CLOSURE WITH REMOVABLE LID FOR CONTAINERS

Charles Tecco, and William A. Loughley, both of c/o Weatherchem Corp., 2222 Highland Road, Twinsburg, Ohio 44087

Filed May 21, 1975, Ser. No. 579,468

Int. Cl.^{2} B65D *47/12*

U.S. Cl. 222—540 **5 Claims**



1. In combination, a container and a child resistant molded plastic end closure, said container having an interior at least partially filled with a product to be dispensed, and said end closure being disposed on one end of said container, said end closure comprising a one-piece stationary cap and a one-piece removable lid; said cap and said lid each including detent means frictionally securing said lid to said cap and permitting removal of said lid from said cap only by an axial force exerted on said lid in a direction away from said interior of said container; said lid including a generally flat round lid cover wall and an annular lid peripheral wall extending axially from said cover wall and terminating at an annular free edge, the juncture of said lid peripheral wall and said annular free edge defining an annular peripheral bottom outside corner of said lid, the juncture of said lid cover wall and said lid peripheral wall defining an annular peripheral top outside corner of said lid; said cap including an annular cap peripheral wall, a cap dispensing wall having at least one opening for dispensing said product from said container, said cap dispensing wall being axially spaced from said cap peripheral wall into said interior of said container, a cap connecting wall extending axially from said cap peripheral wall to said cap dispensing wall, said cap connecting wall including an annular safety wall, and said cap connecting wall and said cap dispensing wall cooperatively defining an open ended cylindrical recess in said cap; said lid being received within said recess, said annular safety wall of said cap closely confronting said lid peripheral wall about its entire annular extent to limit access to said lid peripheral wall, said peripheral bottom outside corner of said lid engaging said annular safety wall of said cap about its entire annular extent to prevent access to said bottom outside corner of said lid and to said annular free edge of said lid; said annular peripheral wall of said lid and said annular safety wall of said cap cooperatively defining an open ended annular groove, said annular groove being dimensioned and arranged to prevent a finger of a child from entering said groove and contacting said lid peripheral wall means on said annular peripheral wall of said lid disposed in said groove for receiving an axial lifting force in a direction away from said interior of said container and said annular safety wall of said cap being conical and facing radially inwardly and axially away from said interior of said container.

4,000,840

TUNDISH CAR AND ROTARY SUPPORT FOR POSITIONING TUNDISH

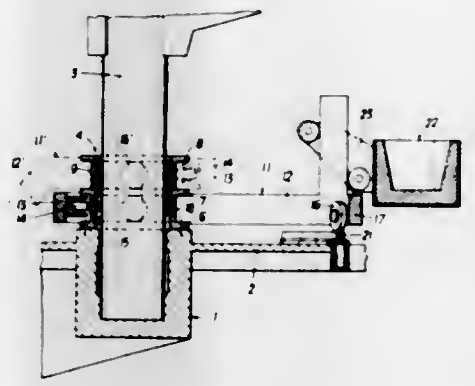
Alois Scheinecker, and Stefan Biricz, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 21, 1975, Ser. No. 606,564

Claims priority, application Austria, Aug. 30, 1974, 7026/74

Int. Cl.^{2} B22D *41/12*

U.S. Cl. 222—607 **4 Claims**



1. In a continuous casting plant with at least one tundish car carrying a tundish at one end and movable on a generally horizontal circular arc-shaped pathway by means of rollers attached to the tundish car adjacent the tundish and supported on top of the pathway, the improvement comprising:

a generally vertical stationary column concentric with the pathway and rotatably supporting the tundish car, said column having at least two flanges extending radially from the exterior of the cylinder to form a guide path,

three guiding rollers attached to the tundish car and symmetrically arranged about the periphery of the column to run on the cylinder face between the flanges of the guide path so as to provide centering of the tundish car relative to the column; and

two supporting rollers attached to the tundish car and arranged to run in the guide path on at least one of the flanges in order to secure the tundish car against tilting.

4,000,841

MULTI-COMPARTMENT, MULTI-LEVEL STACKING CARRIER, PARTICULARLY FOR SMALL PARTS, TOOLS, AND THE LIKE

Emil Bachli, Hauptstrasse 156, CH 5304 Endingen, AG, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,842

Claims priority, application Switzerland, Apr. 29, 1974, 6097/74; Apr. 24, 1975, 5381/75

Int. Cl.^{2} A47G *23/06*

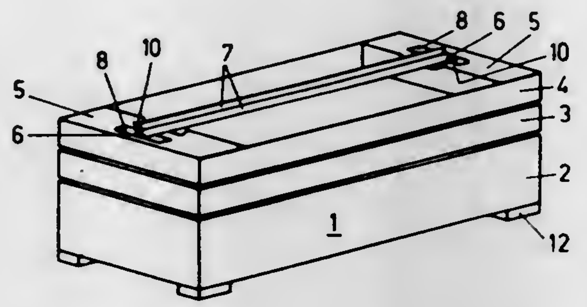
U.S. Cl. 224—48 R **11 Claims**

1. Multi-compartment, mutli-level stacking carrier comprising

a plurality of trays (2, 3, 4) of substantially similar outline stacked above each other;

elongated tension means (9) engaging the trays and secured to the top tray and holding the trays in relative spaced position when the carrier is erected;

at least two elongated tubular guide posts (7) located at opposite sides of the carrier and extending perpendicularly with respect to the trays, the guide posts, each including a folding knee joint (10) to permit articulation thereof in one direction and folding of the guide posts flat over the top-most tray (4) of the stacked trays (2, 3, 4), the knee joint (10) on one of the posts being located at the height above the height of the trays, when the trays are stacked tightly above each other, to permit folding-over of the portion of the post above the respective joint to extend transversely across the topmost tray, the knee joint of the other post being located offset vertically with respect to the knee joint of said one post by the thickness



of the post to permit folding of the posts above each other and form a carrying handle for the carrier;

and respective locks (8) secured to the topmost tray (4) engaging respective posts (7) each said locks including

guide means (24) secured to at least the topmost tray and engaging the respective posts;

and movable locking means (26), located on the topmost tray (4) and operable to engage the posts.

4,000,842

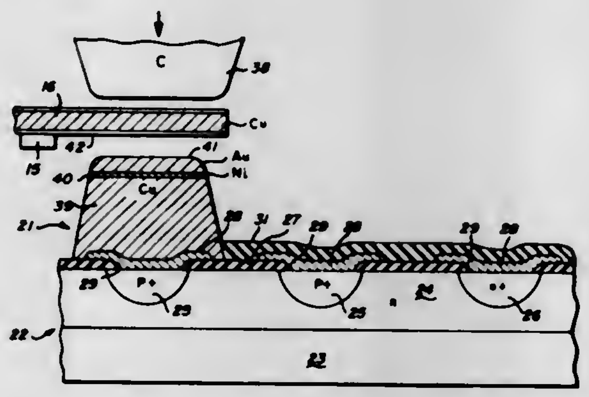
COPPER-TO-GOLD THERMAL COMPRESSION GANG BONDING OF INTERCONNECT LEADS TO SEMICONDUCTIVE DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed June 2, 1975, Ser. No. 582,620

Int. Cl.² B23K *19/00;* **H01L** *21/603*

U.S. Cl. 228—180 A **14 Claims**



1. In a method for thermal compressing gang bonding of lead structures from a tape to a semiconductive device in an automatic gang bonding machine, such semiconductive device being of a type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to underlying patterns of metallization on the semiconductive device, and wherein at least one copper portion of a first structure operatively associated with the semiconductive device is to be thermal compression gang bonded to a gold portion of a second structure operatively associated with the semiconductive device, the steps of:

heating and pressing the copper portion of the first structure into thermal compression bonding relation with the gold portion of the second structure to produce a solid state interdiffusion between the copper and gold portions to obtain upon cooling thereof a final bonding interface between the copper and gold portions, such interface comprising a solid state interdiffusion of the copper and gold portions.

4,000,843

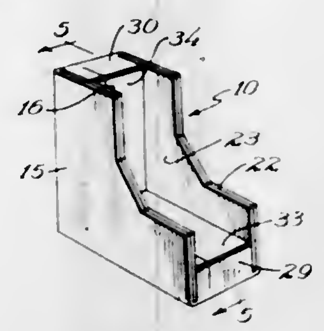
DIE CUT CORNER PAD

Wayne H. Sorensen, St. Paul; John F. Sorensen, Minneapolis, both of Minn., assignors to Hoerner; Waldorf Corporation, St. Paul, Minn.

Filed May 7, 1976, Ser. No. 684,276

Int. Cl.² B65D *85/30, 85/48*

U.S. Cl. 229—14 C **2 Claims**



1. A blank made of corrugated paperboard or similar sheet-like material and adapted to be erected into a right angle outside corner pad, said blank comprising:

a pair of rectangular outer wall panels having horizontal top and bottom edges and vertical lateral edges, said outer wall panels hingedly connected along adjacent lateral edges;

each of said outer wall panels having hingedly attached along the top and bottom edges thereof first and second side wall panels, respectively;

a rectangular spacer panel hingedly attached along the outer lateral edge of each of said outer wall panels, said spacer panels extending vertically a distance substantially equal to the vertical extent of said outer wall panels;

vertically extending spacer tabs hingedly attached to the top and bottom edges of each of said rectangular spacer panels;

a rectangular inner wall panel hingedly connected to the outside lateral edge of each of said rectangular spacer panels, the vertical extent of each of said inner wall panels being approximately equal to said outer wall panels; and

a rectangular locking flap hingedly attached to the outer lateral edge of each of said inner wall panels.

4,000,844

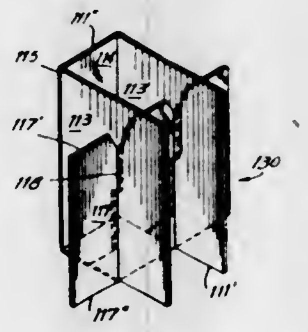
ONE-PIECE PARTITION

Charles Perry Weimer, Plainfield, Conn., assignor to International Paper Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,135

Int. Cl.² B65D *5/48*

U.S. Cl. 229—15 **28 Claims**



1. A blank for a one-piece partition, which comprises:

a panel having a set of two substantially rectangular flaps arranged in a row; said flaps of said panel being foldably connected along a fold line between said flaps;

a continuous slot being provided in the width-wise middle of an outer flap of said set of flaps of said panel, extending from one side of said set of flaps and parallel to said fold line;

a bridging member, one side of which is foldably connected only to an inner flap of said set of flaps along said one slotted side of said set of flaps; and

a forked panel, foldably connected to the opposite side of said bridging member, remote from said one slotted side of said set of flaps, and having a continuous slot extending from a side thereof remote from said one slotted side of said set of flaps;

the center line of said slot in said forked panel being substantially colinear with said fold line between said inner and outer flaps of said set of flaps, and the length of said bridging member, between said forked panel and said inner flap, being about equal to the distance between the center line of said slot in said outer flap and the adjacent fold line between said inner and outer flaps in said set of flaps in said panel.

4,000,845

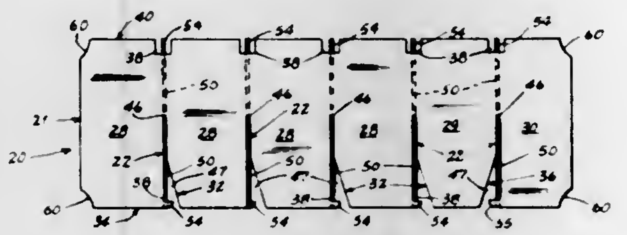
PARTITION ASSEMBLY AND PARTITION STRIPS THEREFOR

Allen D. Zeller, Merced, Calif., assignor to Clevepak Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,746

Int. Cl.² B65D *85/00*

U.S. Cl. 229—15 **5 Claims**



1. A partition strip for use in a partition assembly comprising means to interlock with cooperating cross partition strips, the interlocking means including a plurality of generally parallel slots in the partition strip, the slots dividing the partition strip into a plurality of sections, including a first section having a projection extending at an edge of said strip into a slot, a second section having a projection extending at said edge into another slot and facing opposite to said projection of the first section, the first and second sections being at opposite ends of the strip and said projections of said first and second sections facing each other, intermediate sections between said first and second sections, all but one of said intermediate sections having projections extending at said edge into other of said slots, the strip further including notches in the edge of the strip opposite said projections and in alignment with said slots for reception of projections of cross strips, whereby all of the sections of the partition strip except one intermediate section have projections, the projections of the outer end sections facing each other, for supporting engagement with notches of cross strips.

4,000,846

PRESSURE RELIEF VALVE AND BAG INCORPORATING SAME

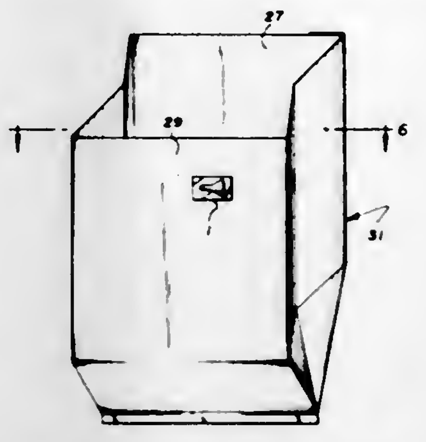
Seymour Gilbert, Piscataway, N.J., assignor to Dunkin' Donuts Incorporated, Randolph, Mass.

Filed June 30, 1975, Ser. No. 591,508

Int. Cl.² B65D *31/14*

U.S. Cl. 229—62.5 **14 Claims**

1. A pressure relief valve for permitting the release of pressure from an enclosed area, without permitting substantial reverse flow into said enclosed area, which comprises a rigid base member including a raised portion, a flexible valve membrane stretched across the surface of said base member, said flexible valve membrane including a surface area of at least 500 times the maximum displacement of said flexible valve membrane at any point thereon which is required to obtain a flow through said valve, said flexible valve membrane further including slot means located in the portion of said flexible valve membrane stretched across the raised portion of said rigid base member, and an entrance port associated with one end of said base member, said raised portion of said base member and said slot means being distal from said entrance port, said entrance port adapted to be in communication with the source of pressure to be controlled, so that when said source of pressure reaches a predetermined level, said pressure is released between said base member and said valve membrane by causing said valve membrane to be displaced from said base member.



4,000,847

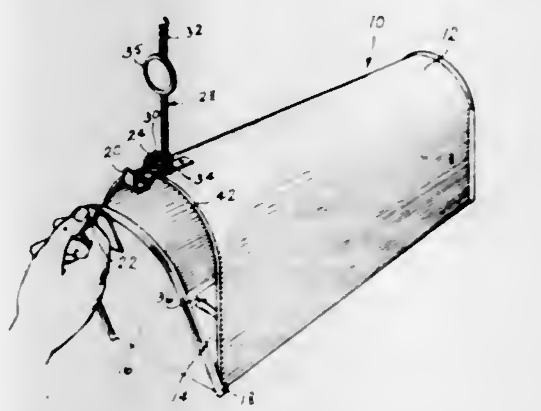
MAIL INDICATOR USED IN CONJUNCTION WITH A MAILBOX

Jack L. Duis, 2784 Copp Road, Niles, Mich. 49120

Continuation-in-part of Ser. No. 599,830, July 28, 1975, abandoned. This application Jan. 16, 1976, Ser. No. 649,661

Int. Cl.² G08C *5/00*

U.S. Cl. 232—35 **7 Claims**



1. In combination a mail indicator and a mailbox comprising an elongated shape-retaining flexible member having upper and lower end portions and defining said mail indicator, said member lower end portion terminating in a hook part, said mailbox including a housing means for receiving mail, said housing means including an open front end, a door, means pivotally connecting said door to said housing means for movement between a closed position spanning said housing means open end and an open position exposing said housing means open end, a latch part mounted to said housing means adjacent its said open end, said door including a tab part, said latch part having one end secured to said housing means and another end releasably engaged with said door when the door is located in its closed position, said latch part including an intermediate portion between its said ends offset from said housing means, the lower end portion of said member extending under said latch part intermediate portion between said intermediate portion and housing means and being return bent over said intermediate portion with said hook part interlocking under said intermediate portion, the upper end portion of said member having an upwardly extending signal indicating position, said upper end portion being flexibly downbent and secured between said door and housing means with said door in its closed position, said upper end portion shifting into its

upwardly extending signal indicating position when said door is opened.

4,000,848
REGULATING DRIVE, ESPECIALLY FOR A THERMOSTATICALLY CONTROLLED VALVE SHAFT

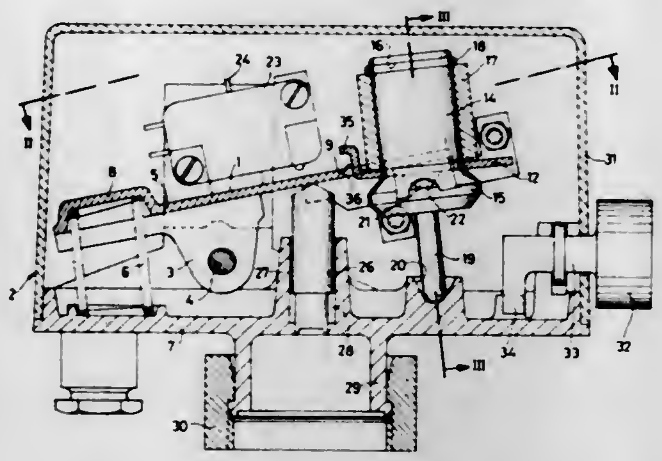
Bernhard W. Braukmann, Am Rosenberg 1, and Rudolf Vollmer, Fr. Holderlinstr. 23, both of D 695 Mosbach, Germany

Filed Apr. 28, 1975, Ser. No. 572,497

Claims priority, application Germany, Apr. 26, 1974, 2420213

Int. Cl.² G05D *23/02*; **F16K** *31/00*

U.S. Cl. 236—68 R **17 Claims**



1. A regulating drive for a thermostatically controlled feed member having a pivotable, spring-loaded actuating lever carrying a control element, the operating member of the said control element being stationary and the mobile element being supported on the actuating lever, characterized in that the control element is mounted pivotably on the actuating lever.

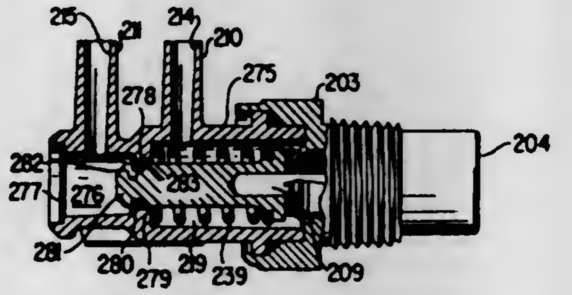
4,000,849
TEMPERATURE RESPONSIVE VALVE

Joseph P. Wagner, and Everett T. Steele, Jr., both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 312,530, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 221,557, Jan. 28, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,621

Int. Cl.² G05D *23/12*

U.S. Cl. 236—100 **20 Claims**



1. A temperature responsive valve comprising, in combination

a valve body having therein first, second, third and fourth cylindrical chambers of successively smaller diameters axially aligned and extending along at least a portion of the length of the body;

said body including wall means having first, second, third and fourth ports opening respectively into said first, second, third and fourth chambers;

means defining a first valve seat between said first and second chambers, said first valve seat having an opening therethrough via which said first port can communicate with said second port;

means defining a second valve seat between said third chamber and said fourth chamber, said second valve seat having an opening therethrough via which said third port can communicate with said fourth port;

a valve stem within said body and extending through said first valve seat and toward said second valve seat, said stem being movable along a predetermined path;

a first valve element movable with said stem to close said opening of said first valve seat;

a second valve element movable with said stem to close the opening of said second valve seat;

movable means for sealing said second chamber with respect to said third chamber throughout the extent of travel of said stem; and

a temperature responsive means for moving said stem from a first position, in which said first valve element engages and closes said opening of said first valve seat and said second valve element is spaced from said second valve seat, to a second position in which said first valve element is spaced from said first valve seat and said second valve element closes the opening of said second valve seat.

15. In a temperature responsive valve, the combination comprising

a generally hollow casing having open and closed ends and a plurality of spaced flow ports between the ends,

a flow passage in said casing establishing communication between said flow ports,

valve seat means in said flow passage,

movable valve means cooperating with said valve seat means for controlling a fluid flow in said flow passage,

temperature responsive means including a thermostatic power element secured to the open end of said casing and operatively connected to said valve means for moving the same between controlling positions,

said valve seat means including an annular surface joined to a first annular bevelled surface with a second annular bevelled surface on the opposite side of the annular surface from the first annular bevelled surface, said first bevelled surface facing in a direction towards the closed end of said casing,

said movable valve means including a valve stem having one end operated by said thermostatic power element and a free end protruding through and spaced from said valve seat means, an annular seal ring of resilient material fixed on said free end, and

spring means interposed between said stem and said valve seat means biasing the ring into simultaneous engagement with both the first bevelled surface and said annular surface during one of the controlling positions of said element,

said first and second surfaces facilitating fluid flow between said stem and annular surface to establish communication between said ports during another one of the controlling positions of said element.

4,000,850
SOLAR HEATED AND COOLED MODULAR BUILDING

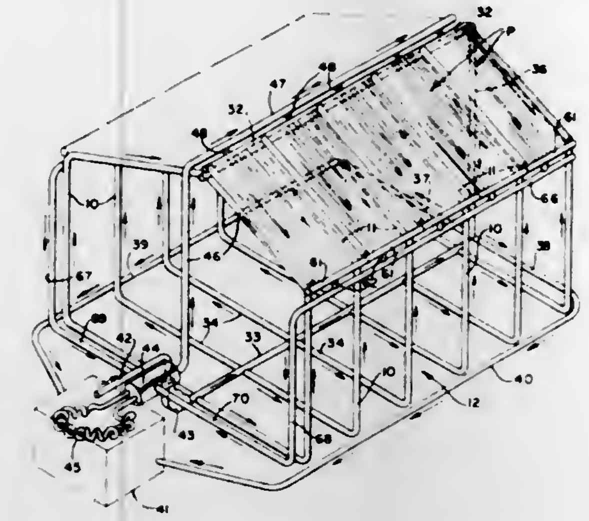
Richard E. Diggs, 12A Road, Carthage, Mo. 64836

Filed May 14, 1975, Ser. No. 577,359

Int. Cl.² F24J *3/02*

U.S. Cl. 237—1 A **19 Claims**

1. A solar heated and cooled modular building, comprising a frame including prefabricated tubular wall columns and prefabricated tubular roof beams supported on the columns, the columns and the beams being adapted to pass fluid therethrough, first fluid circulating means connected with the columns and beams to circulate a first heat exchange fluid therethrough at a desired temperature to maintain a desired temperature in the building, a plurality of rigid, prefabricated insulated panels secured to and supported on the columns and beams defining wall and roof structures, respectively, enclosing the building, a plurality of solar panels secured to and supported on the roof panels, second fluid circulating means connected with the solar panels to circulate a heat exchange fluid therethrough to absorb heat from solar energy and to use said heated heat exchange fluid to obtain the desired temperature of the first heat exchange fluid and plates secured to locations on the columns and roof beams which are adjacent each other and connecting those columns and beams to adjacent structure of the building, the plates each having flow passages defined therein to fluidly connect the columns and the beams.



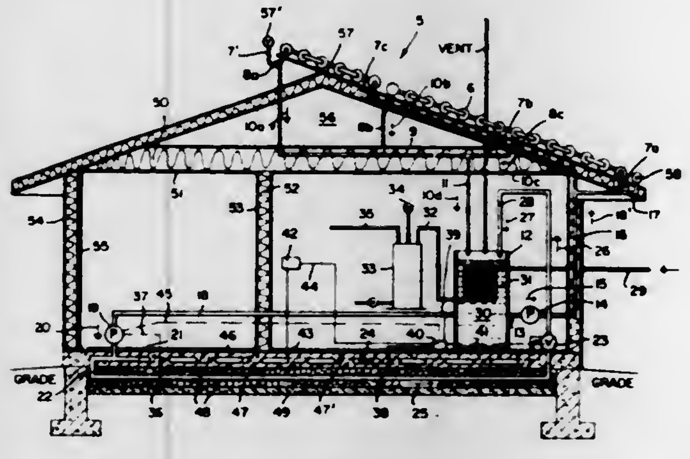
4,000,851
SOLAR-HEATED DWELLING

Volkmar Heilemann, 127 Mountain View Road, Warren Township, N.J. 07060

Filed Nov. 12, 1975, Ser. No. 631,085

Int. Cl.² F24J *3/02*

U.S. Cl. 237—1 A **10 Claims**



1. A solar heating unit comprising in combination: a building structure having floor means for circulating fluid therethrough and for providing a heat-sink reservoir, and floor means comprising concrete having fluid-flow conduits embedded therein, and rocks in a layer beneath and in contact with a lower face of said concrete in heat-flow relationship adapted such that the rocks serve as a heat sink together with said concrete storing thermal energy over extended periods of time, and the building structure having spaced-apart upright wall structures-means for defining an enclosure inhabitable space therebetween mounted on an upper face of the floor means and supportable of overhead structure, and having ceiling means for providing support for upper structure and for insulating said inhabitable space, mounted on said upright wall structures-means above and capping said space, and roof means for providing shelter to the ceiling means and mounted thereabove on said spaced-apart upright wall structures-means and for providing support for solar cells thereon-above; solar heating means for providing solar cells mounted exterior to said building structure with operative exposure thereof to outdoor sunlight source, and for circulating fluid serially to and through the solar cells, and therefrom to and through said floor means, and from the floor means back to the solar cells, in a substantially closed circulation cyclic flow, adapted such that heat becomes extracted from the fluid into the heat-sink-reservoir and thereby provides thermal heat energy to said inhabitable space for the heating thereof, and for providing forced circulation in said closed circulation cyclic flow.

4,000,852
FUEL ATOMIZERS

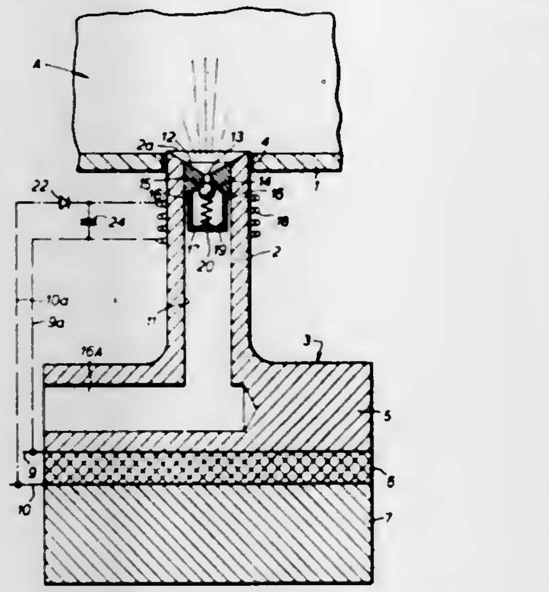
Barrie James Martin, Shenfield, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 24, 1976, Ser. No. 660,929

Claims priority, application United Kingdom, Mar. 5, 1975, 9042/75

Int. Cl.² B05B *1/30, 3/14*

U.S. Cl. 239—102 **3 Claims**



1. A fuel injection system comprising a fuel injection nozzle having a fuel injection orifice, and a vibrator to produce atomization of the fuel injected by the nozzle, the nozzle being equipped at the inlet side of its nozzle orifice with a liquid-retaining valve which is arranged to normally close the nozzle orifice and thus prevent the injection of fuel by the nozzle and which is adapted to move away from the nozzle orifice when the vibrator is activated and thus allow the injection of fuel by the nozzle, the valve being situated in a housing in the nozzle and the housing having biassing means for biassing the valve towards the nozzle orifice when the nozzle is not being vibrated.

4,000,853
SPRINKLER HAVING IMPROVED WATER DISTRIBUTION

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Mar. 29, 1976, Ser. No. 671,716

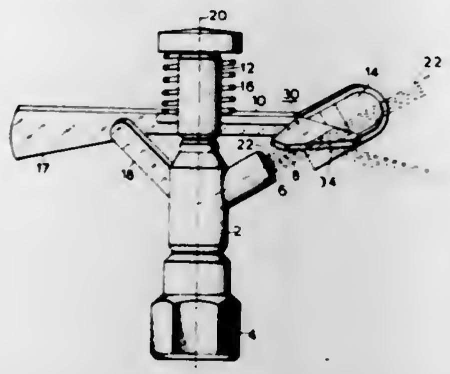
Claims priority, application Israel, Feb. 6, 1976, 48983

Int. Cl.² B05B *3/08*

U.S. Cl. 239—230 **9 Claims**

1. A sprinkler comprising: a spinkler head connectable to a water supply pipe and having a nozzle through which the water issues in the form of a jet; a spring-biassed pivotably-mounted arm impinged by the water jet and oscillated thereby; and a deflector carried by said arm, and oscillated therewith across the path of the water jet so as to be impinged thereby along a line of impingement as the deflector oscillates back and forth along the path of the water jet; said deflector including a lower edge disposed at an angle to and intercepting the line of impingement of the deflector as it oscillates back and forth across the path of the water jet such that the

lower edge of the deflector intercepts an increasing area of the water jet section to deflect it downwardly during one direction of movement of the arm, and a decreasing area of the water jet section to deflect same downwardly during the opposite direction of movement of the arm, to thereby distribute the sprinkled water substantially uniformly from the sprinkler nozzle during the oscillation of the arm.



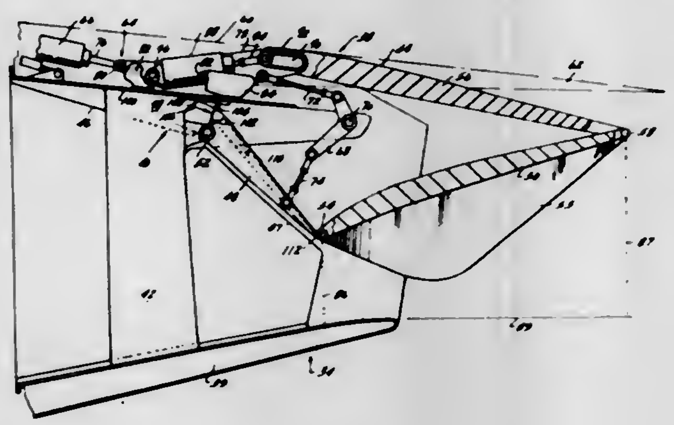
4,000,854
THRUST VECTORABLE EXHAUST NOZZLE

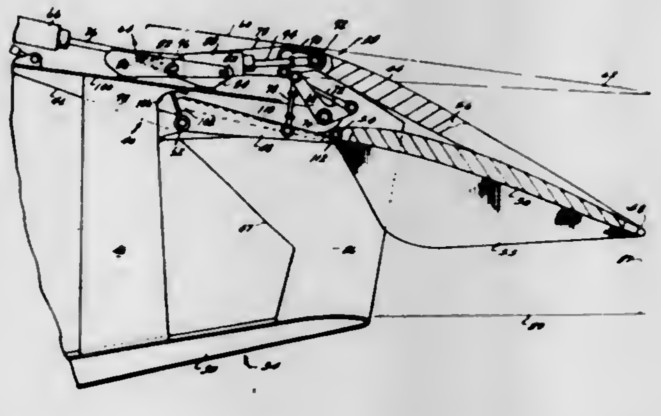
Mieczyslaw Konarski, Fairfield, and Dudley O. Nash, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 2, 1975, Ser. No. 618,796

Int. Cl.² B64C *9/30, 9/38, 15/06;* **F02K** *1/12*

U.S. Cl. 239—265.35 **22 Claims**





1. A flight maneuverable exhaust device for use with a gas turbine engine comprising:
   first variable position flap means partially defining an exhaust stream flow path having a throat and an exit, said first flap means being pivotably connected to an upstream fixed duct portion for varying exhaust stream flow path area convergence;
   second variable position flap means further defining the flow path, said second flap means being downstream of and pivotably connected to the first flap means for providing variable exhaust stream expansion control in a first operating mode and exhaust stream deflection in a second operating mode;
   third variable position flap means pivotably connected to the second flap means proximate their respective downstream extremities, said third flap means partially defining a variable contour flight control surface; and
   an actuation system operatively connected to at least one of said flap means for synchronously moving said first, second and third flap means to control, in a predetermined relationship, the exhaust stream flow path throat area and the exhaust stream flow path exit area.

4,000,855
BELLCRANK ASSEMBLY, NOZZLE ACTUATOR

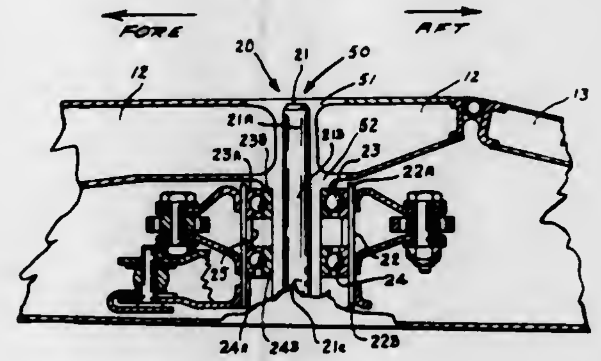
Larry E. Anders, Palm Springs, and Joel F. Sutton, Lake Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,892

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B64C *15/08*

U.S. Cl. 239—265.39 **4 Claims**



1. A bellcrank assembly, adapted for mounting on, and for actuating, a convergent flap of an exhaust nozzle of a turbojet engine, comprising:
   a. a bellcrank shaft having a first end, a middle portion, and a second end;
   b. a sleeve having a first end and a second end, with said sleeve disposed external of and around said bellcrank shaft, and with said sleeve so positioned that said first end of said sleeve is generally located near said middle portion of said bellcrank shaft, and said second end of said sleeve is generally located near said second end of said bellcrank shaft;
   c. a first bearing member of the angular type interposed between said first end of said sleeve and said middle portion of said bellcrank shaft, with said first bearing member having two races, an inner one and an outer one, between which it is moveably positioned;
   d. a second bearing member of the angular type interposed between said second end of said sleeve and said second end of said bellcrank shaft, with said second bearing member having two races, an inner one and an outer one, between which it is moveably positioned;
   e. a spacer disposed between said first bearing member and said second bearing member, and abutting said outer races, with said spacer simultaneously interposed between said sleeve and said bellcrank shaft;
   f. means for securing said sleeve, said first bearing member and races, said second bearing member and races, and said spacer to said bellcrank shaft;
   g. a bellcrank housing subassembly, comprising:
      (1) a housing suitably dimensioned and configurated to contain said sleeve, said first bearing member and races, said second bearing member and races, said spacer, and said middle portion and said second end of said bellcrank shaft;
      (2) and, a fore bellcrank link arm, an aft bellcrank link arm, and a bellcrank actuator arm, with all said arms fixedly attached to said sleeve, whereby said bellcrank actuator arm is pivotally moveable;
   h. means for securing said bellcrank housing subassembly at said second end of said bellcrank shaft;
   i. and, means for mounting and securing said first end of said bellcrank shaft to said convergent flap of said exhaust nozzle of said turbojet engine.

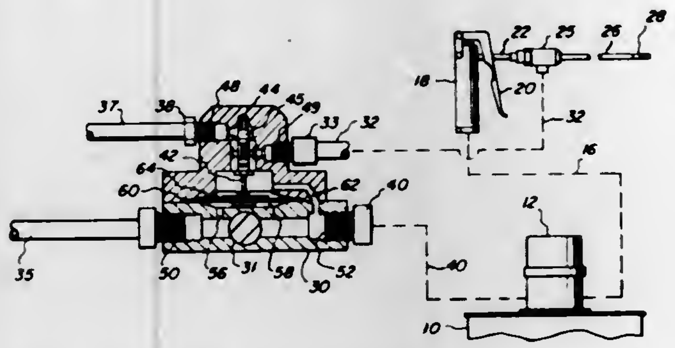
4,000,856
FOG/SPRAY SYSTEM AND APPARATUS

Vernon K. Quarve, Minneapolis, and William Vork, Edina, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Sept. 2, 1975, Ser. No. 609,244

Int. Cl.² B05B *7/12*

U.S. Cl. 239—332 **9 Claims**



1. A fog/spray system actuable from a source of pressurized fluid for pumping liquid coating material from a container and delivering same through a trigger-actuable fog/spray applicator, comprising:
   a. a fluid-operated pumping means, connected to said applicator and to said coating material container, for pumping said liquid coating material under pressure to said applicator, and wherein said applicator further comprises an internal passage therethrough for passing said coating material and an interior valve having a passage opening and closing position and actuable by said trigger;
   b. a fluid control valve having a first valve passage connected between said fluid-operated pumping means and said source of pressurized fluid, said first valve passage having a flow restriction and a diaphragm chamber and diaphragm, with respective sides of said diaphragm being vented upstream and downstream of said flow restriction, and said fluid control valve having a second valve passage with an inlet for pressurized air and an outlet, and a movable valve member in said second valve passage connected to said diaphragm; and
   c. a fogging chamber having a first inlet connected to said applicator and a second inlet connected to said fluid control valve second passage outlet, and having an outlet for delivering said fog/spray liquid coating material.

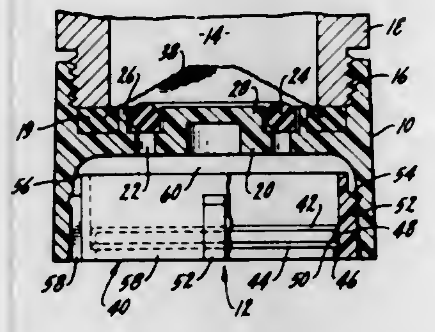
4,000,857
FLOW CONTROL AERATOR

Alfred M. Moen, 25 Lakeview Drive, Grafton, Ohio 44044

Continuation of Ser. No. 489,234, July 17, 1974, abandoned. This application June 30, 1975, Ser. No. 591,635

Int. Cl.² B05B *1/30;* **F16K** *15/08*

U.S. Cl. 239—428.5 **18 Claims**



1. A water aerating device including a housing having a water inlet and outlet, screen means associated with said housing outlet, partition means in said housing positioned upstream of said screen means, air passage means in said housing in communication with the downstream side of said partition means, said partition means including a plurality of annularly arranged water passages extending therethrough, circumferential outer wall means integral with said partition means and extending upstream therefrom, circumferential inner wall means integral with said partition means and extending upstream therefrom, an annular flow control member formed of a distortable material positioned between and by said wall means and positioned to partially mask the upstream end of said partition means water passages, said annular member and wall means cooperating with each passage to form entrances thereto on opposite sides of said annular member.

4,000,858
METHOD AND APPARATUS FOR SCREENING AND COMMINUTING DEVICE

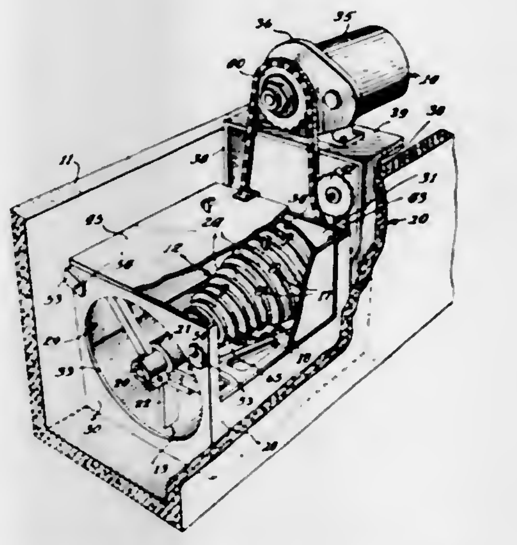
Stanley P. Rudzinski, 1156 S. Lombard Ave., Oak Park, Ill. 60304

Continuation-in-part of Ser. No. 472,681, May 23, 1974, Pat. No. 3,893,923. This application May 23, 1975, Ser. No. 580,135

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² B02C *23/36*

U.S. Cl. 241—27 **5 Claims**



2. A comminutor, said comminutor including
   a housing adapted to be placed in a flow channel in a position to intercept fluids carrying solid materials which must be comminuted,
   a rotor in the housing, said rotor having its axis positioned substantially parallel to the flow path of said fluids, and being composed of
   an axial shaft assembly and a plurality of rings fixed with respect to and carried by the shaft assembly, said rings being of an increasing diameter in a downstream direction,
   each ring carrying a plurality of cutter elements which project radially outwardly from its associated ring,
   each ring cutter element being received in an opening in the periphery of its carrying ring, and being held in place by
   a wedge assembly including an apertured wedge member having a pair of opposed faces disposed in radially outwardly diverging relation to one another, one face being adapted to be placed in abutting relation to a surface of said opening, the other face being adapted to be placed in abutting relation to a surface of a cutter element located in the opening, and a fastener extending through said aperture in said wedge member and secured to said ring, and
   a stationary cutter element carried by support structure integral with the housing,
   said stationary cutter element being located adjacent to the

path of travel of each cutter element carried by a ring whereby a cutting action occurs as each cutter element carried by a ring moves past an adjacent stationary cutter element.

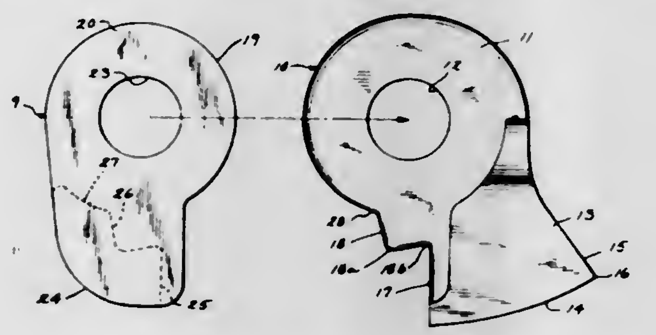
4,000,859
TWO-PIECE HAMMER

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,414

Int. Cl.² B02C *13/28*

U.S. Cl. 241—194 **9 Claims**



1. A two-piece hammer for use in a material shredder comprising: (a) a replaceable hammer face element having a hammer pin engaging portion and a material shredding face and (b) a separate reusable hammer peen portion having a hammer pin engaging portion and a relatively heavy body portion;

said hammer peen element and hammer face element being provided with interlocking means so that they can be united to form a unitary hammer in which the peen is positioned behind the hammer face and the hammer pin engaging portions of the two elements are aligned so that when the hammer is attached to a hammer bearing member by a single hammer pin the two elements cannot be separated and in operation the weight of the peen is effectively transferred to the hammer face to magnify the momentum and centrifugal force behind said face and to thereby facilitate the shredding of material by said hammer face.

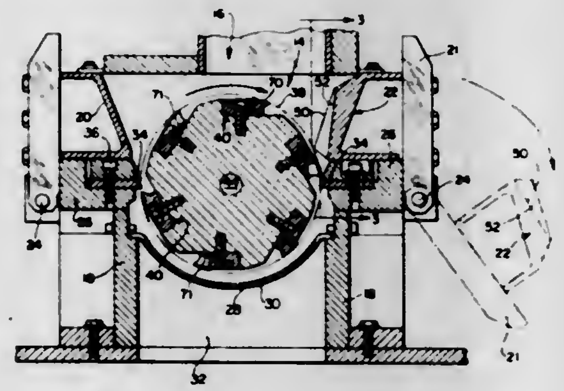
4,000,860
SIZE REDUCTION APPARATUS

Stanley T. Gotham, Somerset, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Nov. 13, 1975, Ser. No. 631,734

Int. Cl.² B02C *13/02*

U.S. Cl. 241—242 **6 Claims**



1. A granulator for size reduction of plastic material including heavy parts such as purgings and the like comprising, a chamber, a generally cylindrical rotor mounted within said chamber for rotation about an axis, means for driving said rotor about said axis, cutting means comprising a plurality of knives affixed on said rotor, a bed knife situated for cooperative cutting relationship with said rotor knives as said rotor is driven to effect size reduction of material fed into said chamber, said rotor having a plurality of partial cut out portions each extending along a chord and spaced about the periphery thereof, each of said cut out portions extending continuously along a major portion of the axis thereof and forming an uninterrupted seat having a flat base portion along said chord and an upstanding shoulder portion at the inner terminus thereof for abutting receipt of a rotor knife, each said rotor knife having a continuous heel and base portion and a knife face portion opposite said heel portion, the knife face of at least some of said rotor knives having a plurality of integral spaced blades and bolt means for maintaining said heel portion of said rotor knife against said shoulder portion of said seat and said base portion of said knife against said base portion of said seat, wherein said rotor knife includes a plurality of depressions provided in a top surface of said knife opposite said base portion of said knife, behind each blade thereof for receipt of said bolt means.

4,000,861
VACUUM FOOD MILL

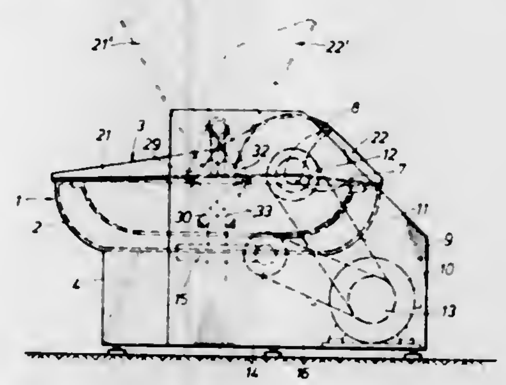
Ludwig Grebe, Wallau, Lahn, and Reiner Grebe, Biedenkopf, Lahn, both of Germany, assignors to Kraemer & Grebe GmbH & Co KG Maschinen- und Modellfabrik, Wallau, Lahn, Germany

Filed May 22, 1975, Ser. No. 579,828

Claims priority, application Germany, May 24, 1974, 2425142

Int. Cl.² B02C *18/12, 18/18*

U.S. Cl. 241—282.1 **8 Claims**



1. In a vacuum food mill or blender for cutting and mixing of food having a vacuum container, means for subjecting same to a source of vacuum, said vacuum container being comprised of a stationary lower part and a removable cover, a receptacle rotatably supported in said vacuum container and a cutter spindle projecting into said vacuum container and having knives thereon for cutting and mixing of the food contained in said receptacle, the improvement comprising wherein said cover of said vacuum container includes hinge means mounted on said lower part and extending transversely over the top of said receptacle and dividing said cover into plural cover sections, each of said cover sections being independently pivotally supported by said hinge means for movement toward and away from said receptacle.

4,000,862
WIRE-WRAP DEPTH CONTROL FOR HAND HELD WIRING GUN

George L. Datwyler, Salt Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,229

Int. Cl.² H01R *43/00*

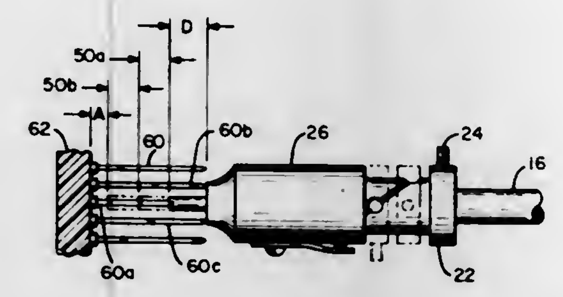
U.S. Cl. 242—7.06 **2 Claims**

2. A depth control for selectively establishing the depth at which a hand-held gun, which gun has a fixed nose assembly through which a wire wrapping bit rotatively extends, will wrap stripped electrical wire about an electrical-connector pin, comprising:

a collet that may be affixed to said wiring gun, said collet having a helical groove in an outer cylindrical surface thereof and a plurality of detents within said helical groove that are spaced along the longitudinal axis of said collet;

a level gauge including:

rotating means having an inside cylindrical surface for rotatively mounting about the outer cylindrical surface of said collet;



follower means for extending through said inside surface and into said helical groove;

means compressively securing said follower means upon said rotating means and within said helical groove for determining the axially directioned movement of said level gauge along said collet as said follower means follows said helical groove and comes to rest within a respective one of said detents.

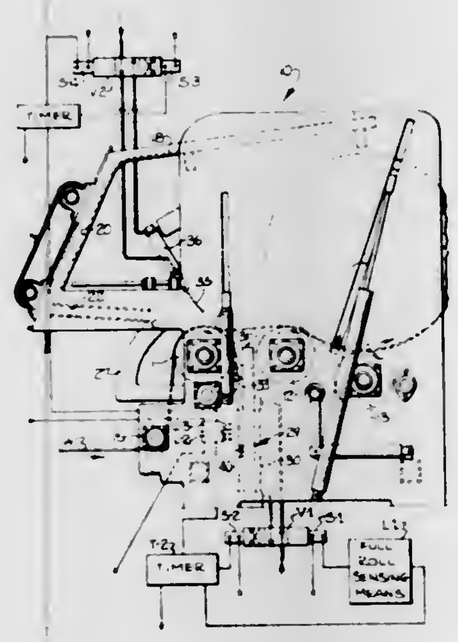
4,000,863
WINDING APPARATUS WITH WRAPPING ARRANGEMENT

John E. Straujups, Lexington, Mass., assignor to Birch Brothers Southern, Inc., Waxhaw, N.C.

Filed June 13, 1975, Ser. No. 586,742

Int. Cl.² B65H *19/20*

U.S. Cl. 242—56 R **9 Claims**



1. A winding apparatus comprising a plurality of elongate driving rolls mounted for rotation about parallel spaced apart axes for guiding forwardly advancing web material to be wound into a roll while supporting the roll of web material at a first winding position and in engagement with one of said driving rolls during initiation of winding and then supporting the roll of web material at a second winding position and in engagement with another of said driving rolls during continuation of winding, means for positioning winding cores at the first winding position for initiation of winding of web material thereon, carriage means movable transversely of the web material between the first and second winding positions, cutting means movable with said carriage means for engaging web material between the first and second winding positions and for severing the web material and forming a leading edge of forwardly advancing web material between the first and second winding positions, means for directing the leading edge of web material rearwardly about a winding core positioned at the first winding position, tucking means mounted for movement between a position withdrawn from the first winding position and a tucking position closely adjacent the first winding position and for engaging a rearwardly directed leading end portion of web material substantially throughout the width thereof for folding the web material about a fold line spaced from the leading edge of the web material while biasing the folded web material into a nip defined between the web material and the winding core at the first winding position, and control means including means for moving said tucking means from the withdrawn position toward the tucking position in timed relation to movement of said carriage means and as a leading end portion of web material is directed rearwardly about a winding core.

4,000,864
METHOD AND MEANS FOR WINDING PRE-CUT BAGS TO FORM ROLLS

Bernard Kurtz, Haguenau, and Ermes Spizzo, Schiltigheim, both of France, assignors to Les Ateliers de Constructions Mecaniques and C. A. Holweg S.A., both of Strasbourg, France

Filed Aug. 5, 1975, Ser. No. 602,184

Claims priority, application France, Nov. 20, 1974, 74.40370

Int. Cl.² B65H *75/00;* **B65G** *15/00*

U.S. Cl. 242—59 **9 Claims**

1. A process for winding bags previously cut to length, into rolls, comprising depositing each bag on an endless conveyor in partially overlapping relation with a bag previously deposited on said endless conveyor, passing the thus-formed series of partially overlapping bags on said endless conveyor between said endless conveyor and a superposed endless conveyor that moves at the same speed as the first-mentioned endless conveyor, gripping the forward edge of the foremost bag with a winding spindle in a winding station, rotating said winding spindle to roll up on said spindle a series of partially overlapping bags, and moving said winding spindle from said winding station thereby to separate the wound up bags from the next bags in said series of overlapping bags.

4,000,865
CONTROLLED TENSION LET-OFF FOR UNWINDING ROLLS OF MATERIAL

Jack C. Gaskins, Lanett, Ala., assignor to Batson-Cook Company, West Point, Ga.

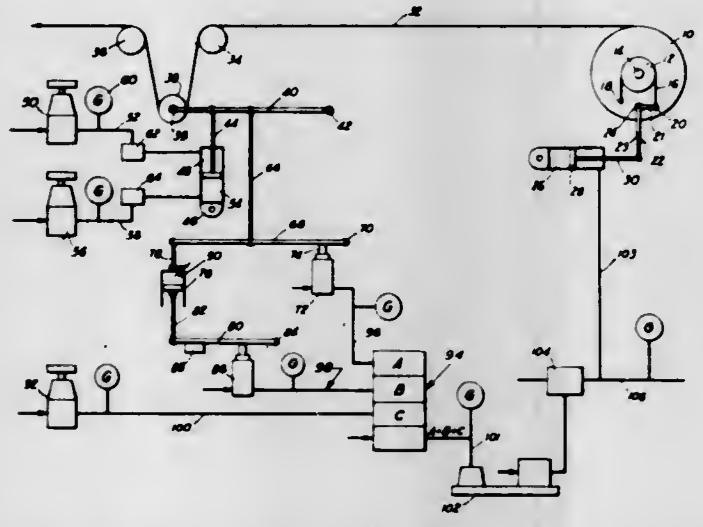
Filed Aug. 27, 1975, Ser. No. 608,184

Int. Cl.² B65H *25/22*

U.S. Cl. 242—75.43 **3 Claims**

1. Apparatus for maintaining uniform tension within a web of material being unwound from a rotatable beam of material, comprising a signal responsive brake operatively associated with said beam of material for retarding the rotation of said beam of material in order to control said tension within said web of material, vertically reciprocating dancer roll means disposed in contact with said web so as to be responsive to a

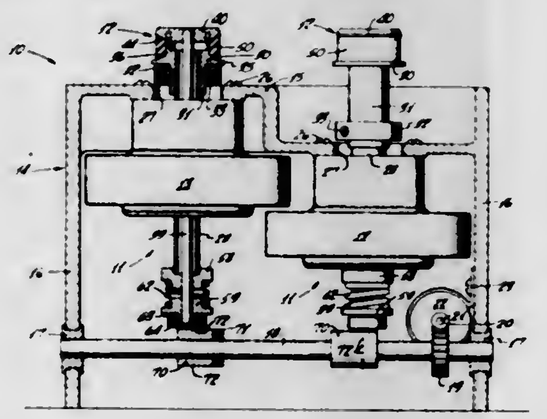
change in said tension of said web, a plurality of air pressure regulator means for emitting pressure control signals in response to the reciprocal movement of said dancer roll means, lever means interconnecting said dancer roll means and said air pressure regulator means for actuating said air pressure regulator means, dashpot means operatively associated with one of said air pressure regulator means for controlling said pressure control signal of said one of said air pressure regulator means for a predetermined period of time, computing relay means for receiving said signals of said plurality of air pressure regulator means and for transmitting a resultant signal to said brake for actuation thereof, pneumatic circuit means interconnecting said computing relay and said brake through which said resultant signal is transmitted, and adjustable ratio air pressure regulator means disposed within said pneumatic circuit means and interposed between said computing relay means and said brake for modifying said resulting signal of said computing means, whereby the braking level will have a predetermined value such that the dancer roll means will be at its mid-stroke position during normal running of said apparatus.



4,000,866
TAPE REEL DRIVE SYSTEM FOR VIDEO RECORDER/REPRODUCER

Gordon Schulz, Villa Park, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jan. 19, 1976, Ser. No. 650,456
Int. Cl.^{2} G03B *1/04*; **G11B** *15/32*
U.S. Cl. 242—203 **10 Claims**

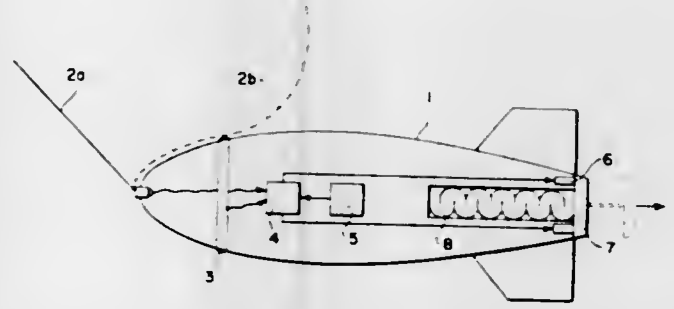


1. A positive gripping reel drive assembly comprising:
a drive shaft;
a motor connected to said drive shaft;
a first clamping ring connected to one end of said drive shaft;
a push rod mounted coaxially with said drive shaft;
a second clamping ring connected to one end of said push rod, adjacent said first clamping ring;
an expandable reel gripping ring mounted between said first and second clamping rings, said gripping ring being adapted to extend into a reel for engaging same, movement of said first and second clamping rings toward each other longitudinally compressing and laterally expanding said gripping ring into engagement with a reel mounted thereon;
means connected between said drive shaft and said push rod for applying a force therebetween to maintain said gripping ring in said expanded condition; and
means for selectibly separating said clamping rings to permit relaxation of said gripping ring and release of said reel.

4,000,867
CONTROL FOR THE RELEASE OF A PARACHUTE WITHIN A TOWED AIRCRAFT

Wolfgang Daikeler, Friedrichshafen, and Horst Deppner, Langenargen, both of Germany, assignors to Dornier GmbH, Germany

Filed Jan. 20, 1976, Ser. No. 650,795
Claims priority, application Germany, Mar. 19, 1975, 2511984
Int. Cl.^{2} B64D *3/00*; **F41J** *9/10*
U.S. Cl. 244—1 TD **4 Claims**



1. A control system for the release of a parachute contained within an aircraft adapted to be towed by cable means secured thereto,
said cable means being electrically conductive and having electrical contact to a control wiring means in said aircraft,
and electrically conductive contact ring means on the contour of said aircraft and being insulated with respect to the skin of said aircraft,
whereby in case of separation of said cable means from a towing aircraft, said cable means touches said contact ring means and closes a circuit composed of said contact ring means, said cable means, and said control wiring means which releases said parachute.

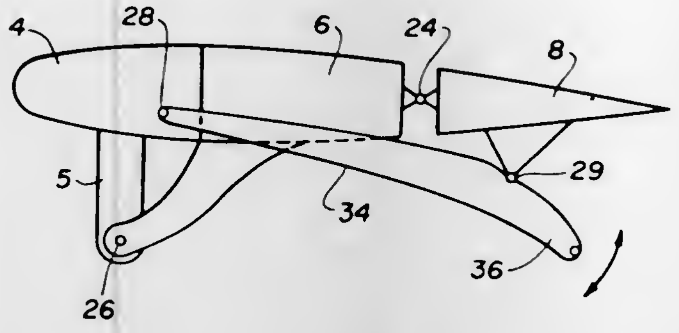
4,000,868
DEFLECTOR BLADE OF VARIABLE CAMBER

Peter Gregor, Immenstaad, Germany, assignor to Dornier GmbH, Friedrichshafen, Germany

Filed Nov. 10, 1975, Ser. No. 630,184
Claims priority, application Germany, Nov. 12, 1974, 2453558
Int. Cl.^{2} B64C *15/06*
U.S. Cl. 244—12.5 **9 Claims**

1. A deflector blade of variable camber comprising
a. a leading edge portion;
b. a trailing edge portion;
c. an intermediate portion interposed between said leading and trailing edge portions;
d. a crank member;
e. a first pivot hingedly connecting said leading edge portion to said intermediate portion;
f. a second pivot hingedly connecting said crank member to said leading edge portion;
g. a third pivot hingedly connecting said intermediate portion to said trailing edge portion,

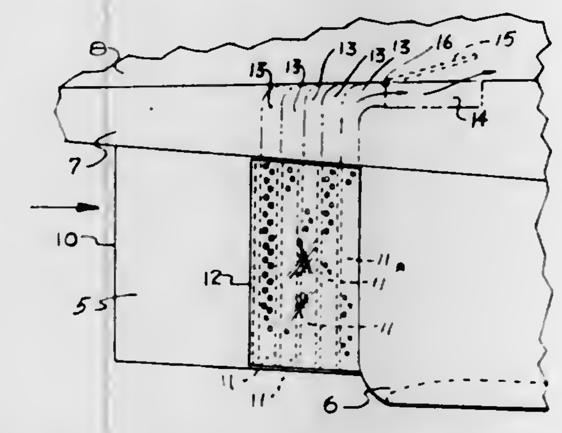
h. a fourth pivot hingedly connecting said trailing edge portion to said crank member,
  1. said first, second, third, fourth pivots having respective spaced, parallel axes,
  2. the axes of said first and third pivots defining a connecting line intersecting the connecting line defined by the axes of said second and fourth pivots in a plane perpendicular to said axes,
  3. a part of said crank member extending from said second pivot beyond said fourth pivot; and
i. actuating means including an actuating member secured to said part of said crank member for angularly moving said crank member about the axis of said second pivot.



4,000,869
STRONG SHOCK BOUNDARY LAYER INTERACTION CONTROL SYSTEM

Wilford F. Wong, Lakewood; Gordon R. Hall, Manhattan Beach; Tatsuo W. Tsukahira, Los Angeles, and Robert D. Sutton, Cypress, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 21, 1975, Ser. No. 624,374
Int. Cl.^{2} B64D *33/02*
U.S. Cl. 244—53 B **3 Claims**

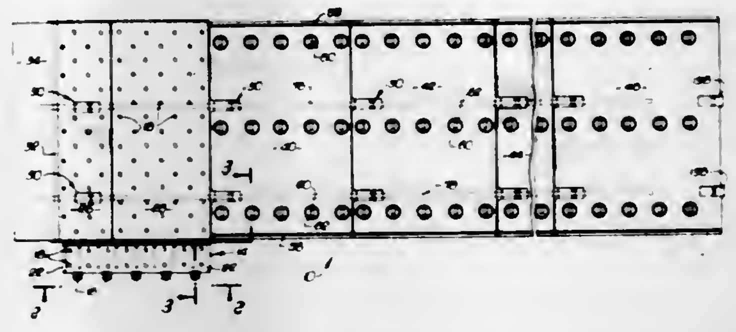


1. In combination with a supersonic aircraft engine inlet provided with a compression ramp extending forwardly of the opening of said inlet, means suppressing strong shock-induced flow separation occurring from the interaction of turbulent boundary layer air on said ramp and normal shock increasing to Mach 2 strength, comprising:
a. means defining a row of vertically disposed plenums in the interior of said ramp, said plenums extending across the region relative to the leading edge of said ramp and the opening of said inlet where said flow interaction occurs,
b. a fixed, flat porous plate covering said plenums to bleed said turbulent boundary layer air into said plenums,
c. separate duct means leading from each of said plenums to a region of low pressure adjacent to the exterior of said aircraft to exhaust air from said plenums, and
d. variable position valve means for incrementally controlling the exhaust exit of said duct means.

4,000,870
MODULAR SYSTEM FOR QUICK CONVERSION OF AIRCRAFT PASSENGER COMPARTMENTS TO CARGO BAGGAGE/COMPARTMENTS

David J. Davies, Everett, Wash., assignor to Western Gear Corporation, Lynwood, Calif.

Filed Sept. 8, 1975, Ser. No. 610,999
Int. Cl.^{2} B64C *1/20*; **B64D** *9/00*
U.S. Cl. 244—118 R **27 Claims**

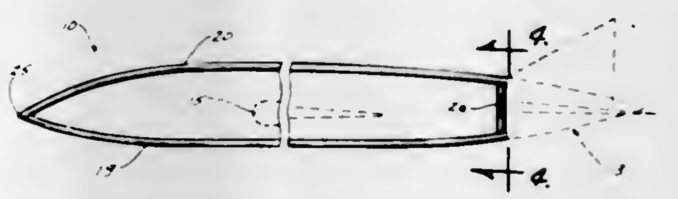


1. A panel for use in a quickly convertible modularized system for securing cargo in passenger compartments of aircraft, said panel comprising:
an elongated flat floor member having an upper side providing a floor surface and a lower side to face an aircraft floor,
quick connect and disconnect fittings in said floor member for engagement with aircraft fittings to secure said floor member to said aircraft,
cargo container stops in said floor member to hold cargo containers in place,
conveying means on said floor member for providing easy movement of cargo containers thereon,
guide means on said floor member for guiding cargo containers into place and for holding said containers in place, and
said quick fittings depend from frames supporting said stops, and include shear plungers for engaging said aircraft fittings and supporting said floor member in shear with respect to said aircraft.

4,000,871
AIRPLANE FUSELAGE STRUCTURE

Kermit M. DeHaai, R.R. No. 1, Monroe, Iowa 50170

Filed July 31, 1975, Ser. No. 600,736
Int. Cl.^{2} B64C *1/08*
U.S. Cl. 244—119 **12 Claims**



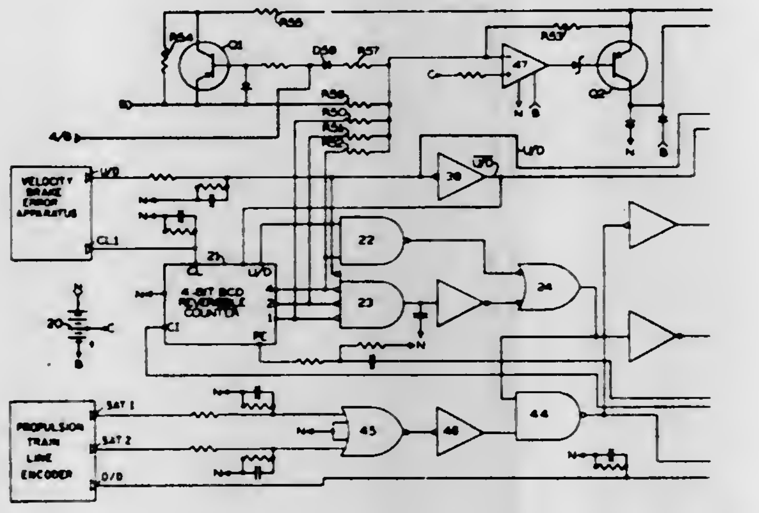
1. An airplane body comprising:
a longitudinally extending fuselage, said fuselage being substantially concave along the bottom thereof;
a first strut member attached to said fuselage along one side of said concave bottom and extending substantially from the front of said fuselage to a point forward of the rear end of said fuselage;
a second strut member attached to said fuselage along the other side of said concave bottom and extending substantially from the front of said fuselage to a point substantially forwardly of the rear end of said fuselage, said first and second strut members having ends terminating substantially forwardly of the rear end of said fuselage and being spaced apart by a substantial distance at said terminating ends, whereby said first and second struts form skid means for emergency landing purposes;
a pair of wings attached to said fuselage; and

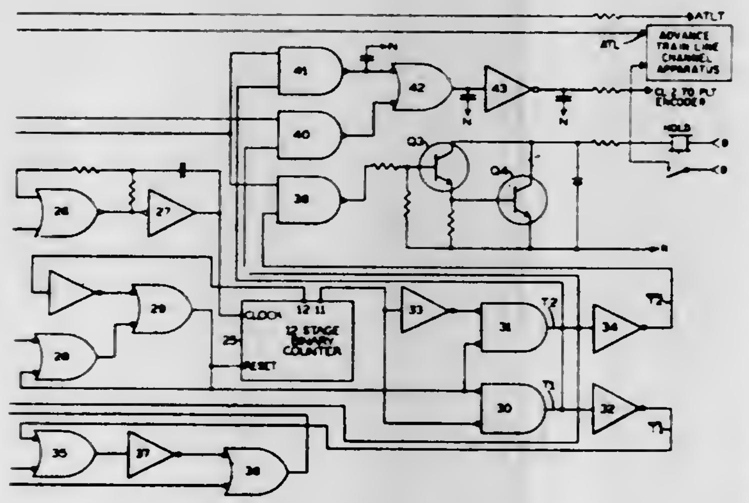
a tail attached to said fuselage rearwardly of the first and second strut members.

4,000,872
ADVANCE TRAIN LINE REGISTER FOR A TRAIN SPEED REGULATION SYSTEM

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,370
Int. Cl.² B61L *3/20*
U.S. Cl. 246—182 R **14 Claims**


VELOCITY BRAKE ERROR APPARATUS
4-BIT BCD REVERSIBLE COUNTER
PROPULSION TRAIN LINE ENCODER
47
22
23
24
45
46
44



1. An advance train line register apparatus for use in a train speed regulation system which also includes on each train a propulsion train line encoder to set base propulsion levels for the train, comprising in combination,

a. a count register means responsive to the reception of clock input pulses and a count direction signal for registering the level of the pulse count by adding or subtracting each received clock pulse from the existing pulse count registry in accordance with the up/down condition of the count direction signal, and operable between zero and a predetermined maximum count limits,

b. said count register means connected for receiving input clock pulses when a speed regulation difference exists between desired and actual train speeds and a count direction signal conditioned in accordance with the under or over status of the speed difference,

c. a converter means connected for receiving the existing pulse count from said register means and operable for converting the total count into a stepped output signal having preselected levels increasing as the count total becomes larger and vice-versa,

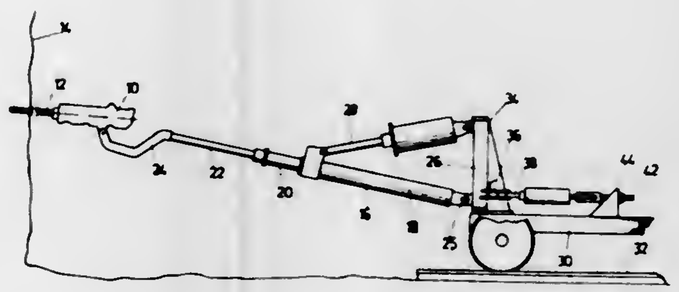
d. an advance train line output means connected for transmitting said stepped signal for changing the propulsion level of said train in successive car by car steps to a higher or lower level as said stepped signal increases or decreases, respectively, and

e. a clock logic means controlled by said register means and responsive to either a maximum or a zero pulse count limit for generating another distinctive clock pulse to actuate a shift to a higher or lower base propulsion level for said train as the maximum or zero limit is reached, respectively, by said count register means.

4,000,873
MOUNTING FOR ROCK DRILLS

Trevor Evelyn Wallace, Sandton, Transvaal, South Africa, assignor to The Steel Engineering Company Limited, Roodepoort, South Africa

Filed Feb. 12, 1976, Ser. No. 657,537
Int. Cl.² E21C *5/11, 9/00, 11/00*
U.S. Cl. 248—2 **2 Claims**

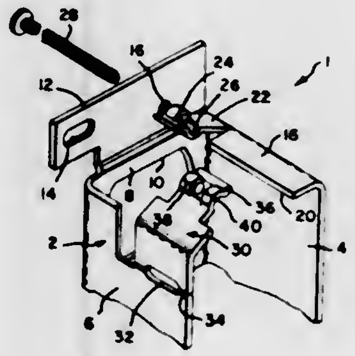


1. A mounting for rock drills comprising a drill feed leg composed of a fluid operated piston and cylinder, a vertical support mounted for rotation about an axis, an adjustable counterbalancing arm, with the rear end of the feed leg, the support and the arm forming a triangle which can swing about an axis parallel to the vertical support and with the front end of the feed leg extending beyond the triangle and carrying a mount for a rock drill, so that the shape of the triangle changes as the mount is raised and lowered, a lever arm extending from the support, a fluid thrustor, the thrust of which can be regulated to counteract the forces tending to move the feed leg sideways, acting between the lever arm and fixed structure, and a common regulated fluid supply for the feed leg and the thrustor so that the bias exerted by the thrustor is proportional to the thrust applied by the feed leg.

4,000,874
WIRING DEVICE WITH REMOVABLE FINGER PORTION

Richard James Finley, Camp Hill, and Warren David Nauman, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 29, 1975, Ser. No. 545,242
Int. Cl.² H02G *3/08*
U.S. Cl. 248—27.1 **3 Claims**

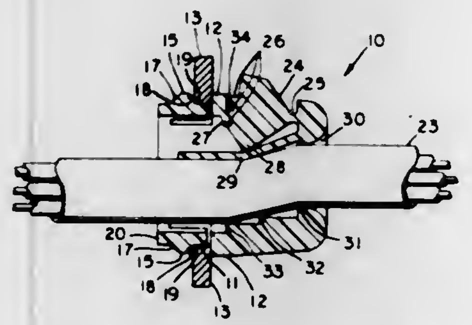


1. A wiring device, comprising: a wire receiving portion, a bracket having a projecting portion engageable on an obverse surface of a wallboard, a finger portion of said bracket being initially assembled in close conformity with the periphery of said bracket to allow insertion of said bracket into an opening of a wallboard, said finger portion being pivotable by a threaded fastener to project outwardly beyond the periphery of said bracket, said finger portion being capable of advancement along said fastener into engagement against a reverse surface of a wallboard whereby the wallboard is gripped between said projecting portion and said finger portion to mount said wiring device in said wallboard opening, stop means provided on said bracket, said finger portion being pivotable into engagement against said stop means to project outwardly beyond the periphery of said bracket, said finger portion being capable of advancement along said fastener while engaged against said stop means, and said finger portion including a first fastener alignment portion freely receiving said fastener therethrough and a fastener securing portion adjustably secured to said fastener, said bracket having a projecting ear provided with a second fastener alignment portion.

4,000,875
ONE-PIECE STRAIN RELIEF BUSHING WITH INDEPENDENT HOLDING MEANS

William Jemison, Summit; Salvatore Orlando, Rahway, and Richard Fink, Basking Ridge, all of N.J., assignors to Heyman Manufacturing Company, Kenilworth, N.J.

Continuation-in-part of Ser. No. 477,780, June 11, 1974. This application May 9, 1975, Ser. No. 574,621
Int. Cl.² H01R *13/58*
U.S. Cl. 248—56 **10 Claims**



1. A one-piece strain relief bushing including means independent of its strain relief function to hold itself locked in an aperture, said strain relief bushing including an opening therethrough through which a cable may be received, and an aperture extending into said bushing from the circumference of its body, said aperture opening into said cable receiving opening, a cam having a locked and unlocked position, said cam extendable through said aperture into the body of said bushing and into said cable opening, said cam including a hinge at one portion of said cam on said body of said bushing and at an edge of said aperture, said cam further including means to grip at another portion of said cam, means in said bushing to engage said cam's means to grip and to hold said cam locked in position in said cable opening.

4,000,876
ONE-WAY SUPPORT FOR STEERING COLUMN

Hideyuki Usui, and Toshimitsu Kimura, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

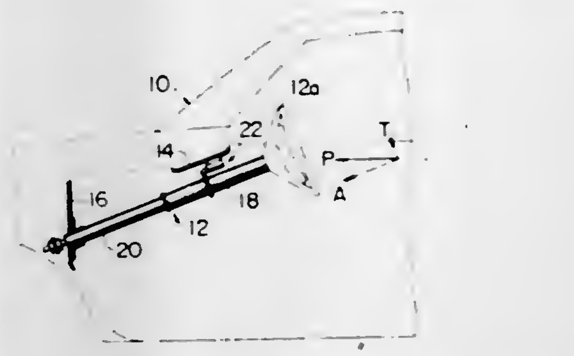
Filed Nov. 4, 1974, Ser. No. 520,952
Claims priority, application Japan, Nov. 7, 1973, 48-128084
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.² F16M *13/02;* **B60R** *21/02*
U.S. Cl. 248—205 R **1 Claim**

1. A "one-way" support for a steering column comprising:

a mount bracket having fixed thereon two elongated tubular collars spaced and extending in parallel with each other;

a support member in the form of a rod, said rod having a generally V-shaped intermediate portion and two end portions extending in the same direction from said V-shaped intermediate portion into said collars and in parallel with each other;

said two tubular collars surrounding circumferentially said two end portions, respectively, and spaced therefrom defining therewith annular interspaces, respectively; and two prestressed elastomeric sleeves positioned between said tubular collars and said end portions in said annular interspaces, respectively; said mount bracket being supported in use on an instrumental panel of a vehicle in which a steering column assembly is installed and said V-shaped intermediate portion carrying securely thereon an upper tube portion of the steering column assembly, such that the steering column assembly thereby provides an arrangement whereby application of an axial force to the assembly in a sense tending to cause forward displacement of the upper tube portion urges said V-shaped intermediate portion forwardly and causes said end portions to slip forwardly out of said collars, and upon the application of a lateral force with respect to said axial force, said end portions compress said elastomeric sleeves radially with consequent absorption of said lateral force;

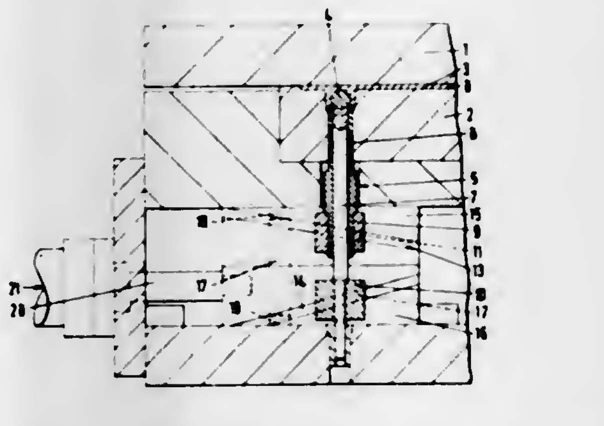


said support member having flanges on said end portions, respectively, engaging forward ends of said tubular collars; and said rod being deformable that upon the application of said lateral force, the upper tube portion of said steering column assembly deforms said V-shaped intermediate portion with efficient absorption of said lateral force.

4,000,877
MOULDING

Terence H. C. Shead, Chorley Wood, and David G. Wills, St. Albans, both of England, assignors to Worldwide Plastics Development Limited, Wolverhampton, England

Filed Apr. 9, 1975, Ser. No. 566,343
Claims priority, application United Kingdom, Apr. 25, 1974, 18179/74
Int. Cl.² B29C *11/00*
U.S. Cl. 249—82 **5 Claims**



1. Apparatus for forming a moulded product comprising a reinforcement encapsulated in a plastic moulding material, the apparatus comprising a mould, said mould including a plurality of support pins for the temporary support of said reinforcement in said mould, and at least one of said pins being retractable into the surface of said mould, wherein at least one reservoir is provided in said mould, each reservoir being formed in or around a retractable support pin, opening into said mould, extending inwardly of said mould surface, and containing therein a piston, the reservoir being positioned so

that during an initial part of a moulding operation some of said plastics moulding material enters the reservoir, and means for retracting said pin and means for moving said piston outwardly on retraction of said pin to force said moulding material out of the reservoir into the vicinity of the part of said mould previously occupied by said pin.

4,000,878

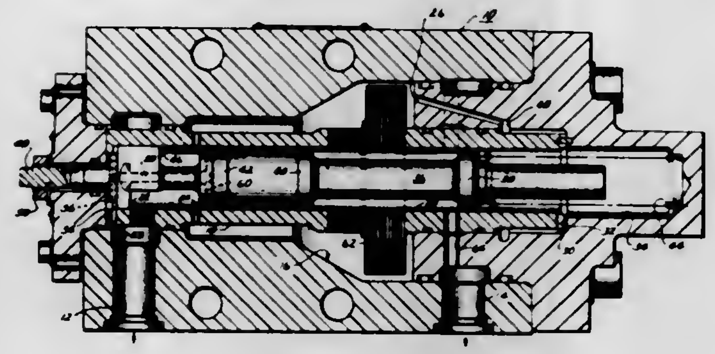
QUIETING MEANS FOR A FLUID FLOW DEVICE

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Division of Ser. No. 470,251, May 15, 1974, which is a continuation of Ser. No. 293,956, Oct. 2, 1972, abandoned. This application July 29, 1975, Ser. No. 600,021

Int. Cl.² F16K *47/08*

U.S. Cl. 251—127 **9 Claims**



1. A flow control device for installation in a fluid transfer system including a spool valve member controlling a flow of fluid under high pressure such that a potentially destructive or noise-generating fluid pressure differential exists;

a rigid structure surrounding said spool valve member comprising a series of stacked annular disks having abutting faces, some of said disks including a pattern of elongated slots therethrough defining areas of individual chambers and some of said disks having orifices therethrough of substantially smaller area than said slots, said slots and orifices alternating in pattern across said disks to produce a plurality of individual passageways across said structure, some of said disks having imperforate areas adjacent said slots to confine flow in defined streams in each of said passageways such that each such stream always changes direction to flow across the same orifice disk,

movement of said spool valve serving to expose varying numbers of said disks to said flow of fluid.

4,000,879

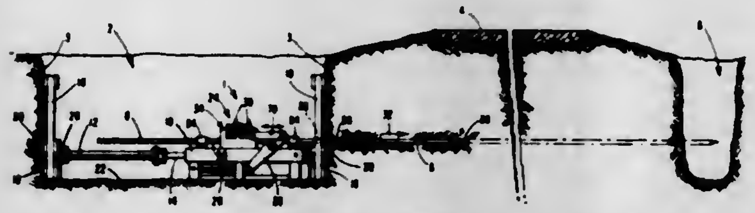
PUSHING OR PULLING APPARATUS FOR PIPE, ROD OR THE LIKE

James Scott Martin, Perry, and Robert E. Cook, Orlando, both of Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Oct. 23, 1974, Ser. No. 517,393

Int. Cl.² E21B *19/00*

U.S. Cl. 254—29 R **9 Claims**



1. Apparatus for pushing or pulling an elongated member, such as a pipe, rod or the like, through a subterranean area comprising:

a frame adapted to be mounted within a subterranean-pit and having extensible means to engage opposed walls of the pit to retain said frame in a desired operating position within the pit, said extensible means comprising a hydraulically extensible jacking means operable by pressurized hydraulic fluid supplieo remote from said jacking means and remote from the subterranean pit for said frame to exert and maintain pressure against the opposed walls of the pit in fixing the apparatus during its operation;

reversible gripping means mounted on said frame to be cooperable with the elongated member and be movable longitudinally relative to said frame, said gripping means having a gripping member whereby the elongated member is grippingly engaged when said reversible gripping means is moved in a gripping direction and is disengaged when said gripping means is moved in an opposite direction relative to said frame, said gripping member being shiftable to reverse the gripping direction of said gripping means; and

hydraulically extensible means connected between said frame and said reversible gripping means for imparting movement to said gripping means relative to said frame wherein pushing of the elongated member is effected when said reversible gripping means is moved in said gripping direction and pulling effected when said gripping member is shifted to reverse the gripping direction.

4,000,880

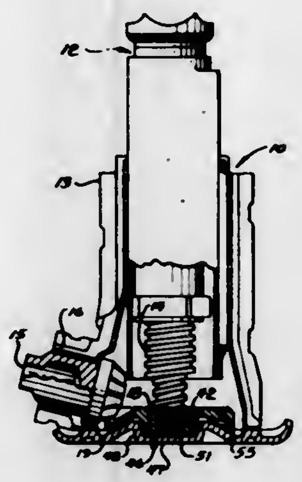
SCREW JACK

Richard S. Graafsma, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Division of Ser. No. 544,384, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,362, April 26, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,854

Int. Cl.² B66F *3/16*

U.S. Cl. 254—103 **7 Claims**



1. A screw jack for lifting autos and the like, comprising a housing, a load member at least partially extensible and retractible relative to the housing, a rotatable screw member adapted to extend and retract the load member, a toothed gear fixed to the screw member for rotation therewith, and means for engaging the gear teeth and causing gear and screw member rotation, the gear having a hub, a planar face, teeth disposed around the gear circumference, and a generally truncated, conical undersurface, the jack further comprising a base plate including a well extending above outer portions of the plate and adapted to receive and journal the gear hub, and a truncated conical surface adjacent the well adapted to generally conform the undersurface of the gear.

4,000,881

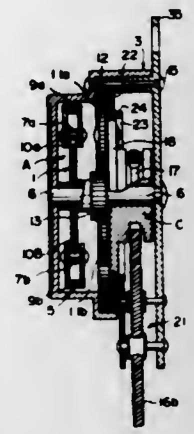
SLOWDOWN ESCAPING APPARATUS

Kouichi Matsumoto, Tokyo, Japan, assignor to Matsumoto Kiko Co., Ltd., Tokyo, Japan

Filed June 19, 1975, Ser. No. 588,302

Int. Cl.² B66D *5/04*

U.S. Cl. 254—157 **2 Claims**



1. In a slowdown escaping apparatus comprising a casing having a brake drum, rotational braking means disposed in the casing, said braking means including a brake disk and a plurality of centrifugal brake members engageable with the brake drum, rotational motion transmitting means disposed in the casing and connected to the brake disk and including a plurality of planetary gears, an internal gear and a pinion gear, a grooved rope pulley disposed in said casing and connected for transmitting rotational motion to said rotational motion transmitting means, and a rope extending around the pulley, whereby in case of an emergency a person supported on the rope can descend at a controlled speed, the improvement which comprises:

said brake disk has a plurality of pairs of circumferentially spaced-apart fan-shaped guide portions projecting therefrom and defining a plurality of circumferentially spaced recessed portions, each of said centrifugal brake members being movably positioned in one of said recessed portions and having a brake lining engageable with the brake drum, each of said centrifugal brake members including a U-shaped base spanning the brake disk, said base having a pair of legs extending toward the brake disk and an outer arcuate connecting web extending between said legs with said brake lining being mounted on said web, and a pair of pins extending between the legs of said base and adapted to contact the respective guide portions of the associated recessed portion, whereby when said brake disk is rotated in either a clockwise or a counterclockwise direction, the corresponding one of said pair of pins is pressed against the corresponding one of said guide portions and said brake lining is pressed against said brake drum.

2. In a slowdown escaping apparatus comprising a casing having a brake drum, rotational braking means disposed in the casing, said braking means including a brake disk and a plurality of centrifugal brake members engageable with the brake drum, rotational motion transmitting means disposed in the casing and connected to the brake disk and including a plurality of planetary gears, an internal gear and a pinion gear, a grooved rope pulley disposed in said casing and having a portion carrying said planetary gears for transmitting rotational motion to said rotational motion transmitting means, and a rope extending around the pulley, whereby in case of an emergency a person supported on the rope can descend at a controlled speed, the improvement which comprises:

a shield plate located in said casing and dividing same into a first chamber containing said grooved rope pulley and a second chamber separate from said first chamber and containing said braking means and said rotational motion transmitting means, said shield plate including an L-shaped flange portion arranged adjacent to the outer periphery of said portion of said grooved rope pulley carrying said planetary gears, said flange portion having a predetermined dimension whereby said portion of said grooved rope pulley remains within said L-shaped flange portion and dust in said first chamber is prevented from entering into said second chamber even when said grooved rope pulley is displaced axially.

4,000,882

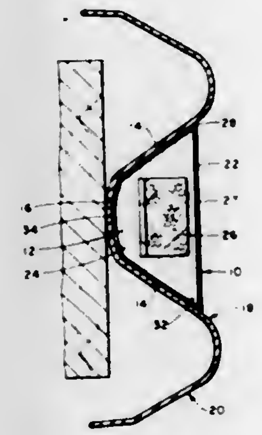
CONTRASTING MARKER PANEL FOR HIGHWAY GUARDRAILS AND THE LIKE

Hugh V. Penton, San Marino, Calif., assignor to California Metal Enameling Company, Los Angeles, Calif.

Filed Aug. 28, 1975, Ser. No. 608,516

Int. Cl.² A01K *3/00*

U.S. Cl. 256—13.1 **10 Claims**



1. In a contrasting marker panel for highway guardrails and the like, the guardrails being of the type having a generally U-shaped cross section recess therein extending continuously longitudinally thereof and generally transversely facing traffic flow; the marker panel comprising: a longitudinally extending main body having a generally vertical front surface and vertically spaced, upper and lower side surfaces; said body being at least internally formed of force crushable material; said body side surfaces being located generally conforming to and abutable against complementary surfaces of the guardrail recess with said body totally within and vertically spanning said recess, said body front surface being located spaced rearwardly of forward extremities of said recess; securement means for fastening said body totally within said guardrail recess; contrasting surface portions on said main body exposed generally forwardly of said main body and the guardrail and clearly distinguishing from the guardrail when said main body is fastened within said guardrail recess, said body contrasting surface portions comprising a majority of body surfaces exposed generally forwardly of said body and said guardrail

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4,000,883

RAILING CONSTRUCTION

Robert H. Murdock, Kensington, Calif., assignor to NEF Systems, Richmond, Calif.

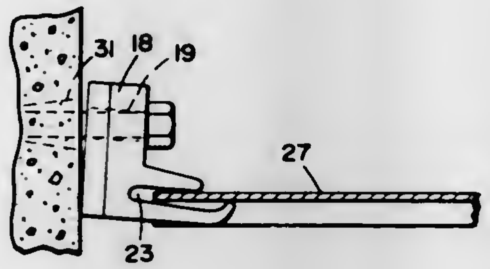
Filed Oct. 1, 1975, Ser. No. 618,566

Int. Cl.² E04H *17/14*

U.S. Cl. 256—65 **7 Claims**

1. A railing assembly comprising a rail member having a laterally extending web portion and a mounting bracket for engaging said web portion and securing said rail member to a structural member, said mounting bracket including a lateral

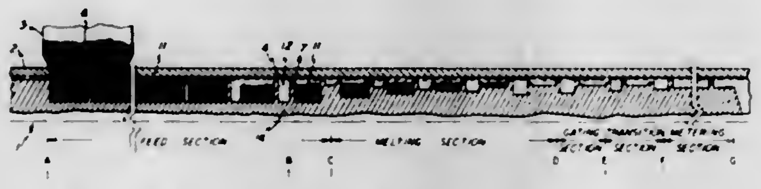
slot for receiving said web portion, and securance means for securing said mounting bracket to said structural member with said lateral slot aligned obliquely with respect to said web portion for binding engagement thereof.



4,000,884
EXTRUDER SCREW

Chan I. Chung, 2483 Whitehall Court, Schenectady, N.Y. 12309

Filed July 25, 1975, Ser. No. 599,004
Int. Cl.² B29B *1/10*
U.S. Cl. 259—191 10 Claims

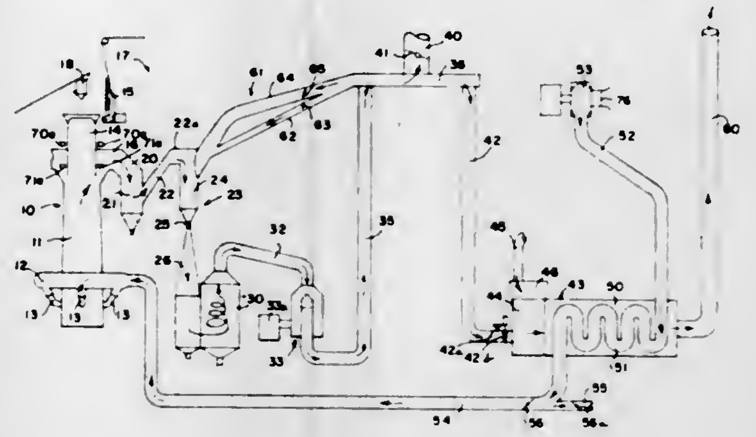


1. An extruder screw comprising:
a feed section along the inlet end of said screw:
a melting section along an intermediate section of the screw:
at least one pair of substantially parallel, helical, primary and secondary threads of substantially constant pitch, integral with a core, each of said threads having a leading edge and a trailing edge;
said primary thread of the pair:
originating at the beginning of said feed section to form a feed channel, defined by the leading edge of the primary thread and the trailing edge of the adjacent, downstream primary thread;
continuing through said melting section;
having a substantially constant diameter in both the feed section and the melting section;
said secondary thread of the pair:
originating in the downstream half of the feed section by its beginning edge arising from the floor of said feed channel without causing significant interference to the material flow from the feed channel;
continuing through the melting section;
having a substantially constant diameter in both the feed section and the melting section, which is less than the diameter of the primary thread of the pair in the same two sections:
the feed channel being divided by said beginning edge of the secondary thread into an open-ended melt channel, defined by the leading edge of the primary thread and the trailing edge of the secondary thread of the pair, and an open-ended solids channel of larger cross-sectional area than that of said melt channel, defined by the leading edge of the secondary thread and the trailing edge of the adjacent, downstream primary thread;
the root diameters of the melt channel, said solids channel and the feed channel, measured at the origin of the secondary thread, being substantially equal to each other;
the initial root diameter of the melt channel progressively increasing to the downstream end of the feed section to a value which is no greater than the diameter of the secondary thread in the same section and, thereafter, progressively decreasing in the melting section;
the root diameter of the solids channel progressively increasing in the melting section to a value which is no greater than the diameter of the secondary thread in the same section.

4,000,885
CUPOLA FURNACE WASTE GAS RECUPERATIVE SYSTEM AND METHOD FOR OPERATING SAME

William A. VanDril, Chicago Heights, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Nov. 18, 1974, Ser. No. 524,543
Int. Cl.² C21B *7/22*
U.S. Cl. 266—83 6 Claims



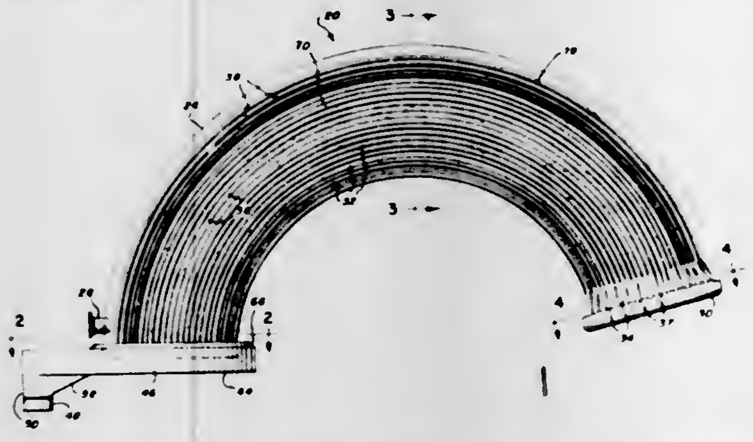
3. In an open top cupola installation comprising an open top cupola with waste gas collecting and cleaning means and a waste gas latent heat recuperative system, said cupola having, means for introducing a variable flow of blast air into the lower portion thereof, waste gas collecting means at the top portion thereof and below the top opening therein, means for sensing and controlling the flow of said blast air, means for sensing and controlling the pressure of waste gas flowing through said waste gas collecting means; cleaning means operatively connected downstream from said collecting means including wet type dust particle removing means, exhaust fan means operatively connected downstream from said cleaning means, waste gas combustion means downstream from said exhaust fan means, and heat exchange means downstream from said combustion means operatively connected in heat exchange relation with the incoming blast air, the improvement comprising having the optimum subatmospheric pressure in said collecting means determined by said flow sensing and controlling means with said pressure sensing and controlling means being operatively responsive thereto, having as the means for controlling the inflow of ambient air into the open top of said cupola as a substantially fixed proportion of the incoming blast air and consequently as a substantially fixed proportion of the waste gas flow, a recirculating duct means including valving means therein connecting the downstream side of said exhaust fan means with the entry portion of said waste gas cleaning means, and said valving means being operatively responsive to said pressure sensing and controlling means for preventing explosions inside said waste gas collecting and waste gas cleaning means.

5. In a method of operating an open top cupola installation including an open top cupola, a wet-type waste gas cleaning system and a latent heat waste gas recuperative system, said method including the steps of: introducing a variable flow of blast air into the lower portion of said cupola; drawing gas into said cleaning and recuperative systems through a waste gas collecting means at the top portion of said cupola and below the top opening therein; measuring the flow of said blast air, measuring the pressure of waste gas flowing inside said gas collecting means; cleaning said waste gas in said cleaning system; raising the pressure of said clean waste gas in exhaust fan means to a level sufficiently high to cause flow of said clean waste gas into a combustor downstream from said exhaust fan means; burning said clean waste gas in said combustor; and exchanging heat from said burned waste gas to said incoming blast air downstream from said combustor, the improvement comprising proportionalizing the flow of incoming blast air with the flow of indrawn ambient air through the open top of said cupola by recirculating at least a portion of the flow of said clean waste gas from a point downstream of the exhaust fan means to the inlet portion of said gas cleaning system, and regulating the recirculating flow by determining the optimum subatmospheric pressure in said gas collecting means according to the flow of incoming blast air, and operating valving means to control said recirculation in response to the pressure in said waste gas collecting means for maintaining a substantially fixed proportion of air in the waste gas regardless of the flow of said incoming blast air and preventing explosions in said waste gas collecting and cleaning means.

4,000,886
FURNACE EXHAUST DUCT

Frank N. Johnson, Fulton, Ill., assignor to J. T. Cullen Company, Fulton, Ill.

Filed Mar. 24, 1975, Ser. No. 561,254
Int. Cl.² C21B *3/00*
U.S. Cl. 266—147 19 Claims



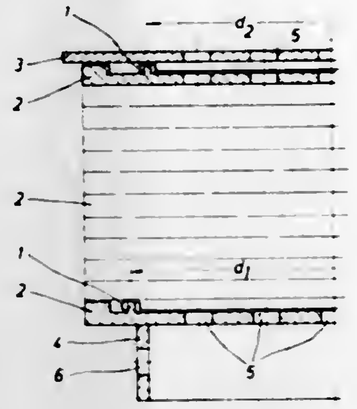
10. A water cooled furnace exhaust duct for use with a blast furnace or the like, comprising:
a duct wall formed by a plurality of adjacent cooling conduits, the axis of each cooling conduit forming an integral part of the duct wall being generally parallel to the duct axis;
a support, coolant inlet conduit connected to at least some of the cooling conduits and for supporting the exhaust duct adjacent the furnace, said support coolant inlet being substantially larger than each of the cooling conduits; and
a manifold connected on the furnace end of the coolant inlet conduit for distributing the coolant to the smaller cooling conduits to thereby provide a self-supporting, water cooled exhaust duct for the furnace.

4,000,887
DEVICE FOR LOW-WARP HARDENING OF ANNULAR SEALING MEMBERS

Ruf Max, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurtt, Germany

Filed May 7, 1976, Ser. No. 684,009
Claims priority, application Germany, May 9, 1975, 2520697; Sept. 20, 1975, 7529806
Int. Cl.² B23K *19/00*
U.S. Cl. 266—274 3 Claims

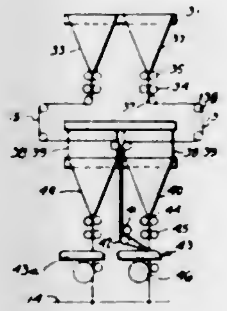
1. Fixture for low-warp hardening of thin-walled annular sealing members of hardenable metallic materials, having a C-shaped cross section and capable of being charged in a tempering furnace or the like, comprising, the fixture consisting of a plurality of stackable trays having an annular rim on top and, radially within said rim, an annular web to accommodate a sealing member, the height of the web being at least equal to that of the rim and greater than the height of the sealing member, and the under-side of the next tray being flat in the neighborhood of the web and presses the sealing member down on the web.



4,000,888
WEB SEVERING DEVICE

Frank H. Gardner, 828 Highview St., Joplin, Mo. 64801, and David L. Dimmitt, 638 Marin Ave., Ontario, Calif. 91761

Filed July 17, 1975, Ser. No. 596,813
Int. Cl.² B41F *13/56*
U.S. Cl. 270—21 7 Claims



1. A device for severing an endwise traveling web of a printing press or the like comprising
a web severing blade,
spring means for actuating said blade through a web severing movement from a retracted position,
first latch means for latching said blade in said retracted position,
means for actuating said first latch means, to allow said blade to move through said severing movement,
second latch means for additionally latching said blade in said retracted position, and
a manually operable control device,
said device being movable to a first position, means interconnecting said control device with said blade for concurrently moving said blade to said retracted position,
said device being movable to a second position to actuate said second latch means to latch said blade in said retracted position, and
said device being movable to a third position to release said second latch means from said blade.

4,000,889
CAM-OPERATED PHASING MECHANISM FOR A COLLATOR

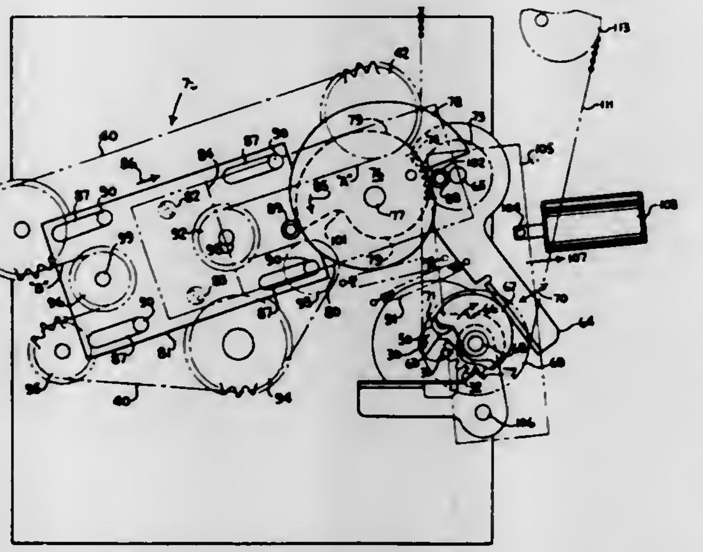
Hans C. Mol, Wilton; Leroy H. Byrne, Waterbury, and Arnold Fassman, Westport, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 6, 1975, Ser. No. 619,652
Int. Cl.² B65H *32/045*
U.S. Cl. 270—58 6 Claims

3. A drive chain mechanism for a rotary drum collator having a rotatable withdrawing means for removing sheet material from pockets in rotatable drum, said withdrawing

means having at least one rotatable element disposed adjacent said drum and rotatably driven in a phase relationship with respect to rotation of the drum to allow said element to properly enter the drum pockets for removing sheet material therefrom, said drive chain mechanism comprising:

a drive chain operatively supported by a plurality of rotatable sprocket wheels for rotating and advancing the phase relationship of said rotatable element with respect to the drum so as to accommodate for the depletion of sheet material from the pockets as said drum rotates, certain ones of the sprocket wheels of said drive chain mechanism being movably mounted so as to effect an operative change in select operating lengths of said drive chain;



cam follower means operatively connected to said movable sprocket wheels for moving the sprocket wheels to effect an operative change in said drive chain; and

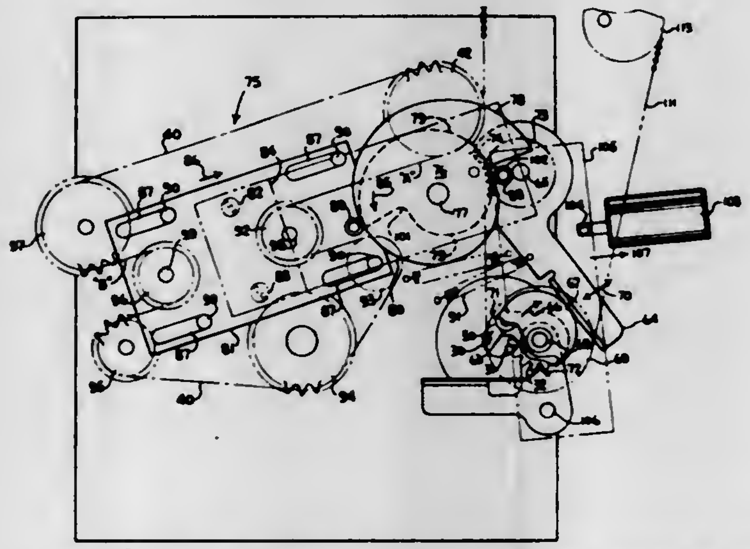
a camming means engageable with said cam follower means for displacing said cam follower means, so as to move the movably mounted sprocket wheels into effecting an operative change in the select operating lengths of the drive chain, whereby the drive chain will advance the phase relationship of said withdrawing means with respect to said drum.

4,000,890
PAPER THICKNESS ADJUSTMENT DEVICE FOR A COLLATOR

Franklin J. Calderazzo, Norwalk, and Arnold Fassman, Westport, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 6, 1975, Ser. No. 620,106
Int. Cl.² B65H *39/045*

U.S. Cl. 270—58 **9 Claims**



1. A rotary drum collator for forming sheet material into collations, said rotary drum collator comprising:

a rotatable drum having pockets for containing quantities of sheet material;

a withdrawing means having at least one rotatable element disposed adjacent said drum for removing the sheet material from the pockets of said drum;

drive means for rotating said rotatable element and said drum in a phase relationship which allows correct entry of the rotatable element into a drum pocket;

phasing means operatively connected to said drive means for changing said phase relationship as said drum rotates to correct for depletion of sheet material in said drum pockets;

advancing means operatively connected to said phasing means for varying the rate of change of the phase relationship of the rotation of said rotatable element with respect to the rotation of said drum, so as to accommodate for the depletion of sheet material of a given thickness from the pockets of said drum; and

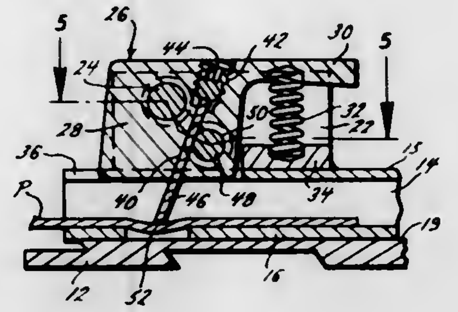
adjusting means operatively connected to said advancing means for selectively adjusting the rate at which said advancing means varies said phase relationship, whereby said phase relationship is varied in accordance with varying rates of depletion of sheet material of different thicknesses.

4,000,891
BACK-UP BRAKE ASSEMBLY FOR A PARTITION STRIP FEEDING MECHANISM IN A PARTITION FABRICATING MACHINE

Frank L. Klafka, Milwaukee, Wis., assignor to Clevepak Corporation, New York, N.Y.

Filed Feb. 28, 1975, Ser. No. 553,972
Int. Cl.² B65H *5/00*

U.S. Cl. 271—8 R **18 Claims**



1. A back-up brake assembly for a partition feeder mechanism for preventing back-up movement of a partition strip fed therepast, said assembly comprising a partition guide having a guide surface for movement of a partition strip therealong from a receiving end to a forward end, a pivot arm, means for mounting the arm for pivotal movement about a generally vertical axis, said arm having an end adapted for engagement with a partition strip as it moves therepast, means resiliently biasing said engaging end toward said guide surface for engagement with a partition strip as it moves past, said guide surface having a recess therein adjacent the engaging end of the pivot arm, the portion of the partition strip overlying the recess being urged into said recess by said engaging end under a force tending to urge the partition strip to back up.

4,000,892
NOTE STORAGE APPARATUS

Frank A. Novak, Seven Hills, and Anthony H. Dolejs, Bedford Heights, both of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Jan. 22, 1974, Ser. No. 435,481
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² B65H *29/46*

U.S. Cl. 271—180 **25 Claims**

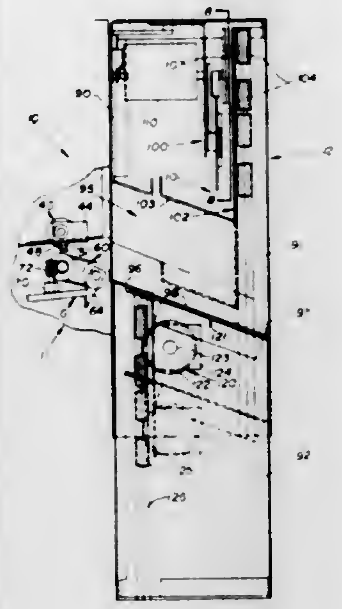
1. A note storage apparatus, comprising:

a stacker assembly.

a collector located in said stacker assembly for receiving the note.

a push bar assembly movably mounted for rolling guided contact in said stacker.

a coffer assembly located in said stacker, and



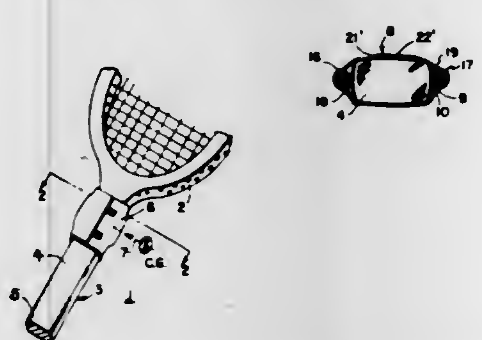
said push bar assembly selectively contacting the note and transferring it to said coffer assembly.

4,000,893
TENNIS RACKET WEIGHT HOLDER AND METHOD OF USE

Raleigh Winslow Evans, 1173 W. First St., Columbus, Ohio 43212

Filed June 2, 1975, Ser. No. 582,719
Int. Cl.² A63B *69/38*

U.S. Cl. 273—29 A **6 Claims**



1. A tennis racket accessory that adds weight at a selected position on a tennis racket and allows the player to position and remove the weight on tennis rackets of different sizes, comprising a flexible material,

said holder having first and second opposite ends and extending lengthwise a sufficient distance to wrap around a tennis racket handle, with said ends overlapping each other,

said holder having a width dimension along the racket handle length,

said holder comprising two, spaced pockets extending in said width dimension direction, said pockets each having a weight therein, said weight being in the shape of a cylinder with a lengthwise dimension greater than the diameter and having the cylinder axis generally in the width dimension direction,

each of said pockets being of sufficient size to permit said weight to roll inside said pocket along the holder lengthwise dimension over a distance that permits each of said weights to be moved inside said pocket by hand to opposite sides of the racket handle and to be properly positioned for the contour of the handle sides, and to be moveable angularly inside said pocket to line up with the direction of the respective racket handle side,

means on said overlapable holder ends to removably fasten said ends together after said holder has been wrapped around the racket handle and said weights are rolled in said positions to press tightly said weights against the racket handle sides and retain said holder on said handle.

5. A method of using a tennis racket accessory that adds weight at a desired location on the tennis racket handle for racket handles of various cross-sectional dimensions and configurations, said accessory comprising a flexible material holder having first and second opposite ends and extending lengthwise a sufficient distance to wrap around a tennis racket handle, with said ends overlapping each other, said holder having a width dimension along the racket handle length, said holder comprising two, spaced pockets extending in said width dimension direction, said pockets each having a weight therein, said weight being in the shape of a cylinder with a lengthwise dimensions greater than the diameter and having the cylinder axis generally in the width dimension direction, each of said pockets being of sufficient size to permit said weight to roll along the lengthwise dimension in said respective pocket over a distance that permits each of said weights to be moved by hand to opposite sides of the racket handle and to be properly positioned for the contour of the handle sides and to be moveable angularly to line up with the direction of the respective racket handle side, and means on said overlapable holder ends to fasten said ends together after said holder has been wrapped around the racket handle and said weights are rolled into said positions and thereby tightly press said weights against the racket handle sides and retain said holder on said handle, the steps comprising,

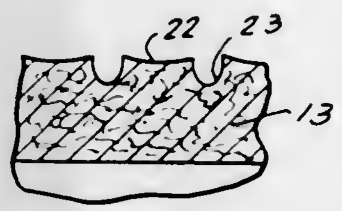
1. loosely wrapping said holder around said racket handle at a location where it is desired to add weight,
2. rotating each of said weights in said pockets to move said weights to press against opposite sides of said handle at a position suitable for the configuration of the handle sides, to maintain said weights in position, each of said weights being positioned to have its axis parallel to the handle side and extending along the handle length, and
3. completing the wrapping of said holder around said handle to have said holder ends overlapping fastened, to tightly wrap said holder to said handle.

4,000,894
GAME BALL

Kenneth B. Butzen, Des Plaines, Ill., assignor to Pepsico, Inc., Purchase, N.Y.

Filed June 23, 1975, Ser. No. 589,189
Int. Cl.² A63B *41/00, 45/02*

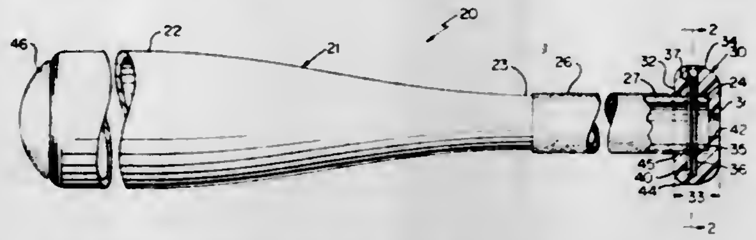
U.S. Cl. 273—65 EG **5 Claims**



1. An inflatable play ball comprising a flexible cover, and valve means for introducing air into said ball, said cover having a pebble grain configuration including raised pebble surfaces separated by depressions between the individual pebble surfaces, the upper ends of said raised pebble surfaces having either a substantially flat or concave configuration, said raised pebble surfaces extending about the entire periphery of the ball and being integral therewith, said pebble grain configuration increasing the dynamic friction characteristics of the ball thereby improving the handling characteristics of the ball.

4,000,895
BALL BAT

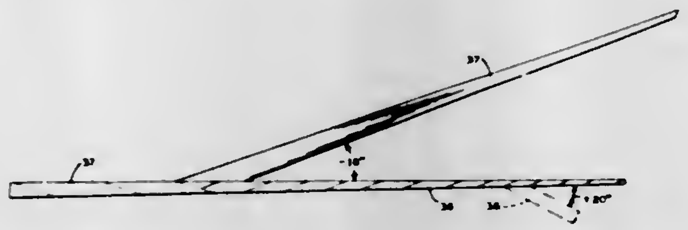
Irvin C. Scott, Jr., and George F. Swenck, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Aug. 18, 1975, Ser. No. 605,660
Int. Cl.^{2} A63B *59/06*
U.S. Cl. 273—72 A **2 Claims**



1. A ball bat comprising, a tubular metallic body having a hitting portion and a handle portion with said handle portion terminating in an outer end portion having a pair of aligned holes therein, a disc-like knob having spaced outer and inner end surfaces interconnected by an outwardly convex rounded edge portion, said knob having a handle portion receiving opening extending therein from said inner surface toward said outer surface and having a pair of aligned holes therein, said outer end portion of said handle portion being disposed in said opening with said holes in said knob being in aligned relation with said holes in said outer end portion, said knob being made of an elastomeric material, said knob having a particular thickness between its inner and outer surfaces and said handle portion receiving opening extending into said knob a distance less than said particular thickness and being defined by serrations in said knob which define the periphery of said opening and provide a surface area for engaging said outer end portion of said handle portion, one of said pair of said aligned holes in said knob extending from the outwardly convex rounded edge portion thereof and communicating with said opening therein and the other of said pair of aligned holes in said knob extending into said knob from said opening and forming a blind hole therein, and an expansion type pin extending through said holes in said outer end portion and said holes in said knob to hold said knob fixed to said handle portion by mechanical spring action of said pin; said elastomeric material of said knob allowing partial radial expansion thereof and compression of said serrations to provide an interference fit between said knob and handle portion.

4,000,896
COMPOSITE GOLF CLUB SHAFT

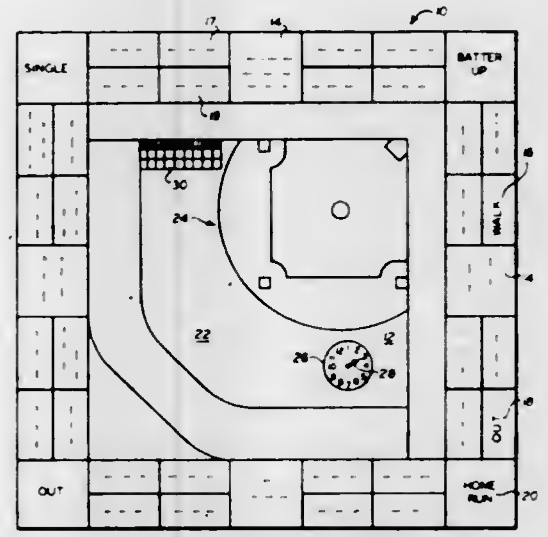
Kristina N. Lauraitis, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Continuation of Ser. No. 379,686, July 16, 1973, abandoned. This application July 17, 1975, Ser. No. 596,796
Int. Cl.^{2} A63B *53/10*
U.S. Cl. 273—80 R **6 Claims**



1. A fiber reinforced plastic tapered tubular golf club shaft comprising at least one inner layer of longitudinally extending carbonaceous fibers extending along the longitudinal axis of the shaft and a plurality of angularly disposed layers of carbonaceous fibers successively disposed over said inner layer; some of the angularly disposed layers having a length less than that of the shaft, the fibers in each one of said angularly disposed layers being substantially parallel, each layer of fibers in said angularly disposed layers being oriented at a different angle relative to the fibers of an adjoining layer in which at least some of said different angles are between plus 10° and plus 30° and between minus 10° and minus 30° relative to the longitudinal axis of the shaft with at least one of said angularly disposed layers extending the full length of the shaft, all of said layers forming the golf club shaft being of carbonaceous fibers impregnated with a resinuous binder in a cured state whereby all of said layers are unitarily joined and locked together and stress applied to any one layer is transmitted to all the other layers.

4,000,897
GAME APPARATUS

David S. York, 2 Beechwood Lane, Garnerville, N.Y. 10923
Filed Mar. 27, 1975, Ser. No. 562,667
Int. Cl.^{2} A63F *3/00*
U.S. Cl. 273—93 C **1 Claim**



1. A game apparatus consisting essentially of a game board having a plurality of defined spaces each marked with indicia representative of a mode of activity in respect of game play, a plurality of game pieces adapted to be moved over said spaces by a player, chance means for determining the extent of movement of said game pieces on said game board, a plurality of card decks, each deck having at least one card therein, each of said cards in a deck having solely spelling words listed thereon, the spelling words of each deck being selected to represent a different grade school level of academic achievement, in which said indicia on said spaces contain information representative of a mode of activity in a conventional game of baseball, said defined spaces are positioned sequentially about the periphery of the playing surface of said game board, and the central portion of said game board is provided with a representation of a conventional baseball field.

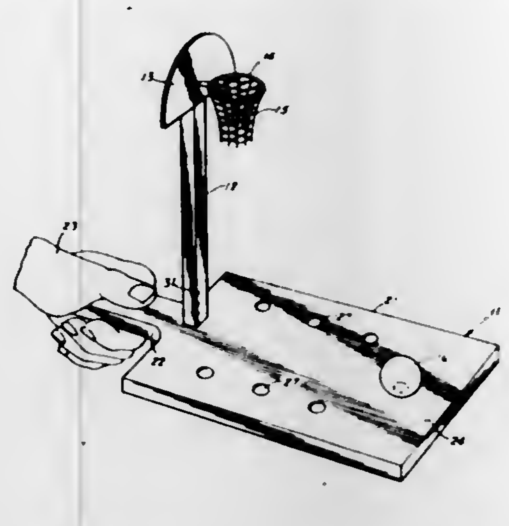
4,000,898
HAND-HELD BASKETBALL GAME DEVICE

Terry A. Cooter, 1585 W. Dakota Ave., Denver, Colo. 80223
Filed Nov. 24, 1975, Ser. No. 634,833
Int. Cl.^{2} A63B *65/12*
U.S. Cl. 273—101 **10 Claims**

1. A basketball game device comprising:

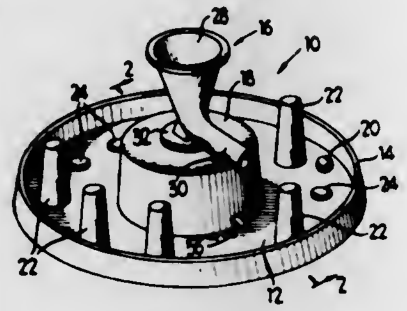
a movable paddle-like member having a grip portion adapted to be gripped by the hand of a player for hand movement, said member having a playing surface on one side with a plurality of ball-launching pockets at selected positions thereon and spaced from one another each pocket adapted to receive and position a ball at one of a plurality of selected points on the playing surface; and

a post mounted upright on said member, said post having a basket spaced a selected distance from the playing surface by said post and arranged substantially parallel to said playing surface to locate said pockets at different locations relative to said basket whereby a ball positioned in one of said pockets is launched toward the basket by a movement of said member by a player gripping said grip portion.



4,000,899
GAME DEVICE

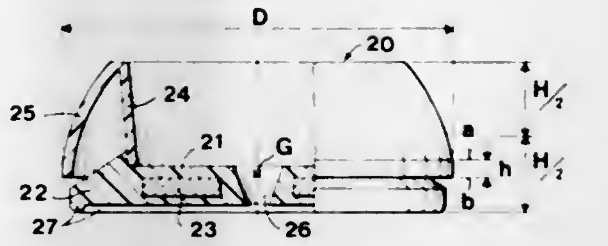
Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed May 16, 1975, Ser. No. 578,004
Int. Cl.^{2} A63F *7/10*
U.S. Cl. 273—101 **2 Claims**



1. A game device, comprising: a game board the top of which defines a playing surface with retaining means about the playing surface, a 360° rotary ball propelling device mounted on the game board and having a ball receiving portion disposed generally centrally of a vertical axis of rotation for receiving play balls individually and immediately propelling a ball outwardly therefrom through an elongated, generally horizontally extending chute portion under centrifugal force, a set of play balls adapted to be individually placed into and propelled radially from the ball propelling device, a plurality of individual upright and upwardly elongated target members positionable on the playing surface about the ball propelling device for engagement by a ball propelled by the ball propelling device in an attempt to knock over the target members, wherein said upright target members have recesses in the bottoms thereof, and said playing surface includes a plurality of bosses thereon about the ball propelling device for positioning in said recesses to define proper positions for the target members, said ball propelling device being mounted on top of a housing mounted on the playing surface so as to elevate the chute portion of the ball propelling device above the playing surface so as to propel a ball through the air in an attempt to strike one of said target members at a point above the playing surface in said attempt to knock over the target members, and constant speed power means disposed within said housing in operative association with the ball propelling device thereabove for continuously and uniformly rotating the ball propelling device during the play of the game whereby a player may selectively place a ball in the powered ball propelling device in a timed relationship to permit the device to immediately propel the ball outwardly therefrom through the air toward a selected target member so that a player can effectively aim his "shots" by properly timing the placing of a ball in the propelling device in an attempt to knock over selective ones of said target members.

4,000,900
CUE-GAME AND SLIDING DISK FOR SAME

Cyrill George Léhmann, Grenljusbacken 21, X. 117 45 Stockholm, Sweden
Filed Jan. 10, 1975, Ser. No. 540,132
Claims priority, application Sweden, Jan. 28, 1974, 7401086
Int. Cl.^{2} A63F *3/00*
U.S. Cl. 273—126 R **11 Claims**



11. A cue-game comprising a table having a substantially horizontal playing surface and being surrounded by uncushioned walls, a plurality of game pieces adapted for sliding movement on said playing surface, and at least one cue for projecting said pieces over said playing surface, each of said game pieces comprising a circular, generally disk-shaped body having uppermost and lowermost surfaces, said body having a vertical axis that is substantially normal to the horizontal plane of said playing surface, and a total height that is less than the maximum diameter of said body, said maximum diameter being confined within a circumferential relatively narrow zone that is vertically spaced from both the uppermost and the lowermost surfaces and has an upper limit which is located at a level which is below the median level of the total body height and forming a caroming surface, said body including a central body portion having an upper limit at said uppermost surface of said body, and an annular outer skirt portion encircling said central body portion and projecting outwardly and downwardly from said upper limit thereof to define a radially resilient upwardly tapered sleeve surrounding at least a portion of the height of said central body portion in radially spaced relationship thereto and forming a cue-striking surface on said game piece, said sleeve converging upwardly toward said vertical axis of said central body at an angle of at least 15°, and said un-cushioned walls having a height that is less than the total height of each of said game pieces and an inwardly facing game piece-reflecting rebound surface leaning inwardly over said playing surface at an angle less than said first-mentioned angle.

4,000,901
RING PUZZLE

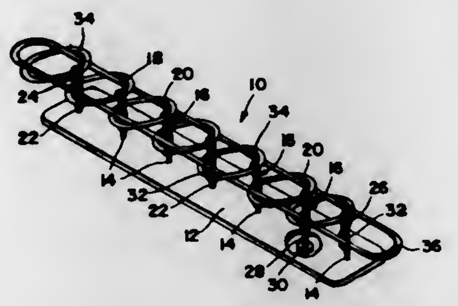
Raul Flores, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed July 8, 1975, Ser. No. 593,933
Int. Cl.^{2} A63F *9/08*
U.S. Cl. 273—158 **3 Claims**

1. A ring puzzle capable of being easily disassembled, which comprises:

a. a flat elongated base having a plurality of longitudinally aligned apertures therethrough;
b. a plurality of inverted U-shaped members, each U-shaped member having a base, a longer leg, and a shorter leg bent inwardly towards said longer leg thereby forming an opening between said legs and said bases, a free end of each said longer leg pivotally mounted through each said aperture;
c. a closed ring member looped through each said opening

of each said U-shaped member, each said ring member looped over an adjacent said U-shaped member;

d. a closed end loop member slidably extending through said ring members and straddling said U-shaped members;



e. means for holding closed said shorter leg and said longer leg, said means including a collar slidably mounted on said longer leg and sliding over said shorter leg; and

f. means for holding said longer leg in said aperture thereby preventing disengagement of said longer leg from said base.

4,000,902

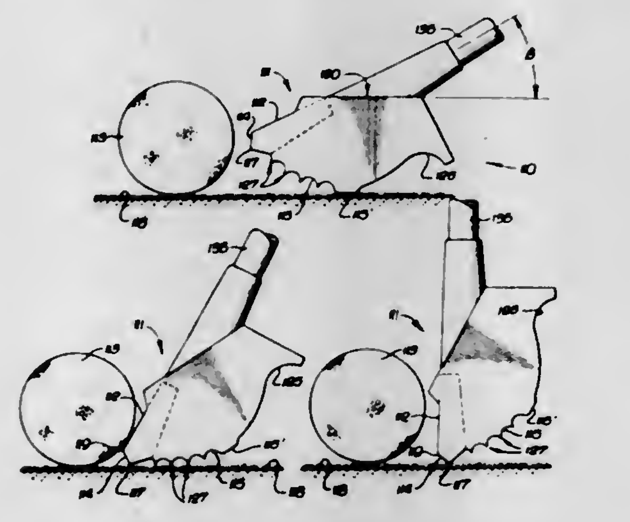
GOLF PUTTER WITH IN-LINE AIMING AND DIRECTIONAL CONTROL CAPABILITIES

Sonnie Joseph Perkins, 2320 186th Ave. NE., Redmond, Wash. 98052

Continuation-in-part of Ser. No. 550,471, Feb. 18, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,337

Int. Cl.^{2} A63B *53/00*

U.S. Cl. 273—164 **9 Claims**



1. In a golf putter, the combination that comprises

a. a shaft, a transversely horizontally elongated blade supported at one end of said shaft, said blade having a substantially vertical planar front face, a turf engaging bottom face located immediately rearwardly of the front face, and a rear face which extends arcuately rearwardly and upwardly above the level of said bottom face, said front face, bottom face and rear face each being transversely horizontally elongated, said rear face rotatably engaging the turf in blade supporting relation as the blade is tilted rearwardly, and

b. a putting path sighting device carried by the blade and projecting angularly upwardly and rearwardly relative thereto, said blade having a rearwardly tilted position in which the front face is elevated, and said device extends rearwardly and substantially horizontally,

c. there being projection means on the blade facing downwardly to engage the turf as the blade is tilted rearwardly, to prevent twisting of the blade during such tilting, said projection means carried by said transverse end portions of the blade, whereby the putter may be tilted rearwardly on said projection means, by tilting the shaft rearwardly and downwardly, and the sighting device brought into alignment relative to a cup on a green, and the putter may then be tilted back upwardly by tilting the shaft upwardly and forwardly to rotate the blade on the green turf and without twisting of the blade to bring the blade front face into aligned putting position.

4,000,903

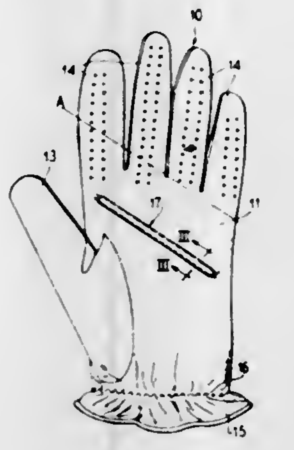
GOLF GLOVE

Arthur P. Swanson, 1454 Estate Lane, Glenview, Ill. 60025

Filed Oct. 21, 1975, Ser. No. 624,379

Int. Cl.^{2} A63B *71/14*

U.S. Cl. 273—166 **9 Claims**



1. In a golf glove for the upper hand of a golfer, having a palm portion, a back portion, a thumb portion and finger portions, the improvement of a raised elongated narrow ridge extending diagonally across substantially the entire palm portion between the thumb and finger portions and secured to the palm portion along its entire length, a one-piece core in said ridge extending along the length of the ridge effective to hold the ridge upright and against buckling, said ridge being substantially parallel to a line extending across the palm and finger portions of the glove from the middle knuckle of the forefinger to just below the base of the little finger and spaced from said line a distance substantially equal to the diameter of the grip portion of a golf club shaft to be gripped by the upper-hand of a golfer, and said narrow ridge having a width insufficient to form an obstruction between the palm portion of the glove and the grip portion of the club shaft.

4,000,904

TEE OFF DEVICE

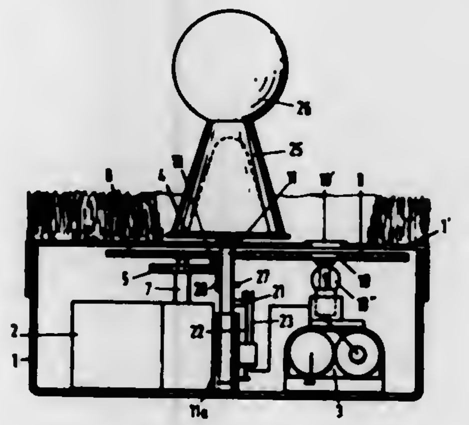
Karel Arnold Poortman, De Brei 4, Ingen, Netherlands

Filed June 26, 1975, Ser. No. 590,689

Claims priority, application Netherlands, July 4, 1974, 7409067

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—183 A **3 Claims**



1. A tee-off device comprising a housing having an upper wall formed with a pair of openings passing therethrough and said housing also having a lower wall situated below said upper wall to define therewith an interior space in said housing, a rotary disc situated in said housing adjacent said upper wall thereof and carrying a plurality of transparent members of different colors for movement past one of said openings while said rotary disc rotates, drive means situated in said housing and operatively connected with said disc for rotating the latter, a lamp situated beneath said disc in said housing in alignment with said one opening at said upper wall of said housing for directing light through one of said transparent members when said lamp is illuminated, circuit means operatively connected to said lamp for illuminating the latter and including a switch for closing said circuit means to illuminate said lamp when said switch is closed, a shaft extending through the other of said openings of said upper wall of said housing carrying above said housing a platform on which a tee with a golf ball thereon is adapted to rest, guide means situated in said housing and supporting said shaft for vertical movement, said switch being located adjacent said shaft and the latter carrying a cam for closing said switch during vertical movement of said shaft, urging means situated in said housing and operatively connected with said shaft for urging the latter to an upper position when a golf ball is not carried by a tee on said platform, said urging means responding to placing of a golf ball on a tee on the platform to free the shaft for downward movement to a lower position, said cam operating said switch to illuminate said lamp during upward movement of said shaft when a golf ball is displaced from a tee on the platform, and arresting means situated in said housing and operatively connected with said shaft for cooperating with said drive means to arrest the operation thereof when said shaft moves upwardly in response to the force of said urging means upon removal of a golf ball from a tee, so that light of a given color will flash through said one opening in said upper wall of said housing to be visible to a golfer when a golf ball is driven from a tee on the platform.

4,000,905

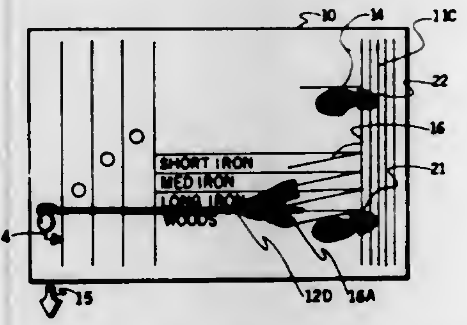
PRACTICE MAT FOR GOLFERS

Milan J. Shirhall, 6134 Montgomery Court, San Jose, Calif. 95135

Filed Sept. 24, 1975, Ser. No. 616,198

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—187 A **1 Claim**



1. A golf practice mat for indicating the placement and alignment of the forward and rearward feet of the player, the placement of the ball and the direction of travel of the club head as the golf club is swung to hit the ball, including the following:

a mat for placement on the ground, said mat including the following indicia;

a series of first lines indicating heel placement of the player;

a series of second lines each having one end intersecting the nearest of the first lines and extending perpendicular thereto such that the other end thereof indicates the point of placement of the ball for different iron and wood shots with indicia adjacent each second line indicating the club to use with the associated line;

a plurality of positions marking the placement of the ball for various golf clubs;

a third line extending perpendicular to the series of first lines and generally towards the ball placement points and spaced from the second linos in the direction opposite to the direction of ball travel for indicating alignment of the rear foot of the player; and

a plurality of fourth lines extending from the intersection of such of said second lines and said nearest of the first lines and generally towards said points of placement of the ball and the intended direction of travel of the ball to indicate alignment of the forward foot of the player; and

a plurality of spaced fifth lines extending parallel to said first lines and passing through the areas of placement of the ball to indicate the direction of club head travel as the club is swung to hit the ball whereby the player can position his heels on a selected first line, align his forward and rearward feet relative to the fourth and third lines respectively and practice swinging at a ball on the placement points near the second line while observing the accurate travel of the club head along the fifth lines.

4,000,906

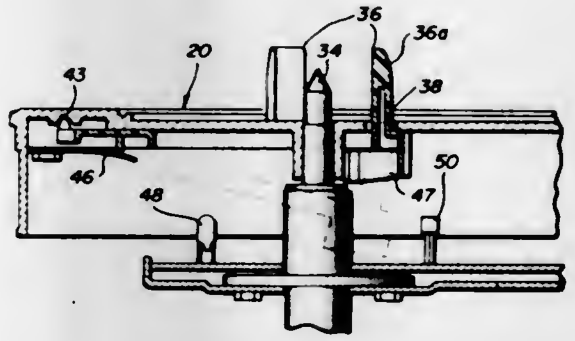
TWO-SPEED AUTOMATIC PHONOGRAPH

Leon F. Kolosko, Cheektowaga, and Alvin S. Topolski, Tonawanda, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Apr. 18, 1975, Ser. No. 569,213

Int. Cl.^{2} G11B *25/04*

U.S. Cl. 274—9 A **7 Claims**



1. In a two-speed automatic phonograph, the combination comprising: a turntable with a plurality of holes therein to receive disc records of different types having relatively large and relatively small record holes respectively to be played at first and second speeds respectively, record hole size sensing means comprising a plurality of separate independently movable elements projecting through said holes and cooperable with a record on said turntable to sense the center hole size thereof, drive means coupled to said turntable for driving said turntable either at said first speed or at said second speed depending on the record hole size sensed by said sensing means, and speed control means responsive to said sensing means and coupled to said drive means for turning said turntable at operating playing speed for the type of record placed thereon, and fixed detecting means coupled with said speed control means and coacting with said elements sequentially and requiring positional coincidence of a plurality of said elements to effect speed control.

4,000,907

CHUCKS FOR MACHINE TOOLS, SUCH AS LATHES AND GRINDING MACHINES

Michel Pascor, Orleans, France, assignor to Equipements de Machines-Outils Spemo, Nanterre, France

Filed Jan. 20, 1975, Ser. No. 542,426

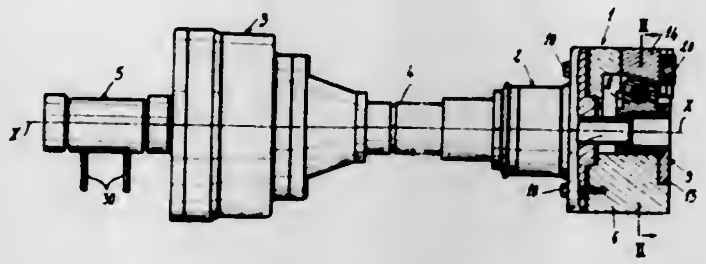
Claims priority, application France, Feb. 1, 1974, 74.03394

Int. Cl.^{2} B23B *31/16*

U.S. Cl. 279—121 **2 Claims**

1. A chuck for a machine tool comprising a frame mounted on a spindle with an axis of rotation, a cam support mounted for sliding movement in said frame parallel to said axis, clamp-

ing jaw guides mounted on said frame for radial sliding movement relative to said axis and guided along substantially their entire length, said guides carrying female ramps on opposite sides of each of a plurality of portions of said cam support, said ramps being inclined in relation to said axis, means for sliding said cam support parallel to said axis, and means carried by said cam support radially to displace said jaw guides, said radial displacing means comprising cylindrical pivots mounted for rotation in and relative to said portions of said cam support about axes transverse to said spindle axis, each said pivot having double lateral flats projecting on opposite sides of each of said portions of said cam support into said female ramps and in sliding engagement therewith, said lateral flats being disposed within the projected cylindrical contour of the associated said cylindrical pivots.



4,000,908
SKI BINDING COMPONENT

Erwin Weigl, Brunn am Gebirge, Austria, assignor to Gertsch AG, Zug, Switzerland

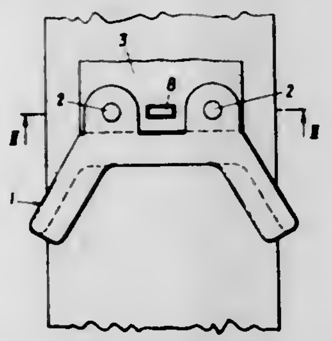
Filed Jan. 22, 1974, Ser. No. 435,570

Claims priority, application Austria, Jan. 22, 1973, 517/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² A63C *9/08*

U.S. Cl. 280—623 **8 Claims**



1. A ski binding device for holding at least one of the toe and heel of a ski boot into engagement with an upper surface of a ski, comprising:
- base means mounted on said ski and having at least vertical guide means thereon;
- vertically movable ski boot engaging means vertically movably mounted on said vertical guide means, at least one of said base means and said ski boot engaging means having horizontal guide means thereon intersecting said vertical guide means;
- movable first lock means movably mounted on said horizontal guide means, said ski boot engaging means having second lock means cooperable with said first lock means to effect securement of said vertically movable ski boot engaging means in a selected position relative to said ski;
- resilient means for continuously resiliently biasing said ski boot engaging means in a vertically upward direction; and
- release means operatively connected to said first lock means for effecting a movement of said first lock means out of cooperating relation with said second lock means to permit a vertical movement of said ski boot engaging means relative to said ski and said ski boot due to the urging of said resilient means.

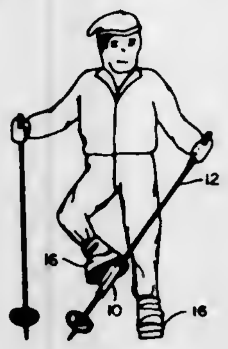
4,000,909
SKI BOOT SNOW SCRAPER

Sidney C. Coale, 4305 Bluebird, Union Lake, Mich. 48085

Filed June 20, 1975, Ser. No. 588,871

Int. Cl.² A63C *11/18*

U.S. Cl. 280—11.37 E **1 Claim**



1. A ski boot snow scraper for attaching to a ski pole, said scraper comprising:
- blade means having a length substantially longer than its width, said blade means being a rigid member,
- attaching means integrally formed with said blade means for attaching said blade means to the ski pole near one end thereof and between the handle and the snow basket on the ski pole, said attaching means having an arcuate form for conforming to and overlapping the pole and having a length longer than said blade means and said blade means is positioned intermediate the ends of said attaching means forming securing ends at each end of said attaching means,
- said securing ends receiving a pair of strap members respectively placed on said securing ends, and encircling the ski pole and securing said scraper rigidly thereto.

4,000,910
VEHICLE PROVIDED WITH A FLUIDIC ACCELEROMETER

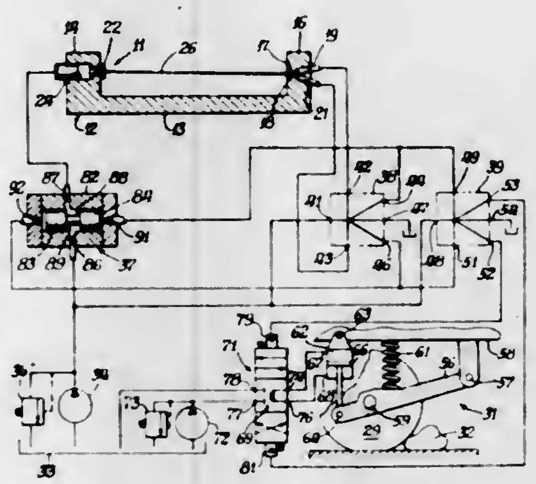
Dale H. Unruh, and Frederick D. Proksch, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 437,205, Jan. 28, 1974, Pat. No. 3,900,042. This application Feb. 18, 1975, Ser. No. 550,810

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B60G *11/56*

U.S. Cl. 280—710 **1 Claim**



1. In a vehicle having a fluidic system disposed on said vehicle for detecting acceleration and for producing an acceleration signal in response thereto, the combination comprising:
- a vehicle wheel, suspension means for attaching said wheel to said vehicle while providing for vertical movement of said wheel relative to said vehicle, resilient means for exerting a force between said vehicle and said suspension means for urging said wheel towards a predetermined vertical position relative to said vehicle, an extensible and contractible fluid cylinder coupled between said vehicle and suspension means,
- fluid flow receiver means having a first flow receiver port, and a second flow receiving port with the center of said second flow receiving port being spaced apart from the center of said first flow receiving port in the direction along which acceleration is to be sensed,
- fluid jet forming nozzle means having a flow orifice,
- means for supplying fluid under pressure to said nozzle means whereby a fluid jet is ejected therefrom,
- support means holding said nozzle means in a spaced-apart relationship from said receiver means with said jet being directed towards said receiver ports across an unobstructed gap, whereby deflection of said fluid jet relative to said receiver means in response to acceleration is accompanied by an increase of flow through one of said ports and a decrease of flow through the other thereof,
- fluidic signal output means communicated with said receiving ports for generating fluidic signals in response to brief departures of the pressure at said receiving ports from a predetermined value,
- a fluid pressure piloted cylinder control valve connected between said cylinder and a source of high pressure fluid and having a normal position at which said cylinder is isolated from said source of high pressure fluid, said control valve having a first pilot means for responding to a relative increase of fluid pressure at said first receiving port by supplying high pressure fluid to said cylinder to raise said wheel relative to said vehicle and having second pilot means responsive to a relative increase of fluid pressure at said second receiving port by supplying high pressure fluid to said cylinder to lower said wheel relative to said vehicle, and
- compensating means for varying the flow passage to said jet nozzle to restore said receiver port pressures to said predetermined value in response to relatively prolonged departures of said pressures from said predetermined value.

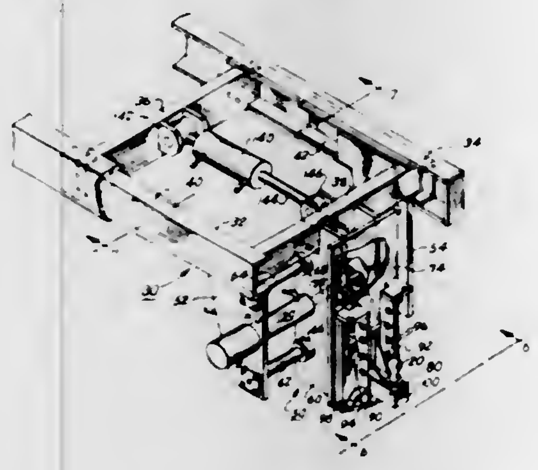
4,000,911
HITCH MECHANISM FOR TOWING AND MANEUVERING MOBILE HOMES AND MODULAR HOME SECTIONS

Charles A. Weber, Elkhart, Ind., assignor to Bock Products, Inc., Elkhart, Ind.

Filed Oct. 16, 1975, Ser. No. 622,810

Int. Cl.² B60D *1/18*

U.S. Cl. 280—468 **13 Claims**



1. A hitch mechanism for towing and maneuvering mobile homes, mobile and modular home sections and similar vehicles, comprising a carriage, a means for mounting said carriage on the rear of a towing vehicle, a hitch head mounted on said carriage for connection to the towed vehicle, a first power means for moving said hitch head laterally, a second power means for moving said hitch head vertically, and a third power means for moving said hitch head forwardly and rearwardly, whereby the adjacent end of the mobile home or mobile or modular home section connected to said hitch head can be moved laterally, vertically and longitudinally without moving the towing vehicle on which the hitch mechanism is mounted.

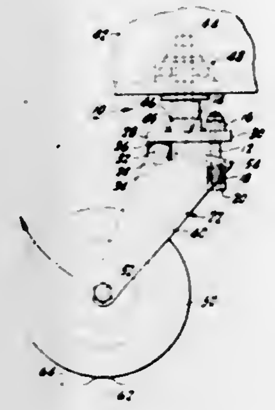
4,000,912
SHOCK ABSORBER

James E. Donald, and Gerald I. Weigt, both of Davis, Calif., assignors to MSE Corporation, Mountain View, Calif.

Filed Feb. 21, 1975, Ser. No. 551,901

Int. Cl.² B60G *11/24*

U.S. Cl. 280—701 **8 Claims**



1. A shock absorber to dampen impact forces normally transmitted to a body, comprising:
- a. a first member attached to the body and having a first and second end portion;
- b. a second member having a first and second end portion, the first end portion of said first member hingedly attached to the first end portion of said second member; said second ends of said members free of intermediate shock absorbing means.
- c. spring means for urging the rotation of said second ends of said first and second member toward one another and resisting rotation of said second ends of said members away from one another, said spring means including a spring, engaging said second end of said second member and a pin fixedly attached to the second end of said first member and passing through an elongated opening in said second member said pin moving freely within said elongated opening along its axis of elongation with the rotation of said second ends of said members away from one another, said pin remaining fixedly attached to said second member during rotation, said spring also engaging said pin.
- d. arm having an end attached to said second member to receive impact forces such that said second ends of said first and second members rotate away from one another upon reception of an impact force by said arm.

4,000,913
LIGHTWEIGHT HIGH STRENGTH AUXILIARY LIFT AXLE SUSPENSION SYSTEM FOR HIGH FRAMED VEHICLES

Gordon L. Gibson, Scottville, Mich., assignor to TWM Manufacturing Company, Inc., Canton, Ohio

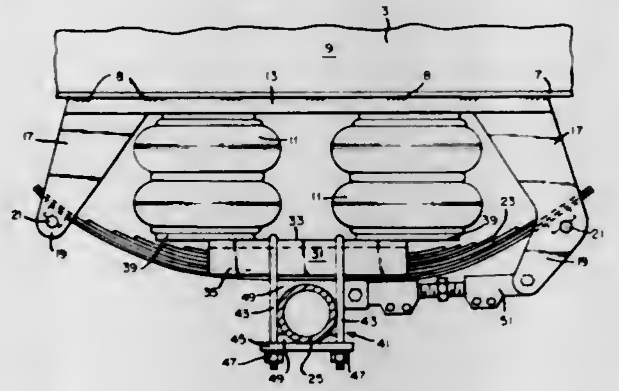
Filed Nov. 8, 1974, Ser. No. 522,186

Int. Cl.² B60G *11/46*

U.S. Cl. 280—704 **24 Claims**

1. A high strength auxiliary lift axle suspension system for use in a vehicle having longitudinal flexible frame members which are comprised of a horizontal flange and a vertical web member, said system comprising a pair of upwardly biased leaf springs for normally retaining said lift axle in its lifted position, each leaf spring being retained at about its central portion by a longitudinally extending spring retaining means supporting

at each end thereof vertically flexible air bag means which when expanded, work against the upward bias of said leaf springs to lower said lift axle to its road travel position, each leaf spring being retained at its ends by spring hanger means which are connected together by a frame-connecting member for connecting the system to said longitudinal flexible frame members of the vehicle, said air bag means extending between said frame-connecting member and spring retaining means, said frame-connecting member being a flexible unitizing frame-connecting member extending between said spring hanger means and including a horizontal flange for connecting said system to the horizontal flange of the flexible frame member of the vehicle and a vertical web member which is offset a spaced distance from and does not contact with the vertical web member of the flexible frame member of the vehicle when the horizontal flange of the frame-connecting member is connected to the horizontal flange of the frame member of the vehicle, the structure of said flexible frame-connecting member extending between said spring hanger means enabling said system to withstand the preload forces of said leaf springs prior to connection of the system to the flexible frame members of the vehicle.



4,000,914
VEHICLE SUSPENSIONS

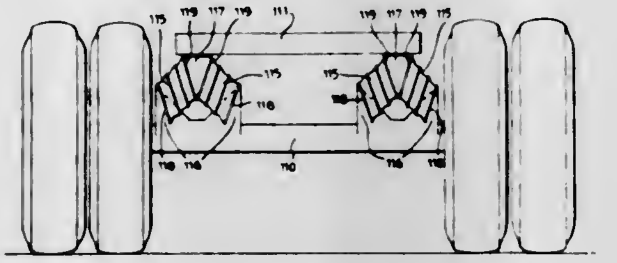
Ronald Wragg, Bellevue House, Waterloo Road, Matlock Bath, Derbyshire, England

Filed Dec. 12, 1974, Ser. No. 532,190

Claims priority, application United Kingdom, Dec. 20, 1973, 59145/73

Int. Cl.² B60G *11/24*

U.S. Cl. 280—716 **6 Claims**



1. A vehicle suspension system including an axle structure comprising at least one axle, and a vehicle-supporting frame structure, wherein the improvement comprises a pair of mountings for pivotally supporting the frame structure on the axle structure at each end of said axle, each mounting consisting of a pair of spring members, located adjacent to one end of said axle, each of which extends between a rigid portion of the axle structure and a rigid portion of the frame structure and comprises a plurality of rigid plates separated in a sandwich-type structure by blocks of resilient material secured to each adjacent plate, the axes of each pair of spring members extending transversely to the direction of travel of the vehicle and being upwardly inclined relative to each other at equal and opposite angles, and each spring member being designed to operate under compression and shear to support the frame structure, but having relatively little torsional resistance so that it operates as a pivotal support.

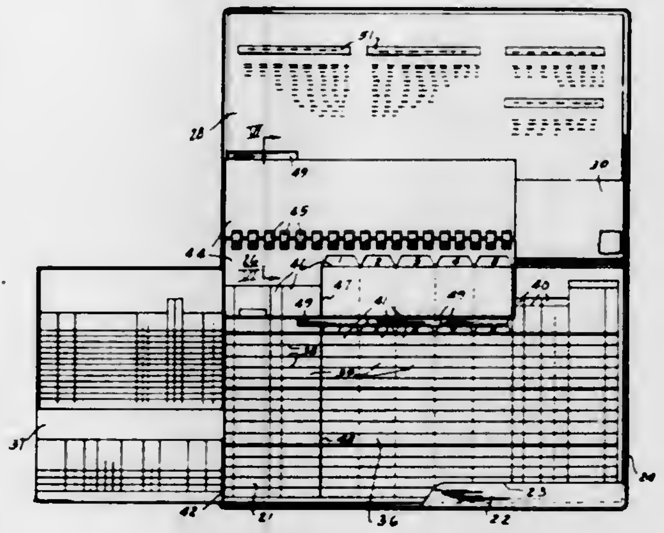
4,000,915
CONSUMER DIARY

Leslie S. Strom, Des Plaines, Ill., assignor to Market Research Corporation of America, Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,270

Int. Cl.² B42D *3/00*; B42F *21/00*

U.S. Cl. 281—31 **1 Claim**



1. A survey diary and reporting folder comprising,

first and second rigidly firm covers hinged together along one edge so that they may both lie flat when unfolded and may be folded into overlying adjacency to protect the contents thereof when closed,

each said cover being generally rectangular and having upper, lower and side edges and inner and outer surfaces,

each said cover comprising a stiff inner backing member enclosed by inside and outside sheet-form members bonded together at the outside edges and fused together between the respective covers to form a hinge section,

a tab formed by a slit parallel to and spaced inwardly of the lower edge of said first cover on said inside sheet-form member,

said tab terminating approximately one-half of the length of the adjacent cover edge,

a pair of spaced apart parallel slits formed in said inside sheet-form member of said second cover inwardly of the hinge section and extending approximately three-quarters of the length of said cover,

a separate slit formed through the inside sheet-form member of said second cover extending approximately the remaining one-quarter length thereof and spaced inwardly of the upper and lower edges to form the opening of a pouch,

a plurality of rectangular information entry sheets inserted and retained in said folder behind said tab and being supported by said first cover,

a data entry index sheet of L-shaped configuration having one leg of the L inserted into the innermost slit of said spaced apart parallel slits in said second cover,

a plurality of postage envelopes inserted into said opening of said pouch,

and a data entry book comprising a rigid backing sheet inserted into the outermost slit of said spaced apart parallel slits in said second cover,

said data entry book comprising a ring binder connected to said rigid backing sheet and disposed to overlie the hinge section, and a plurality of plural page groups,

each page group separated by a separate index page bearing a thumb tab projecting outwardly of the edges of the pages,

thereby to provide flip-over pages to selectively overlie said entry sheets,

each of said rectangular information entry sheets having a first general data zone which folds outwardly away from the folder and an item data zone divided into horizontal lines and vertical columns,

each page of said data entry book having indexed columns aligned with corresponding columns on the item data zone of the topmost information data entry sheet,

each said entry sheet and each said page having a key register to insure accurate pre-alignment,

said data entry index constituting an index to the products in the data entry book,

whereby entries made by a user in the field and requested by the data entry book may be entered on the topmost entry sheet for subsequent posting of the entry sheet to a remote data compilation center.

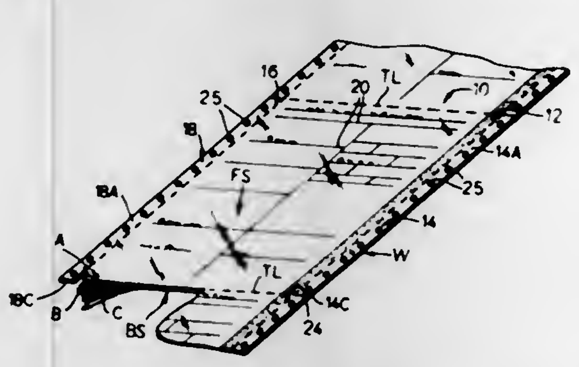
4,000,916
MANIFOLD REPORT FORM AND METHODS FOR USING THE SAME

Roland T. Lucas, Milwaukee, Wis., assignor to St. Luke's Hospital Research Foundation, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 420,645, Nov. 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,702

Int. Cl.² B41L *1/20*

U.S. Cl. 282—11.5 A **1 Claim**



1. A web comprising a plurality of manifold report forms, each manifold report form being joined to an adjacent manifold report form along an adjoining end edge, and a tear line transverse to said web along said adjoining end edge, each manifold report form comprising three superimposed and coextensive record sheets, namely top, middle and bottom record sheets, each record sheet having opposite lateral side edges and opposite end edges, each record sheet being provided with first and second perforate tear lines parallel to and adjacent opposite lateral side edges to define first and second tear strips, respectively, along the lateral side edges of the record sheets, said second tear lines being stronger than said first tear lines whereby said first tear lines separate first, means for mechanically joining together said first and second tear strips, respectively, pin feed holes in each of said tear strips, a first set of carbon papers comprising two first carbon papers arranged so that a first carbon paper is positioned between each adjacent pair of record sheets, one first carbon paper located between said top and middle record sheets having its carbon side facing said middle record sheet and the other first carbon paper having its carbon side facing said bottom record sheet, a second set of carbon papers comprising two second carbon papers arranged so that one second carbon paper is positioned between said one first carbon paper and said top record sheet and so that the other second carbon paper is positioned between said other first carbon paper and said middle record sheet, said one second carbon paper having its carbon side facing said top record sheet and said other second carbon paper having its carbon side facing said middle record sheet, a protective paper positioned between each second carbon paper and the adjacent record sheet, said first and second carbon papers and said protective papers being narrower than said record sheets, means for securing each of said first carbon papers and each protective paper along only one lateral side edge to said first tear strip, means for securing each of said second carbon papers along only one opposite lateral side edge to said second tear strip.

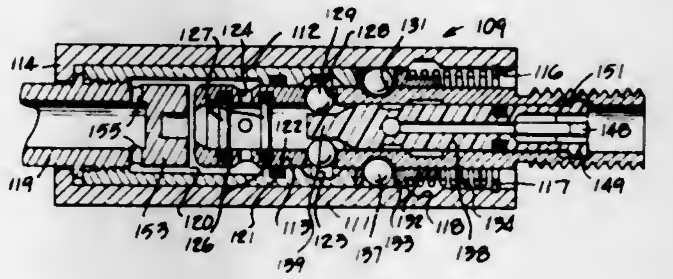
4,000,917
GAS-ACTUATED EMERGENCY PILOT RELEASE SYSTEM

Paul W. Poehlmann, Stinson Beach, Calif., assignor to H. Koch & Sons, Inc., Anaheim, Calif.

Division of Ser. No. 417,140, Nov. 19, 1973, Pat. No. 3,884,436. This application Feb. 26, 1975, Ser. No. 553,096

Int. Cl.² F16L *35/00*

U.S. Cl. 285—18 **8 Claims**



1. A tension release fluid conduit connector comprising in combination,

a male structural member adapted for fluid conduction,

a female structural member adapted for fluid conduction,

means for locking said male member within said female member responsive to fluid pressurization, said locking means being disposed within said male member, and

means coupling said male structural member within said female structural member absent fluid pressurization for releasing said male member responsive to a tensile stress, whereby, a tensile stress will separate said male and female structural members absent fluid pressurization through said connector and whereby upon fluid pressurization through said connector said male and female structural members lock together to thereby prevent decoupling said male and female structural members responsive to a tensile stress.

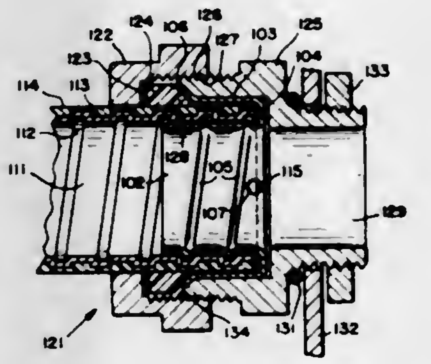
4,000,918
FERRULE FOR LIQUID TIGHT FLEXIBLE METAL CONDUIT

Frederick A. Reker, Burlington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,832

Int. Cl.² F16L *35/00*

U.S. Cl. 285—93 **7 Claims**



1. A metal ferrule for engagement with flexible metal conduit and comprising in combination:

a. a first cylindrical portion having a threaded body adapted to mate with the interior of an open end of the flexible metal conduit and in electrical engagement therewith;

b. a wall joined to said first cylindrical portion and extending outward from said first cylindrical portion and having at least a part thereof in a plane at right angles to the axis of said first cylindrical portion for contacting the end of said flexible metal conduit and thereby limit the penetration of said first cylindrical portion within the interior of the flexible metal conduit; and

c. said ferrule having a hole in the vicinity of the junction of said wall and said first cylindrical portion to provide for inspection of the proximity of the end of the flexible metal conduit to said wall to verify maximum engagement between said ferrule and said conduit.

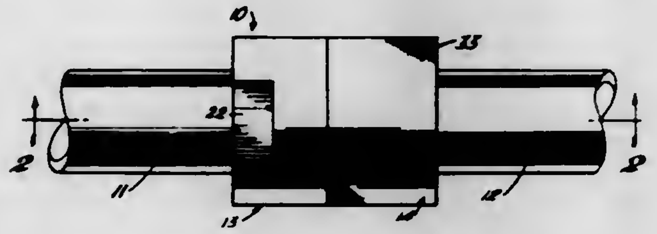
4,000,919
PIPE COUPLER

Francis P. Edwards, and Leo F. James, both of 1111 E. 24th St., Hialeah, Fla. 33013

Filed Apr. 9, 1969, Ser. No. 814,609

Int. Cl.² F16L *17/02*

U.S. Cl. 285—111 **9 Claims**



1. A pipe coupler comprising, in combination, a body member having a first central bore for the slip-fit reception of one end of a pipe section to be connected, a nut member having a second central bore for the slip-fit through passage of pipe to be connected, means for releasably securing said nut member to one end of said body member in coaxial alignment therewith, said body member being formed, at said one end, with a (second) third bore of increased diameter with respect to said first central bore and defining an annular recess with respect thereto, a resilient locking ring having a frusto-conical outer peripheral marginal portion and an angularly-offset inner peripheral marginal portion offset in the direction of divergence of said frusto-conical outer marginal portion, said inner peripheral marginal portion being radially slotted to provide a plurality of arcuate ring segments, and means controlled by the securement of said nut member to said body member for clamping said frusto-conical outer portion of said locking-ring in a plane perpendicular to the axes of said bores, the inner edges of said segments, before said locking-ring is so clamped, defining a circle of no lesser diameter than that of said central bores, and when said locking-ring is so clamped, defining a circle of slightly lesser diameter than that of said bores.

4,000,920
COUPLING FOR REINFORCED FLEXIBLE HOSES

László Horváth; Gusztav Gündisch; Sándor Antal; Mihály Árvai; György Zádor, and Elemer Lantos, all of Budapest, Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

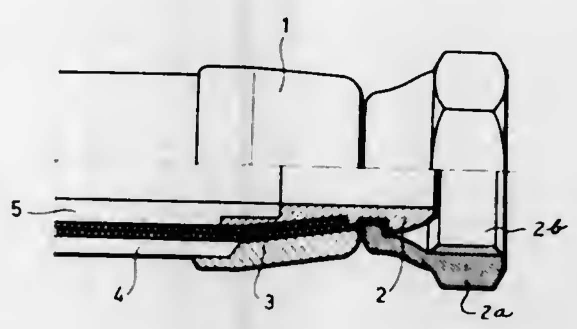
Continuation of Ser. No. 456,208, March 29, 1974, abandoned. This application July 22, 1975, Ser. No. 598,126

Claims priority, application Hungary, Mar. 30, 1973, OA 518

Int. Cl.² F16L *39/00*

U.S. Cl. 285—149 **1 Claim**

1. Coupling device comprising a flexible hose of elastomer reinforced with layers of wires, there being a core of said elastomer bonded to the inside of said layers of wires and a cover of said elastomer bonded to the outside of said layers of wires, an outer socket adhesively bonded to the end of said flexible hose and an inner supporting sleeve bonded adhesively to said flexible hose, the inner surface of said inner sleeve being cylindrical, one end of said inner sleeve being disposed within said outer socket, said supporting sleeve and said outer socket being out of metallic contact with one another, the sole connection between said supporting sleeve and outer socket being an adhesive connection through said flexible hose, the end portion of said layers of wires extending axially beyond said core and cover, the outer surface of said supporting sleeve and the inner surface of said outer socket grasping said end portion of said layers of wires between them and each comprising a truncated cone whose apex is disposed endwise outwardly of said flexible hose, said cover extending axially partway between said wires and said outer socket, said supporting sleeve extending axially partway between said wires and said core.



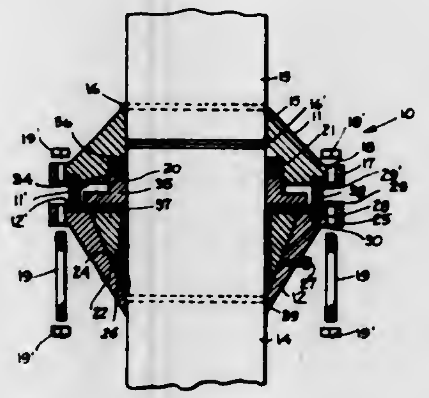
4,000,921
TUBULAR CLAMPING AND SEALING COUPLER

Ronald Albert Daspit, 2401 Delille St., Chalmette, La. 70043

Filed July 21, 1975, Ser. No. 597,637

Int. Cl.² F16L *23/00*

U.S. Cl. 285—336 **3 Claims**



1. A tubular clamping and sealing coupler for underwater pipelines, in which the ends of two tubular conduits (13) (14) are joined and sealed, comprising a coupling section (11) welded to one of the tubular conduits (13), a second coupling section (12) received on the second tubular conduit (14), gripping projections (26) bearing against the second tubular conduit (14), first, second and third seals (37) (36) (38) between the coupling sections (11) (12) and fasteners (19) (19') drawing the second coupling section (12) and second tubular conduit (14) toward the first coupling section (11) and the first tubular conduit (13) and compressing the seals (37) (36) (38) into sealing position, a stepped ring (35) between the coupling sections (11) (12), one surface of said stepped ring bearing against said second seal (36) in the first coupling section (11) and an opposite surface of the stepped ring bearing against said first seal (37) in the second coupling section (12), said second coupling section (12) having a frustoconical recess therein, a gripping member (22) positioned in said recess, the gripping projections (26) being located on the internal surface of the gripping member (22) adjacent the second tubular conduit (14), and a recess (20) in the first coupling section (11), adjacent the first tubular conduit (13), said second seal (36) received in said recess, and a flat ring (34) received in the recess and bearing against said second seal (36), and confronting annular seats (29) (29'), in said first and second coupling sections to receive said third seal, said first annular seal (37) being flat and resting against gripping member (22) and a shoulder (30) in the second frustoconical coupling section (12), the stepped ring (35) having a flange bearing against said first seal (37) and a collar received in recess (20) and bearing against the ring (34).

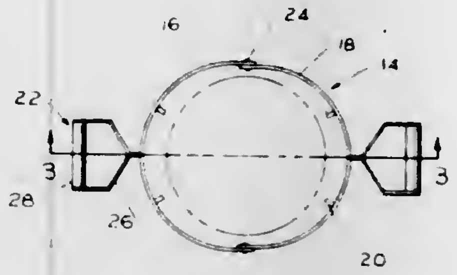
4,000,922
COLLAPSIBLE CARRIER FOR KEGS

John A. Wade, 244 Edgeford Drive, Pratt, Kans. 67124

Continuation of Ser. No. 517,515, Oct. 24, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,141

Int. Cl.² B66C *1/44*

U.S. Cl. 294—16 **1 Claim**



1. A collapsible carrier for metal kegs and other receptacles having a cylindrical configuration, said carrier comprising a collapsible ring clamp having a diameter slightly larger than said keg adapted to grip the exterior of said keg, said clamp comprising a pair of semi-circular rigid ring like split members pivoted together and being collapsible from an expanded circular position to a collapsed position in general registry with one another, handle bar means extending outwardly from a middle portion of each of said split rings and keg gripping means consisting of tooth-like members extending inwardly from each of said split rings and being directed upwardly at a sufficient acute angle above the horizontal when the split ring members are expanded to the fully opened position that when the split ring members are partially closed to the keg clamping position they are still directed at an acute angle slightly above the horizontal so that they dig into the keg to prevent slippage, the handle bar means being comprised of a handle bar member positioned in alignment with a medial portion of the ring-like members extending generally parallel to the axis of the pivot means connecting said ring-like members and being rigidly connected to a medial portion of said ring-like members by a rigid handle bar support, said support in the clamp open position extending outwardly and slightly upwardly and in the partially closed keg clamping position extending upwardly at a greater degree and outwardly to provide space between the handle bar and the keg for the hand of the user.

4,000,923
GABION BASKET EMPLACEMENT APPARATUS AND METHOD

Matt Baldwin, 127 N. Milroy, Olympia, Wash. 98502

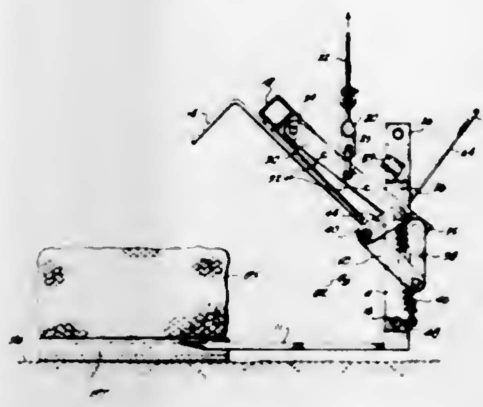
Filed June 26, 1975, Ser. No. 590,461

Int. Cl. B66c *1/38*

U.S. Cl. 294—67 AB **15 Claims**

1. A gabion basket emplacement apparatus for placing filled gabion baskets into a revetment mattress comprising:

- a frame means including a plurality of substantially vertical frame elements rigidly secured together by at least one crossmember;
- a plurality of lifting tines rigidly secured to said frame;
- a plurality of hold-down arms rotatably attached to said frame for engaging a filled gabion basket placed upon said tines to prevent said basket from slipping off said tines when the apparatus is lifted;
- counterbalance means attached to said frame and preventing rotation of said arms whenever said apparatus is empty but permitting rotation thereof whenever a filled gabion basket rests on said tines;
- means to lift said apparatus connected to said counterbalance means whereby said apparatus may be lifted with said arms in an open position and said tines substantially horizontal whenever said apparatus is not loaded and with said arms in a closed, basket engaging position whenever said apparatus is loaded with a filled gabion basket, and secondary lift means attached directly to said frame rearwardly of said means to lift whereby said apparatus may be withdrawn easily from beneath said gabion basket.



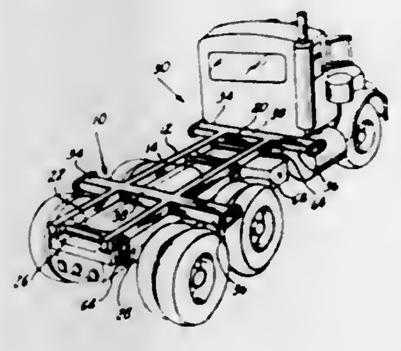
4,000,924
DEMOUNTABLE EQUIPMENT SUPPORT FRAME FOR TRUCK BODIES

Thomas W. Blasingame, P.O. Box 1532, Boise, Idaho 83702

Filed May 5, 1975, Ser. No. 574,460

Int. Cl.² B62D *33/06*

U.S. Cl. 296—35 A **8 Claims**



1. A demountable equipment support unit frame for motor trucks and related vehicles, comprising:

- a pair of parallel spaced longitudinal structural members including a plurality of spaced transverse cross pieces secured thereto to define a unit frame having a front end and a rear end.
- an elongated outrigger assembly arranged transversely of and secured to said unit frame at said front end so as to define a central section intermediate said longitudinal structural members and a respective outrigger member projecting outwardly and perpendicularly from each longitudinal structural member,
- coupling components on said unit frame adapted for cooperation with complementary coupling components on a truck chassis,
- a second like outrigger assembly mounted to said unit frame at a predetermined point rearwardly of the front end thereof,
- an elongated shaft,
- means in said outrigger assembly for rotatably supporting said shaft so that it extends through said central section and into said respective outrigger members,
- a landing gear of the type having a support shoe,
- a vertical reciprocal lifting means on said landing gear with geared means for effecting such reciprocation.

a structural member extending perpendicularly from said landing gear,

a shaft carried by said structural member and operatively connected at one end to said geared means for rotation thereby,

means on said shaft at the other end thereof for removable attachment to and operable engagement with the shaft in one of said outrigger members for rotating such shaft therein, and

with a like improved landing gear operably disposed relative to opposed outrigger members on an outrigger assembly, the operation of the shaft on one landing gear by the geared means thereon automatically effecting the operation of the opposed landing gear to simultaneously selectively raise and lower said opposed landing gear and the resultant raising and lowering of said unit frame.

4,000,925

CHAIR CONTROL WITH FRONT TO REAR TORSION BAR

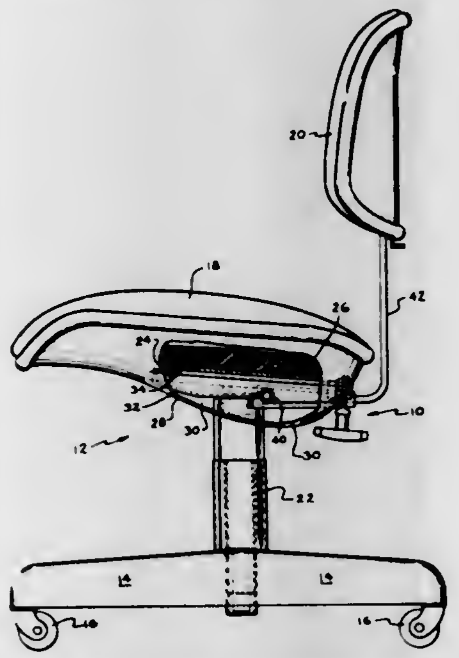
Wendell P. Doerr, Northbrook, Ill., and George F. Janko, Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed July 21, 1975, Ser. No. 597,410

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A47C *3/00*

U.S. Cl. 297—304 **6 Claims**



1. In a chair having a seat supporting frame extending front to rear of the chair, a seat back structure having a lower end portion pivotally supported on said frame and an upper end portion extending upwardly at a position rearwardly of said frame, a torsion bar mounted on said frame at a position extending front to rear thereof, said torsion bar having a front end fixedly secured to said frame and a rear end capable of axial twisting movement relative to said front end, and means connecting said torsion bar rear end to said seat back structure at a position between said lower and upper end portions thereof so that backward tilting movement of said upper end portion causing pivotal movement of said seat back structure results in said twisting of the rear end of said torsion bar.

4,000,926

WHEEL WITH INDIVIDUALLY FORMED RIBS

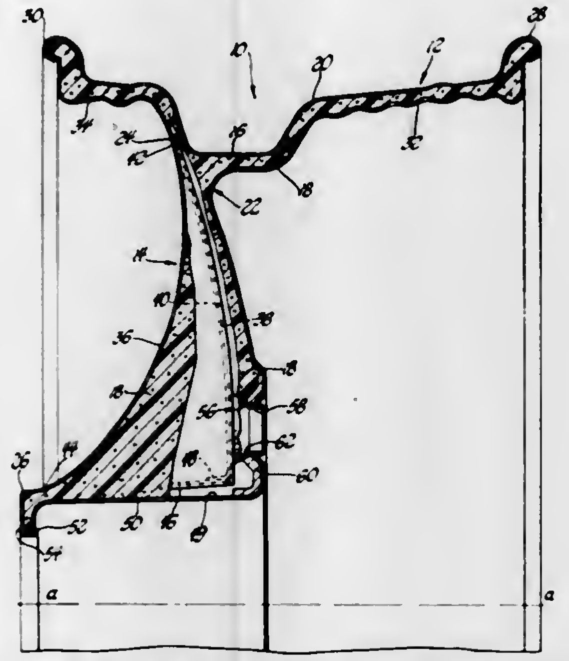
Raymond J. Wkox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

Filed Oct. 31, 1975, Ser. No. 627,580

Int. Cl.² B60B *5/02*

U.S. Cl. 301—63 DD **12 Claims**

1. A vehicle wheel comprising: a plurality of structural members secured to each other to define a cavity; said members defining an outer annular rim for mounting a tire and a disc within the confines of the rim; one of the members being an outboard member that defines the outboard side of the disc and includes a plurality of radially extending openings that are spaced circumferentially with respect to each other; a plurality of ribs projecting in an outboard direction through the openings so as to give the wheel a styled appearance and to cooperate with the structural members to enclose the cavity; and foam received within the cavity and adhered to the structural members and to the ribs to cooperate therewith as a load bearing component of the wheel.



4,000,927

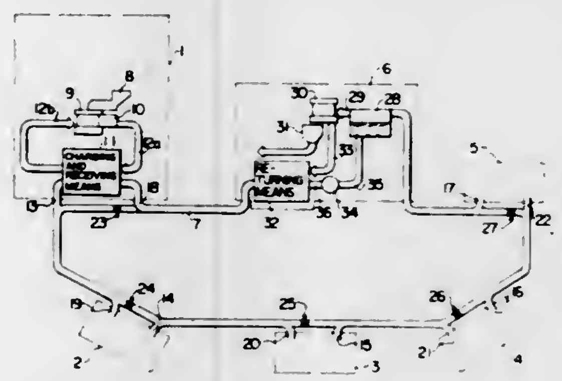
CAPSULE HYDRAULIC-TRANSPORTATION SYSTEM

Masakatsu Sakamoto, Matsudo; Syosaku Watanabe; Takafumi Karino, both of Ibaraki, and Isao Honma, Abiko, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 26, 1975, Ser. No. 590,468

Int. Cl.² B65G *51/00*

U.S. Cl. 302—2 R **10 Claims**



1. A capsule hydraulic-transportation system comprising a plurality of capsule forwarding stations; at least one capsule receiving station; and a transport pipe line interconnecting said plurality of capsule forwarding stations with said capsule receiving station for transporting capsules therebetween;

wherein each of said forwarding stations comprise first means for providing said capsules in timed sequence, and second means interconnected with said first means for continuously feeding said capsules provided by said first means into said transport pipe line, said second means further receiving capsules from said transport pipe line for supply back to said first means;

said first means comprising a plurality of feeding ducts arranged in parallel relation to one another; third means for selectively introducing a predetermined number of capsules respectively into each of said plurality of feeding ducts in a predetermined timed sequence through a first valve in each of said plurality of feeding ducts, a discharge duct coupled to each of said plurality of feeding ducts through a second valve in each of said feeding ducts for discharging said capsules continuously to said second means, first pipe means for introducing transportation liquid under high pressure into each of said plurality of feeding ducts downstream of said first valve in the direction of travel of said capsules, said first pipe means being connected to each of said feeding ducts through a third valve, and second pipe means for discharging said transportation liquid from each of said feeding ducts through a fourth valve, said second pipe means being connected to each of said feeding ducts upstream of said second valve in the direction of travel of said capsules.

4,000,928

VEHICLE SKID CONTROL SYSTEM INCLUDING VEHICLE SPEED SENSOR

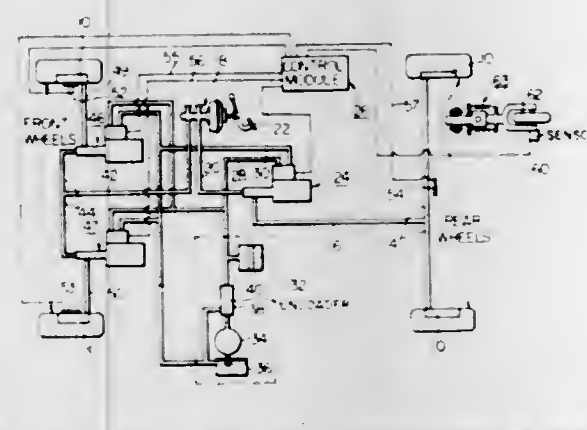
Yasuhisa Takeuchi, Yokosuka, and Haruhiko Iizuka, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 365,465, May 31, 1973, abandoned. This application May 8, 1975, Ser. No. 575,583

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B60T *8/08*

U.S. Cl. 303—103 **8 Claims**



1. A skid control system for a motor vehicle, which comprises:

a wheel speed sensor for generating a wheel speed signal;

a pseudo vehicle speed signal generator for generating a pseudo-vehicle speed signal in accordance with the wheel speed signal;

an actual vehicle speed sensor for generating an actual vehicle speed signal when energized;

first means connected to said pseudo vehicle speed signal generator and actual vehicle speed sensor for passing therethrough the larger in amplitude of said pseudo vehicle speed signal and actual vehicle speed signal;

a differentiator for differentiating said wheel speed signal to produce a wheel acceleration signal;

second means connected to said first means, said wheel speed sensor and said differentiator for producing an impending skid signal in accordance with said the larger from said first means, of said wheel speed signal and the wheel acceleration signal;

a second comparator connected to said differentiator for producing a brake release signal when said wheel acceleration signal lowers below a first predetermined level;

a third comparator connected to said differentiator for producing a brake application signal when said wheel acceleration signal exceeds a second predetermined level;

an actuation signal generator for producing an actuation signal in accordance with said impending skid signal, brake release signal and brake application signal;

a brake pressure modulator for modulating the brake pressure in response to said actuation signal; and

energizing means for energizing said actual vehicle speed sensor in response to said actuation signal or said impending skid signal.

4,000,929

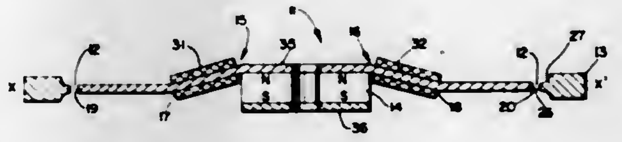
MAGNETIC BEARING SYSTEM

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed July 3, 1975, Ser. No. 593,142

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **33 Claims**



1. A magnetic bearing comprising an inner member symmetrical about a longitudinal axis and having exterior magnetic pole faces on opposite sides of the axis, an outer member coaxial with the inner member having interior magnetic pole faces on opposite sides of the axis, said inner and outer members being mechanically free of each other, one of said members being fixed relative to the longitudinal axis so that it lies in a plane at right angles to the axis and has a predetermined longitudinal position along the axis, said members being adapted to lie in a common plane and to have radial air gaps between the pole faces on the opposite sides of the axis, boundaries of said air gaps including the interior and exterior pole faces, magnetic circuit means for establishing a different, radially extending magnetic flux in the air gaps on the opposite sides of the axis, the fluxes of said magnetic circuit means being radially directed across the gaps to stablize the longitudinal and angular positions of the inner and outer members relative to the axis so that the inner and outer pole faces are aligned relative to the axis and the members have a zero tilt angle relative to the axis, the means for establishing a closed magnetic path, said path including the air gaps on opposite sides of the axis in series, said magnetic path including means for deriving an additional magnetic flux that flows radially across the air gaps on opposite sides of the axis to control the relative radial positions on the inner and outer members, the additional flux flowing radially in the air gap on one side of the axis in the same direction as the radial flow of flux in the magnetic circuit for the air gap, the additional flux flowing in the air gap on the other side of the axis in the opposite direction as the radial flow of flux in the magnetic circuit on the opposite side of the gap, said inner member having a relatively long length in a plane at a right angles to the axis relative to its length along the axis.

4,000,930

GASTIGHT LIQUID-TYPE DYNAMIC SEAL FOR CONTROL SHAFTS OF PRESSURIZED CIRCUIT INTERRUPTERS

Alain Poncet, Grenoble-Villeneuve, and Serge Roccaz, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Mar. 27, 1975, Ser. No. 562,413

Claims priority, application France, Apr. 10, 1974, 74.12701

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² F16C *1/24, 33/72*

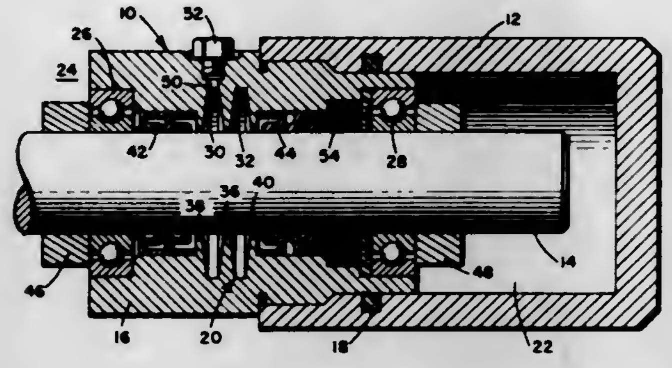
U.S. Cl. 308—36.3 **4 Claims**

1. Gastight dynamic seal sealing the pressurized enclosure of a compressed-gas circuit interrupter to a movable control stud extending through said enclosure, comprising:

a stationary sleeve member connected in a gastight manner to said enclosure and surrounding said stud,

bearing means supporting said stud from said sleeve for free movement of said stud relative to said sleeve,

a plurality of gas-trap chambers defined between said sleeve and said stud, said chambers being spaced apart in the longitudinal direction of said stud and separated by partition wall means clearing said stud so as to leave small throttle passageways between successive chambers along said stud, and



flexible baffle joint means disposed in at least a part of said chambers and bearing against said sleeve in friction and sealing relation with said stud,

said chambers containing a viscous gas-trap liquid dissolving the gas leaking from the interior of said enclosure through said baffle joint means whereby said passageways produce a degressive concentration of the dissolved gas in successive chambers.

4,000,931

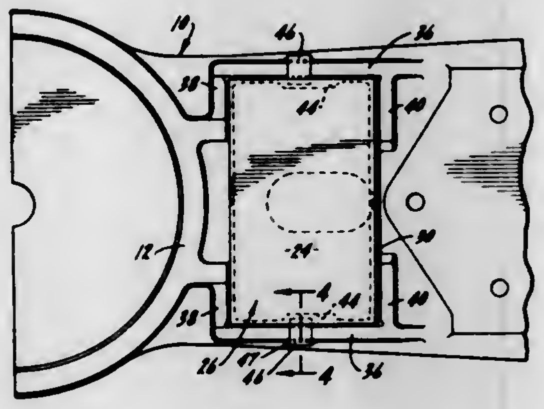
RAILWAY CAR CENTER PLATE AND AUXILIARY RESILIENT BEARINGS

Robert P. Geyer, Palatine, Ill., assignor to Standard Car Truck Co., Chicago, Ill.

Filed July 25, 1975, Ser. No. 598,936

Int. Cl.² B61F *5/08, 5/14, 5/16;* **F16C** *17/04*

U.S. Cl. 308—138 **1 Claim**



1. A railroad car bolster including spaced pad retainers positioned on either side of the bolster center plate area, each of said pad retainers having spaced upwardly-extending opposite side walls, said side walls having a substantially continuous generally level uninterrupted upper surface, a slanted bottom wall for each retainer,

a wedge-shaped elastomeric pad positioned within each retainer, each pad having a generally level top wall and a slanted bottom wall seated on said pad retainer slanted bottom wall, opposite sides of each pad having a wedge-shaped elongated slot extending generally along and spaced from a corresponding retainer side wall, said slots being generally intermediate the opposite ends of each pad, and a fastening member for maintaining each pad within a retainer welded to each side wall generally intermediate its ends and extending into a slot, said fastening members being generally L-shaped, with one side of the fastening member being welded to a retainer side wall and the other side extending along the top of the retainer side wall and into a pad slot, said slots having a length at least twice the width of a fastening member to permit variable positioning of the fastening member upon each side wall, but with full welding area of said fastening member one side to each side wall regardless of the vertical position of the pad within the retainer.

4,000,932

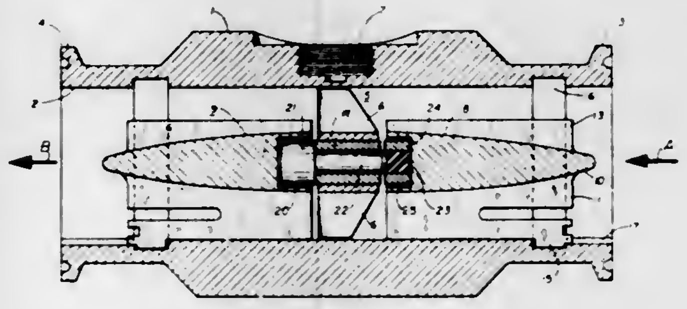
TURBINE METER ROTOR BEARING

Lewis Karl Harris; Billy Steve Burrus, and Donald Wayne Allison, all of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 15, 1975, Ser. No. 613,692

Int. Cl.² F16C *9/00*

U.S. Cl. 308—237 R **3 Claims**



1. A bearing for the rotor of a turbine meter, including,

a bushing of ceramic material mounted axially in the rotor,

a shaft of ceramic material mounted in one of the two spider supports so as to extend axially of the bore of the turbine meter body and through the rotor bushing, and

a body of ceramic mounted in the second of the spider supports and positioned to provide bearing engagement with rotor bushing at one end of the bushing.

4,000,933

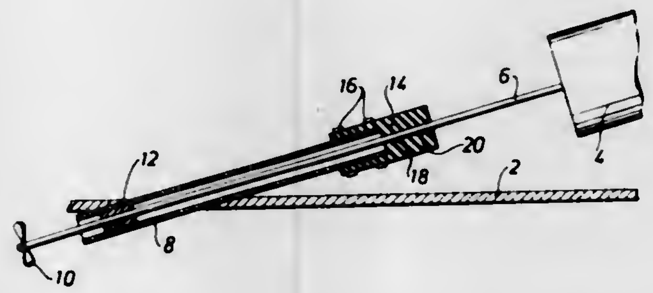
SHAFT SEALING AND BEARING ARRANGEMENT, ESPECIALLY FOR PROPELLER SHAFTS

Karl Gustaf Derman, Sorgardsvagen 7, S-433 00 Partille, and Nils-Erik Bohman, Granvagen 1, S-330 12 Forsheda, both of Sweden

Filed July 8, 1975, Ser. No. 593,964

Int. Cl.² B63H *5/06*

U.S. Cl. 308—237 R **5 Claims**



1. A sealing and bearing arrangement for an axially extending propeller shaft for a boat where one end of the arrangement is to be immersed in water comprising a sleeve of elastic material elongated in the direction of shaft extension and sealingly engaging the boat in a region near one end only of the sleeve, the sleeve enclosing the shaft and including a shaft bearing portion axially spaced from the region of the sleeve engaging the boat and accessible to the water, the sleeve further including a sealing portion at the side of the bearing portion axially opposite from the liquid and from the sleeve one end which engages the boat, the sealing portion being adapted to be guided in the radial direction by the bearing portion.

4,000,934

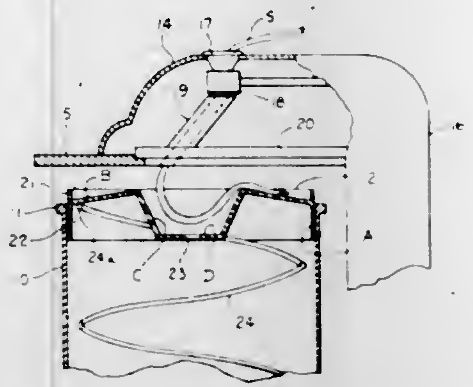
ROVING CAN PISTON

Robert L. Carroll, 408 McIver, Greenville, S.C. 29601

Continuation-in-part of Ser. No. 536,968, Dec. 23, 1974, abandoned. This application June 2, 1975, Ser. No. 582,607

Int. Cl.² A47F *1/00;* **B65D** *25/10*

U.S. Cl. 312—71 **9 Claims**



1. A piston for use with a cylindrical open topped roving can containing a coil spring between a can bottom and said piston urging said piston upwardly within said can toward a tube gear and the like from which a sliver and the like is dispensed into the can comprising:

a vertical cylindrical marginal skirt within and closely adjacent a cylindrical side of said can for guiding said piston within the can;

an annular inwardly extending surface carried adjacent an upper portion of said skirt for receiving said sliver;

an annular downwardly inclined conical surface extending inwardly from said first mentioned surface; and

a central bottom portion bridging said downwardly inclined surface disposed adjacent a lower edge of said skirt;

whereby the capacity of the roving can is increased while avoiding a hard central core of sliver as often ultimately results in faulty yarn.

4,000,935

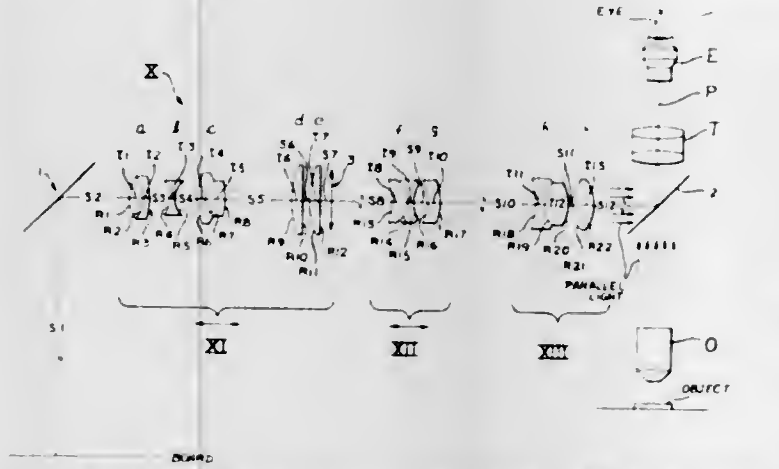
DRAWING ATTACHMENT HAVING A FOCUSING SYSTEM, POWER CHANGER SYSTEM AND A TELESCOPE FOR A MICROSCOPE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 14, 1975, Ser. No. 631,809

Int. Cl.² G02B *7/04, 15/00*

U.S. Cl. 350—41 **4 Claims**



1. A drawing attachment comprising, all sequentially aligned along an optical path, a focusing system XI including (a) a double convex positive doublet, (b) a double concavo negative singlet, (c) a double convex positive doublet (d) a convex-plano positive singlet and (e) a convex-plano positive singlet, a power changer XII including (f) a double convex negative doublet and (g) a concavo-convex negative singlet, said power changer being axially slideable along said optical path, and a telescope XIII including (h) a concavo-convex positive doublet and (i) a double convex positive singlet.

4,000,936

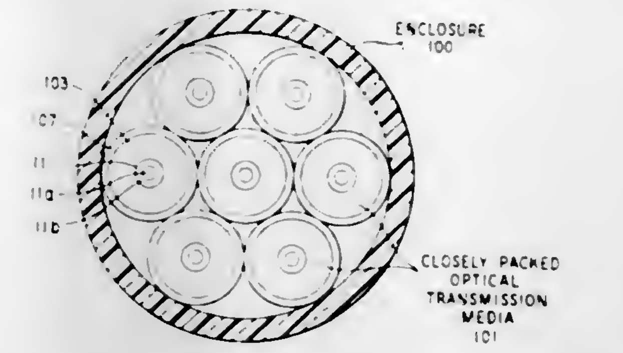
OPTICAL FIBER JACKET DESIGNS FOR MINIMUM DISTORTION LOSS

Detlef Christoph Gloge, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 30, 1974, Ser. No. 493,029

Int. Cl.² G02B *5/16*

U.S. Cl. 350—96 WG **9 Claims**



1. An optical fiber cable comprising a plurality of closely packed optical transmission media, each of said media comprising only one optical fiber waveguide and a protective jacket encasing the fiber and disposed in contact therewith and having an outer diameter less than about 0.4 millimeter and a modulus in the lateral direction which is less than about 50,000 psi, in which said jacket is such that the combined structure of said fiber and said jacket has a characteristic retention length R which exceeds a critical coupling wavelength Λ_c for said fiber, where the retention length R is given by

$$R = 2\pi \left(\frac{H}{D_l} \right)^{1/4}$$

and where H is the flexural rigidity, and D_l is the lateral rigidity, respectively, of said combined structure, and in which at least one of said optical transmission media further comprises an outer shell encasing said jacket, said shell having a modulus at least an order of magnitude larger than said jacket modulus, said shell having a thickness less than about one tenth of said jacket outer diameter and substantially equal to an optimum value related to said jacket modulus, said jacket outer diameter, and said shell modulus according to the relationship indicated by FIG. 8, whereby mode coupling losses are minimized.

4,000,937

PLANAR WAVEGUIDE ELECTROOPTIC PRISM DEFLECTOR

Ivan Paul Kaminow, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

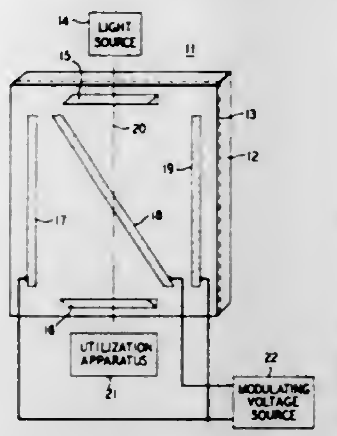
Filed June 5, 1975, Ser. No. 583,895

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG **10 Claims**

1. An optical device comprising a substrate, a light-guiding thin-film disposed on said substrate and composed of an electrooptic material oriented to have its axis for the linear electrooptical effect along a first direction parallel to the interface with said substrate, and means for providing electrooptic deflection of light propagating in said film orthogonal to said first direction,

comprising three metallic electrodes in the form of stripes of the metallic material, two of said stripes being disposed essentially parallel to the path of the incoming light and the third extending essentially diagonally between, but not contacting, opposed ends of the other two stripes,

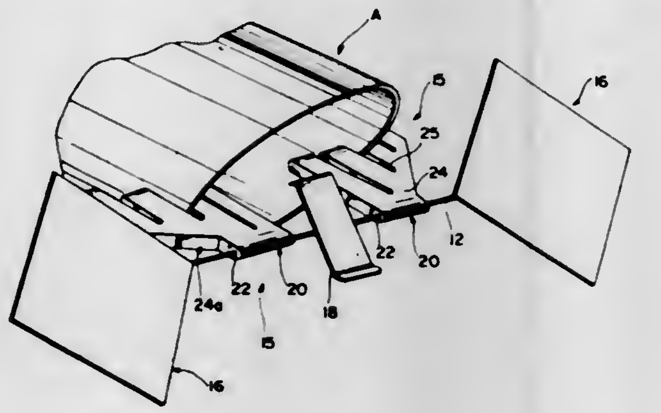


said three stripes defining two substantially triangular electrooptic waveguide portions in said path.

4,000,938
ROTARY SAFETY REFLECTOR

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Mar. 3, 1975, Ser. No. 554,627
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **8 Claims**

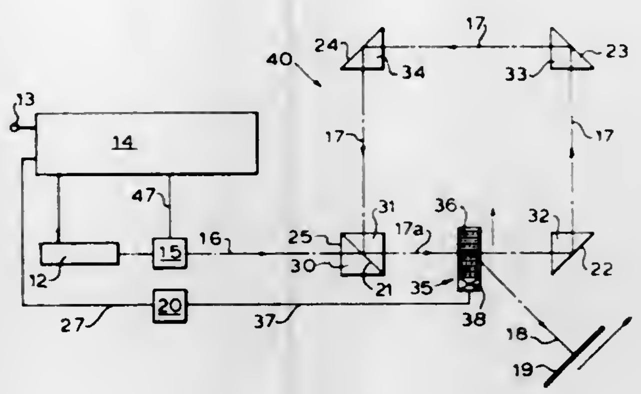


1. A rotary safety reflector assembly for mounting on the exhaust pipe of a vehicle powered by an internal combustion engine, the combustion gases exiting from the exhaust pipe in an exhaust flow, said reflector assembly comprising a rotatable shaft, means for rotatably mounting said shaft in spaced relation with respect to the outlet of the exhaust pipe such that the axis of the shaft is substantially transverse to the direction of the exhaust flow, means defining first and second reflecting surfaces fixedly mounted at each end of said shaft for rotation therewith at locations substantially outboard of said exhaust flow on opposite sides thereof, and a fluid motor fixedly mounted on said shaft intermediate said first and second reflecting surfaces and in alignment with the outlet of the exhaust pipe such that said exhaust flow acts upon said fluid motor to cause rotation of said shaft about its axis, said mounting means comprising means for removably mounting said reflector assembly on the exhaust pipe comprising means for detachably engaging the exhaust pipe on opposite edges thereof, said mounting means including at least two resilient mounting arms which biasingly engage said opposite edges of said exhaust pipe so as to mount said assembly on said exhaust pipe.

4,000,939
LIGHT OPTIC DATA HANDLING SYSTEMS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed Jan. 12, 1976, Ser. No. 648,537
Int. Cl.² G02F *1/16*
U.S. Cl. 350—160 R **3 Claims**

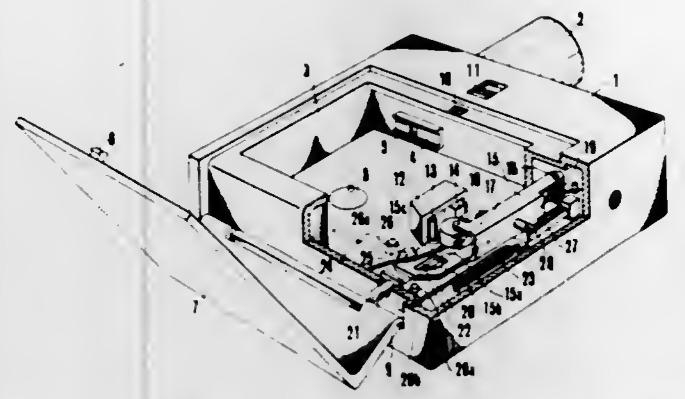


1. A light optic data handling system comprising:
a. a source of light;
b. a light admitting surface;
c. a source of control voltages;
d. ON or OFF light availability control means and means for establishing an ON condition thereof for allowing the passage of light from said source of light along at least one input path toward said admitting surface in response to an extending of the influence of an electrical potential thereto from said source of voltages, and means for thereupon directing said light along a series of 360° primary optical paths within said system so as to establish an availability of light from any one of a plurality of output locations of said system;
e. said system presenting a length dimension and having an array of light reflecting surfaces therein extended along said length dimension for providing said series of optical paths, each said surface angularly oriented so as to establish an optical relationship one with respect to the other and with respect to the light along said input path, said series of optical paths displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension, said plurality of output locations extended along said length dimension and each positioned in a light reflection control relationship to a corresponding one of said primary optical paths;
f. ON or OFF light directional control means and means for establishing an ON condition thereof for allowing light along a primary optical path to follow a path leading away from an output location of said system in response to an extending of the influence of an electrical potential thereto from said source of voltages;
g. signal input circuit means for effecting a predetermined time delay between said allowing of the passage of light along said input path in response to an ON condition of said light availability control means, and said allowing of light to follow a path leading away from an output location of said system in response to an ON condition of said directional control means, for controlling a redirecting of light from a predetermined one of said series of primary optical paths and thereupon along a path leading away from a corresponding output location of said system.

4,000,940
CAMERA ALLOWING SIMULTANEOUS SOUND RECORDING

Yoshio Komine, Tokyo; Kazuya Hosoe, Machida; Mamoru Shimazaki; Toshikazu Ichiyanagi, both of Tokyo, and Kiyoshi Takahashi, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 23, 1974, Ser. No. 508,327
Claims priority, application Japan, Sept. 26, 1973, 48-108249
Int. Cl.² G03B *23/02*
U.S. Cl. 352—72 **4 Claims**

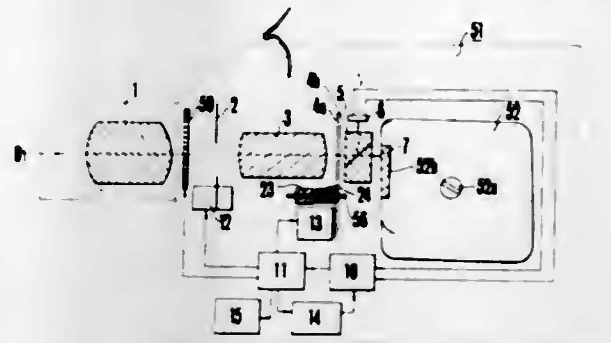


1. A motion picture camera capable of using a film cartridge containing a sound film strip for recording both image information and sound information wherein the improvement comprises:
- a cartridge chamber for accommodating said film cartridge;
- an openable cover for selectively covering the opening of said cartridge chamber;
- a capstan driven at a substantially constant speed and provided along the path of said film;
- a pinch roller provided on the opposite side of said path so as to substantially face said capstan;
- a displacing means for bringing said capstan and pinch roller into mutual resilient contact in cooperation with the closing operation of said cover thereby enabling said film lodged between said capstan and pinch roller to be driven at a substantially constant speed adapted for recording sound information thereon;
- a cartridge detecting means for detecting the presence or absence of said film cartridge in said cartridge chamber and provided with a blocking device forcedly blocking the operation of said displacing means connected with the closing operation of said cover when said film cartridge is not present in said cartridge chamber;
- wherein said cartridge detecting means comprises a cartridge detecting member protruding into said cartridge chamber through an opening provided therein, and a biasing means for biasing said cartridge detecting member so as to protrude constantly in said cartridge chamber;
- and wherein said displacing means comprises:
  - a displacing member capable of moving between (a) a first position wherein said capstan and pinch roller can be brought into mutual resilient contact, and (b) a second position wherein said capstan and pinch roller are mutually clearly separated;
- a biasing means for biasing said displacing member constantly towards said first position;
- a sliding means which maintains said displacing member in its said second position against the biasing force of said biasing means when said cover is opened and allows said displacing member to move to said first position when said cover is closed; and
- a cover position detecting means for controlling said sliding means by detecting the open-closed position of said cover.

4,000,941
AUTOMATIC EXPOSURE ADJUSTING DEVICE

Hidekazu Okajima, Kawasaki; Tomoshi Takigawa, Machida; Noritsugu Hirata, Yokohama; Masamichi Toyama, Machida, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,368
Claims priority, application Japan, Mar. 1, 1974, 49-23947
Int. Cl.² G03B *7/08*
U.S. Cl. 352—141 **28 Claims**

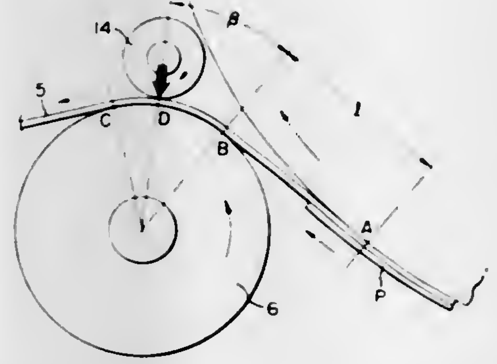


1. In an automatic exposure adjusting device, an improvement comprising:
1. photometric means which receives light corresponding to the quantity of light incident upon an exposure surface and produces an electric output signal corresponding to the quantity of the received light; and
2. controlling means whereby the quantity of light incident upon said exposure surface is controlled to be a preset quantity of light, said controlling means having the following component parts disposed in the path of the incident light coming from a photographing object:
   a. a first light amount regulating means which is activated when the output of said photometric means is not within a preset range of levels so as to control the quantity of light coming from the photographing object through said path of light and which is connected to the output terminal of said photometric means, and
   b. a second light amount regulating means which is also connected to the output terminal of said photometric means and effectively operates when the output of the photometric means is within said preset range of levels so as to permit control over a broader range of exposure adjustment.

4,000,942
TRANSFER MEDIUM SEPARATING DEVICE

Yoshio Ito; Katuhiko Yamada; Tadayuki Kitajima, all of Yokohama; Koichi Miyamoto, Tokyo; Hiroo Kobayashi, Tokyo, and Yoshikuni Tohyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,803
Claims priority, application Japan, Dec. 27, 1974, 50-4018
Int. Cl.² G03G *15/22*
U.S. Cl. 355—3 R **5 Claims**



1. A transfer medium separating device in an electrophoto-

graphic copying apparatus of the type in which a toner image is transferred from the surface of a photosensitive medium to a transfer medium, said device comprising:

- a rotatable separating member disposed at a position downstream of an image transfer station;
- a transfer medium end guide member disposed in contact with the peripheral surface of said rotatable separating member for separating one end of the transfer medium from the surface of the photosensitive medium at the image transfer station where a toner image is transferred from the surface of the photosensitive medium to the transfer medium and for guiding the transfer medium away from the photosensitive medium after the image transfer; and
- a rotatable pressure member disposed in pressure contact with said rotatable separating member for transporting the transfer medium while urging the same against said rotatable separating member and for separating the transfer medium from the surface of the photosensitive medium.

4,000,943

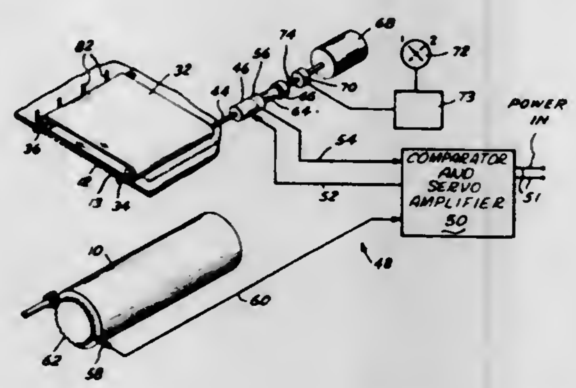
TWO SPEED, DUEL PURPOSE DOCUMENT HANDLING SYSTEM

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1975, Ser. No. 549,684

Int. Cl.² G03G *15/30*

U.S. Cl. 355—8 **16 Claims**



1. A reproducing apparatus for forming an image of a document on a copy sheet comprising:

- a transparent platen for supporting said document to be copied;
- a photoreceptor surface arranged for movement at a constant speed; and
- multi-mode optical means for projecting an image of said document at said platen onto said photoreceptor surface, said optical means in one mode of operation including means for scanning a document while it is held stationary on said platen and in another mode of operation including means for scanning a document which is moved across said platen at a speed synchronized to the speed of said photoreceptor surface;

the improvement wherein said apparatus further includes:

- a multi-mode document handling system for advancing documents over said platen, said document handling system in one mode of operation corresponding to said one optical mode including: means for advancing a document at high speed onto said platen; means for registering said document on said platen; and means for holding said document stationary on said platen during scanning by said optical means; and in another mode of operation corresponding to said another optical mode including means for advancing a document over said platen at a speed synchronized to the speed of said photoreceptor surface, said high speed being greater than said synchronized speed; and
- means for selecting between said one and said another modes of operation of said document handling system.

4,000,944

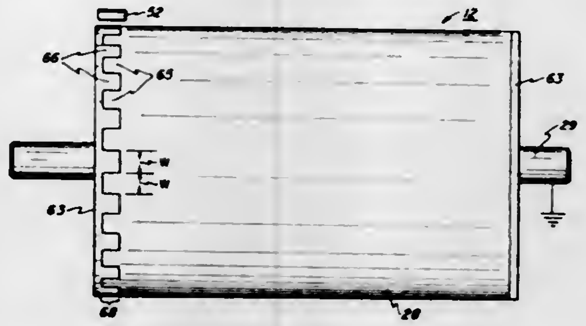
PHOTORECEPTOR FOR ELECTROSTATIC REPRODUCTION MACHINES WITH BUILT-IN ELECTRODE

Lawrence J. Fraser, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1975, Ser. No. 550,301

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **10 Claims**



1. A photoreceptor for use with electrostatic type reproduction machines, comprising:

- a substrate; and
- a coating of photoconductive material on one surface of said substrate, portions of said photoconductive coated surface of said substrate being interrupted at regular intervals by conductive areas, said conductive areas extending in strip-like progression along said substrate one surface in the direction of movement of said photoreceptor whereby to provide a built-in strip-like control electrode with said photoreceptor.

4,000,945

INFORMATION RECORDING APPARATUS

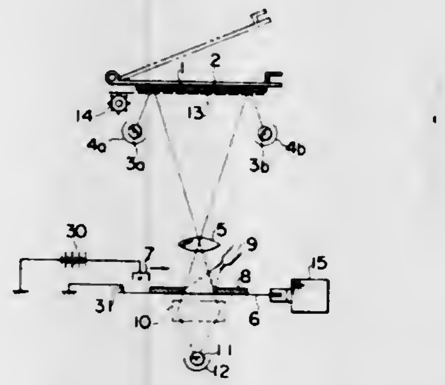
Kunio Tajima; Touhei Kawakami, and Seiichi Hayashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 3, 1975, Ser. No. 538,335

Claims priority, application Japan, Jan. 9, 1974, 49-5280; Feb. 19, 1974, 49-18581

Int. Cl.² G03B *13/28*

U.S. Cl. 355—45 **6 Claims**



1. An information recording apparatus comprising hold means for holding a photosensitive film at a predetermined position, exposure means for exposing the photosensitive film to light from an information carrying original to be recorded, development means for developing the exposed photosensitive film, monitor light source means disposed opposite to the exposure means with the developed photosensitive film interposed therebetween for directing monitor light through said developed photosensitive film,-an optical system for projecting the monitor light passed through said developed photosensitive film to a monitor screen, and a mechanism coupled to said hold means for reversing the developed photosensitive film to obtain a normal image at said monitor screen.

4,000,946

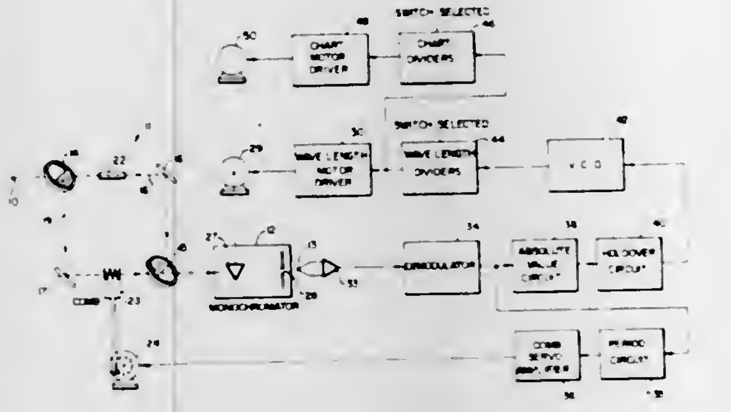
STEPPER MOTOR TRACKING ACCURACY CONTROL FOR SPECTROPHOTOMETERS

Allan S. Way, Irvine, and Stanley L. Pratt, Riverside, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 433,396, Jan. 14, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,512

Int. Cl.² G01J *3/06, 3/42*

U.S. Cl. 356—89 **4 Claims**



1. In a radiant energy analyzer having a radiant energy source, reference and sample radiant energy beam paths, a monochromator and a wavelength scanning mechanism therefor, means generating an error signal which varies as a function of the difference in the intensity in the reference and sample beam paths, attenuator means responsive to the error signal to balance the energy in the beams, the improvement comprising:

- a first stepper motor for driving the wavelength scanning mechanism to continuously vary the wavelength output of the monochromator;
- an oscillator having a pulse train output of predetermined frequency coupled to drive the first stepper motor, and hence the wavelength scanning mechanism, at a predetermined scan speed;
- means responsive to changes in the error signal for varying the frequency of the pulses applied to the stepper motor, whereby the scan speed of the wavelength scanning mechanism is decreased or increased for a corresponding increase or decrease in the error signal to improve the tracking accuracy between the wavelength scanning mechanism and the attenuator means;
- chart recording means for recording a radiant energy parameter of the sample and a second stepper motor for driving the chart recording means along an axis thereof, the pulse train output of the oscillator being coupled to drive both the first and second stepper motors in a fixed speed relationshp at speeds proportional to the output frequency of the oscillator; and
- first and second variable frequency dividers and means coupling the oscillator pulse train output through said first variable frequency divider to the first stepper motor and through a series connection of said first and second variable frequency dividers to the second stepper motor

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4,000,947

OPTICAL READOUT FOR DIFFERENTIAL LASER GYROS

David C. Grant, Jr., Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

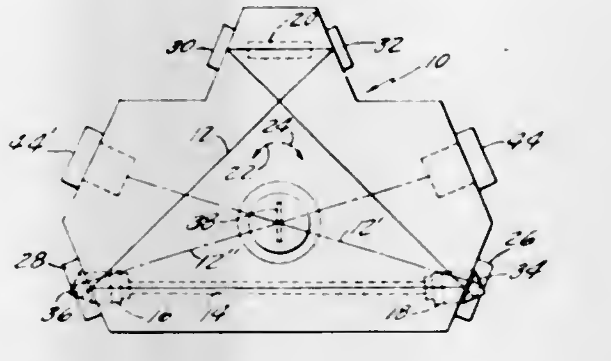
Filed May 27, 1975, Ser. No. 580,660

Int. Cl.² G01B *9/02*, H01S *3/00*

U.S. Cl. 356—106 LR **9 Claims**

1. An optical readout system for a differential laser gyro comprising

- a solid block having a plurality of coplanar passages therein,
- a laser gain medium located in at least one of said passages for generating traveling optical waves,
- a plurality of mirrors fixedly mounted on the periphery of said block in the plane containing said laser gain medium and said passages for causing said traveling optical waves to traverse said block in a closed path in both clockwise and anticlockwise directions through said passages,
- a modulator element having plane parallel end faces located in an additional one of said passages in the path of said traveling optical waves, said modulator element being oriented so that a portion of said clockwise and said anticlockwise traveling waves are respectively reflected



from opposite end faces thereof at a small angle relative to the plane of said traveling optical waves.

- first and second prism means mounted on the periphery of said block for intersecting the reflected portions of said clockwise and anticlockwise waves respectively and redirecting said reflected beam portions in a common plane,
- and beam splitter means fixedly mounted on said block in said common plane and adapted to produce from said reflected beam portions first and second colinear output beams

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4,000,948

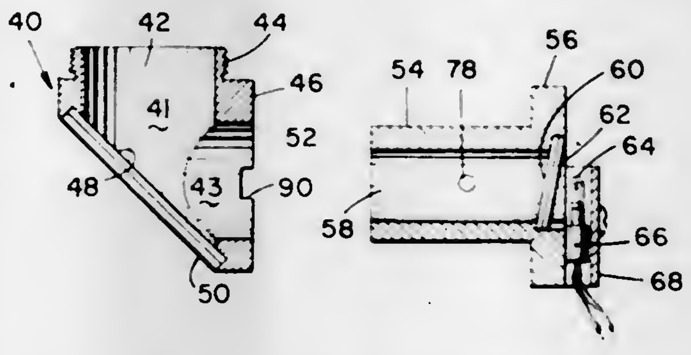
TARGET METHOD AND SYSTEMS FOR BONDING MACHINES

C. Frederick Miller, 2165 N. Glassell St., Orange, Calif. 92667

Filed July 14, 1975, Ser. No. 595,790

Int. Cl.² G01B *11/26*

U.S. Cl. 356—172 **8 Claims**



1. In a conductor bonder of the kind in which a work piece, viewed through a microscope, is moved relative to the working position of a tool, the improvement which comprises:

- a partially reflecting mirror;
- means for holding said mirror externally of the microscope optics in the field of objective view of the microscrope,
- a target;
- image developing means for developing an image of the target and for projecting that image on the mirror such that it is visible when viewing through the microscope; and
- distance altering means for altering the distance of the target from the mirror such that said image can be made to appear at a selected level relative to the level of field that is in focus when viewed through the microscope.

4,000,949

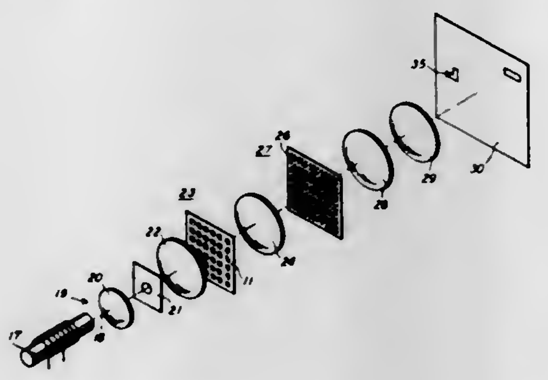
PHOTOMASK INSPECTION BY OPTICAL SPATIAL FILTERING

Laurence S. Watkins, Hopewell, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 858,002

Int. Cl.² G01B *9/08*; G02B *27/00*

U.S. Cl. 356—165 **7 Claims**



1. A method of isolating nonperiodic errors in a photomask containing a pattern formed by a regular array of normally identical elements mutually spaced apart by a predetermined distance, which comprises the steps of:

directing a spatially coherent beam of light at the pattern to diffract the light;

focusing the diffracted light on a filter containing a plurality of discrete opaque regions on a transparent field, the opaque regions being spaced by a distance inversely proportional to the predetermined distance to spatially modulate the intensity of the focused light; and

reimaging the spatially modulated light to form an image exhibiting the nonperiodic errors in the pattern.

4,000,950

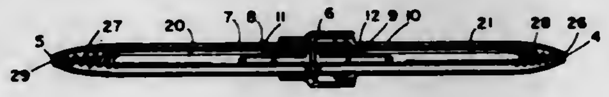
WRITING INSTRUMENT

Eric C. Wahlberg, 32 Eighth St., Stamford, Conn. 06905

Continuation of Ser. No. 457,411, April 3, 1974, abandoned. This application July 9, 1975, Ser. No. 594,297

Int. Cl.² B43K *27/04*

U.S. Cl. 401—32 **8 Claims**



1. A multi-writing means writing instrument comprising a hollow body having a plurality of writing means therein, a separate positioning means located entirely within said hollow body co-acting with each of said plurality of writing means to hold said writing means in either writing or non-writing position in said writing instrument, a separate positioner actuator means located externally on said hollow body and having a part projecting into the interior of said hollow body, said projecting part being freely movable and physically unconnected to each of said positioning means and co-acting separately with each of said positioning means to individually move each of said positioning means into a position where said writing means is held in writing position in said writing instrument separately and independently from the other of said positioning means, and both of said writng means being capable of being positioned at the same time in writing positions at opposite ends of said writing instrument.

4,000,951

LOOSE LEAF BINDERS

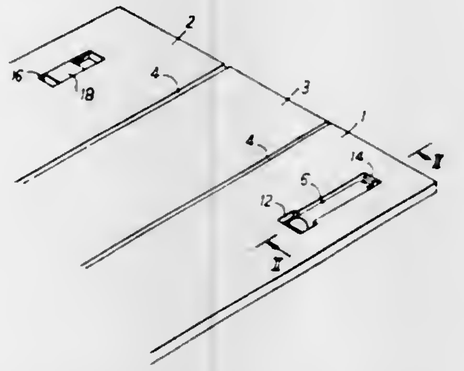
Kenneth Malcolm Agnew, 10 Chesterfield Road, London W4; Charles Henry Pentland Denroche, 90 Park Road, Hampton Wick, Kingston-upon-Thames, Surrey, and Roy Hewlett, 46 Lytton Grove, London SW15, all of England

Filed May 6, 1974, Ser. No. 467,363

Claims priority, application United Kingdom, May 8, 1973, 21950/73

Int. Cl.² B42F *3/00, 13/02*

U.S. Cl. 402—22 **5 Claims**



1. A loose-leaf binder formed in one piece of resiliently deformable plastics material and comprising in integral form a back portion and first and second side portions hinged on opposite edges of said back portion, said first side portion having an elongate opening therein extending generally parallel to said edges, a rigid post lying in said opening and connected by a hinge portion to one end of said opening, said post having a first reaction surface thereon spaced from said hinge portion, said first side portion having a projection extending from a side of said opening, said projection providing a second reaction surface spaced from said hinged portion by approximately the same distance as said first reaction surface, whereby when said post is pivoted upwardly from said opening said reaction surfaces cooperate to retain said post in an upright position, said second side portion having a second opening in a face thereof, means at the edge of said second opening providing an abutment surface facing away from said face, the end of said post remote from said hinge portion having a shoulder formed thereon, said end of said post being insertable in said second opening with said shoulder contacting said abutment surface, and a locking member on said second side portion and movable into and out of said second opening respectively to retain said shoulder in contact with said abutment surface and to release said shoulder therefrom.

4,000,952

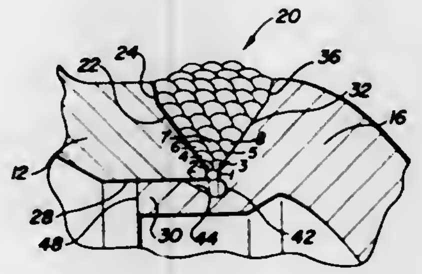
WELD JOINT HAVING A WELD DROPPINGS RECEIVING POCKET

Harold Bryan, and James W. Johnson, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,851

Int. Cl.² B25G *3/34*

U.S. Cl. 403—271 **9 Claims**



1. A full penetration weld joint for connecting two members, comprising:

a. first and second members each having opposed edge portions in juxtaposed relation, said first member having a lip portion extending from one side of said edge portion on said first member and lapping over a portion of said second member,

b. said opposed edge portions having opposed facing end surfaces on inner portions of said opposed edge portions being inclined outwardly in outer portions thereof forming an open groove, with said facing surfaces defining the root of the weld joint, said facing surface on said first member extending outwardly from the plane of the outer surface of said lip,

c. a generally U-shaped undercut groove in said first member having the closed end thereof substantially underneath said inclined edge portion of said first member having one side thereof terminating underneath said second member and opening at the juncture of said facing surface and said lip portion, and said U-shaped groove being inclined relative to said lip portion at an acute angle and at a location such that said groove can be formed in a single machining operation, and

d. weld metal filling said open groove joining said facing surfaces and said opposed edge portions and forming a joint between said first member and said second member.

4,000,953

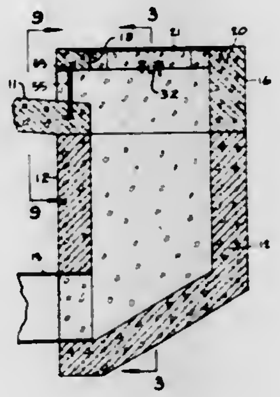
CONCRETE CATCH BASIN WITH SPRING RETAINED MANHOLE COVER

Walter J. Langeliers, and Roger W. Langeliers, both of Springfield, Oreg., assignors to Concrete Curb Inlets Co., Springfield, Oreg.

Filed Mar. 22, 1976, Ser. No. 669,306

Int. Cl.² E02D *29/12, 29/14*

U.S. Cl. 404—5 **5 Claims**



1. In a pre-cast concrete catch basin for mounting in communication with a storm sewer and having a pair of vertical substantially parallel side walls, a rear wall connecting said side walls, a top slab integrally cast with said side walls and said rear wall, said side walls and said top slab defining therebetween a first opening through which surface drainage is received, said side walls and said rear wall defining a chamber communicating with said storm sewer, said top slab having a second opening therein, a recessed seat disposed in said top slab around said second opening, said second opening being substantially symmetrically disposed with respect to said chamber, and a manhole cover removably disposed in said seat such that the upper surface of said manhole cover is substantially flush with the upper surface of said top slab, the improvement comprising

latch means mounted on the lower surface of said manhole cover for removably retaining said manhole cover in said seat, said latch means comprising

a sleeve attached at its upper end to said lower surface of said manhole cover adjacent one edge thereof,

a washer attached to the lower end of said sleeve,

a rod axially disposed within said sleeve, said rod extending outwardly of said upper and lower ends of said sleeve and through said washer attached thereto, said rod being axially rotatable with respect to said sleeve and said washer by means engageable with the upper end thereof,

a bolt attached to the lower end of said rod outwardly of said washer, said bolt extending perpendicularly to the axis of said rod,

a retainer attached to said rod intermediate its ends, said retainer being received within said sleeve and being rotatable with respect thereto, and

spring means disposed interiorly of said sleeve between said retainer and said washer, said spring means being compressible between said retainer and said washer upon a downwardly directed force being applied axially to said rod to extend the same further outwardly of said lower end of said sleeve; and catch means extending from the lower surface of said top slab, said catch means comprising at least one projecting bolt anchored in said top slab and extending downwardly from said lower surface thereof, said catch means being mounted adjacent said second opening therein, said catch means being adapted to engage said bolt on said rod when said rod is extended further outwardly of said lower end of said sleeve and rotated with respect to said sleeve and said washer, said spring means normally biasing said bolt on said rod toward said sleeve and said washer to retain said bolt in said catch means upon said bolt being rotated into engagement therewith.

4,000,954

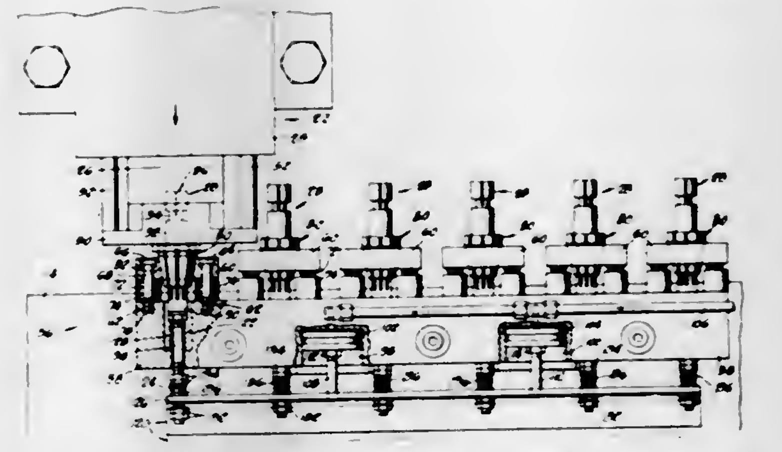
AUTOMATIC TOOL CHANGING APPARATUS FOR DRILLING MACHINES AND THE LIKE

Jayantilal S. Patel, El Monte, Calif., assignor to Digital Systems, Inc., Arcadia, Calif.

Filed Oct. 31, 1975, Ser. No. 627,617

Int. Cl.² B23B *47/00*

U.S. Cl. 408—3 **18 Claims**



1. An automatic tool changing mechanism for a machining mechanism, comprising:

a member for releasably retaining a tool mechanism;

supporting means for supporting a tool mechanism;

said supporting means being movable between a nongripping position wherein it is adapted to relatively loosely support a tool mechanism and a gripping position wherein it is adapted to firmly grasp a tool mechanism; and

means operative in response to delivery of a tool mechanism to said supporting means for moving said supporting means to its said gripping position.

4,000,955

FAN WITH WIDE CURVED BLADES

Kiyoshi Tokutomi, 490 N. 5th St., San Jose, Calif. 95112

Filed Sept. 22, 1975, Ser. No. 615,486

Int. Cl.² F04D *29/44*

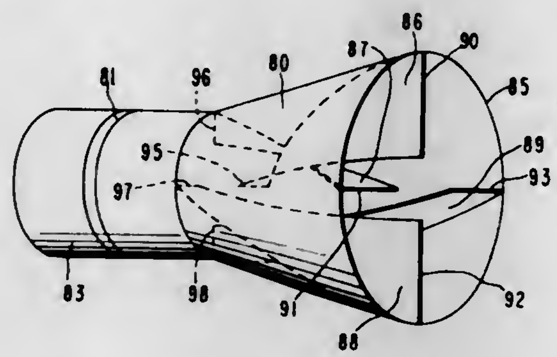
U.S. Cl. 415—183 **6 Claims**

1. A rotating device in combination with an air collector comprising:

a rotatable shaft having a longitudinal axis;

a plurality of blades spaced apart mounted on the shaft, each blade extending from the shaft in an arc of a curvature wherein the radial center of the arc lies along an imaginary line extending between the shaft center and the outer tip of the arc farthest from the shaft, each blade being attached to the shaft at a point approximately 90° away from the imaginary line for a particular blade; and

a funnel-shaped air collector, having a wide open end and a narrow open end, with a plurality of spaced fins attached to a portion of and extending through the interior of the collector, said fins starting at the wide end of the collector and extending toward the narrow end, with the two ends of each fin being aligned so that they are out of phase with each other by approximately 360° divided by the number of fins in the collector, said collector adjacent to said plurality of blades with the narrow end of said collector pointing toward the blades.



4,000,956
IMPACT RESISTANT BLADE

Robert G. Carlson, Greenhills, and Robert W. Harrison, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,495

Int. Cl.² F01D *5/28*

U.S. Cl. 416—230 **7 Claims**

1. A blade for use in a fluid flow machine, said blade having a tip portion and a root portion fabricated of a plurality of bonded filament laminates, said laminates characterized by a plurality of continuous collimated filaments embedded in a first matrix at the blade root and a second matrix at the blade tip, said first and second matrices being bonded together at a common interface, said second matrix comprising two materials sandwiching said filaments and characterized by a greater impact strength than said first matrix and wherein the first of said materials is characterized by a greater bondability to itself and to said filaments relative to said second material.

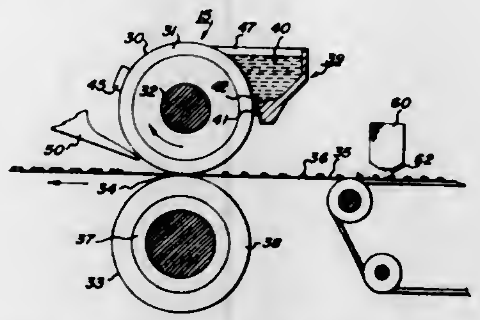
4,000,957
CONTACT FUSER AND RELEASE AGENT APPLICATOR THEREFOR

John G. Ruhland, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1975, Ser. No. 616,458

Int. Cl.² G03G *13/00*

U.S. Cl. 427—22 **8 Claims**



1. Apparatus for fixing toner images to support material, said apparatus comprising:

a heated fuser structure operative to soften said toner images;

a backup member cooperating with said heated fuser structure to form a nip through which said support material moves with said toner images contacting said heated fuser structure;

means for applying a first release material to the surface of said heated structure, said first release material being a liquid at the operating temperature of said fuser structure; and

means for applying a second release material to said heated structure, said second release material being chemically inert and solid at the operating temperature of said fuser structure and forming a layer on said fuser structure which contacts the toner in its molten condition whereby separation of said support material is facilitated.

4,000,958
METHOD FOR TREATING LEATHER

Masaaki Hirooka, Kyoto; Yoshikazu Fujii, Ibaragi, and Kazuhiko Hata, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

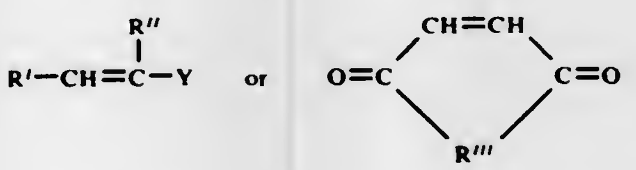
Filed Apr. 14, 1975, Ser. No. 567,846

Claims priority, application Japan, Apr. 17, 1974, 49-43761

Int. Cl.² B05D *3/02*

U.S. Cl. 427—389 **48 Claims**

1. A method for treating a leather, which comprises treating a leather with a copolymer [II] obtained by polymerizing 5 to 2,000 parts by weight of at least one member selected from the group consisting of acrylic esters and methacrylic esters which contain, as the alcohol moiety, a hydrocarbon- or halohydrocarbon-group having 1 to 20 carbon atoms, and 500 parts by weight or less of at least one vinyl compound having the formula:



$$R'-CH=\overset{\displaystyle R''}{\overset{|}{C}}-Y \quad \text{or}$$

wherein R' and R'' are independently a hydrogen atom, a halogen atom, a hydrocarbon- or halohydrocarbon-group having 1 to 8 carbon atoms, or Y; Y is a group having 1 to 20 carbon atoms and having a group selected from the group consisting of a carboxyl group, acid halide groups, a hydroxyl group, ether groups, and oxygen-containing cyclic compound residues; R''' is an oxygen atom or $>N\text{-}R^{iv}$ wherein R^{iv} is a hydrogen atom or a hydrocarbon- or halohydrocarbon-group having 1 to 8 carbon atoms, in the presence of 100 parts by

weight of a coploymer [I] comprising as essential components at least one monoethylenically unsaturated ester compound having 4 to 22 carbon atoms, and at least one member selected from the group consisting of monoethylenically unsaturated hydrocarbon compounds having 2 to 20 carbon atoms or halogen-substituted derivatives thereof.

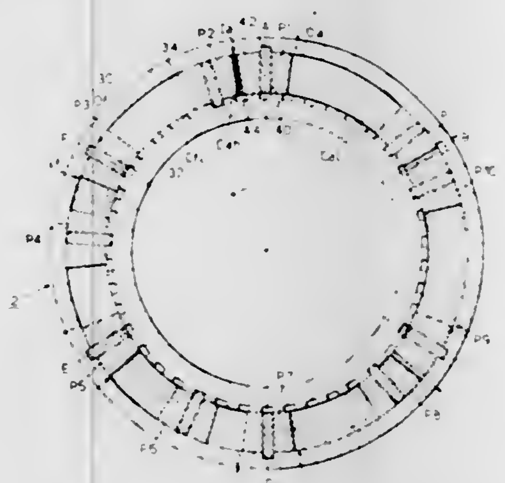
4,000,959
FREE-PISTON ROTARY DEVICE PARTICULARLY USEFUL AS HYDRAULIC MOTOR OR PUMP

Iza Portugali, 14 Givati St., Apt. 17, Afridar, Ashkelon, Israel

Filed Mar. 17, 1975, Ser. No. 559,239

Int. Cl.² F01C *1/00;* **F03C** *3/00;* **F04C** *1/00*

U.S. Cl. 418—35 **8 Claims**



1. A rotary device comprising a stator; a rotor mounted coaxially for rotary movement with respect to the stator and defining an annular gap therewith; a plurality of pistons movable within said annular gap in a circumferential direction with respect thereto; each of said pistons including a coupling member movable from a first position coupling the piston to the stator, to a second position coupling the piston to the rotor; and positioning means including a source of pressurized fluid and a fluid distributor including a stationary member fixed to said stator and having a plurality of passageways leading to different locations of the stator at which the coupling members are coupleable to the stator, and a rotary member driven by the rotor to control the flow of the fluid from said pressurized fluid source to said passageways in synchronized timed relationship to the rotation of the rotor such that the coupling members are alternately coupled to the stator and to the rotor to form alternating expansible and contractable chambers between successive pistons.

4,000,960
APPARATUS FOR MANUFACTURING SYNTHETIC TOW FOR STRETCH-CUT SPINNING PROCESS

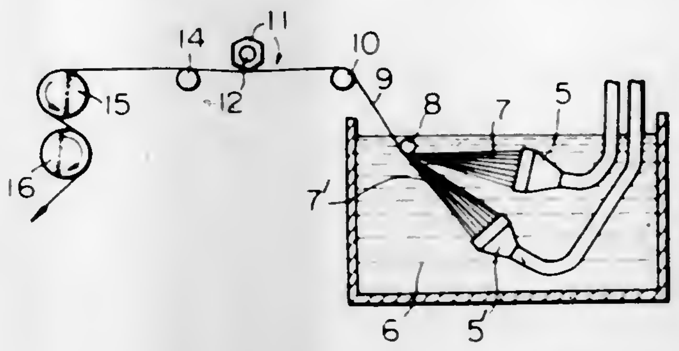
Noboru Oguchi; Takashi Hiramatsu; Ikuo Igami, all of Nagoya; Akira Aoki, Inazawa; Syogo Tanaka, Otake; Toshiro Seki, Otake, and Takao Inoue, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 277,990, Aug. 4, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,974

Int. Cl.² D01D *5/20*

U.S. Cl. 425—76 **6 Claims**

1. An apparatus for continuously producing a synthetic filament's tow from a plurality of synthetic filaments comprising a pair of guide rollers for leading said filaments from spinnerets to a transfer roller for guiding said filaments to a take-up means, a guide disposed at a position where coagulation of said filaments has not been completed, deviation bar means provided with a plurality of transverse radially projecting edges for periodically deviating passage of said tow during rotation of said bar means from a passage defined only by said guide rollers by means of rotational contact of each of said edges with said tow, said bar means being rotatably mounted on an axis transversal to said filaments and disposed just before or after a particular position on a passage defined by said pair of guide rollers were coagulation of said filaments are completed.



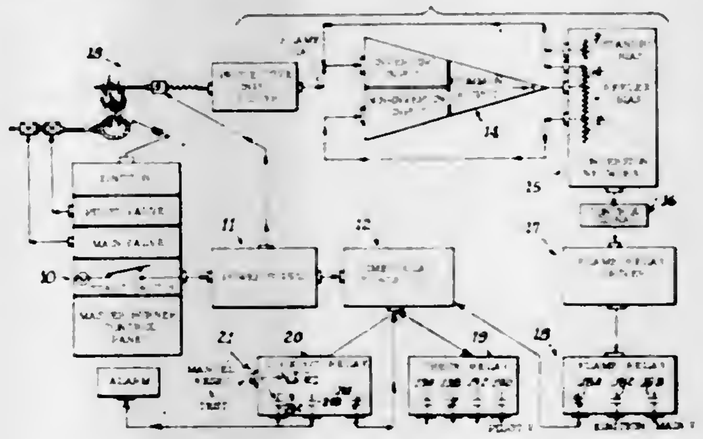
4,000,961
PRIMARY FLAME SAFEGUARD SYSTEM

Richard F. Mandock, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Aug. 26, 1975, Ser. No. 607,917

Int. Cl.² F23N *5/12*

U.S. Cl. 431—2 **19 Claims**



1. The method of producing a control signal from a source of flame-detection current which comprises: deriving flame bias of predetermined polarity from said current; applying said flame bias to input means in a reflexive amplifying means having output means connecting into a conversion network operative to produce a plurality of reflex bias voltages of predetermined polarity and magnitude operative in said input means to produce a regenerative common output in said network and a resultant control signal available as output from said network and having two states of opposite polarity depending upon whether or not said flame bias acts in said input means, there being a first state in the absence of said flame bias which is of a first polarity, and a second state in the presence of said flame bias which is of a second and reverse polarity, said control signal having two states respectively corresponding to said first and second polarities.

4,000,962
METHOD OF HEATING UP GLASS MELTING FURNACES OR THE LIKE

Maurice Hemingway, Mirfield, and Trevor Ward, Dewsbury, both of England, assignors to Hotwork International Limited, England

Filed May 12, 1975, Ser. No. 576,263

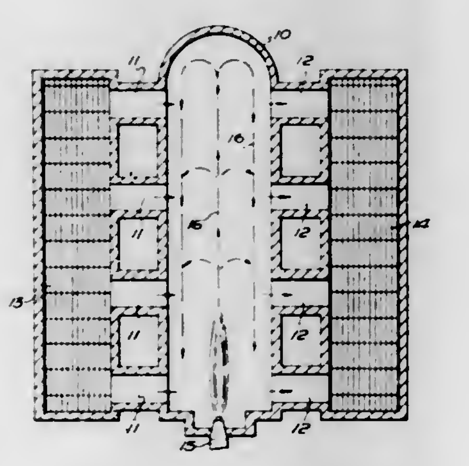
Claims priority, application United Kingdom, May 14, 1974, 21175/74

Int. Cl.² F27D *7/00*

U.S. Cl. 432—4 **2 Claims**

1. A method of pre-heating a refractory lined furnace and the regenerators associated with it to bring the furnace and regenerators up to working temperature, comprising the steps of

1. injecting a flow of hot gases into the furnace from one or more high velocity burners of the nonradiant type whereby the injected gases circulate around the interior of the furnace and heat the interior substantially uniformly,
2. introducing air to the interior of the furnace alternately through different regenerators that are alternately heated by the hot waste gases flowing from the furnace to the flue, and
3. causing the one or more burners to pass to an excess fuel condition whereby the air introduced through the regenerators is consumed within the furnace by combustion with the excess fuel.



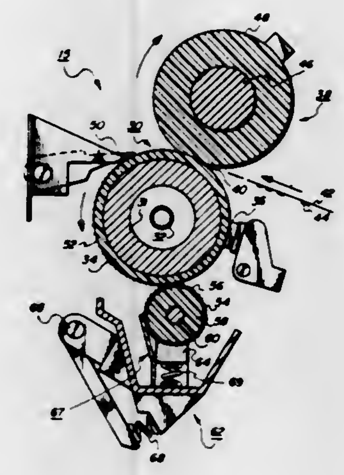
4,000,963
CLEANING APPARATUS FOR A HEAT AND PRESSURE FUSER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 21, 1975, Ser. No. 597,735

Int. Cl.² G03G *13/08*

U.S. Cl. 432—60 **8 Claims**



1. In a heat and pressure fuser apparatus for fixing toner images wherein copy sheets having said toner images thereon are passed through a nip formed between a heated fuser member and a backup member whereby the toner images contact said heated member,
  an improved cleaning apparatus for removing toner and other contaminants from the surface of said heated member, said cleaning apparatus comprising:
  a tacky-surfaced cleaning member supported at least part of the time in contact with said heated fuser member, and
  means for rejuvenating said tacky surface cleaning member whereby the surface thereof maintains its capacity to effectively remove said contamination from said heated fuser member; and
  said means for rejuvenating said tacky-surfaced cleaning member comprising means for applying a coating of polymer material which is tacky at the operating temperature of said cleaning member.

CHEMICAL

4,000,964
POLYCHROMATOGRAPHIC DYEING

Clifford Newton, Stockport, England, assignor to BSG Designs Inc., London, England

Filed Dec. 10, 1974, Ser. No. 531,390

Claims priority, application United Kingdom, Dec. 15, 1973, 58237/73; May 24, 1974, 23245/74; Aug. 14, 1974, 35683/74

Int. Cl.² D06P *3/00*

U.S. Cl. 8—14 **4 Claims**

1. A method of effecting coloration of a dyeable substrate having interstices which comprises filling the interstics in the substrate with a mixture of dye liquors of different colors and different fixation properties, fixing at least one of said dye liquors, applying to said substrate an eluant for another of said dye liquors to promote migration thereof, fixing said migrated dye liquor and washing and finishing said substrate.

4,000,965
METAL COMPLEX DYESTUFFS

Winfried Mennicke, Leverkusen, Germany; Peter Suchanek, Scotch Plains, and Peter F. Vogt, Berkeley Heights, both of N.J., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 29, 1975, Ser. No. 545,119

Claims priority, application Germany, Jan. 30, 1974, 2404314; Sept. 11, 1974, 2443483

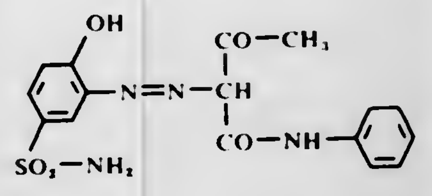
Int. Cl.² C09B *27/00, 45/48;* **D06P** *1/10*

U.S. Cl. 8—26 **18 Claims**

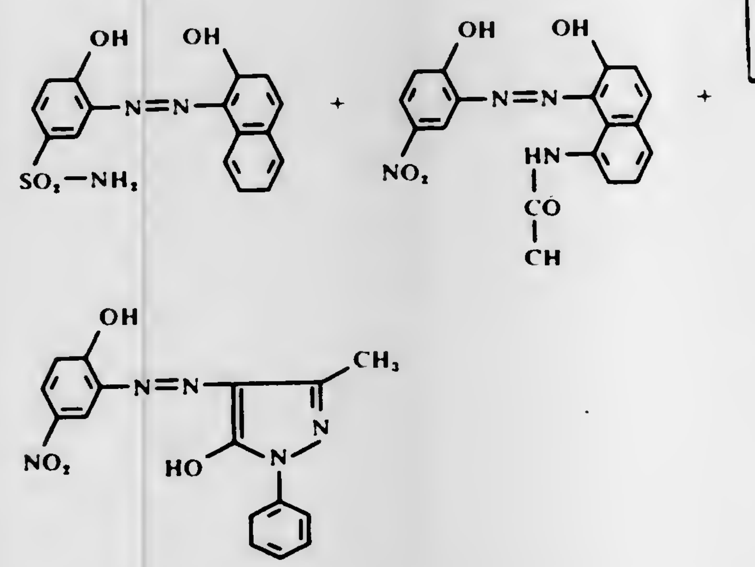
1. The lithium salt of a 1:2 chromium or 1:2 cobalt complex of a monoazo or azomethine dyestuff which before metallization contains a O,O′-dihydroxy-O-hydroxy-O′-amino-azo or -azomethine group.

13. Process for the preparation of concentrated solutions of 1:2-azo- and azomethine complex dyestuffs, characterized in that the metallisable dyestuffs are chromated in hydroxyl group containing solvents in the presence of alkaline lithium salts with chromium acetate or chromium formate.

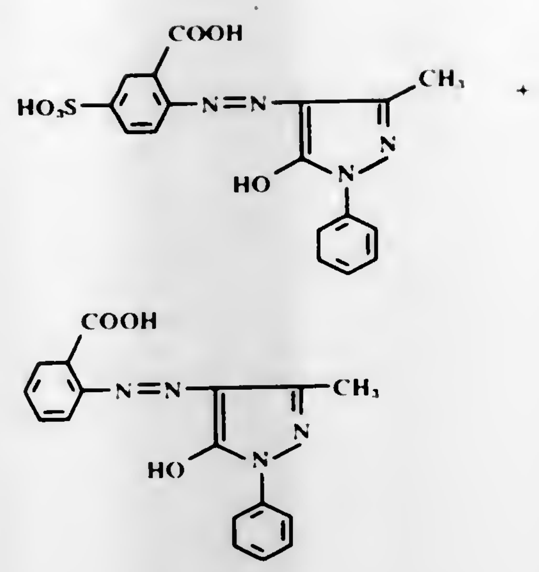
14. Lithium salt of the cobalt complex of the dyestuff of the formula



15. Lithium salt of the chromium complex of the mixtures of the dyestuffs of the formulae



16. Lithium salt of the chromium complex of the mixtures of the dyestuffs of the formulae



4,000,966
DYEING CELLULOSE WITH AMINONAPHTHYL AZOBENZENE VINYL TYPE REACTIVE DYES

Fritz Meininger, Frankfurt am Main; Ludwig Schlafer, Fischbach, Taunus, and Maria Kallay, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 160,153, July 6, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,205

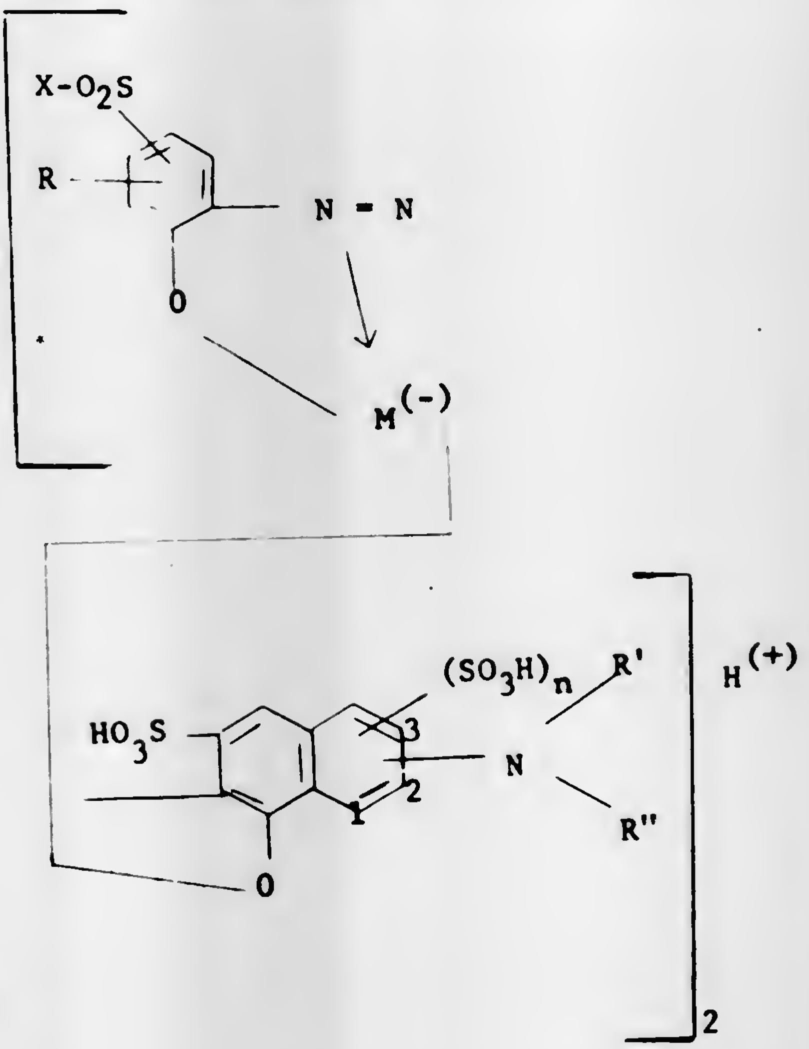
Claims priority, application Germany, July 8, 1970, 2033784

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² D06P *3/00*

U.S. Cl. 8—1 E **17 Claims**

1. A process for the manufacture of fast prints on fibrous materials consisting of or containing cellulose which comprises applying symmetrical metal-containing reactive dyestuffs of the general formula



in which M represents a cobalt or chromium atom, R represents hydrogen, chlorine, bromine, nitro, amino, acetylamino or a lower alkyl or alkoxy group containing 1 to 4 carbon atoms, R′ represents hydrogen or alkyl of 1 to 4 carbon atoms, R″ represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, and wherein the moiety —NR′R″ in the formula is substituted in the 2 or 3 position of the naphthol component, *n* is zero or 1 and X represents the vinyl radical or a group of the formula $-CH_2-CH_2-Y$ in which Y is halogen, sulfuric acid ester, thiosulfuric acid ester, phosphoric acid ester, dimethylamino or diethylamino, on said fibrous materials and fixing them by means of inorganic alkaline agents or by the action of heat at temperatures up to 200°C.

4,000,967
WETTABLE NON-WOVEN STRUCTURES AND COMPONENTS THEREOF

Burnett H. Johnson, and Terrence Huff, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 149,677, June 3, 1971, Pat. No. 3,765,948. This application July 26, 1973, Ser. No. 372,232

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² D06B *1/00*

U.S. Cl. 8—115.5 **15 Claims**

1. An improved process for preparing wettable and rewettable polyolefin non-woven mats which comprises:

contacting a non-wettable non-woven mat of polyolefin fibers having a porosity greater than 40 percent with a gaseous sulfur dioxide-chlorine mixture in the presence of ultraviolet light under conditions to obtain at least 1.0 weight percent sulfur in said mat.

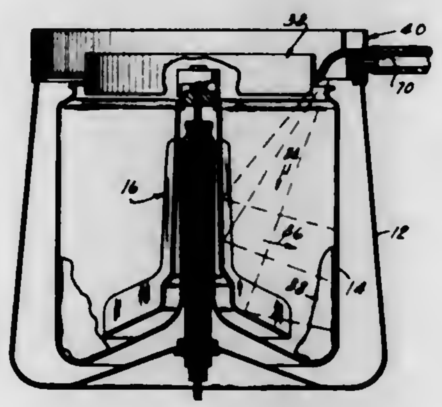
4,000,968
PERMANENT PRESS CYCLE FOR AUTOMATIC WASHER

Joy A. Schrage, Berrien Center; John William Pielemeier, St. Joseph, and James I. Czech, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 503,665, Sept. 6, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,440

Int. Cl.² D06F *13/02, 23/04, 39/08*

U.S. Cl. 8—158 **6 Claims**



1. In a method of washing permanent press fabric wherein the permanent press fabric is agitated in a washing liquid, rinsed in a rinsing liquid after removal of the washing liquid and then centrifuged to remove the rinsing liquid, the improvement comprising the step of: adding moisture to the permanent press fabric during centrifuging to maintain the moisture level above a desired level to minimize setting of wrinkles in the permanent press fabric.

4,000,969
DYEING AND PRINTING SYNTHETIC HYDROPHOBIC FIBERS WITH A CARRIER COMPRISING PHENYL CYCLOHEXANE AND DERIVATIVES

Kurt A. Dellian, and Jayanti V. Isharani, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

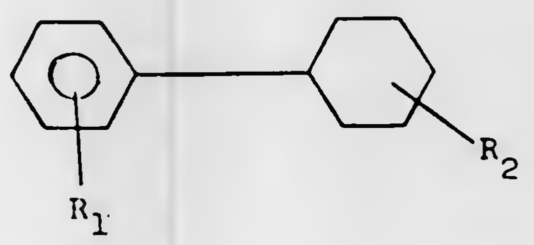
Filed Dec. 27, 1974, Ser. No. 537,058

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² D06P *5/04, 1/673*

U.S. Cl. 8—173 **9 Claims**

1. In a process for coloring a textile fiber with a disperse, acid, basic or premetallized dyestuff with the aid of a carrier, the improvement comprising using as a carrier a compound of the general formula:



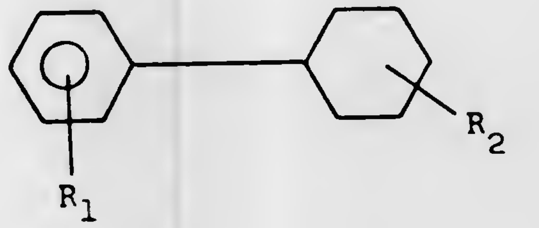
where

R_1 is hydrogen or lower alkyl; and

R_2 is hydrogen, lower alkyl, halogen or lower alkoxy.

6. A composition comprising

a. a compound of the formula



where

R_1 is hydrogen or lower alkyl; and

R_2 is hydrogen, lower alkyl, halogen or lower alkoxy, and

b. an anionic or nonionic surfactant, or mixture thereof.

4,000,970
DYEING PROCESS

Edwin Dennis Harvey; David Melville Fawkes; Denis Ronald Lemin, and James Anthony Hawkes, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 17, 1973, Ser. No. 389,155

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² D06P *3/24*

U.S. Cl. 8—178 R **9 Claims**

1. A process for the batchwise dyeing of polyamide textile materials which comprises treating said material in an aqueous dye liquor containing not more than 10% by volume of at least one organic liquid capable of forming an azeotrope with water and an anionic dye, said dye liquor being maintained during at least part of the treatment at a temperature higher than the boiling point of said azeotrope and under a pressure greater than atmospheric pressure, and then recovering the organic liquid, by distillation before removing the textile material from the aqueous dye liquor.

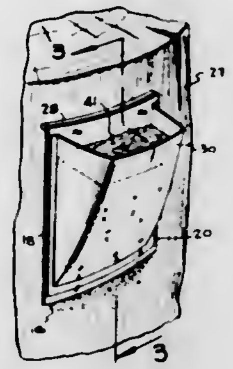
4,000,971
LIQUID APPLYING MEANS

Thomas Gaskins, Palmdale, Fla. 33944

Filed Feb. 3, 1976, Ser. No. 654,789

Int. Cl.² B27K *3/02*

U.S. Cl. 21—63 **9 Claims**



1. Liquid applying means for slowly applying treatment liquid to wooden structural members or the like, said liquid applying means comprising a generally flat support panel having an inner face engageable with the outer surface of a structural member, said flat support panel also having an outer face, an upper edge and a lower edge, attachment means for enabling said support panel to be attached to and supported by such a structural member above a treatment area of the structural member to which it is desired to apply treatment liquid, flexible sheet member means, means bonding said flexible sheet member means to said outer face of said support panel so that said flexible sheet member defines at least one pouch-like member movable between a first position in which it abuttingly engages the outer face of said flat support panel and an extended position in which said flexible pouch-like member bulges outwardly from the outer face of said flat support panel so as to define at least one opentopped volumetric space between said flexible sheet member and said flat support panel in which liquid can be received and stored and liquid discharge openings in said flexible sheet member for permitting liquid in said volumetric space to be gradually discharged through said liquid discharge openings for gravitational flow down the outer surface of said flexible sheet for deposit on the treatment area of said structural member.

4,000,972
MEASURING SYSTEM FOR THE PHARMACOLOGICAL MANIPULATION OF THE COAGULATION MECHANISM IN BLOOD AND FOR THE ELAPSED COAGULATION TIME

Walter Jacob Braun; John Henry Altshuler, both of Englewood; Gerald Lance Schlatter, and Robert LeRoy Poland, both of Boulder, all of Colo., assignors to Hemotec, Inc., Englewood, Colo.

Filed Jan. 16, 1976, Ser. No. 649,648

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **43 Claims**

39. A method for determining the amount of anticoagulant or neutralizing additive to be injected into the blood of a patient so that said blood is maintained at a desired level of anticoagulant, said method comprising the steps of:

taking samples of the patient's blood,

mixing predetermined amounts of varying concentrations of the neutralizing additive into each of the samples,

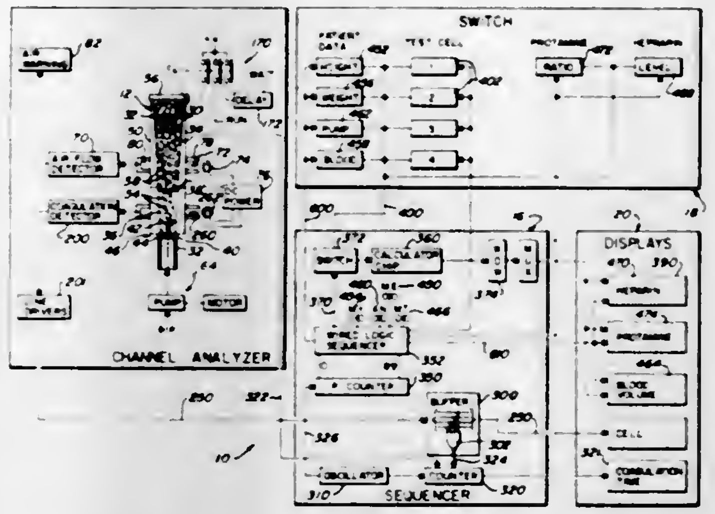
storing the concentration information of the additive in relation to the identity of each sample,

signalling the identity of the sample which is the first to coagulate,

reading the stored concentration information for the first sample to coagulate in response to said identify signal,

determining the amount of anticoagulant with the blood in response to the reading of the concentration information of the additive within the first sample to coagulate, and

determining the amount of desired anticoagulant to be injected in response to the determination of the amount of anticoagulant already in the blood.



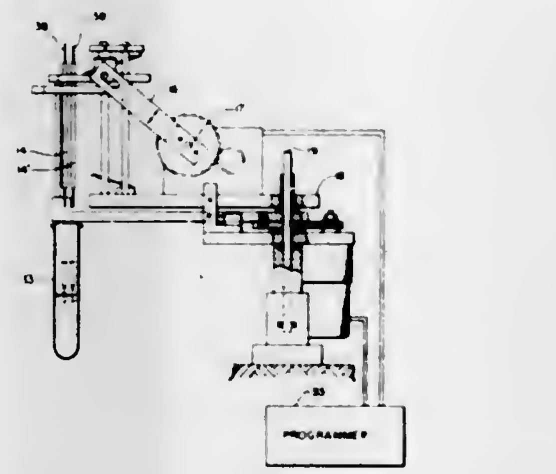
4,000,973
SAMPLE RESIDUE CLEANING SYSTEM FOR BIOLOGICAL ANALYZERS

Arne J. Petersen, Newport Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 9, 1974, Ser. No. 504,390

Int. Cl.² G01N *31/00, 33/16*

U.S. Cl. 23—230 R **7 Claims**



1. An improved method of picking up and dispensing a quantity of liquid sample material for analysis using a sample pick-up probe comprising the steps of:

inserting the probe into the sample material and drawing a quantity of the sample into the probe;

inserting the probe into a reagent chemically reactive with the sample material for a period of time sufficient for the reagent to consume any residue of sample material adherent to the outside of the probe; and

subsequently ejecting at least a portion of the quantity of the sample material from the probe for analysis.

4,000,974
SAMPLE RESIDUE CLEANING SYSTEM FOR BIOLOGICAL ANALYZERS

William A. Acord, Claremont, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 504,390, Sept. 9, 1974. This application Mar. 31, 1976, Ser. No. 672,081

Int. Cl.² B65B *43/56;* **B67C** *3/16;* **G01N** *33/16, 1/14*

U.S. Cl. 23—230 R **7 Claims**

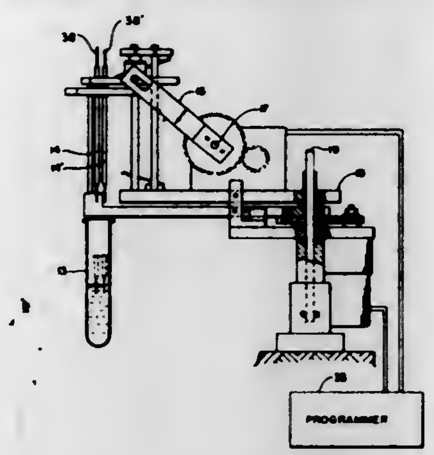
1. An improved method of picking up and dispensing a quantity of liquid sample material for analysis using a sample pick-up probe comprising the steps of:

inserting the probe into the sample material and drawing a quantity of the sample into the probe;

removing the probe from the sample material and drawing a bubble of air into a tip end of the probe;

inserting the probe into a reagent chemically reactive with the sample material for a period of time sufficient for the reagent to consume any residue of sample material adherent to the outside of the probe, the air bubble isolating the sample in the probe from the reagent; and

subsequently ejecting the air bubble and at least a portion of the sample material from the probe for analysis.



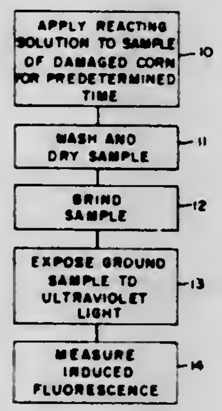
4,000,975
METHOD OF MEASURING DAMAGE TO GRAIN

Gerald Davis Christenbury, Florence, S.C., and Wesley Fisher Buchele, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 12, 1976, Ser. No. 648,285

Int. Cl.^{2} G01N *21/52, 33/10*

U.S. Cl. 23—230 B **10 Claims**


APPLY REACTING SOLUTION TO SAMPLE OF DAMAGED CORN FOR PREDETERMINED TIME
10
WASH AND DRY SAMPLE
11
GRIND SAMPLE
12
EXPOSE GROUND SAMPLE TO ULTRAVIOLET LIGHT
13
MEASURE INDUCED FLUORESCENCE
14

1. A method of measuring mechanical damage to grain comprising: applying a solution to a sample of the damaged grain for a predetermined time, said solution containing a material which selectively chemically bonds to interior protein of said grain, said interior protein having been exposed by said mechanical damage, and which does not bond to other portions of the grain to an appreciable extent, wherein the resulting products fluoresce when irradiated; grinding said sample grains to which said solution has been applied; exposing said ground sample to a source of radiation which induces said fluorescence; and measuring the induced fluorescence of the ground sample, which measurement defines the mechanical damage of said grain.

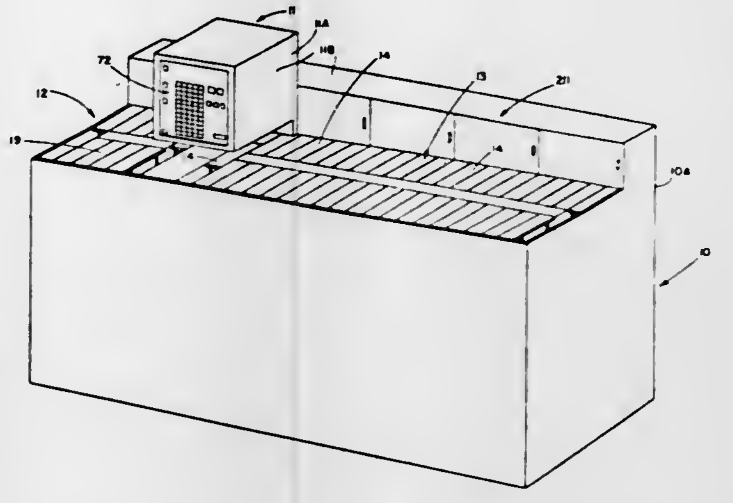
4,000,976
APPARATUS AND METHOD FOR PREPARING, DILUTING AND REPLICATING LABORATORY SAMPLES

Charles E. Kramer, Northbrook, and Menachem Tiger, Mount Prospect, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 312,894, Dec. 7, 1972, abandoned. This application Apr. 11, 1975, Ser. No. 567,349

Int. Cl.^{2} G01N *1/18*

U.S. Cl. 23—259 **43 Claims**



1. A method for preparing samples, including dilutions of a specimen and replication of said specimen and dilution thereof, for use with a source of diluent, and sample preparation apparatus including a dosing tip, a dosing pump means in gated communication with said tip and said diluent source, and a process controller for providing command signals coordinating and governing operation of said apparatus, said method comprising the steps of:

aspirating a specimen of a given dilution thereof into said dosing tip by means of said pump, in response to first command signals from said process controller;

dispensing in proportional fractions a portion of said specimen or given dilution by means of said dosing pump means in response to second command signals through said dosing tip into a plurality of replication receptacles to replicate said specimen or given dilution;

aspirating a quantity of diluent from said diluent source into said pump means in response to third command signals,

dispensing the remaining specimen or given dilution previously aspirated, along with said quantity of diluent, by means of said dosing pump means in response to fourth command signals through said dosing tip into a holding receptacle to form a subsequent dilution.

4,000,977
APPARATUS FOR PRODUCING MONOCRYSTALS BY THE VERNEUIL TECHNIQUE

Richard Falckenberg, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1975, Ser. No. 563,165

Claims priority, application Germany, Mar. 28, 1974, 2415110

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

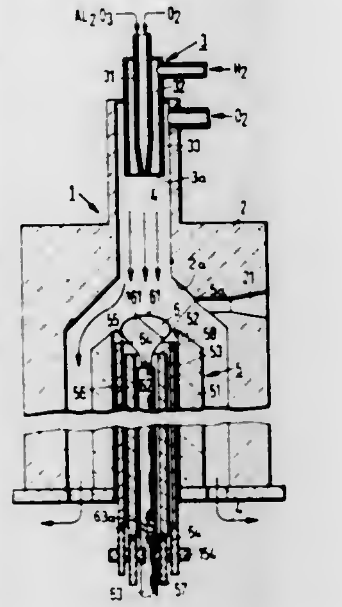
Int. Cl.^{2} B01J *17/24*

U.S. Cl. 23—273 V **5 Claims**

1. An apparatus for producing monocrystals having a relatively large cross-section by the Verneuil technique wherein a seed crystal is mounted on a movable crystal support member within a furnace means having a burner guiding flame gases and crystal growth material to impinge against said seed crystal so that said material melts and adheres to the seed crystal and forms a monocrystal which grows axially upwardly therefrom while the crystal support member is moved axially downwardly a distance corresponding to the amount of axial crystal growth so that substantially uniform growth conditions are maintained throughout the crystal growing process; the combination comprising:

a relatively massive flame deflector member positioned within the furnace means in spaced registry from the burner and having a central through passage therein which radially surrounds and is spaced from the crystal support member, said through passage having an outer diameter somewhat larger than the cross-section of the monocrystal being grown, said flame deflector member having a mass relative to the monocrystal being grown sufficient to form a heat reservoir for said monocrystal after burner shut-down, said flame deflector member having upper conical outwardly beveled surfaces extending radially away from said through passage therein for laterally deflecting flame gases impinging on the upper surface of the monocrystal being grown; and

at least on axially movable insert member positioned within said through passage of the deflector member and radially spaced from the crystal support member and said deflector member, said insert member being selectively movable in relation to said deflector member and said crystal support member.



4,000,978
THERMAL RECOMBINER

James O. Henrie, Hidden Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 340,148, March 12, 1973. This application Sept. 30, 1974, Ser. No. 510,682

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.^{2} B01J *1/14*; **C01B** *5/00*

U.S. Cl. 23—277 R **3 Claims**

1. Apparatus for thermally recombining gases, said apparatus comprising:

a first chamber provided with heating means for initially heating the gases to be combined to a temperature above the threshold for thermal recombination of said gases;

a second chamber comprising:

an outer shell having closed ends,

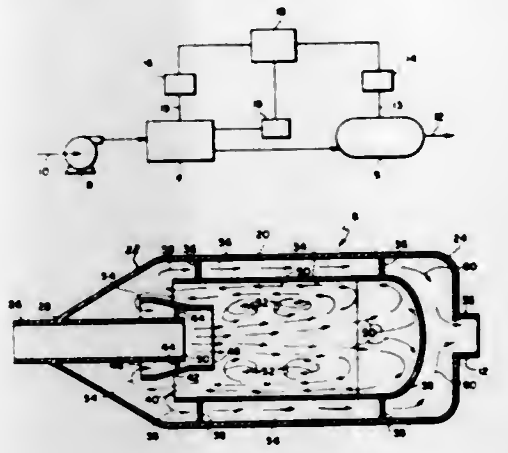
a generally cup-shaped member mounted coaxially within said outer shell in spaced relation with said outer shell.

gas inlet means positioned to deliver gases into said cup-shaped member and cause mixing of reacted gases in said second chamber with the gases being delivered thereto,

an open-ended shroud encircling said gas inlet means to form a venturi section and provide for mixing a portion of the previously reacted gases with the gases delivered through said gas inlet means, and

gas outlet means communicating with the space between the closed end of said cup-shaped member and the adjacent end of said outer shell for removing reacted gases from said second chamber;

a passageway to provide communication between said first chamber and said second chamber gas inlet means.



a temperature sensing means associated with said second chamber for sensing the temperature therein; and

a temperature control means for controlling said first chamber heating means in response to the temperature sensed in second chamber by said temperature sensing means to substantially maintain a desired temperature in said second chamber.

4,000,979
ROLL FOR A ROLLING MILL

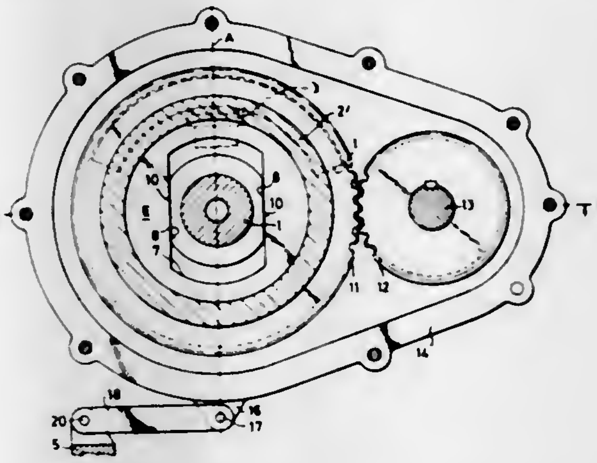
Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 18, 1976, Ser. No. 659,095

Claims priority, application Switzerland, Feb. 18, 1975, 2023/75

Int. Cl.^{2} B60B *15/16*

U.S. Cl. 29—115 **5 Claims**



1. A sag-compensating roll for a rolling mill which comprises

a. a stationary support beam.

b. a roll shell rotatable about said beam.

c. hydrostatic support means for supporting said shell on said beam,

d. external annularly disposed gear teeth at one end of said roll shell,

e. a transmission casing encircling said one end of the roll shell.

f. bearing means encircling said end of the roll shell on each side of said annularly disposed gear teeth for rotatably mounting said casing on said end,

g. gear means rotatably mounted in said casing and cooperating with said annularly disposed gear teeth for driving said roll shell.

h. and torque support means connected between said casing and a fixed support for restraining rotation of the casing with respect to the fixed support.

4,000,980
ABRASION-RESISTANT SLIDING MATERIAL

Tsuyoshi Morishita, and Toshio Yamada, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 27, 1975, Ser. No. 553,807

Claims priority, application Japan, Mar. 1, 1974, 49-25018

Int. Cl.² C22C *29/00*

U.S. Cl. 29—182.5 **8 Claims**

1. An abrasion-resistant sliding material having a structure including (Fe + Fe_3(B,P,C)) portions and Fe_3(B,C) portons, which is formed by molding a powdery alloy mixture comprising 70 to 98% by weight of a powdery eutectic alloy of particle size finer than 200 mesh and comprising 0.2 to 3.0% by weight of boron and 1.0 to 4.0% by weight of carbon with the balance being iron, and 2 to 30% by weight of a powdery eutectic alloy of particle size finer than 200 mesh and comprising 3.0 to 7.0% by weight of a phosphorus and 0.5 to 2.5% by weight of carbon with the balance being iron, into a desired shape under a compression pressure of 0.5 to 3.0 t/cm², and sintering the molded alloy mixture at a temperature of 950° to 1130° C, for at least 5 minutes.

8. A method of producing an abrasion-resistant sliding material comprising forming a powdery mixture consisting of (a) about from 70 to 98%, by weight, of a first eutectic alloy consisting of about from 0.2 to 3.0%, by weight, of boron, about from 1.0 to 4.0%, by weight of carbon, and the balance being iron, said first eutectic alloy having a particle size finer than 200 mesh, and (b) about from 2 to 30%, by weight, of a second eutectic alloy consisting of about from 3.0 to 7.0%, by weight, of phosphorus, about from 0.5 to 2.5%, by weight, of carbon, and the balance being iron, said second eutectic alloy also having a particle size finer than 200 mesh, compression molding the resulting mixture into a desired shape at a compression pressure of about from 0.5% to 3.0 t/cm², and sintering the resulting molded product at a temperature of about from 950° to 1130° C. for at least 5 minutes in an atmosphere of an inert gas or in a vaccum, to obtain a product characterized in that its structure includes portions of iron compounds [Fe_3(B,C)], portions where iron and iron compounds are copresent [Fe + Fe_3 (B,P,C)], and portions of fine pores, and wherein its porosity does not exceed about 7.0% and the pore size does not exceed 50μ in diameter.

4,000,981
SINTERED SELF-LUBRICATING ARTICLE

Akira Sugafuji, Kamakura; Hiroshi Kurimoto, and Tadaaki Takase, both of Fujisawa, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1975, Ser. No. 619,932

Claims priority, application Japan, Dec. 28, 1974, 49-149168

Int. Cl.² B22F *5/00*

U.S. Cl. 29—182.5 **8 Claims**

1. A sintered self-lubricating article having great oxidation resistance, high dimension stability and high wear resistance at elevated temperatures without assistance of any other lubricants and consisting essentially of 5 to 10 percent by weight of tin, 8 to 40 percent by weight of zinc, 5 to 15 percent by weight of graphite and the balance being copper.

4,000,982
BEARING MATERIAL

Hiroshi Ueda, Nagoya, Japan, assignor to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Apr. 10, 1975, Ser. No. 566,788

Int. Cl.² B22F *3/26, 7/04, 5/00*

U.S. Cl. 29—182.3 **6 Claims**

1. In a bearing material comprising a metal back, a porous sintered metal matrix layer bonded to a surface of said metal back, said metal layer consisting essentially of particles of a metal selected from the group consisting of iron, iron alloys, copper and copper alloys; and a composition impregnated into and substantially filling the voids in said metal layer and forming a surface layer thereon, the improvement which comprises: said composition consists essentially of a uniform blend of 45 to 94 percent by weight of polytetrafluoroethylene, 5 to 50 percent by weight of zinc metal powder and 1 to 5 percent by weight of aluminum oxide powder.

4,000,983
METAL-CERAMIC

Vladimir Ilich Alexandrov, ulitsa Ostrovityanova, 31, kv. 281; Vyacheslav Vasilievich Osiko, ulitsa Vavilova, 48, kv. 63, both of Moscow; Ernest Nikolaevich Muraviev, ulitsa Popova, 10, kv. 36, Fryazino Moskovskoi oblasti; Eduard Georgievich Spiridonov, Preobrazhensky val, 24a, kv. 1, Moscow; Vladimir Mikhailovich Tartarintsev, Leninsky prospekt, 45, kv. 112, Moscow, and Vladimir Grigorievich Gordon, 13 Parkovaya, 31, korpus 1, kv. 83, Moscow, all of U.S.S.R.

Filed July 24, 1974, Ser. No. 491,519

Claims priority, application U.S.S.R., July 26, 1973, 1935249; July 26, 1973, 1935248

Int. Cl.² C22C *31/00*

U.S. Cl. 29—182.5 **2 Claims**

1. A metal-ceramic material comprising metallic chromium and at least one high-melting metal chromite selected from the group consisting of chromites of rare earth metals, yttrium chromite, and scandium chromite.

4,000,984
HIGH SILICON-CONTAINING AUSTENITIC-IRON-CHROMIUM-NICKEL ALLOYS

Anton Bäumel, Meerbusch, Germany, assignor to Gebr. Bohler & Co. AG, Wein, Austria

Continuation-in-part of Ser. Nos. 479,140, June 13, 1974, abandoned, Ser. No. 479,550, June 14, 1974, abandoned, and Ser. No. 479,551, June 14, 1974, abandoned. This application July 14, 1975, Ser. No. 595,416

Claims priority, application Germany, June 19, 1974, 2331098

Int. Cl.² C22C *38/26, 38/34*

U.S. Cl. 29—183 **4 Claims**

1. In construction parts, such as furnace grills, rollers of continuous heating furnaces and reaction pipes in the petrochemical industry, operating at temperatures above 800° C in carburizing or air combustion atmospheres or at temperatures above 400° C in a nitriding atmosphere, the improvement being that said construction parts are manufactured from a high silicon-containing, austenitic iron-chromium-nickel alloy consisting of 0.01–0.25% C, 3.5–5.0% Si, 0.0–2.0% Mn, 17.0–20.0% Cr, 14.0–18.0% Ni, 0.0–0.2% N, 1.0–2.0% Nb with the remainder being iron and unavoidable impurities.

4,000,985
AZO DYES HAVING A HIGH SOLUBILITY IN PETROLEUM FUELS

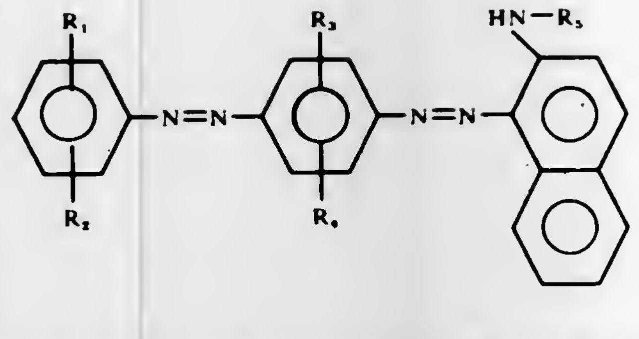
Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 601,015, Aug. 1, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,679

Int. Cl.² C10L *1/22;* **C07C** *107/04*

U.S. Cl. 44—59 **21 Claims**

1. An azo dye having a high solubility in petroleum fuels and having the formula

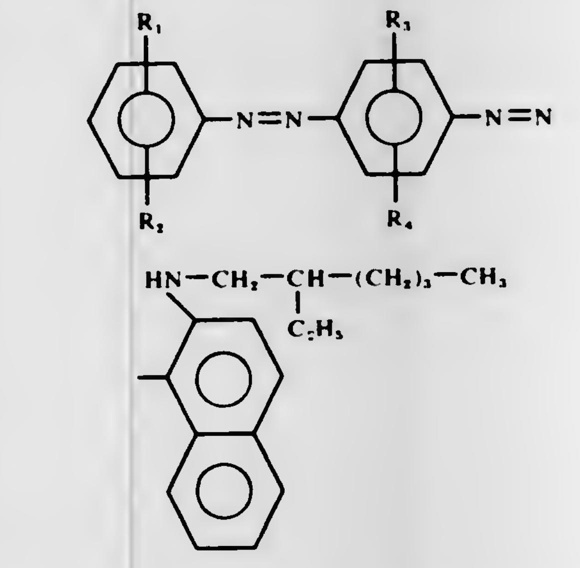


in which R_1, R_2, R_3 and R_4 are each H or CH_3 and R_5 is either 2-ethylhexyl or 2-ethylhexyloxypropyl, wherein:

A. when R_5 is 2-ethylhexyl, then at least one of said R_1, R_2, R_3 and R_4 is CH_3;

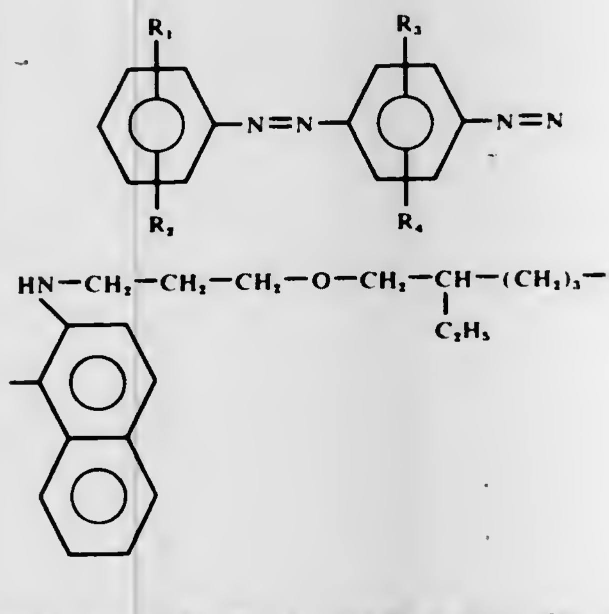
B. when R_5 is 2-ethylhexyloxypropyl, then each of said R_1, R_2, R_3 and R_4 is either, H or CH_3 provided that R_1 and R_3 are not both CH_3 at the same time when R_2 and R_4 are both H, or R_2 and R_4 are not both CH_3 at the same time when R_1 and R_3 are both H.

18. A colored petroleum fuel having dissolved therein an azo dye composition having the general formula



in which R_1, R_2, R_3 and R_4 are each H or CH_3 with the proviso that at least one of said R_1, R_2, R_3 and R_4 is CH_3.

19. A colored petroleum fuel having dissolved therein an azo dye composition having the formula



in which each of R_1, R_2, R_3 and R_4 is H or CH_3, with the proviso that R_1 and R_3 are not both CH_3 at the same time when R_2 and R_4 are both H, and R_2 and R_4 are not both CH_3 at the same time when R_1 and R_3 are both H.

4,000,986
ADDITIVES TO IMPROVE THE FLOW OF HEAVY FUELS AND CRUDE OILS

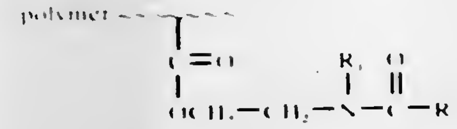
Edward H. Specht, Huntingdon Valley, and James H. O'Mara, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 15, 1975, Ser. No. 541,176

Int. Cl.² C10L *1/22*

U.S. Cl. 44—62 **8 Claims**

1. An improved hydrocarbon oil having a lower pour point and improved flow characteristics comprising (a) a major amount of the oil and (b) a minor amount in the range of about 0.005% to about 1.0% of a composition comprising an N-acylaminoethyl ester of a carboxylic acid-containing polymer having the general formula:



$$\begin{array}{l}\text{polymer} \sim\sim\sim\sim\sim \\ \qquad | \\ \qquad C{=}O \qquad\qquad R_1 \quad O \\ \qquad | \qquad\qquad\qquad | \quad\;\; \| \\ \qquad OCH_2{-}CH_2{-}N{-}C{-}R\end{array}$$

where R is an alkyl or alkene group having about 11 to 29 carbon atoms, and where R_1 is H or an alkyl group having 1 to 4 carbon atoms.

4,000,987
LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

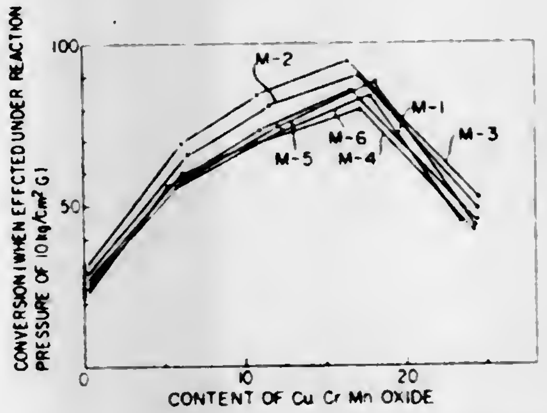
Akio Okagami, Fuchu; Kunihiko Uemoto, Yokohama, and Kouichi Satoh, Noganei, all of Japan, assignors to Japan Gasoline Co., Ltd. and Nikki Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 430,711, Jan. 4, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,303

Claims priority, application Japan, Feb. 3, 1973, 48-013961

Int. Cl.² C10G *11/28;* **C01B** *2/16*

U.S. Cl. 48—214 A **10 Claims**



1. In a process for manufacturing a methane-containing gas by subjecting steam-reformable feed hydrocarbons to adiabatic low-temperature steam reforming in the presence of a nickel catalyst, the improvement which comprises preheating a mixture of said feed hydrocarbon with steam, mixed in the ratio of moles of steam to the number of moles of carbon atoms in said feed hydrocarbon in the range of 0.9 to 5.0, to a temperature in the range of 250° to 600° C, feeding the preheated mixture into a steam reforming reaction zone containing a catalyst composition consisting essentially of (A) Ni—NiO—MgO or Ni—MgO, in which the atomic ratio of Ni/Mg is in the range of 0.5 to 5.0, (B) a member selected from the group consisting of Cu—Cr in oxide form and Cu—Cr—Mn in oxide form, the amount of component (B), calculated as the metals, being from 10 to 25 wt.% based on the nickel content, calculated as nickel metal, of component (A), and (C) up to 70 percent by weight, based on the combined weights of (A), (B) and (C), of a carrier substance selected from the group consisting of α-Al_2O_3, SiC, α-quartz and cal-

cined ZrO_2 calcined at 1500° C for 20 hours, and effecting steam reforming of said feed hydrocarbons by maintaining the temperature of the said catalyst in the range of 300° to 600° C and the pressure of the reaction zone in the range of 10 to 100 kg/cm²G.

4,000,988
LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

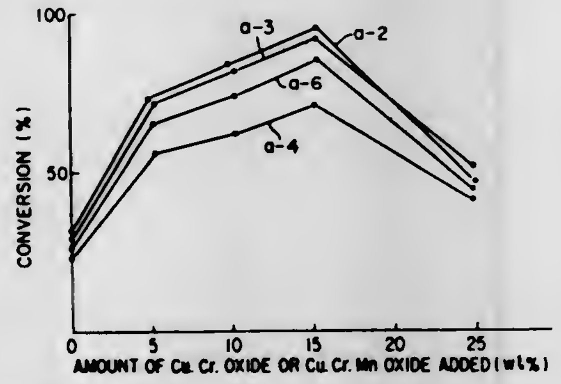
Kunihiko Uemoto; Satoru Shichiji, and Yoshinori Amemiya, all of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd. and Nikki Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 430,741, Jan. 4, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,634

Claims priority, application Japan, June 20, 1973, 48-68718

Int. Cl.² C10G *11/28;* C01B *2/16*

U.S. Cl. 48—214 A **11 Claims**



1. In a process for manufacturing a methane-containing gas by subjecting steam-reformable feed hydrocarbons to adiabatic low-temperature steam reforming in the presence of a nickel catalyst, the improvement which comprises preheating a mixture of said feed hydrocarbon with steam mixed in the ratio of moles of steam to the number of moles of carbon atoms in said feed hydrocarbon in the range of 0.9 to 5.0 to a temperature in the range of 250° to 600° C, feeding the preheated mixture into a steam reforming reaction zone containing a catalyst composition consisting essentially of (A) a nickel-magnesia component in which the atomic ratio of Ni/Mg is in the range of 0.05 to 7.0 and which contains a solid solution consisting of nickel oxide and magnesia, (B) a member selected from the group consisting of a copper-chromium mixture in oxide form and a copper-chromium-manganese mixture in oxide form, the amount of component (B) being from 10 to 25 wt. % based on the nickel content, calculated as the metal, of component (A), and (C) up to 70 percent by weight, based on the combined weights of (A), (B) and (C), of a carrier substance selected from the group consisting of α-Al_2O_3, SiC, α-quartz and calcined ZrO_2, said catalyst composition having been calcined at a temperature in the range of 350° to 1200° C and effective to form said solid solution, and effecting steam reforming of said feed hydrocarbons by maintaining the temperature of the said catalyst in the range of 300° to 600° C and the pressure of the reaction zone being in the range of 10 to 100 kg/cm² G.

4,000,989
METHOD AND APPARATUS FOR ELIMINATING AIR FROM LIQUID FLOW STREAMS

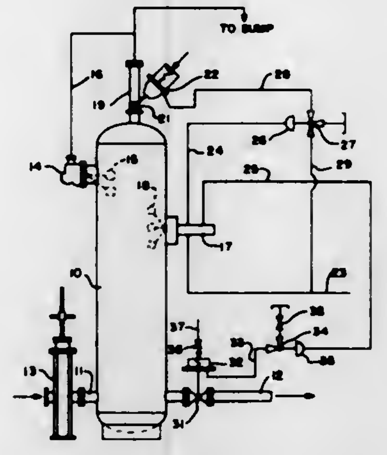
Ronald G. Dunegan, Katy, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Nov. 24, 1975, Ser. No. 634,781

Int. Cl.² B01D *19/00*

U.S. Cl. 55—18 **6 Claims**

1. A method for removing entrained free air or other gas from liquid flowing through piping at pressures above atmospheric, the piping having a closed tank interposed between inflow and outflow portions of the piping, the steps comprising causing liquid from the inlet portion normally to flow continuously into and through the tank and from the lower portion of the tank to the outer portion, maintaining a body of liquid within the tank which directly receives liquid from the inflow piping portion and from which liquid directly flows to the outflow piping portion, collecting and confining free air or other gases separating from the liquid in the tank in the upper portion thereof above the liquid level in the tank, thereby causing the collected air or other gas to be maintained at a pressure which is substantially equal to the pressure of the liquid body, liquid being discharged through the outflow portion of the piping by the pressure of the liquid body within the tank, and effecting controlled venting of air from the upper portion of the tank to maintain the liquid level in the tank between upper and lower limits.



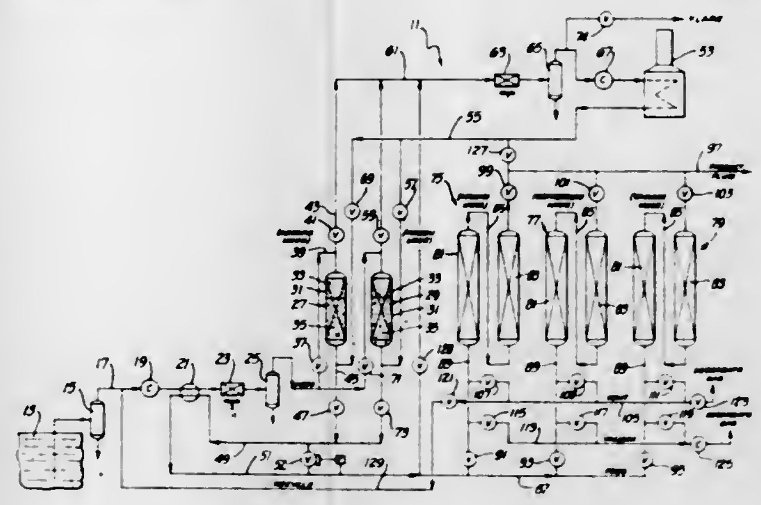
4,000,990
ADSORPTION PROCESS

Larry A. Bingham, Mission Viejo, Calif., assignor to NRG Nufuel Company, Phoenix, Ariz. and Reserve Synthetic Fuels, Inc., Newport Beach, Calif., part interest to each

Filed Apr. 16, 1975, Ser. No. 568,668

Int. Cl.² B01D *53/04*

U.S. Cl. 55—30 **22 Claims**



1. A process for purifying a fluid stream which includes an impurity and a product fluid, said process comprising:

providing at least three adsorption zones each of which has an inlet and an outlet, each of the adsorption zones including adsorbent material capable of selectively adsorbing the impurity from the fluid stream;

introducing the fluid stream into the inlet of the first of said adsorption zones and contacting the fluid stream with the adsorbent material of the first adsorption zone at a first pressure to thereby adsorb the impurity in the adsorbent material and provide product fluid;

discharging the product fluid from the outlet of said first adsorption zone during first and second periods;

reducing the pressure in a second of the adsorption zones during the first period to a second pressure which is less than said first pressure, said second adsorption zone having previously been used for adsorption of the impurity from the fluid stream;

reducing the pressure in the second adsorption zone during at least a portion of the second period to a third pressure which is less than said second pressure and which is less than atmospheric pressure to desirb at least some of the impurity from the second adsorption zone;

providing a pressure in a third of the adsorption zones during at least a portion of the first period which is less than said second pressure and which is less than atmospheric pressure to desorb at leastsome of the impurity from the third adsorption zone, said third adsorption zone having previously had the pressure therein reduced to about the second pressure;

repressurizing the third adsorption zone during at least a portion of the second period;

terminating the inroduction of the fluid stream into the inlet of said first adsorption zone and the repressurization of said third adsorption zone;

introducing the fluid sfream into the inlet of the third adsorption zone to adsorb the impurity in the adsorbent material of the third adsorption zone and to provide product fluid;

discharging the product fluid from the outlet of said third adsorption zone during a third period; and

maintaining the presure in said second adsorption zone below atmospheric pressure during at least a portion of the third period to desorb some of the impurity from the third adsorption zone during the third period.

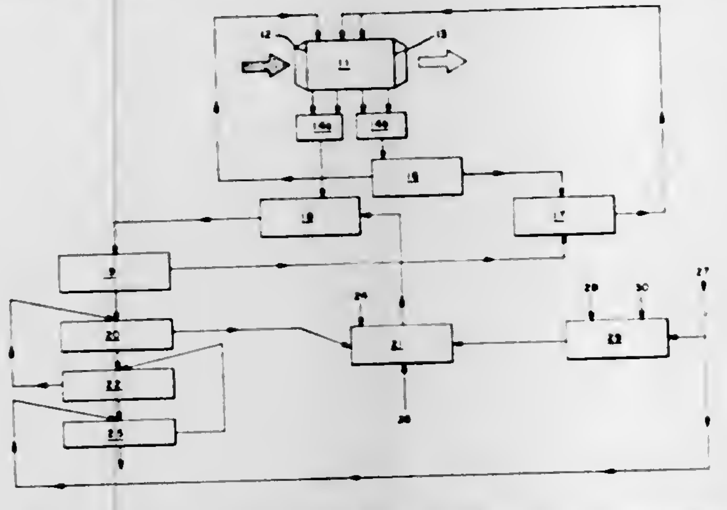
4,000,991
METHOD OF REMOVING FLY ASH PARTICULATES FROM FLUE GASES IN A CLOSED-LOOP WET SCRUBBING SYSTEM

Deering D. Melin, Jr., Palo Alto, and Donald F. Grieve, La Honda, both of Calif., assignors to Krebs Engineers, Menlo Park, Calif.

Continuation-in-part of Ser. No. 562,553, March 27, 1975, abandoned. This application Dec. 5, 1975, Ser. No. 638,182

Int. Cl.² B01D *47/06*

U.S. Cl. 55—48 **14 Claims**



1. In the process of removing fly ash particulates suspended in a flue gas stream utilizing at least one wet scrubber in a closed-loop system, the steps of

a. contacting the gas stream in a scrubbing zone of the scrubber with an aqueous scrubbing solution to wet and collect the fly ash, said scrubbing solution containing an inert diluent comprising a soluble alkali metal salt having an anion which is unreactive with sulfur oxides.

b. removing said contacted scrubbing solution from the scrubbing zone at a pH level of at least 6.0.

c. separating the entrained fly ash from the scrubber effluent solution and disposing of the separated fly ash, and

d. recycling the separated scrubbing solution and inert diluent as a make-up solution to the scrubbing zone.

4,000,992
DUST SUPPRESSION WITH SMALL BUBBLE FOAM IN CYCLONE

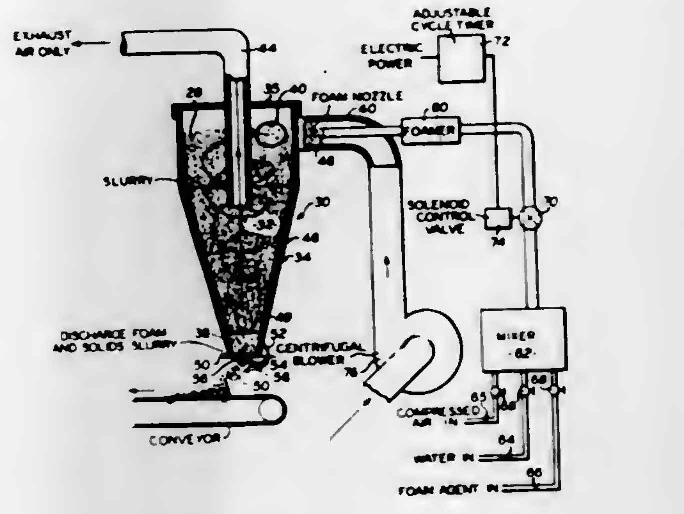
Howard W. Cole, Jr., 12 Vale Drive, Mountain Lakes, N.J. 07046

Filed Nov. 27, 1974, Ser. No. 527,812

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² B01D *47/00*

U.S. Cl. 55—87 **9 Claims**



1. The method of separating very small particulate matter from a gas stream which comprises directing a stream of gas that contains the particulate matter, into a separation chamber of a cyclone separator, discharging into the chamber a small bubble foam, with bubbles of an average size less than 0.015 inch in diameter, to mix with the gas stream and move along the sides of the chamber, trapping the particulate matter from the gas stream in the foam to form a slurry, draining the slurry down the side wall of the separation chamber, and discharging the slurry from the lower part of the chamber.

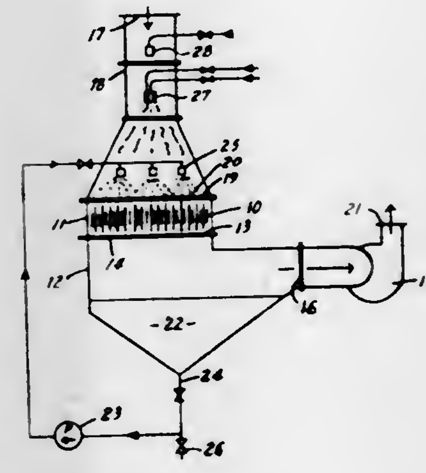
4,000,993
PROCESS FOR SCRUBBING GAS STREAMS

Richard Adolf Holl, St. Catharines, Canada, assignor to Micron Engineering Inc., St. Catharines, Canada

Filed Nov. 10, 1975, Ser. No. 630,713

Int. Cl.² B01D *47/06*

U.S. Cl. 55—94 **38 Claims**

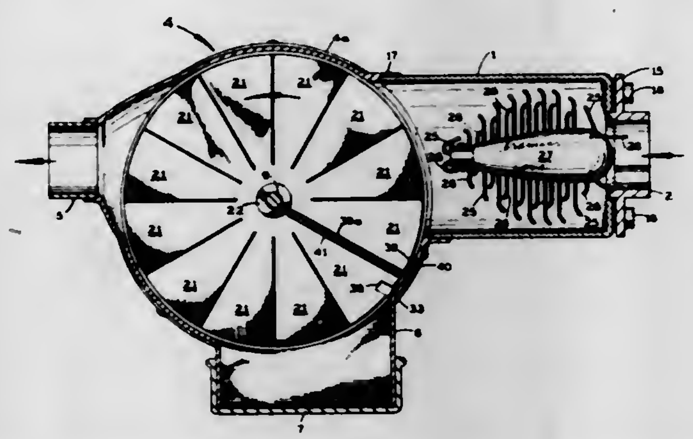


1. A process for the diffusiophoretic scrubbing of a carrier gas stream to remove contaminant material therefrom including the step of discharging into the gas stream a scrubbing material consisting of hydrogen chloride, and thereafter passing the carrier gas stream and entrained scrubbing and contaminant materials through a space in which the gas stream is scrubbed with an aqueous scrubbing liquid such that diffusiophoretic absorption of the scrubbing material into the aqueous scrubbing liquid takes place to scrub the contaminant material from the gas stream.

4,000,994

ELECTROSTATIC PRECIPITATION APPARATUS FOR VEHICLE ENGINE EXHAUST

Joseph Youhouse, 11941 SW. 43rd St., Miami, Fla. 33175
Continuation-in-part of Ser. No. 436,134, Jan. 24, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,511
Int. Cl.² B03C *3/16*
U.S. Cl. 55—112 **6 Claims**



1. An apparatus for treating exhaust gases from an engine exhaust line, said apparatus comprising:

a first housing chamber having an inlet for attachment to said exhaust line and an outlet spaced from said inlet; convoluted coil means inside said first chamber having successive convolutions thereof spaced apart along the flow path through said first chamber from said inlet to said outlet, terminals for applying to said coil means a high DC voltage for charging impurities in the exhaust flowing past;

said first chamber having an open cross-sectional area which is substantially larger than that of the engine exhaust line, whereby to reduce the velocity of the exhaust as it flows past said coil means;

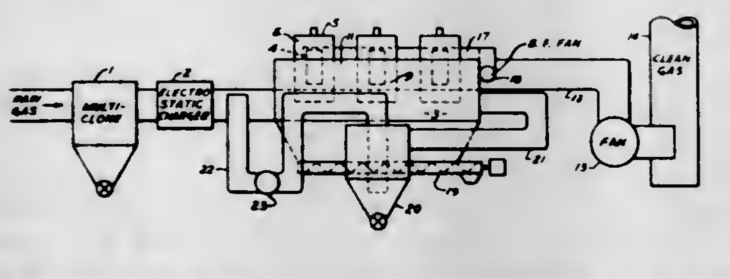
a second housing chamber having an inlet connected directly to the outlet of said first chamber and having an outlet spaced from said last-mentioned inlet;

a plurality of discs positioned in said second chamber with the plane of each disc extending substantially in the direction of the exhaust flow through said second chamber from said second chamber inlet to said second chamber outlet, said discs being at an electrical potential substantially different from that of said coil means whereby to electrostatically attract the charged impurities in the exhaust; and vibration means operatively coupled to said discs for removing the accumulated impurities therefrom.

4,000,995

PARTICULATE BED DUST COLLECTORS

John M. Morris, Louisville, Ky., assignor to Rexnord Inc., Milwaukee, Mich.
Continuation of Ser. No. 521,765, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 366,140, June 1, 1973, abandoned. This application May 19, 1975, Ser. No. 578,518
Int. Cl.² B01D *41/02*
U.S. Cl. 55—282 **4 Claims**

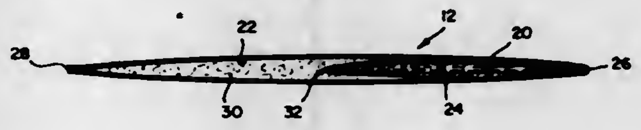


3. In a dust collecting system, in combination, a plenum chamber, a dirty gas inlet at one end of said plenum chamber, a solids removal means at the bottom of the chamber, a plurality of filter bed modules connected to the plenum chamber to receive dirty gas from the chamber and to discharge backflush gas and collected dust to the chamber, and auxiliary means for extracting dust from the plenum chamber comprising a cyclone having its tangential inlet connected to the plenum chamber at a location remote from the dirty gas inlet and having its discharge connected through a fan to the dirty gas inlet to the plenum chamber.

4,000,996

REFRIGERATING PACKAGE

George Jordan, Fairfield, Conn., assignor to Hospital Marketing Services Co., Inc., Fairfield, Conn.
Filed Nov. 7, 1975, Ser. No. 630,042
Int. Cl.² F25D *5/00*
U.S. Cl. 62—4 **4 Claims**

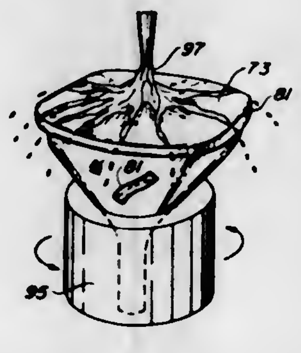


1. A refrigerating package of a multicompartment construction formed of a single sheet of flexible plastic material, said single sheet of material being folded along the middle and sealed along the two coincidental edges opposite the fold to form a cylindrical plastic tube, one end of said tube being sealed closed, said sealed closed end being folded inwardly into said tube to form a compartmental gusset chamber having an open mouth, said gusset compartment being formed within the resulting outer compartment, a liquid placed within said gusset compartment, said gusset compartment being sealed at its said open mouth, a refrigerating chemical supplied to said outer compartment through its open end thereof, said outer compartment being sealed at said open end to enclose said refrigerating chemical and form said multicompartmented package, said gusset compartment being ruptured by pressure applied thereto enabling said liquid and refrigerating chemical to mix.

4,000,997

METHOD FOR REDUCING THERMALLY INDUCED FRACTURE IN CATHODE RAY TUBE BULBS

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Division of Ser. No. 430,828, Jan. 4, 1974, Pat. No. 3,894,858. This application Apr. 17, 1975, Ser. No. 568,953
Int. Cl.² C03C *19/00*
U.S. Cl. 65—23 **4 Claims**



1. In the processing of television cathode ray tubes wherein a cathode ray tube glass bulb or glass bulb component having a visual defect on an exterior surface of said component, said component being subjected to a predetermined high temperature, and subsequently cooled thus establishing, during a period of cooling, a temperature gradient between (i) a relatively rapidly cooling exterior surface area of the glass bulb component and (ii) a more slowly cooling interior portion of the glass bulb component, whereby thermally induced tensile forces are created at the glass surface by the temperature gradient, a method for reducing such tensile forces in the vicinity of said visual glass surface defect on the glass bulb component to lessen the likelihood of fracture of the glass bulb component at the visual defect, said method comprising locally reducing in the vicinity of said visual defect during said cooling period the temperature gradient between said relatively rapidly cooling exterior surface area and said more slowly cooling interior portion of the glass bulb component by applying prior to or during said cooling period a thermal insulator over the visual glass surface defect and its vicinity.

4,000,998

SPONTANEOUSLY-FORMED NEPHELINE-CARNEGIEITE GLASS-CERAMICS

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,730
Int. Cl.² C03B *32/00*; **C03C** *3/22*
U.S. Cl. 65—33 **4 Claims**

1. A method for making a highly crystalline glass-ceramic article consisting essentially of carnegieite and/or nepheline solid solution dispersed within a glassy matrix, said crystals comprising at least 50% by volume of said article, which comprises the steps of:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 14–64% Na_2O, 8–50% Al_2O_3, and 26–65% SiO_2;

b. simultaneously cooling said melt at a rate between about 10°–1000° C./minute to a temperature about 850°–1050° C. to shape said melt into a glass body and obtain a phase separation and nucleation therein;

c. further cooling said shaped glass body and exposing said glass body to a temperature between about 650°–850° C. for a sufficient length of time to cause crystallization of the carnegieite and/or nepheline solid solution crystals in said glass body; and then

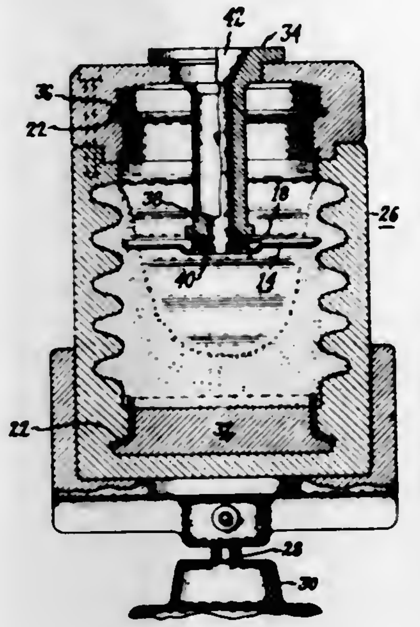
d. cooling the crystallized body to room temperature.

4,000,999

CENTRIFUGALLY CASTING HOLLOW GLASS BODY AROUND VAPOR SHIELD

John R. Lucek, and Vernon B. Palen, both of Pittsfield, Mass., assignors to General Electric Company, N.Y.
Division of Ser. No. 427,517, Dec. 27, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 517,858
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C03B *9/00, 7/00*; **C03C** *27/02*
U.S. Cl. 65—49 **4 Claims**

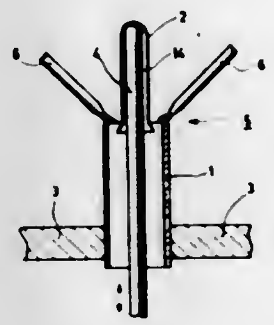
1. A method of embedding a support ring in a vacuum envelope comprising a centrifugal mold, a ring member having an internal welding flange, a cap for said mold, said cap being provided with a ring holding means extending into said mold, said ring holding means holding said support ring within said mold, charging said mold with a predetermined quantity of glass, and rotating said mold to form a glass envelope said glass extending beyond the outer circumference of said ring and firmly embedding said ring in said glass.



4,001,000

METHOD OF MANUFACTURING A PERCUSSION FLASHLAMP

Bauke Jacob Roelevink, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 446,232, March 29, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,728
Claims priority, application Netherlands, Apr. 17, 1973, 7305332
Int. Cl.² C03C *27/02*
U.S. Cl. 65—59 A **2 Claims**



1. A method of manufacturing a percussion flashlamp which comprises: providing a metal tube having a cylindrical section, one end of which is open and one end of which is closed and a cylindrical glass tube, positioning said glass tube relative to said metal tube in generally axially aligned relationship with an axial section of each in concentric relationship, holding said relationships with at least one holding member which includes an elongated pin, said positioning step including positioning said pin in generally coaxial relationship to each of said tubes and, radially spaced from the interior of all of said cylindrical section of said metal tube with an axial extremity of said pin engaging only said closed end of said metal tube, said metal tube being held on said pin only by gravity, sealing said glass tube to said metal tube by heating, and withdrawing said metal pin from said metal tube, said tubes being radially spaced to avoid conduction of heat away from the area where said glass and metal tubes are joined.

4,001,001

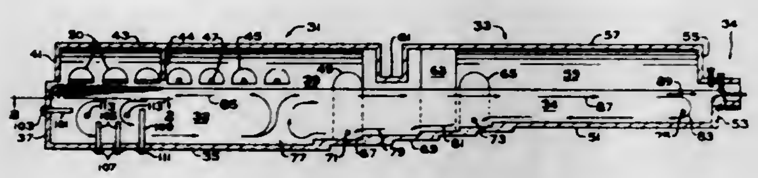
HORIZONTAL GLASSMAKING FURNACE

Leonard A. Knavish, Plum Borough, and Richard L. Cerutti, Seminole, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1976, Ser. No. 650,387

Int. Cl.^{2} C03B *5/02*

U.S. Cl. 65—337 **3 Claims**



1. In a side-fired regenerative glassmaking furnace comprising an enclosed chamber for containing a pool of melted glass and providing a headspace above the molten glass; the chamber having a bottom, side walls, a front wall, a back wall and a roof; further having, in the vicinity of said back wall, means for charging glass batch materials into said furnace; further having, in the vicinity of said front wall, means for discharging molten glass from said furnace; and further having means for supplying heat to at least a portion of said furnace for melting glass batch materials forming molten glass therefrom; said heating means comprising at least five firing ports extending outwardly from each side of the furnace and connected to regenerators; wherein a portion of said furnace is for advancing glass batch materials floating on molten glass in a general direction away from said back wall and toward said front wall while melting said floating glass batch materials, the improvement comprising

- dampering means substantially blocking each of the first and second ports of the furnace providing a substantially enclosed headspace in the region of the first and second ports isolated from the regenerators of the furnace;
- submerged electrode means for applying heat to molten glass contained in the furnace only in a region lying between the side walls of the furnace and extending along the length of the furnace from its back wall to a region between its third firing ports and within a bottom portion of the furnace beneath the surface of a pool of molten glass contained therein; and
- combustion means in firing ports in a downstream region extending between the third firing ports and the front wall and substantially open exhaust means through firing ports in said downstream region for exhausting substantially all exhausted gases from the furnace to the regenerators from said downstream region.

4,001,002

METHOD OF PROMOTING FLOWERING IN FRUIT PLANTS

Ramon C. Barba, 428 Anos St., Los Banos, Laguna, Philippines

Filed Sept. 11, 1974, Ser. No. 504,948

Claims priority, application Philippines, July 3, 1974, 16014

Int. Cl.^{2} A01N *5/00*

U.S. Cl. 71—65 **12 Claims**

1. A method of inducing flowering in a fruit plant which comprises applying a flowering inducing amount of potassium nitrate, sodium nitrate, calcium nitrate, magnesium nitrate, barium nitrate, ammonium nitrate or nitric acid to a fruit plant.

4,001,003

PLANT PHYSIOLOGICALLY ACTIVE COMPOSITIONS CONTAINING 2-HALO-2,3-DIHYDROBENZOFURAN-5-OLESTERS OF SULFONIC ACIDS AND METHODS OF USE

Peter Stuart Gates, Cambridge, England, assignor to Fisons Limited, London, England

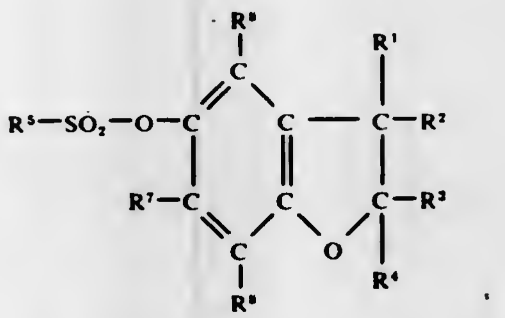
Division of Ser. No. 460,150, April 11, 1974, Pat. No. 3,896,151. This application Apr. 16, 1975, Ser. No. 568,582

Claims priority, application United Kingdom, Apr. 17, 1973, 18395/73

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 71—88 **29 Claims**

1. A plant physiologically active composition consisting essentially of an effective herbicidal or plant gowth regulating amount of a compound of the formula:



in which R^1, R^2 and R^3 are the same or different and each represents hydrogen or alkyl of 1–6 carbon atoms, or R^1 and R^2 together or R^2 and R^3 together form an alkylene chain of 2–5 carbon atoms;

- R^4 represents a halogen atom;
- R^5 represents alkyl of 1–4 carbon atoms, alkyl of 1–4 carbon atoms substituted by halogen or alkoxy of 1–6 carbon atoms, phenyl or phenyl substituted by halogen or alkyl of 1–4 carbon atoms; and
- R^6, R^7 and R^8 are the same or different and each represents hydrogen, alkyl of 1–4 carbon atoms, halogen, cyano, alkanoyl of 2–6 carbon atoms or alkoxy of 1–4 carbon atoms, together with at least one material selected from the group consisting of carriers, surface active agents, pesticides and other plant growth regulants.

4,001,004

SYNERGISTIC HERBICIDAL COMPOSITION FOR PADDY FIELDS

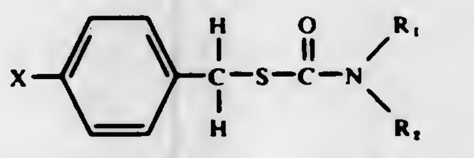
Teruhiko Toyama, Fugisawa, and Yoshio Takasawa, Chigasaki, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sept. 18, 1972, Ser. No. 290,002

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—100 **7 Claims**

1. A herbicidal composition for use in paddy fields consisting essentially of a herbicidally effective amount of a mixture of α-(β-naphthoxy)-propionanilide and a synergistic proportion of a compound having the general formula



wherein X represents Cl, F, CH_3, C_2H_5, n-C_2H_7, iso-C_3H_7, tert-$_4H_9$, OCH_3 or SCH_3 and R_1 and R_2 each represent C_2H_5, and an inert carrier, the ratio of said α-(β-naphthoxy)-propionanilide to said compound being 1–2:1-4.

4,001,005

HERBICIDAL COMPOSITIONS COMPRISING HALOPHENOXY BENZOIC ACID ESTERS

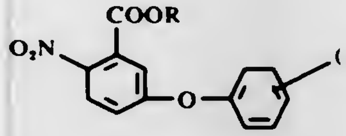
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 477,233, June 7, 1974, Pat. No. 3,907,866. This application May 12, 1975, Ser. No. 576,770

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—108 **7 Claims**

1. A herbicidal composition comprising a carrier and a herbicidal amount of a compound having the formula:



wherein X is halogen, *n* is 1 to 3, and R is alkyl (C_4–C_{12}), cycloalkyl (C_3–C_8), or unsaturated hydrocarbyl (C_3–C_{10}).

4,001,006

DIALKYLAMMONIUM-2,4-DICHLOROPHENOXYACETATES AS PLANT GROWTH REGULATORS AND THE METHOD OF MAKING SAME

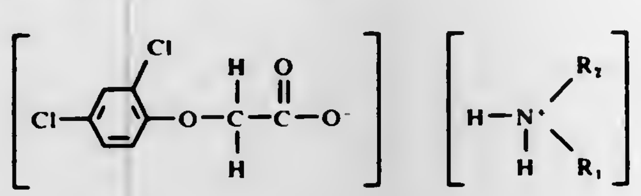
Lawrence H. Nash, Fort Lauderdale, Fla., assignor to Kalo Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 179,333, Sept. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 33,078, April 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 4,087, Jan. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 700,967, Jan. 26, 1968, abandoned. This application June 26, 1975, Ser. No. 590,518

Int. Cl.^{2} A01N *9/24*; C07C *53/16*

U.S. Cl. 71—117 **28 Claims**

1. A compound of the formula



wherein R_1 and R_2 are identical radicals selected from the group consisting of methyl and ethyl, (a) when said R_1 and R_2 are both methyl, said compound has an infra-red spectra according to FIG. 2 and a melting point from about 92.8° to 93.4° C., and (b) when said R_1 and R_2 are both ethyl, said compound has an infra-red spectra according to FIG. 4 and a melting point of about 48° C.

4,001,007

MATERIAL FOR SINTERING EMITTING A LESSER AMOUNT OF NITROGEN OXIDE AND A METHOD FOR MANUFACTURING THE SAME

Minoru Sasaki, Yokohama; Yukihiro Hida; Tsuneo Enokido, both of Kawasaki, and Kaoru Ito, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

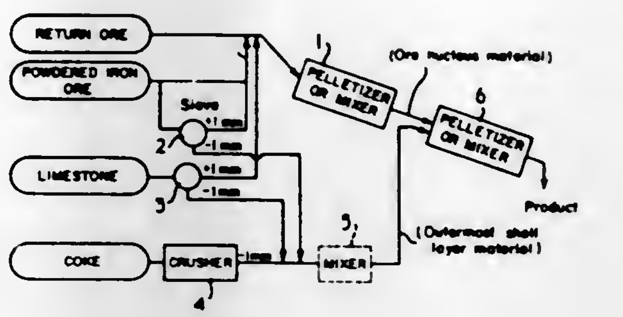
Filed Dec. 30, 1974, Ser. No. 537,533

Claims priority, application Japan, Dec. 31, 1973, 49-3869; Dec. 31, 1973, 49-3870; Dec. 31, 1973, 49-3871; Jan. 24, 1974, 49-9770; Jan. 25, 1974, 49-10209

Int. Cl.^{2} C22B *1/16, 1/24*

U.S. Cl. 75—5 **3 Claims**

1. A pellet for preparing a sintered ore for use in iron making operations, said pellet comprising a core layer of materials selected from the group consisting of iron ore, fines and limestone, there being no coke present in said core layer, and an outer layer of materials selected from the group consisting of iron ore, fines, limestone and coke, said core layer materials having a particle size of between 1 and 10 mm, the concentration of the coke in said outer layer satisfying the following formula:



$$40 \geq C \geq \frac{a}{(100 - b)} \times 100$$

wherein *a* is the weight by per cent of the coke in the pellet; *b* is the weight by per cent of particles having a size of at least 1 mm in the pellet; and *c* is the concentration percentage of the coke in the outer layer.

4,001,008

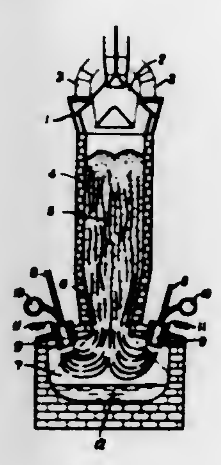
METHOD AND APPARATUS FOR THE REDUCTION OF ORES, ESPECIALLY IRON ORES

Kurt Stift, Leoben, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria

Continuation of Ser. No. 495,184, Aug. 6, 1974, abandoned, which is a continuation of Ser. No. 305,085, Nov. 9, 1972, abandoned, which is a continuation of Ser. No. 90,177, Oct. 8, 1970, abandoned. This application Oct. 1, 1975, Ser. No. 618,675

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—11 **5 Claims**



1. A method of reducing iron ores in a shaft furnace having an upper portion of a given cross-sectional area joined to a lowermost portion of enlarged cross-sectional area, and having an iron bath therein, by an intermediate portion of reduced cross-sectional area, said method comprising the steps of

- a. introducing a descending burden comprising iron ores in the upper portion of the shaft furnace without addition of fuel so that upon descent of the burden no carbon is generated,
- b. producing hot reducing gases through partial combustion of hydrocarbons outside said furnace,
- c. introducing said hot reducing gases and carbon in powder form carried by at least a portion of said hot reducing gases into said lowermost furnace portion in a generally downward direction toward said iron bath said hot reducing gases flow toward the descending burden and effect reduction, and
- d. supplying to the lower portion of said furnace additional heat produced by electric energy.

4,001,009

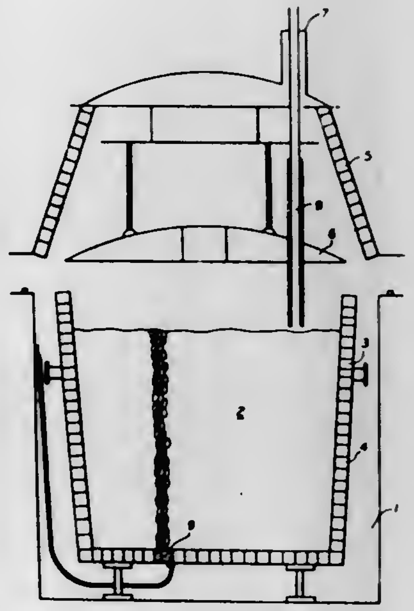
PROCESS FOR THE MANUFACTURE OF STEELS WITH A HIGH CHROMIUM CONTENT

Hannsgeorg Bauer, Buchenweg 21, 581 Witten-Bommern, and Josef Otto, Am Wasserturm 5, 5802 Wetter 4 - Wengern, both of Germany

Continuation-in-part of Ser. Nos. 840,073, April 3, 1969, abandoned, Ser. No. 195,424, Nov. 3, 1971, abandoned, and Ser. No. 331,541, Feb. 12, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,204

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—13 **13 Claims**



1. In a method of making stainless steel, the steps of

melting solid charge material, including stainless steel scrap under substantially atmospheric pressure and environmental conditions whereby, upon completion of melting, a molten charge is obtained,

pouring said molten charge, including the melted solid charge material obtained in the preceding step, into a treatment vessel having sufficient freeboard to contain the violent disruption of the upper exposed surface of the molten charge which is thereafter induced,

said molten charge having about 10–35% Cr, and C in an amount substantially greater than the final desired amount,

adding oxygen to the aforesaid molten charge to supersaturate the charge with oxygen,

exhausting the atmosphere above the surface of the molten charge to thereby subject the upper, exposed surface of the molten charge to a vacuum,

subjecting the molten charge to an absolute pressure of a magnitude which causes the $C + O = CO$ reaction to be preferential to the $3Cr + 4O = Cr_3O_4$ reaction down to and including the desired carbon level,

continuously violently disrupting the upper, exposed surface of the molten charge which is subject to the aforesaid low absolute pressure,

continuously replenishing the violently disrupted surface by vigorously circulating molten metal remote from the surface to the violently disrupted surface by admission of a stirring gas to the lower region of the vessel, and

maintaining said violent surface disruption and vigorous internal circulation during the time the molten charge is exposed to the vacumm which causes the $C + O = CO$ reaction to be preferential to the $3Cr + 4O = Cr_3O_4$ reaction.

4,001,010

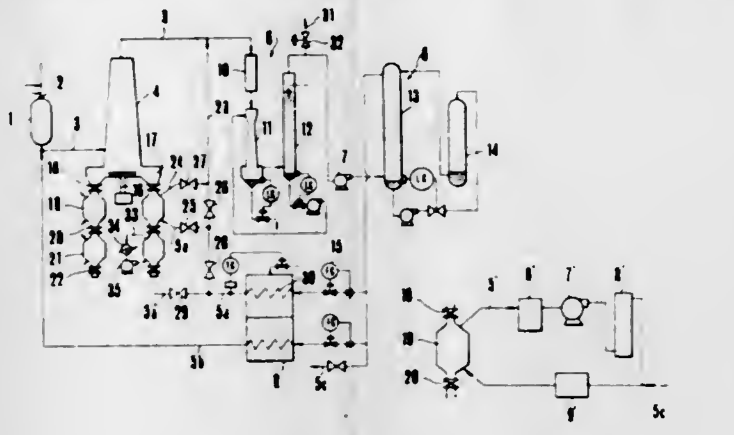
METHOD FOR PROCESSING REDUCED IRON

Kenjiro Kanbara; Masayuki Hattori; Satoru Miyasita; Masaaki Iguchi, and Jihei Yoda, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,684

Int. Cl.^{2} C21B *13/02*

U.S. Cl. 75—35 **4 Claims**



1. In a method for processing reduced iron in which granular iron oxide charged into a vertical furnace is reduced by a reducing gas comprising carbon monoxide, hydrogen, carbon dioxide, water and hydrogen sulfide, and a substantial part of the waste gas containing carbon dioxide, water and hydrogen sulfide resulting from the reducing process is regenerated for the reuse thereof by the removal of carbon dioxide, water and hydrogen sulfide, the improvement which comprises the steps of discharging said reduced iron having been reduced by the gas reduction in the vertical furnace and under isolation from the exterior atmosphere, said reduced iron containing sulfur and carbon, into an airtight sealable component adjusting receptacle, subjecting the reduced iron to desulfurization and carburization in said receptacle at a temperature of 700° to 1100° C by using a portion of said regenerated reducing gas, whereby the sulfur content of the reduced iron is decreased and the carbon content of the reduced iron is increased, discharging the thus treated reduced iron from the receptacle while keeping it isolated from the exterior atmosphere into an airtight sealable cooling receptacle, cooling the reduced iron in said cooling receptacle and thereafter discharging the thus cooled reduced iron from said cooling receptacle.

4,001,011

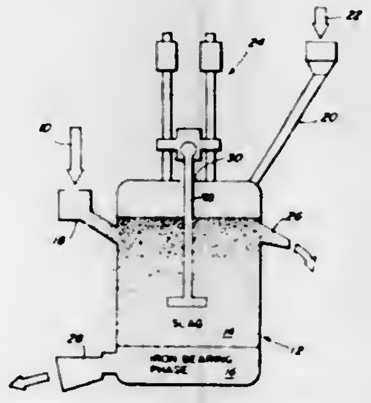
PYROMETALLURGICAL RECOVERY OF IRON FROM IRON SILICATE SLAGS

Jagdish C. Agarwal, Concord; Paul R. Ammann, Boxford, and Jonathan J. Kim, Chelmsford, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,727

Int. Cl.^{2} C21B *11/00*

U.S. Cl. 75—40 **4 Claims**



1. A process for extracting iron from slag comprising the steps of:

a. introducing the slag into a reactor;

b. maintaining a CaO/SiO_2 ratio in the range of 2.0–3.3 in slag in the reactor;

c. maintaining the temperature of the slag in the reactor at a level at which the slag is molten;

d. adding a solid carbonaceous reductant to the molten slag in the reactor at a rate sufficient to reduce FeO in said slag;

e. mixing said reductant into the molten slag in the reactor with an internally cooled, metal bladed, rotating stirrer driven at a rate sufficient to pump said reductant into the slag to enhance said reduction of FeO; and,

f. separating an iron bearing phase from the slag.

4,001,012

METHOD OF PRODUCING STAINLESS STEEL

Franklin E. Rote, Homewood, Ill., and Raymond C. Stephan, Gary, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 28, 1973, Ser. No. 419,753

Int. Cl.^{2} C21C *5/34*

U.S. Cl. 75—51 **17 Claims**

1. A process for producing a chromium-containing steel the steps comprising:

a. forming a steelmaking heat by charging into a refractory-lined steelmaking vessel a charge comprising molten iron containing at least carbon, silicon and phosphorus as impurities, and solid steel scrap in amounts up to about 30 to 35% by weight of total charged metallics;

b. adding a first basic slag-forming flux to the heat and subjecting the heat to a first blowing step in which oxygen is blown for a time sufficient to melt said solid steel scrap and to reduce the phosphorus content of the heat to below about 0.03% by oxidation thereof, and to oxidize a substantial portion of the other impurities, and to provide a first basic fluid slag having a fluid V-ratio of from about 1.5 to 8.0;

c. removing substantially all of said first fluid slag from the heat;

d. adding sufficient chromium-bearing material selected from the group consisting of ferrochromium, chromium containing scrap and mixtures thereof to the deslagged charge to provide approximately the final desired chromium content;

e. subjecting the heat to a second blowing step in which oxygen is injected through the vessel and into the heat below the surface thereof and substantially at the surface of the vessel refractory lining while simultaneously injecting a hydrocarbon-containing protective jacket fluid surrounding the injected oxygen, thereby melting the chromium bearing material;

f. adding a second basic slag-forming flux to the chromium-containing heat to form a second basic fluid slag while continuing the second blowing step until the carbon content of the heat is reduced to the final desired level;

g. blowing an inert gas through the heat to remove dissolved reaction and process gases from the heat, while adding sufficient ferrosilicon to the heat to reduce oxidized chromium from the slag; and

h. thereafter tapping the heat.

4,001,013

METHOD OF OPERATING COPPER ORE SMELTING REVERBERATORY FURNACE

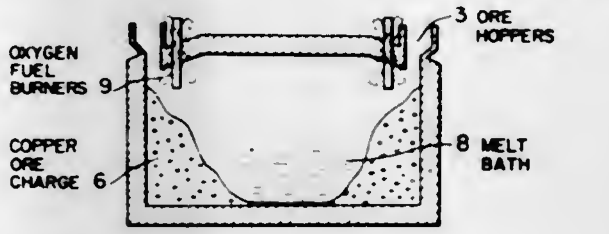
Motoo Goto; Minoru Fujiwara, and Makoto Ishikawa, all of Iwaki, Japan, assignors to Onahama Seiren Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 445,335, Feb. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 264,060, June 19, 1972, abandoned. This application Sept. 29, 1975, Ser. No. 617,843

Claims priority, application Japan, July 23, 1971, 46-54656

Int. Cl.^{2} C22B *15/00*

U.S. Cl. 75—72 **6 Claims**



1. In a method of operating a reverberatory furnace for smelting copper containing ores having a relatively large proportion of sulfur therein, the furnace having a main body with long refractory side walls and transverse refractory end walls, the main body containing a melted bath of matte and slag layer overlying the matte, the furnace having a roof covering the main body with a plurality of hoppers opening through the roof along the side walls or closely adjacent thereto for wet charging the starting material copper ore into ore piles along the side walls below the hoppers, one end wall having main burner means therein for directing combustion flames in a substantially horizontal direction over the melt bath, the furnace having an exit for the matte, an exit for the slag and an exit for the waste gas containing sulfur dioxide produced during operation of the furnace, the last mentioned exit being adapted to be coupled to a sulfur dioxide recovery system, the improvement comprising inserting at least one oxygen fuel burner through the roof of the furnace directed downwardly toward the ore piles and feeding a mixture consisting essentially of oxygen and hydrocarbon fuel through said burner with the oxygen being present in the mixture in an amount of from 100 to 150% of the theoretical amount for burning the fuel, said mixture being fed under feed conditions which cause the tip of the combustion flame from said burner just to reach the surface of said ore piles, and maintaining the oxygen partial pressure within said reverberatory furnace measured at said exit for the waste gas within the range of about 3 to 5.5 mm Hg-absolute, whereby latent heat due to CO and H_2 produced in the products of combustion in the furnace is utilized so as to increase the rate at which the ore can be smelted, thereby increasing production in the furnace, to reduce the amount of fuel necessary per unit weight of smelted ore, and to increase the concentration of sulfur dioxide in the waste gas so as to make more economical the recovery of the sulfur dioxide.

4,001,014

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE PLATE HAVING TELLURIUM PRESENT IN VARYING CONCENTRATIONS ACROSS ITS THICKNESS

Eiji Ando, Katano, and Yoshiki Hayashi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 12, 1974, Ser. No. 505,497

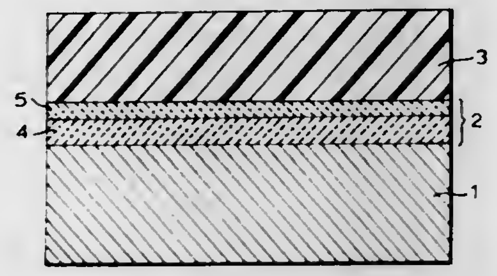
Claims priority, application Japan, Sept. 17, 1973, 48-105269; Oct. 19, 1973, 48-118200

Int. Cl.^{2} G03G *5/04*

U.S. Cl. 96—1.5 **14 Claims**

1. An electrophotographic photosensitive plate comprising, in order from the bottom up, an electrically conducting sub-

strate, a photosensitizing layer comprising vitreous selenium and tellurium and having a thickness of 0.1 to 3 microns, and a top layer comprising a member selected from the group consisting of polyvinylcarbazole and derivatives thereof, said photosensitizing layer being composed of a first layer part 0.05 to 2 microns in thickness having 60 to 90 weight % of selenium and 40 to 10 weight % of tellurium and a second layer part 0.05 to 1 micron in thickness having a higher concentration of selenium than that of said first layer part, and said second layer part being positioned between said first layer part and said top layer.



4,001,015

METHOD FOR THE PRODUCTION OF PRINTING PLATES USING PHOTOSENSITIVE COMPOSITIONS

Helmut Barzynski, Lambsheim, and Peter Richter, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 182,873, Sept. 22, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 437,894

Claims priority, application Germany, Oct. 9, 1970, 2049621

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² G03C *1/70;* **G03F** *7/08*

U.S. Cl. 96—33 **4 Claims**

1. A process for the production of printing plates using a photosensitive composition consisting essentially of an intimate blend of

- A. 40 to 97% by weight, with reference to the whole blend A + B, of a mixture of
  - A.1. 15 to 80% by weight, with reference to A, of a water-soluble linear N-vinylpyrrolidone polymer having a molecular weight of at least 1000, and
  - A.2. 20 to 85% by weight, with reference to A, of a polymer or copolymer of an olefinically unsaturated carboxylic acid having 3–6 carbon atoms which is soluble or swellable in water or aqueous alkali and has a molecular weight of at least 500, the content of carboxyl groups therein being at least 5% by weight based on the polymeric polycarboxylic acid, and
- B. 3 to 60% by weight, with reference to the whole blend A + B, of olefinically unsaturated monomers which are compatible with mixture A (A.1 + A.2), which do not boil below 100°C at atmospheric pressure, and of which the portion having more than one photo polymerizable olefinically unsaturated double bond predominates,

which comprises applying a thin layer of said composition to supports and exposing said layer through an at least partially transparent negative or positive without subsequent development processing.

4,001,016

POLYMERS WHICH CAN BE CROSS-LINKED BY PHOTOPOLYMERIZATION

Hans-Jurgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bochum; Erich Wolff, and Harald von Rintelen, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation-in-part of Ser. No. 256,162, May 23, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,873

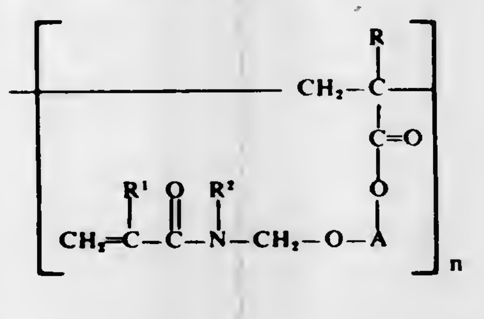
Claims priority, application Germany, May 25, 1971, 2125910

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² G03C *5/00, 1/68*

U.S. Cl. 96—35.1 **2 Claims**

1. A process for the production of photographic relief images or photoresists comprising the steps of imagewise exposing a supported light-sensitive material with a photocrosslinkable polymer in the layer, washing away the unexposed areas of the photosensitive layer to form a relief image of photocrosslinked polymeric material the improvement wherein the said photocrosslinkable polymer compound is a photopolymer of recurrent units of the general formula



wherein

- R stands for hydrogen or alkyl having up to 4 carbon atoms and
- R^1 represents hydrogen or alkyl having up to 4 carbon atoms,
- R^2 stands for hydrogen or alkyl having up to 8 carbon atoms, and
- A represents a divalent aliphatic bridging member having 2-4 carbon atoms or a bridging member of the formula $-(CH_2-CH_2-O)_m-CH_2-CH_2-$
- wherein m represents an integer of 1 to 3,
- n is 2 or more,

wherein the photopolymer is either a homopolymer or a copolymer with comonomers selected from the group consisting of vinyl monomers, vinyl esters, vinyl ethers, acrylic and methacrylic acid and their derivatives, maleic acid anhydride, and styrene and the light-sensitive polymer has an average molecular weight of between 10,000 and 100,000.

4,001,017

PROCESS FOR THE PHOTOPOLYMERIZATION OF ETHYLENICALLY UNSATURATED COMPOUNDS

Niklaus Baumann, Fribourg, and Hans-Peter Schlunke, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 29, 1973, Ser. No. 420,176

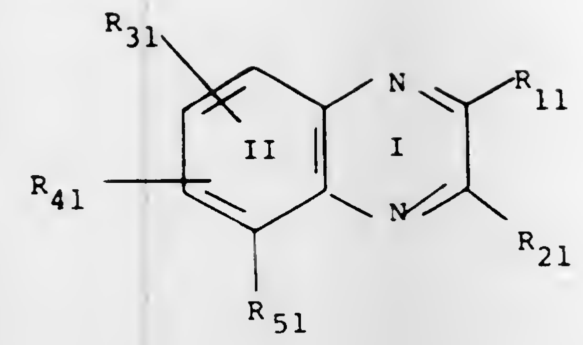
Claims priority, application Switzerland, Dec. 5, 1972, 17658/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² G03C *1/70*

U.S. Cl. 96—35.1 **14 Claims**

1. Process for the photopolymerisation of ethylenically unsaturated monomers which contain terminal $H_2C=$ groups and are water-soluble with the aid of at least one photoredox pair, which comprises employing as redox pair, on the one hand, a diazine compound of the formula



wherein

- R_{11} and R_{21} denote a phenyl radical, a benzoyl radical, a phenylsulphonic acid group a methyl group or a hydrogen atom, or
- R_{11} and R_{21} together with two carbon atoms of the ring I denote a five-membered or six-membered heterocyclic and
- R_{31}, R_{41} and R_{51} denote a hydrogen atom, or lower alkyl group, a chlorine atom, a nitro group, a primary amino group, an acylamino group, a trimethylammonium group, a carboxylic acid amide group which is not substituted further or is substituted further by one to two lower alkyl groups, a carboxylic acid group, carboxylic acid methyl ester group or carboxylic acid ethyl ester group or sulphonic acid group, or two of R_{31}, R_{41} and R_{51} together with two adjoining carbon atoms of the ring II denote an heterocyclic ring, and on the other hand, an electron donor, and using for the photopolymerisation a radiation which lies in the range of 200 to 450 nm.

4,001,018

METHOD FOR MAKING A STRIPE SCREEN ON A FACE PLATE OF A CATHODE RAY TUBE BY ROTATING CORRECTION LENS

Asahide Tsuneta, Kawasaki, and Shigeo Takenaka, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 477,281, June 7, 1974. This application Mar. 8, 1976, Ser. No. 664,863

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.1 **3 Claims**

1. In the manufacture of a color cathode ray tube comprising an in-line arranged three beam electron gun assembly for emitting a central electron beam and a pair of side beams, a tricolor stripe screen formed on the inner surface of a face plate, and a shadow mask mounted in the face plate and having a plurality of slit apertures, a method for making the stripe screen comprising exposing a linear light source having a lengthwise direction coincident with that of the stripes to be formed on the screen through the shadow mask and a correction lens having a symmetrical axis, the correction lens being arranged between the linear light source and the shadow mask, and commonly using the correction lens and the linear light source at exposing steps corresponding to the central beam and to the side beams for making the stripe screen by arranging the correction lens so that the direction of the symmetrical axis of the correction lens at the exposing step corresponding to the central beam is aligned perpendicularly with the plane of the in-line arranged three beams and by arranging the correction lens so that the direction of the symmetrical axis of the correction lens at the exposing steps corresponding to the side beams is aligned with the plane of the inline arranged three beams.

4,001,019

REVERSIBLE LIGHT SENSITIVE GLASS

Toshiharu Yamashita, Hachioji, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 232,667, March 8, 1972, Pat. No. 3,833,511. This application Apr. 2, 1974, Ser. No. 457,304

Claims priority, application Japan, Apr. 2, 1973, 48-37708

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² C03C *3/08*

U.S. Cl. 106—54 **1 Claim**

1. A reversible light sensitive glass comprising 100 weight parts of a base glass, 0.15 to 1.0 weight parts of Ag and an amount of halogen corresponding to or more than the chemical equivalence of the Ag, in which the base glass consists, in weight %, of SiO_2 48 to 62, Al_2O_3 7 to 15, B_2O_3 17 to 26, R_2O, where R represents Na, Li or K, 6 to 16, BaO 0.5 to 5, BaO/R_2O 0.05 to 0.40, TiO_2 0 to 10, ZrO_2 0 to 10, Nb_2O_5 0 to 5, $TiO_2+ZrO_2+Nb_2O_5$ 0.5 to 15, As_2O_3 0 to 2.0, Sb_2O_3 0 to 2.0 and $As_2O_3+Sb_2O_3 < 2.0$

4,001,020

DEVELOPING A SILVER HALIDE EMULSION IN CONTACT WITH A HETEROCYCLIC THIONE AND A POLYALKYLENE OXIDE

Jun Hayashi; Akira Sato, and Tadao Shishido, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 230,493, Feb. 29, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,843

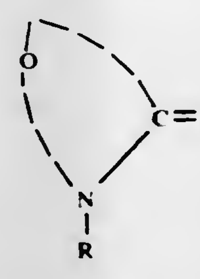
Claims priority, application Japan, Mar. 4, 1971, 46-11156; Mar. 4, 1971, 46-11157

Int. Cl.² G03C *5/20*

U.S. Cl. 96—66.3 **27 Claims**

1. In a method for obtaining photographic images of high sensitivity and high image sharpness by developing a silver halide photographic emulsion layer containing a latent silver image, the improvement which comprises developing said element with a developing agent selected from the group consisting of (a) a mixture of a polyhydroxybenzene and an N-alkylaminophenol, (b) a 1-phenyl-3-pyrazolidone and (c) a mixture of (a) and (b), and in contact with

1. an alkylene oxide polymer selected from the group consisting of polyalkylene glycols and condensation products of polyalkylene oxides with active hydrogen containing organic compounds, wherein the alkylene oxide chain of said alkylene polymer has a molecular weight of at least 300 and wherein said alkylene oxide units comprising said chain have from 2 to 4 carbon atoms, and
2. a heterocyclic compound not containing an unsubstituted N hetero atom represented by the general formula (I)

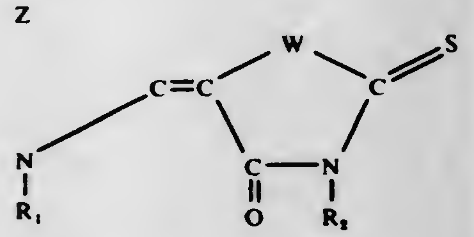


(I)

wherein Q represents the atoms necessary to form a heterocyclic ring selected from the group consisting of a thiazolidine-2-thione ring, an imidazolidine-2-thione ring, a selenazolidine-2-thione ring, a 1,3,4-thiadiazoline-2-thione ring, a 1,3,4-selenadiazoline-2-thione ring, a 4-thiazoline-2-thione ring, a 4-selenazoline-2-thione ring, and a 1,2-dihydropyridine-2-thione ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented

by Q with an unsubstituted alkyl group, a hydroxyalkyl group, a haloalkyl group, an unsubstituted aryl group, an alkylaryl group, a hydroxyaryl group, a haloaryl group, an alkylthio group, or an alkoxycarbonyl group; or Q represents the atoms necessary to form a heterocyclic ring selected from the group consisting of a benzothiazoline-2-thione ring, a benzoxazoline-2-thione ring, a benzimidazoline-2-thione ring, a benzselenazoline-2-thione ring and a 1,2-dihydroquinoline-2-thione ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented by Q with an unsubstituted alkyl group, an unsubstituted aryl group, an aryl group substituted by halogen, alkyl or alkoxy, an aralkyl group, an alkoxy group, a halogen atom, a trimethylene group or a tetramethylene group; and wherein R is an unsubstituted alkyl group having from 1 to 10 carbon atoms, an alkyl group having from 2 to 10 carbon atoms and substituted by hydroxy, morpholino or aryl, an unsubstituted aryl group, an aryl group substituted by an alkyl group, an alkoxy group or a halogen atom, or R is a 2-pyridyl group, or represented by the general formula

(II)



wherein W is a sulfur atom, a selenium atom, an oxygen atom, or a $>N-R_3$ group, R_1, R_2 and R_3 each is an unsubstituted alkyl group, a substituted alkyl group wherein the substituent is carboxy or sulfo, and wherein Z represents the atoms required to form a heterocyclic ring selected from the group consisting of a benzothiazole ring, a naphthothiazole ring, a benzoxazole ring, a naphthoxazole ring, a benzoselenazole ring, a naphthoselenazole ring, an indolenine ring, a benzimidazole ring, a naphthimidazole ring, and a 2-quinoline ring, said heterocyclic ring being unsubstituded or substituted on the benzene ring with a halogen atom, a phenyl group, an unsubstituted alkyl group, an alkoxy group, or a hydroxy group, or substituted on the naphthalene ring with an alkoxy group; or Z represents the atoms required to form a heterocyclic ring selected from the group consisting of a thiazoline ring, a thiazole ring, an oxazole ring, a selenazole ring, and a 2-pyridine ring, said heterocyclic ring being unsubstituted or substituted on the atoms represented by Z with an unsubstituted alkyl or an unsubstituted aryl group.

4,001,021

LITHOGRAPHIC DEVELOPMENT OF A LITH-TYPE SILVER HALIDE EMULSIONS CONTAINING A BENZIMIDAZOLE

Tomio Nakajima, Tokyo; Teiji Habu, Kunitachi; Elichi Sakamoto, Hanno; Hiroshi Yamada, Hachioji; Katsuhide Mitsui, Hino, and Eisaku Hayashi, Shizuoka, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

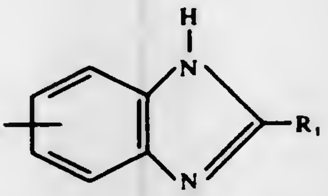
Continuation-in-part of Ser. No. 372,420, June 21, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,924

Claims priority, application Japan, June 30, 1972, 47-64958; United Kingdom, June 21, 1973, 29619/73; Germany, June 27, 1973, 2332754

Int. Cl.^{2} G03C *1/06, 5/20*

U.S. Cl. 96—66 R **4 Claims**

1. In a method for developing a lith-type silver halide material comprising silver halide grains containing silver bromide of less than 65 mole percent and silver chloride of more than 35 mole percent based on total silver halide, the size of the grains being 0.1 to 0.5 μ in diameter, which method comprises developing said photosensitive material which has been imagewise exposed to light by the use of an infectious developer, said developer comprising a silver halide developing agent consisting essentially of hydroquinone and (2) free sulfurous acid ions of very low concentration, the improvement which comprises said photosensitive material comprising, in an amount of 5 mg to 5 g per mole of silver halide, a compound represented by the following general formula:



wherein R_1 is an alkyl, aryl, aralkyl, arylthio, or aryloxy group which can have hydroxy, halogen, nitro, alkoxy, amine and/or alkyl substituents and R_2 is hydrogen, halogen, alkyl, alkoxy or nitro.

4,001,022

PHOTOGRAPHIC MATERIALS COMPRISING DEVELOPER LAYERS AND BINDERS COMPRISING SILICA SOL

Melville R. V. Sahyun, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 13, 1975, Ser. No. 604,354

Int. Cl.^{2} G03C *1/48, 1/06, 1/72, 1/31*

U.S. Cl. 96—76 R **5 Claims**

1. A photographic element suitable for rapid processing by the stabilization method comprising a support bearing superposed in either order: (1) a developer layer having a pH from about 2 to 7 and comprising a silver halide developing agent and a hydrophilic binder at least 45 weight percent being a silica sol, and (2) a silver halide emulsion layer having a pH from about 7 to about 10.5 and comprising a dispersion of silver halide in a hydrophilic binder that comprises by weight on a dry basis (a) about 60 to 94% colloidal silica, and (b) about 6 to 40% of gelatin.

4,001,023

ADHESION OF HYDROPHILIC LAYERS ON POLYESTER FILM

August Jean Van Paesschen, Antwerp; Lucien Janbaptist Van Gossum, Kontich, and Jan Jozef Priem, Mortsel, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 363,390, May 24, 1973, Pat. No. 3,911,172. This application June 3, 1975, Ser. No. 583,209

Claims priority, application United Kingdom, May 26, 1973, 25069/73

Int. Cl.^{2} G03C *1/78*

U.S. Cl. 96—87 A **1 Claim**

1. Photographic gelatin silver halide light-sensitive material comprising a biaxially stretched polyester film support, a single adhesive layer adhered to said polyester film after longitudinal stretching of said film and stretched integrally with said film in the transverse direction, said stretched film and layer being heat-set at 180°–220° C, and at least one light-sensitive gelatin silver halide emulsion layer, said adhesive layer comprising 30 to 80% by weight of chlorine-containing copolymer, 5 to 30% by weight of gelatin, 5 to 40% by weight of a plasticizer for said gelatin, and 8 to 30% by weight of a metal-complexing antistatic agent, said chlorine-containing copolymer comprising about 70 to 95% by weight of a vinyl chloride and/or vinylidene chloride, about 0.5 to 10% by weight of a hydrophilic monomer, and about 0.5 to 25% of at least one other copolymerizable monomer, and said antistatic agent beinga sulphosalicylic acid salt.

4,001,024

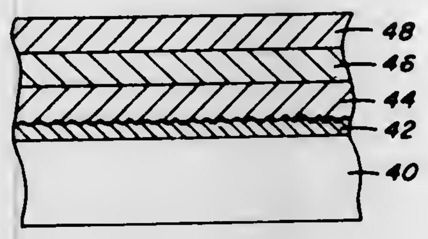
METHOD OF MULTI-LAYER COATING

Donald Allen Dittman, and Francis Armand Rozzi, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,883

Int. Cl.^{2} G03C *1/74;* **B05D** *1/34*

U.S. Cl. 96—87 R **15 Claims**



2. In a method of manufacturing a photographic element by simultaneously applying a plurality of layers of liquid photographic coating compositions to a moving web of photographic support material in which each of said compositions is fed into a coating bead which is maintained in bridging relationship between the surface of said web and a coating device spaced therefrom and the surface of said web is continuously moved across and in contact with said coating bead to simultaneously pick up all of said layers, the improvement wherein the speed of the web is at least 100 centimeters per second, the lowermost layer is thin and formed of a coating composition of low viscosity, and the layer immediately above the lowermost layer is thicker than the lowermost layer and formed of a coating composition of higher viscosity; the thickness and viscosity of the lowermost layer and of the layer immediately above it being such that vortical action of said coating bead is confined within the lowermost layer and the layer immediately above it, whereby interlayer mixing occurs between the lowermost layer and the layer immediately above it but all other layers are coated in distinct layer relationship.

4,001,025

PROCESS OF SENSITIZING SILVER HALIDE EMULSIONS WITH HETEROCYCLIC SULFUR COMPOUNDS

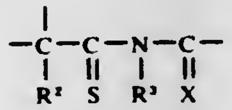
Derek J. Cash, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 10, 1974, Ser. No. 513,492

Int. Cl.^{2} G03C *1/28*

U.S. Cl. 96—107 **17 Claims**

1. A process for sensitizing a photographic silver halide emulsion comprises digesting the silver halide emulsion in contact with a sensitizing amount of a sensitiser whereby said sensitiser compound forms on the silver halide crystals the silver sulphide at a reaction rate v, where $v = k \cdot$ [concentration of the sensitiser compound in the emulsion] and k, the rate constant for the sulphide formation under the digestion conditions, is in the range of from 0.1 to 100 min^{-1}, the sensitiser compound being capable of distributing itself over the silver halide crystal surfaces at a rate which is fast as compared with the reaction rate of the sensitiser compound and the silver halide crystals, in which the sensitiser compound is a compound which includes as part of a 5-, or 6-membered hetersyclic ring the grouping:



$$-\underset{R^2}{\underset{|}{\overset{|}{C}}}-\underset{S}{\underset{\|}{C}}-\underset{R^3}{\underset{|}{N}}-\underset{X}{\underset{\|}{C}}-$$

in which R^2 and R^3 represents a hydrogen atom or an alkyl, alkylene, aryl, aralkyl or alkaryl group, and X represents an oxygen or sulphur atom.

4,001,026

METHOD AND MATERIALS FOR THERMOPLASTIC RECORDING

Antoon Leon Vandenberghe, Hove; Frans Clement Heugebaert, and Albert Lucien Poot, both of Kontich, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

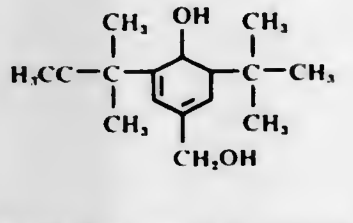
Continuation of Ser. No. 369,125, June 12, 1973, abandoned. This application June 24, 1975, Ser. No. 589,695

Claims priority, application United Kingdom, June 13, 1972, 27656/72

Int. Cl.^{2} E03C *1/02, 5/30*

U.S. Cl. 96—114.1 **9 Claims**

2. A method for recording and reproducing information comprising the steps of image exposing to ultraviolet or actinic radiation a photosensitive recording element comprising a photodeactivatable reductor capable of reducing a silver salt at elevated temperature, and uniformly heating said exposed element while the same is in intimate contact with an image-forming layer comprising an admixture of a reducible silver salt and a sterically hindered phenol derivative having the following structural formula:



said silver salt being a silver salt of an aliphatic carboxylic acid containing at least 14 carbon atoms, and said reductor being a naphthol, a pyrazolin-5-one, an indane-dione-1,3, or an acetoacetonitrile compound, deactivated by said radiation exposure.

4,001,027

INK CONTAINING METHYLENEDISALICYLIC ACID AND METHOD FOR OFFSET PRINTING

Richard George Lankes, Jr., Fairfield, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Jan. 24, 1975, Ser. No. 543,662

Int. Cl.^{2} C09D *11/02, 11/06, 11/12*

U.S. Cl. 106—23 **14 Claims**

1. Printing ink suitable for offset printing comprising a varnish and pigment derived from fluorescein and 5 to 20% of methylenedisalicyclic acid, based on the weight of said pigment.

4,001,028

METHOD OF PREPARING CRACK-FREE MONOLITHIC POLYCRYSTALLINE CORDIERITE SUBSTRATES

Rodney I. Frost; Irwin M. Lachman, and Paul H. Rieth, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 28, 1974, Ser. No. 473,396

Int. Cl.^{2} C04B *35/04, 33/00, 35/14;* **C01F** *1/00*

U.S. Cl. 106—62 **6 Claims**

3. The method of claim 2 wherein the raw clay is selected from laminated kaolin, delaminated kaolin, and mixtures thereof.

4,001,029

GUNNABLE REFRACTORY COMPOSITION

Nicholas Cassens, Jr., Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 26, 1975, Ser. No. 617,262

Int. Cl.^{2} C04B *35/68, 35/02;* **B28B** *19/00, 7/28*

U.S. Cl. 106—67 **16 Claims**

1. A refractory composition suitable for gunning by the method wherein water is admixed with the composition in a gun nozzle and particularly adapted for gunning onto hot

surfaces, consisting essentially of (1) from about 1% to about 5% aluminum sulfate, (2) from about 0.5% to about 5% hydrated lime, (3) from about 0.5% to about 5% bentonite, the balance being (4) sized refractory grain, all percentages being by weight of the total composition.

4,001,030

TREATMENT OF WASTE PRODUCTS FROM PORTLAND CEMENT MANUFACTURE

David Watson, New Barn, near Dartford, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Filed Feb. 18, 1975, Ser. No. 550,569

Claims priority, application United Kingdom, Feb. 28, 1974, 9093/74; Mar. 8, 1974, 10536/74

Int. Cl.² C04B *7/06*

U.S. Cl. 106—100 **7 Claims**

1. In a process of calcining a fluidized bed of flue dust arising from Portland cement manufacture to volatilize alkali metal salts therefrom while causing combination of the calcium carbonate and aluminosilicate constituents of the dust, which comprises the steps of (a) forming a fluidized bed of the flue dust; and (b) calcining the fluidized bed of step (a) at a temperature sufficient to calcine the dust but not more than about 1200° C so that the content of liquid calcium aluminate and calcium aluminoferrite phases are not so high as causes the fluidized bed to become inoperable, whereby there is limited reaction between calcium oxide and aluminosilicate contents of the flue dust; the improvement which comprises:

c. carrying out step (b) in the presence of a minor amount of calcium fluoride sufficient significantly to increase said limited reaction between calcium oxide and aluminosilicate contents of the flue dust at said temperature; and

d. recovering a product which is sufficiently low in free calcium oxide content as to allow the product to be reintroduced into a cement making process.

4,001,031

PROCESS FOR MAKING LOW ALKALI CEMENT CLINKER

Andrew T. McCord, Snyder; Louis E. Wagner, Elma, and Theodore J. Reese, Snyder, all of N.Y., assignors to Chem-Trol Pollution Services, Inc., Model City, N.Y.

Continuation-in-part of Ser. No. 416,458, Nov. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 311,898, Dec. 4, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,663

Int. Cl.² C04B *7/02*

U.S. Cl. 106—100 **6 Claims**

1. The method of making cement clinker, which comprises the steps of:

a. forming a raw feed mix which when calcined will produce cement clinker having an unacceptable high value of K_2O alkalinity;

b. continuously introducing the raw feed mix of step (a) into one end of a kiln while recovering cement clinker from the other end of the kiln;

c. firing the kiln with a fuel at a rate sufficient to produce the cement clinker; and

d. controlling the K_2O alkalinity of the recovered clinker by incorporating a chlorinated organic liquid fuel as part of the fuel employed to fire the kiln in step (c), said organic liquid fuel being incorporated in amount sufficient significantly to reduce the K_2O alkalinity of the recovered clinker.

4,001,032

METHOD OF MAKING NONGELLING AQUEOUS CATIONIC DIALDEHYDE STARCH COMPOSITIONS

Harley D. Heath; Bernard T. Hofreiter, and Adrian J. Ernst, all of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 13, 1975, Ser. No. 604,363

Int. Cl.² C08L *3/04*

U.S. Cl. 106—213 **5 Claims**

1. A process of making stable, nongelling, high-concentration, aqueous cationic dialdehyde starch compositions useful for imparting wet and dry strength to paper and paper products comprising reacting dialdehyde starch (DAS) in aqueous dispersions at concentrations of about 15% by weight with betaine hydrazide hydrochloride in amounts equal to from 3 [-] to 5% of the dry weight of DAS at a temperature of from about 90° C. to 95° C., and holding the resultant reaction mixtures at said temperature for a time inversely related to the amounts of said betaine hydrazide hydrochloride and sufficient to form aqueous dispersions having a pH of from 2.5 to 3.5 which remain fluid when cooled to 25° C.

4,001,033

COMPOSITION AND METHOD FOR SOIL STABILIZATION

Robert Anthone, 602 N. Spruce, Valley, Nebr. 68064 and Michael P. Parks, 9322 Oak St., Omaha, Nebr. 68124.

Filed Sept. 26, 1974, Ser. No. 509,458

Int. Cl.² C08H *5/04;* **C08L** *97/02;* **C09K** *3/22;* **E01C** *7/36*

U.S. Cl. 106—287 SS **5 Claims**

1. A composition for stabilizing soil particles comprising:

a major part of lignin sulfonate; and

a minor part of an additive consisting essentially of fatty acid ester of polyglycerol and polyoxyethylene ether of dialkyl phenol.

4,001,034

HIGH TEMPERATURE COATINGS BASED ON POLY (ZINC PHOSPHINATES)

Joseph Simkin, Lafayette Hill, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,808

Int. Cl.² C09C *1/36*

U.S. Cl. 106—292 **1 Claim**

1. A coating composition composed of a solvent mixture of about 1.0 percent by weight $ZnCl_2$; about 5.7 percent by weight $Ph(PhSO_2C_6H_4)P(O)OH$; about 1.2 percent by weight $Me(Ph)P(O)OH$; about 11.2 percent by weight TiO_2; and the balance substantially all solvent.

4,001,035

COLORING COMPOSITION

Masahiko Ito, Kasukabe; Hiromichi Wada, Yashio; Fumio Kondo, Toride, and Fukio Kai, Kawaguchi, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,744, July 22, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,929

Claims priority, application Japan, Jan. 16, 1974, 49-7009

Int. Cl.² C08J *3/22*

U.S. Cl. 106—307 **12 Claims**

1. A coloring composition prepared by the process comprising mixing under high shear stress:

a. 10 to 90 wt% based on the total *a* and *b* of a pigment;

b. 90 to 10 wt% based on the total *a* and *b* of a carrier resin; and

c. 0.05 to 5 wt% based on the total *a* and *b* of an organic compound having an active hydrogen atom; selected from the group consisting of phenols, primary or secondary amines, mercaptobenzimidazole, dilauryl thiodipropionate, tri-(nonylphenyl) phosphate, distearyl thiodipropionate, p-benzoquinone, hydroquinone, catechol, tert-butyl catechol, nitrosobenzene, picric acid, dithiobenzoyl disulfide and mixtures thereof; in the presence of 0.5 to 3 wt parts of a water soluble inorganic salt per part of the total *a* and *b*, and 0.1 to 1 wt part per part of total *a* and *b* of a hydrophilic solvent selected from the group consisting of dimethylformamide, diacetone alcohol, methylethyl ketone, ethyleneglycol monomethyl ether and ethyleneglycol monoethyl ether; and

separating said coloring composition from the inorganic salt and hydrophilic solvent by washing with water.

4,001,036

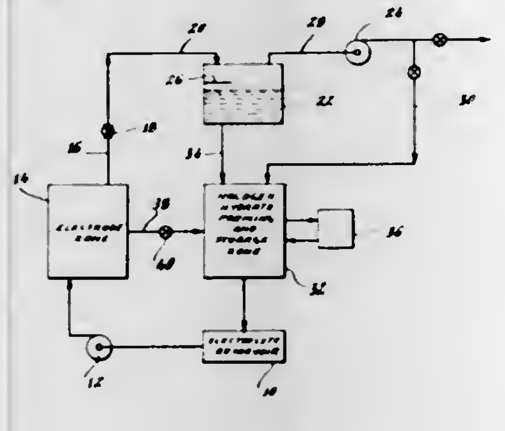
SYSTEM FOR IMPROVING CHARGE EFFICIENCY OF A ZINC-CHLORIDE BATTERY

Alby M. Berman, Oak Park; Richard C. Walker, Gaylord, and David J. Aller, Royal Oak, all of Mich., assignors to Energy Development Associates, Madison Heights, Mich.

Filed Nov. 20, 1975, Ser. No. 634,004

Int. Cl.² H01M *10/00*

U.S. Cl. 429—67 **8 Claims**



1. An improved electrical energy storage system comprising:

at least one cell having a relatively positive metal electrode and a relatively negative halogen electrode separated by an aqueous electrolyte containing ions of said metal and halogen,

means for forming and storing a quantity of halogen hydrate,

means for circulating said electrolyte to said cell and said means for forming and storing said halogen hydrate,

throttling means for partially reducing the pressure on the circulating electrolyte while maintaining the pressure in the cell, thereby causing chlorine to be desorbed therefrom; and

means for separating the desorbed chlorine from the electrolyte under reduced pressure.

4,001,037

LEAD BATTERIES

Fritz Beck, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 285,248, Aug. 31, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,665

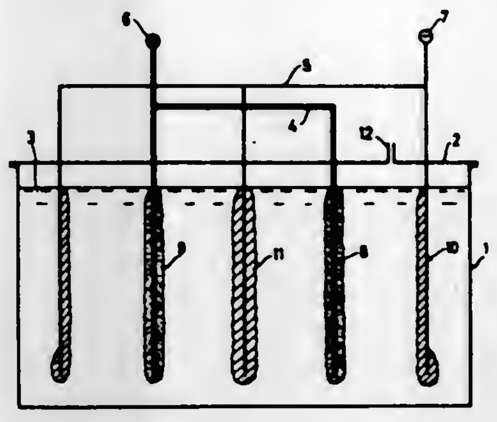
Claims priority, application Germany, Sept. 3, 1971, 2144198

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² H01M *4/36*

U.S. Cl. 429—188 **3 Claims**

1. A lead battery which can be alternately charged and discharged which comprises: a.) an electrolyte selected from the group consisting of perchloric acid, tetrafluoboric acid, fluosilicic acid and sulfamic acid and their corresponding lead salts; b.) a positive lead oxide electrode having a base plate made of titanium; and, c.) a negative lead electrode having a base plate made of graphite or of a graphite powder embedded in a binder which is stable to the electrolyte.



4,001,038

METHOD OF STRIPPING PAINT IN A MOLTEN SALT BATH

Timothy R. Justice, Inkster, and Robert W. Foreman, Bloomfield Hills, both of Mich., assignors to Park Chemical Co., Detroit, Mich.

Filed July 1, 1975, Ser. No. 592,103

Int. Cl.² B08B *3/08*

U.S. Cl. 134—38 **9 Claims**

1. A method of using a salt composition as a paint stripping salt, comprising the steps of:

providing a salt bath composition comprised of in weight percent;

a. about 25% to about 90% of caustic material selected from at least one of the group consisting of alkali and alkaline earth caustic materials,

b. about 2% to about 10% of an oxidizing agent selected from at least one oxidizing type material of the group consisting of alkali and alkaline earth metal nitrates, nitrites, molybdates and metasilicates, and vanadates,

c. about 5% to about 40% of a surface scum reducing agent selected from at least one of the group consisting of alkali and alkaline earth metal sulfate and pyrophosphate materials,

d. 0 to about 60% of a diluent salt material selected from at least one of the group consisting of the salts of chlorides, carbonates and fluorides,

maintaining said salt bath in molten form at a temperature from about 600° to about 1100° F;

immersing paint coated objects in said molten salt bath to remove the paint therefrom.

4,001,039

ELECTROCHEMICAL CELL WITH ALKALI AND ALKALINE EARTH METAL CONTAINING ELECTROLYTE

Glenn V. Elmore, Vestal, N.Y., and Howard A. Tanner, Xenia, Ohio, assignors to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 767,554, July 31, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 12,758, March 4, 1960, abandoned, and Ser. No. 332,812, Dec. 23, 1963, abandoned. This application May 4, 1971, Ser. No. 140,236

Int. Cl.² H01M *8/14*

U.S. Cl. 429—46 **1 Claim**

1. An electrochemical cell for the direct generation of electricity comprising an anode, a cathode, and an electrolyte in contact with each of said anode and cathode,

each of said anode and cathode being a non-consumable gas diffusion electrode and having an open porous structure to enable diffusion of gases and passage of electrolyte into the structure,

said electrolyte having good conductivity in an aqueous medium at a temperature below about 200° C., and being a mixture of at least two alkali metal hydroxides selected from the group consisting of potassium hydroxide, sodium hydroxide, lithium hydroxide, and rubidium hydroxide, and includes calcium hydroxide, and having a melting point not greater than about 300° C.,

said electrolyte being so constituted and proportioned to give said electrolyte a paste-like consistency while remaining mobile at a temperature below about 300° C.

4,001,040
FUEL CELL

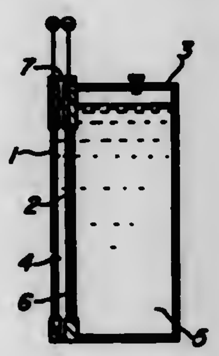
Masataro Fukuda, Toyonaka; Tsutomu Iwaki, Kyoto, and Yoshihiro Kobayashi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 174,041, Aug. 23, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,189

Claims priority, application Japan, Sept. 2, 1970, 45-77670; Sept. 2, 1970, 45-77677; Sept. 4, 1970, 45-78093; Oct. 16, 1970, 45-88575

Int. Cl.² H01M *4/00, 8/04*

U.S. Cl. 429—15 **12 Claims**



1. In a fuel in which electrochemical reaction is carried out by dissolving hydrazine fuel in an aqueous solution of caustic alkali as an electrolyte, the improvement in that the inside of a jar containing an oxidation electrode and a fuel electrode is divided into a first chamber and a second chamber by said fuel electrode, said oxidation electrode is provided in said first chamber so that it opposes said fuel electrode, a porous film which is inactive to fuel and electrolyte-resistant is provided to adhere to the surface of said fuel electrode which faces said second chamber, said fuel electrode allowing the electrolyte in which the fuel is dissolved to freely pass therethrough, said porous film produced by binding with a resin binder powders of a substance which is inactive to said fuel and electrolyte-resistant selected from the group consisting of nickel oxide, aluminum oxide, iron oxide, magnesium oxide and graphite whereby the fuel in the electrolyte which is introduced into said second chamber diffuses through said porous film and said fuel electrode to reach said first chamber.

4,001,041
PRESSURIZED FUEL CELL POWER PLANT

Maurice C. Menard, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,597

Int. Cl.² H01M *8/06*

U.S. Cl. 429—17 **14 Claims**

1. A power plant for generating electricity comprising:

a fuel cell stack including a plurality of fuel cells connected electrically in series through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode;

compressor means for compressing air to greater than two atmospheres pressure including a compressor and turbine means operably connected to said compressor;

means for delivering air at a pressure of at least two atmospheres from said compressor into said cathode gas space;

fuel conditioning apparatus including a reactor for producing hydrogen from a hydrogen containing fuel and steam;

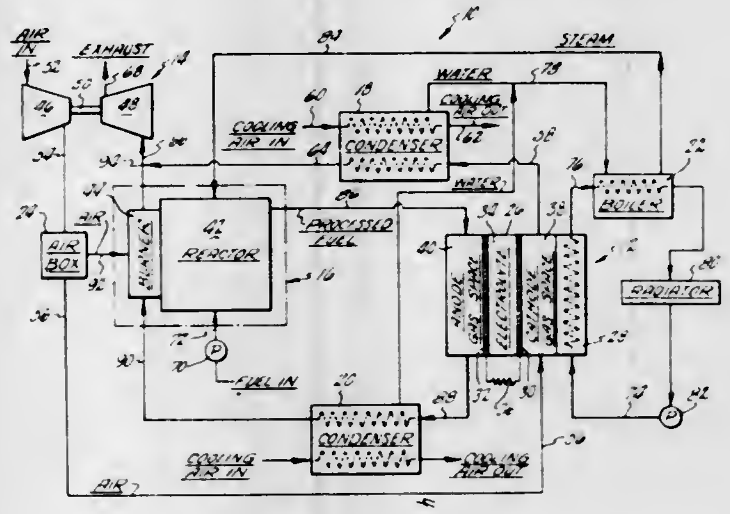
burner means for providing heat to said reactor;

means for producing steam and for delivering said steam into said reactor;

means for delivering pressurized hydrogen containing fuel into said reactor;

means for delivering pressurized hydrogen from said fuel conditioning apparatus into said anode gas space;

condenser means disposed upstream of said turbine means for condensing out water from said anode gas space and cathode gas space effluent gases at least a first portion of said condenser means being disposed downstream of said anode gas space and upstream of said burner means;



means for delivering said anode gas space effluent gases into said first portion of said condenser means for recovering water therefrom;

means for delivering said cathode gas space effluent gases into said condenser means for recovering water therefrom;

means for delivering said anode gas space effluent gases from said condenser means into said burner means;

means for delivering the condensed out water from said condenser means to said means for producing steam; and

means disposed downstream of said condenser means for delivering effluent gases from said cathode gas space and burner means into said turbine means for powering said turbine means and driving said compressor.

4,001,042
SCREEN PRINTING FUEL CELL ELECTROLYTE MATRICES USING POLYETHYLENE OXIDE AS THE INKING VEHICLE

John C. Trocciola, Glastonbury; Dan E. Elmore, South Windsor, and Ronald J. Stosak, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,860

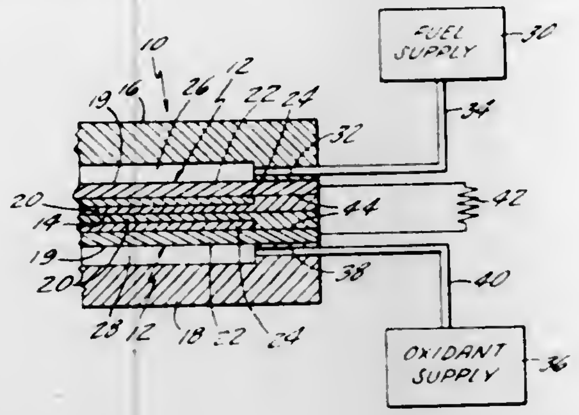
Int. Cl.² H01M *8/00, 2/14*

U.S. Cl. 427—115 **4 Claims**

1. A process for making a fuel cell electrode/matrix element comprising the steps of:

screen printing a hydrophilic electrolyte matrix layer onto the surface of a fuel cell gas diffusion electrode, said electrode including a catalyst layer on the surface onto which the matrix layer is printed, said step of printing including forming an ink by mixing an aqueous solution of polyethylene oxide with a matrix material, and printing

said ink onto the surface of said electrode through a screen; and



heat treating the matrix layer so formed to remove most of the aqueous solution of polyethylene oxide.

4,001,043
ANODE MODERATOR FOR REACTIVE METAL ELECTROCHEMICAL CELLS

William R. Momyer, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 23, 1975, Ser. No. 580,303

Int. Cl.² H01M *6/04*

U.S. Cl. 429—206 **7 Claims**

1. An electrochemical cell consisting essentially of a lithium anode spaced from a cathode by an electrically insulating film formed on said anode in the presence of water, an aqueous lithium hydroxide electrolyte in which said anode and cathode are immersed, and an anode moderator for improving the efficiency of said cell by reducing the said anode's sensitivity to changes in electrolyte molarity, flow rate and temperature, said anode moderator consisting essentially of soluble peroxide ions.

4,001,044
DRY CELL

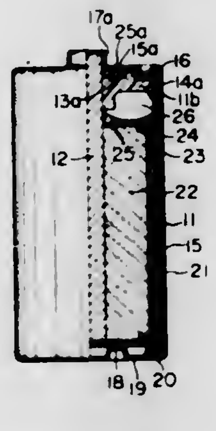
Jun Miyoshi, Miigaoka Neyagawa; Yoji Kajikawa, Katano; Akira Ota, Fujisaka Hirakata; Junichi Asaoka, Moriguchi, and Yoshio Kino, Miyanosaka Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 11, 1975, Ser. No. 612,303

Claims priority, application Japan, Sept. 20, 1974, 49-109091; Sept. 20, 1974, 49-114257[U]

Int. Cl.² H01M *6/06*

U.S. Cl. 429—166 **9 Claims**



1. A dry cell comprising

a. a depolarizing mix comprised of manganese dioxide, carbon black and electrolyte comprised of zinc chloride and ammonium chloride,

b. an anode comprising a zinc can having an open top,

c. a separator comprising a paper sheet base and a gelatinous paste layer formed on the surface opposite to the surface in contact with the inner wall of said zinc can for separating said zinc can from said depolarizing mix,

d. a cathode collector within said zinc can and separated therefrom, and comprising a carbon electrode,

e. a plastic top seal for sealing the open top of said zinc can, said plastic top seal being provided with a center hole through which said cathode collector extends, said plastic top seal having an annular recess ridge and an annular recess in its top surface and coaxial with said center hole, said annular recess being radially inwardly of said ridge,

f. a filler or sealing agent filling said annular recess of said plastic top seal,

g. a plastic tube or jacket surrounding the radially outer periphery of said zinc can, the upper portion of said plastic tube or jacket extending radially inwardly over the top of said zinc can and into said annular recess of said plastic top seal, the edge of said upper portion being embedded in said filler or sealing agent in said annular recess, and

h. a metal top seal placed over said plastic top seal and having a cathode cap formed integral therewith and fitted over the cathode collector, said cathode collector extending upwardly from the top of said plastic top seal.

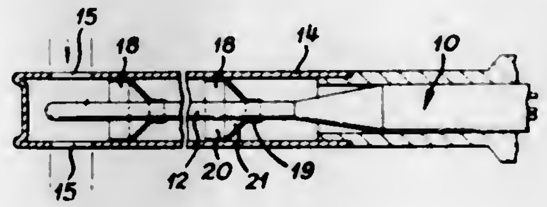
4,001,045
THERMOCOUPLE

George Watson Smith, London, England, assignor to Sangamo Weston Limited, Enfield, England

Filed Mar. 3, 1975, Ser. No. 554,457

Int. Cl.² F16K *16/20*

U.S. Cl. 136—230 **6 Claims**



1. A thermocouple comprising a temperature-responsive thermocouple element having a first relatively large diameter portion and an elongated second relatively small diameter portion, a rigid sheath co-axially surrounding the thermocouple element, and support means mounted on said second portion of the thermocouple element, said support means in use being incapable of movement relative to the thermocouple element lengthwise of said second portion and having at least one surface in sliding contact with the internal wall of said sheath permitting the thermocouple element to slide within the sheath.

4,001,046
THERMOELEMENT ON SEMICONDUCTOR BASE

Herbert Weiss, Munich; Otto Maurer, Worth, and Peter Kolbow, Minfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 21, 1973, Ser. No. 399,632

Claims priority, application Germany, Sept. 29, 1972, 2247962

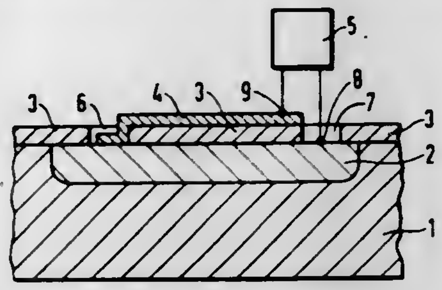
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² H01L *35/04*

U.S. Cl. 136—205 **12 Claims**

1. A two-pole thermoelement arrangement consisting essentially of a semiconductor base, a semiconductor zone, an electrically insulating layer, a conductive path and two terminal contacts, said conductive path being elongated and electrically conductively connected at one end thereof to said semiconductor zone with the remainder of said conductive layer being arranged on said electrically insulating layer, said electrically insulating layer being positioned outside such connection between said conductive path and said semiconductor zone, said semiconductor zone being a doped elongated zone adjacent one face of said semiconductor base, said electrically

insulating layer being elongated and arranged in generally adjacent relationship to said semiconductor zone, one of said terminal contacts being on the opposite end of said conductive path, the other of said terminal contacts being on said semiconductor zone in a region thereof generally adjacent said one terminal contact but generally remote from such connection.



4,001,047

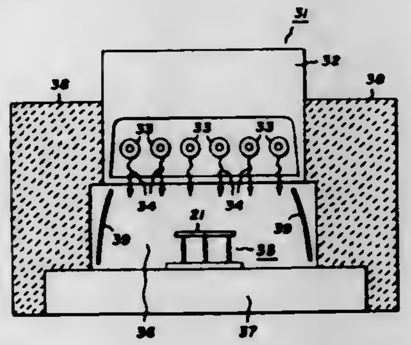
TEMPERATURE GRADIENT ZONE MELTING UTILIZING INFRARED RADIATION

John K. Boah, Auburn, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 19, 1975, Ser. No. 578,807

Int. Cl.² H01L *21/225*

U.S. Cl. 148—1.5 **16 Claims**



1. A method of forming a region of a selected conductivity type in a body of semiconductor material comprising the steps of:

providing a body of semiconductor material;

depositing a quantity of a dopant on one surface of said body, said dopant being deposited in a predetermined pattern and being of a selected conductivity type;

exposing the surface of said body opposite said one surface to infrared radiation, said radiation having an intensity such that said dopant thermally migrates into said body toward said opposite surface and leaves in its path in said semiconductor material a region of recrystallized material uniformly doped to the solid solubility limit of said dopant.

4,001,048

METHOD OF MAKING METAL OXIDE SEMICONDUCTOR STRUCTURES USING ION IMPLANTATION

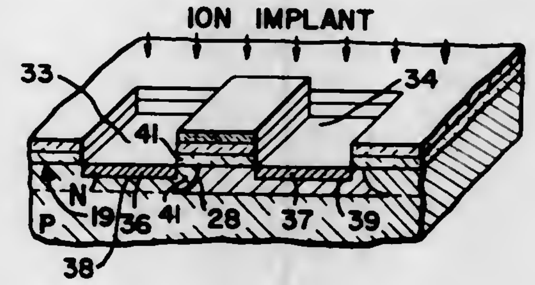
Gerald S. Meiling, Cupertino, and Thomas P. Cauge, Mountain View, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 483,157, June 26, 1974, Pat. No. 3,895,390, which is a continuation of Ser. No. 309,431, Nov. 24, 1972, abandoned. This application May 23, 1975, Ser. No. 580,339

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **22 Claims**

1. In a method of forming a metal oxide semiconductor structure, providing a semiconductor body having at least a portion thereof with an impurity of one conductivity type therein, forming a layer of semiconductor material of opposite conductivity type on said body so that said layer has a planar surface, forming a layer of insulating material on said planar surface having a relatively precise thickness, forming a first mask of a predetermined configuration on said layer of insulating material, forming a second mask overlying said layer of insulating material, driving an impurity of said one conductivity type through said surface in an area determined by said first and second masks to form a first region of said one conductivity type in said layer of semiconductor material defined by a first PN junction extending from the surface to the semiconductor body and underlying said first mask, removing said second mask, forming a third mask overlying said layer of insulating material and having openings therein for the source and drain immediately adjacent the first mask, driving an impurity of said opposite conductivity type through the openings in said third mask and through said surface to form source and drain regions of opposite conductivity type in said layer of semiconductor material, providing a relatively thick layer of insulating material overlying the first named layer of insulating material, and forming contacts extending through the thick layer of insulating material making contact with said source and drain regions to provide source and drain contacts and with said first mask to provide a gate contact, one of said steps of driving in an impurity being carried out by ion implantation.



4,001,049

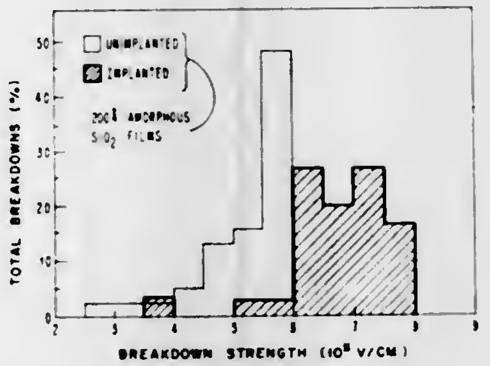
METHOD FOR IMPROVING DIELECTRIC BREAKDOWN STRENGTH OF INSULATING-GLASSY-MATERIAL LAYER OF A DEVICE INCLUDING ION IMPLANTATION THEREIN

John E. Baglin, Mohegan Lake; Thomas H. DiStefano, Tarrytown, and King-Ning Tu, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 11, 1975, Ser. No. 585,924

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **7 Claims**



1. Method for increasing the dielectric breakdown strength of an amorphous SiO_2 film with thickness less than approximately 1 micron of a device in an electric field supporting path of said device comprising steps of:

fabricating said device in a portion thereof including fabricating said film,

irradiating said film with ions selected from the group comprising hydrogen, helium, argon, krypton, neon and xenon, and being of sufficient fluence and energy to densify said film by at least 50 percent of saturation compaction as averaged over the range of said ions in said film and being of insufficient energy to penetrate completely through said film, and

annealing said film with a combination of time and temperature to remove substantially electric charge introduced therein by said energetic ions,

whereby the dielectric breakdown strength of said film is increased.

4,001,050

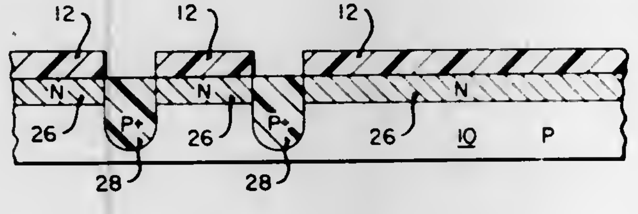
METHOD OF FABRICATING AN ISOLATED P-N JUNCTION

Tuh-Kai Koo, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 10, 1975, Ser. No. 630,490

Int. Cl.² H01L *21/383*

U.S. Cl. 148—1.5 **10 Claims**



1. A method of forming a semiconductor device comprising the steps of:

providing a semiconductor wafer of given conductivity;

implanting a given concentration of a first dopant, of an impurity of the opposite type of conductivity, under the surface of the wafer;

thermally diffusing a second dopant, of the given conductivity, into selected areas on the surface of the wafer, the second dopant concentration being greater than the concentration of the first dopant;

driving the first and second dopant into the wafer.

4,001,051

METHOD AND APPARATUS FOR PROTECTING SUPPORT ELEMENTS FOR CAST METAL STRANDS DURING STRAND CUTTING

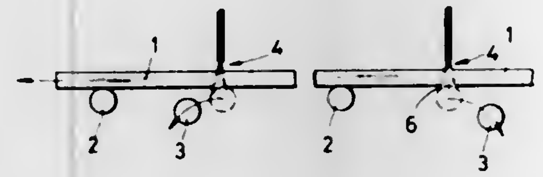
Carl John, Hochdahl, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed Feb. 20, 1975, Ser. No. 551,326

Claims priority, application Germany, Nov. 27, 1974, 2502615; Feb. 23, 1974, 2408855

Int. Cl.² B23K *31/10*

U.S. Cl. 148—9 R **2 Claims**



1. A method for protecting the support rolls of a freshly cast continuous metal strand from damage and deterioration from the effects of a cutting torch working on that strand; the steps which comprise

- a. moving said strand continuously over a plurality of spaced transverse support rolls while continuously moving a cutting torch therewith;
- b. pivoting individual ones of said support rolls from a support position against said strand to a non-support position away from said strand and back sequentially as said cutting torch passes adjacent the support position of the respective individual support rolls, said support position and said non-support position being parallel to each other;
- c. the movement of the individual support rolls being in arcs adjacent and substantially parallel to the path of movement of said strand;
- d. the sequential movement of said rolls from one position to another being during moments of highest exposure in the support position to the effects of said cutting torch and in direct relation to the movement thereof;
- e. the movement of said rolls in the same direction of said torch being at the same speed as the speed of advance of said torch, and maintained at periphery of the spray cone; and
- f. the pivoting speed of said support rolls in a direction opposite said cutting torch movement being greater than the pivoting speed of said rolls in the same direction as said cutting torch movement and through the spray cone thereof.

4,001,052

HOT-ROLLED LOW-CARBON STEEL STRIP WITH AN EXCELLENT PRESS-WORKABILITY CAPABLE OF FORMING SMOOTH PRESSED SURFACE AND A METHOD OF MAKING THE SAME

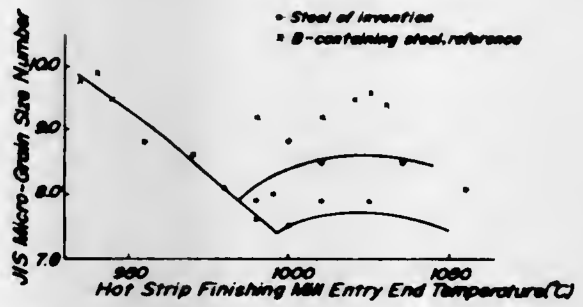
Yoshio Nakazato; Masatoshi Nakazawa; Nobuo Ohashi, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 290,393, Sept. 19, 1972, abandoned. This application Nov. 13, 1974, Ser. No. 523,537

Claims priority, application Japan, Sept. 30, 1971, 46-75795

Int. Cl.² C21D *9/48*, **C22C** *38/00*

U.S. Cl. 148—12 C **17 Claims**



1. Hot-rolled low-carbon deoxidized steel strip having a smooth pressed surface produced by hot-rolling a low carbon deoxidized steel in a hot-strip mill while maintaining the temperature at the entry end of the hot-strip mill above 950° C and the temperature at the delivery end above the A3 transformation point of the steel to form hot-rolled steel strip, said steel consisting essentially of up to 0.12% by weight of carbon, up to 0.01% by weight of nitrogen, up to 0.0094% by weight of boron, and balance iron, the ratio of the boron content in percent by weight to the nitrogen content in percent by weight being 0.3 to 0.94, said hot-rolled steel strip having a ferrite grain size number, JIS, of 7 to 9, and press forming the steel strip after hot-rolling to form said smooth pressed surface without cold-rolling or annealing said steel strip.

4,001,053

METHOD OF REMOVING RESIDUAL STRESS OF A WORK FORMED OF METAL OR CERAMIC AND A SEALING APPARATUS

Taro Igisu, Fukuoka, Japan, assignor to EIM Electric Co., Ltd., Kita-Kyushu, Japan

Continuation-in-part of Ser. No. 267,651, June 29, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,250

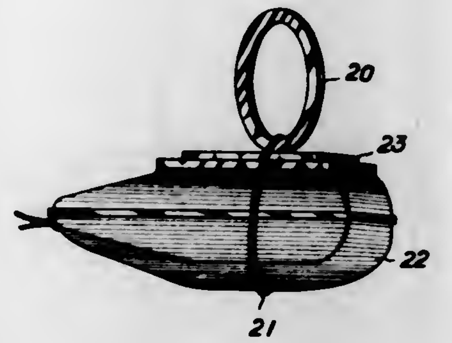
Claims priority, application Japan, Apr. 21, 1972, 47-40562; Dec. 5, 1972, 47-122207

Int. Cl.² C21D *1/04*

U.S. Cl. 148—12.9 **13 Claims**

1. A method of removing residual stress of a work compris-

ing movably mounting said work on a vibrator, forcedly vibrating said work at a frequency below the natural frequency



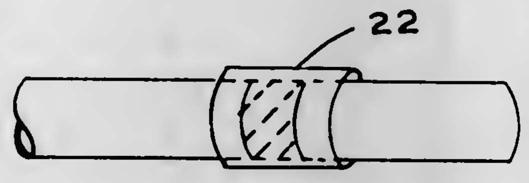
of said work, then releasing said work from said vibrator, thereby affording said work to be subject to free vibration.

4,001,054
PROCESS FOR MAKING METAL PIPE
Charles E. Makepeace, 2314 Elmira Drive, Ottawa, Ontario, Canada (K2C 1H4)

Filed Apr. 10, 1974, Ser. No. 459,611

Int. Cl.^{2} C21D *9/14*

U.S. Cl. 148—16.5 **10 Claims**



2. A process for toughening and strengthening a steel pipeline in a direction transverse to its axis to resist crack initiation and propagation, said pipeline being made up of a plurality of coterminous units, which process comprises the steps of:

1. carburizing a plurality of longitudinal sections of said units, each of said sections being spaced from each other when in position in said pipeline and being spaced from the ends of the unit in which it is located a sufficient distance to permit conventional welding of the ends, and each section to circumscribe the pipeline at least once, by diffusing a sufficient quantity of carbon into the longitudinal section, during the carburization step, to provide the required carbon content for the ultimately strengthened and toughened section of pipe,
2. subjecting each of said carburized sections to inside and outside quenching to provide quenching throughout its entire wall thickness,
3. tempering each of said carburized sections throughout its entire wall thickness by subjecting each to localized heating, the sections being thereby toughened and strengthened to a yield strength of between 60,000 to 300,000 p.s.i., and
4. welding the ends of said units together to form said pipeline.

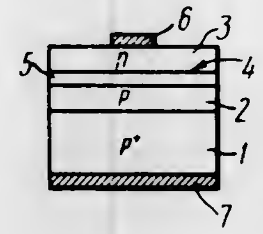
4,001,055
SEMICONDUCTOR LIGHT-EMITTING DIODE AND METHOD FOR PRODUCING SAME
Revaz Alexandrovich Charmakadze, prospekt Vazha pshavela, 6 kvartal, 24 korpus, kv. 22; Rafael Iraklievich Chikovani, prospekt Vazha Pshavela, 39b, kv. 53, both of Tbilisi, and Zhores Ivanovich Alferov, Olginskaya ulitsa, 9, korpus 3, kv. 15, Leningrad, all of U.S.S.R.

Division of Ser. No. 466,505, May 2, 1974, Pat. No. 3,958,265. This application Dec. 9, 1975, Ser. No. 639,199

Claims priority, application U.S.S.R., May 28, 1973, 1922832; May 31, 1973, 1924913; June 12, 1973, 1930156

Int. Cl.^{2} H01L *21/208*

U.S. Cl. 148—172 **3 Claims**



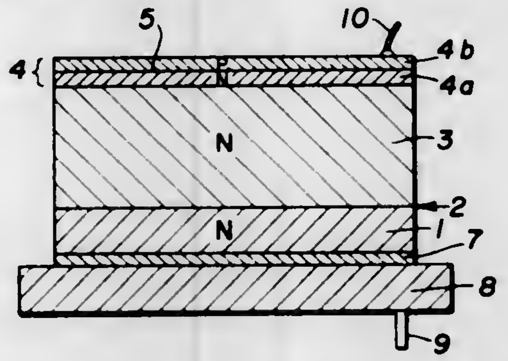
1. A method for producing a semi-conductor light-emitting diode, comprising assembling a substrate of GaAs and two liquid phases of Ga with Al saturated with arsenic, one containing Zn and Te and the other containing Te, contacting said first liquid phase doped with Zn and Te with said substrate to grow an epitaxial p-layer of the diode structure; leaving a layer of said first liquid phase, with the thickness thereof being controlled, on said substrate; contacting said second liquid phase doped with Te with said layer of controlled thickness to alternatively grow the compensated layer having a thickness commensurate with the diffusion length of the injected charge carriers, and an epitaxial n-layer doped to approximately the same concentration level as said compensated layer.

4,001,056
EPITAXIAL DEPOSITION OF III-V COMPOUNDS CONTAINING ISOELECTRONIC IMPURITIES
Warren O. Groves, and Arnold S. Epstein, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 313,227, Dec. 8, 1972, abandoned, which is a division of Ser. No. 158,181, June 30, 1971, abandoned. This application Nov. 11, 1974, Ser. No. 522,380

Int. Cl.^{2} H01L *21/20, 29/12*

U.S. Cl. 148—175 **5 Claims**



1. A process for the preparation of electroluminescent material for light-emitting diodes said process comprising:

a. providing in a reaction chamber a substrate of a single-crystal compound formed from Ga and one of the elements selected from the group consisting of As and P;
b. combining in a vapor phase reactant stream reactant materials including electronic impurity atoms, said materials being adapted for the formation of GaP and epitaxial deposition thereof on said substrate, said reactant materials initially being substantially free of isoelectronic impurity atoms;

c. introducing said reactant stream into said reaction chamber;
d. epitaxially depositing on said substrate from said stream said reactant materials to form a first epitaxial layer of a first electrical conductivity type on said substrate, said layer constituting a bulk region substantially free of isoelectronic impurities;
e. introducing into said stream an isoelectronic impurity in vapor form;
f. epitaxially depositing on said substrate from said stream said reactant materials and said isoelectronic impurity to form a second epitaxial layer of said first conductivity type on said first epitaxial layer, said second epitaxial layer constituting a surface region containing said isoelectronic impurity atoms at a concentration of about 2.0 × 10^{19} atoms/cm.^{3}; and
g. introducing electronic impurity atoms of a second electrical conductivity type opposite to that of said first conductivity type into said surface region to form a P-N junction in said surface region.

4,001,057
SOLID PROPELLANT WITH NF_2 CONTAINING BINDER AND ENERGETIC PLASTICIZER
Mart G. Baldwin, and Paul H. Gehlhaus, both of Huntsville, Ala., assignors to Rohm and Haas Company, Philadelphia, Pa.

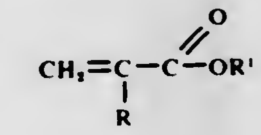
Filed Sept. 24, 1962, Ser. No. 227,109

Int. Cl.^{2} C06B *45/10, 43/00, 33/08*

U.S. Cl. 149—19.3 **4 Claims**

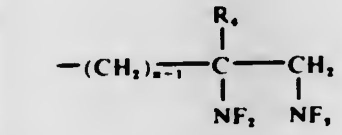
1. Compositions suitable for the manufacture of propellants consisting essentially of

A. 15 to 40 parts of a monomer selected from the group consisting of compounds of the formula



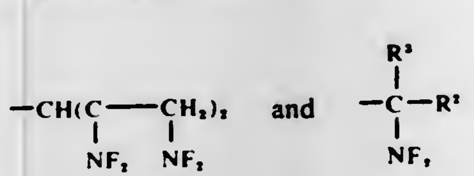
$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}-\overset{\displaystyle O}{\overset{/\!/}{C}}-OR^1$$

in which R is selected from the group consisting of hydrogen, methyl and ethyl, and R^1 is selected from the group consisting of



$$-(CH_2)_{n-1}-\overset{\displaystyle R_4}{\underset{\displaystyle NF_2}{C}}-\underset{\displaystyle NF_2}{CH_2}$$

in which n is an integer from 1 to 5, and R^4 is selected from the group consisting of H and CH_3,



$$-CH(\underset{\displaystyle NF_2}{C}-\underset{\displaystyle NF_2}{CH_2})_2 \quad \text{and} \quad -\overset{\displaystyle R^3}{\underset{\displaystyle NF_2}{C}}-R^2$$

in which R^2 is selected from the group consisting of hydrogen and lower alkyl containing 1 to 4 carbon atoms, and R^3 is selected from the group consisting of hydrogen and lower alkyl containing 1 to 4 carbon atoms,

B. greater than 0 and less than 20 parts of a plasticizer for the polymers prepared by polymerizing the monomers of A), said plasticizers consisting essentially of a major proportion of compounds containing groups selected from the group consisting of NF_2 and ONO_2,

C. 40 to 60 parts of a solid powdered oxidizer, selected from the group consisting of lithium, sodium, potassium and ammonium salts of nitric and perchloric acids and

D. 0 to 25 parts of a finely particled readily combustible solid selected from the group consisting of carbon black, aluminum, magnesium, zinc, zirconium, boron, and beryllium.

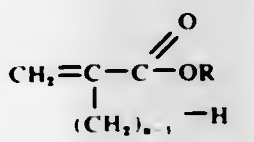
4,001,058
PROCESS FOR THE PREPARATION OF DEKENYL ACRYLATES AND METHACRYLATES AND PRODUCTS THEREOF
Marion F. Hawthorne, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,614, Dec. 29, 1958, abandoned. This application Mar. 10, 1961, Ser. No. 94,937

Int. Cl.^{2} C06L *25/00;* **C08F** *218/00*

U.S. Cl. 149—22 **18 Claims**

3. An ester of the formula



$$CH_2{=}\underset{\displaystyle (CH_2)_{n-1}-H}{\underset{|}{C}}-\overset{\displaystyle O}{\overset{/\!/}{C}}-OR$$

in which *n* is 1 to 2 and R is a radical selected from the group consisting of

$(H\phi CH_2)_2CH-$,

$(H\phi)_2CH-$,

$H\phi CH_2-$,

$H\phi(CH_2)_2-$,

$H\phi(CH_2)_3-$,

$H\phi(CH_2)_4-$,

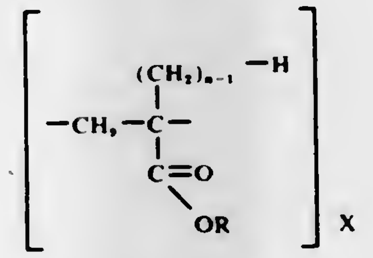
$H\phi(CH_2)_5-$,

and

$(CH_3\phi)_2CH-$

in which formula $-\phi-$ represents $-C_2B_{10}H_{10}-$.

12. Polymers of the formula



$$\left[-CH_2-\overset{\displaystyle (CH_2)_{n-1}-H}{\underset{\displaystyle \underset{\displaystyle \diagdown OR}{C{=}O}}{C}}-\right]_X$$

in which *n* is 1 to 2, R is a radical selected from the group consisting of

$(H\phi CH_2)_2CH-$,

$(H\phi)_2CH-$,

$H\phi CH_2-$,

$H\phi(CH_2)_2-$,

$H\phi(CH_2)_3-$,

$H\phi(CH_2)_4-$,

$H\phi(CH_2)_5-$,

and

$(CH_3\phi)_2CH-$.

X is about 5 to 3000, and —Ø— represents $-C_2B_{10}H_{10}-$.

15. Polymers of claim 12 containing from 5 to 30% on the weight of the polymer of a nitrato ester of an alcohol containing 1 to 10 carbon atoms and having 1 to 3 hydroxyl groups.

4,001,059
NITROGEN- AND FLUORINE-CONTAINING COMPOUNDS

Robert C. Petry, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1963, Ser. No. 283,108

Int. Cl.² C06B *23/00;* C07C *121/16*

U.S. Cl. 149—109.4 **5 Claims**

1. A compound selected from the group consisting of 1,2,3-tris(difluoramino)-cyanopropane, 1-cyano-2,3,5,6-tetrakis(-difluoramino)hexane, 1-cyano-2,3,6,7-tetrakis(difluoramino)heptane, and mixtures of 1-cyano-bis(difluoramino)pentenes.

5. Mixtures of 1-cyano-bis(difluoramino)pentenes.

4,001,060
METHOD FOR PREPARING AN EXTRUDABLE PRIMING MIXTURE CONTAINING MODIFIED KARAYA GUM

Edward A. Staba, Higganum, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 380,626, July 19, 1973. This application Apr. 11, 1975, Ser. No. 567,202

Int. Cl.² C06B *21/00*

U.S. Cl. 149—109.6 **2 Claims**

1. A method of preparing an extrudable priming mixture displaying improved extrusion characteristics and extended pot life, said method comprising the steps of:

a. forming a suspension of karaya gum in an anhydrous alcohol medium selected from the group consisting of methanol, ethanol, propanol-2, propanol-1 and the butyl alcohols;
b. dissolving a reagent selected from the group consisting of tannic acid, benzoic acid, sorbic acid, gluconic acid, formaldehyde, acetic anhydride, and gluconic acid D-lactone in said suspension to form a reaction solution for said karaya gum;.
c. maintaining said suspension of karaya gum in said reaction solution at a reaction temperature of at least room temperature for a time sufficient for said reaction solution to react with said karaya gum to form a karaya gum condensation reaction product;
d. removing said karaya gum condensation reaction product from said solution;
e. drying said karaya gum condensation reaction product;
f. mixing said dry karaya gum condensation reaction product with a mixture of priming ingredients and water to form an extrudable priming mixture comprising about 1 to 2 percent by weight karaya gum condensation reaction product, 16 to 17 percent water, the remainder being priming ingredients.

4,001,061
SINGLE LITHOGRAPHY FOR MULTIPLE-LAYER BUBBLE DOMAIN DEVICES

Kie Y. Ahn, Chappaqua; Michael Hatzakis, Ossining, and John V. Powers, Shenorock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

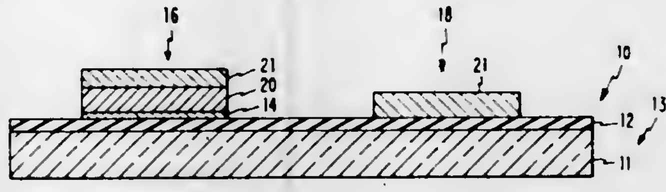
Filed Mar. 5, 1975, Ser. No. 555,644

Int. Cl.² C23F *1/02*

U.S. Cl. 156—3 **9 Claims**

1. A method for fabricating a magnetic bubble domain device, comprising the steps of;

a. depositing a first thin magnetic film on a substrate having a bubble material therein, said magnetic film having a thickness less than about 30 nm;
b. coating said thin film with a resist;
c. exposing said resist in a sensor area and a propagation area with a radiation beam having a different exposure density in said propagation area than in said sensor area;
d. partially developing said resist, so as to expose said thin film only in said sensor area;
e. electroplating on said first magnetic film a second film of a metal having a conductivity higher than that of magnetic film, said second film having a thickness greater than about 200 nm;



f. further developing said resist, so as to expose said first thin film in said propagation area;
g. electroplating a third film onto said first magnetic film in said propagation area, said third film being a magnetic film used to propagate said magnetic bubble domains;
h. removing any remaining undesired resist and any remaining undesired first magnetic film.

4,001,062
VARIABLE SCALE RELIEF REPRODUCTION PROCESS AND PRODUCT THEREOF

Yoshiharu Iisaka; Yasuo Katsurada; Shigeo Suzuki, all of Tokyo, and Takatoshi Saijo, Kawasaki, all of Japan, assignors to Kyodo Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,609, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 889,369, Dec. 31, 1969, Pat. No. 3,748,202. This application May 19, 1975, Ser. No. 578,789

Claims priority, application Japan, Apr. 19, 1969, 44-30474

The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl.² G03C *5/00;* B29C *1/02*

U.S. Cl. 156—59 **27 Claims**

1. A relief printing process suitable for reproducing in mass-production the color and surface irregularities of subject matter including art works, crafts and oil paintings, comprising the steps of preparing a first mold of a hardenable material, said mold being the inverse on a selected scale of said subject matter, preparing a transparent moldment in said mold, said moldment having one flat face, preparing a color reproduction of said subject matter on the same selected scale, and joining said flat face of said moldment to said color reproduction so that the irregularities in said moldment are in registry with said color reproduction as in said subject matter.

4,001,063
MEASURING INSTRUMENT

Peter P. Vaida, 17 Fairview Ave., Clinton, N.J. 08809

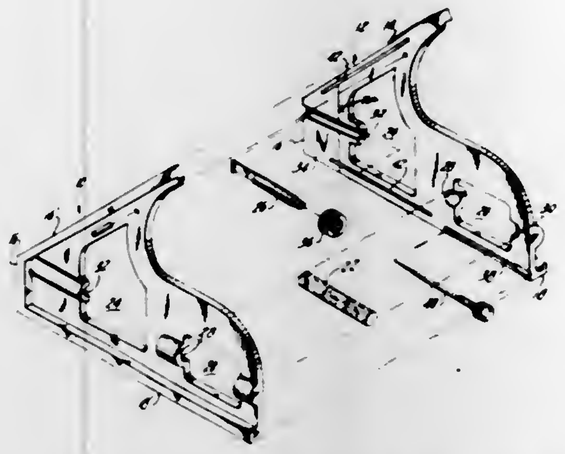
Filed Mar. 15, 1976, Ser. No. 667,027

Int. Cl.² B32B *31/16*

U.S. Cl. 156—73.1 **3 Claims**

1. A method of making a frame for a measuring instrument, said instrument including reference surfaces and a vial disposed in a desired orientation with respect to said reference surfaces, comprising the steps of:

molding a first part of said frame,
molding a mating second part of said frame,
said molded frame parts each including reference surfaces, openings for receipt of a vial, and first and second recesses formed in the border of each of said openings for positioning said vial, said first and second recesses being aligned in a predetermined angular relationship with respect to said reference surfaces and cooperating to form oppositely disposed cavities when said molded frame parts are in mating relationship;
placing a vial in recesses of one of said frame parts, the longitudinal axis of said vial being in said predetermined angular relationship with said reference surfaces;
aligning said frame parts in mating relationship with said vial in said cavities; and



fastening said mated frame parts together to form a unitary structure in which the longitudinal axis of said vial is disposed in said predetermined angular position.

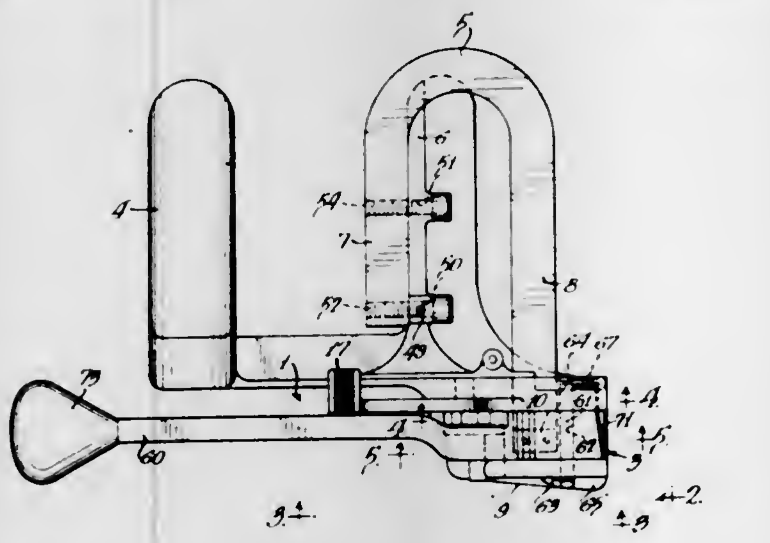
4,001,064
MANUAL STRAPPING TOOL

Robert J. Nix, Park Ridge, Ill., assignor to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 515,435, Oct. 21, 1974, abandoned. This application Sept. 3, 1975, Ser. No. 609,361

Int. Cl.² B32B *31/18, 31/20*

U.S. Cl. 156—73.6 **19 Claims**



16. A method for joining overlapping portions of a thermoplastic strap, comprising the steps of: gripping and compressing the overlapping strap portions between opposing strap gripping surfaces of a pair of jaws, one of the jaws being fixedly mounted on a base, the other jaw being attached to a vibratory end of a cantilevered bar spring anchored to the base so that the spring urges one gripped strap portion against the other gripped strap portion; deflecting the vibratory end to store a predetermined amount of energy in said bar spring; and releasing the vibratory end of said cantilevered bar spring to effect relative oscillatory movement between said gripped strap portions to cause oscillating and sliding frictional movement between said compressed overlapping strap portions sufficient to melt the interface regions thereof.

4,001,065
CROSS-LINKED OLEFINE-ESTER TAPES

Richard John Penneck, Lechlade, and Robin James Thomas Clabburn, Highworth, both of England, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 296,626, Oct. 11, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 568,935

Claims priority, application United Kingdom, Oct. 12, 1971, 47471/71

Int. Cl.² B29C *27/20*

U.S. Cl. 156—86 **20 Claims**

1. A method of covering a substrate, which comprises applying to the substrate a heat shrinkable tape in overlapping relation, said tape comprising a cross-linked copolymer formed from an ethylenically unsaturated hydrocarbon and a carboxylic acid ester having ethylenic unsaturation said tape having the property of adhesively bonding to itself upon heating, and heating the tape to cause it to shrink about the substrate and the overlapping layers to adhesively bond to each other

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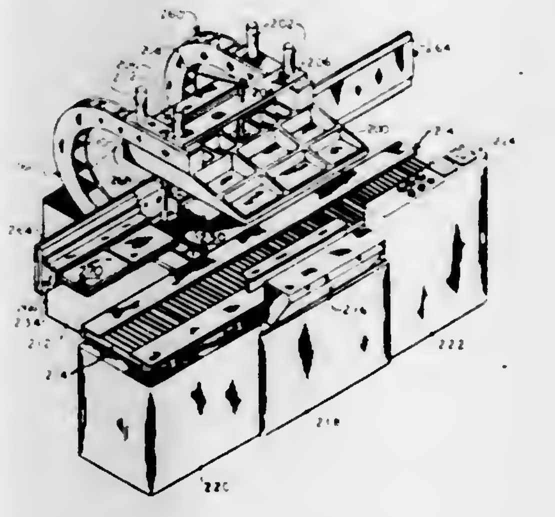
4,001,066
INTERCHANGE AND ALIGNMENT APPARATUS AND METHOD FOR HEATED PLATEN HEAT SEALING MACHINE

Harry M. Channing, Wyomissing, and William J. Eberle, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed June 24, 1975, Ser. No. 589,680

Int. Cl.² B30B *15/34*, C09J *5/00*

U.S. Cl. 156—152 **13 Claims**



12. A heat sealing machine for sealing any of a variety of sizes of battery cover and cases, comprising

a. a plurality of platens, one for each size of battery cover and case to be sealed;
b. carriage means for moving one of said plurality of platens mounted thereon between a first position wherein said platen is disposed between said case and cover to be sealed, and a second position wherein said case and cover may be directly pressed together;
c. means for bringing said platen in said first position into engagement with at least a portion of said case and a portion of said cover; and
d. separate platen interchange means for sliding a preselected one of said plurality of platens onto said carriage means.

4,001,067

BUTT WELDER CUTTING ELEMENT TEMPERATURE CONTROL

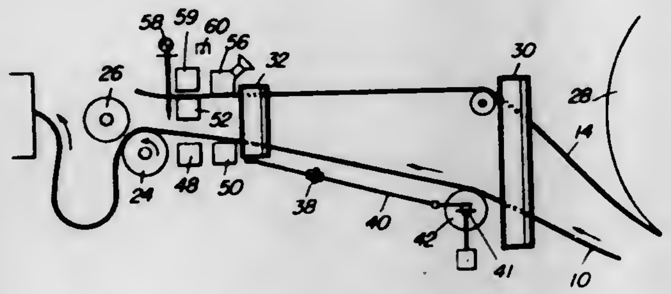
David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,446

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.^{2} B31F *5/00*; **B65H** *19/08*

U.S. Cl. 156—159 **6 Claims**



1. In an apparatus comprising means for feeding a first thermoplastic sheet into the nip of a pair of rolls; drive means operating said rolls drawing said first sheet into proximity to said first sheet and said pair of rolls; clamp means associated with said second sheet; clamp means associated with said first sheet; electrical conductive heating and cutting means proximate to said clamp means movably positioned to pass through both said first and said second sheets, thereby severing said first and second sheets; gate means adopted to allow said heating and cutting means to move in and out of a heat insulating enclosure; and means for contacting the thus severed, hot edges for a time sufficient to weld said first and second edges together; the improvement comprising a gate means which comprises adjacent sections of a flexible material adapted to allow said heating and cutting means to pass through said flexible material comprising said gate, thereby preventing residual thermoplastic build-up.

4,001,068

PROCESS FOR SEALING GLASS TO METAL

Glenn Nelson Robinson, Terre Haute, Ind., and Louis A. Jurisch, Marengo, Ill., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 2, 1975, Ser. No. 618,873

Int. Cl.^{2} C09J *5/04*

U.S. Cl. 156—315 **12 Claims**

1. In a process for joining glass-to-metal surfaces by placing a non-rigid polymeric adhesive between said surfaces to be joined, the improvement comprising the step of applying to said surfaces, prior to applying said adhesive, a methylolated polyoxazoline.

4,001,069

ARRANGEMENT FOR GENERATING AND CONSTRUCTING THREE-DIMENSIONAL SURFACES AND BODIES

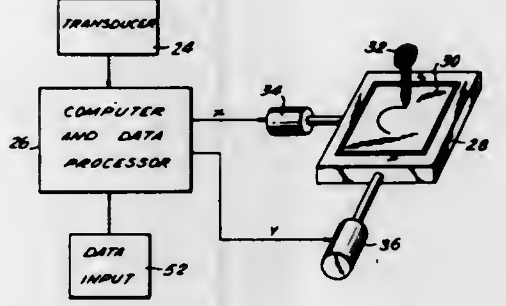
Paul L. DiMatteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Division of Ser. No. 516,373, Oct. 21, 1974, Pat. No. 3,932,923. This application Aug. 27, 1975, Ser. No. 608,033

Int. Cl.^{2} B26D *5/00*

U.S. Cl. 156—353 **12 Claims**

1. An arrangement for constructing a predetermined surface comprising, in combination, means for defining a surface in terms of coordinates in space; means for defining a plurality of cross-sections of said surface in terms of planar coordinates from said coordinates in space, said cross-section lying in parallel planes; means for cutting planar elements from planar sheets for each of said cross-sections; means for directing said cutting means dependent on said planar coordinates, each said element having a cross-section corresponding to the respective cross-section of said defined surface; and means for stacking the cut elements adjacent one another in predetermined sequence to form said surface, the sequence of the stacked cut elements corresponding to the sequence of said plurality of cross-sections of said defined surface.



4,001,070

TIRE BUILDING APPARATUS

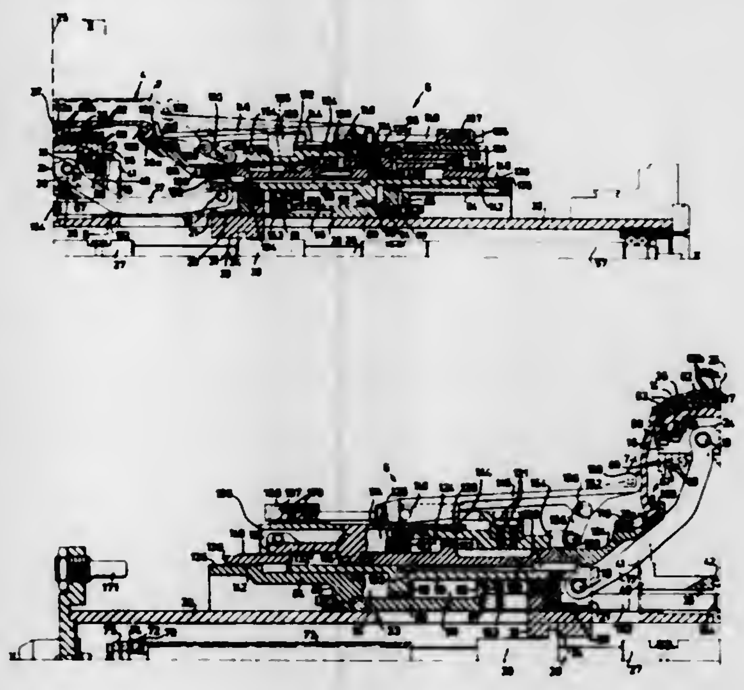
Robert Graham Bell, Hartlebury, England, assignor to National-Standard Company, Limited, Kidderminster, England

Continuation of Ser. No. 450,677, March 13, 1974, abandoned. This application Oct. 23, 1975, Ser. No. 625,189

Claims priority, application United Kingdom, June 15, 1973, 28522/73

Int. Cl.^{2} B29H *17/26*

U.S. Cl. 156—398 **8 Claims**



1. A tyre building apparatus comprising an expandable former embodying axially movable former expanding and contracting means to dispose the former in positions defining firm supporting surfaces of different radii, said expanding and contracting means ensuring symmetrical expansion and contraction of the former with respect to a transverse plane of the former, tyre bead core locating and supporting means disposed on opposite sides of said transverse plane and axially movable independently of the axial movements of said former expanding and contracting means, further means ensuring that axial movements of the two bead core locating and supporting means occur symmetrically at all times with respect to said transverse plane, axially movable, first fluid pressure-actuated means for effecting adjustment of the axial position of said tyre bead locating and supporting means independently of the degree of expansion of the former, whereby a desired tensioning of the components of a tyre mounted on the former can be achieved whilst maintaining said components symmetrically disposed on the former with respect to said transverse plane, second fluid pressure actuated means axially movable with respect to said first fluid pressure actuated means for effecting radial movement of the tyre bead core locating and supporting means from an inner position to a radially outer position which remains constant independent of the degree of expansion of the former, and adjustable stop means comprising manually adjustable, interengaged first and second screw-threaded means carried by at least one of said fluid-pressure actuated means for the purpose of providing a positive limit to the relative axial movement between said first and second fluid-pressure actuated means, whereby said radially outer position of the tyre bead core locating and supporting means may be accurately determined.

4,001,071

CARPET MACHINE

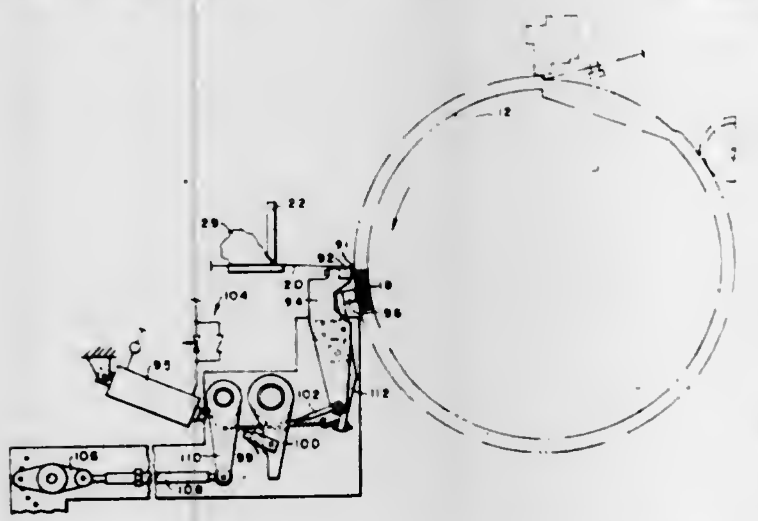
Charles A. Wethington, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.,

Filed June 8, 1974, Ser. No. 475,385

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} D04H *11/08*

U.S. Cl. 156—435 **3 Claims**



1. Apparatus to produce a bonded pile fabric comprising: a rotor, means to rotate said rotor, a set of blade members slidably mounted in said rotor, a second blade member slidably mounted with respect to said rotor and operably associated with said blade members in said rotor, means to supply yarn between said set of blade members and said second blade member, means to slide said second blade member downwardly at a predetermined time to bend the yarn over one blade of said set of blades, means to slide upwardly the blade of said set of blades next adjacent to the blade over which the yarn is bent to form a loop in said yarn, an elongated backing material guiding means spaced from and supplying an adhesive backed backing material into contact with said formed loop, and means operably associated with said elongated guiding means to move and hold said elongate guiding means and the backing material against the previously formed loops when the machine has stopped.

4,001,072

APPLICATOR FOR PRESSURE-SENSITIVE ADHESIVE FASTENERS

Richard P. deNeui, Lake Elmoin, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 13, 1972, Ser. No. 288,757

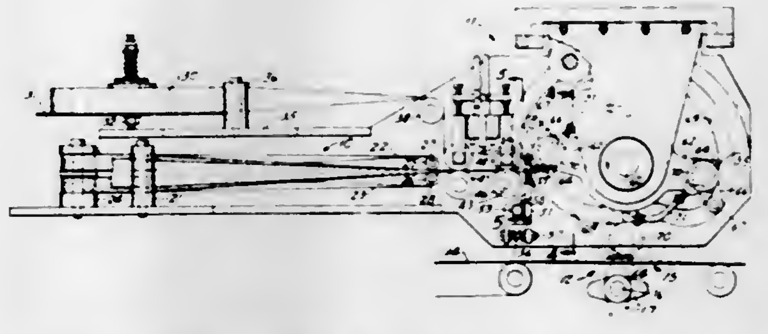
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.^{2} B32B *31/00*; **B31F** *1/00*

U.S. Cl. 156—461 **5 Claims**

1. An applicator for cutting lengths of pressure-sensitive adhesive tape and applying the same to an article moving along a first path, said applicator comprising:

means for feeding a length of said tape along a second path,
a cutting edge disposed on one side of said second path,
vacuum pad means for supporting a severed length of tape,
  said vacuum pad means comprising a generally rectangular pad,
cutting means movable with said pad means and cooperating with said cutting edge to sever a length of said tape,
mounting means for supporting said vacuum pad means and
  said cutting means for movement relative to said cutting edge and for moving said pad means along a third orbital path around an axis past said cutting edge to place the severed lengths of said tape on said pad means and for orienting said pad means to a position generally parallel to and along said first path to apply said severed length of tape to a said article, said mounting means comprising a rotating arm movably supporting said pad means, means for rotating said arm about said axis, and cam means for orientating said pad means during rotation of said arm and for defining said third orbital path, and
wherein said cutting means is mounted on said arm to move
  with said pad means and to cooperate with said cutting edge to cut sections from said tape.



4,001,073

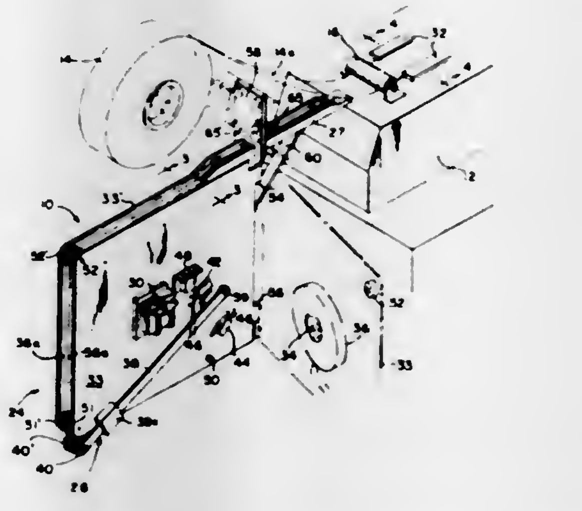
APPARATUS FOR PRODUCING INDIVIDUAL PHOTOGRAPHIC PRINTS WITH STRIP ADHESIVE BACKING

Herman L. Jones, 7302 84th St. NE., Marysville, and John H. Haugen, 9925 Davies Road, Lake Stevens, both of Wash. 98270

Filed Sept. 12, 1974, Ser. No. 505,253

Int. Cl.^{2} B32B *31/00*; **B31F** *5/00*

U.S. Cl. 156—516 **29 Claims**

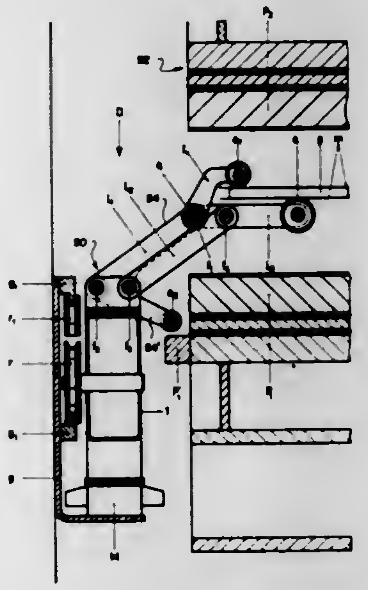


1. Apparatus for dispensing a continuous strip of adhesive transfer tape composed of a transferable pressure sensitive adhesive layer and a releasable backing strip, for progressive application to the back of a continuous strip of photographic film prints as the latter is drawn intermittantly into a film cutter, the apparatus comprising: means for dispensing a strip of adhesive transfer tape from an adhesive transfer tape roll and for directing the tape strip into a course of travel aligned with the direction of travel to be taken by a film print strip as it enters a film cutter; guide means providing an elongated

path in said course of travel along which the tape strip is confined and guided into superimposed registry with the back of the photographic print strip, so as to bring progressively the adhesive layer of the dispensed tape strip and the back of the photographic print strip into face to face engagement with each other as they are drawn conjointly into the film cutter.

4,001,074
METHOD AND APPARATUS FOR FORMING AND PRESSING FOIL AND BOARD LAMINATES

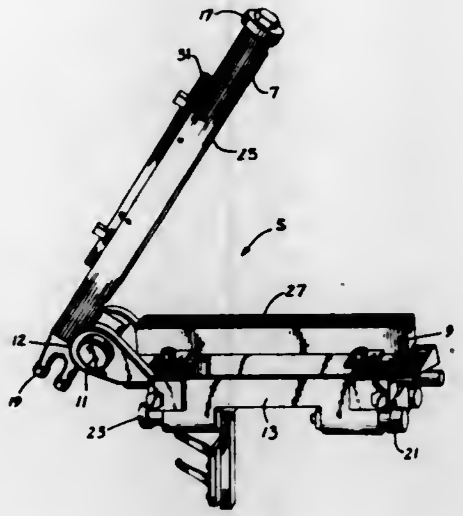
Franco Pagnoni, Monza (Milan), Italy, assignor to Fratelli Pagnoni S.p.A., Monza, Milan, Italy
Filed Sept. 30, 1975, Ser. No. 618,115
Claims priority, application Italy, Feb. 7, 1975, 20054/75
Int. Cl.² B32B *31/00*; B30B *15/30*
U.S. Cl. 156—580 8 Claims



1. A device for transferring panels, boards, etc. to a press, comprising a press having first and second press plates relatively movable toward each other to compress a panel or board therebetween and away from each other to open said press, a panel support spaced from said press, first and second trackways extending between said panel support and the opposite end of said press from said panel support, at least one carriage movable along each trackway between a position alongside said support to a position alongside said press, a pickup mechanism on each carriage including pivotal lever means including a lever pivotal on said carriage toward and away from said panel support and said press and having a support surface engageable below the panel to support it, means to move said carriage, shifting means to shift said lever means and said lever to shift the support surface thereof below said panel for support of the panel thereon, said carriage being movable with said lever means to carry said panel supported thereon to said press, and actuator means associated with said press and responsive to relative closing movement of said first and second press plates to actuate said shifting means to move said lever with said support surface gradually outwardly of said press during closing movement of said press.

4,001,075
SEAL FOR PACKAGES CAPABLE OF THERMOPLASTIC SEALING AND MEANS FOR EFFECTING SUCH SEALING

Donald F. Menzner, and Robert L. Knauf, both of Marathon, Wis., assignors to Marathon Cheese Corporation, Marathon, Wis.
Filed Nov. 20, 1974, Ser. No. 525,577
Int. Cl.² B32B *31/00*; B30B *15/34*
U.S. Cl. 156—581 4 Claims



1. In apparatus for sealing packaging materials having thermoplastic surfaces, a pair of elongated heated jaws which are hingedly connected and at least one of said jaws being mounted on compression springs to float into engagement with one another, one jaw having a longitudinally extending land thereon, the face width of which is greater than its depth, and the other jaw having a longitudinally extending groove therein for receiving said land, said groove having dimensions substantially like the dimensions of the land, said jaws including can means at their opposite ends for forcing said jaws together in substantially parallel relation to stretch, heat, and press together the packaging materials to effect the sealing thereof, such opposite end location of said means on said jaws allowing an unobstructed path of movement of the packaging materials between the jaws in a direction transversely thereof when the jaws are open.

4,001,076
METHOD FOR GROWING THIN EPITAXIAL LAYERS OF A NON-LINEAR, OPTICALLY ACTIVE MATERIAL

Lawrence B. Robinson, Cambridge, and William Powazinik, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Dec. 11, 1974, Ser. No. 531,570
Int. Cl.² B01J *17/20*; C01D *11/02*; C01G *35/00, 57/00*
U.S. Cl. 156—624 23 Claims

1. A method for growing thin single crystal epitaxial layers of a non-linear, optially active material on a lithium tantalate or lithium niobate substrate comprising:

a. providing a solution of said non-linear, optically active material represented by the formula $M_xM'_{(1-x)}NO_3$ or $MN_xN'_{(1-x)}O_3$, where M and M′ are independently alkali metals, and N and N′ are independently niobium and tantalum and x can be any value from 0 to 1, inclusive, in a molten alkali metal halide solvent;

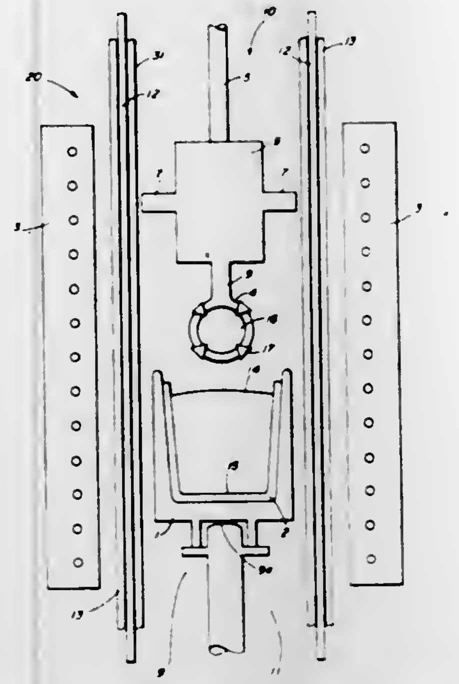
b. heating said solution to an elevated temperature to produce saturation of said non-linear, optically active material in said solvent, with an excess of said non-linear, optically active material remaining undissolved in said solvent;

c. slowly evaporating a portion of said solvent to induce a super-saturated condition in said solution;

d. heating said substrate to a temperature approximately equal to that of said solution;

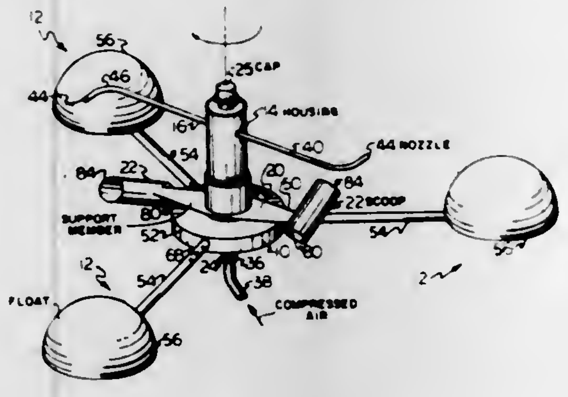
e. bringing said substrate into contact with said solution; and

f. removing said substrate from said solution after a predetermined time interval during which said thin single crystal epitaxial layer of said non-linear, optically active material has been deposited upon said substrate.



4,001,077
EVAPORATION ACCELERATOR

Orville Kemper, 455 Huntridgre, Moab, Utah 84532
Filed Feb. 27, 1976, Ser. No. 662,214
Int. Cl.² B01D *1/16*; F23D *11/04*; B01D *47/16*
U.S. Cl. 159—4 S 12 Claims



1. An evaporation accelerator comprising:

a base;

float means connected to said base to float said evaporation accelerator in an evaporatable liquid;

a housing rotatably secured to said base to extend upward therefrom;

air operated propulsion means connected to said housing to rotate said housing;

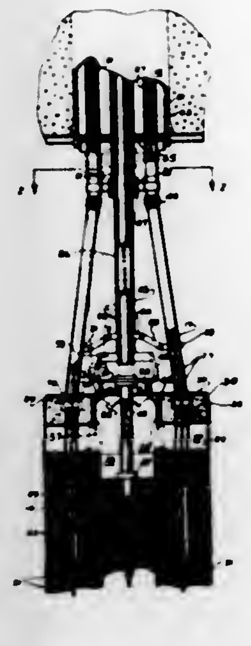
air supply means connected to supply compressed air to said propulsion means;

support members secured to said housing to extend generally radially therefrom;

scoop means secured to the free outer ends of said support members generally perpendicularly thereto, said scoop means being angularly positioned with respect to the horizontal to have a first depressed end positioned into said liquid and a second elevated end positioned above the surface of said float so that as said housing and in turn said scoop means are rotated by said propulsion means, fluid is scooped up by said scoop means at said first end and ejected over the surface of said fluid at said second end.

4,001,078
CONTROL APPARATUS

David W. Doll, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.
Filed Mar. 7, 1975, Ser. No. 556,318
Int. Cl.² G21C *7/08*
U.S. Cl. 176—35 6 Claims



1. In a nuclear reactor system having a pressure vessel with at least one penetration therein, and a core region enclosed by the pressure vessel and in which a plurality of control rod guide holes are distributed over an area larger than the cross section of the penetration, control apparatus comprising, a plurality of flexible control rods, one for each of said guide holes for insertion therein, a plurality of originally parallel guide tubes extending from said penetration and fanning out to respective ones of said guide holes for guiding said control rods from said penetration to said guide holes, an intermediate portion of each of said guide tubes including flexible means to permit said fanning out, means for moving said control rods through said guide tubes and into and out of said guide holes, and means for withdrawing said guide tubes from said guide holes and displacing the more widely fanned out spaced ends of said guide tubes to bring said tubes into parallel alignment for withdrawal through said penetration

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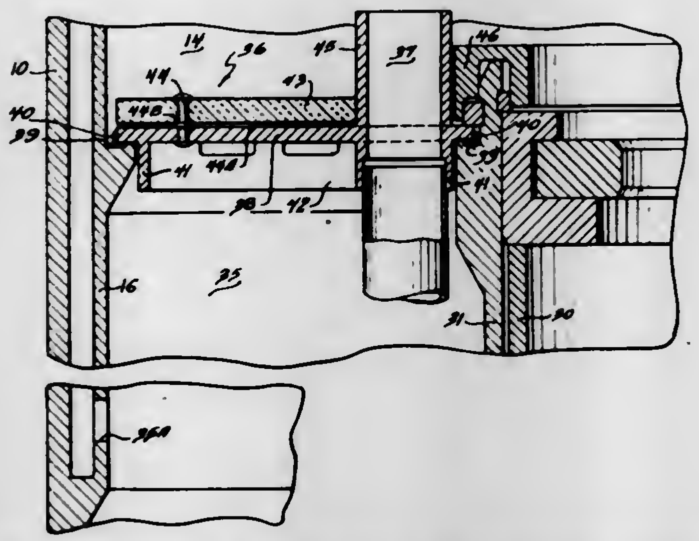
4,001,079
THERMAL BAFFLE FOR FAST-BREEDER REACTON

John A. Rylatt, Monroeville, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Aug. 15, 1975, Ser. No. 605,371
Int. Cl.² G21C *3/22*
U.S. Cl. 176—87 3 Claims

1. In a sodium-cooled fast-breeder reactor comprising a core disposed within a generally cylindrical pressure vessel, a thermal liner having a ledge thereon immediately interior of the upper portion of the pressure vessel, a cylindrical vertically disposed core barrel having a ledge thereon disposed surrounding the core within the pressure vessel, an inlet plenum disposed in the lower portion of the pressure vessel below the core, a plurality of inlet nozzles communicating with said inlet plenum, an outlet plenum in the upper portion of the pressure vessel above the core, a plurality of outlet nozzles communicating with said outlet plenum, a conical skirt connecting the lower end of the core barrel with the pressure vessel, means for bypassing a relatively low volume of coolant past the core and through the annulus between the core barrel and the pressure vessel to the outlet nozzles, and a horizontal thermal baffle extending between the top of the core barrel and resting on the ledge thereon and the thermal liner and

resting on the ledge thereon to separate the hot coolant in the outlet plenum from the relatively cool coolant in the bypass coolant annulus, the improvement wherein said thermal baffle comprises a bridge structure consisting of an austenitic stainless steel baffle plate, a segmented austenitic stainless steel insulating plate covering the upper surface of said baffle plate, tie-down pins spacing the segments of the insulating plate from the baffle plate and fastening them thereto to allow sufficient motion of the segments of the insulating plate relative to the baffle plate for the free thermal bow of each separate segment, flex seals extending between the edge of the baffle plate and the ledges on the core barrel and thermal liner to prevent sodium of different temperatures from washing therethrough, said thermal baffle being keyed to the core barrel to move therewith and being floating with respect to the thermal liner and pressure vessel.



4,001,080

PRODUCTION OF IMMUNOLOGICAL MATERIALS

Jean Michel Goust, and Robert Louis Moulias, both of Paris, France, assignors to Piktor Limited, Paris, France

Continuation-in-part of Ser. No. 407,192, Oct. 17, 1973, abandoned. This application May 5, 1975, Ser. No. 574,256

Claims priority, application United Kingdom, Oct. 20, 1972, 48486/72

Int. Cl.^{2} C12K *9/00*

U.S. Cl. 195—1.8 **3 Claims**

1. A process for the in vitro production of transfer factor comprising:

culturing in vitro at least one strain of lymphoblastoid cells in the presence of added transfer factor to propagate the cells and induce the production of transfer factor by them; and

extracting the produced transfer factor.

4,001,081

PROCESS FOR THE PREPARATION OF AMIDES BY BIOLOGICAL HYDROLYSIS

Auguste Commeyras, Clapier; Alain Arnaud, Clermont L'Herault; Pierre Galzy, and Jean-Claude Jallageas, both of Montpellier, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Dec. 17, 1975, Ser. No. 641,774

Claims priority, application France, Dec. 18, 1974, 74.41828

Int. Cl.^{2} C12D *13/06*

U.S. Cl. 195—29 **12 Claims**

1. A process for the preparation of an amide by hydrolysis of the corresponding nitrile, characterized in that the said nitrile in aqueous solution is subjected to the action of bacteria having a nitrilasic activity, in that the pH of the said aqueous solution is maintained at a value at least equal to the limiting pH of the amide hydrolysis reaction, then in that the bacteria mass is separated from the amide solution.

4,001,082

METHOD OF ISOMERIZING GLUCOSE WITH ENZYME IMMOBILIZED WITHIN MICROBIAL CELL

Nobuzo Tsumura, and Takafumi Kasumi, both of Tokyo, Japan, assignors to Director of National Food Research Institute, Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,730

Claims priority, application Japan, Oct. 2, 1975, 50-118262

Int. Cl.^{2} C12D *13/02*

U.S. Cl. 195—31 F **22 Claims**

1. A method of isomerizing glucose to fructose which comprises contacting an aqueous solution of glucose under conditions suitable for isomerization with a microbial cell having glucose isomerase immobilized therein, said microbial cell being prepared by dipping a microorganism containing glucose isomerase in an aqueous solution of citric acid or of a metal salt thereof, said metal being selected from the group of lithium, sodium, potassium, magnesium, cobalt, calcium and mixtures thereof.

4,001,083

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, and Philip Rotheim, Stamford, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 395,501, Sept. 10, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,585

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—65 **10 Claims**

1. A process for producing isoamylase comprising propagating microorganisms which produce isoamylase in an aqueous nutrient medium having present an amount of maltitol sufficient to increase the amount of isoamylase produced over the amount of isoamylase produced by propagating the microorganisms without the presence of maltitol.

4,001,084

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, Conn.; Gary William Cole, Garland, Tex., and John Anthony Lally, Stamford, Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 413,121, Nov. 5, 1973, abandoned. This application July 1, 1975, Ser. No. 592,146

Claims priority, application Canada, Oct. 31, 1974, 212750

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—65 **9 Claims**

1. A process for producing isoamylase, comprising propagating Flavobacterium sp. ATCC 21918 under aerobic conditions in an aqueous nutrient medium having present a suitable carbon source.

4,001,085

IMMOBILIZATION OF ENZYMES ON AN INORGANIC MATRIX

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 10, 1973, Ser. No. 395,975

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C07G *7/02*

U.S. Cl. 195—68 **8 Claims**

1. A process for depositing and immobilizing an enzyme on an inert, inorganic, porous, sorptive, dimensionally stable, liquid permeable metal oxide supporting matrix having been formed by compacting and sintering a refractory metal oxide powder, said matrix being sufficiently porous to be enzyme and substrate permeable, and having a porosity in the range of about 10 percent to about 80 percent and an average pore diameter in the range of about 0.01 to 10 microns, said process comprising contacting an aqueous dispersion of said enzyme with said matrix, applying at least about 10 psig pressure to said dispersion to cause substantial amounts of said dispersion to flow through said matrix,

maintaining the flow of said dispersion through said matrix for a sufficient time period of at least about 5 minutes to immobilize said enzyme directly on said matrix to form an enzymatically active composite.

4,001,086

ANTIBIOTIC A-30641 AND PROCESS FOR PRODUCTION THEREOF

David H. Berg, Greenfield; Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 597,047, July 18, 1975. This application Apr. 12, 1976, Ser. No. 676,184

Int. Cl.^{2} C12D *9/14;* **C07D** *285/00*

U.S. Cl. 195—81 **3 Claims**

1. The method of producing the A-30641 antibiotic complex comprising antibiotic A-30641 and canadensolide which method comprises cultivating *Aspergillus tamarii* NRRL 8101 in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced by said organism in said culture medium and separating the A-30641 antibiotic complex from said culture medium.

4,001,087

AFFINITY LABELLING ENZYMES WITH ESTERS OF AROMATIC SULFONIC ACIDS

Show-Chu Wong, Riverhead, and Elliott Shaw, Shoreham, both of N.Y., assignors to The United States of America, Washington, D.C.

Continuation of Ser. No. 513,565, Oct. 10, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,133

Int. Cl.^{2} C12K *1/00*

U.S. Cl. 195—103.5 R **2 Claims**

1. In a method for the study of enzymes which comprises affinity labelling enzymes for identifying or inhibiting their functional groups, the improvement which comprises reacting a purified enzyme with a compound selected from the group consisting of nitrophenyl p- and m-amidinophenylmethanesulfonate whereby there is obtained covalent bond formation between said compound and said enzyme with inactivation or inhibition of the enzyme.

4,001,088

METHOD FOR THE DETERMINATION OF CREATINE PHOSPHOKINASE ENZYME

Alan S. Antonik, 599 Exmoor Road, Elk Grove Village, Ill. 60007

Filed Aug. 2, 1974, Ser. No. 493,874

Int. Cl.^{2} C12K *1/04;* **G01N** *33/00*

U.S. Cl. 195—103.5 R **1 Claim**

1. A test reagent useful for the quantitative determination of the enzyme creatine phosphokinase in an organism, thereby to ascertain the presence of normal and pathologically significant excessive concentrational levels of the enzyme in the organism,

said reagent being operative to produce upon addition to and reaction with specimens of dried blood and dried tears measurable bioluminescent light the intensity of which is a determinable function of the concentration of creatine phosphokinase contained in the specimens, said reagent consisting essentially of:

a. firefly lantern extract and

b. creatine phosphate.

4,001,089

METHOD FOR DETERMINATION OF TRIGLYCERIDES AND GLYCEROL

William S. Stavropoulos, Carmel, and Robert D. Crouch, Indianapolis, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 20, 1974, Ser. No. 452,879

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C12K *1/04;* **G01N** *31/00*

U.S. Cl. 195—103.5 R **11 Claims**

1. In a method for determination of triglycerides in biological fluids by hydrolyzing the triglycerides to produce glycerol and quantitatively analyzing the hydrolysis mixture to determine the glycerol content, the improvement which comprises mixing a biological fluid which contains phospholipids with an alkali metal hydroxide and methanol to provide a hydrolysis mixture containing from about 75 to about 99.8 percent by weight of the methanol and an alkali metal hydroxide concentration of from about 0.15 to about 0.45 Normal; holding the resulting hydrolysis mixture for a time of from about 1 to about 20 minutes sufficient to hydrolyze triglycerides, and thereafter quantitatively determining the glycerol content of the resulting hydrolysis mixture.

4,001,090

PROCESS AND APPARATUS FOR THE CULTURE OF MICROORGANISMS

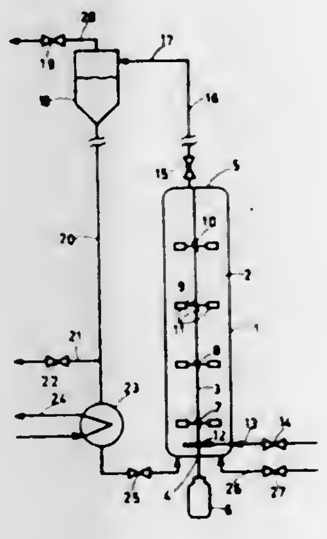
Vladimir Kalina, Lausanne, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 27, 1975, Ser. No. 580,744

Claims priority, application Switzerland, May 28, 1974, 7249/74

Int. Cl.^{2} C12B *1/14, 1/16*

U.S. Cl. 195—109 **13 Claims**



1. A process for the aerobic culture of a microorganism in a fluid nutrient medium therefor containing at least one source of carbon assimilable by the microorganism, comprising

circulating a culture broth consisting of the fluid nutrient medium and a cellular mass of the microorganism in a closed loop flow course having ascending and descending sides extending between upper and lower levels of said closed loop, there being a fermentation zone extending upwardly along the ascending side of the loop from said loop lower level and having a top terminating below said loop upper level,

subjecting said culture broth while flowing through said fermentation zone to the combined action of

the frictional forces of bubbles of an oxygen containing gas or of oxygen released under pressure into the broth,

- a mechanical force applying an upward thrust to the culture broth, and
- at least one couple of mechanical forces acting on the broth in a horizontal plane, and
- imposing a back pressure on the culture broth at the top of the fermentation zone whereby the pressure prevailing at the top of the fermentation zone is maintained at a higher value than the pressure prevailing at the said upper level of said loop.

5. Apparatus for the aerobic culture of microorganisms, comprising

- means defining a closed loop flow course wherein a culture broth can be circulated, said closed loop having ascending and descending sides thereof and communicating with each other at respective upper and lower loop levels,
- means defining a fermentation chamber in the ascending side of said loop, said fermentation chamber extending upwardly a distance from said loop lower level and having a top disposed a distance below said loop upper level,
- means for injecting gas under pressure into said fermentation chamber at the lower end thereof,
- means for mechanically propelling culture broth upwardly from the lower end of said fermentation chamber,
- means for applying at least one couple of mechanical forces acting in a horizontal plane on broth in said fermentation chamber, and
- means for imposing a back pressure on the culture broth at the top of said fermentation chamber whereby the pressure at the top of said fermentation chamber is maintained at a higher value than the pressure prevailing at the upper level of said loop.

4,001,091
ASPHALT BLOWING VESSEL

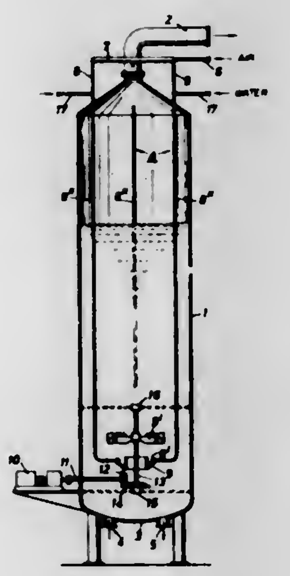
Hans Senolt; Heinrich Tomaschko, and Georg Palvik, all of Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 306,820, Nov. 15, 1972, abandoned, which is a division of Ser. No. 843,970, July 23, 1969, Pat. No. 3,773,649. This application Dec. 16, 1974, Ser. No. 532,823

Claims priority, application Austria, July 25, 1968, 7210/68

Int. Cl.² C10C *1/20;* **C10G** *17/00*

U.S. Cl. 196—46 **3 Claims**



1. In a system for blowing a molten bitumen residue, comprising: a blowing vessel including means for introducing a bitumen distillation residue and removing a converted residue and maintaining a level of the residue being treated in the vessel with a space thereabove, said vessel including an exhaust line at an upper portion thereof for communicating with the space above the level of molten residue maintained in the vessel, the improvement including air-line means for introducing air into said vessel below the surface of the residue, said air-line means extending into the vessel through the space above the residue in the vessel and being immersed therein over a substantial portion thereof in the molten residue in heat-exchanging relationship, said air-line means opening into the vessel for discharging air substantially below the surface of the molten residue maintained therein; water-inlet means connected to the air-line means above the residue level substantially upstream of said air-line means opening introducing water traversing the air-line means with wet air and in a heat-exchanging relationship along said air-inlet means within the molten residue so that the water is evaporated and combines with the air in said air-line means before discharge beneath the surface of the molten bitumen residue, the sizes of the air-line means and water-inlet means and heat-exchanging portions being proportioned so that evaporation of the water in said air-line means is substantially complete before discharge beneath the surface of the molten bitumen residue so that the temperature of the distillation residue is controlled, a masking blanket of steam forms over the surface of the bitumen residue contained within the vessel and reaction and foaming at the surface of the bitumen residue is minimized within the vessel, while stripping off of undesired reaction by-products is enhanced and waste product vapors are removed from the vessel through said exhaust line and are diluted, said air-line means downstream of said water-inlet means comprising a plurality of enlongated tubes depending into said vessel, said tubes being impervious and opening at their distal ends, said vessel being substantially elongated and extending vertically, said air and steam distributor means including an annular ring element disposed axially of the vessel, the tubes having their open ends directed toward the outer surface of the annular ring for dispersing the mixture of steam and air beneath the surface of the molten residue.

4,001,092
CHARGING CAR FOR COKE OVENS

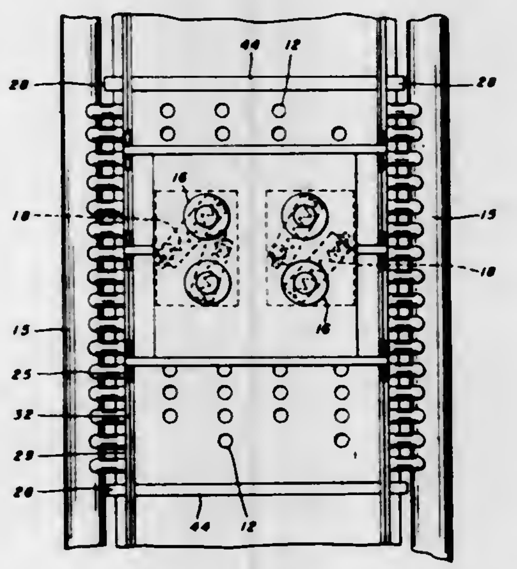
Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 22, 1975, Ser. No. 606,853

Claims priority, application Germany, Nov. 8, 1974, 2452975

Int. Cl.² C10B *35/00, 27/04;* **B66C** *17/08;* **F23K** *3/00*

U.S. Cl. 202—262 **10 Claims**



1. A coal charging apparatus adapted to move along the top of a battery of coke ovens wherein the roof for each coking chamber includes a row of spaced-apart charging holes which are aligned in a parallel relation with the longitudinal axis of the coking chamber, the row of charging holes being covered by lids which are removable to feed a charge of coal into the coking chamber, said coal charging apparatus comprising the combination of:

- a charging car adapted to move along the roof of the battery of coke ovens from oven-to-oven while spaced above the charging holes for each coking chamber,
- a plurality of hoppers which essentially includes a hopper for supplying coal to each charging hole lying within an aligned row thereof for a given coking chamber, said plurality of hoppers being supported by said charging car in a manner such that two hoppers for supplying coal to adjacent charging holes within a given row thereof are supported one after the other in a substantially consecutive relationship extending parallel to the direction of movement of the charging car along the coke ovens,
- a charging tube for each of said plurality of hoppers for directing coal into a charging hole, and
- conveyor means for each charging tube for conducting coal thereto from one of said plurality of hoppers.

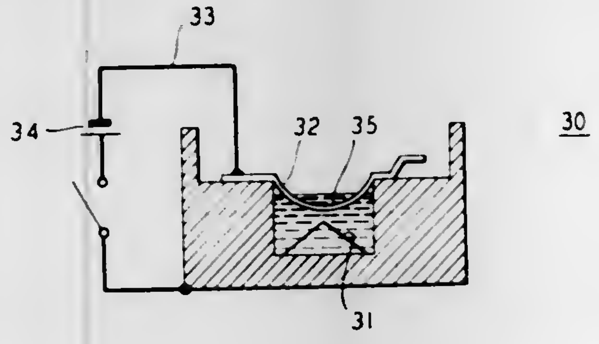
4,001,093
METHOD OF ELECTROPLATING PRECIOUS METALS IN LOCALIZED AREAS

Donald Eldridge Koontz, and Uziel Landau, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 6, 1975, Ser. No. 602,254

Int. Cl.² C25D *5/02*

U.S. Cl. 204—15 **17 Claims**



1. A process for the fabrication of articles in which a precious metal is electroplated on at least one surface comprising the steps of

a. assembling a metal plating cell with an anode-cathode separation distance of a single anode and a single cathode, anode and surface to be plated;
b. pumping metal plating solution of a given composition and temperature between the freezing point and boiling point of the metal plating solution through the metal plating cell thereby producing a given parallel flow rate with anode and cathode in stationary positions;
c. passing current through electrodes of the metal plating cell at a given current density so as to plate metal onto the surface to be plated CHARACTERIZED IN THAT the minimum electrode separation distance is less than about 0.5 inches, the ratio between longest and shortest anode-cathode separation distance of a single anode and a single cathode is at least two to one; the parallel flow rate of the metal plating solution is at least 50 centimeters per second and the plating rate in terms of current density is at least 100 milliamperes per cm².

4,001,094
METHOD FOR INCREMENTAL ELECTRO-PROCESSING OF LARGE AREAS

John F. Jumer, 16 W. 131 Timber Trails Drive, Elmhurst, Ill. 60126

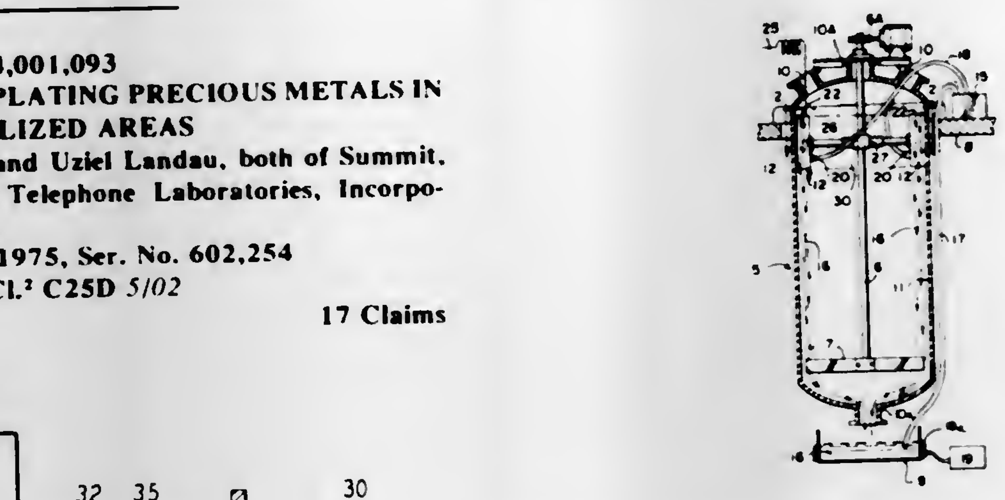
Filed Sept. 19, 1974, Ser. No. 507,534

Int. Cl.² C25F *3/00, 3/16*

U.S. Cl. 204—129.6 **3 Claims**

1. A method for incrementally electro-polishing the interior metal surface of a stationary vertically oriented vessel having closed ends and a side wall generally concentric about its vertical axis with at least one of said closed ends having an access port, said vessel including an agitator therein positioned on a shaft which is adapted for rotation, and said shaft being mounted along at least a portion of the vertical axis of said vessel, said method comprising the steps of:

- removably affixing an extensible arm and processing chamber means on said agitator shaft, said extensible arm being mounted on said shaft, and said processing chamber means being mounted on the distal end of said shaft, and having a first face opening for sequentially masking increments of said metal surface to be electro-polished;
- extending said extensible arm until a sealing means at the edges of said first face opening substantially sealingly engage an increment of said metal surface;
- introducing and maintaining an electrolyte in said processing chamber means;



- supplying current to an ungrounded electrode forming a cathode positioned in said processing chamber means which is in communication with said electrolyte positioned therein to electro-polish said metal surface increment;
- rotating said processing chamber unit laterally around the interior of said vessel to a position on said metal surface where at least a portion of a surface increment forming a wall of said chamber unit is unpolished, and
- moving said extensible arm and chamber unit connected thereto vertically along said shaft and removably affixing same when said chamber unit open face is contacting at least a portion of said vessel interior surface which is unpolished

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4,001,095
METHOD OF DISCOLORATION OF METAL COMPOUNDS BY IRRADIATION OF LASER RAYS

Eisaku Nakatani, Hiratsuka, Japan, assignor to Kansai Paint Company, Ltd., Amagasaki, Japan

Continuation-in-part of Ser. No. 421,735, Dec. 4, 1973, abandoned. This application May 15, 1975, Ser. No. 577,929

Claims priority, application Japan, Dec. 11, 1972, 47-123377

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 R **9 Claims**

1. A method of discoloration of a metal compound to form a compound in which the metal has a lower valence or to deposit the metal which comprises rendering semiconductive a metallic compound selected from the group consisting of oxides, sulfides, chromates and titanates of metal elements, and radiating a laser ray on the resulting semiconductive metallic compound, said laser ray having a wavelength from the visible region to the infrared region and an energy density of at least 0.001 milliwatt per square micron for the cross-section at an irradiated spot of said semiconductive metallic compound, the energy dosage being from 0.5 × 10^{-4} MW sec./cm.² to 3.0 × 10^{-3} MW sec./cm.².

4,001,096

PROCESS FOR PREPARING 25-HYDROXYCHOLECALCIFEROL INTERMEDIATES

William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,698

Int. Cl.² B01J *1/10;* **C07G** *13/00;* **C07J** *9/00*

U.S. Cl. 204—158 R **5 Claims**

1. A method for preparing 9β,10α-cholesta-5,7-diene-3β,25-diol which comprises irradiating cholesta-5,7-diene-3β,25-diol and recovering crystalline 9β,10α-cholesta-5,7-diene-3β,25-diol from the reaction mixture.

5. A method in accordance with claim 4 wherein radiation of wavelength greater than 270–280 mμ is employed.

4,001,097

PROCESS FOR THE PREPARATION OF CURED OLIGOACRYLATES

Takahisa Ogasawara; Yoshimichi Senzaki; Hiroyuki Kato, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,286, Dec. 12, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,714

Claims priority, application Japan, Dec. 16, 1971, 46-101425

Int. Cl.² C08F *8/00;* **C08L** *67/06, 67/00*

U.S. Cl. 204—159.16 **2 Claims**

1. A process for the preparation of a cured oligoacrylate which comprises curing, under the action of ionizing radiation having energy of at least 100 Kev in a molecular oxygen-containing gas, an oligoacrylate containing a) 3–6 acryloyl groups; b) at least one cyclohexene nucleus in the molecule; c) an acryloyl group equivalent of not more than 1000; and d) having a boiling point of not lower than 200° C which oligoacrylate is a reaction product prepared by interesterifying a mixture of:

1. acrylic acid;
2. at least one member selected from the group consisting of tetrahydrophthalic acid and anhydride thereof, and
3. at least one member selected from the group consisting of trimethylolpropane and pentaerythritol and then recovering said cured oligoacrylate.

4,001,098

COMPOSITIONS CURABLE BY EXPOSURE TO ULTRA VIOLET LIGHT IN THE PRESENCE OF CHLORO-SUBSTITUTED ACETOPHENONES

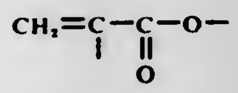
Pieter Dirk Swaters, Lochem; Reginoldus Havinga, Schalkhaar, and Tjerk van der Hauw, Diepenveen, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 427,710, Dec. 26, 1973, abandoned. This application June 30, 1975, Ser. No. 592,020

Int. Cl.² C08F *2/46, 4/00, 2/50, 4/32*

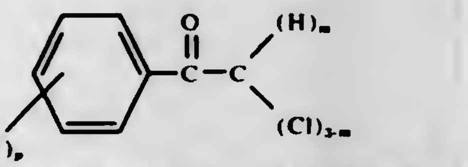
U.S. Cl. 204—159.23 **10 Claims**

1. In a process for preparing a composition curable by ultra violet light containing a compound having at least two structural units of the formula:



$$CH_2=C(-)-C(=O)-O-$$

the improvement which comprises incorporating into the composition a compound having the general formula:



$$(R)_p-C_6H_{5-p}-C(=O)-C(H)_m(Cl)_{3-m}$$

(I)

wherein $m = 0$, 1 or 2 and p represents an integer of from 1 to 5 and wherein, when $p = 1$, R represents an alkyl or alkoxy group having at least 4 carbon atoms and, when $p > 1$, R is an alkyl or alkoxy group having together at least 4 carbon atoms in an amount sufficient for curing the composition by ultra violet light.

4,001,099

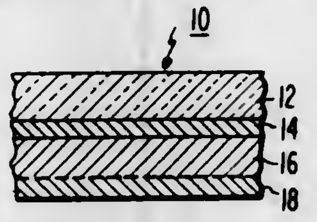
PHOTOSENSITIVE CAMERA TUBE TARGET PRIMARILY OF LEAD MONOXIDE

Chih Chun Wang, Hightstown; Thomas Clifford Lausman, Cranbury, and Ronald Frank Bates, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,631

Int. Cl.² B01K *1/00;* **B05D** *5/12*

U.S. Cl. 204—164 **5 Claims**



1. A method of manufacturing a photosensitive device comprising the step of vapor depositing in an atmosphere containing oxygen and vapors of deuterium oxide a layer comprising primarily lead monoxide on a support which is at a temperature between about 100° and about 120° C., the partial pressure of said deuterium oxide vapors being initially about 50 to about 80% of the sum of the partial pressures of oxygen and deuterium oxide, said sum being from about 5×10^{-3} to about 2×10^{-2} torr.

4,001,100

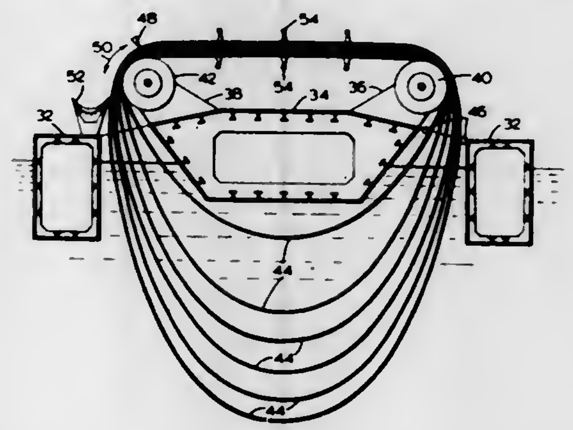
TREATMENT OF SUSPENSIONS AND SLURRIES BY ELECTROPHORESIS AND ELECTRO-OSMOSIS

James Livesey Haydock, 20 Victoria St., Toronto, Ontario, Canada

Filed Jan. 3, 1975, Ser. No. 538,328

Int. Cl.² B03C *5/00, 7/08*

U.S. Cl. 204—180 R **12 Claims**



1. A method of removing suspended particles from an aqueous suspension, comprising introducing a layer of a suspension of the particles between two generally parallel electrodes of an electrode assembly, setting up a DC electric field between the electrodes whereby to cause electrophoretic migration of the particles to one of said electrodes and electro-osmotic consolidation of the particles at said electrode, and separating from said electrode assembly the migrated particles accumulating at said one electrode, wherein the electrode assembly includes collapsible insulating spacer means separating the electrodes, and the electrode assembly is freed from accumulation of particles by collapsing said spacer means so as to press together said electrodes and squeeze out said particle accumulations.

4,001,101

ELECTRODEPOSITION OF EPOXY COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 100,825, Dec. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 100,834, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application July 29, 1971, Ser. No. 167,470

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 **19 Claims**

1. A method of coating a conductive substrate serving as a cathode which comprises passing electric current between an anode and said cathode in electrical contact with a water-dispersed composition comprising an aqueous dispersion comprising an ungelled, water-dispersible epoxy resin having in the resin molecule:

a. at least one 1,2-epoxy group,
b. at least about 0.05 percent by weight of chemically-bound nitrogen, at least one percent of which is in the form of a quaternary ammonium base salt of an acid having a dissociation constant greater than about 1×10^{-5},
c. said water-dispersed composition containing boron in the form of boric acid, an ester of boric acid or a compound which can be cleaved to form boric acid in aqueous medium.

4,001,102

PROCESS FOR GENERATING PERIODIC NON-UNIFORM ELECTRIC FIELD, AND FOR REMOVING POLARIZABLE PARTICULATE MATERIAL FROM FLUID, USING FERROELECTRIC APPARATUS

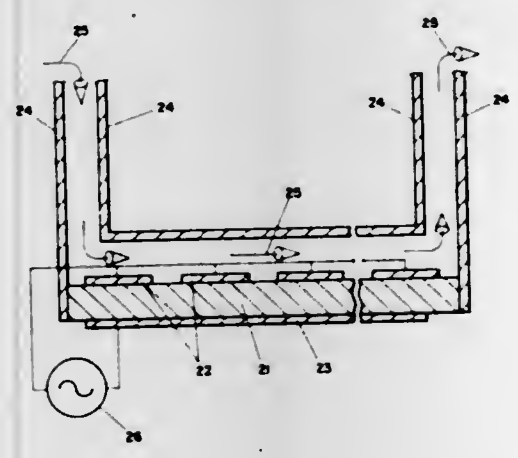
Howard D. Batha, Tonawanda, N.Y., and Leslie E. Cross, State College, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 348,835, April 6, 1973. This application June 23, 1975, Ser. No. 589,179

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C25B *7/00;* **B01D** *13/02*

U.S. Cl. 204—186 **2 Claims**



1. A process for generating a period non-uniform electric field, external to field-generating electrodes of the apparatus for generating the periodic non-uniform electric field, in an apparatus comprising

a. a ferroelectric material, polarizable in directions perpendicular to the surface of the ferroelectric material; the ferroelectric material comprising at least one portion, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, and at least another portion, the direction of polarization of which is to remain the same during the generation of the periodic non-uniform electric field;
b. a plurality of electrodes, applied to opposite sides of the ferroelectric material, covering both sides of the portions of the ferroelectric material, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, but leaving uncovered at least one side of the portions of the ferroelectric material so as to produce a non-uniform electric field, the direction of polarization of which is to remain the same during generation of the periodic non-uniform electric field, defining a location external to the field-generating electrodes and adjacent the boundary between the alternately polarized portions of the ferroelectric material, in which the periodic non-uniform electric field is to be generated; and
c. means for providing alternating potential to the electrodes
    1. for alternating the direction of polarization of the covered portions of the ferroelectric material and leaving polarized in their original direction, the uncovered portions of the ferroelectric material;
    2. for producing periodically alternately polarized portions of the ferrolectric material; and
    3. for generating a periodic non-uniform electric field external to the field-generating electrodes, in the location adjacent the boundary between the alternately polarized portions of the ferroelectric material, said process comprising providing alternating potential to the electrodes on the ferroelectric material in such a way
        a. as to alternate the direction of polarization of the portions of the ferroelectric material, the direction of polarization of which is to be alternated, leaving polarized in their original direction the uncovered portions of the ferroelectric material, the direction of polarization of which is to remain the same;
        b. as to produce thereby, periodically, alternately polarized portions of the ferroelectric material; and
        c. as to generate thereby, a periodic non-uniform electric field, external to the field-generating electrodes, in the location adjacent the boundary between the alternately polarized portions of the ferroelectric material.

4,001,103

DEVICE FOR THE DETECTION AND MEASUREMENT OF NO AND NO_2 GASES

Keith F. Blurton, Yorktown, N.Y., and John M. Sedlak, Norwalk, Conn., assignors to Energetics Science, Inc., Elmsford, N.Y.

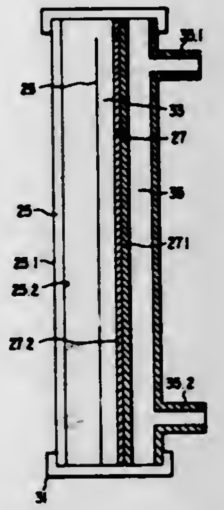
Filed May 7, 1974, Ser. No. 467,671

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **9 Claims**

1. An NO_2 detecting and measuring unit comprising in combination an intake means, an electrochemical cell, means for drawing an NO_2 containing gas through said intake means and into said electrochemical cell at a controlled flow rate, read out means for reading the quantity of NO_2 gas described, said electrochemical cell comprising an anode, a cathode, a reference electrode at which substantially no current flows and an aqueous electrolyte in contact with said anode, cathode and reference electrode, means for exposing said cathode to said NO_2 containing gas, means for maintaining said cathode at a fixed potential relative to the reference electrode of about 0.7 V to 1.1 V with respect to a reversible hydrogen potential in said electrolyte, electrical circuitry connected so that the polarity of the cathode to the anode is negative, the

cathode of said electrochemical cell comprising a catalyst capable of catalyzing the electroreduction of NO_2 at said fixed

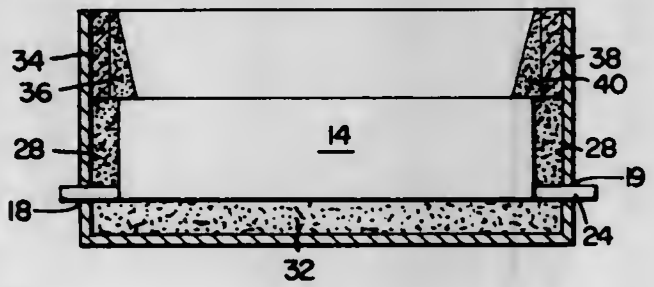


potential bonded to a hydrophobic material to provide a diffusion electrode.

4,001,104
CEMENTED COLLECTOR BAR ASSEMBLIES FOR ALUMINUM CELL CARBON BOTTOM BLOCK

Jostein J. Vadla, Rocky River, and Robert G. Milner, Bay Village, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,385
Int. Cl. C25C *3/08*
U.S. Cl.^{2} 204—243 R **10 Claims**



1. An improved method for constructing a conductive, metallic collector bar-carbonaceous block assembly in the cathode bottom of an aluminum reduction cell comprising the steps of:

- a. positioning a metallic collector bar within a reduction cell upon the bottom surface thereof, the ends of said bar protruding a predetermined distance through openings in oppositely situated side walls of said cell, and
- b. depositing a binder comprising a layer of an electrically conductive, carbonaceous and plastic cement onto the exposed surface of said bar, and
- c. positioning a prebaked carbonaceous cathode block having a transverse slot along its length, in the bottom surface thereof, astride said bar to firmly embed such bar within said slot, said slot having a width exceeding the width of said bar and a depth shallower than the height of said bar, said binder securing said bar to said block, the width of said cell measured between said side walls exceeding the length of said block by a distance insufficient to permit removal of said bar-block assembly as a unit from said cell.

4,001,105
HYDROCRACKING PROCESS FOR THE PRODUCTION OF SYNTHETIC FUELS

Phillip H. Gifford, II, Marble Star Route, Carbondale, Colo. 81623

Continuation-in-part of Ser. No. 429,501, Jan. 2, 1974, abandoned. This application Oct. 11, 1974, Ser. No. 514,185
Int. Cl.^{2} C10G *1/02*
U.S. Cl. 208—11 R **26 Claims**

1. A continuous process for the production of useful products from carbonaceous materials, such as oil-shale, coal, tar sands, lignite, or other carbon-containing solids, or heavy carbonaceous liquids, or mixtures thereof, by catalytically hydrocracking said carbonaceous materials, wherein activated spent oil shale, a catalyst which is derived from either raw oil shale or spent oil shale by treating said raw or spent oil shale in the presence of steam under heat and other conditions which promote decomposition of the carbonates found therein, is used to catalyze the hydrocracking reactions to thereby produce relatively low molecular weight hydrocarbon products, the continuous process comprising the following:

- a. providing a particulate reactive mass containing activated spent oil shale in a reaction zone of a system for hydrocracking carbonaceous materials;
- b. feeding steam and oxygen continuously to the reaction zone, the steam to provide the hydrogen needed for the hydrocracking reactions, and the oxygen to supply the heat duty of the process, these feed gases or their reaction products forming a fluid bed in said reaction zone and also acting as a sweep gas through the reactive mass;
- c. feeding continuously to the reaction zone a feed including at least one of said carbonaceous materials and a precursor for activated spent oil shale selected from the group consisting of raw oil shale and spent oil shale as necessary to maintain adequate activated spent oil shale in said reaction zone to catalyze said hydrocracking, while maintaining conditions in the reaction zone which insure the the continued presence of said activated spent oil shale therein, the point of introduction of said carbonaceous materials into said reactive mass being upstream relative to at least some of the activated spent oil shale present;
- d. continuously withdrawng relatively low molecular weight hydrocarbon products from the system with the sweep gas; and
- e. continuously withdrawing spent material from the system.

4,001,106
CATALYTIC CONVERSION OF HYDROCARBONS

Charles J. Plank, Woodbury, and Edward J. Rosinski, Almonesson, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 548,376, May 9, 1966, Pat. No. 3,769,202, which is a continuation-in-part of Ser. No. 291,585, June 28, 1963, abandoned, and Ser. No. 455,648, May 13, 1965, abandoned, which is a continuation-in-part of Ser. No. 210,215, July 15, 1962, abandoned, and Ser. No. 242,594, Dec. 6, 1962, abandoned, said Ser. No. 291,585, is a continuation-in-part of Ser. No. 210,215, , and Ser. No. 242,594,. This application Aug. 15, 1973, Ser. No. 388,682
Int. Cl.^{2} C10G *37/02*
U.S. Cl. 208—75 12 Claims

1. In the catalytic cracking of a hydrocarbon oil to produce hydrocarbons of low boiling range, the improvement which comprises exposing said oil to catalytic cracking conditions by conducting the same serially through two separate reaction zones, one of which contains a catalyst of a crystalline aluminosilicate zeolite having a pore size of less than 7 Angstrom units and the other of which contains a catalyst of a crystalline aluminosilicate zeolite having a pore size greater than 8 Angstrom units.

4,001,107
MORPHOLINONES AS SELECTIVE SOLVENTS FOR AROMATIC HYDROCARBONS

John W. Bozzelli, and George D. Shier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 18, 1975, Ser. No. 588,128
Int. Cl.^{2} C10G *21/16*
U.S. Cl. 208—323 **8 Claims**

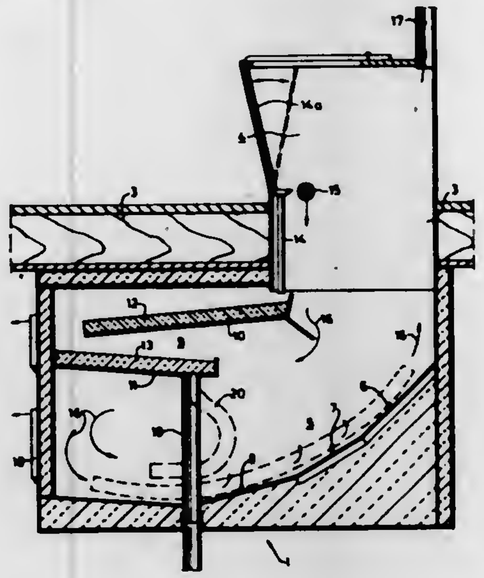
1. In a process for recovering aromatic hydrocarbons from a hydrocarbon mixture containing both aromatic and nonaromatic hydrocarbons by liquid-liquid extraction using a selec-

tive solvent, the improvement wherein the selective solvent comprises a morpholinone free of substituents other than lower alkyl groups with a total alkyl carbon content of not more than about 12 carbon atoms.

4,001,108
METHOD FOR NATURAL BIOCHEMICAL DECOMPOSITION OF LATRINE

Åke O. W. Hellqvist, 130 40 Djurhamn, Sweden

Division of Ser. No. 472,634, May 23, 1974, Pat. No. 3,918,106. This application June 23, 1975, Ser. No. 589,251
Claims priority, application Sweden, June 14, 1973, 7308379
Int. Cl.^{2} C02C *1/04*
U.S. Cl. 210—12 **8 Claims**



1. A method of simultaneous decomposition of feces and urine comprising, separating and maintaining the separation of the feces and the urine from the source thereof avoiding intermixture of the feces and urine and decomposing said feces and urine separately at the same time and independent of each other at different temperatures within a single apparatus, the separation of feces and urine being maintained through the largest part of the decomposition process wherein the feces decomposition is accomplished by applying the feces in layers with a vegetary carbon substrate positioned on a sloping bed, maintaining the bed at a temperature of at least 30° C and the percentage of moisture in the feces mixture at 60 to 75%, and permitting the mixture of feces and carbon substrate to move slowly downwards along the sloping plane of the bed during the decomposition of said mixture, and wherein the urine decomposition is accomplished by flowing the urine slowly and at a relatively low temperature through a porous filter having a large total surface.

4,001,109
DEMULSIFICATION PROCESS

Norman N. Li, Edison; Taras Hucal, Iselin, and Robert P. Cahn, Millburn, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

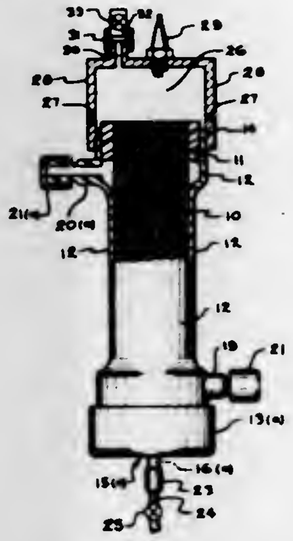
Filed Nov. 19, 1974, Ser. No. 525,204
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.^{2} B01D *13/00, 11/00*
U.S. Cl. 210—22 R **9 Claims**

1. In a liquid membrane process for removing a dissolved component from an aqueous feedstream which comprises contacting said feedstream with a water-in-oil emulsion which is characterized as having an exterior phase which is permeable by said dissolved component, an interior phase containing a reagent which reacts with said permeable dissolved component and converts said permeable dissolved component into a non-permeable form, the improvement which comprises contacting said water-in-oil emulsion with said aqueous feedstream for a time and at conditions sufficient to convert a substantial portion of said reagent to the reaction product of said reagent and said dissolved component, separating said water-in-oil emulsion from said aqueous feedstream, demulsifying said water-in-oil emulsion by (1) mixing the emulsion, at a volume ratio of from 1/9 to 9/1, with a mixture of two or more comiscible volatile solvents, at least one of which is an alcohol or a ketone that is miscible with the water and at least one of which is a low boiling hydrocarbon or chlorinated hydrocarbon which is miscible with the oil, the weight ratio of said alcohol or ketone and hydrocarbon being from 1/9 to 9/1 and the oil miscible solvent further characterized as having a boiling point of at least 50°C less than the boiling point of the oil, under conditions of agitation, (2) terminating said agitation and allowing the mixture to separate into an oil and water layer, said water layer comprising substantially all of said reaction product and said unreacted reagent and said oil layer comprising substantially all of the components of the exterior phase of said emulsion, separating said oil and water layers, distilling off said oil miscible solvent from said oil layer, and recycling said oil back to an emulsification zone for use in preparing fresh emulsion.

4,001,110
METHOD FOR THE THERMAL TREATMENT OF TUBULAR DIALYSIS UNITS AND IMPROVED UNITS RESULTING THEREFROM

Henry C. Geen, Brooklyn; Clarence S. Vinton, and Charles H. Franklin, both of Ann Arbor, all of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Apr. 17, 1975, Ser. No. 569,020
Int. Cl.^{2} B01D *31/00*
U.S. Cl. 210—22 A **12 Claims**



1. The method for cleaning and improving dialyzate fluid flow characteristics in a tubular dialysis unit of the type where multiple tube ends are sealed in place in a manner which provides sharp edged tube lips at end surfaces of the unit to be cleaned which comprises:

- a. providing a noncombustible fluid inside the tubes;
- b. providing a gas which transiently releases thermal energy upon initiation in contact with the lips without removing the noncombustible fluid from inside the tubes; and
- c. initiating the transient thermal energy release in the gas to round the lips of the tubes without rupture of the tubes and to clean the end surfaces of the unit.

4,001,111

DUAL TEMPERATURE GRADIENT ELUTION LIQUID CHROMATOGRAPHY

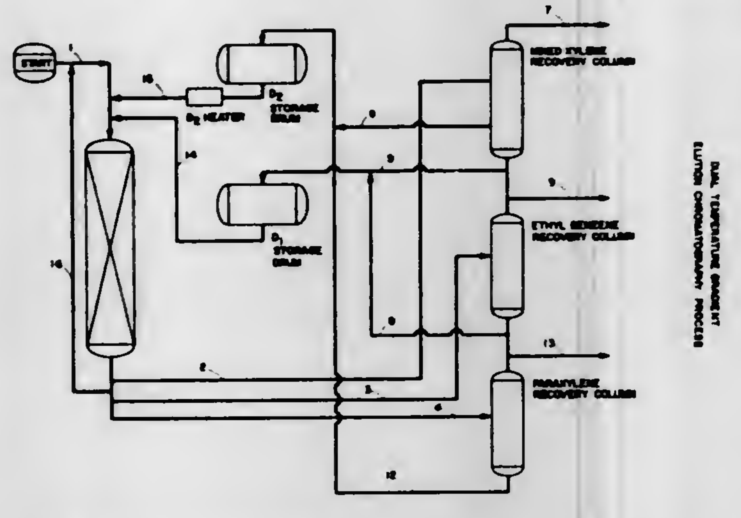
Paul R. Geissler, Edison, and Robert P. Cahn, Millburn, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 19, 1974, Ser. No. 452,501

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B01D *15/08*

U.S. Cl. 210—24 **10 Claims**


START
D2 HEATER
D2 STORAGE DRUM
D1 STORAGE DRUM
MIXED XYLENE RECOVERY COLUMN
ETHYL BENZENE RECOVERY COLUMN
PARAXYLENE RECOVERY COLUMN
DUAL TEMPERATURE GRADIENT ELUTION CHROMATOGRAPHY PROCESS

1. In a liquid chromatographic separation process of up to two components contained in admixture in a feedstream including the steps of:

a. contacting the feedstream mixture containing said components to be separated with a bed of crystalline aluminosilicate adsorbent at conditions to effect the selective retention of up to two of the components by said adsorbent;

b. passing through said bed an eluent selected from the group consisting of aromatics and substituted aromatics;

c. increasing the strength of the eluting agent during the operation of step (b) above to thereby effect desired separation under conditions that cause low elution volume to feed ratios;

d. recovering from said bed a stream or streams containing a portion of the less preferentially adsorbed components; and

e. recovering a stream or streams substantially enhanced in concentration of said selectively adsorbed components relative to other feedstream components wherein the improvement comprises preheating the eluting agent of step (c) above prior to passing it through said bed at temperatures of from about 160° to about 200°C to thereby effect the desired separation of one of said preferentially adsorbed components under conditions resulting in substantially lower elution volume to feed ratios without a corresponding substantial decrease in the separation of the other of said preferentially adsorbed components.

4,001,112

METHOD OF OPERATING A CHROMATOGRAPHIC APPARATUS

Philip Edwin Barker, Eastern Road, Selly Park, Birmingham 29, and Ronald Edward Deeble, 16 Brentford Road, Solihull, both of England

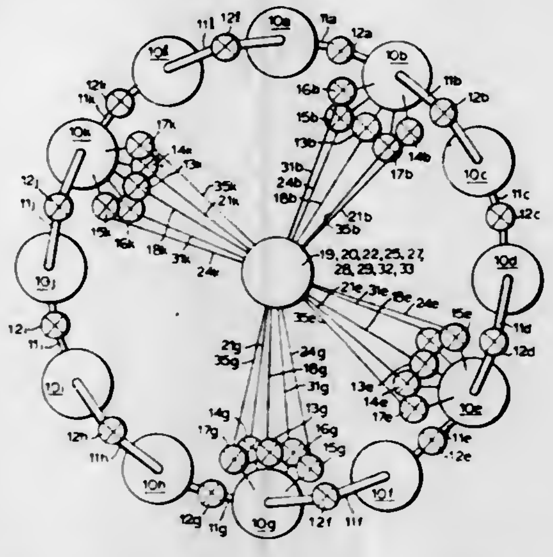
Continuation of Ser. No. 368,584, June 11, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,022

Claims priority, application United Kingdom, June 14, 1972, 27786/72

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **5 Claims**

1. A method of operating a chromatographic apparatus for separating a fluid mixture, which apparatus has a plurality of compartments containing a chromatographic packing, conduit means interconnecting the compartments in at least one closed loop series, an isolating valve in each conduit for isolating each compartment from the remaining compartments, a purge fluid inlet for each compartment having a valve therein and adapted to be coupled to a source of purge fluid, a purge fluid outlet for each compartment having a valve therein, a carrier fluid inlet for each compartment having a valve therein and adapted to be coupled to a source of carrier fluid, a carrier fluid outlet for each compartment having a valve therein, and a fluid mixture inlet for each compartment having a valve therein and adapted to be coupled to a source of a fluid mixture to be separated chromatographically, the method comprising sequentially operating said isolating valves for successively isolating said compartments from the other compartments at least one at a time in one direction around said loop, opening the valves of the purge fluid inlets and the purge fluid outlets of the isolated compartment(s) to allow the purge fluid to pass therethrough at least one at a time, and closing them when the corresponding compartment(s) is/are in communication with said other compartments, operating the valves successively to open in said one direction the valves of the carrier fluid inlets of the compartments and the valves of the carrier fluid outlets of the compartments, the outlet valve which is open at any one time being associated with a compartment which is further in said one direction around the closed loop series from the compartment having the inlet valve thereof open, and operating the valves successively to open in said one direction the fluid mixture inlet valves of the compartments, the compartment the fluid mixture inlet valve of which is open being a compartment through which carrier fluid passes between the open carrier fluid inlet and the open carrier fluid outlet valves, and closing the inlet and outlet valves of the remaining compartments, whereby at any instant during the operation, the compartments the carrier fluid inlet and outlet valves of which are open are being respectively fed with a bled of carrier fluid, and the compartment the fluid mixture inlet valve of which is open is being fed with a fluid mixture to be separated while the isolated compartment(s) is/are being supplied with and bled of purge fluid at least one at a time.



4,001,113

ION EXCHANGE METHOD

Karlheinz W. R. Schoenrock, and Hugh G. Rounds, both of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Continuation of Ser. No. 544,712, Jan. 28, 1975, abandoned, which is a continuation of Ser. No. 356,998, May 3, 1973, abandoned. This application Mar. 2, 1976, Ser. No. 663,200

Int. Cl.² B01D *15/06*

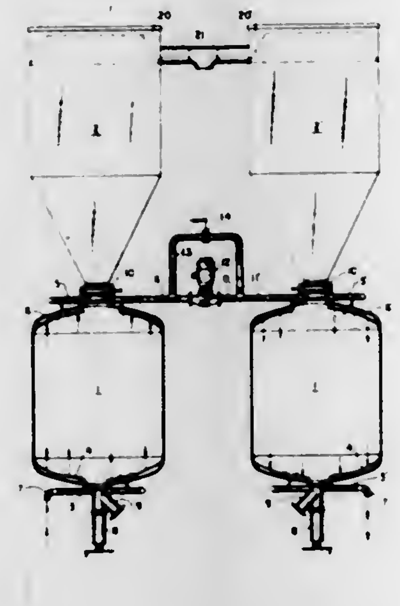
U.S. Cl. 210—33 **3 Claims**

1. A method for conducting an ion exchange operation comprising

a. providing a system comprising at least two pressure vessels connected in series; each of said vessels containing a body of particulate ion exchange material substantially filling said vessel save for sufficient freeboard to allow for the swelling of said exchange material during use; passage means proximate the lower and upper ends of each said vessel providing entrance and exit of fluid to be passed through said vessels whilst retaining within said vessels said bodies of exchange material; each said vessel having a central opening in the top thereof; a non-pressurized expansion chamber located above said vessel and connected to said central opening to allow the entrance of said exchange material from said vessel to said expansion chamber during back wash and drainage of said exchange material back into said vessel after back wash, said central opening being provided with a valve which controls communication between said vessel and said expansion chamber; said expansion chamber being provided with a down take overflow at its top for discharge of back wash water;

b. closing said valves in said central openings,

c. passing an exhaustant liquid into a first said pressure vessel at the bottom thereof and upwardly through said body of exchange material therein, said exhaustant liquid exiting from said first pressure vessel at the top thereof,



d. passing said exhaustant liquid to the top of a second pressure vessel and downwardly through the body of exchange material therein, exiting at the bottom of said second vessel,

e. following the pattern so established for as many vessels as are connected in series;

f. thereafter passing a regenerant liquid in the aforesaid pattern counter current to the exhaustant liquid which regenerant liquid enters at the point where the exhaustant liquid exits and exits where the exhaustant liquid enters the system;

g. opening said valves in said central openings;

h. passing a back wash liquid into each of said vessels at the bottom thereof and upwardly through said body of exchange material therein, said back wash liquid exiting from each of said vessels at the top thereof,

i. passing said back wash liquid upwardly through said expansion chambers whereby causing said body of exchange material to expand into said expansion chamber;

j. passing said back wash liquid upward through said expansion chambers to said down take overflow where said back wash exits from said expansion chamber;

k. terminating the flow of said back wash liquid to permit said body of exchange material to settle back into said vessels; and

l. repeating steps (b) through (k).

4,001,114

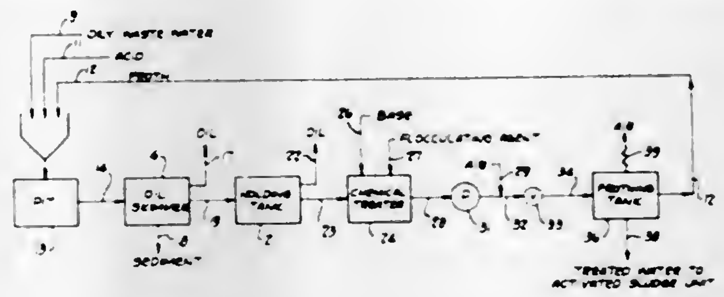
WASTE WATER TREATMENT PROCESS

Joel J. Joseph, Lakewood, Ohio, and John R. Keigher, Plainfield, Ill., assignors to SCM Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,829

Int. Cl.² B01D *17/02*

U.S. Cl. 210—44 **4 Claims**



1. In a process for treating waste water contaminated with fatty residue wherein said waste water is subjected to density separation for removing accumulated lighter oil phase from denser aqueous phase; and said denser aqueous phase is treated with flocculating agent and sufficient base for rendering pH of same at least about 6; and the resulting treated denser aqueous phase subjected to dissolved air flotation for recovery of stripped water product phase from formed oily froth; the improvement which comprises.

mildly acidulating with acid said waste water to pH of about 3–5.5 prior to said density separation step; and

permitting said oil froth collected from said dissolved air flotation step to flow by gravity into admixture with said waste water admitted to said process.

4,001,115

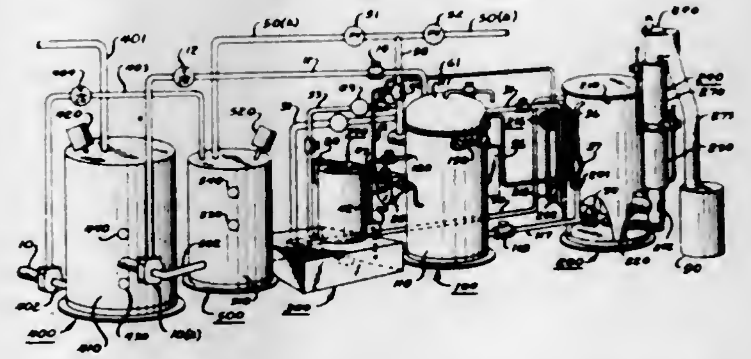
FILTRATION SYSTEM WITH STORAGE AND DILUTION RESERVOIRS

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed June 21, 1974, Ser. No. 481,528

Int. Cl.² B01D *37/04*

U.S. Cl. 210—67 **8 Claims**



1. A method of liquid solid separation providing a controlled percentage of solids material contained in the unclarified liquid being separated comprising the steps of

discharging a contaminated liquid having a first percentage of solids materials therein into a first storage means for containing the liquid,

transferring a portion of the liquid from the first storage means into a second storage means controlling liquid having a second percentage of solids materials therein less than the percentage of solids material in the liquid contained in the first storage means at a transfer rate responsive to the differential between said first and said second percentage of solids material contained in the liquid,

transferring a quantity of the liquid from the second storage means into filtration means for clarifying the liquid by removing the solids materials therefrom at a predetermined transfer rate responsive to said second percentage of solids material contained in the liquid transferred to the filtration means,

clarifying the liquid transferred into the filtration means by removing the solids materials and discharging the clarified liquid therefrom,

selectively transferring the clarified liquid discharged from the filtration means to the second storage means containing liquid having a second percentage of solids materials therein less than the first percentage of solids materials in the liquid contained in the first storage means in response to the percentage of solids materials in the liquid contained in the second storage means.

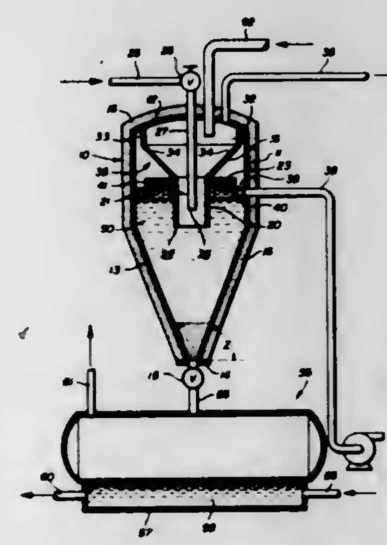
4,001,116
GRAVITATIONAL SEPARATION OF SOLIDS FROM LIQUEFIED NATURAL GAS

Yuksel Ali Selcukoglu, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 5, 1975, Ser. No. 555,354

Int. Cl.² F25J *3/00*

U.S. Cl. 210—83 **7 Claims**



1. A gravitational separator for separating solids from liquefied natural gas comprising:

a closed tank having a conical lower portion angled at least 60° from the horizontal and terminating at the bottom in an apex opening in communication with a valve means for removing settled solids from the tank,

a vertically positioned cylindrical shell, defining a stilling chamber, located in the tank at a position to depend at least partially below a predetermined level of liquefied gas which may be placed in the tank,

a conical shell vapor disengaging and expansion means located above the stilling chamber,

conduit means for feeding a gas or liquefied gas containing impurities into the tank and terminating in the stilling chamber at a location below the level of a liquefied gas in the tank,

means for withdrawing a gas or vapor from the vapor disengaging and expansion means,

means for withdrawing clean liquid from the tank, while maintaining said predetermined liquid level in the tank, without withdrawing a significant amount of solids settling downwardly in the tank,

means for discharging slurry directly from the tank into a vessel having external heating means to vaporize the slurry, and

insulation on the outside of the tank.

4,001,117
SIEVE FILTRATION APPARATUS

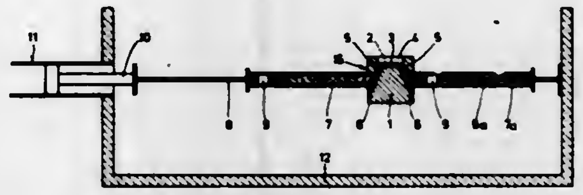
Ulrich Trechsel, Bern, Switzerland, assignor to Pathophysiologisches Institut der Universitat Bern, Bern, Switzerland

Filed Sept. 11, 1975, Ser. No. 612,555

Claims priority, application Switzerland, Sept. 17, 1974, 12593/74

Int. Cl.² B01D *31/00*

U.S. Cl. 210—180 **9 Claims**



1. A sieve filtration apparatus comprising:

at least one filtering vessel having an inlet side and an outlet side and at least one sieving filter dividing said at least one vessel into a primary chamber on said inlet side and a secondary chamber on said outlet side,

two coaxial cylinders disposed on opposite sides of said at least one vessel, projecting outwardly therefrom, and communicating with said primary chamber, said vessel and said cylinders forming an integral unit,

at least two pistons, each having a piston-rod and cooperating with a respective one of said cylinders, at least one of said pistons being movable for producing and stabilizing a predetermined pressure in said vessel-cylinder unit, and

means for producing a relative reciprocating movement between said vessel-cylinder unit and said pistons parallel to the axis of said cylinders.

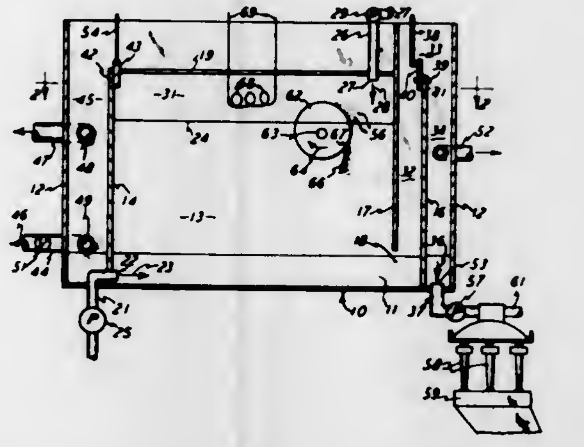
4,001,118
APPARATUS FOR SEPARATING FOREIGN SOLID PARTICLES FROM A LIQUID

Siegmund J. Enzmann, 4534 Leslie Ann Lane, Racine, Wis. 53403

Filed Aug. 11, 1975, Ser. No. 603,634

Int. Cl.² B01D *35/18, 21/26, 29/00*

U.S. Cl. 210—187 **16 Claims**



1. Apparatus for separating foreign solid particles from a liquid comprising a tank having a bottom and side walls for receiving liquid, said tank having a liquid inlet and a liquid outlet for a light-weight liquid and spaced apart from each other to be respectively adjacent said side walls and disposed above the elevation of said bottom for the flow of the light-weight liquid into and out of said tank, said tank having a liquid inlet for a heavy liquid and disposed adjacent said bottom for introducing the heavy liquid into said tank and presenting the heavy liquid in a layer underneath the light-weight liquid and providing a vehicle for moving the foreign solid particles which sink from the light-weight liquid, and said tank having a liquid conduit with a liquid entrance-way disposed adjacent said bottom and a liquid exit-way disposed at an elevation above that of said liquid entrance-way, said liquid entrance-way and said liquid inlet for said heavy liquid being spaced apart with respective ones thereof adjacent opposite ones of said side walls for the flow of the particle-laden heavy liquid out of said tank, a liquid-flow connector connected with said tank in liquid-flow communication with said liquid conduit exit-way for receiving the heavy fluid therefrom, and a hydro-cyclotron connected with said connector in liquid-flow communication with said liquid conduit for receiving the particle-laden heavy liquid and separating the particles therefrom.

4,001,119
THICKENING APPARATUS

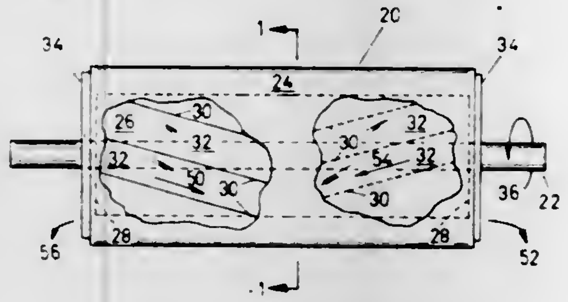
A. Bruce Hunter, 18 W. Park Blvd., Dollard des Ormeaux, Quebec, Canada

Filed Jan. 31, 1975, Ser. No. 545,767

Claims priority, application United Kingdom, Feb. 4, 1974, 04942/74

Int. Cl.² B01D *33/06*

U.S. Cl. 210—402 **1 Claim**



1. A filtering device for separating solid particles from liquid in a slurry of said particles and liquid when substantially immersed in said slurry comprising in combination; axially horizontal and rotatable cylinder-filter means embodying essentially in co-axial relationship therewith, a plurality of longitudinally extending and helicoidally parallel compartments extending from end to end circumferentially contiguous to the inner surface of said cylinder-filter means, those of said compartments upon one side of the vertical axial plane of said cylinder-filter means conveying rich filtrate by gravity to one end of said cylinder-filter means, those compartments upon the other side of said vertical axial plane conveying lean filtrate by gravity to the opposite end of said cylinder-filter means; said cylinder-filter means including in co-axial relationship, an outer cylindrical filter and an inner cylindrical shell, said compartments being circumferentially bounded by said filter and shell and generally radially bounded by elongated generally helicoidal partitions extending between said filter and said shell, and including semi-partition in substantially all of said helicoidal compartments to separate one end of such compartments into inner and outer sub-compartments wherein said inner sub-compartments are closer to the axis of said cylinder-filter means and said outer sub-compartments are more distant therefrom whereby filtrate trapped in said inner sub-compartments will be conveyed to said one end irrespective of the rotational position of said cylinder-filter means.

4,001,120
WATER FILTER DEVICE

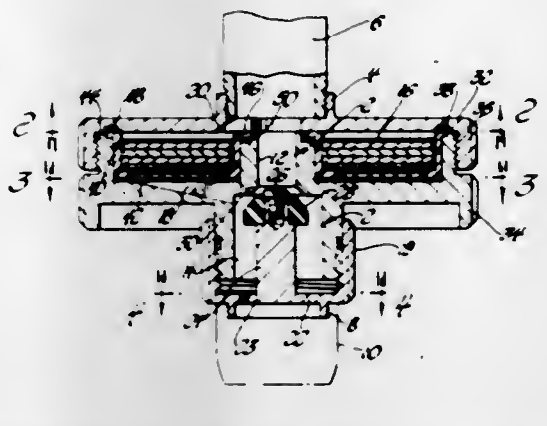
Charles Gelman, and Attila Vadnay, both of Ann Arbor, Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.

Continuation of Ser. No. 516,322, Oct. 21, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,796

Int. Cl.² B01D *27/10*

U.S. Cl. 210—420 **2 Claims**

1. A water filtering device for attachment to a faucet comprising: a passage having an upper portion with an inlet for water from the faucet and having a lower portion with a water outlet at the lower end thereof, a flat annular water filtering chamber surrounding the upper portion of said passage, said water filtering chamber having upper and lower axial portions removably secured together whereby said chamber is adapted to removably receive in fixed position therein a replaceable flat annular water filtering cartridge, sealing means in said chamber for sealing engagement with said cartridge to prevent flow of water through said chamber other than through said cartridge, one or more openings between the lower axial end of said chamber and the lower portion of said passage, one or more openings between the upper axial end of said chamber and the upper portion of said passage, said passage being otherwise imperforate to prevent radial flow of water between said passage and said filtering chamber intermediate the axial ends of said filtering chamber, a sleeve rotatably secured to the lower portion of said passage for movement between selected axial positions relative to said passage, and a valve mounted in said sleeve and projecting into the lower portion of said passage, said valve being movable axially thereof by rotation of said sleeve between a first position in which it blocks the flow of water directly from the upper portion of said passage to the lower portion of said passage whereby water from the faucet is caused to flow from said passage into and then axially through said filtering chamber and then back into said passage and out of said water outlet, and a second position in which said passage is open between said upper and lower portions to permit flow directly through said passage to bypass said filter chamber.



4,001,121
CENTRIFUGAL TREATMENT OF FLUIDS

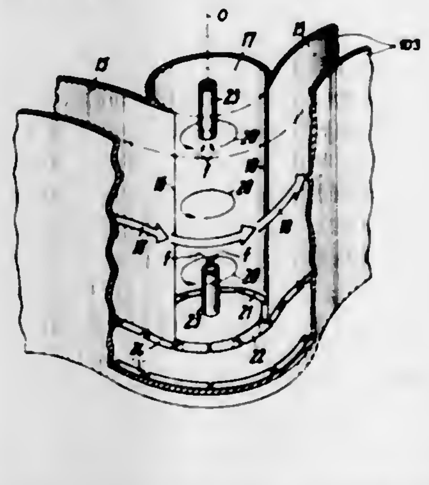
Ernst-August Bielefeldt, Neumunster, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau, Hamburg, Germany

Filed Feb. 8, 1973, Ser. No. 330,719

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B01D *21/26*

U.S. Cl. 210—512 R **12 Claims**



1. An apparatus for centrifugally treating a fluid, comprising

conduit means forming a curved channel of substantially rectangular cross-section connected to a source of fluid to be treated for traversal by said fluid at high speed, said conduit means being provided at a concave side of said channel with at least one transverse recess extending across the full width of said channel, said recess being partly separated from said channel by a transverse upstream edge overhanging said recess and by a transverse downstream edge confronting the oncoming fluid stream, and extraction means opening into said recess adjacent a centerline thereof for axially removing a portion of a body of fluid circulating in said recess, the cross-section of said channel being larger at said upstream edge than at said downstream edge, said recess having a generally part-cylindrical periphery extending over an arc of at least 180°, said channel being fully open toward said recess over a complementary arc lying between said upstream and downstream edges, at least said upstream edge forming an acute vertex angle pointed in a direction tangent to said complementary arc.

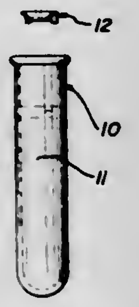
4,001,122
METHOD AND DEVICE FOR SEPARATING BLOOD COMPONENTS

Richard J. Griffin, Denver, Colo., assignor to Telan Corporation, Denver, Colo.

Filed Aug. 22, 1973, Ser. No. 390,354

Int. Cl.² B01D *21/26*

U.S. Cl. 210—516 **9 Claims**



1. A barrier device for separating the sera, fibrin and heavier phases with the latter phase including red cells, white cells and platelet elements and wherein the phases have differing specific gravities from a blood sample within a tube or tubular holder, said barrier device comprising a circular member having an outer diameter less than the inner diameter of said tube with the diametric difference therebetween allowing gravity motivated movement of said barrier device coaxially in said tube with fluidic flow of the blood sample components past the peripheral edge of said circular member, said barrier device having a specific gravity intermediate that of the sera and the heavier phases of the blood sample to be separated, having at least one opening through said circular member large enough to allow the flow of at least the lighter components therethrough when the tube and said member are in an environment conducive to component separation based upon specific gravity differences along the axis of said tube, and having means including a series of projections spaced around the peripheral edge extending substantially in an axial direction from said circular member , whereby application of a migration inducing environment such as by centrifugal force to said tube will cause said member to migrate along the length of said tube while passing through the blood sample phases until it occupies a position intermediate the sera and the other blood sample phases.

4,001,123
FABRIC SOFTENER COMPOSITIONS CONTAINING N-ALKYL-1,3-PROPYLENE DIAMINE TREATED WITH MALEIC ANHYDRIDE

Adolph Renold, Dornack, Switzerland, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 287,834, Sept. 11, 1972, Pat. No. 3,891,563. This application Apr. 18, 1975, Ser. No. 569,162

Int. Cl.² D06M *13/34*

U.S. Cl. 252—8.8 **6 Claims**

1. A fabric softener composition comprising an N-higher alkyl-1,3-propylene diamine, said higher alkyl group having from 12 to 22 carbon atoms, said N-higher alkyl-1,3-propylene diamine having been contacted with maleic anhydride, and an additive, said additive selected from the group consisting of urea, sugar, and mixtures thereof.

4,001,124
LONG-WEARING PLASTIC BEARINGS

Eugene H. Hussey, Temple, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Mar. 17, 1975, Ser. No. 559,142

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C10M *5/00, 7/00*

U.S. Cl. 252—12 **4 Claims**

1. A plastic bearing material adapted to be used in sliding contact with metal comprised of a minor amount of a polymeric polyolefin material having a low exchange time, minor amount of a relatively chemically inert fluorinated hydrocarbon polymeric material that is capable of replacing or supplementing the low exchange time material at the metal surface, and a comparatively tough, rigid material selected from the group consisting of nylon, polyesters, polycarbonates, polyacetals, and polysulfones that will act as a carrier and retainer for the polymeric material having the relatively high chemical inertness.

4,001,125
LUBRICANT FOR MANDRELS, FORGING DIES, MOLDS AND THE LIKE

Archibald R. Newton, III, Emlenton, Pa., assignor to Grafo Colloids Corporation, Sharon, Pa.

Filed June 9, 1975, Ser. No. 584,722

Int. Cl.² C10M *1/10*

U.S. Cl. 252—29 **13 Claims**

1. In a lubricant composition for high temperature use with mandrels, forging dies and molds comprising a dispersion of a solid lubricant powder, water, a thickener and a dispersant; the improvement wherein said solid lubricant powder comprises gilsonite.

4,001,126
HEAT PROTECTIVE MATERIAL AND METHOD OF MAKING THE MATERIAL

Frank A. Marion, and Hugh J. McSpadden, both of Riverside, Calif., assignors to Universal Propulsion Co., Riverside, Calif.

Continuation of Ser. No. 253,971, May 17, 1972, abandoned, which is a continuation of Ser. No. 4,157, Jan. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 766,066, Nov. 15, 1968, abandoned. This application Jan. 21, 1974, Ser. No. 434,960

Int. Cl.² C04B *43/00*

U.S. Cl. 252—62 **4 Claims**

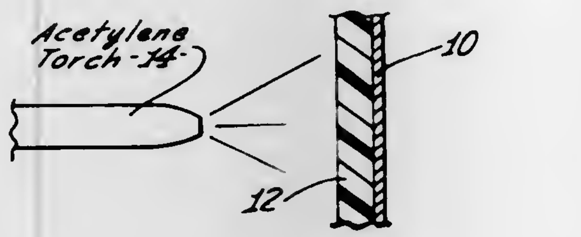
1. A method of producing a thermally protective material capable of providing heat insulation by withstanding elevated temperatures in the thousands of degrees for extended periods of time in the tens of hours without gross destruction including:

mixing an epoxide and a filler material to form a first mixture, the filler material having properties of being chemically non-reactive at normally encountered ambient temperatures and having properties of chemically reacting in successive steps at progressive increments of temperature above the normally ambient temperature to provide a plurality of chemical products each resulting from an endothermal chemical reaction of previous chemical products where each successive endothermic chemical reaction in the chain occurs at an elevated temperature of small increment relative to the previous endothermic chemical reaction in the chain,

mixing a polysulfide and the filler materials and a curative for the epoxide to form a second mixture, and

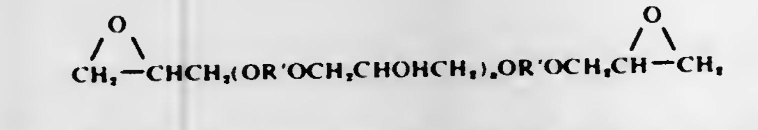
mixing the first and second mixtures to produce the thermally protective material,

the epoxide having a range of 4 parts by weight to 1 part by weight of epoxide to 1 part to 4 parts by weight of polysulfide, the thermally protective material being initially non-porous and the thermally protective material providing transpirational cooling by the passage through a char of the gases produced from the filler materials, the thermally protective material having elastomeric properties to inhibit cracking of the thermally protective material during the formation of the char as a result of the subjection of the thermally protective material to the elevated temperatures, the binder being selected from a selected group consisting of mercapto-terminated polymers having the general formula



$HS(R-SS)_nRSH$

where R is a polyvalent organic radical containing at least one methylene group and *n* is an integer of from about 3 to 100, and preferably from about 3 to 25 and the epoxy-terminated polymers having the general formula



$$\overset{O}{\overbrace{CH_2-CH}}CH_2(OR'OCH_2CHOHCH_2)_nOR'OCH_2\overset{O}{\overbrace{CH-CH_2}}$$

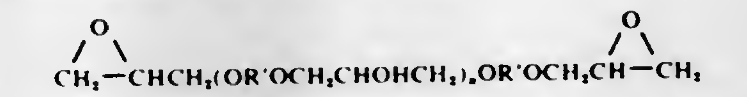
where R′ is the divalent organic radical of a dihydric alcohol or a dihydric phenol and *n* usually has a value of less than 1 to a value of about 20, the material selected for crosslinking the mercapto-terminated polymers and the epoxide-terminated polymers having a percentage by weight of approximately 15 parts to 100 parts by weight of epoxide-terminated polymers, the filler materials including phosphates and borates, the phosphates being selected from a group consisting of sodium and ammonium phosphate and the borates being selected from a group consisting of sodium and ammonium borate, the filler materials being uniformly dispersed in the binder in about 10 to 80 parts by weight of at least one of sodium or ammonium phosphate per 100 parts by weight of binder and from about 25 to 80 parts by weight of at least one of sodium or ammonium borate per 100 parts by weight of the binder.

2. A thermally protective material capable of providing heat insulation by withstanding elevated temperatures as high as thousands of degrees Fahrenheit for extended periods of time as long as tens of hours without gross destruction, consisting essentially of:

a binder having properties of forming a char when subjected to heat, and at least one filler material mixed with the binder and having properties of chemically reacting in successive steps to provide in sequence a plurality of chemical products each resulting from an endothermal chemical reaction of previous chemical products where each successive endothermic chemical reaction in the chain occurs at an elevated temperature of small increment relative to the previous endothermic chemical reaction in the chain, the filler material has properties of obtaining the production in the successive chemical reactions of gases which travel through the char to the surface of the thermally protective material to cooperate with the char in providing a surface reflective to the heat and wherein the filler materials have properties of obtaining the production in the successive chemical reactions of chemical products which decompose on an endothermal basis, the binder being selected from a group consisting of mercapto-terminated polymers and epoxy-terminated polymers, the mercapto-terminated polymers and epoxy-terminated polymers being cross-linked, the mercapto-terminated polymers having the general formula

$HS(R-SS)_nRSH$

where R is a polyvalent organic radical containing at least one methylene group and *n* is an integer of from about 3 to 100, and preferably from about 3 to 25 and the epoxy-terminated polymers having the general formula



$$\overset{O}{\overbrace{CH_2-CH}}CH_2(OR'OCH_2CHOHCH_2)_nOR'OCH_2\overset{O}{\overbrace{CH-CH_2}}$$

where R′ is the divalent organic radical of a dihydric alcohol or a dihydric phenol and *n* usually has a value of less than 1 to a value of about 20,

a material selected from a group consisting of the aliphatic and aromatic primary, secondary and tertiary amines and having properties of serving as an agent for cross-linking the mercapto-terminated polymers and the epoxide-terminated polymers, the material selected for cross-linking the mercapto-terminated polymers and the epoxide-terminated polymers having a percentage by weight of approximately 15 parts to 100 parts by weight of the epoxide-terminated polymers, the filler materials being selected from a group consisting of phosphates and borates, the phosphates being selected from a group consisting of sodium and ammonium phosphate and the borates being selected from a group consisting of sodium and ammonium borate, the filler materials being uniformly dispersed in the binder in about 10 to 80 parts by weight of at least one of sodium or ammonium phosphate per 100 parts by weight of binder and from about 25 to 80 parts by weight of at least one of sodium or ammonium borate per 100 parts by weight of the binder.

4,001,127
PROCESS OF PREPARING SINGLE CRYSTALS OF STRONTIUM BARIUM NIOBATE

Kouiti Megumi; Kazuyuki Nagatsuma; Yasutoshi Kashiwada, and Yoshio Furuhata, all of Kokubunji, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,677

Claims priority, application Japan, July 25, 1973, 48-83043

Int. Cl.² B01J *17/18*

U.S. Cl. 252—62.9 **4 Claims**

1. In a process of preparing single crystals of strontium barium niobate of the type wherein a melt of a mixture of strontium oxide, barium oxide and niobium pentoxide is prepared, said melt having a temperature variation of less than 1° C and a single crystal of strontium barium niobate is grown from said melt by the Czochralski method, wherein a seed crystal is immersed in said melt and pulled therefrom at a speed of 2mm/hour, the improvement wherein the compositions, included in region B shown in FIG. 3 of the accompanying drawings are used as the ternary compositions of strontium oxide, barium oxide and niobium pentoxide in said melt, said

single crystals having a composition included in region B' shown in FIG. 4 and a local gradient of birefringence of smaller than 1 × 10^{-4}/cm.

4,001,128
HIGH VOLTAGE INSULATING MATERIALS

Richard John Penneck, Lechlade, England, assignor to Raychem Corporation, Menlo Park, Calif.
Filed July 21, 1972, Ser. No. 274,110
Int. Cl.² H01B *3/00*
U.S. Cl. 252—63.2 10 Claims

1. Blended anti-tracking insulating material suitable for high voltage applications consisting essentially of an organic synthetic polymeric materials and an anti-tracking filler system wherein the polymeric material is at least 10% by weight of the insulating material, and the anti-tracking filler system comprises at least 20% by weight of alumina trihydrate based on the weight of the polymer and filler system and at least 1% by weight of an organic silicon-containing compound containing the Si—O—Si group which has been coated prior to blending of said material and system with at least one organosilicon compound, based on the weight of the polymer and filler system, wherein said organosilicon compound is a silane of the formula:

$$R_nSiX_{4-n}$$

wherein *n* is an integer no higher than 3, R represents an organic radical bonded to the silicon atom by a Si—C bond and X is selected from the group consisting of chlorine or a radical bonded to silicon by an oxygen atom.

2. Blended anti-tracking insulating materials suitable for high voltage applications consisting essentially of at least 10% by weight of an organic synthetic polymer selected from the group consisting of polyolefins, polyacrylates, silicon polymers, polyepoxides, butyl rubbers, ionomeric polymers, polyvinul acetate and copolymers or terpolymers thereof having a residual char after pyrolysis of less than 10%, at least 20% by weight of alumina trihydrate and at least 1% by weight of an inorganic silicon-containing compound selected from the group consisting of silica or metal silicate which has been coated prior to blending of said polymer, alumina trihydrate and filler with a silane of the formula:

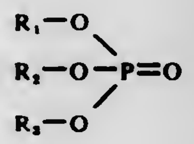
$$R_nSiX_{4-n}$$

wherein *n* is an integer no higher than 3, R is an organic group bonded by a Si—C bond and X is a radical selected from the group consisting of chlorine or a radical bonded to silicon by an oxygen atom.

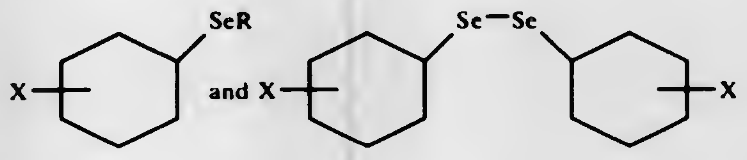
4,001,129
FIRE RESISTANT FUNCTIONAL FLUIDS

Martin B. Sheratte, Canoga Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Continuation-in-part of Ser. Nos. 230,131, Feb. 28, 1972, abandoned, and Ser. No. 449,623, March 11, 1974, Pat. No. 3,935,116. This application Nov. 1, 1974, Ser. No. 520,052
The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.
Int. Cl.² C10M *3/40, 3/32*
U.S. Cl. 252—78.5 24 Claims

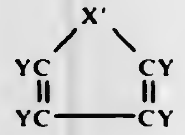
1. A functional fluid composition consisting essentially of (1) a phosphorus compound selected from the group consisting of phosphate esters and mixtures of said phosphate esters, said phosphate esters having the general formula:



where R_1 and R_2 are each a member selected from the group consisting of alkyl of from about 3 to about 10 carbon atoms, and alkoxyalkyl having from about 3 to about 8 carbon atoms, and R_3 is a member selected from the group consisting of alkyl and alkoxyalkyl, as above defined, aryl and alkaryl, containing from 6 to about 8 carbon atoms, (2) a polyalkylene glycol material, said glycol material selected from the group consisting of a polypropylene glycol mono- or diether, and a mono- or diether of an ethylene-propylene copolymer, said mono- or diether having at least one terminal oxyalkyl group wherein the alkyl radicals contain from 1 to about 4 carbon atoms, and mixtures thereof, said polyalkylene glycol material having a molecular weight ranging from about 500 to about 2,000, (3) a dicarboxylic acid ester selected from the group consisting of the alkyl diesters of adipic and sebacic acid, containing alkyl groups of from about 4 to about 12 carbon atoms, and an alkyl diester of phthalic acid containing alkyl groups of from about 4 to about 12 carbon atoms, said phosphorus compound being present in an amount ranging from about 14 to about 89%, and said glycol material being present in an amount ranging from about 9 to about 84%, by weight of said composition, said dicarboxylic acid ester being present in an amount ranging from about 5% up to about 200%, by weight of said glycol material or of said mixtures thereof, said phosphorus compound, said glycol material and said dicarboxylic acid ester being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (4) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:



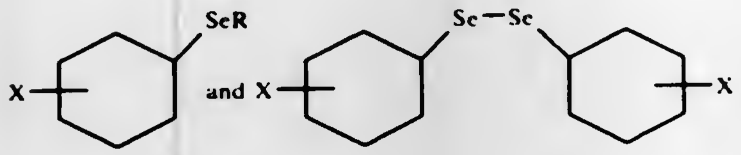
where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



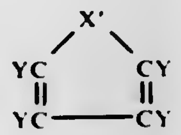
where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

3. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combination of at least two polyalkylene glycol ethers containing terminal oxyalkyl groups wherein the alkyl radicals contain from 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol ethers having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol ethers having a molecular weight ranging from about 2,000 up to about 25,000, (3) a dicarboxylic acid ester selected from the group consisting of the aliphatic and aromatic dicarboxylic acid diesters, and mixtures thereof, said dicarboxylic acid ester containing alkyl groups of from about 4 to about 12 carbon atoms, said dicarboxylic acid ester being present in an amount ranging from

about 5 up to about 200% by weight of said combination of glycol ethers, said phosphate esters, said polyalkylene glycol ethers and said dicarboxylic acid ester being present in amounts such that said composition has a viscosity at −65° F of not greater than about 6,000 centistokes, and a viscosity at 210° F of not less than 2.25 centistokes, and (4) a small amount of an additive compound sufficient to enhance the autoignition temperature of said composition, said additive compound selected from the class (a) having the general formulae:

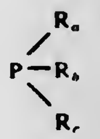


where X is selected from the group consisting of H, alkyl, halogen, alkoxy, amino and dialkylamino, and R is alkyl of from about 1 to about 12 carbon atoms, and (b) having the general formula



where X' is a member selected from the group consisting of Se and Te, and Y is a member selected from the group consisting of H and a halogen.

14. A functional fluid composition as defined in claim 3, including a small amount of a tertiary organic phosphine having the formula:



where R_a, R_b and R_c are each a member selected from the group consisting of aryl and alkaryl.

4,001,130
OPTICAL BRIGHTENERS

Erich Schinzel, Hofheim, Taunus; Wilfried Sahm, Kelkheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 7, 1974, Ser. No. 431,045
Claims priority, application Germany, Jan. 12, 1973, 2301438
Int. Cl.² C11D *3/42*
U.S. Cl. 252—89 B 8 Claims

1. A detergent composition consisting essentially of as optical brightener 0.01 to 2% by weight of a compound of the formula (1)

$$A - CH = CH - CH = CH - B \qquad (1)$$

in which A is phenyl, naphthyl or 2-thienyl and B is 2-benzoxazolyl or defined as A, which radicals A and B are unsubstituted or substituted by lower alkyl; lower alkoxy; phenyl; lower alkyl substituted by phenyl; chlorine; cyano; lower alkanoylamino; benzoylamino; carboxy or sulfo or a group of the formula

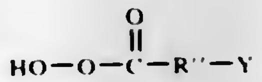
$$-COOR, -CONR^1R^2, -SO_2OR, -SO_2NR^1R^2, -COR^3 \text{ or } SO_2R^4$$

in which R is lower alkyl or phenyl, which radicals R are unsubstituted or substituted by hydroxy, lower alkoxy, lower dialkylamino or lower trialkylammonium; R^1 and R^2 are hydrogen or lower alkyl or R^1 and R^2 together with the nitrogen are piperidino or morpholino; R^3 is lower alkyl or phenyl and R^4 is lower alkyl or phenyl which racicals R^4 are unsubstituted or substituted by lower dialkylamino, lower trialkylammonium, lower alkanoylamino or sulfo.

4,001;131
ACTIVATION OF ORGANIC PERACIDS BY DI-KETONES

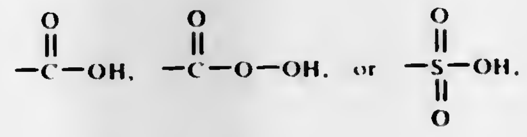
Ronald Earl Montgomery, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 3, 1975, Ser. No. 583,383
Int. Cl.² C11D *7/56*
U.S. Cl. 252—99 14 Claims

1. A bleaching and dye transfer inhibition composition, consisting essentially of:
   a. from about 1% to 75% by weight of a water-soluble organic peroxyacid or salt thereof bleaching agent of the formula



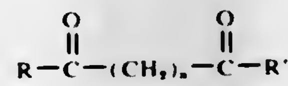
$$HO-O-\overset{\overset{O}{\|}}{C}-R''-Y$$

   wherein R'' is an alkylene group containing from 1 to about 16 carbon atoms or an arylene group containing from 6 to about 8 carbon atoms and Y is hydrogen, halogen, alkyl, aryl.



$$-\overset{\overset{O}{\|}}{C}-OH,\quad -\overset{\overset{O}{\|}}{C}-O-OH,\quad \text{or}\quad -\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-OH,$$

   b. from about 0.1% to 50% by weight of a water-soluble di-ketone activator of the formula



$$R-\overset{\overset{O}{\|}}{C}-(CH_2)_n-\overset{\overset{O}{\|}}{C}-R'$$

   wherein *n* is 0 or 1 and R and R' are alkyl and substituted alkyl moieties having from 1 to 20 carbon atoms; aryl and substituted aryl moieties; heterocyclic moieties; or moieties wherein R and R' are joined in a ring structure having 5 to 12 carbon atoms, and
   c. from about 1% to 85% by weight of a buffering agent to maintain the in-use pH of the composition within the range of from 6 to 10.

4,001,132
AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Edward John Maguire, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 17, 1974, Ser. No. 479,969
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² C11D *7/54, 7/56*
U.S. Cl. 252—105 15 Claims

1. A granular cleaning composition, particularly suitable for use in automatic dishwashers, having improved cleaning and anti-redeposition properties, consisting essentially of,
   a. from about 4% to about 20% by weight of an alkoxylated nonionic surface-active agent, wherein said alkoxy moiety is selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof,
   b. from about 5% to about 20% by weight of a sulfonated aromatic compatibilizing agent having a critical micelle concentration greater than about 1% by weight at 25°C.

wherein the weight ratio of said alkoxylated nonionic surface-active agent to said sulfonated compatibilizing agent is in the range from about 2:5 to about 5:3;

c. from about 15% to about 60% by weight of a mixture of (1) a water-soluble alkali metal sulfite, ammonium sulfite, substituted ammonium sulfite or mixtures thereof and (2) a water-soluble alkali metal sulfate, ammonium sulfate, substituted ammonium sulfate or mixtures thereof, said components being present in a weight ratio of sulfite to sulfate from about 1:4 to about 2:1;

d. which is substantially free of a chlorine bleach component.

4,001,133
METHOD OF WASHING GLASSWARE AND INHIBITED CLEANING SOLUTION AND ADDITIVE COMPOSITION USEFUL THEREIN

Malachi E. Sorgenfrei, Grosse Ile, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 4, 1974, Ser. No. 520,546

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C11D *7/06, 3/30*

U.S. Cl. 252—156 **9 Claims**

1. In a method of recycling returnable hot end coated glass containers wherein the glass containers are cycled a plurality of cycles over the normal useful life thereof, the glass containers in said cycles being filled with a product and thereafter emptied and the resultant soiled empty containers being returned for washing and refilling with a product, the said soiled returned glass containers being washed in said cycles in an alkaline aqueous solution of alkali metal hydroxide prior to refilling, the said hot end coated glass containers having a thin protective coating thereon including a coating of an organic hot end coating material applied to the glass containers while hot, the resultant hot end coating initially being substantially free of objectionable color and imparting abrasion resistance to the glass containers, the initial hot end coating being altered by the repeated washings in said cycles in the said aqueous solution of alkali metal hydroxide whereby the glass containers exhibit loss of abrasion resistance or an objectionable discoloration appears, the improvement in combination therewith which consists essentially of prolonging the useful life of the said protective hot end coating including the said coating of the organic hot end coating material by washing the said soiled hot end coated glass containers in an inhibited aqueous caustic soda cleaning solution consisting essentially of on a weight basis from 0.3 to 6.0 percent of caustic soda, from 0.01 to 0.3 percent of a soluble zinc containing compound when calculated as zinc oxide, and the remainder water.

4,001,134
SCALE INHIBITING PROCESS

Sheldon Boris Markofsky, Olney, and Jacob Block, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,274

Int. Cl.^{2} C02B *5/06*

U.S. Cl. 252—180 **3 Claims**

1. A process for inhibiting the deposition of scale onto the heat exchange surfaces of evaporators which consists essentially of adding a copolymer of maleic anhydride or maleic acid and allylacetate, the copolymer containing from 10 to 90% maleic anhydride or maleic acid and having a molecular weight of 500 to 10,000; so as to provide a concentration of 0.1 to 100 parts per million.

4,001,135
FLUORINE GENERATING SOLID FORMULATION FOR USE IN CHEMICAL LASERS

John E. O'Pray; Ronald E. Channell, both of Edwards, and Francisco Q. Roberto, Lancaster, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 537,492, Dec. 30, 1974, abandoned. This application July 1, 1975, Ser. No. 592,296

Int. Cl.^{2} C06D *5/06*

U.S. Cl, 252—187 R **4 Claims**

1. A fluorine generating solid composition comprising a compressed mixture of (a) an xenon fluoride oxidizer selected from the group consisting of xenon tetrafluoride, xenon difluoride and xenon hexafluoride; and (b) a hydrocarbon polymer fuel selected from the group consisting of polyethylene and polytetrafluoroethylene wherein said xenon fluoride oxidyzer is present in a ratio of about 1 to 7 moles of oxidizer to about 1 mole of said fuel.

4,001,136
FLUORINE GENERATING FORMULATION FOR USE IN CHEMICAL LASERS

Ronald E. Channell; John E. O'Pray, both of Edwards, and Francisco Q. Roberto, Lancaster, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 537,491, Dec. 30, 1974, abandoned. This application July 1, 1975, Ser. No. 592,298

Int. Cl.^{2} C06D *5/06*

U.S. Cl. 252—187 R **3 Claims**

1. A solid gas generating composition comprising a compressed mixture of (a) about 53 to 92 weight percent of a perfluoroammonium salt of a fluorinated Lewis acid selected from the group consisting of perfluoroammonium tetrafluoroborate, perfluoroammonium hexa fluoroarsenate, and perfluoroammonium hexafluoroantimonate; (b) about 0.5 to 2 weight percent of a metal nitride selected from the group consisting of aluminum nitride, magnesium nitride, and lithium nitride; and (c) about 7 to 46 weight percent of an alkali metal fluoride selected from the group consisting of lithium fluoride, sodium fluoride, potassium fluoride, rubidium fluoride, and cesium fluoride.

4,001,137
NEMATIC COMPOUNDS AND MIXTURES

Ralf Steinstrasser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

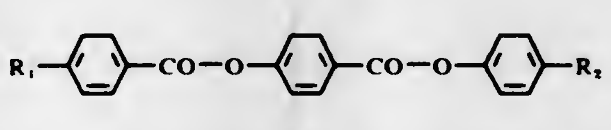
Division of Ser. No. 277,502, Aug. 3, 1972. This application June 24, 1975, Ser. No. 589,916

Claims priority, application Germany, Aug. 7, 1971, 2139628

Int. Cl.^{2} G02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299 **8 Claims**

1. A nematic mixture of liquid crystalline compounds, at least one of which is (a) a compound of the formula:



wherein R_1 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms or straight-chain alkanoyloxy of 2–7 carbon atoms and R_2 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms, or (b) a member of the group consisting of 4′-pentoxyphenyl ester of 4-propylbenzoic acid, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-butylbenzoic acid, 4′-pentoxyphenyl ester of 4-pentylbenzoic acid, 4′-butoxyphenyl, 4′-pentoxyphenyl, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-hexylbenzoic acid, 4′-pentylphenyl ester of anisic acid, 4′-butylphenyl and 4′-pentylphenyl esters of 4-

pentoxybenzoic acid, and 4′-propylphenyl, 4′-butylphenyl, 4′-pentylphenyl and 4′-hexylphenyl esters of 4-hexoxybenzoic acid.

4,001,138
STABLE SOLUTIONS OF FLUORESCENT BRIGHTENERS

Frank Lohmann, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,297

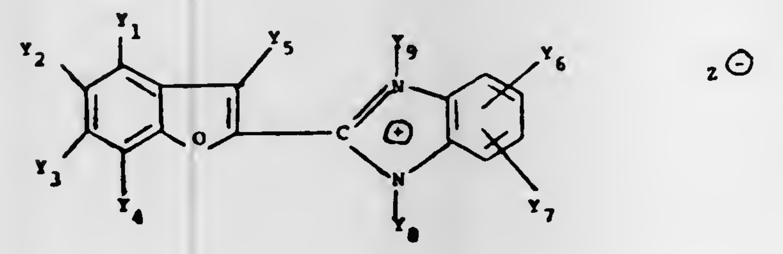
Claims priority, application Switzerland, Dec. 19, 1973, 17811/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C09K *11/00;* **C07D** *231/54,* **D06L** *3/12*

U.S. Cl. 252—27 **11 Claims**

1. A stable acid or neutral solution of quaternised fluorescent brighteners consisting essentially of a quaternised fluorescent brightener of the formula



wherein Y_1 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_2 represents a fused benzene ring, Y_2 represents hydrogen, methyl, ethyl, methoxy, halogen or together with Y_1 or Y_3 represents a fused benzene ring, Y_3 represents hydrogen, methyl, ethyl, alkoxy with 1 to 4 carbon atoms, halogen or together with Y_2 or Y_4 represents a fused benzene ring, Y_4 represents hydrogen, alkyl with 1 to 4 carbon atoms, methoxy, halogen or together with Y_3 represents a fused benzene ring, Y_5 represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl which is unsubstituted or substituted by at least one of methyl or methoxy, Y_6 represents hydrogen, alkyl with 1 to 4 carbon atoms, alkylsulphonyl with 1 to 4 carbon atoms, methoxy or halogen, Y_7 represents hydrogen, methyl, methoxy or halogen, Y_8 represents alkyl with 1 to 4 carbon atoms, hydroxyalkyl with 2 to 4 carbon atoms, cyanoethyl, phenyl, cyclohexyl or benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, Y_9 represents alkyl with 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxy or alkoxy with 1 to 4 carbon atoms, benzyl which is unsubstituted or substituted by chlorine or methoxy or represents a radical $-CH_2CN$, $-CH_2CONH_2$ or $-CH_2COOR$, wherein R represents an alkyl group with 1 to 4 carbon atoms, and Z represents halogen, an alkylsulphate with 1 to 4 carbon atoms or a phenylsulphonyl radical which is unsubstituted or substituted by methyl and, in the case of the weakly acid solution, a polar organic compound, water and a weak acid, and, in the case of the neutral solution, a polar, aprotic organic compound and water.

4,001,139
LIQUID SCINTILLATION SOLUTION

Edward C. Long, Huntington Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 541,243, Jan. 15, 1975, abandoned. This application Nov. 28, 1975, Ser. No. 636,383

Int. Cl.^{2} C09K *11/06;* **G01T** *1/204*

U.S. Cl. 252—301.17 **8 Claims**

1. A liquid scintillation solution comprising a mixture of (a) a liquid scintillation solvent, (b) a primary scintillation solute, (c) a secondary scintillation solute, (d) a plurality of substantially different surfactants, (e) a dissolving-transparentizing agent.

2. The liquid scintillation solution of claim 1 wherein the dissolving-transparentizing agent is a cyclic ether.

5. The liquid scintillation solution of claim 2 wherein the secondary scintillation solute is Dimethyl POPOP.

8. The liquid scintillation solution of claim 2 wherein the scintillation solvent is toluene, the primary scintillation solute is PPO, the secondary scintillation solute is Dimethyl POPOP, the plurality of substantially different surfactants are isooctylphenolpolyethoxyethanol and sodium dihexyl sulfosuccinate and the dissolving and/or transparentizing agent is tetrahydrofuran.

4,001,140
CAPSULE MANUFACTURE

Peter L. Foris; Robert W. Brown, and Paul S. Phillips, Jr., all of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed July 10, 1974, Ser. No. 487,322

Int. Cl.^{2} B01J *13/02*

U.S. Cl. 252—316 **8 Claims**

1. A process for manufacturing minute capsules, en masse, in an aqueous manufacturing vehicle, comprising the steps of:

a. establishing an agitating single-phase aqueous solution system including urea and a system modifier material present as 0.75 to 10 percent, by weight, of the aqueous manufacturing vehicle, selected from the group consisting of poly(ethylene-co-maleic anhydride), poly(methylvinylether-co-maleic anhydride), and poly(acrylic acid),

b. dispersing into the solution system particles of an intended capsules core material substantially insoluble in the system

c. adding formaldehyde to the system

d. continuing agitation of the system to yield a polymerization reaction between the urea and the formaldehyde resulting in

i. liquid-liquid phase separation of the urea/formaldehyde polymerization product above a molecular weight to be soluble in the system and

ii. continued reaction of the separation liquid polymerization product to solid capsule wall material individually surrounding particles of the dispersed intended capsule core.

4,001,141
COSMETIC EMULSIFIERS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-la-Tour, both of France, assignors to Societe Anonyme dit: L'Oreal, Paris, France

Division of Ser. No. 480,671, June 17, 1974, Pat. No. 3,914,407, which is a division of Ser. No. 119,363, Feb. 26, 1971, Pat. No. 3,824,294, which is a continuation-in-part of Ser. No. 780,299, Nov. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 677,047, Oct. 23, 1967, Pat. No. 3,595,924. This application June 6, 1975, Ser. No. 584,499

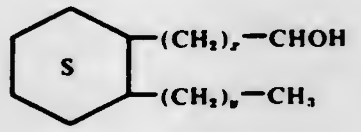
Claims priority, application Luxembourg, Oct. 21, 1966, 52227; Oct. 24, 1966, 52228; Oct. 6, 1967, 54622; France, Dec. 1, 1967, 67.130712

Int. Cl.^{2} B01F *17/42*

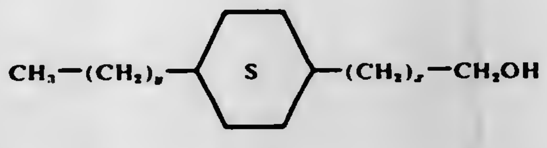
U.S. Cl. 252—351 **1 Claim**

1. A composition consisting essentially of a mixture of different compounds, each having the formula

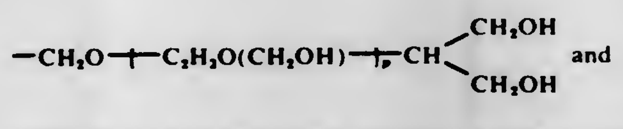
$RO\{C_2H_3O(R')\}_m\{C_2H_3O(X)\}_n H$
wherein R is a lipophilic hydrocarbon residue of a member selected from the group consisting of hydrogenated lanolin,



wherein $x + y = 10$ and



wherein $+ y = 12$, R′ is selected from the group consisting of methyl and ethyl, X is selected from the group consising of $-CH_2OH$,



$$-CH_2O\!\left[C_2H_3O(CH_2OH)\right]_p CH\begin{matrix}\diagup CH_2OH\\ \diagdown CH_2OH\end{matrix} \quad \text{and}$$

$$-CH_2O\!\left[C_2H_3O(CH_2OH)\right]_p CH_2-CHOH-CH_2OH,$$

m has a statistical average value between 1–10 inclusive, *n* has a statistical average value between 1–5 inclusive, *p* is an integer between 0–10 inclusive and the product $n(p+2)$ lies between 2–12 inclusive, said mixture being present in surface-active amounts in said composition.

4,001,142
BLOOD GAS CONTROL

James E. Turner, Madison, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed July 25, 1975, Ser. No. 599,291

Int. Cl.² G01N *31/00, 33/16*

U.S. Cl. 252—408 **16 Claims**

1. A liquid composition of matter for use as a blood gas control which comprises water, a dye, a buffering agent, a lower alkyl acid, a source of bicarbonate ion and an amount of dissolved oxygen, carbon dioxide and nitrogen gas.

4,001,143
CATALYST PREPARATION

Elrey L. McCann, III, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1975, Ser. No. 566,110

Int. Cl.² B01J *23/10*

U.S. Cl. 252—462 **5 Claims**

1. A process for preparing a catalyst comprising impregnating reactive alumina with a solution of metal compounds, thermally decomposable to metal oxides, in which said solution contains

A. at least one compound of a platinum group metal in a concentration sufficient to impart to the alumina about 0.001% to 5% by weight of the platinum group metal;

B. at least one compound of a lanthanide metal of atomic number 57 to 71, inclusive, in an atomic amount between about 1 and 1000 times the atomic amount of the platinum group metal; and

C. at least one compound of a metal selected from alkali and alkaline earth metals having ionic radii between about 0.9 and 1.65 Angstroms, in an atomic amount of about from 0.25 to 4 times the atomic amount of the platinum group metal; drying the resulting impregnated alumina and heating the resulting impregnated alumina at a temperature of at least about 800° C. for at least about one hour.

4,001,144
PROCESS FOR MODIFYING THE PORE VOLUME DISTRIBUTION OF ALUMINA BASE CATALYST SUPPORTS

Michael J. Pearson; Ronald J. Rigge, both of Pleasanton, and Stephen C. Carniglia, Byron, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 19, 1975, Ser. No. 642,275

Int. Cl.² B01J *21/04*

U.S. Cl. 252—463 **8 Claims**

1. A process for modifying the pore volume distribution of an alumina base catalyst support precursor which comprises the steps of:

a. treating an alumina precursor of chi-rho-eta structure with an aqueous solution of an ammonium salt selected from the group consisting essentially of ammonium carbonate, ammonium bicarbonate and mixtures thereof;

b. subjecting the treated alumina to a pressure treatment at a temperature in the range of about 100° and 160° C for a time period of about 10 hours to 24 hours;

c. drying of the pressure-treated alumina at a temperature in excess of about 100° and up to about 200° C for about 1–24 hours followed by thermal activation at a temperature of at least about 500° and not in excess of about 700° C; and

d. recovering an eta-free, alumina base catalyst support of modified pore volume distribution characterized by having at least about 70% of its total pore volume in the 45–300 angstrom unit pore diameter range.

4,001,145
GLASSY RESISTOR COMPOSITION FOR USE IN A RESISTOR INCORPORATED SPARK PLUG

Masao Sakai, Kasugai; Masaru Fukuoka, Aichi, and Katsuyoshi Hayashi, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 18, 1974, Ser. No. 524,733

Claims priority, application Japan, Nov. 21, 1973, 48-130065

Int. Cl.² H01B *1/02, 1/04;* **H01C** *1/02, 1/04*

U.S. Cl. 252—513 **5 Claims**

1. A glassy resistor composition for use in a resistor incorporated spark plug formed by mixing 100 parts by weight of a mixture of 1–40% by weight of at least one semiconductible oxide selected from group consisting of TiO_2, Nb_2O_5, ThO_2 and La_2O_3; 35–85% by weight of a glass powder; and 5–35% by weight of at least one metal powder selected from group consisting of Cu, Ag, Mn, Cr, Fe and an alloy of FeB; with 0.1–30 parts by weight of at least one powdery carbide selected from the group consisting of TiC, B_4C, SiC and TaC; serving as a reducing agent for said oxides.

4,001,146
NOVEL SILVER COMPOSITIONS

Samuel Jacob Horowitz, Snyder, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,421

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01B *1/02*

U.S. Cl. 252—514 **18 Claims**

1. Silver compositions useful for forming highly adherent conductor patterns on ceramic dielectric substrates, said compositions comprising a glass-free mixture of finely divided inorganic powders dispersed in a liquid vehicle, the inorganic powders comprising, based upon the total weight of inorganic powders in the composition, 1–5% crystalline inorganic binder and 95–99% metal powder selected from among (i) Ag and (ii) Ag plus Pt, Pd, Au, an alloy of Cu with one or more of Pt,

Pd, Au, and Ag, or mixtures thereof; wherein the weight ratio of Ag to other metals is at least 17/1; and wherein said crystalline inorganic binder consists essentially of bismuth oxide plus copper oxide, or lead oxide, or mixtures thereof, there being 0.3–6 parts by weight of copper oxide and/or lead oxide per part by weight of bismuth oxide.

4,001,147
OXAZOLINE AND/OR OXAZINE-MODIFIED POLYMERS

Thomas A. Chamberlin, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

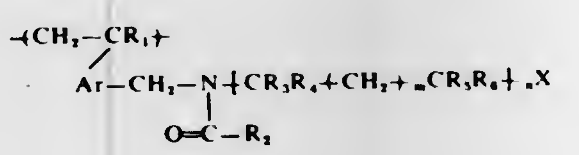
Filed Mar. 3, 1975, Ser. No. 554,380

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C08G *22/44*

U.S. Cl. 260—2.5 B **23 Claims**

1. A liquid-permeable, water-insoluble, synthetic resinous body, capable of removing a phenol from a phenol solution in contact therewith, comprising a cross-linked vinyl-addition polymer whose backbone contains a plurality of units corresponding to the formula



$$\begin{array}{l} -\!\left(CH_2-CR_1\right)\!- \\ \quad\;\; / \\ Ar-CH_2-N\!\left[CR_3R_4(CH_2)_m CR_5R_6\right]_n X \\ \qquad\qquad\;\; | \\ \qquad\quad\; O{=}C-R_2 \end{array}$$

wherein:

R_1 is hydrogen or methyl;

R_2 is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms;

R_3–R_6 are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, with the proviso that at least two of R_3–R_6 are hydrogen;

Ar is a carbocyclic aromatic nucleus;

m is 0 or 1;

n is an integer of at least 1; and

X is Cl, Br, I, or OH.

4,001,148
PROCESS FOR THE PRODUCTION OF FLAME-RESISTANT PHENOLIC RESIN FOAM PLASTICS

Dragomir Simic, Mulheim; Heinz-Ulrich Zupancic, Duisburg, and Martin Cherubim, Rheinkamp-Eick, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Germany

Filed Mar. 3, 1975, Ser. No. 554,899

Claims priority, application Germany, Mar. 21, 1974, 2413567

Int. Cl.² C08J *9/14, 9/16*

U.S. Cl. 260—2.5 F **13 Claims**

1. A process for the production of a flame-resistant, phenolic resin foam plastic which comprises:

1. forming in aqueous solution an alkaline-condensed phenol-formaldehyde resin,
2. mixing with the said resin solution an expanding agent and an acidic curing agent, and
3. subjecting the mixture to foaming at a temperature of about 15° to about 80° C to form the foam plastic, and wherein the said acidic curing agent is a mixture comprising:
   a. 8 to 70 percent by volume of an aromatic sulfonic acid,
   b. 10 to 40 percent by volume of a glycol, and
   c. 20 to 80 percent by volume of an about 75 to 85 weight percent phosphoric acid.

4,001,149
NOVEL FIRE-RETARDANT POLYMER

Anthony L. Scaggs, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1975, Ser. No. 619,334

Int. Cl.² C08J *9/02;* **C08F** *118/14*

U.S. Cl. 260—2.5 FP **6 Claims**

1. Cross-linked poly[N-(3-vinylphenyl)maleimide].

2. A process for the preparation of poly[N-(3-vinylphenyl)-maleimide] comprising polymerizing the product derived from the reaction of an aminophenyl ethanol and an unsaturated dicarboxylic anhydride, then subjecting the polymerized product to a heat source sufficient to cause cross-linking

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4,001,150
COMPOSITION FOR PREPARING ELECTROCONDUCTIVE RESIN COMPRISING AN UNSATURATED POLYESTER AND PHOSPHORIC OR SULFONIC UNSATURATED ESTER

Kiyoshi Juna; Koji Ohdan; Hiroyuki Nakayama, and Kiyohiko Asada, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Division of Ser. No. 201,991, Nov. 24, 1971, Pat. No. 3,867,351. This application Dec. 6, 1974, Ser. No. 530,148

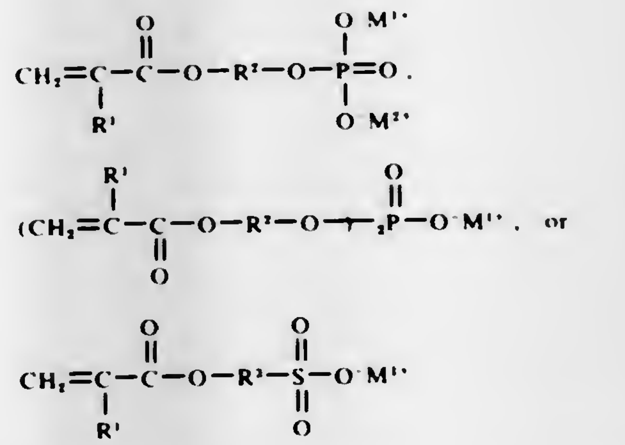
Claims priority, application Japan, Nov. 25, 1970, 45-103328; Dec. 25, 1970, 45-118132

Int. Cl.² C07F *9/08;* **C08L** *1/10, 1/26, 1/32*

U.S. Cl. 260—17 R **10 Claims**

1. An electroconductive composition which comprises:

A. at least one alkylene phosphoric ester, alkylene phosphate ester, alkylene sulfonic ester or alkylene sulfonate of acrylic acid or methacrylic acid, represented by the following formulae:



$$CH_2{=}\underset{\displaystyle R^1}{\underset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-O-R^2-O-\underset{\displaystyle O^-M^{2+}}{\underset{|}{\overset{\displaystyle O^-M^{1+}}{\overset{|}{P}}}}{=}O,$$

$$\left(CH_2{=}\overset{\displaystyle R^1}{\overset{|}{C}}-\underset{\displaystyle O}{\underset{\|}{C}}-O-R^2-O\right)_2\overset{\displaystyle O}{\overset{\|}{P}}-O^-M^{1+}, \quad \text{or}$$

$$CH_2{=}\underset{\displaystyle R^1}{\underset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-O-R^3-\underset{\displaystyle O}{\underset{\|}{\overset{\displaystyle O}{\overset{\|}{S}}}}-O^-M^{1+}$$

in which R^1 is hydrogen or a methyl group, R^2 is an alkylene group having 1 to 4 carbon atoms, R^3 is an alkylene group having 1 to 5 carbon atoms, and each M^1 and M^2 is hydrogen, a monovalent metal, ammonium or monoamine, and

B. unsaturated polyester of acrylic acid, methacrylic acid, α-chloroacrylic acid or α-bromoacrylic acid, and polyhydric alcohol having 2 to 4 hydroxyl groups, said polyester having at least two polymerizable ethylenically unsaturated groups.

4,001,151
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,580

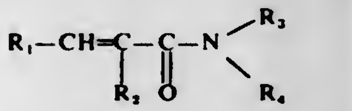
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C08L *5/06, 5/04*

U.S. Cl. 260—17.4 ST **4 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and powdered polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material selected from the group consisting of
   1. a copolymer of an acrylamide having the formula:



$$R_1-CH=\underset{R_2}{\underset{|}{C}}-\underset{O}{\underset{\|}{C}}-N\begin{matrix}\diagup R_3\\ \diagdown R_4\end{matrix} \qquad (1)$$

   wherein R_1 is methyl or hydrogen; and R_2, R_3, and R_4 are each hydrogen or 1 to 7 carbon lower alkyl, with a vinyl quaternary ammonium salt selected from the group consisting of trialkylaminoalkyl acrylate salts, trialkylaminoalkyl methacrylate salts, and vinyloxyalkyltrialkylammonium salts, wherein the alkyl group contains from 1 to 7 carbon atoms; and
   2. a copolymer of an acrylamide having the formula (1) above with a vinyl or alkyl-substituted vinyl pyridinum salt, wherein the alkyl group is 1 to 7 carbon lower alkyl; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive, of at least one anionic gum selected from the group consisting of gum karaya, gum arabic, gum Shiraz, gum tragacanth, pectin, pectinates, algin and alginates.

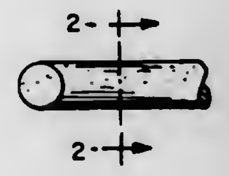
4,001,152
FLAMMABLE THERMOPLASTIC CEMENT

Horst M. Leonhardt, 6-"I" Green Knoll Circle, Brockton, Mass. 02402

Continuation-in-part of Ser. No. 37,152, May 14, 1970, abandoned. This application Nov. 13, 1972, Ser. No. 306,326

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—18 N **10 Claims**



1. A self-heating hot melt formulation capable of being applied without auxiliary equipment consisting essentially of an organic thermoplastic synthetic resin hot melt adhesive intimately admixed with a lesser portion by weight of fuel capable of undergoing a sustained burning upon ignition, said fuel being in such an amount that a molded shape formed from said combination of hot melt adhesive and fuel upon being ignited at one end will slowly undergo said burning causing the hot melt adhesive to melt and drip forming a deposit of molten adhesive containing a residuum of fuel which continues to undergo said burning maintaining said adhesive molten until said fuel is consummed.

4,001,153
UNSATURATED POLYESTER RESIN COMPOSITION

Akira Ogino, Osaka; Yoshikazu Nakai, Hyogo; Takeo Nakayama, and Koji Miyamura, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Dec. 13, 1974, Ser. No. 532,640

Claims priority, application Japan, Dec. 14, 1973, 48-140866

Int. Cl.^{2} C08G *63/48*

U.S. Cl. 260—22 CB **15 Claims**

1. An air-drying unsaturated polyester resin composition for powder coating application comprising (1) a solid unsaturated polyester resin made up of (a) a polyol component containing not less than 30 mole percent of a glycol having cycloalkylene or phenylene groups and (b) an unsaturated polycarboxylic acid component containing (i) a drying oil fatty acid or (ii) tetrahydrophthalic acid and a drying oil fatty acid, (2) a solid vinyl or allyl compound and (3) a catalyst.

4,001,154
PRIMER ADHESIVE COMPOSITION

Donald L. Schmidt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 4, 1973, Ser. No. 393,853

Int. Cl.^{2} C08L *61/20*

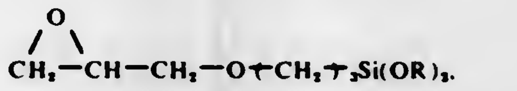
U.S. Cl. 260—29.4 UA **14 Claims**

1. A thermally-curable, film-forming, primer adhesive composition comprising an aqueous solution of

a. a water-soluble, cross-linkable polymer bearing a plurality of carboxyl groups selected from the group consisting of a copolymer of an α-olefin with maleic acid; and copolyer of a vinyl aromatic hydrocarbon with maleic anhydride, acrylic or methacrylic acid; a copolymer of acrylic or methacrylic acid with acrylamide, a vinyl ketone, vinyl alkanoate or vinyl pyrrolidone; a terpolymer of acrylic acid and styrene and an alkyl acrylate; or a partially hydrolyzed polyacrylamide having from about 5 to about 30 percent of the acrylamide moieties in the form of free carboxyl groups; or a water-soluble alkali metal or ammoniumsalt thereof, and

b. a small but sufficient amount of a water-soluble cross-linking agent to react with the carboxy groups in (a) and thereby form a water-swellable polymer, and

c. a silane corresponding to the formula $NH_2-CH_2CH_2NH)_qCH_2CH_2CH_2-Si(OR)_3$ or an N-alkylated derivative thereof or $HS-CH_2)_3Si(OR)_3$ or



$$\overset{O}{\overbrace{CH_2-CH}}-CH_2-O\!+\!CH_2\!+_3Si(OR)_3.$$

wherein q is 0 to 10 and R is hydrogen, methyl or ethyl.

4,001,155
PAINT BINDERS OF MANNICH BASES AND EPOXY RESINS

Firtz Erdmann Kempter, Mannheim; Guenther Sabelus, Lambsheim, and Herbert Spoor, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 11, 1974, Ser. No. 522,629

Claims priority, application Germany, Nov. 15, 1973, 2357075

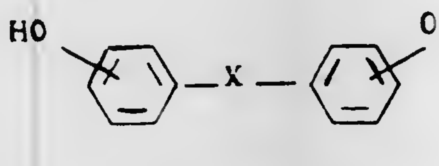
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C08G *51/24*

U.S. Cl. 260—29.2 EP **3 Claims**

1. An aqueous paint binder for the cathodic electrocoating of electrically conductive metal surfaces, comprising a substantially epoxide group-free reaction product of

a. Mannich bases of
   a_1.



wherein X is a straight-chain or branched-chain divalent aliphatic radical of from 1 to 3 carbon atoms or is $>SO_2$, $>SO$ or $-O-$

   a_2. at least one secondary mono amine containing at least one hydroxyalkyl group, or a mixture of said secondary amine with one other secondary or primary mono amine, and
   a_3. formaldehyde or a formaldehyde-donating compound, with

b. at least one epoxide resin containing 1,2 epoxide groups, the components (a) and (b) being combined in such quantities that from 0.6 to 1.3 epoxide groups of component (b) are present for each molecule of component (a_1).

4,001,156
METHOD OF PRODUCING EPOXY GROUP-CONTAINING, QUATERNARY AMMONIUM SALT-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 277,697, Aug. 3, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, abandoned, and Ser. No. 100,825, Dec. 22, 1970, abandoned, and Ser. No. 100,834, Dec. 22, 1970, abandoned, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and Ser. No. 100,825, , and Ser. No. 100,834, , said Ser. No. 100,825, and Ser. No. 100,834, each is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application Mar. 28, 1974, Ser. No. 455,686

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C08G *51/24*

U.S. Cl. 260—29.2 EP **14 Claims**

1. A method of preparing an ungelled, water-dispersible, epoxy group containing quaternary ammonium salt-containing resin comprising

A. reacting, at a temperature of about 70 to about 100°C. in the presence of about 1.75 to about 20 percent by weight based on total reaction mixture solids of water:
   1. an organic polyepoxide having a 1,2-epoxide equivalent greater than 1, and
   2. an amine acid salt, the weight ratio of said amine acid salt to said epoxy being from about one part to about 50 parts by weight of the salt per 100 parts by weight of epoxy; and,

B. adding to the resultant reaction product a material selected from the group consisting of aqueous boric acid solutions, boric acid, and compounds hydrolyzable to form boric acid in aqueous medium.

4,001,157
PRODUCTION OF NON-FOAMING AQUEOUS SUSPENSIONS OF POLYETHYLENE OR POLYPROPYLENE FIBRIDS

Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal; Heinz Berbner, Moerlenbach, and Manfred Hoffmann, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 515,550, Oct. 17, 1974, Pat. No. 3,950,293. This application Nov. 19, 1975, Ser. No. 633,291

Claims priority, application Germany, Oct. 18, 1973, 2352190

Int. Cl.^{2} C08L *61/20*

U.S. Cl. 260—29.4 UA **5 Claims**

1. A process for the manufacture of non-foaming aqueous suspensions of polyolefin fibrids by dispersing polyethylene fibrids or polypropylene fibrids in water in the presence of a dispersing agent, said fibrids having a specific surface area of 1–150 m^2/g, the improvement wherein the dispersing agent used consists of from 0.1 to 2.0% by weight, based on the dry weight of the fibrids, of a urea/formaldehyde polycondensate which has been modified with sodium bisulfite or a melamine/-formaldehyde polycondensate which has been modified with sodium bisulfite, the molar ratio of urea to formaldehyde to sodium bisulfite and melamine to formaldehyde to sodium bisulfite being in the range of 0.1–10:0.2–20:0.01–1

4,001,158
CRUSHED FOAM-BACKED FABRICS AND EMULSIONS FOR PRODUCING THE SAME

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 433,634, Jan. 16, 1974, Pat. No. 3,933,691. This application Dec. 9, 1974, Ser. No. 530,311

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.^{2} C08L *23/08*

U.S. Cl. 260—29.6 TA **10 Claims**

1. A foamable pigmented aqueous emulsion comprising an aqueous medium having colloidally suspended therein an emulsion copolymer consisting essentially of from 15–40% ethylene, from 1.5–9% of cross-linking monomers including at least 0.5% of monoethylenically unsaturated monomer carrying the N-methylol group, balance vinyl acetate, said copolymer having a molecular weight of at least about 300,000, said emulsion including dissolved thickener providing a viscosity of from 500 – 5,000 centipoises, added surfactant to enable the emulsion to be foamed, and dispersed pigment in a pigment to binder weight ratio of from 0.1:1 to 2:1.

4,001,159
AQUEOUS DISPERSION OF OLEFIN-ACRYLATE COPOLYMER

Shozaburo Imai, and Masaaki Hirooka, both of Ibaragi, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 353,493, April 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,684

Int. Cl.^{2} C08L *23/22*

U.S. Cl. 260—29.6 TA **24 Claims**

1. An aqueous dispersion of a copolymer in water, charac-

terized in that the copolymer is an olefin-acrylate copolymer, said olefin being at least one member selected from the group consisting of olefins having 3 to 20 carbon atoms, said acrylate being at least one member selected from the group consisting of esters of acrylic acid in which the alcohol moiety is a hydrocarbon or halohydrocarbon group having 1 to 20 carbon atoms,

said copolymer containing 5 to 60 mole percent of the olefin, 40 to 95 mole percent of the acrylate and 0 to 30 mole percent of at least one member selected from the group consisting of acryloyl halides and maleic anhydride;

is present in a proportion of 1 to 300 parts by weight per 100 parts by weight of water; and

forms substantially dispersed phase, and water forms the continuous phase.

4,001,160

AQUEOUS EMULSION ADHESIVES BASED ON C_2-C_8 ETHERS OF N-METHYLOL AMIDES COPOLYMERIZED WITH VINYL ESTERS IN THE PRESENCE OF HYDROXY FUNCTIONAL PROTECTIVE COLLOIDS

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 401,088, Sept. 26, 1973, Pat. No. 3,941,735. This application Feb. 18, 1975, Ser. No. 550,815

Int. Cl.² C08L *1/28, 23/08*

U.S. Cl. 260—29.6 WA **12 Claims**

1. An aqueous adhesive emulsion which develops water resistance through cure, the water of said emulsion having emulsified therein an aqueous emulsion copolymer consisting essentially of monoethylenic monomers, at least 40% up to 99.5% of the copolymer being vinyl ester of a saturated aliphatic monocarboxylic acid having up to 18 carbon atoms and from 0.5–15% of the copolymer of monomers providing thermosetting characteristics and consisting essentially of an N-methylol derivative of acrylamide or methacrylamide etherified with a $C_2 - C_8$ alcohol, any balance of said copolymer consisting essentially of nonreactive monoethylenic monomers copolymerizable with said vinyl ester, the monomers of said copolymer being emulsified during copolymerization by from 0.05% to 10% of an hydroxy functional protective colloid selected from the group consisting of polyvinyl alcohol and hydroxy ethyl cellulose.

4,001,161

LOW MOLECULAR WEIGHT HYDROLYZED POLYACRYLAMIDE AND USE THEREOF AS SCALE INHIBITOR IN WATER SYSTEMS

Dae Suk Song, Wyckoff, N.J.; Richard Joseph Duffy, Greenwich, Conn.; Charles Richard Witschonke, Noroton, Conn.; Arthur Maurice Schiller, Stamford, Conn., and Mark Allan Higgins, Guilford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 13, 1975, Ser. No. 586,765

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 H **4 Claims**

1. A process for polymerizing acrylamide to produce a hydrolyzed acrylamide polymer of 500–5000 molecular weight which comprises (1) charging to a reaction zone, equipped with a reflux condenser and containing water heated to reflux as the polymerization medium, simultaneously and continuously without external heating, separate streams of acrylamide, ammonium persulfate and a mercaptoalkanoic acid, the amounts by weight of ammonium persulfate and mercaptoalkanoic acid so charged being from about 0.05 to about 2 parts and from about 5 to about 20 parts, respectively, per 100 parts of acrylamide charged and the charging rates of the separate streams being controlled so that the introduction of all three streams starts and finishes substantially together and the heat of polymerization is sufficient to maintain reflux in the reaction zone without exceeding the capacity of the condenser to remove the heat of reaction, (2) applying heat to the reaction zone to maintain the refluxing towards the end of the addition of the three streams and (3) charging a sufficient amount of aqueous sodium hydroxide to hydrolyze from about 60% to about 90% of the amide groups of the polymer to carboxylate groups and provide a water solution of the hydrolyzed polymer product.

4,001,162

STABLE HEAT-SENSITIVE LATEX MIXTURES

Martin Matner, Odenthal; Hermann Perrey, Krefeld, and Ernst Schwinum, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 7, 1975, Ser. No. 565,402

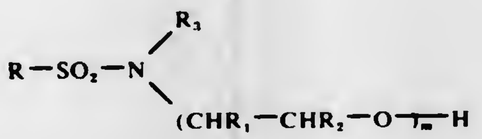
Claims priority, application Germany, Apr. 11, 1974, 2417705

Int. Cl.² C08L *33/00*

U.S. Cl. 260—29.6 SQ **3 Claims**

1. A heat-sensitized polymer latex mixture containing from 0.05 to 10% by weight, based on the polymer, of a heat-sensitizer, and

from 0.1 to 10% by weight, based on the polymer, of a sulphonamide acting as a stabilizer corresponding to the general formula:



$$R-SO_2-N\begin{cases} R_3 \\ (CHR_1-CHR_2-O)_m-H \end{cases}$$

wherein:

R represents alkyl, chloroalkyl or cycloalkyl having from 8 to 30 carbon atoms or alkaryl having from 10 to 30 carbon atoms,

R_1 and R_2 which may be the same or different, represent hydrogen, chloromethyl, methyl, ethyl or phenyl,

m is 0 or an integer from 1 to 50, and

R_3 represents hydrogen, alkyl, alkaryl, aryl or $-(CHR_1-CHR_2-O)_m H$ wherein R_1, R_2 and *m* are as defined above.

4,001,163

STYRENE-BUTADIENE COPOLYMER LATICES CONTAINING CARBOXYL GROUPS

Martin Matner, Odenthal; Ernst Schwinum, Leichlingen, and Ludwig Mott, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 11, 1975, Ser. No. 567,358

Claims priority, application Germany, Apr. 17, 1974, 2418419

Int. Cl.² C08L *25/10*

U.S. Cl. 260—29.7 T **9 Claims**

1. A carboxyl group-containing polymer latex comprising a copolymer of

73.5 to 18.5 parts by weight of butadiene,

20.0 to 80.0 parts by weight of styrene,

1.0 to 4.0 parts by weight of acrylic acid,

0.5 to 6.0 parts by weight of methacrylic acid,

0 to 10.0 parts by weight of acrylonitrile and

0 to 5.0 parts by weight of at least one ethylenically unsaturated carboxylic acid amide or methylol derivative thereof

and, as the sole emulsifier in said latex, less than 0.5 parts by weight, per 100 parts by weight of copolymer, of at least one anionic emulsifier.

4,001,164

FAST DRYING INK

Victor Fu Hua Chu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 537,597, Dec. 30, 1974, abandoned, and a continuation-in-part of Ser. No. 324,825, Jan. 18, 1973, abandoned. This application July 2, 1975, Ser. No. 592,658

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08K *5/11, 5/12*

U.S. Cl. 260—31.8 N **19 Claims**

1. A liquid ink composition of low volatility consisting essentially of

A. a colorant;

B. as a film former, 15–40% by weight of the composition of a compound of classes II through X; and

C. a carrier having a vapor pressure of less than about 10 mm./Hg. at 20°C., and most of which will separate from the composition by migration into the substrate to which the composition is applied,

the film derived from the composition under normal use conditions having a melting point of no more than about +18°C if crystalline or a glass transition temperature of no more than about −18°C. if non-crystalline.

4,001,165

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYFUNCTIONAL ISOCYANATES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,697, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 423,373

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 UB **18 Claims**

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc which is demoldable, without the application of an external source of heat, within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;

B. an organic polyisocyanate having an NCO functionality of at least about 2.5;

C. a liquid modifier compound having a boiling point of at least about 150° C or mixture of such compounds and which moderates the reaction exotherm between components (A), (B) and (D) without substantial reaction therewith selected from the group consisting of aromatic compounds free from ester groups, partially hydrogenated aromatic compounds free from ester groups, and mixtures thereof; and

D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, component (C) is present in quantities of from about 10 to about 50 percent by weight of the combined weights of components (A), (B) and (C); and component (D) is present in quantities of from about 0.01 to about 10 percent by weight of the combined weight of components (A), (B) and (C).

4,001,166

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 405,244

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 UB **31 Claims**

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of aromatic compounds free from ester groups, and groups reactive with NCO groups and mixtures thereof; and

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C)

4,001,167

ADHESIVE COMPOSITIONS COMPRISING AROMATIC PROCESS OIL AND BLOCK COPOLYMER

Barry F. Tungseth, St. Paul, and James A. Lindlof, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1969, Ser. No. 852,256

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **9 Claims**

1. A self-healing tacky adhesive composition consisting essentially of: a major proportion of an aromatic hydrocarbon process oil having a viscosity of at least about 250 (SSU/210° F.), an initial boiling point of at least about 700° F., and an aromatic content (clay-gel method) of at least about 50%, and a minor proportion of a block copolymer having an average molecular weight of at least about 85,000 and having the type formula A-B-A wherein the A components account for about 10–40 percent of the total, each A represents a non-elastomeric vinyl arene polymer block having an average molecular weight of about 5,000 to about 125,000, and B represents an elastomeric conjugated diene polymer block having an average molecular weight of about 75,000 to about 250,000; the amount of said copolymer being between about 35 and about 45 parts per 100 parts of said oil; and said composition having the following properties when tested as described in the specification

adhesion	at least	10 gm /sq cm
tensile	at least	4 psi
elongation	at least	100 %
brittle point	not above	20° F
slump	not more than 1/8 inch	

4,001,168

TRANSPARENT STORAGE-STABLE POLYSILOXANES WHICH CROSS-LINK UNDER ATMOSPHERIC CONDITIONS

Günther Maass, Cologne; Hans Joachim Lücking, Bergisch-Neukirchen; Hans Sattlegger, Odenthal-Gloebusch, and Karl-Heinz Rudolph, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1975, Ser. No. 559,473

Claims priority, application Germany, Mar. 22, 1974, 2413850

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **6 Claims**

1. A polysiloxane composition which can be cross-linked under atmospheric conditions to a transparent silicone elastomer and which consists essentially of:

- a. 100 parts by weight of an α,ω-dihydroxymethylphenylpolysiloxane with about 7–15 mole % of diphenylsiloxy units or about 14–28 mole % of methylphenylsiloxy units, and having a viscosity of between about 1,000 and 500,000 cSt (at 20° C),
- b. about 1 to 40 parts by weight of an uncoated reinforcing filler consisting essentially of SiO_2 having a specific surface area of about 40 to 500 m^2/g by the BET method, and
- c. about 1 to 100 parts by weight of a cross-linking agent of the formula

$RSiX_3$

wherein

R is an alkyl, alkenyl, halogenoalkyl, phenyl or phenylalkyl radical having up to 6 carbon atoms in each alkyl or alkenyl moiety, or cyclohexyl, and

X is an alkoxy or alkylamino radical having up to 6 carbon atoms in each alkyl moiety, a lower acyloxy radical or an oxime radical of an alkyl ketone or aldehyde having up to 4 carbon atoms.

4,001,169

COLORATION OF POLYESTERS

Ian Cheetham; Kenneth Dunkerley; Colin William Greenhaigh; James Albert Moyse, and David Francis Newton, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

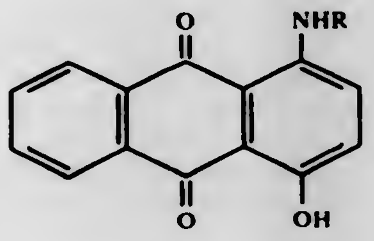
Filed Feb. 26, 1974, Ser. No. 445,837

Claims priority, application United Kingdom, Mar. 2, 1973, 10234/73

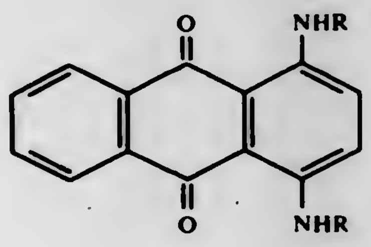
Int. Cl.^{2} C08K *5/08*

U.S. Cl. 260—40 P **6 Claims**

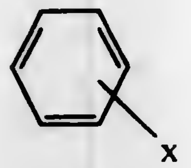
1. A process for mass colouring synthetic linear polyesters which process comprises incorporating into a preformed polyester a mixture comprising a first dyestuff of the formula:



and a second dyestuff of the formula



wherein R is a group of the formula



and X is an acylamino radical which is free from hydroxy or carboxylic acid groups.

4,001,170

PROCESS FOR BULK DYEING HIGH MOLECULAR ORGANIC COMPOUNDS

Arnold Wick, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 1, 1974, Ser. No. 485,188

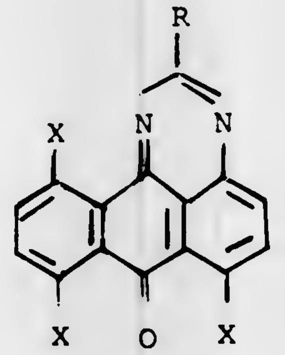
Claims priority, application Switzerland, July 4, 1973, 9769/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C08K *5/35*

U.S. Cl. 260—40 P **6 Claims**

1. A process for bulk dyeing high molecular organic compounds characterized by employing anthrapyrimidines of the formula



as the dyestuffs wherein R is an aromatic radical, one X is an arylamino group, and the remaining X groups are hydrogen atoms.

4,001,171

POLYMERIC FIBERS CONTAINING COLOR CONCENTRATES

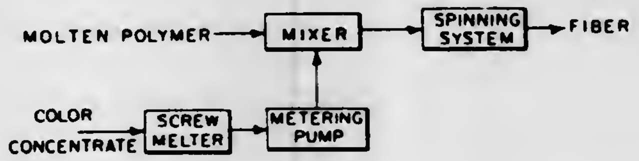
Ram-Tirth Khanna, Linden Heath, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 414,287, Nov. 9, 1973, Pat. No. 3,905,937, which is a continuation-in-part of Ser. No. 241,253, April 5, 1972, abandoned. This application June 26, 1975, Ser. No. 590,502

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} C08K *9/04*

U.S. Cl. 260—40 R **9 Claims**



1. A polymeric fiber containing enough of a composition comprising, as essential components,

- A. colorant, 1–80% by weight;
- B. 1–25% by weight of a deflocculating agent of Class I through Class X; and
- C. a polymeric carrier, not of Class I through Class X in (B), compatible with the fiber-forming polymer,

to provide 0.05–5%, by weight of the fiber, of colorant.

4,001,172

POLYMERS WITH IMPROVED PROPERTIES AND PROCESS THEREFOR

Robert A. Steinkamp, and Thomas J. Grail, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 240,494, April 3, 1972, Pat. No. 3,862,265, and a continuation-in-part of Ser. No. 132,838, April 9, 1971, abandoned. This application July 10, 1974, Ser. No. 487,070

Int. Cl.^{2} C08K *7/14, 3/04;* **C08F** *255/02, 255/08*

U.S. Cl. 260—42.18 **20 Claims**

1. A masterbatch comprising 50 to 90 wt. percent of a grafted polymeric composition, prepared from a base polyolefin polymer, comprising from 0.02 to 20 weight percent of grafted compound and having a melt flow rate of from 3 to 1000 and at least 50% higher than said base polymer and a die swell of at least 0.05 unit less than that of said base polymer and 10 to 70 weight percent of conventional additive for polyolefins selected from the group consisting of heat stabilizers, slips agents, antioxidants, anti-static agents, colorants, flame retardants, plasticizers, preservatives, processing aids, and fillers.

4,001,173

PROCESS FOR PRODUCING VINYL POLYMERS

Alexandr Evgenievich Chuchin, Petrovsko-Razumovsky proezd, 20, kv. 52; Leonid Leonidovich Proskurin, 2 Sinichkina ulitsa, 26, kv. 76; Irina Jurievna Kalnova, Teply Stan, 3 mikroraion, korpus 41, kv. 97, and Vladimir Viktorovich Rozhkov, shosse Entuziastov, 212, korpus 4, kv. 474, all of Moscow, U.S.S.R.

Filed Jan. 22, 1975, Ser. No. 543,049

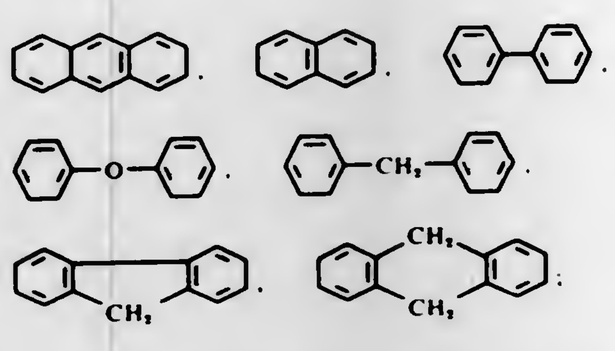
Int. Cl. C08k *3/00*

U.S. Cl. 260—45.7 R **4 Claims**

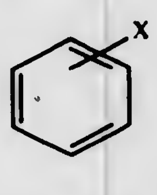
1. In a process for polymerizing vinyl monomers, the improvement which comprises carrying out the polymerization in the presence of aromatic compounds selected from the group consisting of (1) polyarylenealkylenes of the formula:

$$-\!\left[Ar_1-CH_2)_k\right]\!-_m \qquad Ar_2\!-\!\left[(CH_2)_k\,Ar_1\right]\!-_n.$$

wherein Ar_1 and Ar_2 are



$m + n = 2$ to 30; k is an integer of 1 and 2; and when $k = 1$, Ar_1 and Ar_2 are also



where X is H or a C_1–C_4 alkyl; and (2) hydroperoxides of said polyarylenealkylenes; said aromatic compounds being used in an amount within the range of from 0.01 to 15% by weight of the starting vinyl monomers.

4,001,174

INCOMBUSTIBLE POLYOLEFIN MOLDING COMPOSITIONS AND METHOD OF CROSSLINKING SAME

Kiyoshi Yagi, Susono, and Miyoshi Yamamoto, Gotenba, both of Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,511

Int. Cl.^{2} C08K *5/02, 5/03, 3/22*

U.S. Cl. 260—45.7 R **14 Claims**

1. An incombustible polyolefin molding composition characterized by comprising 100 parts by weight of a polyolefin, 1–35 parts by weight of zirconium oxide, 50–100 parts by weight of a compound selected from the class consisting of aluminum hydroxide and aluminum oxide and 1–75 parts by weight of chlorine-containing hydrocarbon having a chlorine content of less than 50% by weight.

4,001,175

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 29, 1975, Ser. No. 626,938

Int. Cl.^{2} C08K *5/42*

U.S. Cl. 260—45.7 S **13 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of aromatic sulfoxides, and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic sulfoxides is selected from the group consisting of alkyl radicals and electron withdrawing radicals and mixtures thereof.

4,001,176

RING PHOSPHONATES AS FLAME-RETARDANTS

James S. Clovis, and Francis R. Sullivan, both of Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

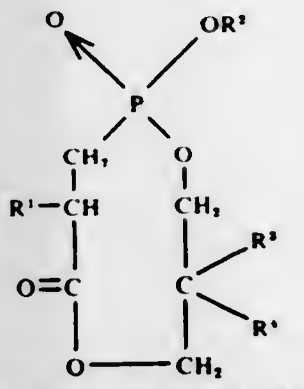
Division of Ser. No. 139,949, May 3, 1971, Pat. No. 3,812,219. This application Apr. 26, 1973, Ser. No. 354,730

Int. Cl.^{2} C08K *5/53*

U.S. Cl. 260—45.8 R **6 Claims**

1. As an article of manufacture, an acrylic composition comprising an addition polymer formed from a mixture comprising:

- a. at least 50 percent by weight of methyl methacrylate; and
- b. 5 to 30 percent by weight of a flame-resistant phosphorus compound defined by the general formula:



wherein R^1 is selected from the group consisting of hydrogen and methyl, R^2 is phenyl or substituted phenyl wherein the substitution is one or more of halogen, nitro, lower alkyl, cyclohexyl, alkoxy, naphthoxy, or phenoxy, and R^3 and R^4 are the same or different and are lower alkyl of up to 8 carbon atoms.

4,001,177
FLAME-RETARDING POLYAMIDE COMPOSITION

Tadao Tsutsumi, Nagoya; Nobuo Kato, Aichi; Masanobu Morikawa; Toshikazu Aoyama, both of Nagoya, and Kazumi Nagai, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

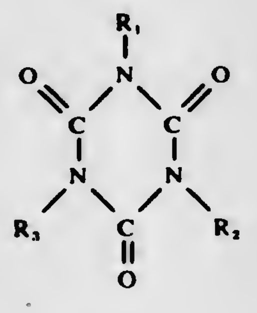
Filed Nov. 3, 1975, Ser. No. 628,338

Claims priority, application Japan, Nov. 7, 1974, 49-127521

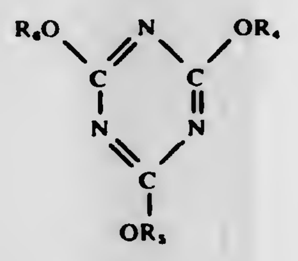
Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.8 NT **9 Claims**

1. A flame-retarding polyamide composition which comprises polyamide having receiving amide groups as integral parts of the main polymer chain, about 3 to 40% by weight of melamine on the basis of the polyamide, and about 0.5 to 20% by weight on the basis of the polyamide and about 2 to 75% by weight on the basis of melamine of a compound represented by a compound selected from the group consisting of the following formulas (I) and (II):



(I)



(II),

wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of hydrogen, alkyl, alicyclic and aromatic radicals having from 1 to 10 carbon atoms, and from such radicals having a substituent selected from the group consisting of —OH, —COOR′ and $—CONH_2$, wherein R′ is aliphatic alkyl group having from 1 to 5 carbon atoms.

4,001,178
ORGANO-TIN MERCAPTIDES WITH POLYSULPHANEDIYL GROUPS

Georges Bakassian, Les Lyon, and Michel Gay, Lyon, both of France, assignors to Rhone-Poulenc, Paris, France

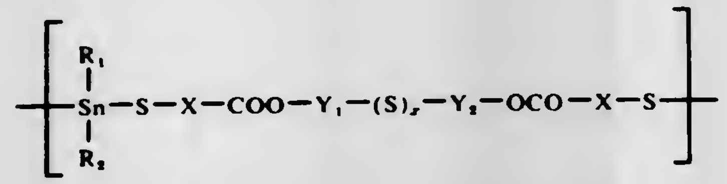
Filed May 10, 1974, Ser. No. 468,997

Claims priority, application France, May 14, 1973, 73.17326

Int. Cl.² C08K *5/58*

U.S. Cl. 260—45.75 S **7 Claims**

1. An organo-tin mercaptide consisting essentially of groups of the formula:



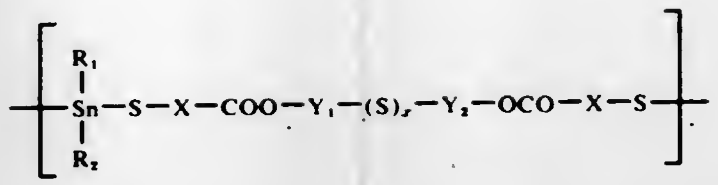
$$\left[-\overset{R_1}{\underset{R_2}{\mathrm{Sn}}}-\mathrm{S}-\mathrm{X}-\mathrm{COO}-\mathrm{Y}_1-(\mathrm{S})_x-\mathrm{Y}_2-\mathrm{OCO}-\mathrm{X}-\mathrm{S}- \right]$$

in which X represents a straight or branched chain alkylene group with up to 4 carbon atoms or a phenylene group;

x represents an integer from 2 to 6;

Y_1 and Y_2, which may be identical or different each represents a straight or branched chain alkylene group with at most 6 carbon atoms, and R_1 and R_2, which may be identical or different, each represents a straight or branched chain alkyl group with 1 to 10 carbon atoms.

2. A halogenated vinyl resin containing 0.2 to 3% by weight of an organo-tin mercaptide consisting essentially of groups of the formula:



$$\left[-\overset{R_1}{\underset{R_2}{\mathrm{Sn}}}-\mathrm{S}-\mathrm{X}-\mathrm{COO}-\mathrm{Y}_1-(\mathrm{S})_x-\mathrm{Y}_2-\mathrm{OCO}-\mathrm{X}-\mathrm{S}- \right]$$

in which X represents a straight or branched chain alkylene group with up to 4 carbon atoms or a phenylene group;

x represents an integer from 2 to 6;

Y_1 and Y_2, which may be identical or different each represents a straight or branched chain alkylene group with at most 6 carbon atoms, and R_1 and R_2, which may be identical or different, each represents a straight or branched chain alkyl group with 1 to 10 carbon atoms.

4,001,179
BIS-(TETRAHALOPHTHALIMIDOCARBONYL)-BENZENE

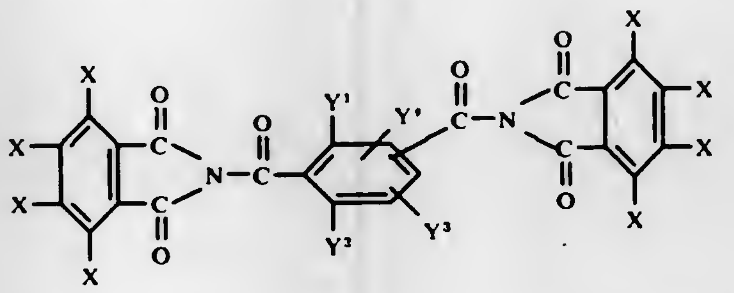
Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,453

Int. Cl.² C07D *209/48;* **C08K** *5/00*

U.S. Cl. 260—45.75 B **13 Claims**

1. A compound of the formula



wherein X is chlorine or bromine and each of Y^1, Y^2, Y^3 and Y^4 are hydrogen, chlorine or bromine.

7. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of a compound of claim 1.

4,001,180
POLYURETHANE CURING AGENT

Earl N. Doyle, 1737 Campbell Road, Houston, Tex. 77055, and Anna W. Crull, 6110 Cheena, Houston, Tex. 77035

Filed Feb. 27, 1975, Ser. No. 553,652

Int. Cl.² C08G *18/30, 18/32*

U.S. Cl. 260—75 NH **12 Claims**

1. A polyfunctional curing agent for polyurethane elastomers comprising the reaction product of methylene bis (methyl anthranilate) and from about 0.025 to about 0.1 equivalents of an isocyanate-terminated prepolymer containing from about 2 to about 10 mole percent excess isocyanate groups.

4,001,181
HINDERED PIPERIDINE CARBOXAMIDE ACIDS, METAL SALTS THEREOF, AND STABILIZED COMPOSITIONS

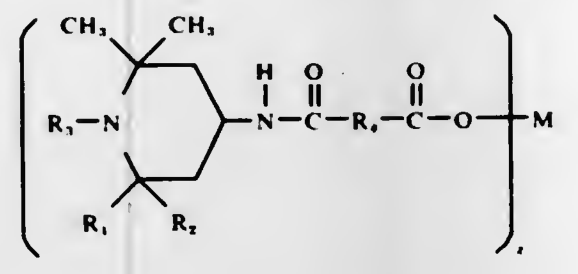
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,327, Dec. 28, 1973, Pat. No. 3,907,803. This application July 30, 1975, Ser. No. 600,234

Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.75 N **9 Claims**

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.005 to 5% of a stablizing compound of the formula:



(1)

wherein

R_1 and R_2 independently of each other are straight- or branched-chain lower alkyl having 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl,

R_4 is straight- or branch-chain alkylene having 1 to 8 carbon atoms, phenylene, phenylene substituted with one or more alkyl groups, or the group $-(CH_2)_mY(CH_2)_n-$, wherein Y is oxygen or sulfur and m and n independently of each other are an integer of from 1 to 3,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin, dialkyl tin and

z has a value of from 1 to 4, the value of z being the same as the available valence of M.

4,001,182
FLAME RETARDANTS FOR POLYMERS

Timothy P. Murtha, and Roy A. Gray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1972, Ser. No. 236,342

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.85 R **5 Claims**

1. A flame-retardant composition comprising 1,11-diacetoxy-6-acetoxymethyl-2,2,6,10,10-penta(bromomethyl)-4,8-dioxaundecane and a synthetic polymer plastic.

4,001,183
TETRAPHENOL CONTAINING POLYCARBONATES

Dieter Freitag; Ulrich Haberland, and Heinrich Krimm, all of Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 404,557, Oct. 9, 1973, which is a division of Ser. No. 285,699, Sept. 1, 1972, Pat. No. 3,799,953, which is a continuation-in-part of Ser. No. 178,443, Sept. 7, 1971, abandoned. This application Mar. 13, 1975, Ser. No. 558,049

Claims priority, application Germany, Mar. 19, 1971, 2113347

Int. Cl.² C08G *63/62*

U.S. Cl. 260—47 XA **9 Claims**

1. A high molecular weight, branched polycarbonate substantially free of crosslinking which comprises a polycarbonate polymer containing residues of an aromatic dihydroxy compound, about 0.01 to about 1 mol percent of residues of 1,4-bis(4′,4″-dihydroxy-triphenylmethyl)-benzene and about 0.1 to 8 mol percent of monohydric phenol, the mol percentages being based on the mols of the aromatic dihydroxy compound, said branched polycarbonate having a relative viscosity of from 1.2 to about 1.55 measured on a solution of 0.5 gram in 100 ml of methylene chloride at 20° C, an average molecular weight of between about 30,000 and about 100,000, measured by light diffusion and a melt viscosity of between 20,000 and about 300,000 poises at 280° C.

4,001,184
PROCESS FOR PREPARING A BRANCHED POLYCARBONATE

Steven William Scott, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 31, 1975, Ser. No. 563,494

Int. Cl.² C08G *17/13*

U.S. Cl. 260—47 XA **14 Claims**

1. A process for preparing a thermoplastic randomly branched aromatic polycarbonate having improved resistance to thermal oxidation and having excellent blow molding properties which process comprises reacting at least 20 weight percent of a stoichiometric quantity of a carbonate precursor with a mixture of a dihydric phenol and at least 0.05 mole percent of a polyfunctional aromatic compound in a medium of water and an inert organic solvent for the polycarbonate having present therein at least 1.2 mole percent of a polymerization catalyst, a molecular weight regulator, and an inert organic solvent for the polycarbonate while concomitantly adding to the reaction medium sufficient alkali metal hydroxide to maintain a pH range of about 3.0 to about 6.0, and then adding sufficient alkali metal hydroxide to raise the pH to at least 9.0 but less than about 12.0 while reacting the remaining amount of the stoichiometric quantity of the carbonate precursor; said polyfunctional aromatic compound containing at least three functional groups selected from the group consisting of carboxyl, carboxylic anhydride and haloformyl or mixtures thereof.

4,001,185
ACCELERATION SENSING DEVICE

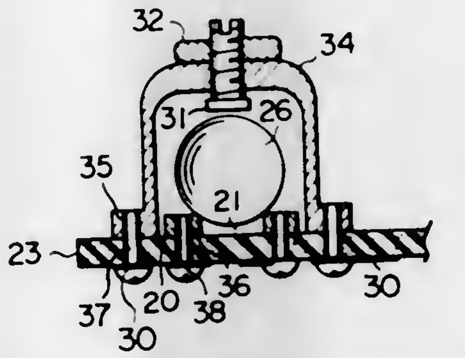
Tatsuo Mitsui, Hirakata; Okihiko Nakano, Katano, and Itaru Mitsugi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

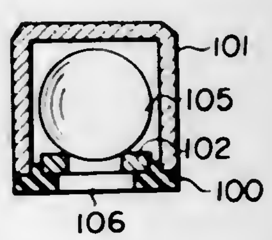
Filed June 18, 1973, Ser. No. 370,637

Claims priority, application Japan, June 28, 1972, 47-65274; July 20, 1972, 47-86117[U]; July 31, 1972, 47-90743[U]; Aug. 18, 1972, 47-96900[U]; Aug. 22, 1972, 47-98351[U]; Nov. 10, 1972, 47-130227[U]; Nov. 10, 1972, 47-130228[U]; Jan. 20, 1973, 48-9511[U]; Feb. 19, 1973, 48-21437[U]; Feb. 23, 1973, 48-23748[U]; May 18, 1973, 48-58929[U]

Int. Cl.² H01H *35/14, 1/16*

U.S. Cl. 200—61.45 R **23 Claims**





1. An acceleration sensing device comprising an electrically conductive horizontally disposed cylindrical non-magnetic support ring having a hole of predetermined radius, an insulating substrate supporting said support ring, an electrically conductive sphere having a radius larger than that of the hole of said support ring and placed on the upper inner periphery of said support ring, an electrically conductive contact member, and means supporting said contact member fixedly above said sphere and spaced therefrom when the sphere is normally on the support ring, said contact member having an axis substantially coaxial with the axis of the hole in said support ring, thereby establishing an electrical path between said support

ring and said contact member when an acceleration having a horizontal component greater than a predetermined value is applied to the sphere causing it to pivot on the inner edge of said support ring to make contact with the contact member.

4,001,186

PREPARATION OF POLYIMIDE FROM ORGANIC DIISOCYANATE WITH ALKALI METAL SALT OF ALCOHOL AS CATALYST

Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 7, 1974, Ser. No. 521,744

Int. Cl.² C08G *18/06, 73/14*

U.S. Cl. 260—63 N **13 Claims**

1. In a process for preparing an essentially linear dipolar aprotic solvent soluble solid polyimide by the condensation of an organic diisocyanate with a polycarboxylic compound containing two intramolecular carboxylic anhydride groups or free carboxylic acids thereof under anhydrous conditions in said solvent, the improvement which comprises carrying out said process in the presence of a catalytic amount of a compound MOR, wherein R represents alkyl or aryl, and M is an alkali metal and at a temperature of from about 40° C to about 140° C.

4,001,187

METHOD OF PRODUCING POLYESTERS TEREPHTHALIC ACID AND ETHYLENE GLYCOL

Yoshio Itabashi; Kentaro Noguchi, and Masao Seki, all of Hofu, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Continuation of Ser. No. 250,345, May 4, 1972, abandoned. This application July 11, 1974, Ser. No. 487,755

Claims priority, application Japan, Dec. 29, 1971, 47-34491; Mar. 13, 1972, 47-25405; Mar. 13, 1972, 47-25406

Int. Cl.² C08G *63/18*

U.S. Cl. 260—75 M **28 Claims**

1. A method of producing polyethylene terephthalate from terephthalic acid and ethylene glycol, which comprises continuously feeding a slurry of terephthalic acid in ethylene glycol having a molar ratio of ethylene glycol to terephthalic acid of not more than 1.3, into a reaction system containing at least one of bis-(β-hydroxyethyl) terephthalate and oligomers thereof, said terephthalic acid having a slurry forming ability of not more than 0.48, a slurry stability of not less than 60%, 4-carboxybenzaldehyde content of not more than 600 ppm and a *b* value of not more than 2.0, wherein slurry forming ability is defined as the weight ratio of ethylene glycol to terephthalic acid in a slurry having a viscosity of 30 poises and slurry stability is determined by the equation

$$\text{slurry stability} = \eta/30 \times 100$$

wherein η is the slurry viscosity measured 5 minutes after a slurry having an initial viscosity of 30 poises is placed in a vessel having a diameter of 75 mm to a depth of 10 cm; effecting the esterification reaction at a temperature of not lower than 240° C while removing the formed water out of the reaction system and then effecting the polycondensation.

4,001,188

DIMETHYL 2,5-DIBROMOTEREPHTHALATE ESTERIFICATION

James P. Nelson, Woodridge, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 263,199, June 15, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,828

Int. Cl.² C08G *63/34, 63/68*

U.S. Cl. 260—75 H **3 Claims**

1. A process for the preparation of homopolymeric trimethylene 2,5-dibromoterephthalate comprising reacting dimethyl 2,5-dibromoterephthalate with trimethylene glycol in the presence of 0.01 to 0.20% calcium salt of saturated aliphatic acids containing 2 to 8 carbon atoms based on the weight of dimethyl ester and 0.01 to 0.20% tetraalkyl titanate based on the weight of dimethyl ester at 150° to 265° C.

4,001,189

FIBERS OF ACID-DYEABLE POLYESTER HAVING TETRAMETHYLPIPERIDINE GROUPS ATTACHED THROUGH OXYALKALENE LINKAGES TO ENDS OF POLYMER CHAINS

Murty S. Tanikella, Newark, Del., and Odorich von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,953, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,700

Claims priority, application Germany, Sept. 17, 1973, 2346734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **10 Claims**

1. Acid-dyeable textile fibers or filaments of polyester containing a minor proportion, sufficient to provide at least 0.02 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups attached through oxyalkylene linkages to carboxylate units at the ends of polyester chains, said linkages being through the 1 or 4 positions of the tetramethylpiperidine ring, the oxyalkylene linkages consisting of oxyethylene or oxyethylene and oxypropylene, and there being an average of at least about 10 oxyalkylene units per tetramethylpiperidine group of which at least 5 are oxyethylene units.

4,001,190

ACID-DYEABLE FIBERS OF POLYESTER MODIFIED WITH TETRAMETHYLPIPERIDINE POLYETHER GLYCOLS

Murty S. Tanikella, Newark, Del., and Odorich von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,952, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,701

Claims priority, application Germany, Sept. 17, 1973, 2346734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **10 Claims**

1. Acid dyeable polyester fibers or filaments comprising, as integral components in linear polyester chains, a minor proportion sufficient to provide at least 0.05 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups linked to dicarboxylate chain units through substituents at both the 1 and 4 positions of the piperidine ring which contain oxyethylene units, and the number of oxyethylene units in such linking substituents on tetramethylpiperidine groups in the polyester averages at least 10 oxyethylene units per tetramethylpiperidine group.

4,001,191

COMBUSTIBLE MONOMERS AND POLYMERS THEREFROM

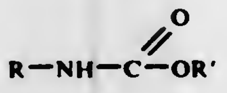
Samuel F. Reed, Jr., Huntsville, Ala., assignor to Rohm and Haas Company, Philadephia, Pa.

Continuation-in-part of Ser. No. 785,523, Jan. 7, 1959, abandoned. This application Oct. 18, 1960, Ser. No. 63,443

Int. Cl.² C08F *18/24*

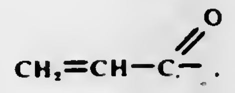
U.S. Cl. 260—77.5 BB **15 Claims**

2. Carbamates of the general formula:



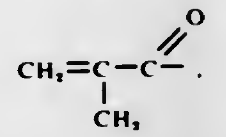
$$R{-}NH{-}\overset{\overset{\displaystyle O}{/\!/}}{C}{-}OR'$$

in which R is selected from the group consisting of



$$CH_2{=}CH{-}\overset{\overset{\displaystyle O}{/\!/}}{C}{-}.$$

and



$$CH_2{=}\underset{\underset{\displaystyle CH_3}{|}}{C}{-}\overset{\overset{\displaystyle O}{/\!/}}{C}{-}.$$

and R′ is selected from the group consisting of

$(CH_2ONO_2)\,3C{-}CH_2{-}$,

$(C_2B_{10}H_{11}{-}CH_2)_2CH{-}$,

$(C_2B_{10}H_{11})_2CH{-}$,

and

$C_2B_{10}H_{11}(CH_2)_n{-}$,

in which *n* is 1 to 4.

15. A copolymer of at least one of the monomers of claim 2 with at least one monomer selected from the group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, the higher alkyl esters of methacrylic and ethacrylic acids and mixtures thereof.

4,001,192

TRANSPARENT POLYAMIDES FROM BIS(AMINOMETHYL)-NORBORNANES

Eckart Reske, Hofheim, Taunus; Ludwig Brinkmann, Frankfurt am Main; Hartmut Fischer, Kelkheim, Taunus, and Freimund Röhrscheid, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 306,202, Nov. 14, 1972, Pat. No. 3,876,585. This application Oct. 30, 1974, Ser. No. 519,244

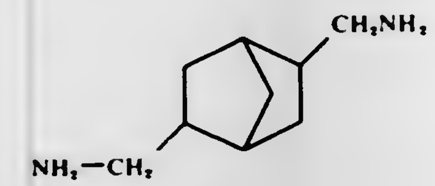
Claims priority, application Germany, Nov. 16, 1971, 2156723

Int. Cl.² C08G *20/20*

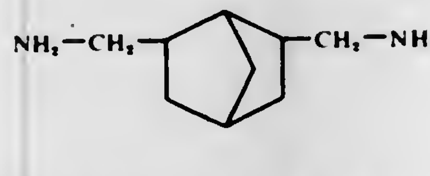
U.S. Cl. 260—78 R **4 Claims**

1. A transparent polyamide having improved toughness and a reduced specific viscosity of 0.5 to 4.0 dl/g measured at a 1% concentration of the polyamide in phenol/tetrachloroethane in a weight ratio of 3:2 at 25° C., said polyamide consisting essentially of the polymeric polycondensation product

a. a mixture of bis-(aminomethyl)-norbornanes of the formulae



and



b. one or more aromatic carbocyclic dicarboxylic acids of 7 to 20 carbon atoms,

c. one or more aliphatic dicarboxylic acids of 2 to 20 carbon atoms, and

d. one or more aliphatic diamines of 2 to 20 carbon atoms, said diamines and said dicarboxylic acids being present in approximately stoichiometric proportions and said aliphatic diamine being used in an amount of no more than 80 mole percent of the total diamine.

4,001,193

ANIONIC SIZES

Wulf von Bonin, Leverkusen; Friedhelm Müller, Odenthal, and Nikolaus Schön, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 28, 1974, Ser. No. 437,209

Claims priority, application Germany, Jan. 31, 1973, 2304535

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C08F *222/16, 220/06*

U.S. Cl. 526—26 **3 Claims**

1. A copolymer, which is suitable for use in anionic sizes, which is an ammonium or alkali metal salt of a copolymer consisting of

a. 0.5 to 50% by weight of copolymerized units of at least one half ester of an α,β-olefinically unsaturated C_4 or C_5 dicarboxylic acid and an aliphatic or cycloaliphatic alcohol having 1 to 18 C-atoms,

b. 6 to 40% by weight of copolymerized units of at least one acid selected from the group consisting of acrylic acid and methacrylic acid and

c. 40 to 85% by weight of copolymerized units of an aromatic compound which contains a single polymerizable double bond.

4,001,194

PROCESS FOR POLYMERIZING METALLOCENES

F. Louis Floyd, Strongsville, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed Nov. 11, 1974, Ser. No. 522,446

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C08F *30/04*

U.S. Cl. 526—240 **5 Claims**

1. In a process for the polymerization of a metallocene compound that is polymerizable by free radical polymerization and has a metal nucleus in a state of oxidation below maximum, the improvement for suppressing oxidation of the metal nucleus of said metallocene which comprises:

forming a reaction mixture containing said metallocene and the reducing agent of a redox catalyst combination;

then initiating and maintaining polymerization of said metallocene with the gradual addition of the oxidizing agent of said combination to said reaction mixture.

4,001,195

COPOLYMERIZATION OF OLEFINS

Ronald John Wyatt, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 14, 1972, Ser. No. 271,743

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C08F *210/00, 212/00*

U.S. Cl. 526—348 **12 Claims**

1. A process for the preparation of an amorphous, vulcanisable, elastomeric copolymer of ethylene and propylene in a proportion in the range 20:80 to 80:20 parts by mole by copolymerisation of ethylene and propylene in the presence of, as polymerisation catalyst, a transition metal composition which is the product of reacting a transition metal complex of the general formula

$$R_mMX_p \qquad (1)$$

with a substantially inert matrix material having a hydroxylic surface which is free from adsorbed water, wherein M is a transition metal of Groups IVA to VIA of the Periodic Table of the Elements, R is a hydrocarbon group or substituted hydrocarbon group, X is a monovalent ligand and *m* and *p* are integers, *m* having a value from 2 to the highest valency of the metal M, and *p* having a value from 0 to 2 less than the valency of the metal M, the copolymerisation process being effected at a temperature in the range of 10° to 80°C in a diluent consisting essentially of propylene or mixture thereof with another α-olefin which is in liquid form under the prevailing polymerisation conditions and in which the catalyst and copolymer are insoluble.

4,001,196

REACTIVATION OF ORGANOCHROMIUM OLEFIN POLYMERIZATION CATALYST IN PRESENCE OF OXYGEN

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1974, Ser. No. 529,534

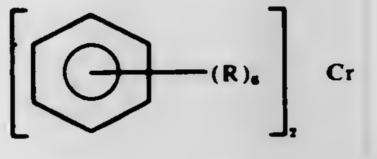
Int. Cl.² C08F *4/02, 4/22, 110/02*

U.S. Cl. 526—348 **18 Claims**

1. A process for producing a catalyst comprising:

calcining a silica-containing particulate support containing titanium in air at a temperature within the range of 700 to 2000° F.;

thereafter impregnating the thus-calcined titanium-containing support with a nonaqueous solution of a diarene organochromium compound having the following structure



wherein R is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms; and

thereafter treating the thus organochromium impregnated support with molecular oxygen at a temperature within the range of 40° to 150° F.

4,001,197

MAGNETIC SEPARATION METHOD

Ralph Mitchell, Lexington, and Ilan Chet, Cambridge, both of Mass., assignors to Sala Magnetics, Inc., Cambridge, Mass.

Filed June 12, 1975, Ser. No. 586,520

Int. Cl.² A23J *1/18*

U.S. Cl. 260—112 R **14 Claims**

1. A magnetic separation method for recovering single cell protein from single cell organisms comprising:

dispersing magnetic seed in a fluid medium containing single cell organisms, to allow attachment of the magnetic seed to the single cell organisms in the mixture to occur;

submitting the mixture to a magnetic separator to entrap and hold by magnetic forces in the magnetic separator the magnetic seed and attached single cell organisms, to concentrate the single cell organisms;

lysing the entrapped single cell organisms to break the cell walls of the single cell organisms and release protein from the single cell organisms into the fluid medium; and

recovering the released protein in the fluid medium by discharging the fluid medium from the magnetic separator while the seed and remaining portions of the cells which are attached to the magnetic seed are held by the magnetic forces.

4,001,198

METHOD OF RECOVERING NUTRIENTS FROM CHEESE WHEY AND PURIFYING THE EFFLUENT

Frank A. Thomas, 309 Reese St., Greenwood, Wis. 54437

Continuation-in-part of Ser. No. 483,912, May 28, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,843

Int. Cl.² A23J *3/00;* **A23C** *21/00*

U.S. Cl. 260—112 R **21 Claims**

1. A method of separating lactose constituents from whey comprising the steps of:

removing substantially all proteins from the whey,

separating and concentrating the milk sugar constituents from the remaining whey constituents by the process of ultrafiltration using membranes substantially impermeable to whey sugar but permeable to the water, salt and ash constituents of whey,

washing the whey sugar concentrate, reconcentrating said whey sugar concentrate, and drying the twice concentrated whey sugar concentrate.

4,001,199

NOVEL POLYPEPTIDES USEFUL FOR TREATING DIABETES AND HYPERCHOLESTEREMIA

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu, Osaka; Shigehisa Taketomi, Osaka, and Eiichiro Ishikawa, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 19, 1975, Ser. No. 560,092

Claims priority, application Japan, Mar. 26, 1974, 49-34161; Jan. 24, 1975, 50-10878

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **58 Claims**

1. A compound of the formula

R_1-Arg-R_2-Phe-Phe-R_3 (I)

wherein R_1 is hydrogen, or a basic or neutral amino acid residue having not more than 10 carbon atoms, R_2 is a neutral amino acid residue having not more than 10 carbon atoms and R_3 is NH_2, Tyr-NH_2, a residue of Tyr¹-peptide consisting of 2 to 5 amino acid residues, each of the amino acid residues having 2 to 10 carbon atoms, or R_3 is a residue of an amide of the Tyr¹-peptide, provided that when R_1 is hydrogen, R_2 is Pro and that when any of the amino acid residues constituting the compound of the formula (I) is an optical isomer, the amino acid residue is in L-configuration.

4,001,200

NOVEL POLYMERIZED, CROSS-LINKED, STROMAL-FREE HEMOGLOBIN

Pieter Bonsen, Los Altos, Calif.; Myron B. Laver, Weston, Mass., and Kent C. Morris, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 27, 1975, Ser. No. 554,051

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **6 Claims**

1. Polymerized, cross-linked, stromal-free hemoglobin, soluble in aqueous and physiological fluids, capable of reversibly binding a ligand, having a molecular weight of 64,000 to 1,000,000 and the formula poly(Hb)ₙ wherein Hb is a member selected from the group consisting of a stromal-free monomer, dimer, trimer and tetramer hemoglobin, and *n* is 4 to 60.

4,001,201

PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS USING VINYL SUBSTITUTED, SO_2 CONTAINING, AMINE SALT

Rolf Kyburz, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 16, 1973, Ser. No. 333,247

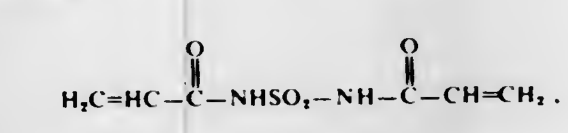
Claims priority, application Switzerland, Feb. 25, 1972, 2722/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C09H *7/00;* **C08F** *116/06*

U.S. Cl. 260—117 **5 Claims**

1. Process for crosslinking hydrophilic colloids which contain amino-, imino- and/or hydroxyl groups, which process comprises employing as crosslinking agent a compound of the formula



$$H_2C{=}HC-\overset{\overset{O}{\|}}{C}-NHSO_2-NH-\overset{\overset{O}{\|}}{C}-CH{=}CH_2\ .$$

or a salt of such compound, formed with one equivalent of an amine.

4,001,202

PROCESS FOR MAKING SULFONATED LIGNIN SURFACTANTS

Peter Dilling, and Gerald Prazak, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,441

Int. Cl.² C07G *1/00*

U.S. Cl. 260—124 R **7 Claims**

1. In a process for modifying a sulfonated lignin to provide dye dispersant properties by reacting a sulfonated lignin with an epihalohydrin the improvement commprising.

reacting an aqueous solution of a sulfonated lignin at a solids concentration between 5% and 35% with from 0 1 to 2.0 moles of an epihalohydrin per 1,000 grams of lignin at a temperature between 20° C. and 100° C. and a starting pH between 9 and 13 until the sulfonated lignin-epihalohydrin adduct has a viscosity below 500 cps. at 25° C.

4,001,203

HEAVY METAL COMPLEXES OF AZO DYESTUFFS CONTAINING A HETEROCYCLIC DIAZO COMPONENT AND THE RESIDUE OF 5-HALOGENO-2,3-DIHYDROZYPYRIDINE AS COUPLING COMPONENT

Gerhard Back, Loerrach, Germany, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

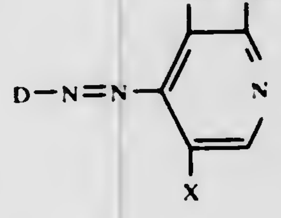
Continuation of Ser. No. 140,283, May 4, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,516

Claims priority, application Switzerland, May 6, 1970, 6784/70

Int. Cl.² C09B *45/00*

U.S. Cl. 260—146 R **5 Claims**

1. The 1:1 and 1:2 cobalt, nickel, copper or chromium complex of a compound of the formula



wherein

X is chloro or bromo, and

D is pyridinyl, quinolinyl benzthiazolyl, indazolyl, triazolyl, pyrazolyl, benztriazolyl, benzimidazolyl, thiazolyl, pyrazol-5-one-yl, thiadiazolyl, acrindinyl, carbazolyl or benzisothiazolyl, which is unsubstituted or substituted by chloro, bromo, nitro, cyano, lower alkyl, lower alkoxy, lower alkylsulfonyl, sulfo, carboxy, sulfamoyl, N-lower alkyl sulfamoyl, N-lower hydroxyalkyl sulfamoyl, formylamino, acetamido, benzoylamino, phenylsulfonamido, p-tolylsulfonamido, methylsulfonamido, carboxymethyoxyamino, carboethoxyamino, dimethylaminosulfonylamino, carboisopropoxyamino, phenyl, pyridyl, methylthio, ethylthio, phenylthio, cyclohexylthio, phenylsulfonyl, carbomethoxyethyl, phenylazo, napthylazo, sulfophenylazo or a fiber reactive radical selected from the group consisting of chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, β-chloroacrylyl, β-bromoacrylyl, α-chloroacrylyl, α-bromoacrylyl, α,β-dichloroacrylyl, α,β-dibromoacrylyl, trichloroacrylyl and chlorocrotonyl, said fiber-reactive radical bonded via —NH— or aminosulfophenylazo.

4,001,204

MAGENTA IMAGE-PROVIDING PHENYLAZONAPHTHYL DYES CONTAINING A MORPHOLINYL OR PIPERIDINE RADICAL

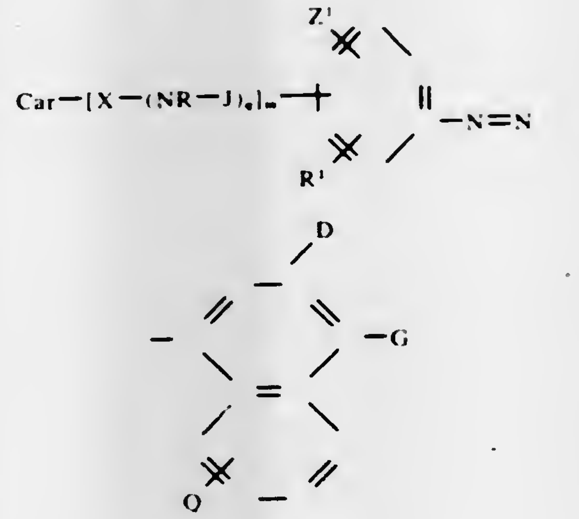
James J. Krutak, Sr., Kingsport, Tenn.; Jan R. Haase, and Richard A. Landholm, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 439,787, Feb. 5, 1974, Pat. No. 3,932,380. This application Nov. 3, 1975, Ser. No. 628,713

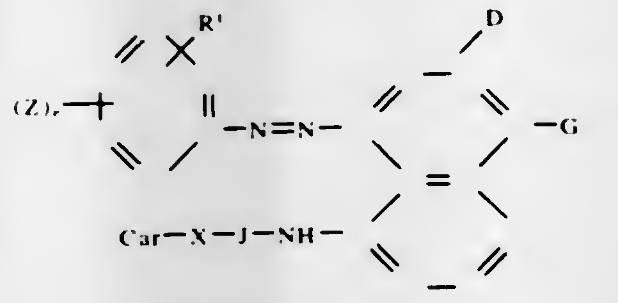
Int. Cl.² C09B *29/10*

U.S. Cl. 260—152 **11 Claims**

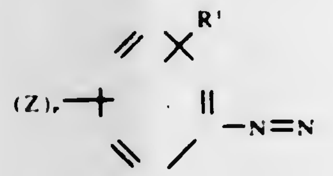
1. A magenta image dye-providing compound having a formula as follows:



I



II



III

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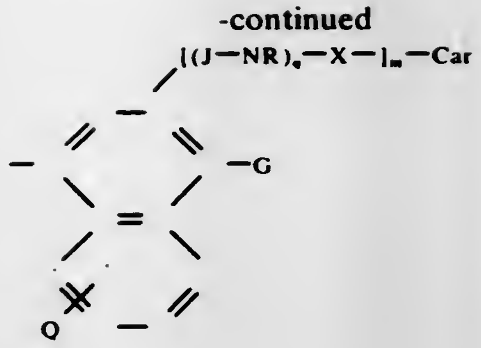
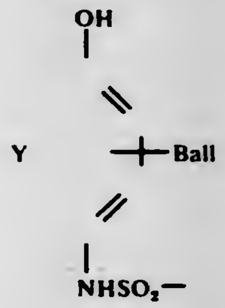


wherein:

Car represents a carrier moiety which as a function of oxidation under alkaline conditions, releases a diffusible dye from said compound and having the formula



wherein

Ball represents an organic ballasting group containing at lease 8 carbon atoms which renders said compound nondiffusible in a photographic element during development in an alkaline processing composition;

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

m and *q* each represent an integer having a value of 0 or 1;

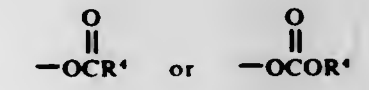
X represents a bivalent linking group of the formula —R^2—L$_n$—R^2_p— where each R^2 can be the same or different and each represents alkylene having 1 to 8 carbon atoms; phenylene; or phenylene substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy or sulfo; L represents oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; *n* is an integer having a value of 0 or 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when *q* is o; Car-X- represents Car-alkylene—SO$_2$—, Car-C$_6$H$_4$CH$_2$SO$_2$—, or Car-phenylene—SO$_2$—, provided that the carbon content of X does not exceed 14 carbon atoms;

R represents hydrogen or alkyl having 1 to 6 carbon atoms;

J represents sulfonyl or carbonyl;

Q is in the 5- or 8-position relative to G and represents hydroxy, —NHCOR^3 or —NHSO$_2$R^3 wherein R^3 is alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxyl or sulfo; benzyl, phenyl, or phenyl substituted with carboxy, cyano, chloro, methoxy, methyl or sulfamoyl;

G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof, or a hydrolyzable acyloxy group having the formula:



$$-O\overset{O}{\overset{\|}{C}}R^4 \quad \text{or} \quad -O\overset{O}{\overset{\|}{C}}OR^4$$

wherein

R^4 is alkyl having 1 to 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro;

r represents an integer having a value of 1 or 2;

Z represents cyano, trifluoromethyl, fluorosulfonyl, carboxy, —COOR^4 wherein R^4 is as described previously, nitro in the 2- or 3-position relative to the azo linkage, fluoro, chloro or bromo, alkylsulfonyl having 1 to 7 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl, phenylsulfonyl substituted with sulfamoyl, carboxy, fluorosulfonyl or methoxy; alkylcarbonyl having 2 to 5 carbon atoms, —SO$_2$NR^{5}R^6 wherein R^5 represents hydrogen, alkyl having 1 to 8 carbon atoms; R^6 represents hydrogen, alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, fluorosulfonyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; alkylcarbonyl having 2 to 7 carbon atoms, phenylcarbonyl, alkylsulfonyl having 1 to 6 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms substituted with cyano or hydroxy; phenylsulfonyl or methoxyphenylsulfonyl; or R^5 and R^6 taken together with the nitrogen atom to which they are bonded represent morpholino or piperidino; or Z represents —CON(R^5)$_2$ wherein each R^5 can be the same or different and is as described previously;

Z^1 represents hydrogen or Z;

R^1 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with cyano, hydroxy or methoxy; alkoxy having 1 to 4 carbon atoms, chloro, bromo or fluoro;

D represents cyano, sulfo, fluorosulfonyl, chloro, bromo, fluoro, —SO$_3$-phenyl or —SO$_3$-phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; alkylsulfonyl having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with chloro, fluoro, hydroxy, phenyl, cyano, phenylsulfonyl or phenylsulfonyl substituted with carboxy, fluorosulfonyl or methoxy; alkylsulfinyl having 1 to 8 carbon atoms or alkylsulfinyl having 1 to 8 carbon atoms substituted with cyano, phenyl, hydroxy or sulfamoyl; phenylsulfinyl or phenylsulfinyl substituted with sulfo or fluorosulfonyl; —SO$_2$NR^{5}R^6, or —CON(R^5)$_2$ wherein each R^5 and R^6 is as described previously for Z,

with the proviso that there be no more than one sulfo radical, no more than one carboxy radical, and at least one morpholino or piperidino radical present in said compound.

4,001,205

WATER-SOLUBLE, FIBER-REACTIVE PHENYLAZODIHYDROXY, METHYL, CYANOPYRIDINE DYESTUFFS

Arthur Buehler, Rheinfelden; Alfred Fasciati, Bottmingen, and Gerd Hoelzle, Liestal, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 200,210, Nov. 18, 1971, abandoned, which is a continuation of Ser. No. 840,036, July 8, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,624

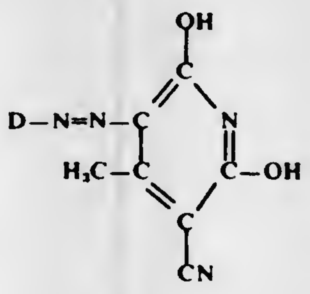
Claims priority, application Switzerland, July 15, 1968, 10521/68

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C09B *62/08, 62/24, 62/50;* **D06P** *3/58*

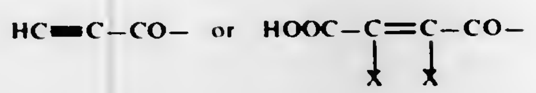
U.S. Cl. 260—156 **4 Claims**

1. A water soluble dyestuff of the formula



wherein D is phenyl which is substituted by at least one sulphonic acid group imparting solubility in water, and is additionally substituted by a fiber-reactive substituent attached to the diazo component via an -NH- group and selected from the

group consisting of acryloxy, α-bromoacryloyl, α-chloroacryloyl, chloro- or bromo- triazinyl, chloro- or bromo-pyrimidyl, chloro- or bromo-propionyl, α,β-dibromopropionyl, fluorocyclobutançcarbonyl, chloroquinoxalinecarbonyl, methanesulphonylpyrimidinyl and a group of the formula



$$HC\equiv C-CO- \quad \text{or} \quad HOOC-\underset{X}{\underset{|}{C}}=\underset{X}{\underset{|}{C}}-CO-$$

in which one of the symbols X represents hydrogen and the other chlorine or bromine; and said phenyl is further unsubstituted or substituted by at least one member selected from the group consisting of hydroxy, cyano, 4-methyl-3-sulfophenylsulfonyl, sulphamide, nitro, chloro, methoxy and acetylamino.

4,001,206

OPTIONALLY SUBSTITUTED BENZOTHIAZOLYLPHENYL-AZO-ALKANOYLACETAMIDONAPHTHALENES

Georg Schoefberger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

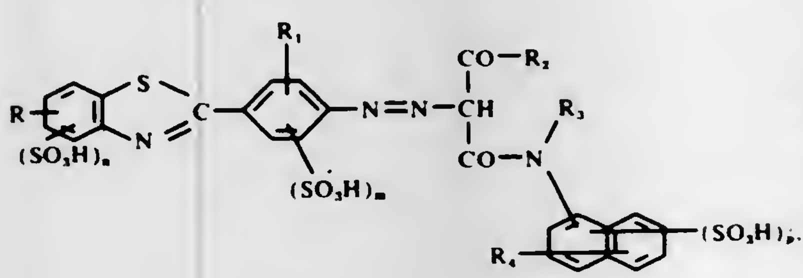
Filed Feb. 11, 1972, Ser. No. 225,629

Claims priority, application Switzerland, Feb. 16, 1971, 2250/71

Int. Cl.^{2} C09B *29/32;* **D06P** *1/06;* **D21H** *3/80*

U.S. Cl. 260—158 **19 Claims**

1. A compound of the formula



or a water-soluble salt thereof,

wherein

R is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

R$_1$ is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

R$_2$ is alkyl of 1 to 6 carbon atoms,

R$_3$ is hydrogen or alkyl of 1 to 6 carbon atoms,

R$_4$ is hydrogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

m is 0 or 1,

n is 0 or 1,

p is 0 to 3,

with the proviso that the sum of *m*, *n* and *p* is 1 to 5.

4,001,207

TERTIARY-ALIPHATIC AMIDAZO COMPOUNDS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application June 1, 1971, Ser. No. 148,885

Int. Cl.^{2} C07C *107/02, 109/06*

U.S. Cl. 260—192 **2 Claims**

1. t-Butylazo-N-carboxymethl-formamide.
2. T-cumylazoformamide.

4,001,208

1-N-[(S)-α-HYDROXY-ω-AMINOACYL]

Hamao Umezawa; Sumio Umezawa; Kenji Maeda, all of Tokyo; Osamu Tsuchiya; Shinichi Kondo, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyo Kai, Tokyo, Japan

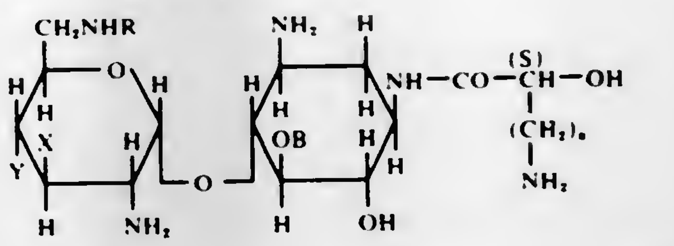
Filed Oct. 1, 1973, Ser. No. 402,085

Claims priority, application Japan, Oct. 6, 1972, 47-99866; Oct. 19, 1972, 47-103988; Dec. 11, 1972, 47-123482; Jan. 23, 1973, 48-9146

Int. Cl.^{2} C07C *128/18*

U.S. Cl. 536—17 **9 Claims**

1. A compound of the formula:



wherein R is hydrogen or alkyl of 1–4 carbon atoms; B is hydrogen or β-D-ribofuranosyl; at least one of X and Y is hydrogen and the other of X and Y is hydrogen or hydroxyl; *n* is 2 or 3; and the pharmaceutically acceptable acid addition salts thereof.

4,001,209

ANTIBIOTIC G-52 AND METHOD FOR THE PRODUCTION THEREOF

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 271,838, July 14, 1972, abandoned. This application Feb. 28, 1975, Ser. No. 554,291

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} C07H *15/22*

U.S. Cl. 536—17 **5 Claims**

1. A composition of matter selected from the group consisting of Antibiotic G-52, non-toxic acid addition salts and Schiff base-oxazolidine derivatives thereof.

4,001,210

PROCESS FOR MANUFACTURING CELLULOSE CONTAINING 2,3-DIHYDROXYPROPYL ETHER GROUPS

Konrad Engelskirchen, Lank, Niederrhein, and Joachim Galinke, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Mar. 17, 1975, Ser. No. 558,632

Claims priority, application Germany, Mar. 29, 1974, 2415155

Int. Cl.^{2} C08B *11/08, 11/20;* **C08L** *1/26*

U.S. Cl. 536—84 **10 Claims**

8. A 2,3-dihydroxypropyl ether of cellulose containing 1% to 10% by weight of borate ions.

4,001,211

PHARMACEUTICAL CAPSULES FROM IMPROVED THERMOGELLING METHYL CELLULOSE ETHERS

Nitis Sarkar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

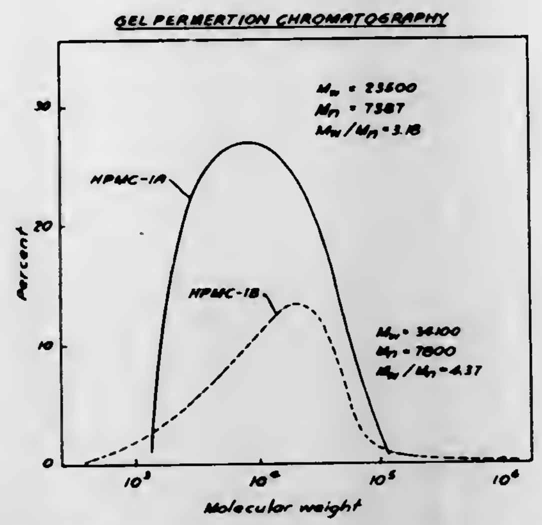
Continuation-in-part of Ser. No. 528,830, Dec. 2, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,549

Int. Cl.^{2} B29C *13/00;* **C08B** *11/08, 11/193*

U.S. Cl. 536—84 **10 Claims**

1. A thermal gelling methyl cellulose ether composition suitable for use in preparing pharmaceutical capsules by an aqueous dip coating process using preheated pins and having a methoxyl DS of about 1.5–2.0, a C$_2$–C$_3$ hydroxyalkyl MS of about 0.1–0.4, a 2 wt. % aqueous solution viscosity of about

2–10 cps at 20° C and a thermal gel point of about 50°–80° C, and a 15–30 wt. % aqueous solution viscosity of about 1,000–10,000 cps at 20° C, said composition being further characterized by having as a 15–30 wt. % aqueous solution:



A. Essentially Newtonian fluid properties as defined by a power law coefficient, *n*, of 0.9–1.0 at shear rates of between 0.1–10 sec^{-1}, and

B. A 50 sec gel yield strength of at least 150 $dynes/cm^2$ at 65° C.

4,001,212

MACROCYCLIC POLYAMINES

Jack E. Richman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

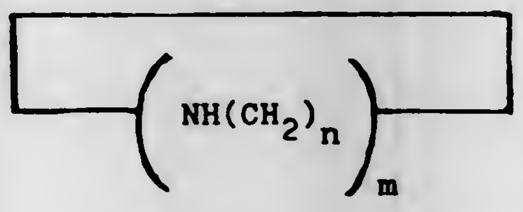
Filed Oct. 3, 1973, Ser. No. 403,326

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07D *259/00*

U.S. Cl. 260—239 BC **7 Claims**

1. A compound having the formula



where *m* is an integer of 3–7, and each *n*, independently, is an integer of 2–5, with the provisos that

when *m* is 3 and two of the *n* values are 2 or 3, then the third *n* is 4 or 5, and when *m* is 4 and one *n* is 2, then the remaining values of n are 3, 4 or 5.

4,001,213

REPRESSION OF POLYMER FORMATION IN THE CONVERSION OF LINEAR OR BRANCHED PRIMARY DIAMINES TO CYCLIC IMINES

Arnold Hershman, St. Louis, Mo., and Anthony J. C. Pearson, Highton, Australia, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 26,131, April 6, 1970, abandoned. This application May 17, 1974, Ser. No. 470,900

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07D *207/06, 211/02, 223/04, 295/02*

U.S. Cl. 260—239 B **16 Claims**

1. Process for the conversion of linear or branched primary alkyl diamines to saturated cyclic secondary amines, the said diamines having a carbon chain of 3 to 7 carbon atoms between amine groups, with the repression of the formation of linear or branched secondary amines, tertiary amines and polymers, which comprises passing the said diamines in the vapor phase, in the absence of added ammonia, at a temperature of from 100°C to 250°C over a solid catalyst comprising an element selected from the group consisting of nickel, copper, cobalt or iron.

4,001,214

AMINOALKYL ETHERS OF 2,2'- AND 3,3'-DIHYDROXYBENZIL

Gerhard R. Wendt, Havertown, and Michael W. Winkley, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

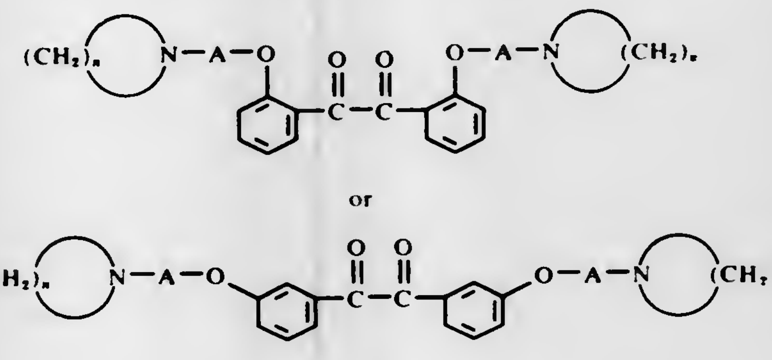
Filed Oct. 30, 1975, Ser. No. 627,486

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

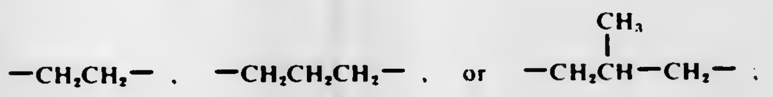
Int. Cl.² C07D *295/08*

U.S. Cl. 260—239 B **3 Claims**

1. A symmetrical compound of the formula:



wherein A is a divalent aliphatic hydrocarbon radical of the formula



$$-CH_2CH_2-,\quad -CH_2CH_2CH_2-,\quad \text{or}\quad -CH_2\overset{CH_3}{\overset{|}{CH}}-CH_2-.$$

and *n* is the number 7 or 8; or the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,001,215

1,2,5,8-TETRA HYDRO-2,4,6,8-TETRAMETHYL-1,5-DIAZOCINE-2,8-DIOL AND METHOD OF PREPARATION

Thomas J. Dietsche, Berkeley, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 12, 1976, Ser. No. 666,512

Int. Cl.² C07D *245/02*

U.S. Cl. 260—239 BC **7 Claims**

1. 1,2,5,8-Tetrahydro-2,4,6,8-tetramethyl-1,5-diazocine-2,8-diol.

2. The process of preparing the compound of claim 1 which comprises the step of reacting 2,4-pentanedione with ammonia by contacting said dione with the ammonia as components of a solution in a C_1 to C_3 alcohol, at a temperature such that said solution is a liquid, but below about 125° C.

4,001,216

AMINOALKYL ETHERS OF 2,2'- AND 3,3'-DIHYDROXYDESOXYBENZOIN

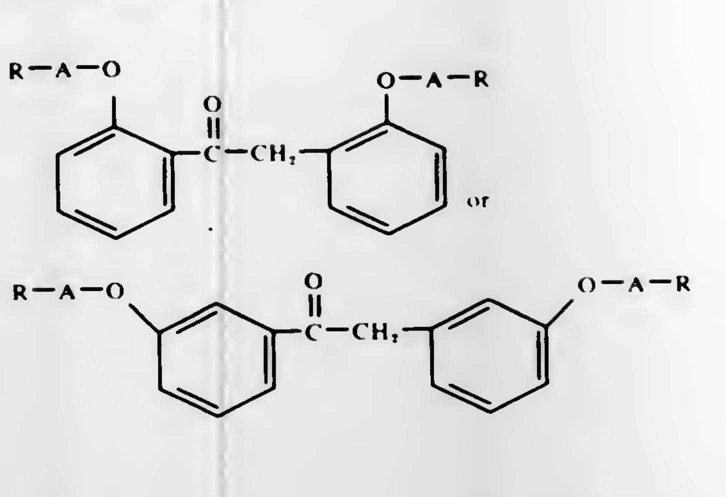
Michael W. Winkley, Malvern, and Gerhard R. Wendt, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,487

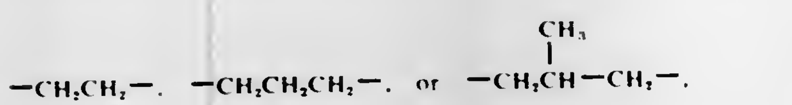
Int. Cl.² C07D *295/08*

U.S. Cl. 260—239 B **2 Claims**

1. A compound of the formula

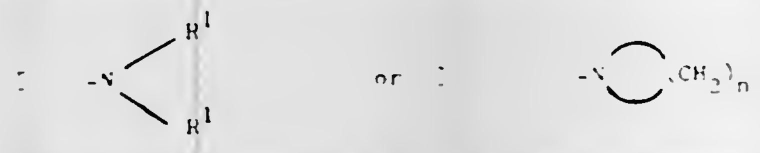


wherein A is a divalent aliphatic hydrocarbon radical of the formula



$$-CH_2CH_2-,\quad -CH_2CH_2CH_2-,\quad \text{or}\quad -CH_2\overset{CH_3}{\overset{|}{CH}}-CH_2-.$$

and R is identically a substituted amino group of the formula



wherein *n* is the number 4, 5, 6, 7, or 8, and the non-toxic, pharmaceutically acceptable acid addition salts thereof

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4,001,217

AZETIDINYL CARBOTHIOLATES

Adolf Fischer, Mutterstadt; Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 446,674, Feb. 28, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,064

Claims priority, application Germany, Mar. 10, 1973, 2312045

Int. Cl.² C07D *205/04*

U.S. Cl. 260—239 A **1 Claim**

1. S-trichloroallyl-(2,2,4-trimethylazetidine)-1-carbothiolate

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4,001,218

PENICILLINS

Günter Schmidt, and Karl Georg Metzger, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 419,950, Nov. 29, 1973. This application Feb. 5, 1975, Ser. No. 547,208

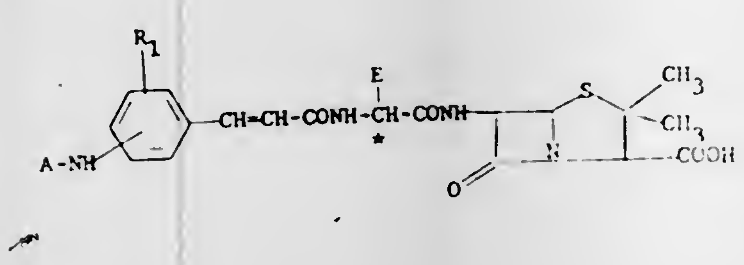
Claims priority, application Germany, Dec. 8, 1972, 2260118

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *499/68, 499/70*

U.S. Cl. 260—239.1 **16 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

the carbon atom designated by * is asymmetrically substituted,

R_1 is hydrogen, halo, lower alkyl, hydroxy, nitro or A—NH—,

A is R_3CO- or R_4CS- in which

R_3 is hydrogen; lower alkyl; halo(lower alkyl); cycloalkyl of 3 to 11 carbon atoms unsubstituted or substituted by hydroxy or alkyl of 1 or 2 carbon atoms; cycloalkenyl of 3 to 11 carbon atoms; bicycloalkyl of up to 8 carbon atoms, bicycloalkenyl of up to 8 carbon atoms, aryl of 6 to 10 carbon atoms, unsubstituted or substituted by from 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, nitro, amino and alkylsulfonyl of 1 to 4 carbon atoms, or substituted by methylenedioxy, azidoaryl of 6 to 10 carbon atoms, azido(lower alkyl, amino, or thienyl, and

R_4 is lower alkylamino or arylamino of 6 to 10 carbon atoms, and

E is phenyl; phenyl substituted by hydroxy, azido, lower alkyl, lower alkoxy, lower alkylthio or chloro; or thienyl

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4,001,219

STEROIDAL DERIVATIVES OF BENDAZOLIC ACID AND PROCESS FOR THE PREPARATION OF THE SAME

Leandro Baiocchi, via Platina, 22 Rome, Italy

Filed Jan. 9, 1976, Ser. No. 647,749

Claims priority, application Italy, Feb. 13, 1975, 48150/75

Int. Cl.² C07J *5/00*

U.S. Cl. 260—239.5 **2 Claims**

1. Esters of [(1-benzyl-1H-indazol-3-yl)-oxy]-acetic acid at primary hydroxyl in position 21 of hydrocortisone, cortisone, prednisone and prednisolone

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4,001,220

6-(AMINATED METHYL)-3β-OXY-5α-(CHOLESTANE-STIGMASTANE)-5,6-DIOLS, SALTS THEREOF, AND INTERMEDIATES THERETO

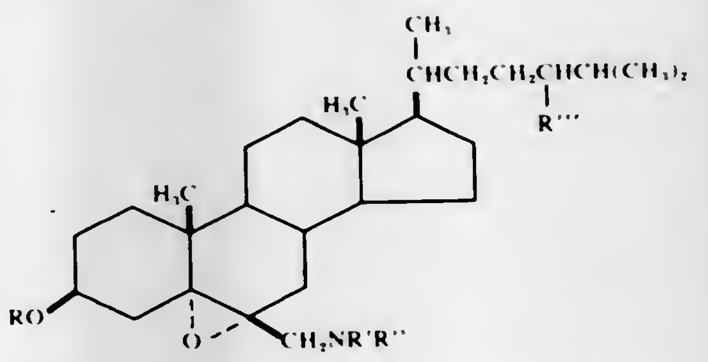
Leonard N. Nysted, Highland Park, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 27, 1976, Ser. No. 652,944

Int. Cl.² C07J *21/00*

U.S. Cl. 260—239.55 R **17 Claims**

12. A compound of the formula



wherein R represents hydrogen or acetyl, R' and R'' each represent hydrogen, alkyl containing fewer than 8 carbons, or hydroxyalkyl of the formula

$$-Alk-OH$$

in which Alk represent alkylene containing more than 1 and fewer than 6 carbons; and R''' represents hydrogen or ethyl.

4,001,221

4-STILBENYL-5-CYANO-1,2,3-TRIAZOLES

Dieter Günther; Hans Jürgen Nestler, both of Kelkheim, Taunus; Günter Rösch, Altenhain, Taunus, and Erich Schinzel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

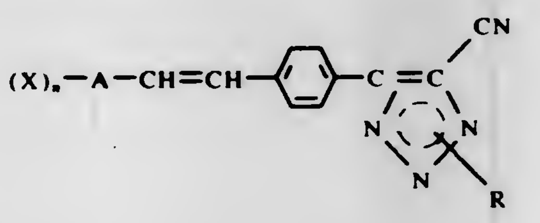
Filed Sept. 12, 1975, Ser. No. 612,700

Claims priority, application Switzerland, Sept. 13, 1974, 12469/74

Int. Cl.^{2} C07D *249/04, 249/06, 413/04*

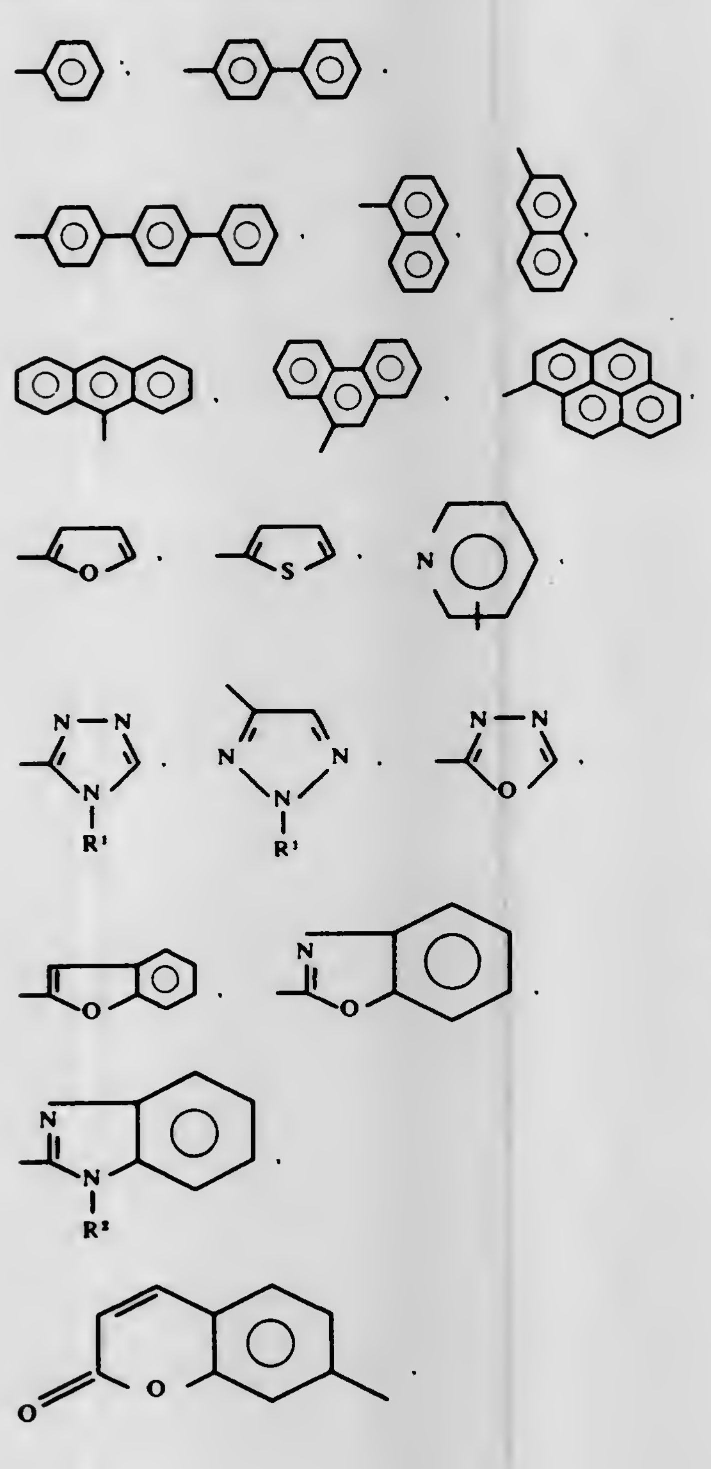
U.S. Cl. 260—240 C **9 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl which may be substituted by phenyl, hydroxy, lower carbalkoxy or cyano

A is a group of the formula



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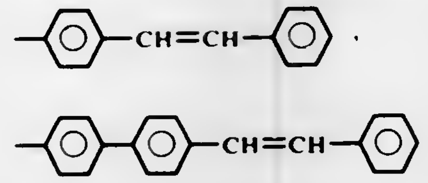
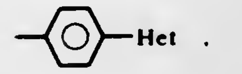
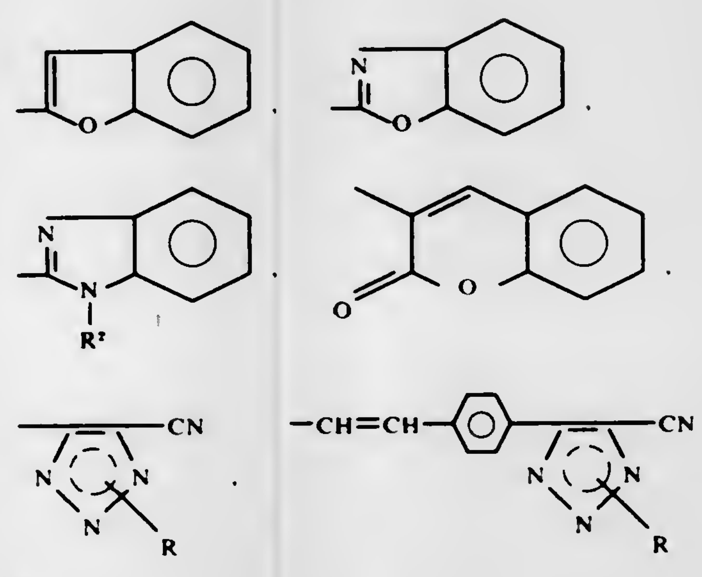


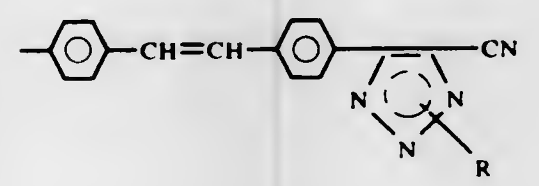
or



wherein Het has the following meaning:



or



X is hydrogen or identical or different non-chromo-phorous groups of the series of fluorine, chlorine or bromine atoms, lower alkyl, lower alkoxy, amino, lower mono- or di-alkyl amino, lower trialkyl ammonium or acyl amino groups, or carboxy or sulfo which may be functionally modified, and 2 adjacent radicals X may together also represent a lower alkylene or an 1,3-dioxypropylene group, *n* is an integer from 1 to 3,

R^1 is hydrogen, lower alkyl or phenyl, and R^2 is hydrogen or lower alkyl.

4,001,222

3-(AMINOACYL)-1-{[5-(SUBSTITUTED PHENYL)FURFURYLIDENE]AMINO}HYDANTOINS AND PROCESS FOR THE PREPARATION THEREOF

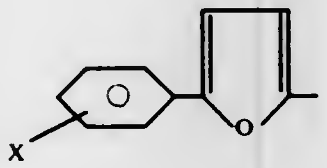
Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,262

Int. Cl.^{2} C07D *405/06*

U.S. Cl. 260—240 G **11 Claims**

1. A compound of the formula:



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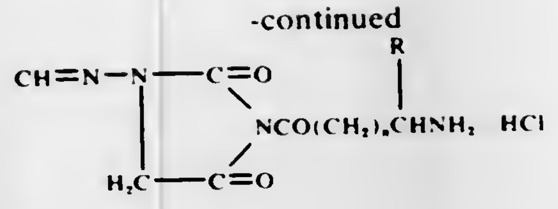


wherein X is 4-nitro, 3,4-dichloro, 4-fluoro, 4-chloro, 4-cyano, or 4-methoxy, *n* is 0–4; and R is hydrogen, methyl or benzyl.

4,001,223

ADAMANTANE-PIPERAZINE DERIVATIVES

Michio Sugimoto; Fumitada Yamamoto; Kosaku Honna; Konomu Kurisaki; Hirozo Sugahara; Kiyoshi Watanabe, all of Chiba; Yasuo Fujimoto, Tokyo, and Syoji Ryu, Noda, all of Japan, assignors to Idemitsu Kosan Co., Ltd. and Nippon Chemiphar Co., Ltd., both of Tokyo, Japan

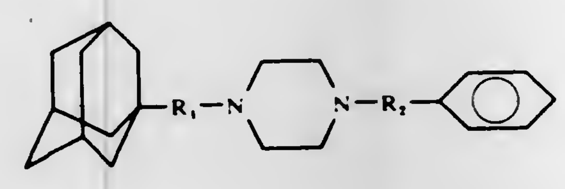
Filed Dec. 16, 1975, Ser. No. 641,232

Claims priority, application Japan, Jan. 13, 1975, 50-5567; Jan. 13, 1975, 50-5568; Jan. 13, 1975, 50-5569; Jan. 17, 1975, 50-7065; Jan. 16, 1975, 50-6468; Jan. 16, 1975, 50-6467; Jan. 14, 1975, 50-5903; Jan. 17, 1975, 50-7066

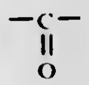
Int. Cl.^{2} C07D *241/02*

U.S. Cl. 260—240 J **5 Claims**

1. Adamantane derivatives represented by the formula

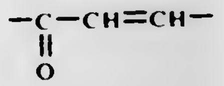


wherein R_1 is



$$-\underset{\underset{O}{\|}}{C}-$$

or $-CH_2-$ and R_2 is



$$-\underset{\underset{O}{\|}}{C}-CH=CH-$$

or $-CH_2-CH=CH-$.

4,001,224

4-SUBSTITUTED-2, 3-DIHYDRO-1-BENZOXEPIN-3, 5-DIONES AND TAUTOMERS

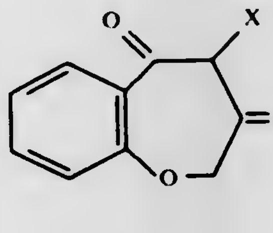
Sylvester Klutchko, Hackettstown, and Max von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 554,876, March 3, 1975. This application Mar. 18, 1976, Ser. No. 667,916

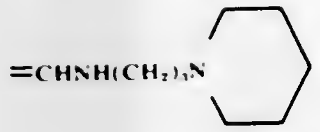
Int. Cl.^{2} C07D *313/08, 405/12*

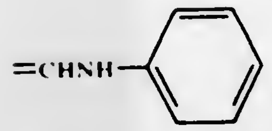
U.S. Cl. 260—240 R **4 Claims**

1. A compound of the formula:

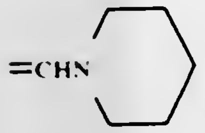


wherein X is





or .



and tautomers thereof.

4,001,225

PYRIDYL SUBSTITUTED 7-αESTERS OF 3 HETEROTHIO 7-ACETAMIDO CEPHALOSPORANIC ACIDS

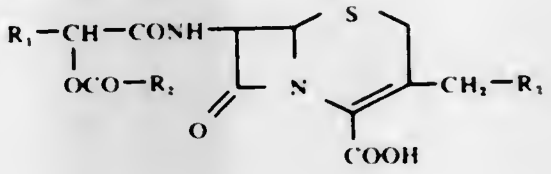
Hirokichi Harada, Nishinomiya, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 476,037, June 3, 1974. This application Jan. 30, 1975, Ser. No. 545,342

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 260—243 C **8 Claims**

1. A compound of the formula:



wherein

R_1 is phenyl or thienyl,

R_2 is pyridyl, and

R_3 is thiadiazolylthio or tetrazolylthio, either of which may be substituted with methyl,

and pharmaceutically acceptable salts thereof.

4,001,226

3-(SUBSTITUTED)CARBONYLAMINO CEPHEM DERIVATIVES

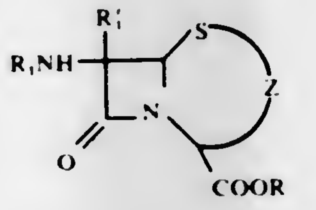
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 4, 1974, Ser. No. 529,676

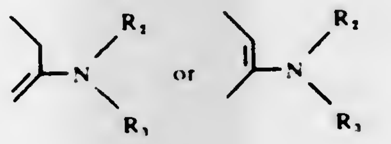
Int. Cl.^{2} C07D *501/20, 501/60*

U.S. Cl. 260—243 C **30 Claims**

1. A compound of the formula

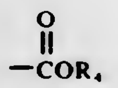


wherein Z is a group of the formula



wherein R_2 and R_3 are each hydrogen or taken together form the group =C=O, wherein R_2 taken singly is hydrogen and R_3 taken singly is

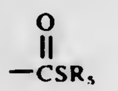
a. a group of the formula



$$-\overset{O}{\overset{\|}{C}}OR_4$$

wherein R_4 is C_1–C_6 alkyl, C_3–C_6 alkenyl, C_1–C_6 haloalkyl, 2,2,2-trihaloethyl, methoxybenzyl, nitrobenzyl, benzyl or phenyl; or

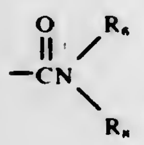
b. a group of the formula



$$-\overset{O}{\overset{\|}{C}}SR_5$$

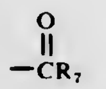
wherein R_5 is C_1–C_6 alkyl, phenyl, or benzyl; or

c. a group of the formula



wherein R_6 is hydrogen, C_1–C_6 alkyl, benzyl, phenyl, or tolyl and R_8 is hydrogen, C_1–C_6 alkyl or benzyl; or wherein R_6 and R_8 and the nitrogen atom to which they are bonded taken together form a 5 or 6 membered heterocyclic ring selected from the group consisting of piperidine, morpholine, and pyrrolidine; or

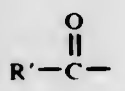
d. a group of the formula



$$-\overset{O}{\overset{\|}{C}}R_7$$

wherein R_7 is C_1–C_6 alkyl, di(C_1–C_3 alkoxycarbonyl)-methyl, benzyl or phenyl; and

wherein R is hydrogen or a carboxylic acid protecting ester forming group; R_1' is hydrogen; and wherein R_1 is an acyl group of the formula



$$R'-\overset{O}{\overset{\|}{C}}-$$

wherein R′ is

a. C_1–C_7 alkyl, C_3–C_7 alkenyl, cyanomethyl, halomethyl, 4-amino-4-carboxybutyl, 4-protected amino-4-protected carboxybutyl; or

b. C_1–C_6 alkoxy, benzyloxy, 4-nitrobenzyloxy or 4-methyoxybenzyloxy; or

c. the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl, or substituted phenyl wherein the substituents are 1–3 halogens, hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, carboxy, caraboxymethyl, hydroxymethyl, aminomethyl, or protected aminomethyl; or

d. an arylalkyl group of the formula

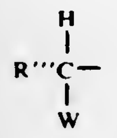
$R''-(Y)m-CH_2-$

wherein R″ is as defined above,

X is O or S, and

m is 0 or 1; or

e. a substituted arylalkyl group of the formula



$$R'''\overset{H}{\overset{|}{C}}\underset{W}{\underset{|}{}}-$$

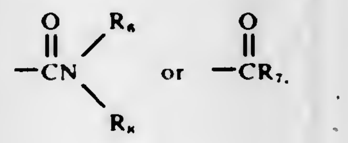
wherein R‴ is R″ as defined above, 2-thienyl, or 3-thienyl; W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino, protected amino; or

f. a heteroarylmethyl group of the formula

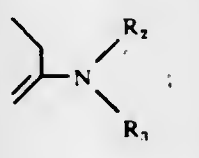
$R''''\ CH_2-$

wherein R⁗ is 2-theinyl, 3-theinyl, 2-furyl, 3-furyl, 2thiazolyl, 5-tetrazolyl or 1-tetrazolyl;

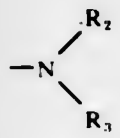
and when R is hydrogen, the pharmaceutically acceptable non-toxic salts of the acids represented thereby; with the limitations that when R_3 is



, Z can only be



and when the group



is —N=C=O, R cannot be hydrogen.

4,001,227

TETRAZOLO- AND TRIAZOLOBENZOTHIAZINES

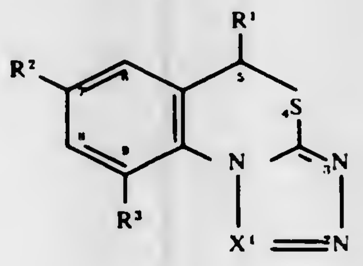
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1975, Ser. No. 643,273

Int. Cl.² C07D *279/08*

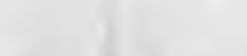
U.S. Cl. 260—243 R **6 Claims**

1. A compound of the formula



wherein

X represents

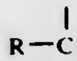


R represents hydrogen or C_1–C_4 alkyl;

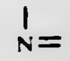
R^1 represents hydrogen or phenyl;

R^2 and R^3 independently represent hydrogen, C_1–C_3 alkyl, chloro or bromo;

provided that at least one of R^2 and R^3 represents hydrogen, that R^3 represents hydrogen when X represents



and R represents C_1–C_4 alkyl and that R^2 does not represent C_1–C_3 alkyl when X represents



4,001,228

2-THIOL-4,5-DIPHENYLOXAZOLE S-DERIVATIVES

Gabriele Mattalia, Rome, Italy, assignor to Serono Laboratories, Inc., Boston, Mass.

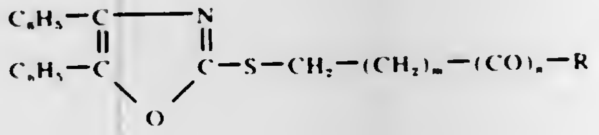
Filed July 23, 1975, Ser. No. 598,186

Claims priority, application United Kingdom, Aug. 6, 1974, 34673/74

Int. Cl.² C07D *263/46*

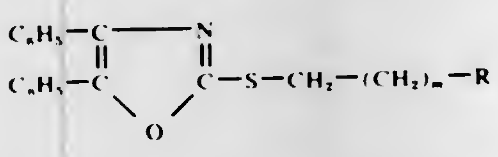
U.S. Cl. 260—247.1 M **6 Claims**

1. A compound of the formula



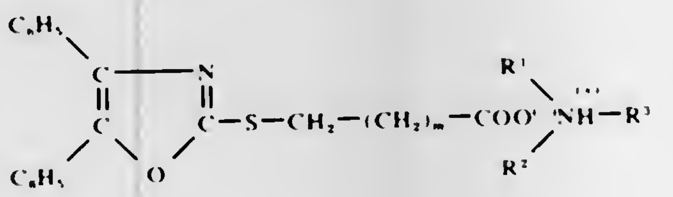
wherein *m* is 0, 1 or 2; *n* is 0 or 1; R is a hydroxy, amino, alkylamino, morpholino, piperidino, pyrrolidino, aminoalkoxy, or alkylaminoalkoxy radical, the alkyl chains in said radicals having 1–4 carbon atoms, and provided that R is not hydroxy when *n* is 1; and the pharmaceutically acceptable addition salts thereof.

5. 2-Oxyalkylthio-4,5-diphenyloxazole of the formula



wherein *m* is 0, 1 or 2 and R is hydroxy or alkoxy of 1 to 4 carbon atoms

6. An addition salt of S-(4,5-diphenyloxazol-2-yl)-mercaptocarboxylic acid of the formula



wherein *m* is 0, 1 or 2 and R^1, R^2 and R^3 are each hydrogen or an alkyl or hydroxyalkyl having from 1 to 4 carbon atoms

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4,001,229

ALKANESULFONAMIDO TRIPHENYLETHYLENES

William E. Kreighbaum, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

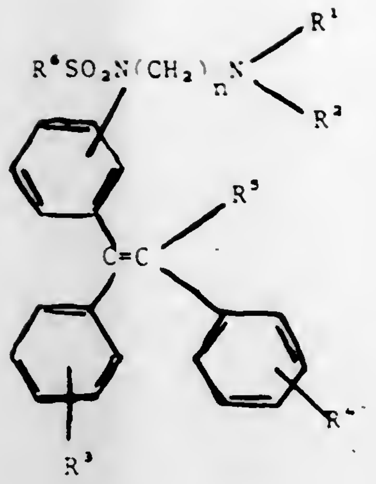
Filed Apr. 4, 1974, Ser. No. 457,931

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07D *295/14*

U.S. Cl. 260—247.1 R **12 Claims**

1. A compound selected from the group consisting of bases having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

- R^1 and R^2 are lower alkyl having 1 to 4 carbon atoms, or together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of morpholine, thiamorpholine, aziridine, pyrrolidine, piperidine, hexahydroazepine, and octahydroazocine.
- R^3 and R^4 are selected from the group consisting of hydrogen, hydroxy and methoxy.
- R^5 is selected from the group consisting of hydrogen, chlorine, bromine, iodine, nitro, alkyl having 1 to 4 carbon atoms and perfluoroalkyl having 1 to 4 carbon atoms.
- R^6 is lower alkyl having 1 to 4 carbon atoms, and
- *n* is the integer 2 or 3.

4,001,230

3-(5-NITROIMIDAZOL-2-YL)PYRAZOLO[3,4-d]PYRIMIDINE COMPOUNDS

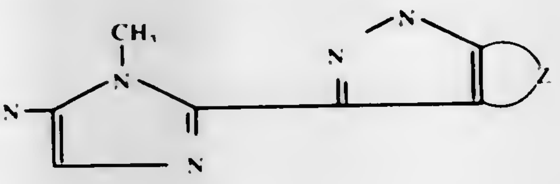
Henry Friedman, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 469,256, May 13, 1974, abandoned. This application Jan. 31, 1975, Ser. No. 545,852

Int. Cl.² C07D *487/04*

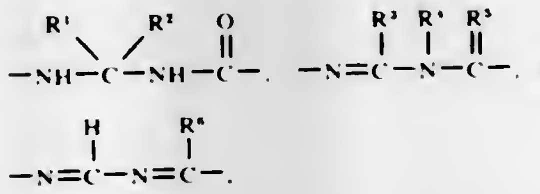
U.S. Cl. 260—247.5 DP **13 Claims**

1. A pyrazolo[3,4-d]-pyrimidine compound of the formula



wherein

Z is selected from the group consisting of

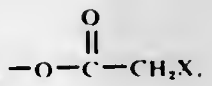


and

R is C_1–C_3 alkyl, hydroxy(C_1–C_3)alkyl, or halo(C_1–C_3)alkyl.

R^1 is $-CH_2X$.

R² is

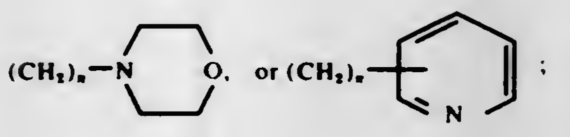


$$-O-\overset{O}{\overset{\|}{C}}-CH_2X.$$

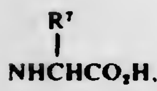
X is bromine, chlorine, fluorine, or iodine;

R^3 is hydrogen, C_1–C_4 alkyl, or CF_3;

R^4 is hydrogen, C_1–C_4 alkyl, $(CH_2)_nN(C_1$–C_4 alkyl$)_2$, $CH_2CH[O(C_1$–C_4 alkyl$)]_2$, $(CH_2)_n$-OH, 9-octadecenyl,



R^5 is NH or oxygen;
R^6 is NH_2, $NHCOCH_3$,



$NH\overset{R^7}{\overset{|}{C}}HCO_2H$,

R^7 is hydrogen or $—CH_2CH_2SCH_3$;
n is 1, 2, 3, or 4;
and the nontoxic, pharmacologically-acceptable salts thereof.

4,001,231

PROCESS FOR MAKING A METHENAMINE SALT OF AN OPTICALLY ACTIVE ACID

Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Mar. 29, 1973, Ser. No. 332,442

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C07D *251/04*

U.S. Cl. 260—248.5 **1 Claim**

1. The process for making a salt of methenamine which comprises slowly adding d-mandelic acid to a boiling, stirred suspension of methenamine in a solvent selected from the group consisting of ethyl methyl ketone, acetone, ethanol and isopropanol, in the molar ratio of 0.8:1.0 to 1.0:0.8, removing the heat but continuing the stirring until the mixture cools to room temperature, cooling in an ice-water bath and recovering the formed crystals of methenamine dextro-mandelate.

4,001,232

PROCESS FOR PREPARING 1-SUBSTITUTED 2-METHYL-TETRAHYDROPYRIMIDINES

Gerhard Groegler, Leverkusen; Gerhard Dankert; Klaus Recker, both of Cologne, and Josef Backes, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 22, 1975, Ser. No. 598,083

Claims priority, application Germany, Aug. 17, 1974, 2439550

Int. Cl.² C07D *239/06*

U.S. Cl. 260—251 R **7 Claims**

1. Process for preparing 1-substituted, 2-methyltetrahydropyrimidine which comprises reacting an N-substituted propylene diamine with an acetoacetic acid ester or amide at a temperature of from 0° to 80° C, and removing the water produced in the reaction at a temperature of from 0° to 80° C.

4,001,233

2-AMINO-1-(2′-BROMO-3′-SUBSTITUTED PHENYL) PYRIDINIUM COMPOUNDS

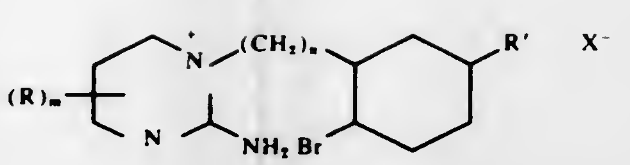
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 532,796, Dec. 16, 1974, Pat. No. 3,957,787, which is a division of Ser. No. 382,804, July 26, 1973, Pat. No. 3,868,374. This application Jan. 22, 1976, Ser. No. 651,390

Int. Cl.² C07D *239/42*

U.S. Cl. 260—256.4 N **4 Claims**

1. A compound of the formula



wherein *m* is 1 or 2; when *m* is 1, R occupies either the 4- or 5-positions of the starting 2-aminopyrimidine, but when R is halogen it occupies only position-5; when *m* is 2, the two R-substituents occupy the 4- and 5-positions of the starting 2-aminopyrimidine, but only one of the two R-substituents can be halogen and it must occupy the 5-position;

R is the same or different and is hydrogen, F, Cl, Br, alkyl of from 1 to 4 carbons, benzyl, phenyl, or mono-substituted phenyl wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, and *m* is 1, R occupies only the 5-position in the starting 2-aminopyrimidine;

R′ is hydrogen, F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, alkylsulfonyl wherein the alkyl radical has from 1 to 4 carbons, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl wherein each alkyl radical has from 1 to 4 carbons, trifluoromethyl, mono-substituted phenyl or mono-substituted phenyloxy wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons or trifluoromethyl; *n* is 2 or 3 and X is Cl or Br.

4,001,234

SUBSTITUTED PYRIMIDINYLOXY(THIO)PHENYL UREAS AND DERIVATIVES THEREOF

Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

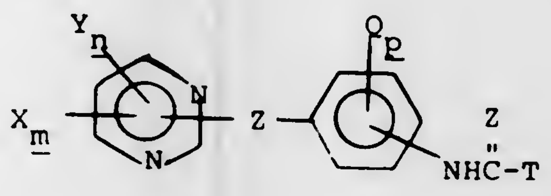
Filed Jan. 22, 1974, Ser. No. 435,617

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

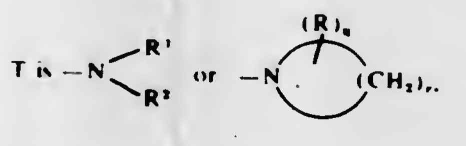
Int. Cl.² C07D *239/34*

U.S. Cl. 260—256.4 C **16 Claims**

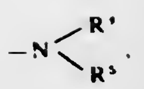
1. A compound corresponding to the formula:



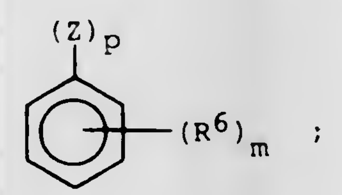
wherein:



r represents an integer of 4 or 5;
q represents an integer of 0 to 2, inclusive;
p represents an integer of 0 or 1;
each X independently represents bromo, chloro, iodo or fluoro;
m represents an integer of 0 to 3, inclusive;
each Y independently represents cyano, nitro, ZR^3, $—C(X')_3$ or



n represents an integer of 0 to 2, inclusive, the sum of *m* + *n* being from 0 to 3, inclusive;
each Z independently represents oxygen or sulfur;
Q represents methyl, ethyl, halo, nitro, cyano or trifluoromethyl;
each X′ independently represents hydrogen or halo;
each R independently represents hydrogen or alkyl of from 1 to 3 carbon atoms;
R^1 represents hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms;
R^2 represents alkyl of from 1 to 3 carbon atoms or



R^3 represents alkyl of from 1 to 3 carbon atoms;
R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms; and
each R^6 represents halo or alkyl of from 1 to 3 carbon atoms.

4,001,235

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 455,304, March 27, 1974, Pat. No. 3,857,849, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Sept. 5, 1974, Ser. No. 503,345

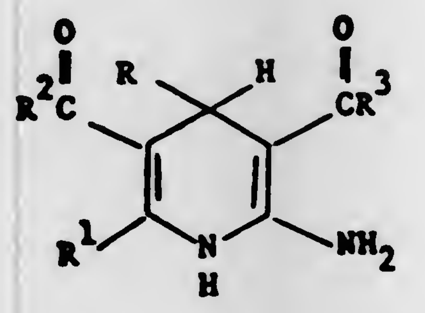
Claims priority, application Germany, Mar. 6, 1972, 2210674

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *239/26*

U.S. Cl. 260—256.4 Q **5 Claims**

1. A compound of the formula:



wherein

- R is quinolyl, isoquinolyl, or pyrimidyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;
- R^1, when taken independently, is hydrogen, lower alkyl, phenyl or pyridyl;
- R^2, when taken independently, is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)-amino,
- R^1 and R^2 when taken together are alkylene of 2 to 4 carbon atoms, and
- R^3 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkyl-amino or di(lower alkyl)amino.

4,001,236

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

Jürgen Habermeier, Pfeffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

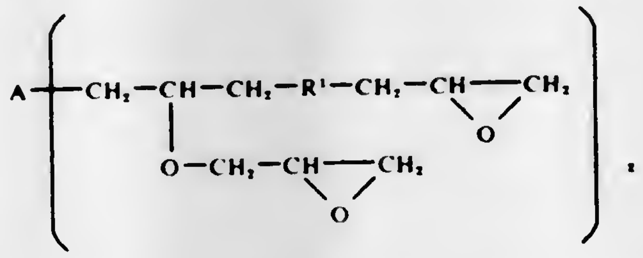
Division of Ser. No. 371,449, June 13, 1973, Pat. No. 3,900,493. This application June 19, 1975, Ser. No. 588,528

Claims priority, application Switzerland, June 23, 1972, 9528/72

Int. Cl.² C07D *49/32, 51/20, 51/30*

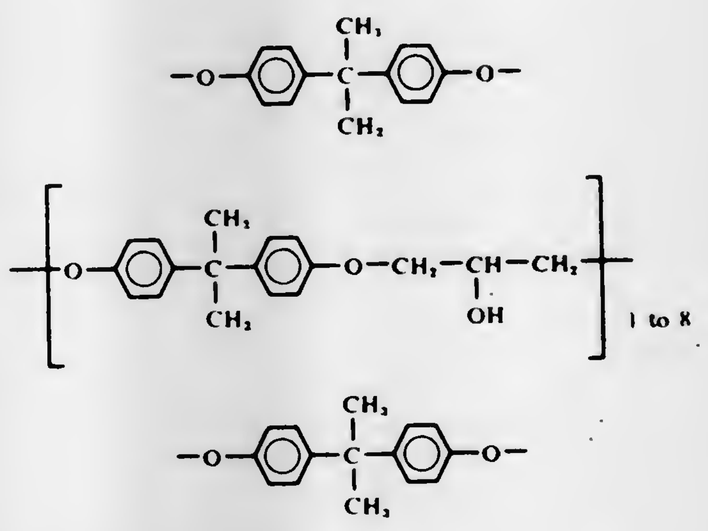
U.S. Cl. 260—256.4 F **5 Claims**

1. A polyglycidyl compound of the formula I

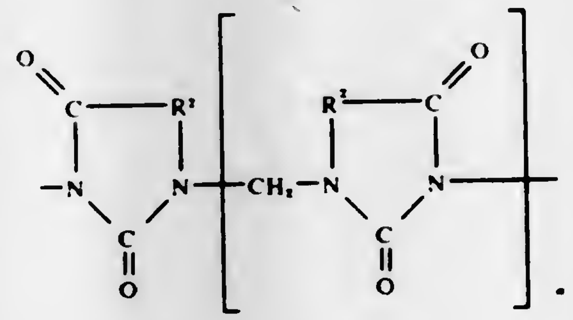


(I)

wherein A denotes one of the radicals of the formulae

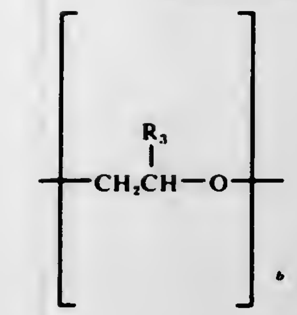


R^1 represents a divalent radical of the formula II



(II)

-continued

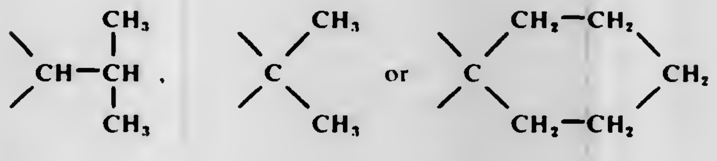


wherein

a and b are identical or different and denote either 0 or 1;

R^3 is hydrogen or methyl;

and R^2 denotes one of the radicals



4,001,237

OXAZOLE, ISOXAZOLE, THIAZOLE AND ISOTHIAZOLE AMIDES

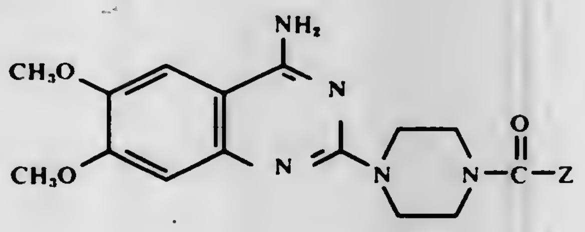
Richard Anthony Partyka, Liverpool, and Ronnie Ray Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,961

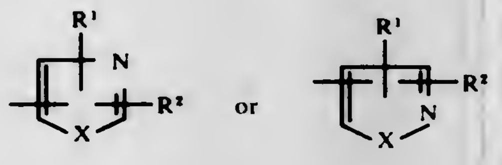
Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 B **12 Claims**

1. A compound having the formula:



wherein Z is either the radical



in which X is either oxygen or sulfur and R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, (lower)alkyl having from 1 to 6 carbon atoms, (lower)alkoxy having from 1 to 6 carbon atoms and (lower)alkylthio having from 1 to 6 carbon atoms and pharmaceutically acceptable acid addition salts thereof.

4,001,238

1,3,4-OXADIAZOLE AMIDES

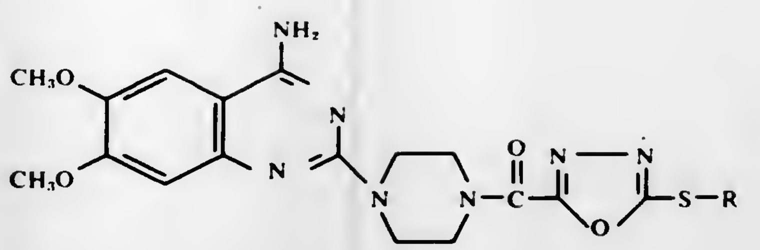
Richard Anthony Partyka, Liverpool, and Ronnie Ray Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,979

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 B **3 Claims**

1. A compound having the formula:



in which R is (lower)alkyl of 1 to 6 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,001,239

CEPHALOSPORIN CLEAVAGE PROCESS

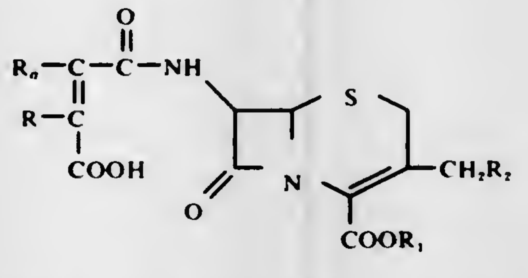
Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 371,011, June 18, 1973, Pat. No. 3,905,966. This application June 13, 1975, Ser. No. 586,689

Int. Cl.² C07D *501/18*

U.S. Cl. 260—243 C **11 Claims**

1. A process for cleaving the amic acid function of a 7-(amic acid) cephalosporin having the formula

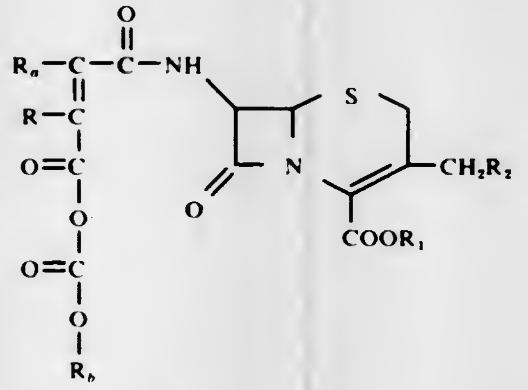


in which R and R_a are hydrogen, or R and R_a taken together with the carbon atoms to which they are attached represent orthophenylene;

R_1 is a carboxy protecting group; and

R_2 is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio; which comprises

1. contacting said 7-(amic acid) cephalosporin with an alkyl chloroformate in the presence of a tertiary amine to form the corresponding mixed anhydride having the formula



in which R_b is an alkyl group having from 1 to 4 carbon atoms;

2. contacting the product mixture from step (1) with a hydrazine of the formula

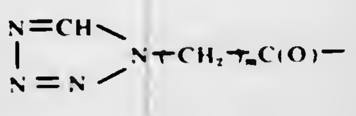
R_3HNNHR_4

in which R_3 and R_4 independently are hydrogen or methyl; and

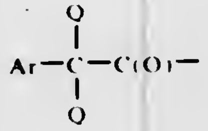
3. contacting the reaction mixture from step (2) with an acyl halide to produce the corresponding 7-acylamido cephalosporin, said acyl halide having the formula

R_x-Y

in which Y is halogen and R_x is C_1 to C_8-alkanoyl; C_2 to C_8-chloro- or bromoalkanoyl; azidoacetyl, cyanoacetyl; 2-sydnone-3-C_1 to C_3-alkanoyl;



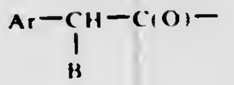
in which *m* is zero, 1, or 2;



$$Ar-\overset{Q}{\underset{Q}{C}}-C(O)-$$

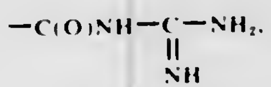
in which each Q is hydrogen or methyl, and Ar is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, phenyl, or phenyl substituted with chlorine, bromine, iodine, fluorine, trifluoromethyl, hydroxy, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy, cyano, or nitro,

$Ar-X-CH_2-C(O)-$ in which X is oxygen or sulfur, and Ar is as defined above, or Ar is 4-pyridyl and X is sulfur, or



$$Ar-\underset{B}{CH}-C(O)-$$

in which Ar is as defined above, and B is -NH_2, an amino group protected with benzyloxycarbonyl, C_1 to C_4-alkoxycarbonyl, cyclopentyloxycarbonyl, cyclohexyloxycarbonyl, benzhydryloxycarbonyl, triphenylmethyl, 2,2,2-trichloroethoxycarbonyl,



$$-C(O)NH-\underset{NH}{\underset{\|}{C}}-NH_2,$$

or the enamine from methyl acetoacetate or acetylacetone, —OH, or —OH protected by esterification with a C_1 to C_6-alkanoic acid, —COOH, or —COOH protected by esterification with a C_1 to C_6-alkanol, $-N_3$, —CH, or $-C(O)NH_2$

4,001,240

HEXAKIS(2-PYRIDYLTHIO)TETRAZINC MONOOXIDE

Mitsuo Masaki; Satoshi Matsunami; Susumu Fuzimura, and Kiyomi Okimoto, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

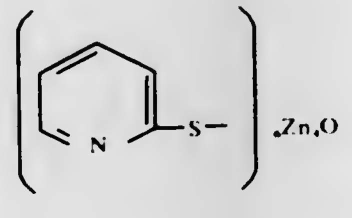
Filed July 16, 1975, Ser. No. 596,264

Claims priority, application Japan, Dec. 4, 1974, 49-138494; Dec. 13, 1974, 49-142466; Feb. 3, 1975, 50-13317; Feb. 3, 1975, 50-13318; Feb. 13, 1975, 50-17410

Int. Cl. C07d *213/70*

U.S. Cl. 260—270 K **4 Claims**

1. Hexakis(2-pyridylthio)tetrazinc monooxide having the formula



4,001,241

2-ALKOXY(AND 2-ALKOXYALKYL)-2-QUINOLYL-THIOACETAMIDES

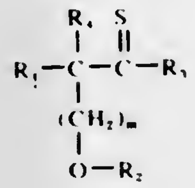
Helene E. Bowman Van Hoeven, Wallingford; L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 386,898, Aug. 9, 1973, Pat. No. 3,907,814, which is a continuation-in-part of Ser. No. 284,375, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,512, April 28, 1972, abandoned. This application June 12, 1975, Ser. No. 586,483

Int. Cl.² C07D *215/14*

U.S. Cl. 260—283 S **6 Claims**

1. A compound of the formula.



$$R_1-\overset{R_4}{\underset{\underset{O-R_2}{(CH_2)_m}}{C}}-\overset{S}{\overset{\|}{C}}-R_3$$

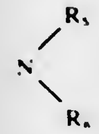
in which

m is 0, 1 or 2,

R_1 is [2-pyrimidyl, 4-pyrmidyl, 2-pyrazinyl, 2-pyrrolyl,] 2-quinolyl [, 2-thiazolyl or 4-thiazolyl];

R_2 is lower alkyl, allyl or cyclopropanemethyl;

R_3 is



$$N{<}^{R_5}_{R_6}$$

NH-phenyl or NH-$(CH_2)_n$-cycloalkyl,

said cycloalkyl having 3–6 carbon atoms,

R_4 is hydrogen or lower alkyl,

R_5 and R_6 are hydrogen or lower alkyl and

n is 0 or 1 or a pharmaceutically acceptable acid addition salt thereof

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4,001,242

D-6-METHYL-8-FORMYL-10α-ALKOXY-8-ERGOLENE

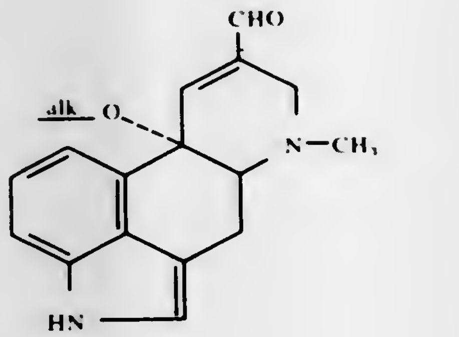
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 494,149, Aug. 2, 1974, Pat. No. 3,923,812. This application Aug. 4, 1975, Ser. No. 601,740

Int. Cl.² C07D *457/02*

U.S. Cl. 260—285.5 **1 Claim**

1. D-6-methyl-8-formyl-10α-alkoxy-8-ergolene of the formula



wherein alk is (C_1–C_3) alkyl.

4,001,243
SUBSTITUTED BENZO(IJ)QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

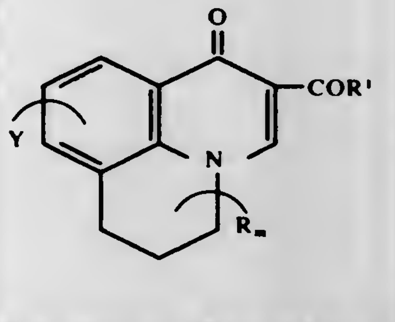
Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,149

The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.

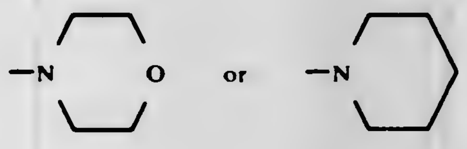
Int. Cl.² C07D *471/06*

U.S. Cl. 260—287 P **1 Claim**

1. A compound having the formula



wherein R is methyl, ethyl or trifluoromethyl; Y is methylenedioxy or ethylenedioxy bonded to adjacent ring positions; m is zero, one or two, and when R is trifluoromethyl, m is one; and R^1 is -OH, -OR^2 where R^2 is alkyl having 1 to 4 carbon atoms, halide, -OM where M is a pharmaceutically acceptable cation, NHR^3 where R^3 is alkyl having 1 to 4 carbon atoms,



4,001,244
1-ARYL-3,4-DIHYDRO-2(1H)-ISOQUINOLINE CARBONYL CHLORIDES

Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 381,505, July 23, 1973, Pat. No. 3,905,982. This application Apr. 25, 1975, Ser. No. 571,638

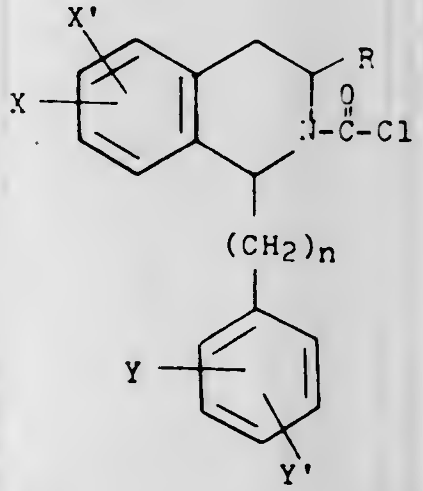
Claims priority, application Greece, July 18, 1974, 4872

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C07D *217/06*

U.S. Cl. 260—287 D **10 Claims**

1. A compound of the formula



wherein X and X' are each selected from the group consisting of hydrogen, lower alkoxy, benzyloxy, and methyl, or X and X' together represent a single methylenedioxy or ethylenedioxy group; Y and Y' are each selected from the group consisting of hydrogen, halogen, lower alkoxy, and methyl; *n* is selected from the group consisting of 0 and 1; and R is selected from the group consisting of hydrogen and methyl.

4,001,245
2-[2-(PIPERIDINO)ETHYL]-10,10a-DIHYDRO-1H,5H-IMIDAZO[1,5-b]ISOQUINOLIN-1,3(2H)-DIONE

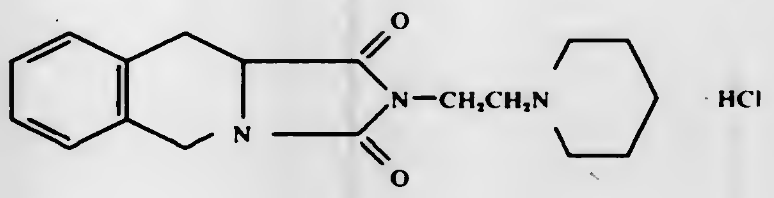
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,913

Int. Cl.² C07D *471/14*

U.S. Cl. 260—287 CF **1 Claim**

1. A compound of the formula:



4,001,246
DERIVATIVES OF 24-METHYLENE-14A-AZA-D-HOMO-CHOLESTADIENES

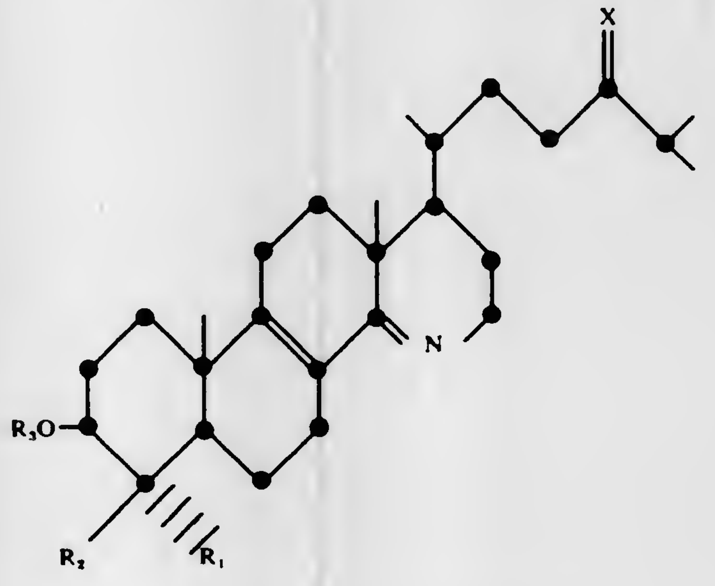
Charles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 503,561, Sept. 6, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,584

Int. Cl.² C07D *215/16, 215/38*

U.S. Cl. 260—288 CF **6 Claims**

1. The compound of the formula



wherein:

R_1 and R_2 are both hydrogen or both methyl;

R_3 is hydrogen; and

X is oxygen or NOR_4, wherein R_4 is hydrogen or C_1–C_4 alkyl,;

and the pharmaceutically acceptable salts thereof.

4,001,247
1-ETHYL 3A-(SUBSTITUTED-PHENYL) DECAHYDROISOQUINOLINE

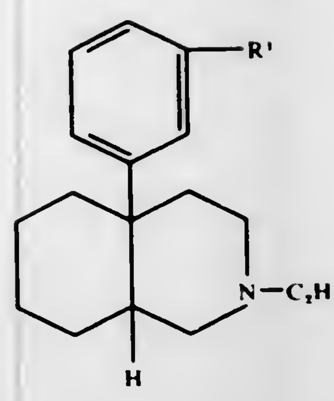
Dennis M. Zimmerman, Indianapolis, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,220

Int. Cl.² C07D *217/12*

U.S. Cl. 260—289 D **6 Claims**

1. A compound of the formula



wherein

R^1 is O-alk or OH; and

alk is (C_1–C_3) alkyl.

4,001,248
N-CYCLOALKYLMETHYL DECAHYDROISOQUINOLINES

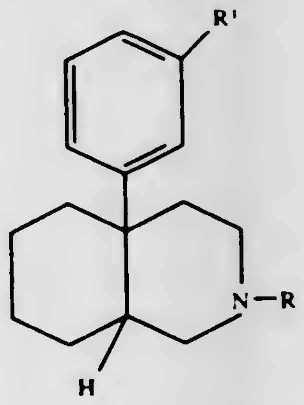
Dennis M. Zimmerman, Indianapolis, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 7, 1974, Ser. No. 477,222

Int. Cl.² C07D *217/04*

U.S. Cl. 260—289 D **9 Claims**

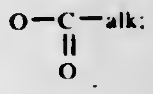
1. A compound of the formula:



wherein

R is cyclopropylmethyl or cyclobutylmethyl;

R' is O-alk, OH, or



$$O-\underset{\underset{O}{\|}}{C}-alk;$$

and

alk is (C_1–C_3) alkyl and pharmaceutically-acceptable acid-addition salts thereof

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4,001,249
PROCESS FOR THE PREPARATION OF TROPANE ALKALOIDS

Ryoji Noyori, Nagoya; Yoshihiro Hayakawa, Ichinomiya; Yutaka Baba, Bisai, and Shinji Makino, Hazu, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co. Ltd., Nagoya, Japan

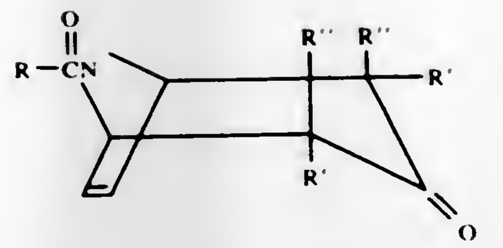
Filed Aug. 12, 1974, Ser. No. 496,579

Claims priority, application Japan, Oct. 15, 1973, 48-115424

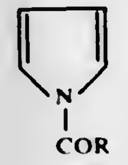
Int. Cl.² C07D *451/12, 451/10*

U.S. Cl. 260—292 **19 Claims**

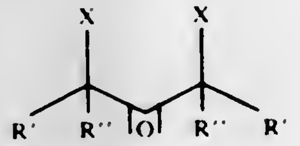
1. A process for the preparation N-acyldehydronortropinone having the formula.



, wherein R represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, phenyl and phenoxy, and R' and R'' each represents the same or different member selected from the group consisting of hydrogen lower alkyl, and halogen, comprising reacting an N-acylpyrrole having the formula.



, wherein R has the meaning given above, with an α, α'-halogenoketone having the formula:



, wherein R' and R'' respectively have the meanings given to them above and X represents halogen, in the presence of a reducing agent selected from the group consisting of iron carbonyl and zinc-copper couple.

4,001,250
PROCESS FOR PREPARING 4-AMINO-2,2,6,6-TETRAMETHYL PIPERIDINE

Reinhard Lantzsch, and Dieter Arlt, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1975, Ser. No. 552,508

Claims priority, application Germany, Mar. 16, 1974, 2412750

Disclosure was also published under second Trial Voluntary Protest Program on Mar 16, 1976

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.52 **9 Claims**

1. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine which comprises reacting phorone with ammonia and hydrogen in the presence of a hydrogenation catalyst.

4,001,251
APOVINCALDEHYDE

Henry Najer, and Yves Robert Alain Pascal, both of Paris, France, assignors to Synthelabo, Paris, France

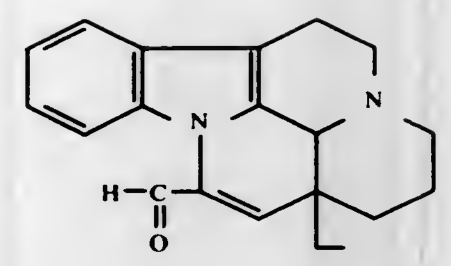
Division of Ser. No. 423,901, Dec. 12, 1973, Pat. No. 3,925,392. This application June 5, 1975, Ser. No. 583,893

Claims priority, application France, Dec. 15, 1972, 72.44673

Int. Cl.² C07D *459/00*

U.S. Cl. 260—293.53 **1 Claim**

1. Apovincaldehyde of the formula:



and its stereoisomers.

4,001,252
2-AMINO-3,4-DIHYDROPYRIDINES

Horst Meyer; Friedrich Bossert; Wulf Vater, all of Wuppertal, and Kurt Stoepel, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 25, 1974, Ser. No. 445,166

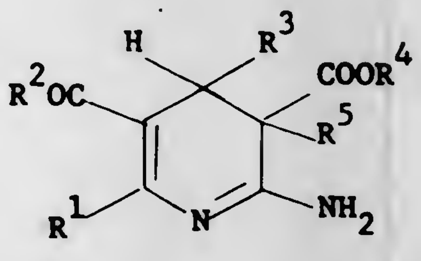
Claims priority, application Germany, Mar. 3, 1973, 2310747

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² 424 *258, 266*

U.S. Cl. 260—294.8 G **15 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen, straight or branched chain lower alkyl, or amino;

R^2 is straight or branched chain lower alkyl or OR′ wherein R′ is straight or branched chain lower alkyl, lower alkenyl, lower alkynyl or alkoxyalkyl of 2 to 4 carbon atoms;

R^3 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or unsubstituted or substituted phenyl or naphthyl which when substituted bears 1, 2 or 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, azido, cyano, phenyl, nitro, trifluoromethyl, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and SO_n -alkyl of 1 to 4 carbon atoms in the alkyl moiety wherein *n* is 0, 1 or 2;

R^4 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, or straight or branched chain alkynyl of 2 to 6 carbon atoms; and

R^5 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, straight or branched chain alkynyl of 2 to 6 carbon atoms, or benzyl.

4,001,253
NAPHTHOLACTAM DYESTUFFS

Horst Harnisch, Cologne, and Alfred Brack, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

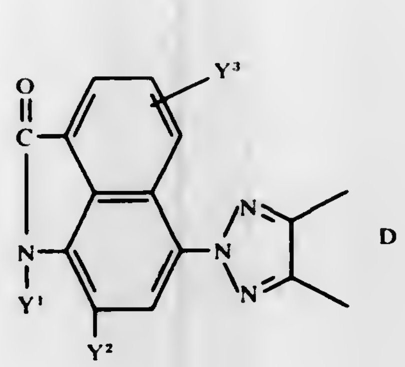
Division of Ser. No. 363,989, May 25, 1973, Pat. No. 3,950,347. This application Aug. 21, 1975, Ser. No. 606,546

Claims priority, application Germany, May 26, 1972, 2225648

Int. Cl.² C07D *249/22*

U.S. Cl. 260—294.8 B **6 Claims**

1. Naphtholactam dyestuff of the formula



wherein

Y^1 is hydrogen, C_1–C_5-alkyl, benzyl, C_1–C_2-alkylbenzyl, chlorobenzyl, C_1–C_2-alkoxybenzyl, cyanobenzyl, phenyl, C_1–C_2-alkylphenyl, chlorophenyl, C_1–C_2-alkoxyphenyl, cyclohexyl, or C_1–C_5-alkyl substituted by chloro, hydroxy, cyano, carboxy, carboxylic acid (C_1–C_4-alkyl) ester, benzyl ester, carboxylic acid amide, or C_1–C_3-alkoxy;

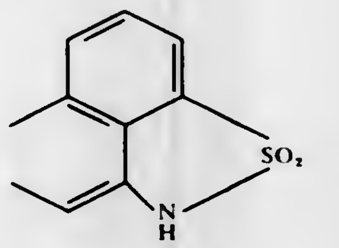
Y^2 is hydrogen, chloro, bromo, C_1–C_3-alkyl, C_1–C_2-alkoxy, amino, or sulpho;

Y^1 and Y^2, when taken together, are propylene;

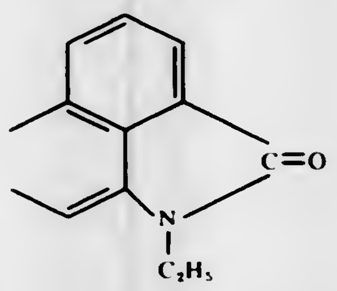
Y^3 is hydrogen or C_1–C_2-alkoxy;

D represents the remaining members of a naphthalene ring which is unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, C_1–C_4-alkyl, chlorine, bromine, cyano, carboxy, carboxylic acid C_1–C_3-alkyl ester, sulphonic acid, carboxylic acid amide, sulphonic acid amide, carboxylic acid C_1–C_4-alkylamide, carboxylic acid di-C_1–C_4-alkylamide, sulphonic acid C_1–C_4-alkylamide, sulphonic acid di-C_1–C_4-alkylamide, amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or C_2–C_3-alkylcarbonylamino; and

D additionally represents



or



4,001,254
ISOTHIOCYANOPYRIDINE DERIVATIVES

Wolfgang Schmid, Therwil; Ernst Gutzwiller, Rheinfelden, and Urs Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

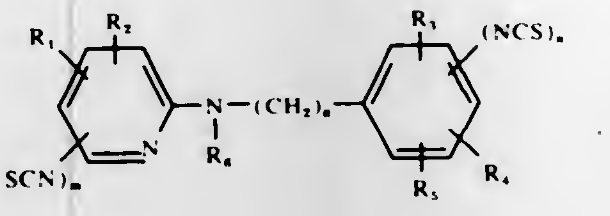
Division of Ser. No. 386,796, Aug. 8, 1973, Pat. No. 3,929,806. This application Oct. 10, 1975, Ser. No. 621,443

Claims priority, application Switzerland, Aug. 10, 1972, 11886/72; Aug. 10, 1972, 11887/72

Int. Cl.² C07D *213/74*

U.S. Cl. 260—294.8 E **5 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen,

R_2 is hydrogen,

R_3 is hydrogen, halogen, methyl, methoxy, ethoxy, butoxy, hydroxy, dimethylamino, phenoxy, or phenyl,

R_4 and R_5 are hydrogen,

R_6 is hydrogen,

m is 1,

n is 0,

q is 0 or 1.

4,001,255
PROCESS FOR THE PRODUCTION OF CYANOPYRIDINES

Francois Moulin, Neuchatel, and Karl-Josef Boosen, Erlach, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Aug. 2, 1974, Ser. No. 494,339

Claims priority, application Switzerland, Aug. 10, 1973, 11550/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **14 Claims**

1. In a process for the production of a cyanopyridine by conversion of a monoalkylpyridine, the alkyl having one to four carbon atoms, with (a) oxygen or air and (b) ammonia in the gaseous phase in the presence of a catalyst, the improvement which consisting essentially of using a catalyst which consists of pure V_2O_5 having a grain size of 50 to 500 μ and a specific surface of up to 10 m^2/g and conducting the reaction at a temperature which is calculated according to the formula $T = S.m + b$, wherein T is the reaction temperature in °C., S is the specific surface of the catalyst in m^2/g, m is a factor of -4 to -6 and b a number from 320 to 322

4,001,256
PYRIDYLALKYL PHENYL UREAS AND THEIR N-OXIDES

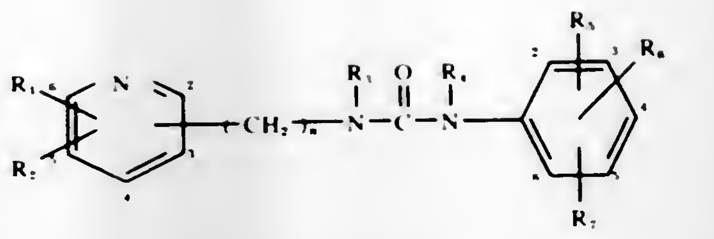
William A. Callahan; Eldridge Myles Glenn, both of Kalamazoo, and Douglas L. Rector, Parchment, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 428,361, Dec. 26, 1973, abandoned. This application June 25, 1975, Ser. No. 590,031

Int. Cl.² C07D *213/38*

U.S. Cl. 260—295 E **11 Claims**

1. A compound selected from those of formula



and a pharmaceutically acceptable acid addition salt thereof wherein R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, alkyl of one to six carbon atoms, inclusive, cycloalkyl of three to six carbon atoms, inclusive, alkenyl of two to six carbon atoms, inclusive, phenyl, alkoxy of one to twelve carbon atoms, inclusive, nitro, amino, alkylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl having one to twelve carbon atoms, inclusive, acylamino with the acyl group being alkyl of one to twelve carbon atoms, inclusive, and trihalomethyl;

R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl of one to four carbon atoms, inclusive, cycloalkyl of three to four carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, and aryl of six to twelve carbon atoms, inclusive, substituted with a group selected from halogen, alkoxy of one to four carbon atoms, inclusive, nitro, aryloxy with aryl of six to twelve carbon atoms, inclusive alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, and aralkyl of seven to twelve carbon atoms, inclusive,

R_5 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, iodo, alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, alkoxy of one to twelve carbon atoms, inclusive, halogen substituted alkyl of one to twelve carbon atoms, inclusive, halogen substituted cycloalkyl of three to eight carbon atoms, inclusive, halogen substituted alkenyl of two to twelve carbon atoms, inclusive, halogen substituted aryl of six to twelve carbon atoms, inclusive, and halogen substituted aralkyl of seven to twelve carbon atoms, inclusive;

R_6 and R_7 are each selected from the group consisting of nitro, amino, acylamino with acyl being alkyl of one to twelve carbon atoms, inclusive, alkylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl of one to twelve carbon atoms, inclusive, aryloxy with aryl of six to twelve carbon atoms, inclusive, and a group R_5 as previously defined and n is an integer of from 1 to 2, inclusive, provided that when one of R_5, R_6 and R_7 is chlorine, the pyridine ring moiety of said compound is attached to the rest of the molecule through the pyridyl ring carbon atom at the four carbon position, and further provided that when R_1 and R_2 are both selected from the group consisting of hydrogen and alkyl of one to six carbon atoms, inclusive, said compound is selected from those wherein R_7 is selected from the group consisting of cycloalkyl of three to eight carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, amino, acylamino with acyl being alkyl from one to twelve carbon atoms, inclusive, aikylamino with alkyl of one to twelve carbon atoms, inclusive, dialkylamino with each alkyl being one to twelve carbon atoms, inclusive, and aryloxy with aryl of six to twelve carbon atoms, inclusive; and those compounds wherein R_4 is selected from the group consisting of cycloalkyl of three to six carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, aralkyl of seven to twelve carbon atoms, inclusive, and aryl substituted with a group selected from the group consisting of halogen, alkoxy of one to four carbon atoms, inclusive, nitro, aryloxy with aryl of six to twelve carbon atoms, inclusive, alkyl of one to twelve carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, alkenyl of two to twelve carbon atoms, inclusive, aryl of six to twelve carbon atoms, inclusive, and aralkyl of seven to twelve carbon atoms, inclusive.

4,001,257

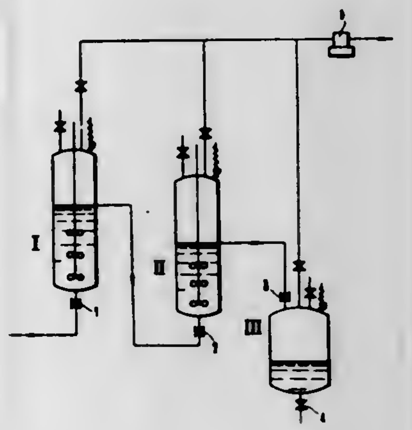
PROCESS FOR PRODUCING NICOTINIC ACID

Keiji Masuda; Hidenori Kizawa, both of Nakago, and Yasuhiko Otaki, Joetsu, all of Japan, assignors to Nippon Soda Company Limted, Tokyo, Japan

Continuation-in-part of Ser. No. 303,028, Dec. 2, 1972, abandoned. This application Aug. 8, 1975, Ser. No. 603,133

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **6 Claims**



1. A process for the production of nicotinic acid which consists essentially of the steps of reacting 2-methyl-5-ethylpyridine with an amount of nitric acid which is 100 to 108 weight percent of that theoretically required to oxidize the 2-methyl-5-ethylpyridine to nicotinic acid, at a temperature of 225° C. to 235° C. and a pressure of 30 to 45 kg/cm² for 5 to 30 minutes, to oxidize said 2-methyl-5-ethylpyridine to nicotinic acid, while maintaining the pH of the reaction mixture at 1.5 to 3.5, concentrating the resulting reaction mixture while maintaining the pH thereof at 1.5 to 3.5, cooling the concentrated reaction mixture to precipitate nicotinic acid, and separating the nicotinic acid having a purity of at least about 98 percent and in a yield of at least about 85 to 90 weight percent.

4,001,258

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Oct. 17, 1974, Ser. No. 515,642

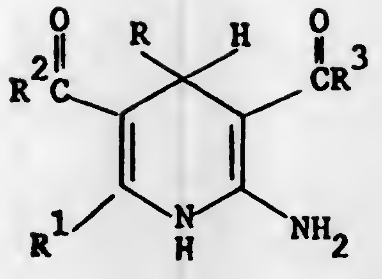
Claims priority, application Germany, Mar. 6, 1972, 2210674

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *213/56*

U.S. Cl. 260—295.5 A **5 Claims**

1. A compound of the formula:



wherein

R is phenyl; substituted phenyl in which the substituents are one of three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio or phenyl; or naphthyl;

R^1 is hydrogen, lower alkyl, phenyl, or pyridyl; and one or both of R^2 and R^3 are independently selected from the group consisting of amino, lower alkyl-amino or di(lower alkyl)amino and the other of R^2 and R^3 when both are not so selected is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy.

4,001,259

3,6-DIAMINO-3,4-DIHYDRO-2-PYRIDONES

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 30, 1975, Ser. No. 545,299

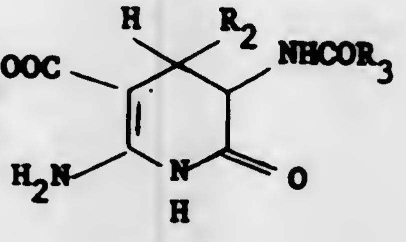
Claims priority, application Germany, Feb. 9, 1974, 2406200

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl. C07d *213/56*

U.S. Cl. 260—295.5 A **10 Claims**

1. A 3,6-diamino-3,4-dihydro-2-pyridone of the formula



wherein

R_1 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkoxyalkyl of 2 to 6 carbon atoms;

R_2 is straight or branched chain alkyl of 1 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl unsubstituted or substituted by 1 or 2 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, nitro, cyano, trifluoromethyl, carb(lower alkoxy) of 1 to 4 carbon atoms in the alkoxy portion and $\cdot SO_n$-(lower alkyl) in which alkyl contains 1 to 4 carbon atoms and *n* is 0 or 2; naphthyl; and

R_3 is straight or branched chain alkyl of 1 to 6 carbon atoms; or phenyl unsubstituted or substituted by methyl, ethyl, methoxy, ethoxy, nitro, trifluoromethyl or chloro or bromo.

4,001,260

SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 429,027

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C *85/02*

U.S. Cl. 260—296 R **6 Claims**

1. In a process for aminating an aromatic compound selected from benzene, pyridine and aniline by reaction with ammonia at a temperature of from about 150°C. to about 500°C. and at a pressure of from about 10 to about 1000 atmospheres in the presence of a cataloreactant comprising nickel/nickel oxide/zirconium oxide wherein the ratio of nickel to nickel oxide is from 0.001:1 to 10:1 and the ratio of total nickel to zirconium oxide is from 0.1:1 to 100:1 that was conditioned by (1) reducing in hydrogen from about 10 to 90% of the nickel oxide to metallic nickel and (2) oxidizing with an oxygen containing gas, the improvement which comprises carrying out the reaction in intimate molecular contact with the conditioned cataloreactant which is treated with from about 0.01 to about 20 moles of ammonia per mole of total nickel in the conditioned cataloreactant at a temperature of from about 20°C. to about 500°C. for from about 1 to about 60 minutes prior to introduction to the amination reactants.

4,001,261

PROCESS FOR THE PRODUCTION OF 1-[(DIMETHYLAMINO)METHYL]-6-PHENYL-4H-IMIDAZO[1,2-a][1,4]-BENZODIAZEPINE

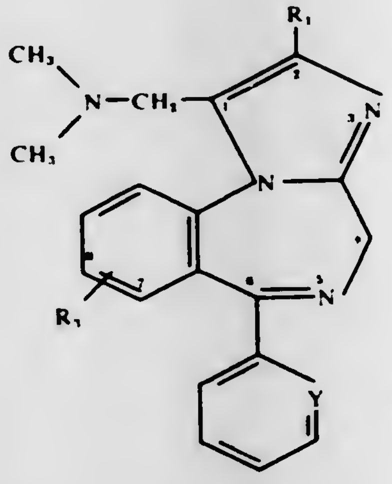
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 20, 1975, Ser. No. 623,971

Int. Cl.² C07D *213/02, 487/04*

U.S. Cl. 260—296 T **7 Claims**

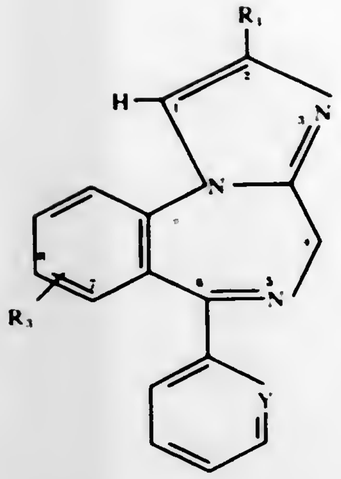
1. A process for the production of 1-[(dimethylamino)-methyl]-6-substituted-4H-imidazo[1,2-a][1,4]benzodiazepines of the formula II.



II

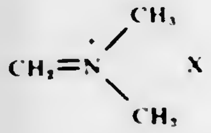
wherein R_1 is hydrogen or alkyl of 1 or 2 carbon atoms, inclusive; wherein Y is nitrogen or C-R_2 in which R_2 is hydrogen, fluoro, or chloro; and wherein R_3 is hydrogen, fluoro, chloro, bromo, trifluoromethyl; which comprises:

treating a compound of formula I:



I

wherein R_1, Y and R_3 are defined as above, in solution between 50°-100° C with a compound of formula IV



$$CH_2{=}N(CH_3)_2 \quad X$$

wherein X^- is the anion of monovalent inorganic or organic acid to yield the corresponding compound of formula II.

4,001,262

PROCESS FOR THE PRODUCTION OF 1-[(DIMETHYLAMINO)METHYL]-6-PHENYL-4H-TRIAZOLO[4,3-a][1,4]-BENZODIAZEPINE

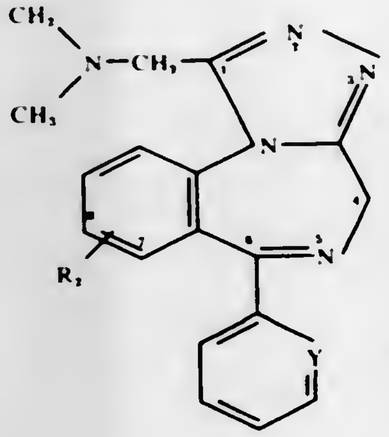
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 20, 1975, Ser. No. 623,972

Int. Cl.² C07D *213/72, 403/06*

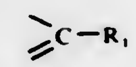
U.S. Cl. 260—296 T **7 Claims**

1. A process for the production of 1-[(dimethylamino)methyl]-6-substituted-4H-s-triazolo[4,3-a][1,4]benzodiazepines of the formula II:



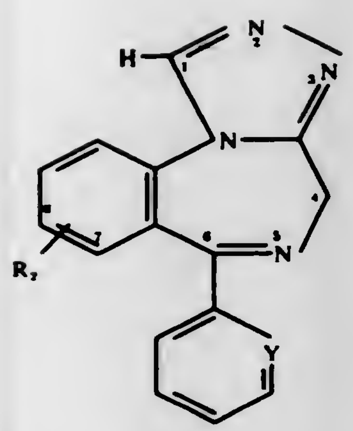
II

wherein Y is nitrogen or



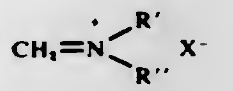
in which R_1 is hydrogen, fluoro, or chloro; and wherein R_2 is hydrogen, fluoro, chloro, bromo, trifluoromethyl, or nitro; which comprises:

treating a compound of formula I.



I

wherein R_2 and Y are defined as above, in solution, between 50°–100° C. with a compound of formula IV



$$CH_2{=}\overset{+}{N}(R')(R'')\quad X^-$$

IV

wherein X^- is the anion of a monovalent inorganic or organic acid, to yield the corresponding compound of formula II above.

4,001,263

5-ARYL-1,2,3,4-TETRAHYDRO-γ-CARBOLINES

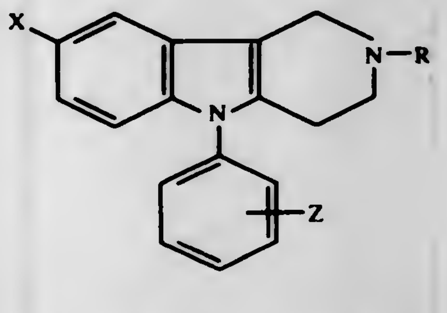
Jacob J. Plattner, East Lyme; Charles A. Harbert, and James R. Tretter, both of Waterford, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,640, April 1, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,354

Int. Cl.² C07D *471/04*

U.S. Cl. 260—296 A **25 Claims**

1. A compound selected from those of the formula

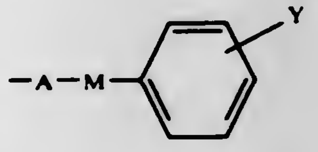


and the pharmaceutically acceptable acid addition salts thereof, wherein

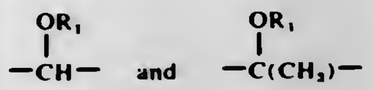
X is selected from the group consisting of fluoro, chloro, bromo and hydrogen;

Z is selected from the group consisting of hydrogen, fluoro, chloro and methoxy and

R is of the formula



wherein A is alkylene having 1 to 5 carbon atoms, M is selected from the group consisting of



$$-\overset{OR_1}{\overset{|}{CH}}-\quad\text{and}\quad-\overset{OR_1}{\overset{|}{C}}(CH_3)-$$

wherein R_1 is hydrogen and Y is selected from the group consisting of fluoro, chloro, methyl and hydrogen.

4,001,264

ENZYME COMPLEXES AND THEIR USE

Thomas Adrian Savidge, Stayning, and Lawson William Powell, Worthing, both of England, assignors to Beecham Group Limited, England

Filed Dec. 12, 1974, Ser. No. 532,051

Claims priority, application United Kingdom, Dec. 28, 1973, 59978/73

Int. Cl.² C07D *499/42*

U.S. Cl. 260—306.7 C **8 Claims**

1. In the process for preparing 6-aminopenicillanic acid, which process consists essentially of maintaining an aqueous solution of benzylpenicllin or phenoxymethylpenicillin or a salt thereof at a pH of from 6.0 to 9.0 while treating it with a water-insoluble enzyme complex, wherein a penicillin acylase enzyme has been adsorbed on a water-insoluble polymer substrate and cross-linked with a cross-linking agent selected from the group consisting of glutaraldehyde, glyoxal and formaldehyde, the improvement wherein the said polymer substrate for the said enzyme is a water-insoluble polymer or coploymer of methacrylic acid.

4,001,265

3,4-DIMETHYL-5-ISOXAZOLYLSULFAMYLANILINE

Daniel Tim-Wo Chu, Greenfield Park, and David Lyon Garmaise, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

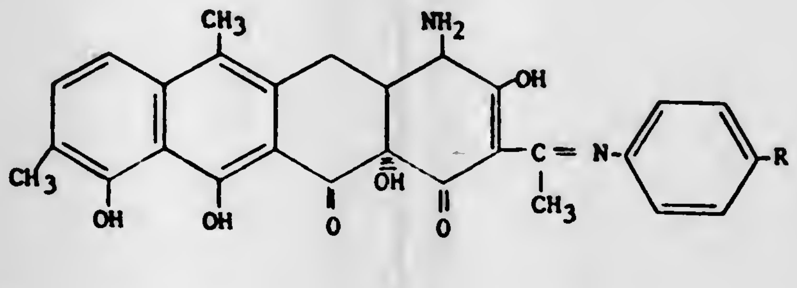
Division of Ser. No. 378,305, July 11, 1973, Pat. No. 3,894,061. This application Mar. 3, 1975, Ser. No. 554,848

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07D *261/16*

U.S. Cl. 260—307 H **2 Claims**

1. A compound of the formula:



wherein R is 4-dimethyl-5-isoxazolylsulfamyl or the corresponding tautomeric form or a pharmaceutically acceptable acid addition salt thereof.

4,001,266

PROCESS FOR THE MANUFACTURE OF 2-(2-HYDROXYPHENYL)BENZTRIAZOLES

Jean Rody, Basel, and Alain Claude Rochat, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

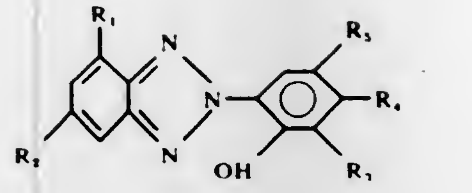
Filed Nov. 25, 1974, Ser. No. 527,180

Claims priority, application Switzerland, Nov. 27, 1973, 16636/73

Int. Cl.² C07D *249/20*

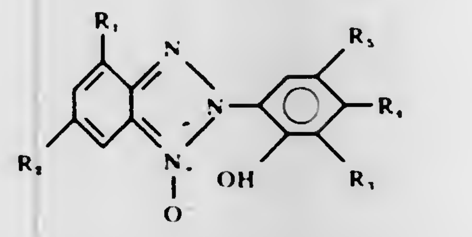
U.S. Cl. 260—308 B **9 Claims**

1. A process for the manufacture of a 2-(2-hydroxyphenyl)-benzotriazole of the formula I



(I)

wherein R_1 denotes hydrogen, chlorine or bromine, R_2 denotes hydrogen, alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 12 carbon atoms, alkylsulphonyl having 1 to 12 carbon atoms, acylamino having 2 to 12 carbon atoms, $-SO_3H$, $-COOH$, bromine or chlorine, R_3 denotes hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 6 to 8 carbon atoms, aralkyl having 7 to 11 carbon atoms, phenyl, chlorine or bromine, R_4 denotes hydrogen, methyl, alkoxy having 1 to 12 carbon atoms, or OH, and R_5 denotes hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 6 to 8 carbon atoms, aralkyl having 7 to 11 carbon atoms, phenyl, carboxyalkyl having 2 to 13 carbon atoms, alkoxy having 1 to 12 carbon atoms, acylamino having 2 to 12 carbon atoms, chlorine or bromine, which comprises reacting in a molar ratio 1 mole of a 2-(2-hydroxyphenyl)benzotriazole-1-oxide of formula III



(III)

with 0.5 to 0.6 moles of hydrazine hydrate in the presence of a base and at a temperature above 100° C in an ether solvent with a boiling point over 140° C and selected from the group consisting of phenyl methyl ether, phenyl ethyl ether, diphenyl ether, ethylene glycol dibutyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, diethylene glycol dibutyl ether, triethylene glycol dimethyl ether, and tetraethylene glycol dimethyl ether, and removing the water formed by azeotropic distillation.

4,001,267

FELDAMYCIC ACID

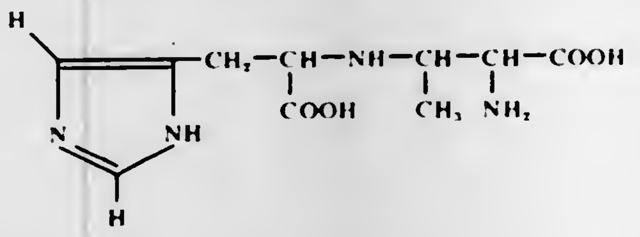
Alexander D. Argoudelis, Portage; Lubomir Baczynskyj, and Stephen A. Mizsak, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 22, 1975, Ser. No. 615,769

Int. Cl.² C07D *233/64*

U.S. Cl. 260—309 **5 Claims**

1. Feldamycic acid, a compound having the following structure:



and acid and base addition salts thereof.

4,001,268

SUBSTITUTED PHENYL-BENZIMIDAZO COMPOUNDS

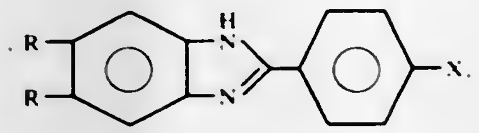
Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 495,471, Aug. 7, 1974, abandoned. This application July 18, 1975, Ser. No. 597,060

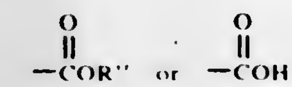
Int. Cl.² C07D *235/18*

U.S. Cl. 260—309.2 **3 Claims**

3. A substituted phenyl-benzimidazo compound having the following structural formula



wherein R is $-NHSO_2R'$ and X is



$$-\overset{O}{\overset{\|}{C}}OR''\quad\text{or}\quad-\overset{O}{\overset{\|}{C}}OH.$$

with R′ being phenyl, tolyl, xylyl, naphthyl, diphenyl, methylnaphthyl, benzyl, chlorophenyl, bromophenyl, iodophenyl, fluorophenyl, chloronaphthyl, chlorodiphenyl, methyl, ethyl, propyl, amyl, octyl, decyl, dodecyl, octadecyl, cyclohexyl, cycloheptyl, methylcyclohexyl, or ethylcycloheptyl, and with R″ being methyl, ethyl, propyl, butyl, cyclopropyl, cyclopentyl, cyclohexyl, cycloheptyl, tolyl, xylyl, phenyl, biphenyl, or naphthyl.

4,001,269

3-AMINO-5,6-DIMETHOXYINDAZOLE HYDROCHLORIDE

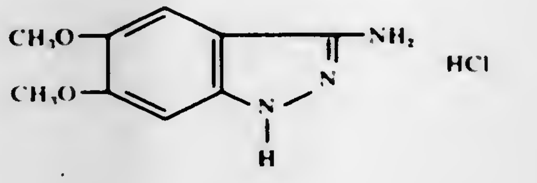
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,447

Int. Cl.² C07D *231/56*, A61K *31/415*

U.S. Cl. 260—310 C **1 Claim**

1. The compound of the formula.



4,001,270

9-BENZOYL-1,2,3,4-TETRAHYDROCARBAZOLE

Ernest John Alexander, East Greenbush, and Aram Mooradian, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 514,767, Oct. 15, 1974, Pat. No. 3,948,939, which is a continuation-in-part of Ser. No. 314,099, Dec. 11, 1972, Pat. No. 3,905,998, which is a continuation-in-part of Ser. No. 200,205, Nov. 18, 1971, Pat. No. 3,758,496, which is a continuation-in-part of Ser. No. 42,620, June 2, 1970, Pat. No. 3,687,969. This application Dec. 12, 1975, Ser. No. 640,249

Int. Cl.² C07D *209/86*

U.S. Cl. 260—315 **1 Claim**

1. 9-Benzoyl-3-(N-phenylcarbamoyloxymethyl)-1,2,3,4-tetrahydrocarbazole.

4,001,271
3-(ISOPROPYL AMINO ALKOXY)-2-PHENYL-ISOINDOLIN-1-ONES

Claude Cotrel, Paris; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 7, 1974, Ser. No. 440,548

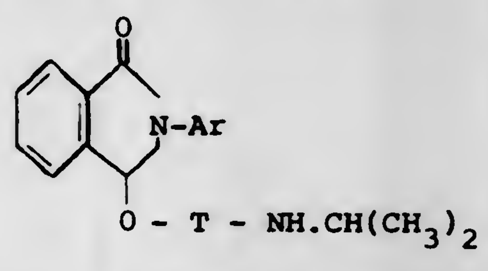
Claims priority, application France, Feb. 8, 1973, 73.04460

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.^{2} C07D *209/46*

U.S. Cl. 260—325 PH **6 Claims**

1. An isoindoline derivative of the formula:



wherein Ar is phenyl and T is alkylene of 2 through 6 carbon atoms, and non-toxic pharmaceutically-acceptable acid addition salts thereof.

4,001,272
HERBICIDAL
2-FLUORO-4-HALO-PHENYL-4,5,6,7-TETRAHYDRO-2H-ISOINDOLE-1,3-DIONES

Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 502,968, Sept. 3, 1974, abandoned. This application Dec. 24, 1974, Ser. No. 536,322

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} C07D *209/48*

U.S. Cl. 260—326 HL **3 Claims**

1. The compound 2-(4-chloro-2-fluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

3. The compound 2-(2,4-difluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

4,001,273
CONTINUOUS MANUFACTURE OF PHTHALIMIDE

Eckhard Hetzel; Ludwig Vogel, both of Frankenthal; Gerhard Rotermund, Heidelberg, and Hans Christoph Horn, Lambsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 8, 1974, Ser. No. 486,678

Claims priority, application Germany, July 10, 1973, 2334916

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C07D *209/48*

U.S. Cl. 260—326 R **7 Claims**

1. A process for the continuous manufacture of phthalimide which comprises reacting phthalic anhydride with ammonia at a temperature of from about 135°C. to 300°C., washing the off-gas with a melt of substantially pure phthalimide or a melt of crude phthalimide obtained as the end product from the reaction of phthalic anhydride with ammonia and containing at least 70% by weight of phthalimide, at a temperature of not less than 210°C, and then recycling the melt to the reaction.

4,001,274
RECOVERY OF 2-PYRROLIDONE FROM AQUEOUS SOLUTIONS

Kiyoshi Katsumoto, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 28, 1975, Ser. No. 635,996

Int. Cl.^{2} C07D *207/12*

U.S. Cl. 260—326.5 FN **6 Claims**

1. A process for recovering 2-pyrrolidone from an aqueous solution, which includes the step of adding to the solution potassium hydrogen phosphate in an amount sufficient to cause separation of the solution into two liquid phases, one of which contains substantially more 2-pyrrolidone than the other.

4,001,275
INDOLE DEHYDRO PHTHALIDES AND NAPHTHALIDES

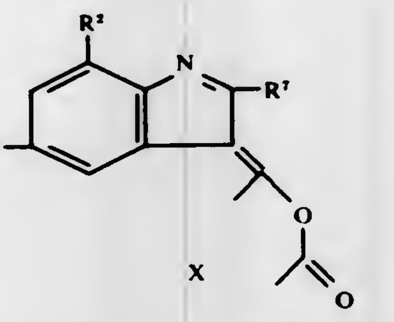
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 446,732, Feb. 28, 1974, Pat. No. 3,941,807, which is a continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,271

Int. Cl.^{2} C07D *209/10, 209/12, 209/14, 209/18*

U.S. Cl. 260—326.12 R **7 Claims**

1. A compound of the formula:



wherein R^2 is selected from $-NH-SO_2-R_1$ wherein R_1 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl and $-SO_2-NH-R_2$ wherein R_2 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substitued alkyl and alkyl-substituted phenyl; R^7 is selected from hydrogen, phenyl, o-hydroxyphenyl and alkyl containing 1 to 3 carbon atoms; R^8 is selected from hydrogen, cyano, carboxy, halo, trifluoromethyl, alkoxy containing 1 to 18 carbon atoms and $-SO_2-R_3$ wherein R_3 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide, unsubstituted or substituted in one of the 4- or 7-positions with carboxy, and naphthalide, unsubstituted.

4,001,276
α-ALKYL(OR ARYL)THIO-5-HYDROXYTRYPTOPHAN DERIVATIVE AND THE PREPARATION PROCESS THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Japan

Filed Feb. 26, 1974, Ser. No. 446,107

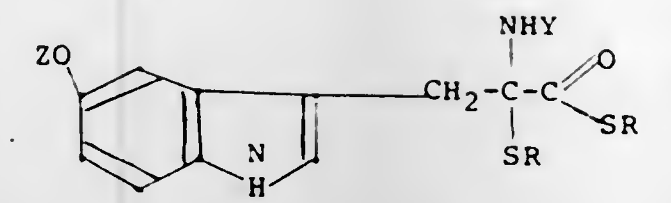
Claims priority, application Japan, Mar. 1, 1973, 48-23734

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} C07D *209/20*

U.S. Cl. 260—326.12 R **2 Claims**

1. A thio-5-hydroxytryptophan derivative expressed by the following formula



(I)

wherein R is alkyl having one to three carbon atoms, Y is acetyl, trifluoroacetyl, benzyloxycarbonyl or p-toluenesulfonyl and Z is methyl, benzyl, benzoyl or acetyl.

4,001,277
3,3-DISUBSTITUTED PHTHALIDES AND NAPHTHALIDES

Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

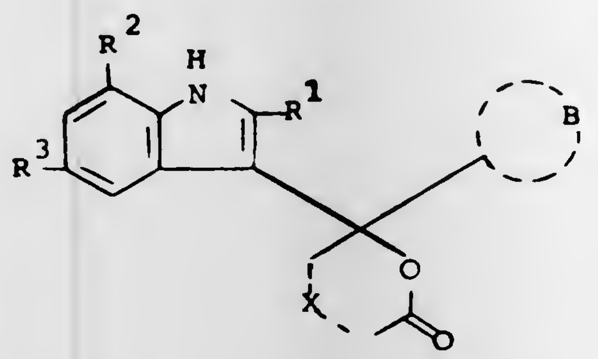
Continuation-in-part of Ser. No. 202,558, Nov. 26, 1971, Pat. No. 3,816,124. This application Apr. 1, 1974, Ser. No. 456,869

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

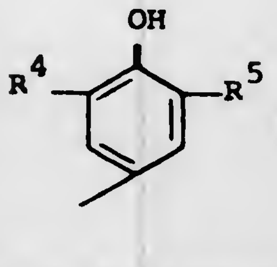
Int. Cl.^{2} C07D *209/18*

U.S. Cl. 260—326.13 R **13 Claims**

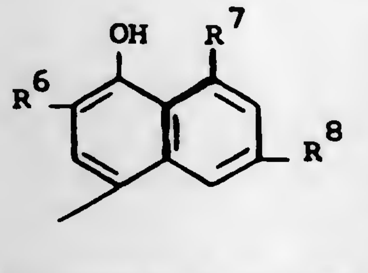
1. A compound of the formula



wherein R^1 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —NH— and selected from carboxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, $-NH-SO_2-R$ and $-SO_2-NH-R'$ wherein said R and R′ each are hydrocarbon groups selected from alkyl containing 1 to 20 carbon atoms, phenyl, naphthyl, alkylsubstituted phenyl containing up to 20 carbon atoms and phenyl-substituted alkyl containing up to 20 carbon atoms; R^2 is hydrogen or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —NH— and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, $-NH-SO_2-R$ and $-SO_2-NH-R'$ wherein R and R′ have the same meaning given above, not more than one of R^1 and R^2 being a hydrogen-bonding group; R^3 is hydrogen or alkoxy containing 1 to 18 carbon atoms; B is selected from



and



wherein R^4 is hydrogen or alkyl containing 1 to 20 carbon atoms, R^5 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, $-NH-SO_2-R$ and $-SO_2-NH-R'$ wherein R and R′ have the same meaning given above, R^6 is hydrogen, alkyl containing 1 to 20 carbon atoms or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, $-NH-SO_2-R$ and $-SO_2-NH-R'$ wherein R and R′ have the same meaning given above, R^7 is hydrogen or a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent —OH and selected from carboxy, hydroxy, bis trifluoromethyl carbinol, $-NH-SO_2-R$ and $-SO_2-NH-R'$ wherein R and R′ have the same meaning given above, not more than one of R^6 and R^7 being a hydrogen-bonding group, R^8 is hydrogen or alkoxy containing 1 to 18 carbon atoms, and X represents the atoms necessary to complete a ring-closing moiety selected from phthalide and naphthalide.

4,001,278
INDOLE PHTHALIDES AND NAPHTHALIDES

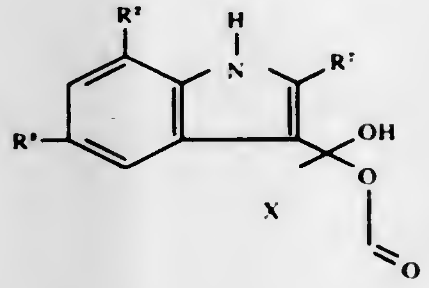
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 446,732, Feb. 28, 1974, Pat. No. 3,941,807, which is a continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,300

Int. Cl.^{2} C07D *209/10, 209/12, 209/14, 209/18*

U.S. Cl. 260—326.12 R **8 Claims**

1. A compound of the formula:



wherein R^2 is selected from hydrogen, hydroxy, carboxy; $-NH-SO_2-R_1$ wherein R_1 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl, $-SO_2-NH-R_2$ wherein R_2 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; o-hydroxyphenyl; bis-trifluoromethylcarbinol; methoxy; and alkyl containing 1 to 16 carbon atoms; R^7 is selected from hydrogen; phenyl; o-hydroxyphenyl; and alkyl containing 1 to 3 carbon atoms, and R^8 is selected from hydrogen; cyano, carboxy; halo; trifluoromethyl; $-SO_2-R_3$ wherein R_3 contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; and alkoxy containing 1 to 18 carbon atoms; and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide, unsubstituted or substituted in the 4- or 7- position with carboxy, and naphthalide, unsubstituted.

4,001,279
ASYMMETRIC MACROCYCLES CONTAINING OXYGEN AND BINAPHTHYL RING MEMBERS

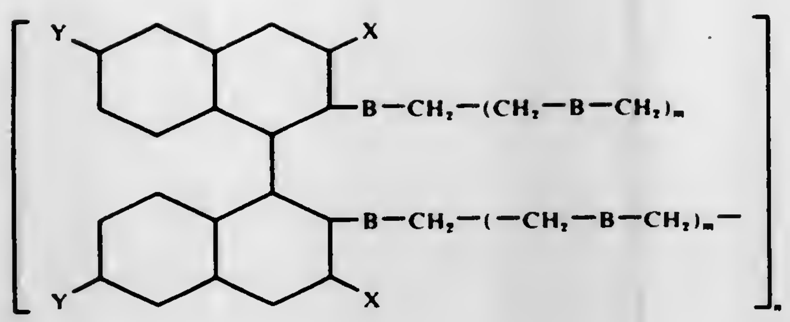
Donald J. Cram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 346,089, March 29, 1973, abandoned. This application Mar. 5, 1974, Ser. No. 448,333

Int. Cl.^{2} C07D *321/00*

U.S. Cl. 260—340.3 **23 Claims**

1. A compound according to the formula:



wherein

- *n* is 1 to 3; each *m* taken separately = 0 to 5, the sum being at least 1;
- B is —O—;
- X is $(CH_2)vR$, where v = 1 to 3 and R = H, CH_3, CO_2H, OH or OCH_3, or X is CH_2OH; CH_2Cl; $CH_2OCH_2CO_2H$; $CH_2OCH_2CO_2CH_3$; $CH_2SCH_2CO_2H$; $CH_2CH_2CO_2H$; $CH_2SCH_2CH_2CO_2H$;
- Y is H, Br, CO_2H, CH_2OH, CH_2Cl, $CH_2OCH_2CO_2H$, $CH_2SCH_2CO_2H$, $CH_2CO_2CH_3(CH_2)_{16}C(CH_3)_2$ or $CH_3(CH_2)_{17}CHCH_3$.

4,001,280
CHROMONE DERIVATIVES

Suminori Umio, Kawanishi; Ikuo Ueda, Yao; Masaaki Matsuo, Toyonaka; Masakazu Kobayashi, Ikeda; Osamu Nakaguti, Osaka, and Yoshinari Sato, Tanashi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

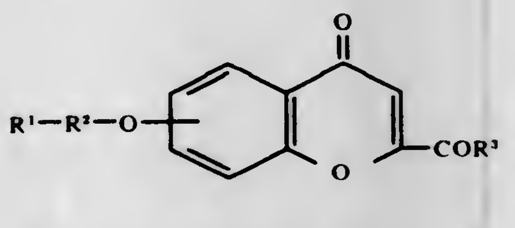
Filed June 20, 1973, Ser. No. 371,852

Claims priority, application Japan, June 21, 1972, 47-62626; June 24, 1972, 47-63407; June 29, 1972, 47-65573

Int. Cl.² C07D *311/24*

U.S. Cl. 260—340.5 **4 Claims**

1. A compound of the formula:



wherein R^1 is aryloxy substituted with lower alkylenedioxy, said aryloxy being phenoxy, napthyloxy, tolyloxy, xyloxy, mesityloxy or cumenyloxy;

R^2 is lower alkylene;

R^3 is hydroxy or lower alkoxy or a nontoxic, pharmaceutically acceptable salt thereof.

4,001,281
2-OXO-CYCLOPENTA[b]FURAN-5α-CARBOXYLIC ACID ESTERS

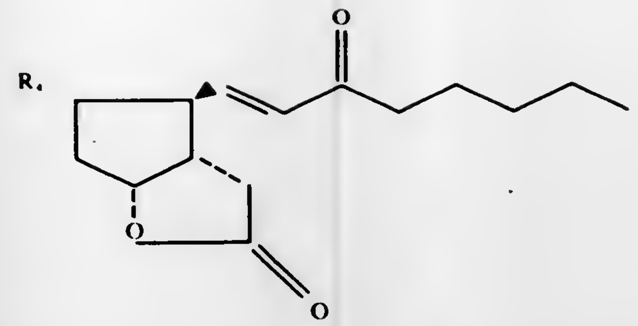
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 612,135

Int. Cl.² C07D *307/83*

U.S. Cl. 260—343.3 R **2 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen, lower alkyl, carboxy or carboxy protected with a group convertible thereto by hydrolysis; or enantiomers or racemates thereof.

4,001,282
PROCESS FOR PRODUCING GAMMA-BUTYROLACTONE

Elwood M. Miller, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 12, 1973, Ser. No. 331,530

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **16 Claims**

1. In a vapor phase process for the production of gamma-butyrolactone by passing a vaporized feed of maleic acid, maleic anhydride, succinic acid or succinic anhydride or a mixture thereof with hydrogen over a metallic catalyst capable of hydrogenolyzing a carboxylic group to a methyleneoxy group, the improvement which comprises the steps of:

i. providing a vaporized mixture of (a) maleic acid, maleic anhydride, succinic acid, succinic anhydride or a mixture thereof, and (b) water at a ratio of from 10 to 60 parts by weight of acid/anhydride to 90 to 40 parts by weight of water, and

ii. contacting the resulting vaporized mixture and hydrogen in the vapor phase with a metallic catalyst capable of hydrogenolyzing a carboxylic group to a methyleneoxy group.

4,001,283
METHOD FOR THE MANUFACTURE OF FURFURAL USING HYDROGEN CHLORIDE

Preston A. Wells, Jr., 345 Locust Road, Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 761,734, Sept. 23, 1974, abandoned. This application Sept. 14, 1970, Ser. No. 71,831

Int. Cl.² C07D *307/50*

U.S. Cl. 260—347.9 **5 Claims**

1. A method for producing furfural by reacting pentosan-containing material with water in the presence of hydrochloric acid catalyst, comprising the steps of establishing a static bed of the pentosan-containing material having a moisture content of less than 10 percent by weight and substantially free from hydrochloric acid catalyst, introducing steam and hydrogen chloride concurrently into the bed adjacent one end thereof, and recovering a furfural-containing mixture of gases at the other end of the bed, there being substantially no liquid water introduced into the bed before or during the course of the reaction.

4,001,284
PROCESS FOR THE MANUFACTURE OF 5-SULFAMOYL-ANTHRANILIC ACIDS

Karl Sturm, Heidesheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

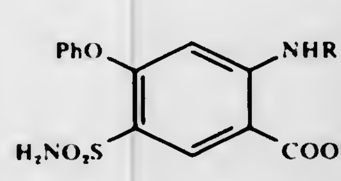
Filed Feb. 12, 1975, Ser. No. 549,430

Claims priority, application Germany, Feb. 14, 1974, 2406972

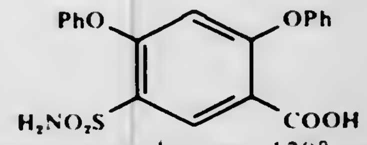
Int. Cl.² C07C *143/78, 143/80*

U.S. Cl. 260—397.7 R **3 Claims**

1. A method of preferentially preparing a 5-sulfamoylanthranilic acid of the formula



in a yield of 70-90 percent, where in Ph is phenyl or phenyl mono- or di-substituted with a member selected from the group consisting of halogen, lower alkyl, and lower alkoxy, and R is furylmethyl, thienylmethyl, pyridylmethyl, benzyl, benzyl mono- or di-substituted by halogen, lower alkyl, or lower alkoxy, or is cycloalkylmethyl having from 5 to 8 carbon atoms in the ring or heterocyclooxyalkyl methyl having from 4 to 5 carbon atoms in the ring, which method comprises reacting a 5-sulfamoylcarboxylic acid of the formula



at a temperature between 120° and 160° C, with from 1 to 10 molar equivalents of an amine of the formula RNH_2.

4,001,285
AMIDOPOLYAMINESULFONATES

Richard Hochreuter, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

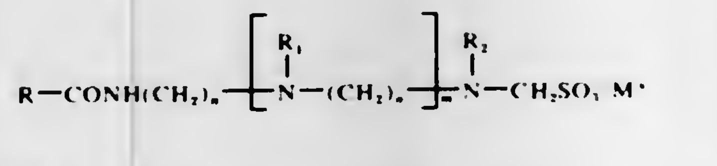
Continuation of Ser. No. 274,232, July 24, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,524

Claims priority, application Switzerland, July 27, 1971, 11040/71

Int. Cl.² C07C *143/90*

U.S. Cl. 260—401 **12 Claims**

1. A compound of the formula



$$R-CONH(CH_2)_n-\left[\overset{R_1}{\overset{|}{N}}-(CH_2)_n-\right]_m\overset{R_2}{\overset{|}{N}}-CH_2SO_3^-M^+$$

wherein

- R is alkyl or alkenyl of 5 to 22 carbon atoms,
- R_1 and R_2 are hydrogen or $-CH_2SO_3^-M^+$ with at least one of R_1 and R_2 being $-CH_2SO_3^-M^+$,
- *m* is an integer 0 to 4,
- *n* is 2 or 3,
- M is hydrogen, ammonium or mono-, di- or triethanolammonium cation or an equivalent of an alkali metal or alkaline earth metal cation.

4,001,286
PHENYL-SUBSTITUTED PROSTAGLANDIN-β-TYPE ANOLOGS

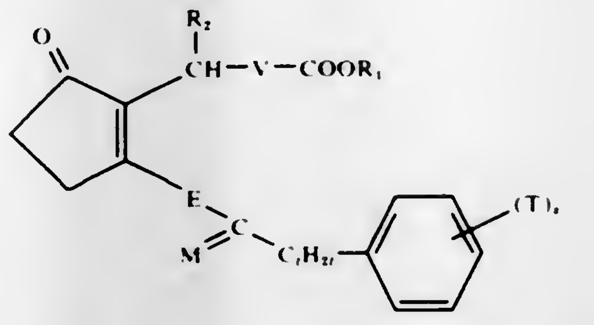
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,011, Jan. 7, 1974, Pat. No. 3,987,087, which is a continuation-in-part of Ser. No. 167,446, July 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 86,303, Nov. 2, 1970, abandoned. This application Dec. 29, 1975, Ser. No. 645,277

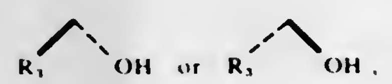
Int. Cl.² C07C *5/22, 69/76*

U.S. Cl. 260—410.9 R **91 Claims**

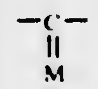
1. A compound of the formula



wherein E is $-CH_2-CHR_4-$ or trans $-CH=CR_4-$, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, wherein M is



wherein R_2, R_3, and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between



$$-\underset{\underset{M}{\|}}{C}-$$

and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that net more than two T's are other than alkyl; and wherein V is (a) alkylene of 3 to 12 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with 3 to 7 carbon atoms, inclusive, between $-CHR_2-$ and $COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, (b) $-CH=CH-A-$, cis or trans, or (c) $-C \equiv C-A-$, wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with one to 5 carbon atoms, inclusive, between $=CH-$ (or $\equiv C-$) and $-COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, with the further proviso that when E is $-CH_2-CHR_4-$ V is (a) above; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,287

REACTION PRODUCT OF NORMAL LEAD BETA RESORCYLATE AND MONOBASIC CUPRIC SALICYLATE

Thomas E. Dunigan, Oak Ridge, and George C. Sisco, Budd Lake, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 78,954, Oct. 7, 1970. This application Feb. 18, 1972, Ser. No. 226,580

Int. Cl.^{2} C07F *7/24*

U.S. Cl. 260—435 R **1 Claim**

1. An organo-metallic complex consisting essentially of the residue product of the interacting of 15–85% by weight of normal lead beta resorcylate and 85–15% by weight of monobasic cupric salicylate in a solvent medium of the group consisting of water and an alcohol and mixtures thereof at an elevated temperature of at least about 180° F.

4,001,288

MAGNETIC ORGANO-IRON COMPOUNDS

Howard S. Gable, Kansas City, and Glenn W. Kerr, Mission, both of Kans., assignors to Howard S. Gable, Kansas City, Mo.

Continuation-in-part of Ser. No. 487,565, Sept. 15, 1965. This application Apr. 16, 1970, Ser. No. 29,008

Int. Cl.^{2} C07F *15/02*

U.S. Cl. 260—439 R **21 Claims**

1. A process for preparing a water soluble organo-iron compound exhibiting strongly ferromagnetic properties both in the dry state and in aqueous solution, including the steps which comprise:

a. combining ferrous and ferric ions in approximately the stoichiometric ratio of one molar part ferrous to two of ferric in an alkaline solution to form a precipitate in situ, said precipitate (after drying) having an X-ray diffraction pattern essentially the same as that of magnetite,

b. reacting the preciptitate with a hydroxy-carboxylic acid to form an alkali-soluble complex, said reaction being effected under conditions to preserve the magnetite-like crystalline structure, and

c. solubilizing said complex with an alkaline material.

4,001,289

ALCOHOL-RHODIUM SEPARATION PROCESS

Steven J. Dougherty, St. Albans, and Rex C. Wells, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,864

Int. Cl.^{2} C07C *27/06, 27/26*

U.S. Cl. 260—450 **4 Claims**

1. In the extraction process of separating the alcohol products, including ethylene glycol, of the high pressure production solvent containing, homogeneous liquid phase reaction between oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex catalyst, whereby the alcohol products of the reaction and rhodium from said catalyst are in solution in said production solvent, the improvement which comprises mixing said solution with water and an organic extraction solvent in which said production solvent is more soluble than it is in water, which extraction solvent is characterized as being liquid under the conditions of the extraction, it is essentially immiscible in water, it is essentially non-reactive with water and the alcohol products, the extraction solvent being further characterized in the formation of two layers (one principably containing water and the ethylene glycol and the other principally containing the extraction solvent and the rhodium content which was in the production solution) when it is intermixed at 25° C with an equal volume of water and blended at 25° C with an equal volume of production solution, whereby said products are separated into an aqueous phase and the catalyst is separated into the extraction solvent phase.

4,001,290

ORGANIC ISOCYANATE COMPOSITIONS AND PRODUCTION THEREOF

Kuno Wagner, Leverkusen, and Rudolf Braden, Odenthal-Scheuren, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

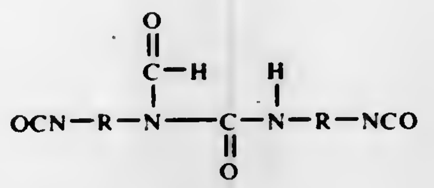
Filed Mar. 12, 1969, Ser. No. 806,695

Claims priority, application Germany, Mar. 15, 1968, 1668115

Int. Cl.^{2} C07C *119/042, 119/045, 119/048*

U.S. Cl. 260—453 A **9 Claims**

1. N,-formyl-N,N'-disubstituted diisocyanato urea having the formula:



$$OCN-R-\overset{\overset{\overset{O}{\|}}{C-H}}{\overset{|}{N}}-\underset{\underset{O}{\|}}{C}-\overset{H}{\overset{|}{N}}-R-NCO$$

wherein R is the organic radical remaining after the removal of the isocyanato groups from an organic diisocyanate selected from the group consisting of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates.

4,001,291

2,2,2-FLUORODINITROETHANETHIOL AND METHOD OF PREPARATION

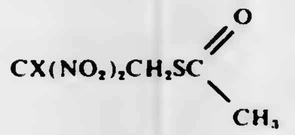
Horst G. Adolph, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 666,103

Int. Cl.^{2} C07C *153/09, 149/16, 149/20;* **C06B** *25/00*

U.S. Cl. 260—455 R **15 Claims**

1. A compound of the formula



$$CX(NO_2)_2CH_2SC(=O)CH_3$$

wherein X is selected from the group consisting of nitro, fluoro, chloro, bromo, and lower alkyl of from 1 to 4 carbon atoms.

8. A compound of the formula

$CX(NO_2)_2CH_2SH$

wherein X is selected from the group consisting of nitro, fluoro, chloro, bromo, and lower alkyl of from 1 to 4 carbon atoms.

4,001,292

SULFITES OF AROMATIC GLYCOLIC AMIDES

Adolf Fischer, Mutterstadt; Hanspeter Hansen, Ludwigshafen, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 1, 1974, Ser. No. 484,419

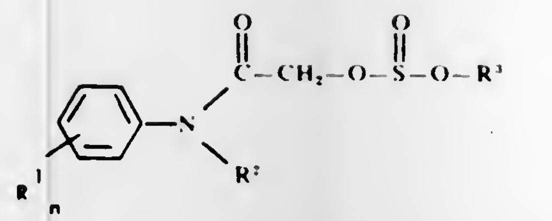
Claims priority, application Germany, July 7, 1973, 2334715

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} C07C *137/00*

U.S. Cl. 260—456 NS **4 Claims**

1. A sulfite of an aromatic glycolic amide of the formula



wherein R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, *n* is one of the integers 0, 1, 2, 3 and 4, R^2 is alkyl of 1 to 4 carbon atoms, and R^3 is alkyl of up to 6 carbon atoms.

4,001,293

PROCESS FOR PRODUCTION OF γ-HALONITRILES

James H. Pionka, and Ralph A. Davis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1975, Ser. No. 564,252

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} C07C *120/04*

U.S. Cl. 260—465.7 **14 Claims**

1. A process for the preparation of γ-halonitriles comprising reacting by contacting a 1,3-dihalopropane wherein the halogens are chlorine, bromine, or iodine, with an alkali metal cyanide in the presence of at least 0.3 moles of an alkali metal halide wherein the halide is chlorine, bromine,,or iodine, per mole of the 1,3-dihalopropane, sufficient water to dissolve the inorganic salts, and a catalytic amount of an onium salt selected from the group consisting of a quaternary ammonium salt, a quaternary phosphonium salt, and a tertiary sulfonium salt.

4,001,294

METHOD OF PREPARING UNSATURATED DINITRILES

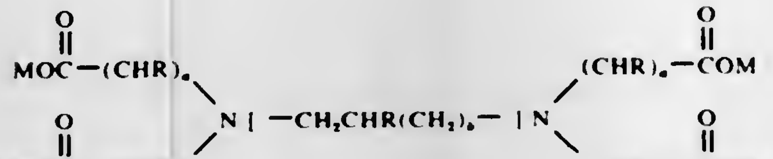
Charles A. Drake, and Stanley J. Marwil, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1975, Ser. No. 624,023

Int. Cl.^{2} C07C *120/00, 121/20*

U.S. Cl. 260—465.8 R **17 Claims**

1. A method for inhibiting the formation of 5-methyl-4-hexenenitrile during the preparation of mixed, isomeric C$_{10}$ unsaturated dinitriles by the twofold addition of acrylonitrile to isobutylene under reaction conditions suitable for producing said isomeric C$_{10}$ unsaturated dinitriles comprising providing that the reaction mixture contain, at a point in the reaction where 5-methyl-4-hexenenitrile is found to form, in an amount sufficient to inhibit the formation of 5-methyl-4-hexenenitrile, an alkali metal salt of the formula



$$\left(MO\overset{O}{\overset{\|}{C}}-(CHR)_a\right)_2N[-CH_2CHR(CH_2)_b-]N\left((CHR)_a-\overset{O}{\overset{\|}{C}}OM\right)_2$$

wherein

- each M is individually selected from the group consisting of hydrogen and an alkali metal such that at least one M is an alkali metal atom,
- each R is individually selected from the group consisting of hydrogen, methyl, and ethyl such that the total number of carbon atoms per molecule is in the range of 10 to 21,
- *a* is an integer of value 1 or 2, and
- *b* is an integer of value 0 or 1.

4,001,295

11,12-DIFLUOROMETHYLENE SUBSTITUTED PROSTANOIC AND PROST-5-CIS-ENOIC ACID DERIVATIVES

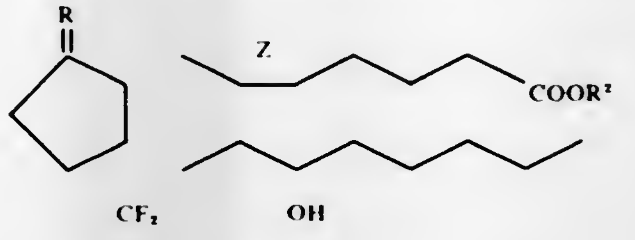
Joseph M. Muchowki, Mexico City, Mexico, and John H. Fried, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 23, 1975, Ser. No. 589,219

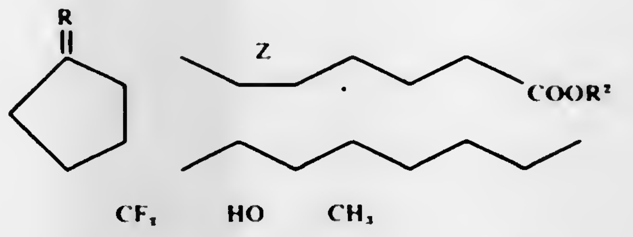
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **38 Claims**

1. A racemic or antimeric compound selected from the group of those represented by the formulas:



(A)



(B)

wherein

- R is a keto group or α-hydroxy-β-hydrogen;
- R^2 is hydrogen, a lower alkyl group or the non-toxic, pharmaceutically acceptable salts of compounds in which R^2 is hydrogen;
- Z is a saturated linkage or a cis double bond and the wavy lines ( ) indicate the α or β configuration or mixtures thereof, provided that when the side chain attached at the C-12 position is β, the difluoromethylene group at the C-11,12 positions is 11α,12α only, and when the side chain attached at the C-12 position is α, the difluoromethylene group at the C-11,12 positions is 11β,12β only

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4,001,296

5-OXA PROSTAGLANDIN E$_1$ ANALOGS

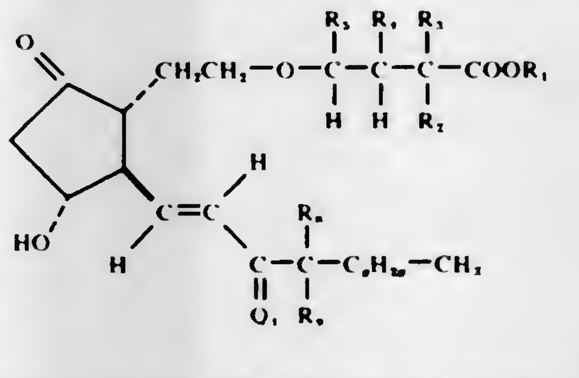
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,991, May 21, 1973, Pat. No. 3,931,279. This application Dec. 6, 1974, Ser. No. 530,087

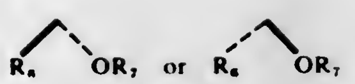
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **15 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_8R_9-$ and terminal methyl; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_3, R_8, and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso tht R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,297

THIOUREIDOBENZENE PREPARATIONS AND USES THEREOF

Teruhisa Noguchi, Tokyo; Kimpei Kato, Ohiso, and Koshin Miyazaki, Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

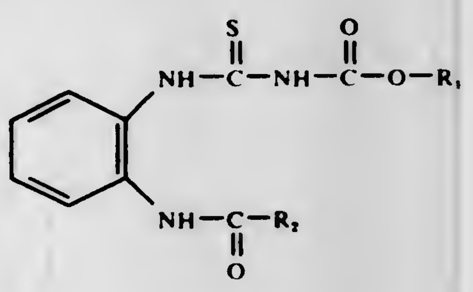
Continuation-in-part of Ser. No. 832,425, June 11, 1969, abandoned. This application Oct. 15, 1974, Ser. No. 514,453

Claims priority, application Japan, June 18, 1968, 43-41588; Oct. 12, 1968, 43-73914; Nov. 2, 1968, 43-79655; Nov. 5, 1968, 43-80379; Nov. 18, 1968, 43-83999; Dec. 9, 1968, 43-89523

Int. Cl.² C07C *149/40*

U.S. Cl. 260—470 **3 Claims**

1. A compound of the formula



wherein R_1 is alkyl of 1 through 4 carbon atoms; R_2 is cyclopropyl or phenyl.

4,001,298

TRIIODIZED N-METHYLDICARBOXYLIC ACID ANILIDES

Heinz Gries, and Heinrich Pfeiffer, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

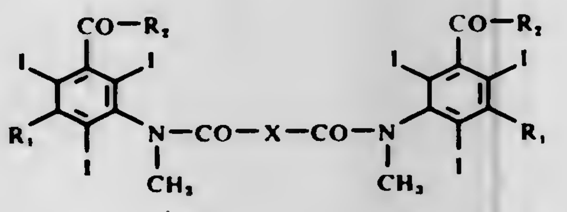
Filed Aug. 17, 1972, Ser. No. 281,379

Claims priority, application Germany, Aug. 17, 1971, 2141803

Int. Cl.² C07C *101/50*

U.S. Cl. 260—471 R **14 Claims**

1. A triiodized N-methyldicarboxylic acid anilide of the formula



wherein R_1 is hydrogen or halogen, carboxyl, R_2 is chlorine, hydroxy, lower alkoxy, hydroxyalkoxy or alkoxyalkoxy, alkoxy in each instance being of 1–6 carbon atoms; and X is alkylene of 2–14 carbon atoms interrupted by at least one oxygen atom, or a physiologically acceptable salt thereof.

4,001,299

HINDERED HYDROXYPHENYLALKANOATES OF SUBSTITUTED ISOPROPANOLS

Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

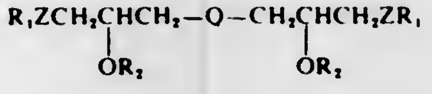
Filed Dec. 12, 1974, Ser. No. 532,140

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *149/20, 69/76*

U.S. Cl. 260—473 S **4 Claims**

1. A compound having the formula

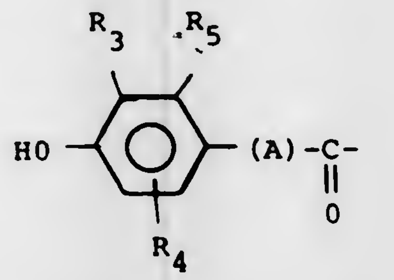


$$\underset{\textstyle OR_2}{R_1ZCH_2CHCH_2}—Q—\underset{\textstyle OR_2}{CH_2CHCH_2ZR_1}$$

wherein

R_1 is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkylthioethyl of 4 to 27 atoms in the chain or alkylpolyoxyalkylene of 4 to 27 atoms in the chain having the general structure $R°(OC_nH_{2n})_h$ or $R°(OCH_2.CHR')_h$ where R° is alkyl of 1 to 18 carbon atoms, *n* is 2 to 4, R' is hydrogen, methyl or ethyl and *h* is 1 to 3,

R_2 is the group



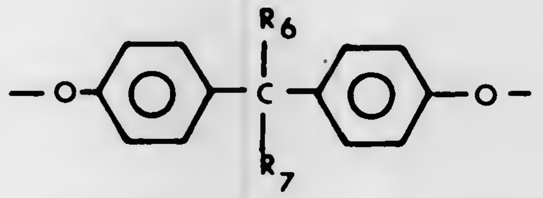
R_3 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms or α-methylbenzyl,

R_4 is alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms,

R_5 is hydrogen or lower alkyl of 1 to 4 carbon atoms or R_3 and R_5 together are a butylene chain which, together with the phenyl ring, form a tetrahydronaphthyl group, and provided when R_3 is hydrogen, R_5 is alkyl and R_4 is located on the carbon atom ortho to the hydroxyl group,

A is a covalent carbon bond or a straight or branched lower alkylene having 1 to 8 carbon atoms,

Q is the group



R_6 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_7 is hydrogen or alkyl of 1 to 8 carbon atoms, and

Z is oxygen or sulfur.

4,001,300

2,2-DIFLUORO-16-PHENOXY-PGF₂ ANALOGS

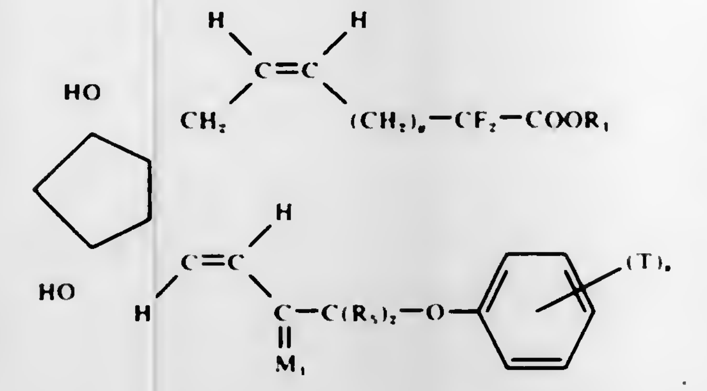
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 24, 1975, Ser. No. 552,708

Int. Cl.² C07C *65/22, 61/76*

U.S. Cl. 260—473 A **58 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein g is 2 to 4, inclusive;

wherein M_1 is

R_7 OR_8

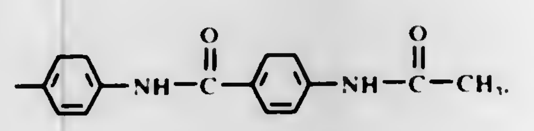
or

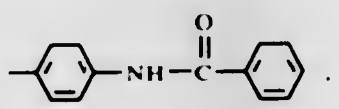
R_7 OR_8

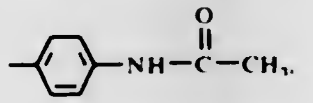
wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

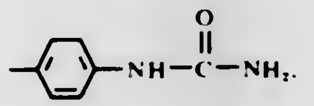
wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_4$ wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl,

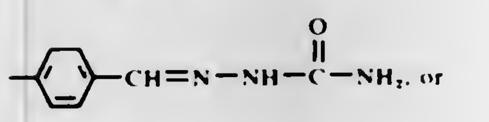
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation











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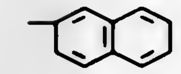


, and

wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,001,301

6-SUBSTITUTED 2-NAPHTHYL ACETIC ACID DERIVATIVES

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama City, Panama

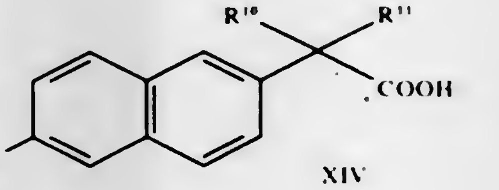
Division of Ser. No. 195,878, Nov. 4, 1971, Pat. No. 3,896,157, which is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application Mar. 17, 1975, Ser. No. 558,874

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 F **10 Claims**

1. The compounds of the formula



XIV

wherein,

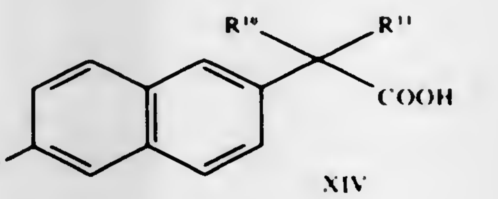
R^7 is alkoxy having 1 to 6 carbon atoms

one of R^{10} and R^{11} is hydrogen, the other being methyl or ethyl;

the alkyl esters of the compounds of Formula XIV derived from alkonols having 1 to 12 carbon atoms, and

the pharmaceutically acceptable addition salts thereof.

5. The compounds of the formula



XIV

wherein

R^7 is alkylthio having 1 to 6 carbon atoms,

one of R^{10} and R^{11} is hydrogen, the other being methyl or ethyl,

the alkyl esters of the compounds of Formula XIV derived from alkanols having 1 to 12 carbon atoms; and

the pharmaceutically acceptable addition salts thereof.

4,001,302

9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

Ulrich Eder; Gregor Haffer; Jürgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

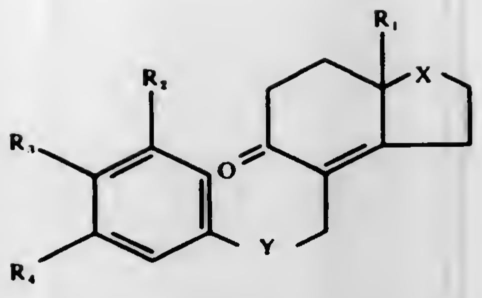
Continuation-in-part of Ser. No. 409,235, Oct. 24, 1973, Pat. No. 3,890,391. This application Apr. 21, 1975, Ser. No. 570,091

Claims priority, application Germany, Oct. 25, 1972, 2253089

Int. Cl.² C07C *69/02*

U.S. Cl. 260—479 R **4 Claims**

1. A 9;10-secoestrane of the formula



wherein R_1 is methyl or ethyl; R_2 and R_3 each is a hydrogen atom or alkoxy of 1–4 carbon atoms; R_4 is a hydrogen atom, alkoxy of 1–4 carbon atoms, or hydrocarboncarbonyloxy of 1–12 carbon atoms; X is carbonyl, dialkoxymethylene wherein the alkoxy groups each contain 1–4 carbon atoms, hydroxymethylene, alkoxymethylene wherein the alkoxy group contains 1–10 carbon atoms, or aralkoxymethylene wherein the aralkoxy group contains 7–10 carbon atoms, or hydrocarbon-carbonyloxymethylene wherein the hydrocarboncarbonyloxy group contains 1–10 carbon atoms, and Y is carbonyl or dialkoxy methylene, provided that R_4 is hydrocarboncarbonyloxy when X is other than hydrocarbon-carbonyloxymethylene.

4,001,303

PRODUCTION OF ω-FORMYL CARBOXYLIC ACID ESTERS

Helmut Waldmann, Leverkusen; Wulf Schwerdtel, Leverkusen-Steinbuechel, and Wolfgang Swodenk, Odenthal-Globusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 26, 1973, Ser. No. 410,074

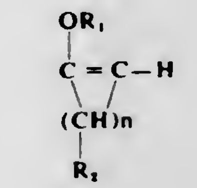
Claims priority, application Germany, Oct. 27, 1972, 2252780

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *67/00*

U.S. Cl. 260—483 **11 Claims**

1. A process for the production of an ω-formyl carboxylic acid ester, comprising reacting hydrogen peroxide with an enol ether of a cyclic ketone of the formula

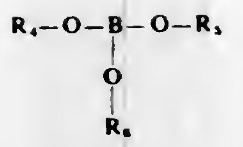


wherein

R_1 is alkyl of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms substituted by fluorine, chlorine, alkoxy of 1 to 3 carbon atoms, cyano or phenyl,

n is an integer of about 3 to 10, and R_2 each independently is hydrogen, fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms substituted by fluorine, chlorine, cyano or alkoxy of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms,

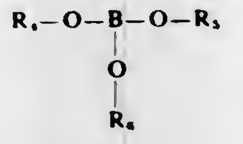
in the presence of a catalyst consisting essentially of a member selected from the group consisting of a compound of boron, a compound of boron plus a compound of a metal of the Fifth Secondary Group of the Periodic Table, and a compound of boron plus a compound of a metal of the Sixth Secondary Group of the Periodic Table, said compound of boron being selected from the group consisting of a boron oxide, a boric acid, a salt of a boric acid, boron trifluoride, boron trichloride, a boric acid ester of the formula



$$R_4-O-\underset{\substack{|\\ O\\ |\\ R_6}}{B}-O-R_5$$

wherein

R_4, R_5 and R_6 each independently is alkyl of 1 to 6 carbon atoms, alkyl of 1 to about 6 carbon atoms substituted by hydroxyl, fluorine, chlorine, alkoxy of 1 to 3 carbon atoms, phenyl or phenyl substituted by fluorine, chlorine or alkyl of 1 to 3 carbon atoms, or an adduct of boron trifluoride, boron trichloride or a boric acid ester of the formula



$$R_4-O-\underset{\substack{|\\ O\\ |\\ R_6}}{B}-O-R_5$$

with an alcohol of the formula R_4—OH, an alcoholate of the formula R_4—OMe, a carboxylic acid of the formula R_4—COOH, an ether of the formula R_4—O—R_5 or a hydrogen halide, wherein Me is an alkali or alkaline earth metal, zinc or aluminum, said compound of a metal of the Fifth or Sixth Secondary Group of the Periodic Table being selected from the group consisting of a carboxylate, carbonyl, nitrosocarbonyl, acetonate and acetylacetonate at a temperature of −80° to +30°C.

4,001,304

ACRYLIC ACID ESTERS

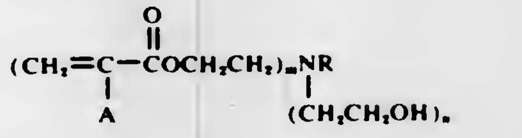
Kayson Nyi, Sellersville, and Sandra I. Graham, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 2, 1974, Ser. No. 466,353

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **3 Claims**

1. A compound of the formula:



$$(CH_2=\underset{\substack{|\\ A}}{C}-\overset{\substack{O\\ \|}}{C}OCH_2CH_2)_m\underset{\substack{|\\ (CH_2CH_2OH)_n}}{N}R$$

wherein A is hydrogen or methyl; R is a radical of the formula $-CH_2CH_2X$ wherein X is, hydroxy or nitro; m is a number having a value in the range of 1 to 2 and n is a number having a value in the range of 0 to 1.

4,001,305

RF-GLYCOLS CONTAINING TWO PERFLUOROALKYLTHIO GROUPS AND USEFUL COMPOSITIONS THEREFROM

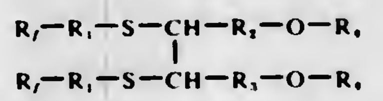
Robert Ernest Arthur Dear, Mount Kisco, and Robert Allan Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 439,497, Feb. 4, 1974, Pat. No. 3,935,277. This application Nov. 12, 1975, Ser. No. 631,005

Int. Cl.² C07C *149/20, 149/40*

U.S. Cl. 260—486 H **12 Claims**

1. A compound of the formula



$$\begin{array}{l} R_f-R_1-S-CH-R_2-O-R_4\\ \qquad\qquad\quad\;\, |\\ R_f-R_1-S-CH-R_3-O-R_4\end{array}$$

in which

R_f is straight or branched-chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R_1 is branched or straight chain alkylene of 1 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, or alkyleneoxyalkylene of 2 to 12 carbon atoms;

R_2 and R_3 each independently is straight or branched chain alkylene of 1 to 12 carbon atoms; straight or branched chain alkylene of 1 to 12 carbon atoms, substituted by one or two of phenyl or cyclohexyl; or R_2 and R_3 are a group of the formula

$C_mH_{2m}(OC_kH_{2k})_r$

where

m is an integer from 1 to 12,

k is an integer from 2 to 6,

r is an integer from 1 to 40

R_4 is alkanoyl of 1 to 24 carbon atoms, alkenoyl of 1 to 24 carbon atoms or said alkanoyl or alkenoyl substituted by 1 to 3 of chloro, bromo and carboxyl,

or said alkanoyl substituted by phenyl or naphthyl, said phenyl or naphthyl being unsubstituted or substituted by 1 to 3 of chloro, bromo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms,

or said alkanoyl substituted by lower acyl or lower acylamino where lower acyl means alkanoyl or alkenoyl of 2 to 6 carbon atoms and the mono- or di-chloro or bromo derivative thereof;

or R_4 is benzoyl or benzoyl substituted by 1 to 3 of chloro, bromo, alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 8 carbon atoms or lower acyl or lower acylamino where lower acyl means alkanoyl or alkenoyl of 2 to 6 carbon atoms, and the mono- or di-chloro or bromo derivative thereof.

4,001,306

PROSTAGLANDIN $F_{2\alpha}$ 15-MONOACRYLATES

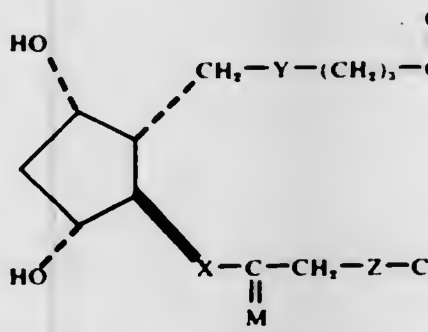
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 214,472, Dec. 30, 1971, abandoned. This application Jan. 30, 1975, Ser. No. 545,366

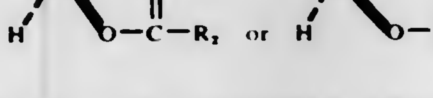
Int. Cl.² C07C *177/00*

U.S. Cl. 260—488 R **3 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein (a) X is trans—CH=CH— or —CH_2CH_2—, and Y and Z are both —CH_2CH_2—, or (b) X is trans—CH=CH—, Y is cis—CH=CH—, and Z is —CH_2CH_2— or cis—CH=CH—; wherein M is



wherein R_2 is n-propyl; and wherein R_1 is hydrogen or alkyl of one to 8 carbon atoms, inclusive and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,001,307

PREPARATION OF HALOESTERS FROM DIENES

Carlos G. Cardenas, Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed May 10, 1973, Ser. No. 359,011

Int. Cl.² C07C *67/10*

U.S. Cl. 260—491 **8 Claims**

1. A process for the preparation of 4-halo-3-methylbut-2-enyl lower fatty acid esters from isoprene comprising the steps of;

a. halogenating isoprene in the presence of at least about 0.05 mols per mol of isoprene of a dipolar aprotic solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, acetamide, N-methylpyrrolidine, hexamethyl phosphoramide, and dimethylsulfoxide under halogenation conditions with elemental halogen to produce a reaction mixture a predominant portion of which is 1,4-dihalo-2-methyl-2-butene;

b. esterifying the reaction mixture of step (a) in an esterification reaction under esterification reaction conditions with an alkali metal salt of a lower fatty acid, the esterification reaction being carried out in the presence of a catalyst consisting essentially of an amine or phosphine at a temperature in the range of about −100° to 300° C, the amount of alkali metal salt employed being the amount stoichiometrically necessary to replace the halogen ion in the 1-position with the anion of said alkali metal salt to produce a product mixture of which a predominant portion is the desired 4-halo-3-methylbut-2-enyl lower fatty acid ester.

4,001,308

PROCESS FOR THE PREPARATION OF 1,4-DIACETOXYCYCLOPENT-2-ENE

Seizi Kurozumi; Takeshi Toru; Toshio Tanaka; Shuzi Miura; Makiko Kobayashi, all of Hino, and Sachio Ishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 13, 1974, Ser. No. 532,616

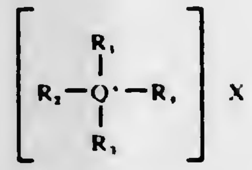
Claims priority, application Japan, Dec. 19, 1973, 48-141180

Int. Cl.² C07C *67/10*

U.S. Cl. 260—491 **10 Claims**

1. A process for the preparation of 1,4-diacetoxycyclopent-2-ene, which comprises contacting a solution (A) of 1,4-dibromocyclopent-2-ene in an inert organic solvent which is slightly soluble or insoluble in water, with an aqueous solution or suspension (B) of at least one metal salt of acetic acid which is at least partially water soluble, in the presence of a cationic surface active compound which is substantially insoluble both in the solution (A) and the aqueous solution or suspension (B), and is selected from the group consisting of

1. nitrogen-containing or phosphorus-containing quaternary organic compounds of the formula:



$$\left[\begin{array}{c} R_1\\ |\\ R_2-Q^{+}-R_4\\ |\\ R_3\end{array}\right]X \qquad (I)$$

in which Q stands for nitrogen or phosphorus atom, R_1, R_2, R_3, and R_4 may be different or same, each denoting a hydrocarbon group, and X^- stands for a halogen ion, and

2. alkylamine salts selected from the group consisting of laurylamine acetate and octadecylamine acetate.

4,001,309

METHOD OF PREPARING POLYFLUOROALKYL GROUP CONTAINING COMPOUNDS

Takao Hayashi, and Masashi Matsuo, both of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1973, Ser. No. 351,455

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.^{2} C07C *27/00, 29/00, 67/20*

U.S. Cl. 260—493 **12 Claims**

1. A method of preparing perfluoroalkyl group containing compounds which comprises reacting a polyfluoroalkyl halide having the formula $R_fCH_2CH_2X$, wherein R_f represents a perfluoroalkyl group containing 1–23 carbon atoms and X represents a bromine atom or an iodine atom, with water and an amide having the formula RCONR′R″, wherein R, R′ and R″ represent hydrogen atoms or lower alkyl groups under conditions in which the mole ratio of water to said polyfluoroalkyl halide is in the range from 1 : 1 to 10 : 1 and the ratio of said amide to said polyfluoroalkyl halide is at least 1 : 1 at a temperature from about 80° to 200°C.

4,001,310

POLYETHERS HAVING OXIDIZED THIOETHER SIDE CHAINS

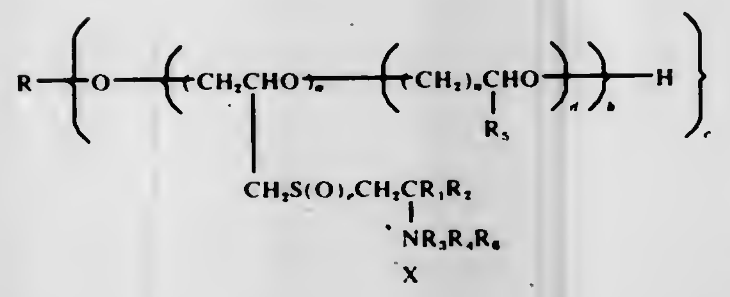
Hugh A. Farber, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 427,607, Dec. 26, 1973, Pat. No. 3,917,697, which is a division of Ser. No. 846,929, Aug. 1, 1969, Pat. No. 3,821,306. This application Sept. 15, 1975, Ser. No. 613,150

Int. Cl.^{2} C07C *87/30*

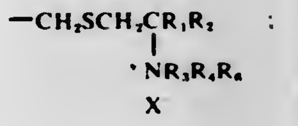
U.S. Cl. 260—501.15 **9 Claims**

1. The polyether represented by the formula:



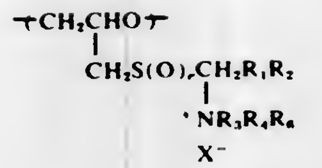
$$R\!-\!\left\{O\!-\!\left(\left(\underset{\substack{|\\ CH_2S(O)_eCH_2CR_1R_2\\ |\\ {}^+NR_3R_4R_6\\ X}}{CH_2CHO}\right)_a\!-\!\left(\underset{\substack{|\\ R_5}}{(CH_2)_nCHO}\right)_d\right)_b\!-\!H\right\}_c$$

wherein R is hydrogen or the residue of an organic active hydrogen activator selected from the group consisting of aliphatic monohydric alcohols, aliphatic polyhydric alcohols, hydroxyl terminated polyalkylene polyethers and haloalkyl alcohols; R_1 and R_2 are individually hydrogen, alkyl, alkoxy, poly(alkyleneoxy) alkyl, poly(alkylenethio) alkyl, hydroxyalkyl, aryl, aralkyl, cycloalkyl or aryloxy; R_3, R_4 and R_6 are individually alkyl, hydroxyalkyl, alkoxyalkyl, poly(alkyleneimino)alkylamine, aryl, aralkyl, alkenyl, alkoxyaryl, aryloxyaryl, aryloxyalkyl, or cycloalkyl; X is an anion common to ammonium salts; R_5 is hydrogen, alkyl, haloalkyl, mercaptoalkyl, alkoxyalkyl, alkylthioalkyl, aryl, aryloxyalkyl or



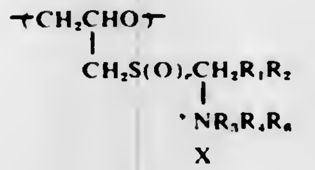
$$-CH_2SCH_2\underset{\substack{|\\ {}^+NR_3R_4R_6\\ X}}{C}R_1R_2 \quad ;$$

a is a positive number sufficient to provide repeating units of



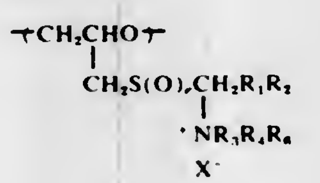
$$-\!\!\left(\underset{\substack{|\\ CH_2S(O)_eCH_2R_1R_2\\ |\\ {}^+NR_3R_4R_6\\ X^-}}{CH_2CHO}\right)\!\!-$$

and *d* is 0 or a positive number with the proviso that the ratio of *a* to *d* is such that the polyether contains at least 10 mole percent of



$$-\!\!\left(\underset{\substack{|\\ CH_2S(O)_eCH_2R_1R_2\\ |\\ {}^+NR_3R_4R_6\\ X}}{CH_2CHO}\right)\!\!-$$

b is a positive integer; *c* is a positive integer 1 to 8 and *n* is a positive integer from 1 to 4, *e* of each



$$-\!\!\left(\underset{\substack{|\\ CH_2S(O)_eCH_2R_1R_2\\ |\\ {}^+NR_3R_4R_6\\ X^-}}{CH_2CHO}\right)\!\!-$$

is 1 or 2; said polymer having a molecular weight in the range from about 300 up to about 2 million.

4,001,311

STABILIZED CHOLINE SALICYLATE COMPOUNDS

William Kelly, deceased, late of Liverpool, England; by Monica Kelly, personal representative, Liverpool; by John Kelly, personal representative, Great Sankey near Warrington, both of England, and Alfred Halpern, Lake Success, N.Y., assignors to Synergistics, Inc., New York, N.Y.

Division of Ser. No. 501,004, Sept. 3, 1974, Pat. No. 3,947,491, which is a division of Ser. No. 237,927, March 24, 1972; Pat. No. 3,855,282. This application Oct. 24, 1975, Ser. No. 625,783

Claims priority, application United Kingdom, July 24, 1971, 34941/71

Int. Cl.^{2} C07C *91/26*

U.S. Cl. 260—501.15 **16 Claims**

1. A choline salicylate sulfite-containing compound selected from the group consisting of choline salicylate sodium bisulfite, choline salicylate sodium metabisulfite, choline salicylate sodium dithionate, choline salicylate sodium hydrosulfite, choline salicylate sodium hyposulfite, choline salicylate potassium bisulfite, choline salicylate potassium metabisulfite, choline salicylate potassium dithionate, choline salicylate potassium hydrosulfite, choline salicylate potassium hyposulfite, choline salicylate lithium bisulfite, choline salicylate lithium metabisulfite, choline salicylate lithium dithionate, choline salicylate lithiumhydrosulfite and choline salicylate lithium hyposulfite.

4,001,312

AMINOALCOHOLS

Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Isamu Maruyama, Minoo; Shigenari Katayama, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 203,002, Nov. 29, 1971, abandoned. This application Aug. 14, 1974, Ser. No. 497,389

Claims priority, application Japan, Dec. 9, 1970, 45-109767

Int. Cl.^{2} C07C *91/28*

U.S. Cl. 260—501.18 **4 Claims**

1. 4-[2-(2-Ethoxyphenoxy)ethylamino]-1-(4-fluorophenyl)-1-butanol and its pharmaceutically acceptable acid addition salt.

4,001,313

MANUFACTURE OF AROMATIC AMINO COMPOUNDS

Osamu Manabe, and Kenichi Nara, both of Osaka, Japan, assignors to Osaka City, Osaka, Japan

Continuation of Ser. No. 210,215, Dec. 20, 1971, abandoned. This application Sept. 26, 1974, Ser. No. 509,631

Claims priority, application Japan, Dec. 29, 1970, 45-127299

Int. Cl.^{2} C07C *143/56, 85/02, 101/44*

U.S. Cl. 260—508 **8 Claims**

1. A process for producing an aromatic amine which comprises heating an aromatic sulfonate having a formula of

$$A-(SO_3Z)_n$$

wherein Z is selected from the group consisting of alkali metals, alkaline earth metals and ammonium, *n* is an integer of 1 to 4 and A is a benzene, naphthalene, anthracene or pyrene ring having or not having 1 to 5 substituents, said substituent being an alkyl of 1 to 4 carbon atoms, aminoalkyl of 1 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, phenylalkyl of 7 to 10 carbon atoms, phenyl, alkylphenyl of 7 to 13 carbon atoms, carboxyl, carbonamide, amino, hydroxyl or styryl, and a metal amide selected from the group consisting of alkali metal amide and alkaline earth metal amide in liquid ammonia in a closed reactor at a temperature of 70° to 200° C to produce a metal arylamide, removing ammonia from the reaction mixture, reacting the resultant metal arylamide with water or lower alkanol of 1 to 3 carbon atoms to produce an aromatic amine and separating the aromatic amine thus produced from the reaction mixture, said metal amide being used in an amount of about 2.1 to 3.6 moles per sulfonyl group of said aromatic sulfonate.

4,001,314

15-ETHYNYL-PGE$_2$

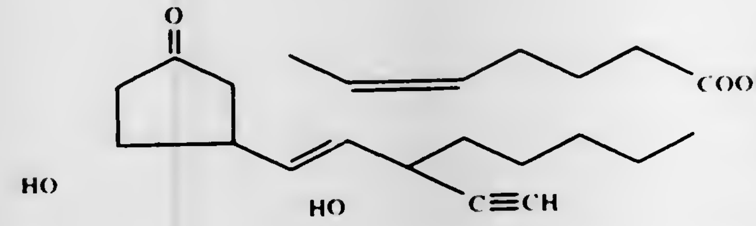
George E. M. Husbands, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 568,212

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D **2 Claims**

1. A compound of the formula:



wherein R is hydrogen, alkyl of from 1 up to about 6 carbon atoms, alkali metal, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

4,001,315

PROSTAGLANDIN DERIVATIVES

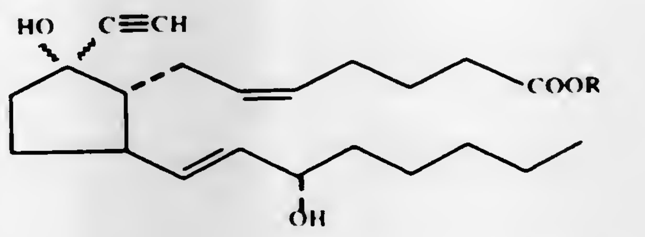
Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 505,802, Sept. 13, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,452

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D **4 Claims**

1. A chemical compound of the structure



wherein R is hydrogen or alkyl of from 1 to 6 carbon atoms

4,001,316

METHOD FOR MANUFACTURE OF METHACRYLIC ACID

Kazuo Ishimi, Takasaki, Japan, assignor to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 481,255, June 20, 1974, Pat. No. 3,956,182. This application Mar. 17, 1975, Ser. No. 558,939

Claims priority, application Japan, June 30, 1973, 48-74014; Dec. 14, 1973, 48-138691; Feb. 21, 1974, 49-19933

Int. Cl.^{2} C07C *51/32*

U.S. Cl. 260—530 N **6 Claims**

1. A method for the manufacture of methacrylic acid comprising: providing a catalyst having the following composition.

$$Mo_aP_bSb_cZn_dX_eO_f(NH_4)_g$$

wherein, X denotes at least one element selected from the group consisting of chromium, tungsten, iron, cobalt, nickel, copper, tin, manganese, vanadium and bismuth, the subscripts *a, b, c, d, e*, and *f* respectively denote the numbers of molybdenum, phosphorus, antimony, zinc, X and oxygen atoms, the subscript g denotes the number of ammonium groups, with the proviso that the elements are present in a ratio so that *a* is 12, *b* is 0.8 to 6, *c* is 0.1 to 7, *d* is less than 4 but not 0, *e* is 0 to 6 and *g* is 0 to 3.5 and *f* is 38 to 81; and

contacting said catalyst with a gaseous feed comprising methacrolein and molecular oxygen or a molecular oxygen-containing gas to effect oxidation of the methacrolein in the vapor phase.

4,001,317

PROCESS FOR THE OXIDATION OF OLEFINS USING CATALYSTS CONTAINING VARIOUS PROMOTER ELEMENTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed July 22, 1974, Ser. No. 490,428

Int. Cl.^{2} C07C *51/32, 45/04*

U.S. Cl. 260—533 N **5 Claims**

1. In the process for the preparation of unsaturated aldehydes and acids from propylene or isobutylene by the vapor phase oxidation of propylene or isobutylene with molecular oxygen at a temperature of about 200° to 600° C. in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst of the formula

$$Ce_a\,A_b\,D_c\,E_d\,Fe_f\,Bi_g\,Mo_{12}\,O_x$$

wherein

A is an alkali metal, Tl or mixture thereof;

D is Ni, Co, Mg, Zn, Cd, Ca, Sr or mixture thereof;
E is P, As, B, S, Al or mixture thereof;
and wherein
a is greater than 0 but less than 5;
b and *d* are 0–4;
c, *f* and *g* are 0.1–12; and
x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,001,318
PREPARATION OF N-CHLOROFORMYL-CARBAMIC ACID AMIDES AND ESTERS

Artur Botta, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Continuation-in-part of Ser. No. 416,569, Nov. 16, 1973. This application May 17, 1974, Ser. No. 471,116
Claims priority, application Germany, Nov. 22, 1972, 2257344
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C07C *127/19*
U.S. Cl. 260—544 C **2 Claims**

1. The compound N-chloroformyl - N-phenyl-N′-(β-chloroethyl)-N′-methylurea.

4,001,319
PROCESS FOR THE PREPARATION OF CARBACYL HALOSULFATES

David C. England, and Carl G. Krespan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 7, 1973, Ser. No. 357,526
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² C07F *143/70*
U.S. Cl. 260—545 R **1 Claim**

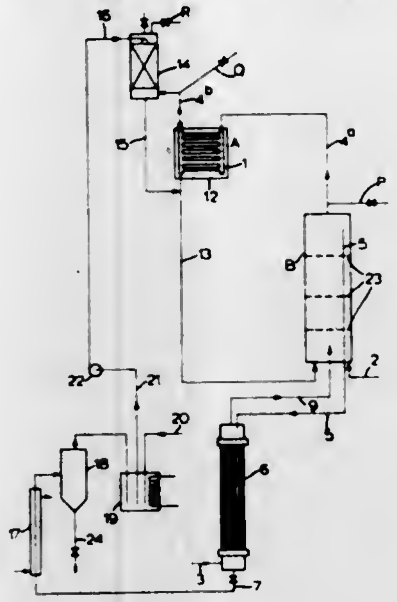
1. Method of making carbacyl fluorosulfates which comprises contacting and reacting trifluoroacetyl fluoride with sulfur trioxide at −30°C to 100°C.

4,001,320
METHOD FOR CONTROLLING THE AMMONIA AND CO_2 RATIOS IN A UREA MANUFACTURING PROCESS

Petrus J. C. Kaasenbrood, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands
Continuation of Ser. No. 41,163, May 25, 1970, abandoned, which is a continuation of Ser. No. 631,335, April 17, 1967, abandoned, which is a continuation-in-part of Ser. No. 531,833, March 4, 1966, Pat. No. 3,356,723, which is a continuation-in-part of Ser. No. 100,339, April 13, 1961, abandoned. This application May 13, 1975, Ser. No. 577,015
Claims priority, application Netherlands, Apr. 22, 1966, 6605483
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A **2 Claims**

1. In continuous processes for producing urea which comprise (1) reacting NH_3 and CO_2 at a pressure of 100–140 atm. and a temperature of 155°–170° C to form initially an ammonium carbamate solution (2) subsequently converting said solution at a pressure of 100–140 atm. and a temperature of 170°–190° C into a urea solution which contains ammonium carbamate and/or dissolved NH_3 and CO_2, (3) thereafter stripping the said urea solution with a member selected from the group consisting of NH_3, CO_2 and mixtures thereof, whereby a large part of the unreacted NH_3 and CO_2 and the additional NH_3 and CO_2 from the decomposition of the unconverted ammonium carbamate present in said solution is removed therefrom in the gaseous state, (4) feeding the stripped NH_3 and CO_2 to the ammonium carbamate-formation zone or the urea-formation zone, (5) expanding the resulting urea solution to a low pressure to effect further removal of still dissolved NH_3 and CO_2, (6) removing the urea solution freed of dissolved NH_3 and CO_2 for further processing,

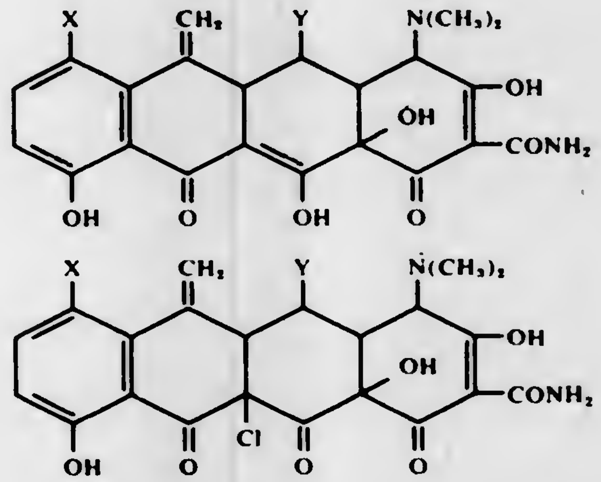
the improvement wherein there is maintained (a) in the ammonium carbamate-formation zone a value of from 2:1 to 3:1 for the NH_3/CO_2 molar ratio of the NH_3 and CO_2 bonded otherwise than in the form of urea and biuret, and (b) in the urea-formation zone, a value of from 3:1 to 6:1 for the NH_3/CO_2 molar ratio of the NH_3 and CO_2 present in the liquid phase as such and as NH_3 and CO_2 bonded otherwise than in the form of urea and biuret, by continual sensing and analysis of the molar NH_3/CO_2 gas ratio in one of the gas phases that are in contact with the liquid phases in said respective zones, and controlling the supply of NH_3 and/or CO_2 so as to maintain the thus-sensed said gas ratio within the range of 1:1 to 6:1, whereby the said NH_3/CO_2 ratios in the respective said liquid phases, and the desired temperatures in the said respective zones are thereby maintained.



4,001,321
PREPARATION OF α-6-DEOXYTETRACYCLINES

Hermann Faubl, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.
Continuation-in-part of Ser. No. 590,598, June 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 534,452, Dec. 19, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,714
Int. Cl.² C07C *103/19*
U.S. Cl. 260—559 AT **17 Claims**

1. A process which comprises introducing a catalytic amount of a compound of the formula $Rh(OCOR)_2(P[C_6H_5]_3)$ and a tetracycline compound selected from the group consisting of

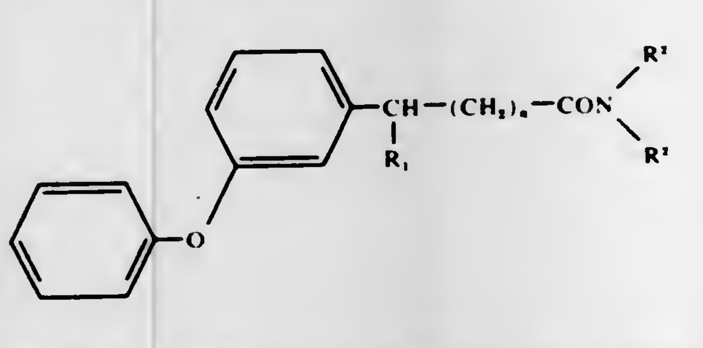


and the acid-addition salts thereof into a reaction-inert solvent, and maintaining hydrogen in contact with the reaction mixture thus formed, at a temperature of from about 20° to about 100° C., and at a pressure from about 1 to about 100 atmospheres until reaction of from about 1 to about 2 moles of hydrogen per mole of tetracycline compound occurs;
wherein R is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, chloromethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluromethyl, trifluoromethyl, phenyl, chlorophenyl, tolyl or anisyl;
X is selected from the group consisting of hydrogen and chloro;
and Y is selected from the group consisting of hydrogen, hydroxy and alkanoyl having from 2 to 7 carbon atoms.

4,001,322
3-SUBSTITUTED PHENYLALKYL AMINES

Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 536,769, Dec. 27, 1974, abandoned, which is a division of Ser. No. 380,038, July 17, 1973, Pat. No. 3,890,137, which is a division of Ser. No. 122,999, March 10, 1971, Pat. No. 3,972,934, which is a continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, which is a continuation-in-part of Ser. No. 823,477, May 9, 1969, abandoned, and a continuation-in-part of Ser. No. 752,801, Aug. 15, 1968, abandoned. This application Nov. 14, 1975, Ser. No. 632,132
Int. Cl.² C07C *103/75, 101/00, 101/72*
U.S. Cl. 260—559 D **8 Claims**

1. A compound of the formula

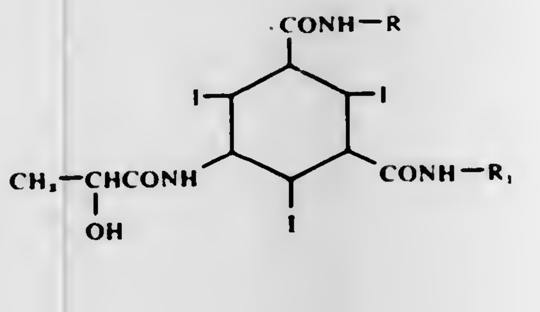


wherein R_1 is hydrogen, C_1 to C_5-alkyl, C_2 to C_5-alkenyl, C_2–C_5-alkynyl;
n is an integer of from 0 to 3;
each R_2 is the same or different and is hydrogen, C_1 to C_5-alkyl, or $—CH_2—COOR_3$, where R_3 is hydrogen, C_1 to C_5-alkyl, or a pharmaceutically acceptable cation;
and the pharmaceutically acceptable acid addition salts thereof.

4,001,323
WATER-SOLUBLE, NON-IONIZING HYDROXY-CONTAINING AMIDE DERIVATIVES OF 2,4,6-TRIIODO-ISOPHTHALIC ACID

Ernst Felder, Riva S. Vitale, Switzerland, and David E. Pitre, Milan, Italy, assignors to Savac AG, Chur, Switzerland
Filed Nov. 24, 1975, Ser. No. 634,836
Claims priority, application Switzerland, Dec. 13, 1974, 16588/74
Int. Cl.² C07C *103/26;* **A61K** *29/02*
U.S. Cl. 260—559 A **3 Claims**

1. A compound of the formula

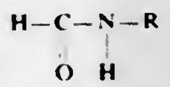


wherein R and R_1 are members of the group consisting of 1,3-dihydroxyisopropyl and 2,3-dihydroxypropyl.

4,001,324
PROCESS FOR PRODUCING N-MONOSUBSTITUTED FORMAMIDES

Florin Seng, Schildgen, and Kurt Ley, Odenthal-Globusch, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 10, 1974, Ser. No. 513,781
Claims priority, application Germany, Nov. 2, 1973, 2354717
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² C07C *103/02*
U.S. Cl. 260—561 R **7 Claims**

1. Process for producing an N-monosubstituted formamide having the formula

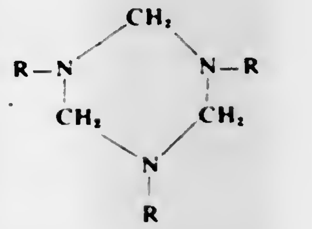


$$\mathrm{H-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle H}{\underset{|}{N}}-R}$$

in which R is selected from the group of linear and branched alkyl having up to 18 carbon atoms, cycloalkyl having 4 to 12 carbon atoms, phenyl and naphthyl, the foregoing substituted by nitro, cyano, aryl or alkoxy, and aralkyl wherein the aromatic portion is phenyl or naphthyl and the alkyl portion has up to 8 carbon atoms,
which comprises reacting a formaldimine having the formula

$$H_2C = N — R$$

in which R is as defined above; or a hexahydrotriazine having the formula



in which R is as defined above, with hydrogen peroxide.

4,001,325
α-CHLOROACETANILIDE SELECTIVE HERBICIDES

Henry Bluestone, Beachwood; James A. Scozzie, Willoughby Hills, and Joseph A. Ignatoski, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 316,408, Dec. 18, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,379
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² C07C *103/365*
U.S. Cl. 260—562 B **2 Claims**

1. 2-Chloro-2′,6′-diethyl-N-propargylacetanilide.
2. 2-Chloro-2′-methyl-6′-ethyl-N-propargylacetanilide.

4,001,326
BENZOBICYCLOALKANE IMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

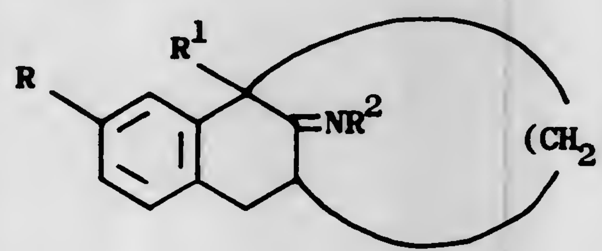
Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,373

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C *119/14*

U.S. Cl. 260—566 R **12 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, phenyl lower alkyloxy wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy, lower alkanoyloxy of from 2 to 7 carbon atoms, lower cycloalkanoyloxy, aromatic hydrocarbon carbonyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, lower alkenyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; R^2 is hydrogen, lower alkyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; and *n* is an integer from 3 to 5 inclusive.

4,001,327
NOVEL QUATERNARY SALTS AND METHOD

Benedict R. Lucchesi, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 269,128, July 5, 1972, Pat. No. 3,840,666. This application June 17, 1974, Ser. No. 480,114

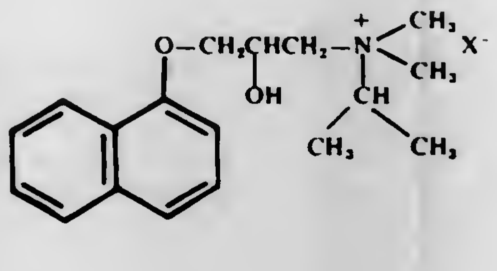
Claims priority, application United Kingdom, June 28, 1973, 30787/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C07C *91/26*

U.S. Cl. 260—567.6 M **4 Claims**

1. A compound of the formula



wherein X⁻ is the anion of a pharmaceutically acceptable non-toxic acid.

4,001,328
DIARYLBUTANOLAMINES

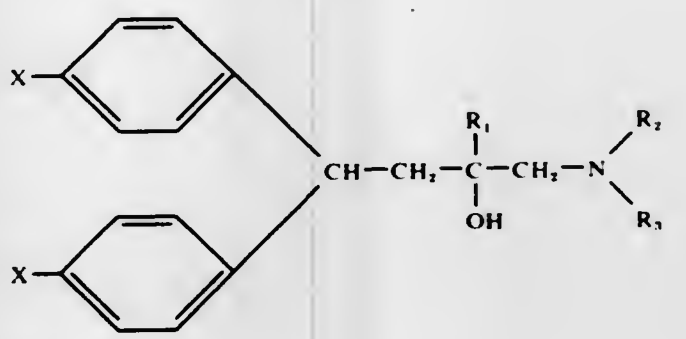
Bryan Barnet Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 4, 1975, Ser. No. 583,819

Int. Cl.² C07C *91/22, 91/26*

U.S. Cl. 260—567.6 M **11 Claims**

1. The compound of the formula



wherein:

X is hydrogen or fluorine;

R_1 is hydrogen or C_1-C_3 alkyl;

R_2 and R_3 independently are hydrogen, C_1–C_6 alkyl, or $-CH_2R_4$, wherein R_4 is C_2–C_5 alkenyl; and the non-toxic pharmaceutically acceptable salts thereof.

4,001,329
ANILINE BASED REACTION PRODUCT

Reuben H. Bell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 25, 1974, Ser. No. 445,408

Int. Cl.² C07C *87/28, 91/40*

U.S. Cl. 260—570 D **8 Claims**

1. An acid condensation product formed by reacting, under acidic conditions, propoxylated aniline, formaldehyde and diethanol amine, having a mole ratio of propoxylated aniline to formaldehyde to diethanol amine of 1 to 10: 1 to 8: 0.1 to 4, wherein the propoxylated aniline is a reaction product of propylene oxide and aniline.

4,001,330
AMINO ETHANOL-INDANE AND TETRAHYDRONAPHTHALENE DERIVATIVES

Adrian Charles Ward Curran, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed May 23, 1974, Ser. No. 472,760

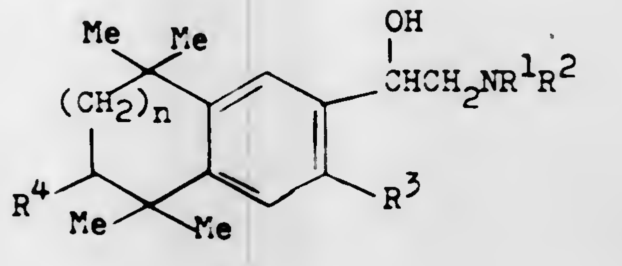
Claims priority, application United Kingdom, June 7, 1973, 27123/73

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C07C *91/22*

U.S. Cl. 260—570.6 **4 Claims**

1. A compound having the formula:



(I)

wherein R^1 represents hydrogen or lower alkyl; R^2 represents lower alkyl; R^3 and R^4 independently represent hydrogen or lower alkyl; and *n* is the integer 1 or zero; or a pharmaceutically acceptable acid addition salt thereof.

4,001,331
BENZOBICYCLOALKANE

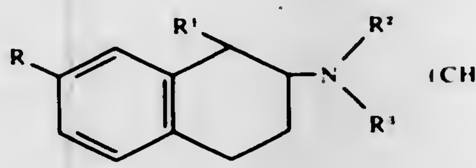
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,375

Int. Cl.² C07C *41/02*

U.S. Cl. 260—571 **24 Claims**

1. A compound of the formula.



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, benzyloxy, halogen, or trifluoromethyl, R^1 is lower alkyl, lower alkenyl or phen(lower)alkyl; R^2 is hydrogen, or lower alkyl; R^3 is hydrogen, lower alkyl, alkenyl, or alkynyl; and n is an integer of from 2 to 6; and the pharmaceutically non-toxic addition salts thereof.

4,001,332
PROCESS FOR COMPRESSING KETENE

Günter Mau; Günter Jacobsen, and Erich Brandes, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 432,430, Jan. 10, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,110

Claims priority, application Germany, Jan. 13, 1973, 2301655

Int. Cl.² C07C *45/24, 49/22*

U.S. Cl. 260—585.5 **6 Claims**

1. A process for compressing ketene which comprises: (a) introducing, as an operating liquid in a liquid ring pump, diketene; (b) compressing ketene, initially at a temperature between about −30° and 50° C. at a pressure between about 20 and about 500 mm. Hg in said liquid ring pump and obtaining said ketene as a compressed ketene at a temperature between −8° and 20° C. as a gas/operating liquid mixture having a temperature between 0° and 50° C, said diketene operating liquid being saturated with ketene under operating conditions at a pressure of up to about 1.2 atmospheres; (c) separating ketene from said operating liquid; and (d) recirculating said operating liquid to said liquid ring pump.

4,001,333
PROCESS FOR THE PREPARATION OF DIOLDIONES

Luciano Re, and Valerio Caciagli, both of Rome, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

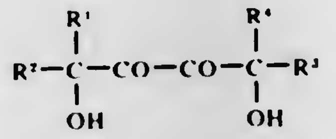
Filed June 12, 1975, Ser. No. 586,357

Claims priority, application Italy, June 12, 1974, 23897/74

Int. Cl.² C07C *45/16, 45/00*

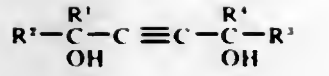
U.S. Cl. 260—586 P **3 Claims**

1. The process of preparing a dioldione compound represented by the formula:



$$R^2-\underset{OH}{\overset{R^1}{\underset{|}{\overset{|}{C}}}}-CO-CO-\underset{OH}{\overset{R^4}{\underset{|}{\overset{|}{C}}}}-R^3$$

in which R^1, R^2, R^3, R^4, the same or different, represent alkyl, cycloalkyl, arylalkyl, aryl or hydrogen, comprising reacting a compound represented by the formula:



$$R^2-\underset{OH}{\overset{R^1}{C}}-C\equiv C-\underset{OH}{\overset{R^4}{C}}-R^3$$

wherein R^1, R^2, R^3, R^4 have the above meanings, with an aqueous oxidizing mixture constituted by at least a catalytic quantity of osmium tetroxide and at least a stoichiometric quantity of an alkali or alkali-earth metal chlorate, at a temperature in the range of from 0 to 100° C. and at sufficient pressure to maintain the system in the liquid phase.

4,001,334
RACEMIZATION OF OPTICALLY ACTIVE ALLETHROLONE

Takeaki Umemura, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 21, 1975, Ser. No. 597,813

Claims priority, application Japan, Aug. 12, 1974, 49-92653

Int. Cl.² C07C *45/00*, **C07B** *20/00*

U.S. Cl. 260—586 R **4 Claims**

1. A process for preparing racemic allethrolone which comprises reacting (−) allethrolone with hydroxylamine to form the corresponding allethrolone oxime and then hydrolyzing the oxide to racemic allethrolone by contacting it with water or a mixture of water and an organic solvent miscible with water at a temperature between 0° C and 200° C in the presence of an acid, wherein said organic solvent is a member selected from the group consisting of acetone, acetylacetone, dioxane, tetrahydrofuran and mixtures thereof and said acid is a member selected from the group consisting of hydrochloric acid, sulfuric acid, acetic acid, oxalic acid, pyruvic acid, levulinic acid, trifluoroacetic acid and mixtures thereof, said acid being used in amounts sufficient to hydrolyze the allethrolone oxime to the objective racemic allethrolone

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4,001,335
PRODUCTION OF 3-MONOCHLORO-2,4,5-TRIALKYLBENZOPHENONES AND 3,6-DICHLORO-2,4,5-TRIALKYLBENZOPHENONES

Ernst Schaffner, Ludwigshafen; Heinz Eilingsfeld, Frankenthal; Ernst Schefczik, and Manfred Patsch, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1973, Ser. No. 416,257

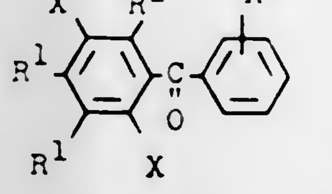
Claims priority, application Germany, Nov. 18, 1972, 2256662

Disclosure was also published under second Trial Voluntary Protest Program on Mar 16, 1976

Int. Cl.² C07C *49/80*

U.S. Cl. 260—591 **8 Claims**

1. A 3,6-dichloro-2,4,5-trialkylbenzophenone of the formula



in which the individual radicals R^1 may be identical or different and each is alkyl, R^2 is hydrogen or halogen and X is chloro

4,001,336

2,6,10-TRIMETHYL-DODECAN-1-AL AND 2,6,10-TRIMETHYL-DODECA-4,8-DIEN-1-AL

Werner Hoffman, Neuhofen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 1, 1975, Ser. No. 601,023

Claims priority, application Germany, Aug. 16, 1974, 2439198

Int. Cl.^{2} C07C *47/02*

U.S. Cl. 260—601 R **2 Claims**

1. 2,6,10-trimethyl-dodeca-4,8-dien-1-al.

4,001,337

STABILIZED AQUEOUS FORMALDEHYDE SOLUTIONS AND PROCESS FOR THEIR MANUFACTURE

Hans Diem; Herbert Libowitzky; Guenther Matthias; Christian Dudeck, and Gunter Lehmann, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

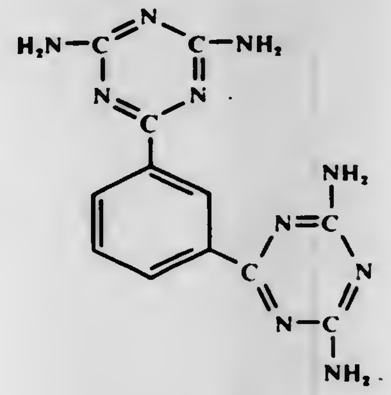
Filed Nov. 13, 1974, Ser. No. 523,443

Claims priority, application Germany, Nov. 26, 1973, 2358856

Int. Cl.^{2} C07C *47/04*

U.S. Cl. 260—606 **6 Claims**

1. An aqueous formaldehyde solution containing a stabilizing amount in the range of 0.001 to 0.5% w/w of the bisguanamine having the formula



4,001,338

PURIFICATION OF DIALKYLBENZENE DIHYDROPEROXIDE

Ward J. Burkholder, Houston, Tex., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 25, 1969, Ser. No. 845,044

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.^{2} C07C *179/02*

U.S. Cl. 260—610 A **2 Claims**

1. In the recovery of para-diisopropylbenzene dihydroperoxide from an oxidation reactor effluent containing dihydroperoxide and the corresponding monohydroperoxide by physically separating crude solid oxidate from the effluent., the improvement comprising mixing the solid oxidate with an aromatic hydrocarbon in which the monohydroperoxide is soluble and dihydroperoxide is essentially insoluble at temperatures befow about 30°C, said hydrocarbon being selected from the class consisting of benzene, toluene, xylene, and para-dialkylbenzenes, in a weight ratio of between about 2:1 and 1:5 respectively, maintaining the resulting mixture at a temperature of between about 55°C and the boiling point of said hydrocarbon with sufficient agitation to form a slurry, cooling the slurried mixture to a temperature below about 30°C and recovering the dihydroperoxide.

4,001,339

PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner; Norbert Rigassi, both of Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

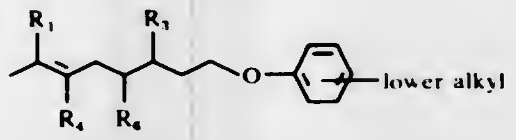
Division of Ser. No. 279,897, Aug. 11, 1972, Pat. No. 3,879,429, which is a continuation-in-part of Ser. No. 30,295, April 20, 1970, Pat. No. 3,944,531. This application Jan. 17, 1975, Ser. No. 541,749

Claims priority, application Switzerland, Apr. 30, 1969, 6597/69; South Africa, Mar. 23, 1970, 70/2003; Australia, Apr. 7, 1970, 13535/70

Int. Cl.^{2} C07C *43/20*

U.S. Cl. 260—612 D **3 Claims**

1. A compound of the formula:



wherein R_1 is methyl or ethyl, R_2 and R_3 are hydrogen, methyl or ethyl; R_4 is hydrogen or methyl; R_5 and R_6 are hydrogen or lower alkyl; Y_1 is lower alkyl; and *m* and *n* are o or 1.

4,001,340

HYDROLYSIS OF HALOAROMATIC COMPOUNDS

William E. Smith, Midland, and Edmund H. Sommerfield, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 25, 1975, Ser. No. 616,728

Int. Cl.^{2} C07C *37/02*

U.S. Cl. 260—620 **14 Claims**

1. In the process of hydrolyzing a non-phenolic haloaromatic compound selected from the group consisting of halotoluenes, halobiphenyls, and dihalobenzenes of the group consisting of the o-, m-, and p-chloro- and bromotoluenes, the o-, m-, and p-chloro and bromo-biphenyls, the o-, m-, and p-dichloro- and dibromobenzenes to produce the corresponding hydroxy aromatic compounds wherein the hydrolysis is effected by reaction of the haloaromatic compound with an alkali metal hydroxide, the improvement comprising conducting the reaction at a temperature of about 250–330° C, in the presence of a phenolic compound, and with a 50–100% aqueous alkali metal hydroxide solution.

4,001,341

EXTRACTION SEPARATION

John F. Welch, and Frank P. Civardi, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 24, 1964, Ser. No. 340,101

Int. Cl.^{2} C07C *37/28*

U.S. Cl. 260—621 B **11 Claims**

1. A process for purifying, in a countercurrent extraction system, a crude 2,6-xylenol feed of 20 to 98% by weight initial purity containing phenolic impurities consisting essentially of phenol and cresols comprising introduction of aqueous inorganic alkali countercurrently to a phenolic impurity-solvent hydrocarbon phase and said crude 2,6-xylenol feed, said aqueous inorganic alkali being introduced at the top of a countercurrent extraction rectifier, said phenolic impurity-solvent hydrocarbon phase being introduced at the bottom of said countercurrent rectifier, and said crude 2,6-xylenol feed being introduced at a point intermediate thereto, whereby a substantially pure 2,6-xylenol-solvent hydrocarbon stream is removed from the top of the countercurrent extraction rectifier and a first aqueous phase stream is removed from the bottom of the countercurrent extraction rectifier consisting essentially of an aqueous solution of the inorganic alkali salts of the phenolic

impurities and a minor portion of the 2,6-xylenol, recovering said portion of the 2,6-xylenol from its aqueous alkali salt solution by contacting it countercurrently with a phenolic impurity-solvent hydrocarbon phase in a stripping zone whereby the first aqueous phase is introduced into the top of said stripping zone and the phenolic impurity-solvent hydrocarbon phase is introduced at the bottom of said stripping zone whereby a phenolic impurity-solvent hydrocarbon-2,6-xylenol stream is recovered from the top of the stripping zone and a portion recycled to the crude 2,6-xylenol feed into the countercurrent extraction rectifier, and a second aqueous phase stream is removed from the bottom of the stripping zone consisting essentially of an aqueous solution of the inorganic alkali salts of the phenolic impurities essentially free of 2,6-xylenol, springing the phenolic salts by addition of acid thereto, recovering the free phenolic impurities essentially free of 2,6-xylenol by extraction from the acidified second aqueous stream with a solvent hydrocarbon to form a phenolic impurity-solvent hydrocarbon phase and recycling a portion of said phenolic impurity-solvent hydrocarbon phase essentially free of 2,6-xylenol to the bottom of the stripping zone for recovery of the 2,6-xylenol from its aqueous inorganic alkali salt solution.

4,001,342

PRODUCTION OF ETHYLPHENOLS

Philippe Jean Andre Camerman, Wezembeek-Oppem, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,446

Claims priority, application United Kingdom, Feb. 19, 1974, 7550/74

Int. Cl.^{2} C07C *39/06*

U.S. Cl. 260—624 R **5 Claims**

1. In a process for the production of ethylphenol comprising the steps of (1) oxidizing diethylbenzene by passing a molecular oxygen containing gas into contact with said diethylbenzene at a temperature between 100° C. and 180° C. to convert 5% to 30% of diethylbenzene into diethylbenzene monohydroperoxide, (2) withdrawing the reaction mixture, (3) separating the unconverted diethylbenzene therefrom to obtain a mono-hydroperoxide concentrate containing at least 40% of diethylbenzene mono-hydroperoxide, (4) mixing the diethylbenzene mono-hydroperoxide concentrate with a solvent selected from the group consisting of lower alkanols, lower alkanones and mixtures thereof, (5) decomposing said monohydroperoxide by intimately contacting said mixture of diethylbenzene mono-hydroperoxide and solvent with a strong acid, whereby there is produced a decomposition mixture containing as by-products ethylacetophenone, 1-(ethylphenyl) ethanol, diacetylbenzene, 1-(acetylphenyl)ethanol, bis(1-hydroxyethyl) benzene, 1(acetylphenyl)ethylhydroperoxide, and bis(1-hydroperoxyethyl)benzene, and (6) recovering from the decomposition mixture a bottom fraction containing ethyl phenol and a top fraction containing acetaldehyde, wherein the improvement comprises the step of hydrogenating said decomposition mixture at a temperature within the range of from about 10° to 150° C., at a pressure within the range of 0.1 to 300 atmospheres and in the presence of a hydrogenation catalyst containing a transition metal of Groups VI and VII of the Periodic Table, whereby said by-products are converted into diethyl benzene or ethylphenol, without hydrogenation of the benzene nucleus, without hydrogenolysis of the phenolic hydroxyl group and without hydrogenation of any acetaldehyde or solvent which may be present, whereby the yield of ethylphenol based upon converted diethylbenzene is increased.

4,001,343

PROCESS FOR MANUFACTURING DICYCLOHEXANOL PROPANE BY HYDROGENATING DIPHENOL PROPANE

Jean Gaillard, Carrieres, and Christian Lassau, Villepreux, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 9, 1975, Ser. No. 575,996

Claims priority, application France, May 10, 1974, 74.16524

Int. Cl.^{2} C07C *29/20*

U.S. Cl. 260—631 H **10 Claims**

1. In a process for manufacturing dicyclohexanol propane by hydrogenating diphenol propane dissolved in a solvent, by molecular hydrogen in the presence of a hydrogenation catalyst selected from the group consisting of Raney nickel, nickel deposited on a carrier, a noble metal from group VIII, and a reaction product of at least one transition metal compound with AlR_3 wherein R is hydrogen, hydrocarbyl or hydrocarbyloxy, the improvement in which 2-ethylhexanol is used as the solvent.

4,001,344

CATALYST FOR PARTIAL HYDROGENATION

Herwig Hoffmann, Frankenthal; Guenther Boettger, Bad Duerkheim; Karl Baer, Weinheim; Harro Wache, Fussgoenheim; Heinz Graefje, Ludwigshafen, and Wolfgang Koernig, Dossenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 30, 1975, Ser. No. 591,834

Claims priority, application Germany, July 3, 1974, 2431929

Int. Cl.^{2} C07C *33/02*

U.S. Cl. 260—635 M **10 Claims**

1. A process for the manufacture of butene-2-diol-1,4 by hydrogenation of butynediol in aqueous solution in the presence of a supported catalyst which comprises contacting said butynediol with a catalyst, said catalyst comprising from 0.05 to 2 percent palladium and from 0.05 to 1 percent of zinc and cadmium

2. A process for the manufacture of butene-2-diol-1,4 by hydrogenation of butynediol in aqueous solution in the presence of a supported catalyst which comprises contacting said butynediol with a catalyst, said catalyst comprising from 0.05 to 2 percent palladium, from 0.05 to 1 percent zinc or cadmium, and from 0.05 to 1 percent of bismuth and/or tellurium

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4,001,345

DISTILLATION OF METHYLCHLOROFORM

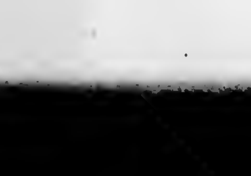
Earl M. Gorton, Sulphur, and Robert W. Kline, Lake Charles, both of La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1975, Ser. No. 583,228

Int. Cl.^{2} C07C *17/38, 19/02*

U.S. Cl. 260—652 P **3 Claims**

1. An improved method of purifying methylchloroform containing ferric chloride which comprises dissolving in the methylchloroform at least about two moles of quaternary ammonium halide represented by the formula



$$\left[\begin{array}{ccc} & R_1 & \\ R_4 & N & R_2 \\ & R_3 & \end{array}\right]^{+} X$$

where

R_1, R_2, R_3 and R_4 may be the same or different and are selected from methyl radicals, or alkyl and alkenyl radicals of 7 to 20 carbon atoms, provided that at least one and no more than two members of the group R_1, R_2, R_3 and R_4 are methyl radicals; and X is bromine, iodine or chlorine.

per mole of ferric chloride and distilling methylchloroform therefrom.

4,001,346
SELECTIVE PRODUCTION OF PARA-XYLENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 538,664, Jan. 6, 1975. This application Apr. 2, 1976, Ser. No. 673,167

Int. Cl.² C07C *3/52, 15/08*

U.S. Cl. 260—671 M **10 Claims**

1. A process for the selective production of para-xylene which comprises reacting toluene with a methylating agent in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range from 1 to 12, which catalyst has undergone prior treatment to deposit a coating of between about 15 and about 75 weight percent of coke thereon.

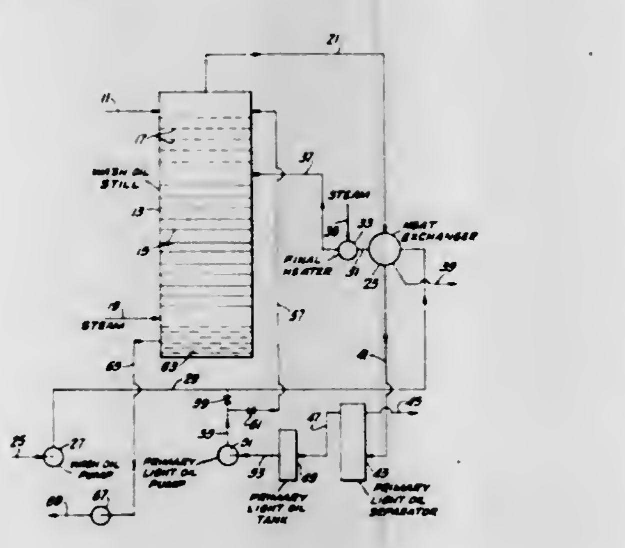
4,001,347
METHOD FOR THE REMOVAL OF NAPHTHALENE FROM COKE OVEN GAS

Herbert A. Grosick, Allison Park, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,959

Int. Cl.² C07C *7/00*

U.S. Cl. 260—674 N **1 Claim**



1. A system for removing naphthalene from coke oven gas comprising:

a. a wash oil still wherein there are a plurality of normal first trays and in spaced apart relation thereabove a plurality of additional second trays;
b. a conduit carrying oil from a naphthalene scrubber into the top portion of said still at a level above the topmost second tray;
c. a conduit carrying light oil vapors from said still to a heat exchanger from which a conduit carries vapors to a light oil rectifier;
d. a conduit carrying light oil from said heat exchanger to a primary light oil separator;
e. a conduit carrying steam into said still;
f. a conduit carrying wash oil from benzol washers into said heat exchanger;
g. a conduit carrying said wash oil from said heat exchanger to and into said wash oil still at a level between said first and second sets of trays;
h. a conduit carrying primary light oil from said separator into a primary light oil tank and thence into said wash oil still at a level above said topmost second tray; and
i. a conduit carrying wash oil away from said still.

4,001,348
UNSATURATED POLYESTER RESINS CONTAINING ADDITIONAL ACCELERATORS

Harald Selbeck, Krefeld-Gartenstadt; Rolf Dhein, Krefeld-Bockum; Hans Rudolph, Krefeld; Manfred Patheiger, Krefeld, and Otto Bendszus, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 11, 1975, Ser. No. 630,938

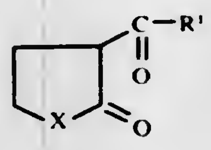
Claims priority, application Germany, Nov. 15, 1974, 2454325

Int. Cl.² C08L *67/06;* **C08K** *5/04*

U.S. Cl. 260—864 **7 Claims**

1. A composition comprising:

A. from 20 to 90 %, by weight, based on the sum of components (A) and (B), of at least one α,β-ethylenically unsaturated polyester;
B. from 80 to 10 %, by weight, based on the sum of components (A) and (B), of at least one polymerisable ethylenically unsaturated compound;
C. from 0.1 to 8.0 %, by weight, based on the sum of components (A) and (B), of at least one polymerisation initiator;
D. from 0.001 to 0.1 %, by weight, based on the sum of components (A) and (B), of at least one polymerisation inhibitors;
E. from 0.001 to 0.5 %, by weight, based on the sum of components (A) and (B), of at least one accelerator; and
F. from 0.05 to 5.0 %, by weight, based on the sum of component (A) and (B) of at least one compound corresponding to the followng general formula:



wherein

X represents O, S or >NR²
R¹ represents a C_1-C_8 aliphatic radical, —OH, —NR⁴R⁵, cyclohexyl, cyclopentyl, a C_1–C_4 alkoxy radical or —COOR³,
R² represents a hydrogen atom, a C_1–C_8 aliphatic radical a C_5–C_8 cycloaliphatic radical, acetyl, benzoyl or benzyl,
R³ represents a hydrogen atom, a C_1–C_8 aliphatic radical or an optionally substituted aromatic radical,
R⁴ and R⁵ which may be the same or different, each represents a hydrogen atom, a C_1–C_4 aliphatic radical, phenyl or cyclohexyl or R⁴ and R⁵ taken together represent a C_4–C_8 cycloaliphatic radical.

4,001,349
IMPACT RESISTANT POLYSTYRENE AND A PROCESS FOR ITS PRODUCTION

Febo Severini; Carlo Tavazzani, both of Milan, and Piero Delle Ville, Novara, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Apr. 11, 1975, Ser. No. 567,312

Claims priority, application Italy, Apr. 12, 1974, 21367/74

Int. Cl.² C08F *255/04, 255/06;* **C08L** *23/26*

U.S. Cl. 260—878 R **3 Claims**

1. Process for preparing crude graft products of styrene on saturated polyolefinic elastomers consisting of copolymers of ethylene with alpha-olefins containing from 3 to 6 carbon atoms or on low unsaturation polyolefinic elastomers consisting of copolymers of ethylene with at least one of said alpha-olefins and at lest one diene or polyene hydrocarbon, in which graft products the by-weight ratio polystyrene of the gel/total rubber is greater than 1.0 and not greater than 1.8, said process comprising heating a mixture containing the styrene, the elastomer and a radical initiator in two phases, the first phase being conducted between 50° and 150° C. in the presence of water in a by-weight ratio water/oily phase comprised between 0.3 and 2, operating in the absence of surfactants, until a styrene conversion comprised between 15 and 40% is reached; and the second phase being carried out by suspension polymerization with the aid of one or more suspending agents and of a radical initiator, while stirring the reaction mass and heating it at temperatures up to 150° to 200° C.

4,001,350
BLOCK AND GRAFT COPOLYMERS

Gerhard Fahrbach, Plankstadt; Erhard Seiler, Freiburg, and Karl Gerberding, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 30, 1974, Ser. No. 537,119

Claims priority, application Germany, Jan. 15, 1974, 2401629

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 B **14 Claims**

1. Block or graft copolymers consisting essentially of

1. A substantially linear elastomer block B having a molecular weight of from 10,000 to 1,000,000, said block being formed from units of anionically polymerizable monomers *b*; and
2. one or more copolymer blocks A of alternately polymerized monomers *a* and *a'*, of which *a* has a polar group and *a'* a phenyl group, said ends of said block B being joined to blocks A via one or more monomer units of aromatic nuclei bearing nonvinyl groups or vinylidene groups.

4,001,351
PROCESS FOR PREPARING TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMER BLENDS

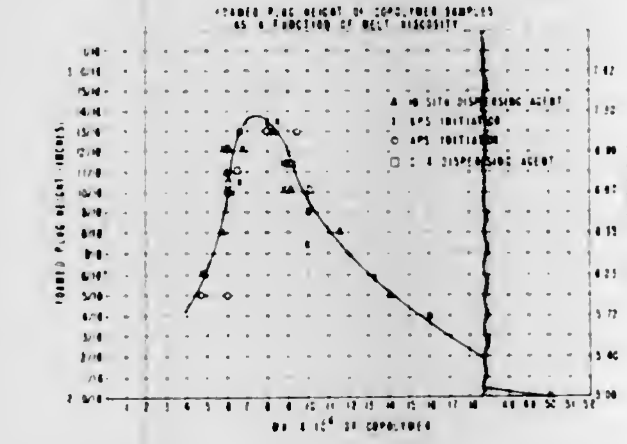
Miguel Jacinto Roura, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,902

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C08L *27/12*

U.S. Cl. 260—900 **4 Claims**



1. A process which comprises heating separately in an atmosphere of air containing between about 3% and about 20% of water vapor, based on weight of atmosphere, at between about 340°C. and about 380°C. for a time sufficient to remove substantially all volatiles, groups of melt-processible copolymers of tetrafluoroethylene and hexafluoropropylene having between about 6.75 and about 27 weight percent hexafluoroethylene:

A. one said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 13 × 10⁴ and 50 × 10⁴ poise at 372°C.,
B. a second said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 1 × 10⁴ and 5 × 10⁴ poise at 372°C.; and
C. optionally, a third said group of such copolymers comprising at least one or more copolymers having a melt viscosity of between about 5 × 10⁴ and 13 × 10⁴ poise at 372°C.; and after heating, combining group (A) with group (B) and optionally group (C) in such a ratio so as to obtain a final blend product having a melt viscosity between 5 × 10⁴ and 13 × 10⁴ poise at 372°C

4,001,352
PROCESS FOR THE PREPARATION OF ETHANE-1,2-DIPHOSPHINIC ACID DIESTERS

Hans-Jerg Kleiner, Bad Soden, Taunus, and Walter Rupp, Schneidhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

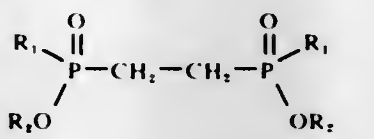
Continuation of Ser. No. 434,030, Jan. 17, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,769

Claims priority, application Germany, Jan. 19, 1973, 2302523

Int. Cl.² C07F *9/40*

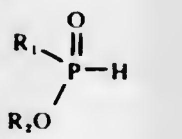
U.S. Cl. 260—970 **5 Claims**

1. In a process for the preparation of an ethane-1,2-diphosphonic acid diester of the formula



$$R_1(R_2O)P(=O)-CH_2-CH_2-P(=O)(OR_2)R_1$$

wherein R_1 represents an alkyl, phenyl and/or phenylalkyl group having from 1 to 18 carbon atoms and R_2 is an alkyl group or a halogen substituted alkyl group having from 1 to 18 carbon atoms, by reacting with acetylene a phosphonous acid ester of the formula



$$R_1(R_2O)P(=O)-H$$

wherein R_1 and R_2 are as defined above, at a temperature of from 50° to 230° C in the presence of a catalytic amount of a radical-forming agent, the improvement which comprises first heating said phosphonous acid ester to the desired reaction temperature under atmospheric pressure with the exclusion of atmospheric oxygen and then introducing acetylene and simultaneously slowly adding the radical-forming agent dissolved in said phosphonous acid ester.

4,001,353
PREPARATION OF O,S-DIMETHYL-THIOL-PHOSPHORIC ACID DIESTER-AMIDE

Wolfgang Hofer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 303,302, Nov. 2, 1972, Pat. No. 3,845,170. This application Mar. 27, 1974, Ser. No. 455,486

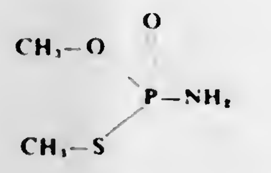
Claims priority, application Germany, Nov. 16, 1971, 2156718

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C07F *9/24*

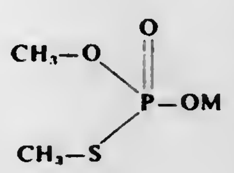
U.S. Cl. 260—984 **3 Claims**

1. A process for the production of O,S-dimethyl-thiol-phosphoric acid diesteramide of the formula



$$(CH_3-O)(CH_3-S)P(=O)-NH_2$$

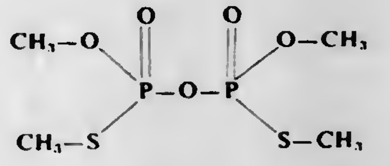
which comprises reacting about 1.3 moles of phosgene with about 2 moles of a salt of O,S-dimethyl-thiolphosphoric acid ester of the formula



in which

M is an alkali metal of ammonium,

at about 20° to 60°C in the presence of a diluent to form tetramethyl-dithiolpyrophosphoric acid ester of the formula



and contacting the tetramethyl-dithiolpyrophosphoric acid ester in an inert diluent with ammonia.

4,001,354

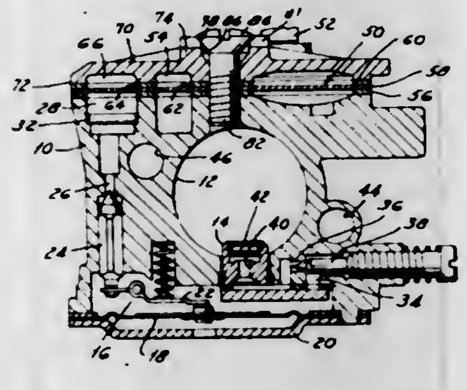
COVER PLATE FOR A CARBURETOR BODY

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Nov. 17, 1975, Ser. No. 632,277

Int. Cl.² F02M *17/04*

U.S. Cl. 261—35 **5 Claims**



1. A cover plate for a carburetor body in which sealing gaskets are provided between the plate and the body which comprises:

a. a rectangular, relatively-flat plate having peripheral and other bottom surfaces to contact a gasket interposed between the plate and the body,

b. an upstanding boss formed on said plate rising above the general surface thereof, said boss having an opening to receive a holding screw,

c. a plurality of spaced ribs on the top surface of said plate and integral with said boss and plate and extending from the top portion of said boss centrally of said plate to the periphery at the corners of said plate raised above the general surface of the plate and extending to the outer edges, and

d. a holding screw having a head with a surface to contact and apply a radial outward camming force on the upper portion of the wall of said opening in said boss and on said ribs to hold said plate on said carburetor when said screw is moved axially into said body.

4,001,355

CARBURETOR

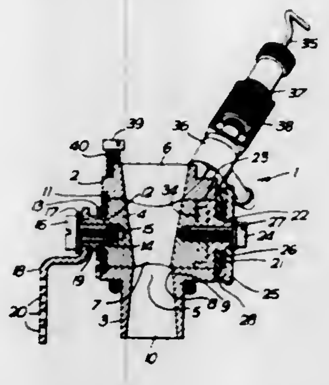
Kenneth Edwin Day, 14, Riversdale Road, Thames Ditton, Surrey, England

Filed July 10, 1975, Ser. No. 594,611

Claims priority, application United Kingdom, July 12, 1974, 31088/74

Int. Cl.² F02M *9/08*

U.S. Cl. 261—44 R **10 Claims**



1. A carburettor comprising a body provided with fuel control valve means, means to secure the body to an engine, a barrel rockably mounted in the body and means for rocking said barrel, means defining a passage extending through the body and the barrel to the engine which passage can be restricted by rotation of the barrel relative to the body, the part of the passage through the body and the barrel being tapered down to the trailing edge of the barrel, the barrel being provided with a sleeve member embracing part thereof, said sleeve member having a circumferential tapering slot, the barrel having a fuel passageway defined therein extending from said tapering slot in the circumferential edge of the sleeve member to an opening adjacent said trailing edge of the barrel, which opening also communicates with said passage extending through said body and said barrel in all operative positions of the barrel, the tapering slot being adjacent a hole extending through the body and leading to said fuel control valve means so that movement of the barrel alters the cross section of said tapering slot presented to said hole to meter the quantity of fuel to be passed through said tapering slot and further including means for rotating said sleeve relative to said barrel to adjust the position of said tapering slot relative to said passageway extending through said barrel.

4,001,356

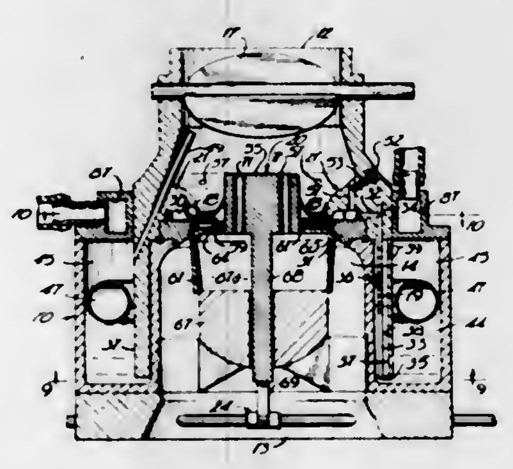
VARIABLE VENTURI DOWNDRAFT CARBURETOR

Clinton Graybill, P.O. Box 396, Superior, Mont. 59872

Filed Aug. 22, 1975, Ser. No. 606,798

Int. Cl.² F02M *9/14*

U.S. Cl. 261—144 **21 Claims**



1. A downdraft variable venturi carburetor for an internal combustion engine, comprising:

a hollow carburetor body having an upwardly open air intake end and a downwardly open end adapted to be mounted to an intake manifold of an internal combustion engine and a fuel-air mixing chamber intermediate the ends for receiving and guiding air in a downstream flow from the intake and through the downwardly open end and into the manifold;

an annular fuel dispensing orifice encircling the fuel mixing chamber within the body;

means for supplying fuel to the orifice at a plurality of angularly spaced locations in response to operation of the engine;

a first movable venturi member located centrally within the body along an upright axis for axial movement therein within the mixing chamber;

wherein the first venturi member is substantially bell-shaped and includes a reduced end facing the intake end; a convex portion curving down and outwardly from the reduced end to a downstream edge; a first axial rim extending downstream from the downstream edge of the convex portion; a first outwardly beveled portion extending downstream from the first axial rim; and an inwardly beveled portion extending downstream from the first outwardly beveled portion;

a second venturi member defining the orifice and located coaxially with and radially adjacent to the first venturi member;

wherein the first and second venturi members together form an annular restricted air passage downwardly adjacent to the fuel dispensing orifice; and

throttle means for axially moving the first venturi member relative to the second venturi member to enlarge and reduce the restricted air passage and thereby increase and decrease the flow of air and fuel through the mixing chamber.

4,001,357

PROCESS FOR THE MANUFACTURE OF FIBERS FROM FUSIBLE MATERIALS

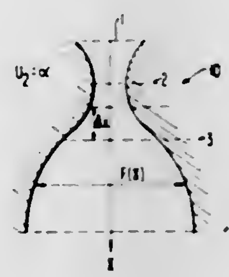
Alfred H. Walz, Emmendingen, and Paul-Jürgen Hahn, Karlsruhe-Durlach, both of Germany, assignors to Alfred Walz, Emmendingen, Germany

Filed Aug. 1, 1973, Ser. No. 384,565

Claims priority, application Germany, Aug. 2, 1972, 2237884

Int. Cl.² B22D *23/08*

U.S. Cl. 264—12 **8 Claims**



1. A method for the manufacture of fine fibers from fusible low-viscosity melts of inorganic, mineral or metal materials or organic materials, comprising:

heating the starting material to a temperature above the melting point thereof;

causing said melt to pass through an orifice means into a Laval-nozzle;

causing a pressure drop across the Laval-nozzle of a magnitude sufficient to bring a flow medium, which carries said melt, passing through the nozzle to supersonic speed therewithin; and

causing the temperature of the flow medium to drop abruptly in a sufficiently short distance within the Laval-nozzle to solidify the melt into the form of fibers before the surface tension of the melt forms the melt into droplets, by selecting an appropriate configuration of said Laval-nozzle.

4,001,358

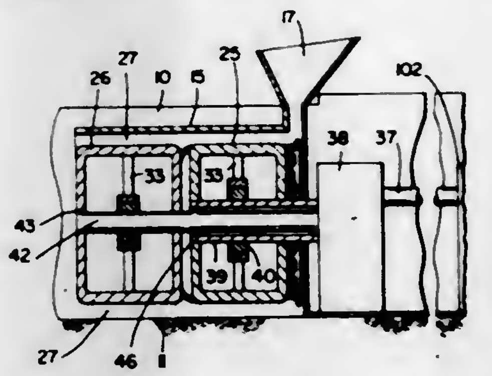
APPARATUS AND METHOD FOR FORMING A CEMENTITIOUS CONDUIT IN SITU

Charles T. McNeill, and Melba F. Silva, both of Yuba City, Calif., assignors to No-Joint Concrete Pipe Co., Yuba City, Calif.

Continuation-in-part of Ser. No. 256,891, May 25, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,105

Int. Cl.² E03F *3/06*

U.S. Cl. 264—33 **25 Claims**



1. The method of continuously forming smooth walled concrete pipe in situ in a ditch or the like comprising the steps of:

a. defining an elongated volume of generally annular cross-section having a cylindrical inner surface within said ditch with the axis of elongation of the annular volume extending along said ditch and with one end of said annular volume closed and the other end thereof open;

b. introducing a solidifiable cementitious material into said annular volume at the closed end thereof;

c. continuously urging said solidifiable cementitious material to move toward said open end of said annular volume at a rate at least as great as and substantially equal to a given rate by applying frictional forces including components acting in one circumferential direction and components acting in the axial direction toward said open end of said annular volume to said cementitious material in a first portion of said annular volume immediately adjacent said closed end thereof and having an axial length less than about one-half the axial length from the closed end to the open end of said annular volume; and simultaneously,

d. moving said annular volume along said ditch at said given rate with the closed end of said annular volume preceding the open end thereof and

e. applying frictional forces in the second circumferential direction opposite said one circumferential direction to said cementitious material at the inner surface of said annular volume throughout a second portion of said annular volume comprising the remaining length thereof.

4,001,359

TESTING AND CORRECTING METERING ACCURACY OF MULTIHOLE SPINNERETS

William Bernard Fisher, Chester; Howard Lyle Helmer, Colonial Heights, and David Pendlebury, Chester, all of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

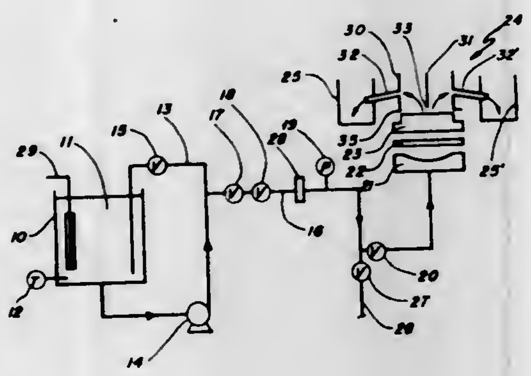
Division of Ser. No. 507,509, Sept. 19, 1974, Pat. No. 3,930,775. This application July 7, 1975, Ser. No. 593,402

Int. Cl.² G01B *13/08*

U.S. Cl. 264—40.1 **11 Claims**

1. A method for off-line testing and correcting the metering accuracy of a split multihole spinneret fed by a single metered stream, comprising the steps of: (a) feeding through the split spinneret a fluid having a viscosity such that its flow through the holes of the split spinneret is laminar, by a single metered

steam which hydraulically splits to each of the sides of the split spinneret; (b) collecting in segregation according to the sides of the split spinneret the fluid as it flows therefrom; (c) weighing separately the segregated collections of fluid; (d) determining the percent bias of the split spinneret; (e) choosing the side of the split spinneret with the lower flow rate for reworking of its respective holes; (f) calculating the number of holes to be reworked in said side of the split spinneret by the equation



$$N = k \times D$$

where

N is the number of holes to be reworked,

k is a constant between 15 and 150, and

D is the percent bias of the split spinneret; and (g) reworking approximately the number of holes "N" in the side of the split spinneret having said lower flow rate.

4,001,360
METHOD FOR PREPARING PULVERULENT POLYMERS EXHIBITING AN APPARENT INCREASE IN GLASS TRANSITION TEMPERATURE AND SHAPING THE RESULTANT POLYMER MATERIALS

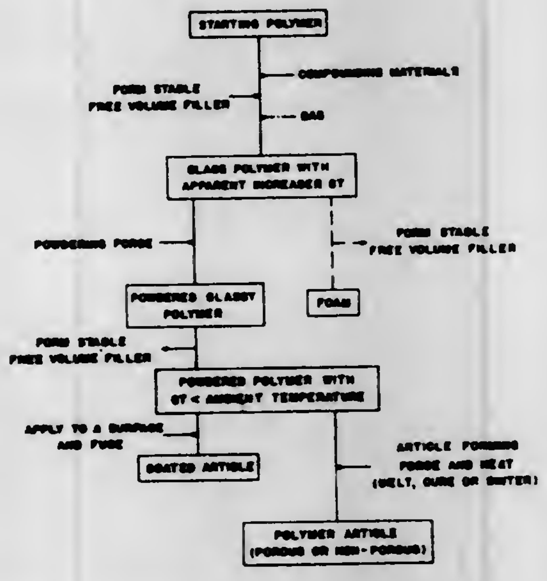
William J. Davis, 1700 Reading Blvd., Wyomissing, Pa. 19610, and Anthony J. Izbicki, 1704 Westwood Drive, Reading, Pa. 19610

Continuation of Ser. No. 215,565, Jan. 5, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,164

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² B29D *27/00, 27/08*

U.S. Cl. 264—49 **13 Claims**


STARTING POLYMER
COMPOUNDING MATERIALS
FORM STABLE FREE VOLUME FILLER
GAS
GLASS POLYMER WITH APPARENT INCREASED GT
POWDERING FORCE
FORM STABLE FREE VOLUME FILLER
POWDERED GLASSY POLYMER
FOAM
FORM STABLE FREE VOLUME FILLER
POWDERED POLYMER WITH GT < AMBIENT TEMPERATURE
APPLY TO A SURFACE AND FUSE
COATED ARTICLE
ARTICLE FORMING FORCE AND HEAT (MELT, CURE OR SINTER)
POLYMER ARTICLE (POROUS OR NON-POROUS)

1. A method for preparing a polymer in pulverulent form comprising the steps of dissolving a sugar into a liquid suspension of finely divided particles of the polymer, coagulating with precipitation the polymer suspension removing the liquid from the coagulated and precipitated suspension to form a dried polymer mass, comminuting the dried polymer mass and removing the sugar from the comminated polymer mass.

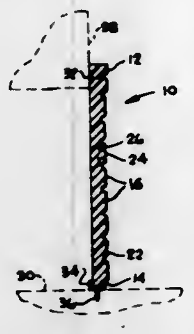
4,001,361
MOBILE HOME SKIRTING SIDE PANEL

Earl L. Unruh, 612 Pinewood Drive, San Jose, Calif. 95129

Filed Oct. 29, 1974, Ser. No. 518,345

Int. Cl.² E04C *2/20;* **B29D** *27/00*

U.S. Cl. 264—51 **1 Claim**



1. A process for forming a skirting panel having a surface configuration simulating masonry blocks comprising the steps of: providing a mold for said panel having a mold surface including a plurality of generally rectangular cavities complementary to masonry blocks; filling said mold with expandable beads of polystyrene; and applying heat to said beads to fuse the same together and form said panel with a density of between about 1 and 2 pounds per cubic foot, whereby cavity interstices are formed between fused beads at said surface configuration which simulate the surface cavitations on masonry blocks.

4,001,362
METHOD FOR THE TREATMENT OF CLAY AND PRODUCTS OBTAINED

Bernard Delmon, Wavre; Jacques LeMaitre, and Michel Bulens, both of Brussels, all of Belgium, assignors to UNIBRA, Brussels, Belgium

Filed Sept. 18, 1974, Ser. No. 507,177

Claims priority, application France, Oct. 3, 1973, 73.35287; May 31, 1974, 74.18959

Int. Cl.² C04B *33/32*

U.S. Cl. 264—56 **21 Claims**

1. A method for the treatment of clay compositions, comprising

contacting the clay composition with a liquid phase containing metal ions in a concentration of at least 0.001 gram equivalent per liter, in sufficient amount to provide a total of from 1 to 40 mole percent of said metal ion based on contained alumina in said clay composition, for a sufficiently long time period to ensure diffusion of said ions throughout the clay composition, wherein the metal of said metal ions is capable of forming its oxide at a temperature at or below the firing temperature of the clay composition; and

firing the resulting impregnated clay composition at a temperature of from 750°–1100° C. whereby said metal ions are transformed into the corresponding oxides.

4,001,363
METHOD OF MANUFACTURING A CERAMIC FERROMAGNETIC OBJECT

Leonardus Josephus Koppens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 117,355, Feb. 22, 1971, abandoned. This application Sept. 13, 1974, Ser. No. 505,656

Claims priority, application Netherlands, Mar. 19, 1970, 7003901

Int. Cl.² C04B *35/26*

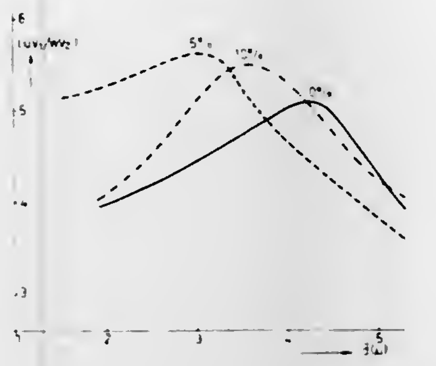
U.S. Cl. 264—61 **5 Claims**

1. A method of manufacturing ferromagnetic objects, comprising the steps of forming an aqueous suspension comprising the combination of a ferromagnetic powder having the composition $M_{A_x}^{2+}\, M_{B_{1-x-y}}^{2+}\, M_{C_y}^{2+}\, Fe_2^{3+}\, O_4$, a sol having the composition $M_{A_x}^{2+}\, M_{B_{1-x-y}}^{2+}\, M_{C_y}^{2+}\, Fe_2^{3+}\, (OH)_8$, wherein M_A, M_B, or M_C are bivalent metals or bivalent metal complexes, and wherein:

$0 \leq x \leq 1$

$0 \leq y \leq 1$

$x + y \leq 1$



and a polymerized organic compound, applying said suspension to a substrate, drying said suspension to form a layer on said substrate, forming objects of desired shape and dimensions from said layer, and heating said objects to eliminate said polymerized organic compound, convert said sol to the ferromagnetic powder, and form coherent bodies of said ferromagnetic powder.

4,001,364
METHOD FOR IMPROVING THE PHYSICAL PROPERTIES OF CERAMICS

Kazuo Suzuki, Otu, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 326,252, Jan. 24, 1973, abandoned, and a continuation-in-part of Ser. No. 329,992, Feb. 6, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,705

Claims priority, application Japan, Aug. 3, 1972, 47-58813; Sept. 1, 1972, 47-6763

Int. Cl.² C04B *35/64*

U.S. Cl. 264—63 **6 Claims**

1. A method for improving the physical properties of ceramics, comprising the steps of coating 100 parts by weight particles of said ceramics with 5 to 10 parts by weight atactic polypropylene; forming the coated ceramics into desired shape under cold compression of 200 to 400 Kg/cm²; and sintering the formed product at 1100° C to 1300° C, wherein said ceramic is barium ferrite or low soda alumina.

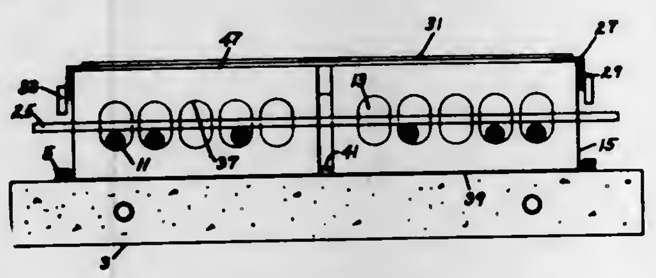
4,001,365
LOAD-BEARING WALL PANEL WHOSE ELEMENTS ARE MORTAR-BINDED, AND APPARATUS AND METHOD FOR FABRICATING SAME

Wilson E. Graham, R.D. No. 1, Rensselaer, N.Y. 12144

Filed Jan. 20, 1975, Ser. No. 542,585

Int. Cl.² B28B *1/08;* **B32B** *31/06*

U.S. Cl. 264—69 **8 Claims**



1. A method of fabricating a wall panel whose elements have mortar-binded joints, the facings of which are double-concave, smooth, water-proof and weather-proof, comprising: disposing said elements on trapped, melted thermoplastic material with the temperature of said elements being sufficiently cooler than the temperature of said melted thermoplastic material such that upon contact of said elements with said melted thermoplastic material a thin skin of solidified thermoplastic material forms on the bottom portions of said elements, forcing said melted thermoplastic material between and within said joints of said elements, immediately thereafter allowing said elements contacting said melted thermoplastic material at joint surfaces between said elements to cool, solidify and form thereby a thin skin of solidified thermoplastic material on said contacting joint surfaces between said elements and with said melted thermoplastic material in the mid points between and within said element joints remaining in a melted state, such that said melted thermoplastic material at said mid points between and within said element joints, upon subsequently cooling and solidifying, shrinks the most at said mid points between and within said element joints and forms thereby a double-convex configuration of said thermoplastic material within said joints, thereby water-proof sealing said bottom portions of said elements and their said joints preparatory to the introduction of mortar; allowing the remaining melted thermoplastic material to solidify; introducing mortar within said element joints; allowing said mortar to cure to complete fabrication of said wall panel and for removal of same from said thermoplastic material; and removing said wall panel from said thermoplastic material.

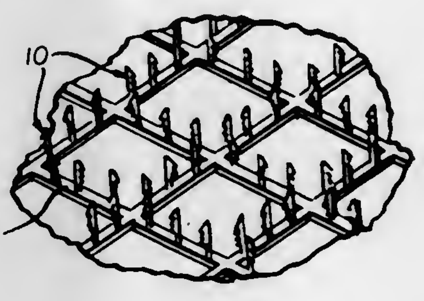
4,001,366
METHOD FOR MAKING SELF-GRIPPING DEVICES HAVING INTEGRAL TRAINS OF GRIPPING ELEMENTS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., Montclair, N.J.

Continuation of Ser. No. 214,871, Jan. 3, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 401,083

Int. Cl.² B29H *7/18;* **A44B** *17/00*

U.S. Cl. 264—147 **1 Claim**



1. Process for forming a self-gripping device which comprises extruding a base with a plurality of parallel, integral ribs thereon extending in the direction of extrusion, said ribs having the shape of a gripping element in cross-section and being oriented at right angles to the direction of extrusion, slitting said ribs through said base generally transverse to the direction of extrusion and stretching and expanding said base and said ribs thereby forming an open, net-like structure of crossing members from said base with spaced apart gripping elements from said ribs integrally extending from said crossing members.

4,001,367
METHOD FOR PERMANENTLY AND UNIFORMLY INCORPORATING AN ADDITIVE INTO AN UNDRAWN FIBER

Roger T. Guthrie, Westfield; Justin L. Hirshman, East Brunswick; Stanley Littman, Somerset; Edwin L. Sukman, Fanwood, and Philip H. Ravenscroft, Clark, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

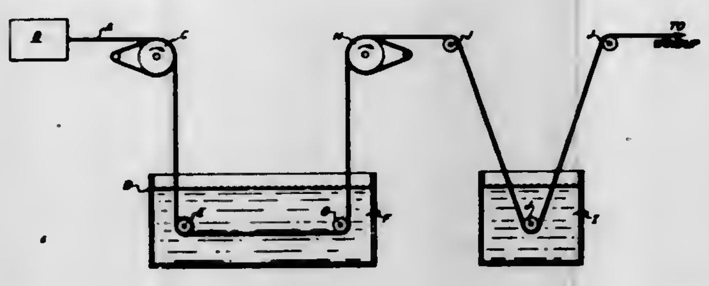
Continuation-in-part of Ser. No. 456,130, March 29, 1974, abandoned. This application Nov. 7, 1974, Ser. No. 521,843

Int. Cl.² B29C *17/02;* **B29D** *27/00*

U.S. Cl. 264—154 **31 Claims**

1. A method of permanently and uniformly incorporating between 0.1 and 25% by weight of an additive into an un-

drawn or partially drawn fiber formed from a molten polymer selected from the group consisting of polyesters, polyamides, polyesteramides, polypropylene and high density polyethylene, the method comprising cold drawing said fiber at a draw ratio of between 1.5:1 and the breaking elongation of the fiber to achieve a localized reduction in diameter concurrently with formation of an interconnecting network of microvoids that occurs while the fiber is immersed in a liquid or vapor medium containing said additive as a solution, dispersion or emulsion, at a concentration of between 0.1 and 99% by weight wherein



1. the maximum particle size of a dispersed or emulsified additive does not exceed two microns;
2. the medium is a non-solvent for the undrawn fiber and penetrates into said network of interconnecting microvoids;
3. the wetting angle defined by the liquid medium and the surface of said fiber is less than 90°; and
4. the temperature of the medium is below the effective glass transition temperature of said fiber when in contact with the medium.

4,001,368

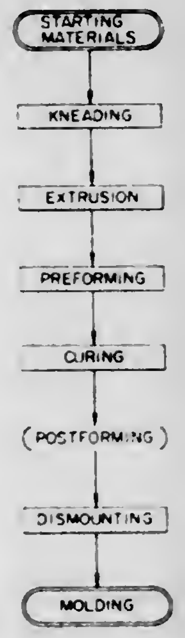
METHOD FOR CONTINUOUS EXTRUSION MOLDING OF THERMOSETTING RESINS

Yoshio Michizoe, Takatsuki; Masafumi Toyomatsu, Kadoma, and Masakatsu Uchida, Nagoya, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Feb. 8, 1974, Ser. No. 440,810

Int. Cl.² B28B *3/20*

U.S. Cl. 264—176 R **9 Claims**



1. A method for continuous molding of a thermosetting resinous composition to form a cured product, said method comprising the steps of:

1. extruding a thermosetting resinous composition comprising by weight
    a. 100 parts of a mixture of an uncured unsaturated polyester resin and a copolymerizable unsaturated monomer in the weight ratio of 80/20 to 30/70, respectively,
    b. 1–70 parts of thermoplastic vinyl chloride resin powder,
    c. 0.2 – 3 parts of a polymerization initiator and
    d. a non-reactive filler in a screw-type extruder in which the cylinder temperature is maintained at a at a level not exceeding 92° C. so that the composition has at the outlet end of the extruder a flowability corresponding to a needle penetration degree of at least 20 under a load of 100g for a loading time of 5 seconds according to ASTM D5 and the composition is not cured in the extruder,
2. passing the extrudate from step (1) through a preliminary molding passage maintained at a temperature of not more than 120° C, said passage having a cross-sectional area decreasing progessively towards the outlet end of said passage;
3. passing the product emerging from said preliminary molding passage through an open-ended die passage maintained at a temperature of 80° to 250° C., under a pressure not higher than 200 kg/cm² for a residence time of 1 second to 5 minutes and
4. withdrawing the cured molded product.

4,001,369

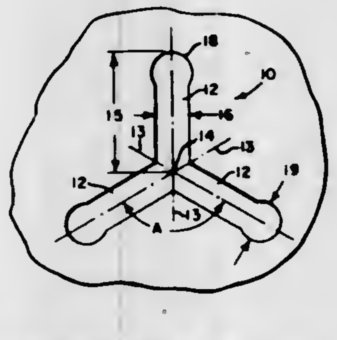
PROCESS FOR COSPINNING TRILOBAL FILAMENTS

Chandrakant Shantilal Shah, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1976, Ser. No. 663,834

Int. Cl.² B28B *21/54*

U.S. Cl. 264—177 F **8 Claims**



1. In a process for cospinning at least two synthetic trilobal filaments from the same polymer composition wherein the undrawn filaments have a difference between their modification ratios of at least 0.3 MR units, the improvement comprising spinning one filament from a spinneret orifice having a configuration comprised of three radially intersecting slots with each slot having parallel sides and spinning the other filament from a spinneret orifice having a configuration comprised of three radially intersecting tapered slots.

4,001,370

MANUFACTURING OF RESIN-AGGREGATE PIPES

Clifford Aubrey Baker, Glen Waverley, Australia, and Rex Miller, deceased, late of Kilsyth, Australia (by Florence Edith Miller, executrix), assignors to Humes Limited, Melbourne, Australia

Division of Ser. No. 838,009, June 16, 1969, abandoned, which is a continuation of Ser. No. 610,966, Jan. 23, 1967, abandoned. This application Apr. 9, 1973, Ser. No. 349,479

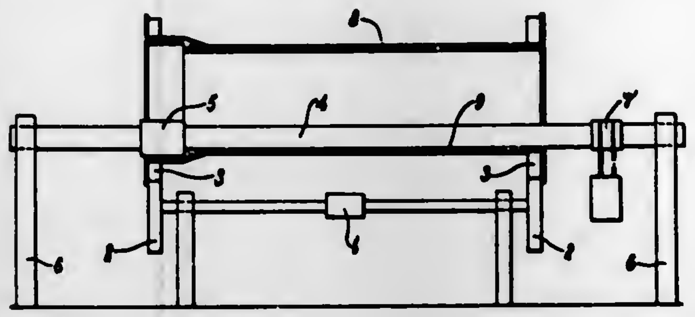
Claims priority, application Australia, Jan. 27, 1966, 916/66

Int. Cl.² B28B *1/20*

U.S. Cl. 264—256 **6 Claims**

1. A method of manufacturing a hollow resin-aggregate pipe comprising the steps of introducing into a rotatable mould a pipe formable resin-aggregate mixture in the proportion of from 12 to 20 parts of aggregate to 1 part of resin by weight, rotating the mould to apply centrifugal force to the mixture to form the pipe, moving a compacting roller into contact with the pipe being formed and rotating the compacting roller at a speed greater than the speed of rotation of the mould, applying pressure to the compacting roller to force the compacting roller against the pipe being formed to compact the mixture

until the speed of the roller is reduced and a portion of the mixture adheres to the compacting roller, reducing the pressure exerted by the compacting roller on the pipe being formed until the original speed of the roller is reached causing the roller to be cleaned of the adhering portion of the mixture, increasing the pressure exerted by the compacting roller on the pipe being formed until a portion of the mixture adheres to the compacting roller and repeating the steps of reducing and increasing the pressure exerted by the compacting roller on the pipe being formed until a portion of the mixture no longer adheres to the compacting roller and the pipe is compacted.



4,001,371

CATALYTIC PROCESS

Joseph Peter Remeika, Warren, and Rudolf Johannes H. Voorhoeve, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 375,948, July 2, 1973, Pat. No. 3,884,837. This application Mar. 6, 1975, Ser. No. 555,809

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.2 **5 Claims**

1. In a catalytic process for the removal from a gas flow of at least one material from the group, carbon monoxide, hydrocarbons and nitrogen oxides of the formula NO_x, at elevated temperatures, the improvement comprising contacting said gas flow with a catalyst containing an active ingredient consisting essentially of a perovskite-like manganite of at least one rare earth element selected from the group consisting of La, Pr, and Nd in which the said rare earth element is partially replaced, in that the said manganite is of a composition represented by the atom formula $RE_{1-x}M_xMnO_3$ in which RE is at least one element selected from the group consisting of La, Pr, and Nd; M is at least one element selected from the group consisting of Na, K, and Rb in which x is from 0.1 to 0.4 and in which the amount of any of the indicated cations may be reduced by up to about 15 atoms percent to accommodate vacancy structures.

4,001,372

REMOVING OXIDES OF NITROGEN FROM GASEOUS MIXTURES WITH ALKALI MANGANATE SOLUTIONS

Taijiro Okabe; Akitsugu Okuwaki, both of Sendai, and Shigetoshi Nakabayashi, Shinminato, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 332,792, Feb. 16, 1973, Pat. No. 3,929,966. This application July 1, 1975, Ser. No. 592,318

Claims priority, application Japan, Feb. 19, 1972, 47-17556

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² C01B *21/00*

U.S. Cl. 423—235 **6 Claims**

1. A method for removing oxides of nitrogen (NOx) existing in a gaseous mixture and consisting predominantly of nitric oxide and nitrogen dioxide, which consists essentially of subjecting said gaseous mixture to a contact-reaction with an aqueous solution consisting essentially of an alkali metal manganate and an alkali metal hydroxide, thereby absorbing the oxides of nitrogen into the solution.

4,001,373

REMOVAL OF TETRANITROMETHANE FROM TNT PLANT WASTE

Thomas N. Hall, Adelphi, Md., and William H. Gilligan, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1975, Ser. No. 605,775

Int. Cl.² B01D *53/34*

U.S. Cl. 423—236 **34 Claims**

1. A gas scrubbing process for removing tetranitromethane from trinitrotoluene plant waste gases comprising scrubbing the waste gases with a solution of (1) water, (2) hydrogen peroxide, and a hydroxyl ion source selected from the group consisting of ZOH, Z_2CO_3, and mixtures thereof wherein Z is selected from the group consisting of Li^+, Na^+, K^+, Cs^+, Rb^+ and mixtures thereof.

4,001,374

PROCESS FOR REMOVING AMMONIA FROM GASES

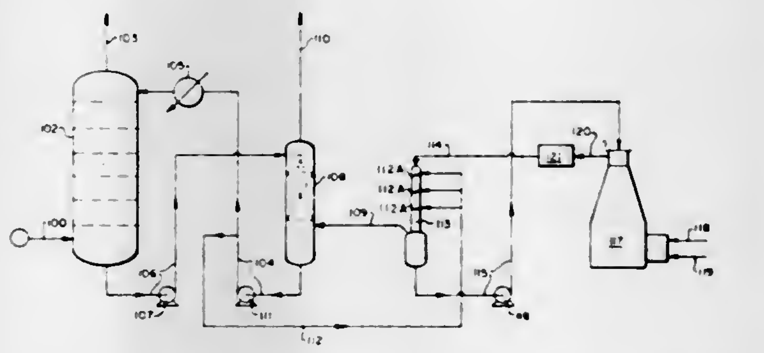
Egon Haese, Bochum-Linden, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed July 2, 1974, Ser. No. 485,232

Claims priority, application Germany, July 2, 1973, 2333518

Int. Cl.² C01C *3/00*

U.S. Cl. 423—237 **7 Claims**



1. A process for removing ammonia from coke oven gases, said process including the steps of:

- forming ammonium sulfite salt solution by washing said coke oven gases containing ammonia with a washing liquid essentially including at least 15% by weight inorganic acidic ammonium bisulfite,
- regenerating acidic ammonium bisulfite by washing the formed ammonium sulfite salt solution with gases bearing sulfur dioxide,
- using a portion of the regenerated acidic ammonium bisulfite for continuous washing of ammonia from the coke oven gases while diverting a portion of the regenerated acidic ammonium bisulfite,
- burning the diverted portion of the regenerated acidic ammonium bisulfite to recover gases essentially including sulfur dioxide, nitrogen and water vapor, and
- using the sulfur dioxide for the recovered gases from said step of burning for said step of regenerating acidic ammonium bisulfite.

4,001,375

PROCESS FOR THE DESULFURIZATION OF FLUE GAS

John M. Longo, New Providence, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 21, 1974, Ser. No. 499,324

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C01B *7/00*; B01J *8/00*

U.S. Cl. 423—244 **7 Claims**

1. A process for the removal of sulfur oxides from a gas, which comprises the steps of contacting the gas with a cerium oxide sorbent at a temperature of from 300° to 800°C until the cerium oxide sorbs sulfur oxide, and regenerating the spent

sorbent by contacting with hydrogen wherein during regeneration the sulfur sorbed cerium is subsequently converted to cerium oxide and the desorbed sulfur specie is initially sulfur dioxide and subsequently hydrogen sulfide.

4,001,376

FLUE GAS DESULFURIZATION SORBENT AND PROCESS

Neville L. Cull, Baker, and Warren M. Smith, Baton Rouge, both of La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 315,590, Dec. 15, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,989

Int. Cl.² C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **9 Claims**

1. In a process wherein sulfur dioxide is separated from a gaseous mixture containing the same by contacting said gaseous mixture, under desulfurization conditions, with a solid sorbent comprising a carrier and an active material supported thereon, which active material will selectively react with sulfur dioxide at said desulfurization conditions, the improvement wherein the carrier comprises alumina and from about 2 to about 20 wt. %., based on the weight of alumina, of a refractory metal oxide different from alumina, said refractory metal oxide being disposed at or near the surface of the alumina by first contacting said alumina with a hydrolyzable organic compound under anhydrous conditions and then converting said hydrolyzable compound to said refractory metal oxide different from alumina.

4,001,377

METHOD FOR PRODUCING STABILIZED AMMONIUM NITRATE

Heinrich Hahn, Gelsenkirchen-Buer; Hans Heumann, and Manfred Schweppe, both of Herne, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Oct. 17, 1974, Ser. No. 515,794

Claims priority, application Germany, Oct. 18, 1973, 2352304

Int. Cl.² C05C *1/02*

U.S. Cl. 423—267 **10 Claims**

1. A method for producing the stabilized ammonium nitrate from an aqueous solution of ammonium nitrate which consists essentially of reducing the water content of the aqueous ammonium nitrate solution so that the water is present in the amount of up to 0.2% by weight, thereafter adding to the ammonium nitrate composition an agent selected from the group consisting of ammonium polyphosphate and potassium polyphosphate in an amount of 0.1 to 1% by weight, based upon the weight of ammonium nitrate and thereafter forming the resultant composition into a prill by prilling.

4,001,378

ANTI-CAKING OF NITROGENOUS MATERIALS

John J. Jasnosz, Huntington Beach, Calif., assignor to Petrochemicals Company, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 421,248, Dec. 3, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 631,111

Int. Cl.² C01B *21/48;* **C05C** *1/60*

U.S. Cl. 423—268 **11 Claims**

1. A composition of matter that flows freely and resists caking even on prolonged storage comprising particles of a nitrogen-containing material consisting essentially of ammonium salts useful as an ingredient of fertilizer and normally posing a problem with caking; said particles of said nitrogen-containing material having on their external surfaces an amount that is sufficient to reduce the normal caking tendency of the nitrogen-containing particles, of an alkene sulfonate in which the alkene moiety contains from 6–26 carbon atoms, inclusive; said particles of nitrogen-containing material also having on their external surface an amount that is sufficient to further reduce the caking thereof, of a finely divided inert material selected from the class consisting of magnesium carbonate, kieselguhr and clay, and having the properties of further reducing the caking.

4,001,379

PROCESS OF MAKING SUPERFINE AMORPHOUS HIGH STRUCTURAL SILICIC ACID

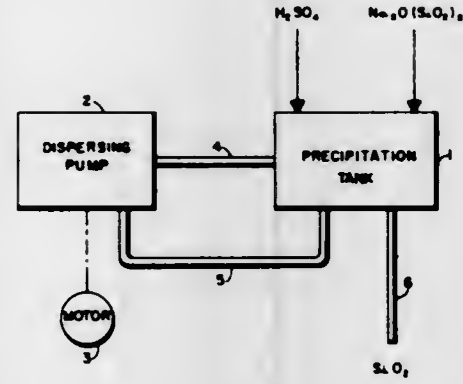
Günter Türk, Gross-Auheim, and Joseph Welsch, Neu-Isenburgh, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation of Ser. No. 199,054, Nov. 15, 1971, abandoned, which is a continuation of Ser. No. 849,739, April 28, 1969, abandoned. This application Sept. 21, 1972, Ser. No. 290,884

Claims priority, application Germany, Apr. 27, 1968, 1767332

Int. Cl.² C01B *33/18, 33/12*

U.S. Cl. 423—339 **9 Claims**



1. A process for the production of a fine-grain, amorphous, high structure silicic acid comprising the steps of precipitating a silicic acid by heating an aqueous alkali-metal silicate solution to a temperature between 70° and 100° C, then adding an acid or an acidic-acting substance or a mixture of said acid and acidic-acting substance together with further alkali-metal silicate to the said heated solution, thus causing the mixture to pass first through an alkaline phase and then through an acid precipitation phase, whereby a gradual transition of the silicate to an intermediate hydrated silica sol and thereafter gradual conversion of the hydrated silica sol by flocculation to a silicic acid suspension occurs in said alkaline phase and these steps being carried out with the following provisions:

a. the alkali number of the reaction mixture is maintained substantially constant throughout the said alkaline precipitation phase at a value within the range from 10 to 40;

b. the amounts of components for the precipitation reaction are selected to obtain an SiO_2 end concentration above 65 grams SiO_2 per liter;

c. a dispersing and shearing force is applied to the mixture throughout the major part of the period of said gradual conversion of the intermediate hydrated silica sol to the flocculated silicic acid;

d. the said dispersing and shearing force is applied by passing the mixture in a continuous stream through a flow-through dispersing pump, centrifugal pump, or combination of these devices, the said pump operating at a frequency of at least 10 per hour, the said frequency being the ratio of the performance of the dispersing device expressed in cubic meters per hour to the initial volume of the reaction mixture in cubic meters; and

e. the said mixing, precipitation and suspension formation is carried out in a single reaction vessel.

4,001,380

MANUFACTURE OF NITROGEN TRIFLUORIDE

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 16, 1961, Ser. No. 111,130

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² C01B *21/00, 9/08*

U.S. Cl. 423—406 **10 Claims**

1. The process for making nitrogen trifluoride which comprises introducing gaseous fluorine azide into a reaction zone containing fluorinating agent of the group consisting of nitrosyl fluoride and chlorine trifluoride, maintaining temperature in the reaction zone in the range of above the boiling point of fluorine azide and below about 100° C., and discharging from the reaction zone gaseous reaction products containing nitrogen trifluoride.

4,001,381

MANUFACTURING PROCESS FOR HEAVY SODIUM CARBONATES IN BRIQUETTE FORM

Aurelian M. Dascalescu, and Grigore O. Socolescu, both of Bucharest, Romania, assignors to Uzina De Produse Sodice, Ocna Mures, Romania

Continuation-in-part of Ser. No. 232,219, March 6, 1972, abandoned. This application July 20, 1973, Ser. No. 381,058

Claims priority, application Romania, Nov. 14, 1970, 54918

Int. Cl.² C01D *7/37, 7/38, 7/12*

U.S. Cl. 423—426 **4 Claims**

1. A process for the manufacture of heavy sodium carbonate briquettes, which comprises the steps of drying a raw, light sodium carbonate - forming starting substance selected from the group consisting of sodium bicarbonate and a mixture of sodium sesquicarbonate and sodium carbonate monohydrate to a 2–4% moisture content, subjecting the thus-dried starting substance to a pressure of about 800 kg/cm² to produce briquettes of the same starting substance having a density of approximately 1.8 kg/dm³, and then calcining the thus-formed dense briquettes of the starting substance in a closed space heated to a temperature of 700°–750° C for a time period sufficient to convert the dense briquettes of said starting substance into briquettes of heavy sodium carbonate having a density of 2.2–2.4 kg/dm³ and to simultaneously evolve a dust-free gas mixture of CO_2 and H_2O vapors.

4,001,382

PROCESS FOR PRODUCING CARBON FIBERS HAVING EXCELLENT PHYSICAL PROPERTIES

Yasuo Matsumura; Soichiro Kishimoto, and Saburo Okazaki, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Jan. 20, 1975, Ser. No. 543,008

Claims priority, application Japan, Feb. 4, 1974, 49-14209

Int. Cl.² C01B *31/07*

U.S. Cl. 423—447.1 **10 Claims**

1. In a process for producing carbon fibers having a high strength and a high modulus of elasticity which comprises heating acrylonitrile copolymer fibers made from an acrylonitrile copolymer containing at least 80 mole % acrylonitrile, the improvement wherein the acrylonitrile copolymer contains 0.3 to 6 mole % of an unsaturated carboxylic acid and its alkali metal or ammonium salt, and the content of the carboxylic groups in the salt form in the fiber is 0.1 to 15% based on the total amount of carboxyl groups and their salts in the fiber.

4,001,383

IMPURE SULFURIC ACID TREATMENT PROCESS

Alfred W. Petersen, Salt Lake City, Utah, assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 171,365, Aug. 12, 1971, abandoned, which is a division of Ser. No. 812,124, April 1, 1969, abandoned. This application July 25, 1975, Ser. No. 599,231

Int. Cl.² C01B *17/90, 17/72, 25/16*

U.S. Cl. 423—531 **2 Claims**

1. A process for removing non-degradable organic matter in spent sulfuric acid comprising mixing about 90:10 percent by weight of said acid with about 10:90 percent by weight of spent sulfuric acid containing carbon formed by thermally-degraded organic matter.

4,001,384

PROCESS FOR RECOVERY OF OXIDES OF SULFUR FROM COMBUSTION WASTE GAS

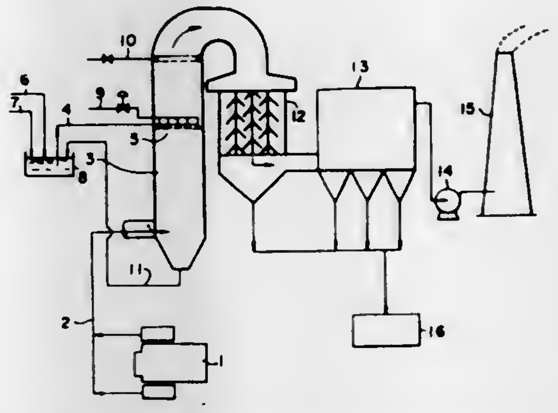
Junji Iwakura, Amagasaki; Kimihiko Sato, Yokohama; Hisashi Fujii, Amagasaki; Yoshihiro Hashimoto, Daito; Shigeo Ono, Yokohama; Shozaburo Watanabe, Amagasaki, and Akio Yokoyama, Nishinomiya, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed May 29, 1973, Ser. No. 364,416

Claims priority, application Japan, Aug. 1, 1972, 47-76474

Int. Cl.² C01D *5/00;* **C01B** *17/60*

U.S. Cl. 423—551 **8 Claims**



1. A process for the recovery of oxides of sulfur from oxygen containing combustion waste gases, which comprises:

cooling said waste gases having an initial temperature of 400° - 600° C and forming entrained articles of sodium compounds consisting essentially of sodium carbonate, by spray contacting said waste gases with a solution of sodium hydroxide or sodium carbonate, wherein the ratio of said sodium hydroxide or sodium carbonate to said oxides of sulfur is 0.9 to 1.5;

converting sodium carbonate in the particles to sodium sulfate by passing said waste gases containing said oxides of sulfur and said sodium compound particles over plate-like packings, whereby said particles are comminuted to a finer particle size form, so as to enhance the reaction of said particles with the oxides of sulfur in said waste gases; and

collecting entrained particles after said conversion step in a dust collector.

4,001,385

SULFUR RECOVERY SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 230,525, Feb. 29, 1972, abandoned. This application June 21, 1974, Ser. No. 481,778

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² C01B *17/04*

U.S. Cl. 423—573 G **5 Claims**

1. In the process of oxidizing hydrogen sulfide gas with an

oxygen containing gas in the presence of an aqueous medium at a neutral or acid pH and a solid heterogenous catalyst to form elemental sulfur, the improvement comprising:

reacting said hydrogen sulfide gas and said oxygen containing gas in a reaction chamber filled with said aqueous medium and said solid heterogeneous catalyst in particulate form, said solid catalyst being carbon particles which are relatively free from chemical attack by the reactants and the reaction products, said carbon particles having surface portions in contact with a hydrophobic material selected from the group consisting of polystyrene, polytetrafluoroethylene, polyethylene, silicones, polychlorotrifluoroethylene, prepolymerized silicone oils, high vacuum silicone grease, poly (chloro-p-xylylene), paraffin, paratoluene sulfonamide, polydichlorodifluorethylene and octadecyl amine without being completely encapsulated by or encapsulating said hydrophobic material.

4,001,386

PROCESS FOR H_2S REMOVAL EMPLOYING A REGENERABLE POLYALKANOLAMINE ADSORBENT

Johannes P. Klein, The Hague, Netherlands; Swethadrivas R. Setlur, New Delhi, India, and Willem Groenendaal, The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 465,445, April 29, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,956

Claims priority, application United Kingdom, Mar. 1, 1973, 9931/73

Int. Cl.^{2} C01B *17/00*

U.S. Cl. 423—574 L **6 Claims**

1. A process for reducing the total sulfur content of Claus off-gases comprising

A. passing the off-gases from a Claus process at a temperature above 175° C, together with a hydrogen- and/or carbon monoxide-containing gas, over a sulfided Group VI and/or Group VIII metal catalyst supported on an inorganic oxidic carrier,

B. passing the off-gases thus treated to an absorption step in which they are contacted with a liquid and regenerable polyalkanolamine absorbent for hydrogen sulfide, discharging the unabsorbed portion of the said off-gases, optionally after incineration, into the atmosphere, and producing a hydrogen sulfide-enriched polyaklanolamine absorbent emanating from the absorption step,

C. increasing the hydrogen sulfide content of the hydrogen sulfide-enriched polyalkanolamine absorbent emanating from the absorption step by contacting said hydrogen sulfide-enriched absorbent with a stream which contains hydrogen sulfide at a higher partial pressure than that of the said reduced Claus off-gases,

D. regenerating the hydrogen sulfide-enriched absorbent from step C by heating and/or stripping and using it again for further absorption of hydrogen sulfide, and

E. passing the hydrogen sulfide liberated in the regeneration to a Claus process.

4,001,387

PROCESS FOR PREPARING RADIOPHARMACEUTICALS

Morton Barak, Walnut Creek, and Harry S. Winchell, Lafayette, both of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

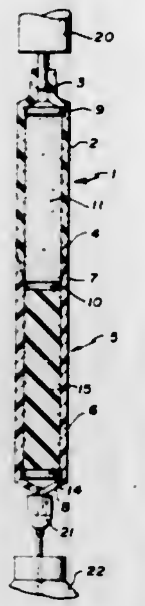
Division of Ser. No. 383,797, July 30, 1973, Pat. No. 3,902,849, which is a continuation-in-part of Ser. No. 173,099, Aug. 19, 1971, Pat. No. 3,749,556. This application Jan. 2, 1975, Ser. No. 537,930

Int. Cl.^{2} A61K *43/00*

U.S. Cl. 424—1 **7 Claims**

1. A process for making a technetium-99m labeled pharmaceutical comprising:

selectively adsorbing and simultaneously reducing technetium-99m pertechnetate upon a particulate reducing agent comprising a metal more electronegative than hydrogen and eluting the reduced technetium-99m from said reducing agent by combination with a physiologically benign chelating agent for reduced technetium-99m dispersed in a physiologically benign liquid carrier having an initially acidic pH.



4,001,388

OPHTHALMOLOGICAL BIOERODIBLE DRUG DISPENSING FORMULATION

John W. Shell, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 369,916, June 14, 1973, Pat. No. 3,914,402. This application July 2, 1975, Ser. No. 592,555

Int. Cl.^{2} A61K *9/14, 9/22, 9/32*

U.S. Cl. 424—14 **5 Claims**

1. An ophthalmic dosage form comprising solid particles of an ophthalmic drug within a bioerodible release rate-controlling material formed of a polyester of the general formula:

$$—[\text{-O-(W)-CO-}]_y—$$

wherein W is a lower alkylene of 1 to 7 carbons and Y has a value such that the molecular weight of the polymer is from about 4,000 to 100,000 mixed with a member for improving ocular compatability of the dosage selected from the group consisting of cellulose and cellulose ethers, said particles consisting of up to 20 parts drug to about 1 part rate controlling material to about 1 part drug up to about 30 parts rate controlling material with the particles having a thickness of rate controlling material that improves release of drug and being from 10 to 300 microns in largest dimensions and forming a bland and non-irritating suspension of 1 part up to 50 parts when admixed prior to administration to the eye with up to 100 parts of an opthalmically acceptable carrier having a pH acceptable to the eye, and wherein ophthalmic drug is released when the dosage is in the eye as the particles erode in response to the ocular environment at a controlled and continuous rate over a prolonged period of time.

4,001,389

SLOW RELEASE BIOLOGICALLY ACTIVE MATERIALS FOR FEEDING TO RUMINANT ANIMALS

Francis James Thomas Fildes, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

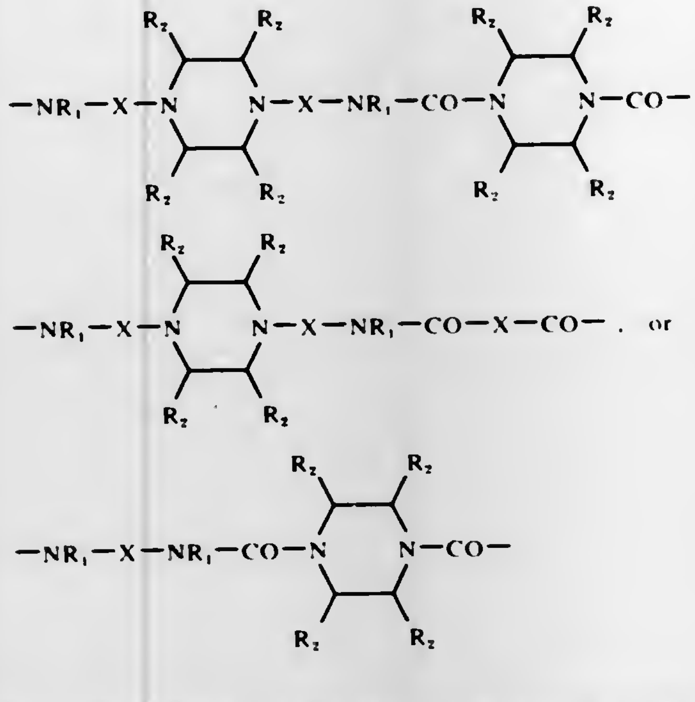
Filed Sept. 23, 1974, Ser. No. 508,715

Claims priority, application United Kingdom, Sept. 26, 1973, 45089/73

Int. Cl.^{2} A61K *9/22, 9/32*

U.S. Cl. 424—19 **14 Claims**

1. A biologically active composition suitable for feeding to a ruminant animal comprising a biologically active material coated with or in a matrix of a polymeric material, the polymeric material comprising amide repeat units having the structure



wherein the groups R_1, which may be the same or different, are hydrogen, or alkyl groups, the groups R_2, which may be the same or different, are hydrogen or alkyl groups and the groups X, which may be the same or different are selected from the group consisting of methylene, polymethylene and alkyl derivatives thereof, the proportion of nitrogen in the polymeric material derived from the amino groups in the piperazine groups being in the range of from 2% to 10% by weight of the polymeric material and the molecular weight of the polymeric material is such that the polymeric material has a reduced viscosity of at least 0.3 dl g^{-1} when measured in a 1% by weight solution in methanol containing 5% by weight of lithium chloride at 25° C.

4,001,390

METHOD OF COATING PHARMACEUTICAL SOLID DOSAGE FORMS

Shigeru Ohno, Kamakuna; Fujio Sekigawa, Yono, and Shokichi Yamagishi, Omiya, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1975, Ser. No. 563,979

Claims priority, application Japan, Apr. 4, 1974, 49-38128

Int. Cl.^{2} A61K *9/32, 9/36*

U.S. Cl. 424—35 **3 Claims**

1. A pharmaceutical solid dosage form coated with three successive layers comprising:

1. an inside layer closest to said solid dosage form containing no pigment and consisting of hydroxy propylmethyl cellulose or hydroxy propylmethyl cellulose phthalate;
2. a layer over layer (1) consisting of said polymer and a pigment; and
3. an outer layer over layer (2) consisting of said polymer and up to 10 weight percent pigment based on the weight of said polymer.

4,001,391

MEANS FOR DEPOSITING AEROSOL SPRAYS IN BUTTERY FORM

Wolffe Harry Feinstone, and Fred J. Bandelin, both of Memphis, Tenn., assignors to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 817,572, April 18, 1969, abandoned. This application Sept. 16, 1971, Ser. No. 181,208

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} A61K *7/00, 7/42, 9/12;* **B65D** *83/14*

U.S. Cl. 424—45 **10 Claims**

1. An aerosol package for spraying a cosmetic or pharmaceutical substance such that it deposits on a desired limited surface area of living skin tissue in the form of a buttery, liquescent solid comprising a pressure-resistant container; actuatable aerosol spray valve means for hermetically sealing said container and regulating the passage of material therethrough such that it leaves the terminal orifice as a finely divided spray, said container housing an anhydrous cosmetically or pharmaceutically acceptable, oleaginous base containing said substance, a wax in an amount of about 5 to 50% by weight of the base, said wax being a paraffin wax having a melting point in the range of 120° to 150°F.; and an effective amount of a propellant miscible with said base.

4,001,392

HAIRDRESSINGS

Kenneth Vasey Curry, Camberley, and Ahamado Ismail Sahir, Isleworth, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,761

Claims priority, application United Kingdom, Jan. 31, 1969, 5431/69

Int. Cl.^{2} A61K *7/11*

U.S. Cl. 424—47 **8 Claims**

1. A hairdressing composition for holding and imparting lustre to the hair comprising from 10 to 70% of a lower aliphatic alcohol having from 1 to 4 carbon atoms; up to 40% water; from 0.1 to 5% of a film-forming agent selected from the group consisting of a copolymer of vinyl pyrrolidone and vinyl acetate, a copolymer of vinyl acetate and crotonic acid, polyvinyl pyrrolidone and a water soluble neutralized copolymer of a vinyl alkyl ether and maleic anhydride; and, from about 2 to about 30% of a lustre aid being selected from the group consisting of polyethylene-polypropylene glycol ether having a viscosity of from 10 to 400 centistokes at 100° F and diisopropyl adipate.

4,001,393

MEANS FOR CARIES PROPHYLAXIS

Raul L'Orange, Mainz, Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Germany

Filed Jan. 9, 1974, Ser. No. 431,856

Claims priority, application Germany, Jan. 20, 1973, 2302812

Int. Cl.^{2} A61K *7/18, 7/22*

U.S. Cl. 424—52 **10 Claims**

1. A composition effective in preventing caries comprising a non-toxic carrier substance and a caries-prophylactic amount of a member selected from the group consisting of 1,6-di-4'-fluorophenyldiguanidohexane, its non-toxic salts and mixtures thereof.

4,001,394

SHAMPOO CREME RINSE CONTAINING A QUATERNARY AMMONIUM SACCHARINATE, CYCLAMATE OR PHTHALIMIDATE

Arnold W. Fogel, Montvale, and Anthony F. Mercurio, Rivervale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

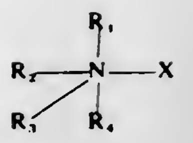
Filed Jan. 30, 1974, Ser. No. 438,048

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

1. A shampoo, creme rinse composition comprising, an aqueous carrier, an anionic or amphoteric detergent, or a combination thereof, the total amount of detergent being from about 10 to 55 parts, and from 0.1 to 1 part of a substituted quaternary ammonium compound represented by the formula:



where R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms:

R_3 is a benzyl radical which may be further substituted by a C_1 or C_2 alkyl radical;

R_4 is a long chain alkyl radical of 16 to 22 carbon atoms; and

X is an organic anion selected from the group consisting of a saccharinate, a cyclamate and a phthalimidate radical said parts being per 100 parts of composition.

4,001,395
HYDROSOLUBLE EXTRACTS OF MYCOBACTERIA

Pierre Jolles, Paris, and Daniéle Migliore-Samour, Kremlin-Bicetre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 371,658, June 19, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,477

Claims priority, application France, June 20, 1972, 72.22208; May 4, 1973, 73.16130; Sept. 4, 1974, 74.30107

Int. Cl.^{2} A61K *39/00, 39/02*

U.S. Cl. 424—92 **15 Claims**

1. A process for the preparation of hydrosoluble extracts of delipidated mycobacteria, said extracts having a molecular weight in the range of about 3,500 to 20,000, said process consisting essentially of subjecting the bacterial residues of said delipidated mycobacteria to a treatment with pyridine, extracting with a solvent selected from the group consisting of alcohol and water, and isolating hydrosoluble substances from the extract by physicochemical means.

4,001,396
HORMONAL PRODUCT EXTRACTED FROM PARATHYROID GLAND AND PROCESS FOR THE PREPARATION THEREOF

Laszlo Feuer, Budapest, Hungary, assignor to Chinoin Pharmaceutical and Chemical Works Ltd., Budapest, Hungary

Continuation-in-part of Ser. No. 274,723, July 24, 1972, abandoned. This application Apr. 3, 1974, Ser. No. 457,627

Claims priority, application Hungary, Aug. 4, 1971, CI 1146

Int. Cl.^{2} A61K *35/46*

U.S. Cl. 424—112 **4 Claims**

1. A method of making a hormonal composition distinguished from parathormone in that it has a molecular weight of between 200 and 1000 and a physiological activity different from parathormone, said composition being effective in the treatment of:

Skin radiation damage,

said method comprising the steps of:

a. degreasing ground, lyophilized, protein-containing parathyroid gland powder or powder derived from tissual or cell culture of the parathyroid gland in acetone or chloroform to produce a degreased gland powder;

b. extracting the degreased gland powder produced in step (a) with water to form an aqueous extract containing the principle associated with said physiological activity;

c. treating the aqueous extract formed in step (b) with trichloroacetic acid to precipitate the protein therefrom and to remove parathormone contained therein to yield an aqueous solution free from the protein and the parathormone and containing the principle associated with said physiological activity;

d. raising the pH of the aqueous extract of step (c) to a pH of 4.0 to 4.5 to produce an aqueous extract of increased pH;

e. purifying the aqueous extract of increased pH by gel-filtering same on a gel column eluted with water and absorption spectrometrically evaluating the eluate fractions at a wavelength of 234, 280 or 300 μm;

f. recovering from the eluate of step (e) the fraction corresponding to $(0.67 \pm 0.02) \times V_0$ where V_0 is the total volume of the eluate from the appearance of sodium chloride therein as detected by determining the presence of chloride ion in the eluate; and

g. lyophilizing the fraction recovered in step (f) to form a powder constituting said hormonal composition, said powder having therapeutic effectiveness in amounts of about 0.5 to 10 milligrams per dose.

4,001,397
ANTIBIOTIC COMPOUND 41,012

Walter D. Celmer, New London; Charles E. Moppett, Mystic; Walter P. Cullen, East Lyme; John B. Routien, Lyme; Mark T. Jefferson, Waterford, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,366

Int. Cl.^{2} A61K *35/74*

U.S. Cl. 424—116 **2 Claims**

1. The Antibiotic Compound 41,012 which in the form of the free acid is soluble in water, ethanol, water saturated n-butanol, dimethylformamide or dimethylsulfoxide and insoluble in heptane, diethyl ether, chloroform or methylene chloride; has an optical rotation of $[\alpha]_D^{25°} = -7.1°$ at a concentration of 1% in methanol; has an average composition by weight of 44.81% carbon, 6.56% hydrogen, 9.55% nitrogen and 39.08% oxygen (by difference); and when pelleted in KBr exhibits characteristic absorption in the infrared region at the following wavelengths in microns: 3.00, 3.48, 5.80, 5.93, 6.07, 6.55, 6.92, 7.25 and 8.10.

4,001,398
OCTAHYDRO AND DECAHYDRO DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway; Sidney Roemer, Flanders, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1974, Ser. No. 482,058

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} A61K *35/00*

U.S. Cl. 424—122 **14 Claims**

1. An antimicrobial substance, octahydroacid S, prepared by treating octahydroacid S methyl ester (1 equivalent) with 5 percent aqueous sodium hydroxide solution (50 equivalents) for 30 minutes at 100° and having the following characteristics:

a. Molecular Formula $C_{28}H_{50}O_6$; molecular weight 482.

b. Infrared Spectrum ν_{max} 3350, 1720, 1460, 1380, 1080 and 720 cm^{-1}.

4,001,399
PROCESS FOR THE PRODUCTION OF MONOPROPIONYL-JOSAMYCIN-2

Takashi Osono; Kiruko Moriyama; Keisuke Murakami, and Hamao Umezawa, all of Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Japan

Division of Ser. No. 282,013, Aug. 21, 1972, Pat. No. 3,959,252, which is a continuation-in-part of Ser. No. 811,346, March 28, 1969, abandoned. This application May 23, 1975, Ser. No. 580,345

Claims priority, application Japan, Mar. 29, 1968, 43-20381; Mar. 29, 1968, 43-20382

Int. Cl.^{2} A61K *33/44*

U.S. Cl. 424—123 **7 Claims**

1. A process for the production of monopropionyl-josamycin-2 by hydrolysis of dipropionyl-josamycin, which comprises dissolving dipropionyl-josamycin in aqueous methanol and then distilling the resultant solution to remove the solvent and recovering monopropionyl-josamycin-2.

4,001,400
PRESERVATIVE FOR WOOD

Bror Olof Hager, Djursholm, Sweden, assignor to Hager Aktiebolag, Stockholm, Sweden

Filed Jan. 17, 1972, Ser. No. 218,546

Claims priority, application Sweden, Jan. 26, 1971, 880/71

Int. Cl.^{2} A01N *13/00*

U.S. Cl. 424—134 **10 Claims**

1. Preservative for wood and other organic fiber products consisting essentially of a copper compound and a fatty acid having from 6 to 12 carbon atoms per molecule dissolved in an aqueous ammoniacal solution.

4,001,401
BLOOD SUBSTITUTE AND BLOOD PLASMA EXPANDER COMPRISING POLYHEMOGLOBIN

Pieter Bonsen, Los Altos, Calif.; Myron B. Laver, Weston, Mass., and Kent C. Morris, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 27, 1975, Ser. No. 553,514

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.^{2} A61K *37/04, 35/14*

U.S. Cl. 424—177 **20 Claims**

1. A pharmaceutical composition useful as a blood substitute and blood plasma expander comprising a therapeutically effective amount of cross-linked, stromal-free hemoglobin, soluble in aqueous and physiological fluids, capable of reversibly binding a ligand and having a molecular weight of 64,000 to 1,000,000, mixed with a pharmaceutically acceptable carrier.

4,001,402
CARDENOLIDE GLYCOSIDES AND METHOD OF MAKING THE SAME, AND THERAPEUTIC COMPOSITION

Hans Peter Albrecht, Luetzelsachsen ueber Weinheim, and Guenter Neugebauer, Mannheim, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

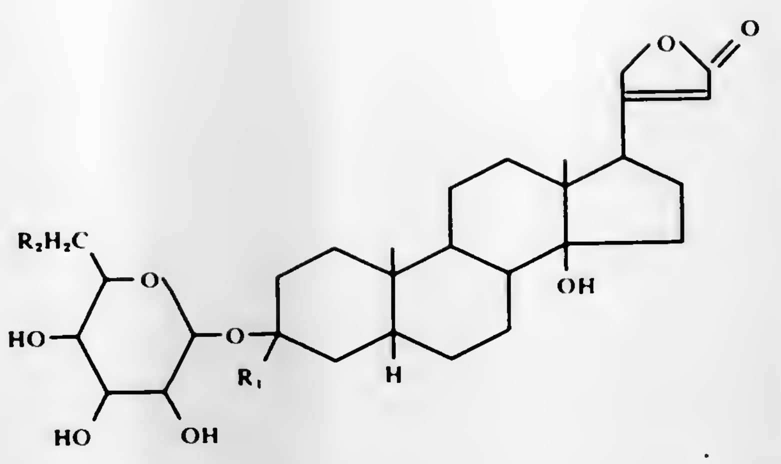
Filed Apr. 5, 1976, Ser. No. 673,592

Claims priority, application Germany, Apr. 18, 1975, 2517293

Int. Cl.^{2} A61K *31/705*

U.S. Cl. 424—182 **8 Claims**

1. A cardioactive glycoside of the formula



wherein R_1 is saturated aliphatic hydrocarbon having 1 – 4 carbon atoms or unsaturated aliphatic hydrocarbon having 2 – 4 carbon atoms or phenyl and R_2 is hydrogen or hydroxyl.

8. A pharmaceutical composition containing a cardioactively effective amount of a compound as i claim 1 as an active ingredient, in combination with a pharmaceutical excipient.

4,001,403
METHOD FOR REDUCING THE REPRODUCTIVE FUNCTION OF MAMMALS

Donald R. Bennett, Midland, Mich., and James A. McHard, Gainesville, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 743,602, July 10, 1968, abandoned. This application Mar. 16, 1973, Ser. No. 342,227

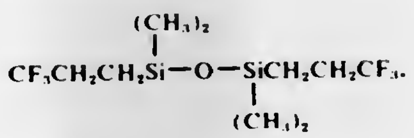
Int. Cl.^{2} A61K *31/695*

U.S. Cl. 424—184 **9 Claims**

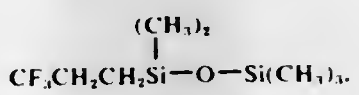
1. A method for reducing the reproductive function of mammals which comprises administering a pharmacologically effective amount of a certain fluoroalkyl-substituted oganosilicon compound to a mammal, said compound being selected from the group consisting of

(1) $Si(CH_2CH_2CF_3)_4$.

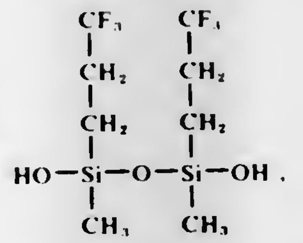
$Si(CH_2CH_2CF_3)_4$. (1)



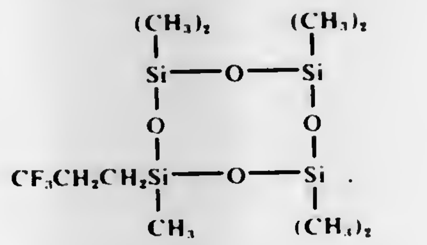
$$CF_3CH_2CH_2\overset{(CH_3)_2}{\overset{|}{Si}}-O-\underset{(CH_3)_2}{\underset{|}{Si}}CH_2CH_2CF_3. \quad (2)$$



$$CF_3CH_2CH_2\overset{(CH_3)_2}{\overset{|}{Si}}-O-Si(CH_3)_3. \quad (3)$$



(4)



(5)

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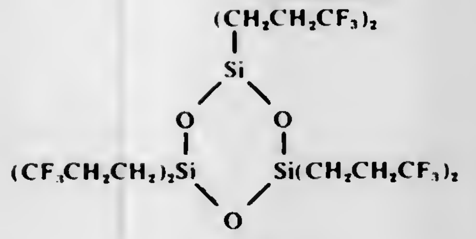
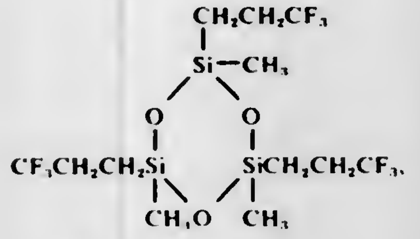
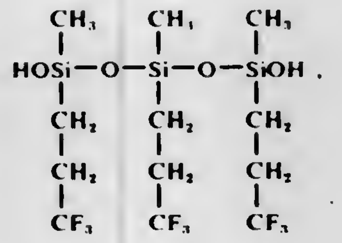
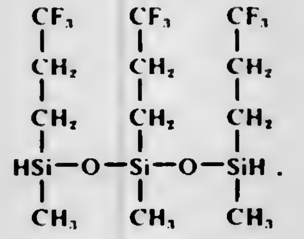
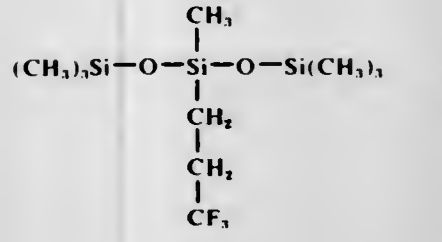

(6)

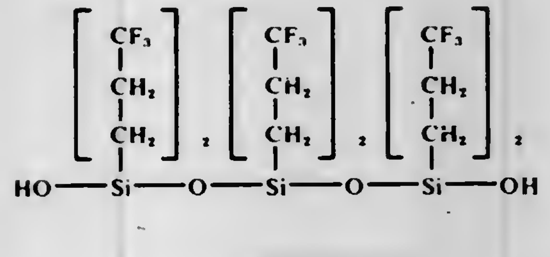

(7)


(8)


(9)


(10)

and


(11)

to 4 carbon atoms or dialkylaminoalkyl with 1 to 4 carbon atoms in each alkyl moiety.

7. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,001,405
PHOSPHONATE SYNERGISTS

Peter E. Letchworth, Cupertino, Calif., and Edward D. Weil, Hastings-on-Hudson, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 427,160, Dec. 21, 1973, abandoned, which is a continuation of Ser. No. 158,542, June 30, 1971, abandoned. This application Mar. 26, 1975, Ser. No. 562,368

Int. Cl.² A01N *9/36*

U.S. Cl. 424—210 **2 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of an insecticidal compound consisting of O,O-dimethyl-O-(2-methoxy-4-cyanophenyl)-phosphorothioate and a synergistic amount of a synergist compound consisting of O,O′-dipropargyl chloromethylphosphonate; said compounds being present in an amount of about 1 part insecticidal compound to about 0.1 to 10 parts synergist compound.

4,001,406
BENZENEDISULFONAMIDES AS ANTHELMINTIC AGENTS

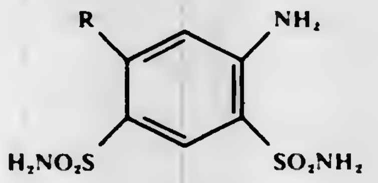
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 477,542, June 2, 1974, abandoned, which is a division of Ser. No. 359,393, May 11, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,638

Int. Cl.² A61K *31/63*

U.S. Cl. 424—228 **5 Claims**

1. A method for curing fascioliasis which comprises administering to an animal so infected a fasciolicidally effective amount of a compound having the formula:



wherein R is a haloalkyl group of from 2 to 6 carbon atoms containing from 1 to 13 halogen atoms.

4,001,404
N-DITHIOPHOSPHORYL-CARBAMIC ACID ESTERS

Hellmut Hoffmann, Wuppertal; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

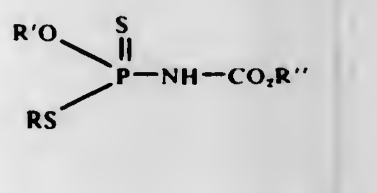
Filed June 20, 1975, Ser. No. 588,921

Claims priority, application Germany, July 2, 1974, 2431849

Int. Cl.² A01N *9/36;* **C07F** *9/24*

U.S. Cl. 424—212 **9 Claims**

1. An N-dithiophosphoryl-carbamic acid ester of the formula



in which

R and R′ each independently is alkyl with 1 to 6 carbon atoms, and

R″ is alkyl with 1 to 6 carbon atoms, halogenoalkyl with 1

4,001,407
REDUCTION OF SERUM LIPID LEVELS AND AGENTS AND COMPOSITIONS USEFUL THEREFOR

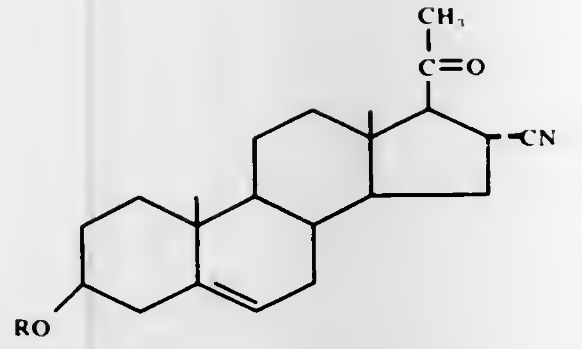
Wendell H. Rooks, II, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 417,972, Nov. 21, 1973, which is a continuation-in-part of Ser. No. 315,997, Dec. 18, 1972. This application Nov. 5, 1975, Ser. No. 629,173

Int. Cl.² A61K *31/56*

U.S. Cl. 424—238 **15 Claims**

1. A method for lowering elevated serum lipid concentrations comprising administering to a mammalian host a therapeutically effective amount of a compound selected from the group of compounds represented by the formula:



where R is hydrogen, alkyl having 1 to 6 atoms, cycloalkyl having 3 to 6 carbon atoms, acyl having 2 to 7 carbon atoms, tetrahydrofuran-2′-yl, tetrahydropyran-2′-yl, or 4′-alkoxy-tetrahydropyran-4′-yl where the alkoxy moiety has 1 to 6 carbon atoms.

4,001,408
SUBSTITUTED HETEROCYCLIC COMPOUNDS, PROCESSES AND COMPOSITION INCLUDING THOSE

Silvano Rossi, Milan, Italy, assignor to Roussel-UCLAF, Paris, France

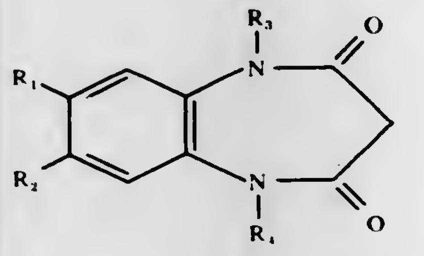
Division of Ser. No. 41,757, June 3, 1970, which is a continuation of Ser. No. 689,810, Dec. 12, 1969, abandoned. This application July 27, 1972, Ser. No. 276,242

Claims priority, application Italy, Dec. 14, 1966, 31085/66

Int. Cl.² A61K *31/33*

U.S. Cl. 424—244 **8 Claims**

1. A therapeutic composition having tranquilizing anti-convulsive and analgesic properties which comprises a pharmaceutically acceptable carrier and a small but effective amount of a compound having the formula



wherein R_1 is halogen, hydroxyl, methoxyl or carboxyl esterified with an alkanol having 1 to 3 carbon atoms when R_2 is hydrogen, R_3 is hydrogen, phenylloweralkyl, loweralkenyl, or (cycloalkyl)loweralkyl, said cycloalkyl having 3 to 7 ring carbon atoms and R_4 is methyl; and wherein R_1 is hydrogen, when R_2 is hydrogen, halogen, hydroxyl, methoxyl, or carboxyl esterified with an alkanol having 1 to 3 carbon atoms, R_3 is hydrogen, phenylloweralkyl, loweralkenyl, (cycloalkyl)-loweralkyl, said cycloalkyl having 3 to 7 ring carbon atoms, or alkyl having 1 to 6 carbon atoms, and R_4 is phenyl.

4,001,409
INJECTABLE FORMULATIONS OF 7-[D-α-AMINO-α-(P-HYDROXYPHENYL)ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Alphonse Peter Granatek, Baldwinsville, and Murray Arthur Kaplan, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,268

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **21 Claims**

1. A stable, solid, water-soluble antibiotic composition for reconstitution upon addition of sterile water as a stable injectable solution of 7-[D-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid, said composition comprising a mixture of one part by weight of 7-[D-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid hydrate and about 0.25 to about 2.0 parts by weight of sodium, potassium or calcium levulinate.

11. A process for the preparation of a stable, solid, water-soluble composition suitable upon reconstitution with sterile water as a stable injectable solution of 7-[D-αamino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid; which process comprises

1. forming an aqueous solution of one part by weight of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid hydrate or hydrochloride and about 0.25 to about 2.0 parts by weight of sodium, potassium or calcium levulinate; and
2. lyophilizing the so-produced aqueous solution to produce the desired solid composition.

4,001,410
3-AMINO-1,2,4-BENZOTRIAZINE-1,4-di-N-OXIDE COMPOSITIONS AND METHOD OF USING SAME

Kurt Ley, Odenthal-Globusch; Florin Seng, Schildgen, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

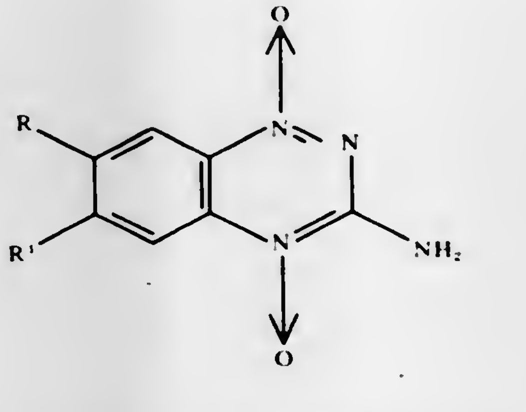
Division of Ser. No. 465,165, April 29, 1974, which is a division of Ser. No. 326,389, Jan. 24, 1973, Pat. No. 3,868,371. This application June 9, 1975, Ser. No. 584,910

Claims priority, application Germany, Feb. 1, 1972, 2204574

Int. Cl.² A61K *31/53*

U.S. Cl. 424—249 **28 Claims**

1. A composition useful for promoting the growth of animals which comprises a growth promoting amount of a compound of the formula:



or an isomeric mixture thereof, wherein

R is hydrogen, halogeno, lower alkyl, halo(lower alkyl), lower alkoxy, carbamyl, sulfonamido carboxy or carbo(-lower alkoxy), and

R^1 is hydrogen, halogeno, lower alkyl, halo(lower alkyl), lower alkoxy, carbamyl, sulfonamido, carboxy or carbo(-lower alkoxy),

in combination with an edible animal fodder.

4,001,411
2-ACYL-4-OXO-PYRAZINO-ISOQUINOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Jürgen Seubert, Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

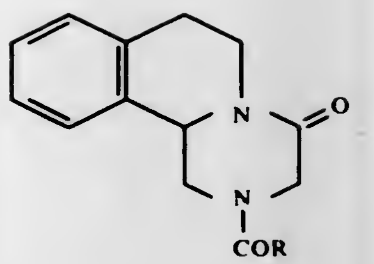
Filed Dec. 16, 1974, Ser. No. 533,467

Claims priority, application Germany, Dec. 17, 1973, 2362539

Int. Cl.² C07D *241/36*

U.S. Cl. 424—250 **16 Claims**

1. A compound of the formula



wherein R is (a) cycloalkyl of 3-7 carbon atoms, or a corresponding group mono-substituted by fluorine, chlorine, nitro, hydroxy, amino, formylamino, acetylamino, pentanoylamino, hexanoylamine, octanoylamine, oleoylamine, methoxyacetylamine, methylamine, dimethylamino or allylamino;

b. alkyl of up to 7 carbon atoms or a corresponding group substituted by methoxy or ethoxy; (c) oxocyclobutyl, oxocyclopentyl or oxocyclohexyl; or (d) cyclohexenyl; and the physiologically acceptable acid addition salts thereof.

15. A pharmaceutical composition consisting essentially of an anthelmintically effective amount per unit dosage of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

16. A method of treating cestode and trematode infestations which comprises administering to an animal infested with cestodes or trematodes an anthelminitically effective amount of a compound of claim 1.

4,001,412

1-SUBSTITUTED-1,2-DIHYDROTHIENO[2,3-d]-PYRIMIDIN-2-ONE DERIVATIVES

Toshiyuki Hirohashi, Ashiya; Hiromi Sato; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 335,775, Feb. 26, 1973, abandoned. This application May 6, 1975, Ser. No. 575,042

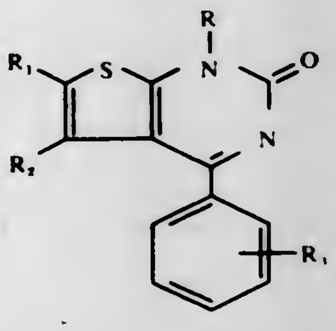
Claims priority, application Japan, Feb. 28, 1972, 47-20357

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.^{2} C07D *495/04;* **A61K** *31/495*

U.S. Cl. 424—251 **13 Claims**

1. A thienopyrimidine derivative represented by the formula,



(I)

wherein R_1 is chlorine, methyl or nitro; R_2 is hydrogen or methyl; R_3 is hydrogen, chlorine or fluorine; and R is C_1-C_4 alkyl or cyclopropylmethyl.

4,001,413

PHARMACEUTICAL LOCAL ANESTHETIC COMPOSITION EMPLOYING SAXITOXIN

Herbert J. F. Adams, Westboro, and Bertil H. Takman, Worcester, both of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Division of Ser. No. 369,147, June 12, 1973, Pat. No. 3,957,996; which is a continuation-in-part of Ser. No. 206,182, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 109,942, Jan. 26, 1971, abandoned. This application Nov. 6, 1975, Ser. No. 629,633

Int. Cl.^{2} A61K *31/52*

U.S. Cl. 424—253 **8 Claims**

1. An injectable local anesthetic composition having long-lasting local anesthetic effect which is a solution consisting essentially of a pharmaceutically acceptable carrier having dissolved therein

a. a heterocyclic aminoacyl anilide local anesthetic compound in a concentration of from 0.05% to 5% by weight of the carrier and

b. from 0.5 to 10 micrograms of saxitoxin per milliliter of the carrier.

4,001,414

1,3,4-TRIMETHYL-2-(3,4,5-TRIMETHOXYBENZYL)-1,2,5,6-TETRAHYDROPYRIDINE AND ANALGESIC COMPOSITION AND METHOD USING IT

Ricardo Granados Jarque; Juan Bosch Cartes; Jorge Canals Cabiro, all of Barcelona; Cristobal Martinez Roldan, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Spain

Filed Apr. 29, 1975, Ser. No. 572,863

Claims priority, application Spain, May 4, 1974, 425971

Int. Cl.^{2} A61K *31/44;* **C07D** *211/70*

U.S. Cl. 424—263 **3 Claims**

1. The compound selected from the group consisting of 1,3,4-trimethyl-2-(3,4,5-trimethoxybenzyl)-1,2,5,6-tetrahydropyridine and pharmaceutically acceptable acid addition salts thereof.

4,001,415

COMPOSITION FOR AND METHOD OF TREATING DISEASES CAUSED BY PROTOZOA

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

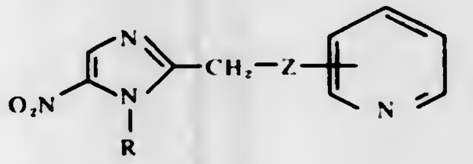
Division of Ser. No. 476,990, June 6, 1974, Pat. No. 3,905,985. This application Sept. 4, 1975, Ser. No. 610,459

Claims priority, application Germany, June 8, 1973, 2329376

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A pharmaceutical composition for treatment of diseases caused by trichomonads and amebae, consisting essentially of an amount, effective against said trichomonads and amebae, an active compound of the formula



in which R stands for methyl, ethyl or hydroxyethyl and Z stands for —SO— or —SO_2— and the pyridine ring is linked to the sulfinyl or the sulfonyl group in 2, 3 or 4 position in admixture with a pharmaceutical carrier.

4,001,416

CERTAIN FUNGICIDAL PYRIDINES

Ernst-Heinrich Pommer, Limburgerhof; Bernd Zeeh, Ludwigshafen; Norbert Goetz, Bobenheim-Roxheim, and Bjoern Giergensohn, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

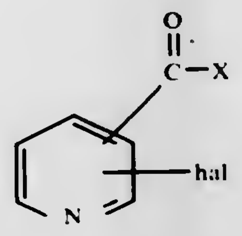
Filed Mar. 19, 1975, Ser. No. 559,686

Claims priority, application Germany, Apr. 9, 1974, 2417216

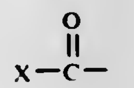
Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—266 **9 Claims**

1. A process for combatting fungi which comprises treating the fungi or the crop plants to be protected against fungal attack with a fungicidal amount of a pyridine compound of the formula



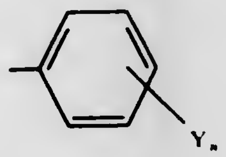
the two radicals hal and



$$X{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}$$

being in ortho-position to each other, wherein hal denotes chloro, bromo or iodo and X denotes NH—R^1,

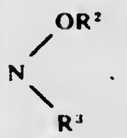
R^1 being a member selected from the group consisting of: cycloalkyl of 5 or 6 carbon atoms; cyclohexyl substituted by hydroxy, methyl, ethyl, isopropyl or ethynyl; phenyl; naphthyl; indanyl; pyridyl; pyridyl substituted by amino; pyrimidyl substituted by methyl or hydroxy; and the radical



in which *n* is one of the integers, 1, 2, 3 and 4 and Y is hydrogen, C_1 to C_4 alkyl, fluoro, chloro, bromo, iodo, hydroxy, amino, phenyl, C_1 to C_3 alkoxy, acetyl, benzoyl, trifluoromethyl, phenoxy, chlorophenoxy, hydroxycarbonyl, C_1 to C_4 alkoxycarbonyl, hydroxycarbonylmethyl or nitro;

or X denotes

or X denotes



$$N\begin{matrix} \diagup OR^2 \\ \diagdown R^3 \end{matrix}$$

R^2 being hydrogen or methyl and R^3 being cyclohexyl.

4,001,417

METHOD FOR PRODUCING DIURESIS IN A MAMMAL BY USE OF THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

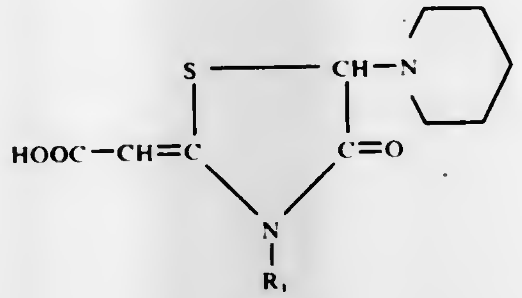
Division of Ser. No. 553,715, Feb. 27, 1975. This application Oct. 6, 1975, Ser. No. 619,992

Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **9 Claims**

1. A method for producing diuresis in a mammal in need thereof which comprises the administration of a compound of the general formula:



wherein R_1 is a lower alkyl radical containing 1 to 4 carbon atoms in an effective amount to cause diuresis.

4,001,418

1′-SUBSTITUTED-THIOXANTHENE-9-SPIRO-4′-PIPERIDINE DERIVATIVES AND THE 10-OXIDES AND 10,10-DIOXIDES THEREOF

Ronald Hilson Begg Galt, and Edwin Harry Paterson Young, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

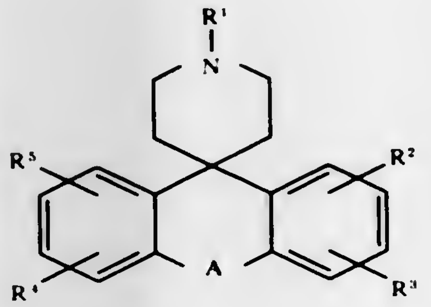
Filed Jan. 9, 1975, Ser. No. 539,627

Claims priority, application United Kingdom, Feb. 4, 1974, 5017/74

Int. Cl.^{2} C07D *409/04*

U.S. Cl. 424—267 **10 Claims**

1. A method of relieving or preventing pain in warm blooded animals including man which comprises administering an analgesically-effective amount of a compound of the formula:



I

wherein R^1 is selected from the group consisting of

1. hydrogen;
2. alkyl of 1 to 10 carbons;
3. alkenyl of 3 to 10 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least 1 carbon;
4. cycloalkylalkyl of 4 to 7 carbons optionally substituted in the cycloalkyl nucleus by an aryl of 6 to 10 carbons or by one or two alkyls of 1 to 3 carbons;
5. aroylalkyl of 8 to 12 carbons optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons; and
6. hydroxyalkyl of 2 to 5 carbons wherein the oxygen atom

it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbon atoms;

R^2, R^3, R^4 and R^5, which may be the same or different, are selected from the group consisting of

7. hydrogen;
8. halogen;
9. alkyl of 1 to 5 carbons;
10. haloalkyl of 1 to 5 carbons;
11. alkoxy of 1 to 5 carbons;
12. alkylthio of 1 to 5 carbons;
13. alkanoyloxy of 1 to 5 carbons;
14. hydroxyalkyl of 1 to 5 carbons; and
15. hydroxy;

A stands for sulphur, sulphinyl or sulphonyl; and the pharmaceutically-acceptable acid-addition salts thereof.

4,001,419

1'-SUBSTITUTED XANTHENE-9-SPIRO-4'-PIPERIDINE DERIVATIVES

Ronald Hilson Begg Galt, and Robert James Pearce, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

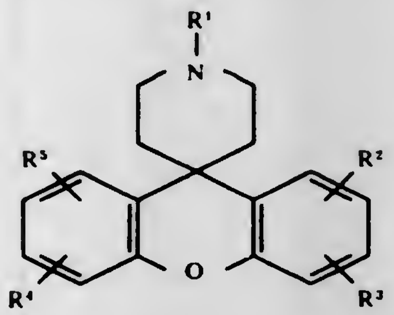
Filed Jan. 9, 1975, Ser. No. 539,742

Claims priority, application United Kingdom, Feb. 4, 1974, 5016/74

Int. Cl.² C07D *405/04*

U.S. Cl. 424—267 8 Claims

1. A method of relieving or preventing pain in warm blooded animals including man, which comprises administering an analgesically-effective amount of a compound of the formula:



wherein R^1 is selected from the group consisting of

1. hydrogen;
2. alkyl of 1 to 10 carbons;
3. alkenyl of 3 to 10 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
4. haloalkenyl of 3 to 6 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
5. alkynyl of 3 to 6 carbons wherein the triple bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
6. cycloalkylalkyl of 4 to 7 carbons, optionally substituted in the cycloalkyl nucleus by an aryl radical of 6 to 10 carbons or by one or two alkyls of 1 to 3 carbons;
7. phenyl;
8. arylalkyl of 7 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
9. aroylalkyl of 8 to 12 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
10. hydroxyalkyl of 2 to 5 carbons wherein the oxygen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons;
11. dialkylaminoalkyl of 4 to 8 carbons wherein the nitrogen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons;
12. carbamoylalkyl of 2 to 8 carbons;
13. alkylcarbamoylalkyl of 3 to 8 carbons;
14. dialkylcarbamoylalkyl of 4 to 8 carbons; and
15. alkanoylalkyl of 3 to 8 carbons; R^2, R^3, R^4 and R^5, which may be the same or different, are selected from the group consisting of
16. hydrogen;
17. halogen;
18. alkyl of 1 to 5 carbons;
19. haloalkyl of 1 to 5 carbons;
20. alkoxy of 1 to 5 carbons;
21. alkylthio of 1 to 5 carbons;
22. hydroxy;
23. thiol;
24. alkanoylamino of 1 to 5 carbons;
25. alkanoyloxy of 1 to 5 carbons;
26. aroyloxy of 7 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
27. arylalkenoyloxy of 9 to 12 carbons;
28. hydroxyalkyl of 1 to 5 carbons;
29. alkylsulphinyl of 1 to 5 carbons; and
30. alkanesulphonyloxy of 1 to 5 carbons; and the pharmaceutically-acceptable acid-addition salts thereof.

4,001,420

THIAZOLYL BENZOIC ACID COMPOUNDS

Charles Malen, Fresnes, and Pierre Desnoyers, Fontenay-aux-Roses, both of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, Suresnes, France

Division of Ser. No. 881,590, Dec. 2, 1969, Pat. No. 3,821,237. This application Apr. 25, 1974, Ser. No. 463,912

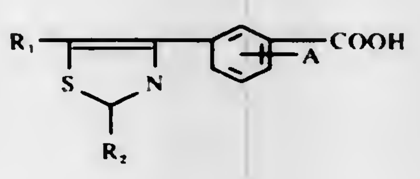
Claims priority, application United Kingdom, Dec. 12, 1968, 59720/68

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 9 Claims

1. A method of treating a living animal body for alleviation of a diseased condition due to a thrombosis or a thromboembolism, comprising administering to said body orally, rectally, or parenterally compound selected from the group consisting of

A. thiazolyl benzoic acid compounds of the general formula (I)



(I)

wherein:

R_1 and R_2 are selected from the group consisting of: lower alkyl containing 1 to 5 carbon atoms inclusive, phenylalkyl, phenyl, halophenyl, lower alkylphenyl, lower alkoxyphenyl and for R_1 hydrogen;

A is selected from the group consisting of: hydrogen, halogen, hydroxy, lower alkyl and lower alkoxy; and

B. physiologically acceptable addition salts with mineral or organic bases, in an effective fibrinolytic amount.

4,001,421

THIAZOLE CARDIOVASCULAR AGENTS

John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

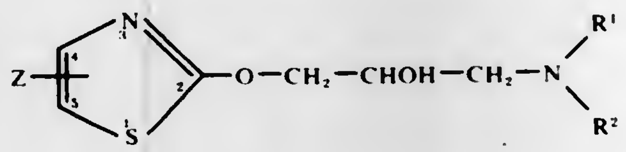
Division of Ser. No. 451,179, March 14, 1974, Pat. No. 3,897,441, which is a continuation-in-part of Ser. No. 289,730, Sept. 15, 1972, Pat. No. 3,850,945, which is a continuation-in-part of Ser. No. 193,172, Oct. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 343,945, March 22, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,718

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 6 Claims

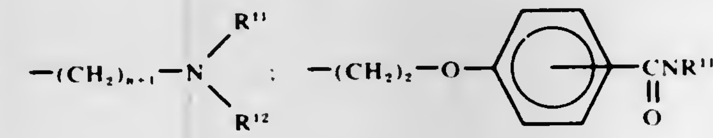
1. A pharmaceutical compostion for treating cardiovascular

disorders in mammals by blocking β-adrenergic receptor sites, comprising a pharmaceutically acceptable carrier and an effective amount of β-adrenergic blocking agent selected from the group of the compounds having the formula:



(I)

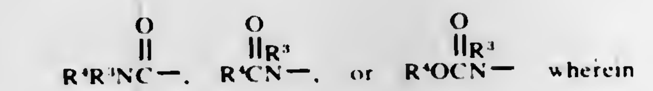
wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl; cycloalkyl having from three through seven ring atoms; lower alkenyl; phenyl; phenyl lower alkyl wherein said alkyl has from one through six carbon atoms; substituted phenyl or substituted phenyl lower alkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy and halo; and groups having the formulas



or $-(CH_2)\,n-Y'$ wherein n is a whole integer of from one through four; R^{11} and R^{12} are independently hydrogen or lower alkyl; and Y' is a heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N-lower alkylpiperazinyl or N'-hydroxy lower alkylpiperazinyl; or

R^1 and R^2 together with the nitrogen atom to which they are joined form a nitrogen heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N'-lower alkylpiperazinyl or N'-hydroxy lower alkylpiperazinyl;

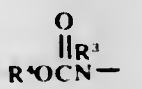
Z is a substituent on the thiazole ring at either the 4 - or 5 -position selected from the group having the formulas:



$$R^4R^3N\overset{\overset{O}{\|}}{C}-,\quad R^4\overset{\overset{O}{\|}}{C}\overset{R^3}{N}-,\quad \text{or}\quad R^4O\overset{\overset{O}{\|}}{C}\overset{R^3}{N}-\quad \text{wherein}$$

wherein

R^3 and R^4 are independently selected from the group of hydrogen; alkyl having from one through 12 carbon atoms; cycloalkyl having from three through 12 carbon atoms; phenyl; phenyl lower alkyl wherein said alkyl has from one through six carbon atoms; substituted phenyl or substituted phenyl lower alkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy, or halo; terminally substituted alkyl group having from two through 12 carbon atoms having one substituted terminal carbon atom having a substituent selected from the group of hydroxy, acyloxy having from two through 12 carbon atoms and alkoxy having from one through six carbon atoms; and groups having the formulas $-(CH_2)_{n-1}NR^8R^9$ or $(CH_n nR^{10}$ wherein n is a whole integer of from one through four, R^8 and R^9 are independently selected from the group of hydrogen and alkyl groups having from one through four carbon atoms and R^{10} is cycloalkyl having from three through eight carbon atoms; and wherein when Z is



$$R^4O\overset{\overset{O}{\|}}{C}\overset{R^3}{N}-$$

then R^4 cannot be hydrogen; a pharmaceutically acceptable salt of the compound of formula I; and mixtures thereof.

4,001,422

4-AMINOQUINAZOLINE CARDIAC STIMULANTS

John C. Danilewicz, Ash; Anthony G. Evans, Sandwich; Allan L. Ham, Broadstairs, and Colin Thomson, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

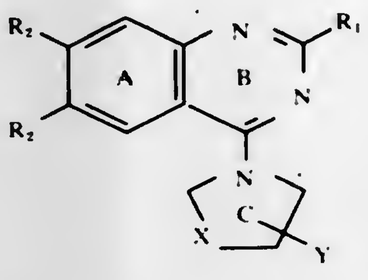
Filed July 24, 1975, Ser. No. 598,723

Claims priority, application United Kingdom, July 25, 1974, 32805/74; Jan. 6, 1975, 416/75

Int. Cl.² A01N *9/22;* **C07D** *239/72*

U.S. Cl. 424—251 24 Claims

1. A compound selected from the group consisting of



and the pharmaceutically acceptable acid addition salts thereof, wherein

R_1 is selected from the group consisting of hydrogen and alkyl having from one to three carbon atoms;

R_2 is alkoxy having from one to two carbon atoms;

X is selected from the group consisting of —CH=CH—, and alkylene having from one to two carbon atoms; and

Y is a substituent at the 3- or 4-position of ring C selected from the group consisting of $-Z_1COR_3$, $-N(R_4)SO_2R_5$, $-Z_2CONR_6R_7$ and $Z_2CSNR_6R_7$ wherein

Z_1 is selected from the group consisting of $-CH_2-$ and $-N(R_4)-$; R_3 is selected from the group consisting of alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, benzyloxy, phenoxy, ethoxy-carbonylmethyl and pyridyl; R_5 is selected from the group consisting of alkyl having from one to four carbon, pyridyl and $-NR_6R_7$; Z_2 is selected from the group consisting of —O—, $-CH_2-$ and $-N(R_4)-$ wherein R_4 is selected from the group of hydrogen, pyridyl, phenyl, alkyl having from one to four carbon atoms and substituted said alkyl wherein said substituent is selected from the group consisting of amino, dimethylamino, hydroxy, pyridyl and phenyl; and R_6 and R_7 when considered separately are each selected from the group consisting of hydrogen, alkyl having one to four carbon atoms and R_6 and R_7 when considered together with the nitrogen to which they are attached form a piperidine ring, with the proviso that when X is —CH=CH— or $-CH_2CH=CH-$ Y is selected from the group consisting of $-CH_2COR_3$, $-CH_2CONR_6R_7$ and $-CH_2CSNR_6R_7$.

24. A method of stimulating the heart of an animal which comprises administering to said animal a cardiac stimulating amount of a compound selected from the group of claim 1.

4,001,423

2-(2-ETHOXY)ETHOXYETHYL BENZIMIDAZOLECARBAMATE

Dale I. Dodds, 560 S. Orange Grove Blvd., Pasadena, Calif. 91105

Filed June 20, 1975, Ser. No. 588,933

Int. Cl.² A01N *9/22;* **C07D** *235/12*

U.S. Cl. 424—273 5 Claims

1. 2-(2-ethoxy)ethoxyethyl benzimidazolecarbamate.

2. A fungitoxic composition comprising from about 0.1 to about 2.5 percent by weight of 2-(2-ethoxy) ethoxyethyl benzimidazolecarbamate and a carrier therefor to make up 100 percent by weight of the composition.

4,001,424

1-OXO-1H-NAPHTHO[2,1-b]PYRAN DERIVATIVES FOR TREATING DEPRESSION

Norina Passerini, Milan; Aldo Ermili, Genoa; Giorgio Roma, Genoa; Alessandro Balbi, Genoa, and Mauro Mazzei, Genoa, all of Italy, assignors to Carlo Erba S.p.A., Italy

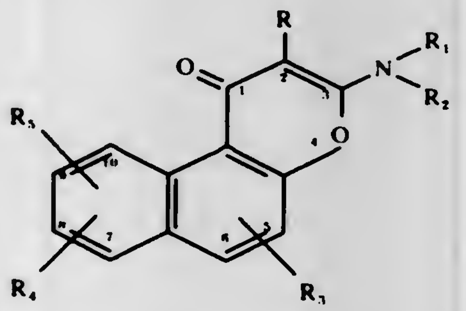
Division of Ser. No. 493,611, July 31, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,329

Claims priority, application Italy, Sept. 27, 1973, 29430/73; Sept. 28, 1973, 29485/73

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **7 Claims**

1. Method of treating depression in patients in need of such treatment, said method comprising orally administering to said patients an antidepressive therapeutically effective amount of a compound of the formula:



wherein R may be hydrogen, halogen or C_1–C_6 alkyl; each of the R_3, R_4 and R_5 groups, being the same or different, may be hydrogen, halogen, nitro, hydroxy, amino, C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl; each of the R_1 and R_2 groups, being the same or different, may be hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, or R_1 and R_2, taken together with the nitrogen atom, may form a monocyclic ring which may contain one or more other hetero atoms, or a physiologically acceptable salt thereof.

4,001,425

METHODS OF TREATING HYPERTENSION AND PHARMACEUTICAL COMPOSITIONS COMPRISING 1-TERTIARY-ALKYL-3-(SUBSTITUTED FURYL)UREAS AS ANTIHYPERTENSIVE AGENTS

William A. Price, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

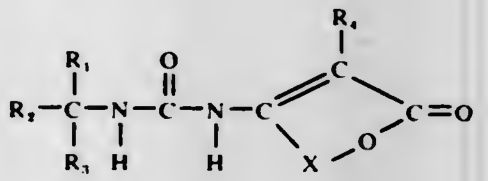
Continuation-in-part of Ser. No. 461,698, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,309

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **20 Claims**

1. A method of treating hypertension in a warm-blooded animal comprising administering to said warm-blooded animal an antihypertensive amount of a compound selected from the group consisting of

a. compounds of the formula



where

- R_1, R_2, and R_3 are C_1–C_4 alkyl, C_2–C_4 alkenyl, or C_2–C_4 alkynyl, with the provisos that the total number of carbon atoms of R_1 plus R_2 plus R_3 does not exceed 6, that not more than one of R_1, R_2, or R_3 is alkynyl, and that two of R_1, R_2, and R_3 may be joined to form a cycloalkyl or cycloalkenyl group;
- X is $-CH_2-$, methyl-substituted methylene, ethyl-substituted methylene, propyl-substituted methylene, or butyl-substituted methylene; and
- R_4 is hydrogen or methyl with the proviso that when R_4 is methyl, X is methylene; and

b. sodium, potassium, or calcium salts of the compounds of (a) wherein X is methylene, methyl-substituted methylene, or ethyl-substituted methylene.

9. A pharmaceutical composition comprising a pharmaceutical carrier and a compound recited in claim 1.

4,001,426

SUBSTITUTED BENZOFURANS AND BENZOTHIOPHENES

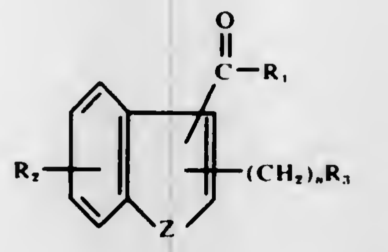
L. Martin Brenner, Havertown, and Charles K. Brush, Malvern, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 515,808, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 462,008, April 18, 1974, abandoned. This application May 9, 1975, Ser. No. 575,877

Int. Cl.² C07D *405/12*

U.S. Cl. 424—285 **23 Claims**

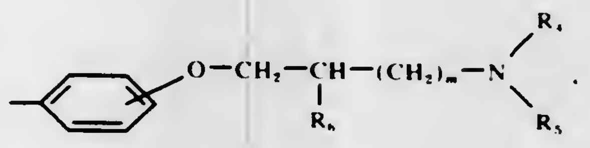
1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

- R_1 is phenyl, halophenyl, dihalophenyl, trihalophenyl, lower alkylphenyl, di-lower alkylphenyl, tri-lower alkylphenyl, lower alkoxyphenyl, di-lower alkoxyphenyl, tri-lower alkoxyphenyl, lower alkyl-di-lower alkoxyphenyl or lower alkoxy-di-lower alkylphenyl;
- R_2 is hydrogen, halo, lower alkyl, lower alkoxy, nitro or trifluoromethyl;

R_3 is



- R_4 is hydrogen, methyl, ethyl or propyl and R_5 is methyl, ethyl or propyl or R_4 and R_5 together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine, N-(lower alkyl)piperazine, morpholine or perhydroazepine ring;
- R_6 is hydrogen or hydroxy;
- m is 0 or 1 when R_6 is hydrogen and 1 when R_6 is hydroxy;
- n is 0 or 1; and
- Z is oxygen or sulfur.

4,001,427

N-DIMETHYLACETONITRILE-α-(SUBSTITUTED PHENOXY) ALKYLAMIDES AND THEIR USE AS MITICIDES

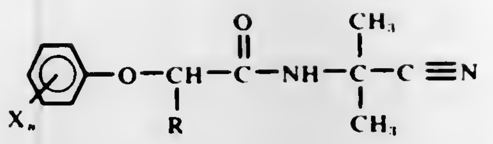
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,727

Int. Cl.² A01N *9/20, 9/24;* **C07C** *121/78*

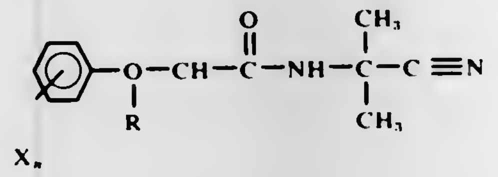
U.S. Cl. 424—304 **26 Claims**

1. A compound having the formula



wherein R is either methyl or ethyl; X is either chlorine or trifluoromethyl; and where X is chlorine, *n* is 3 with the proviso that the 2- and 4-positions are not both occupied on the phenyl ring; and where X is trifluoromethyl, *n* is 1.

14. A method of controlling mites comprising applying to said mites a miticidally effective amount of a compound having the formula



wherein R is either methyl or ethyl; X is either chlorine or trifluoromethyl; and where X is chlorine, *n* is 3 with the proviso that the 2- and 4-positions are not both occupied on the phenyl ring; and where X is trifluoromethyl, *n* is 1.

4,001,428

CYCLOPROPANE DERIVATIVES AND USE THEREOF AS CELL MEMBRANE MOBILITY AGENTS

Edward M. Kosower, and Nechama S. Kosower, both of Tel-Aviv, Israel, assignors to Polymer Sciences Corporation, New York, N.Y.

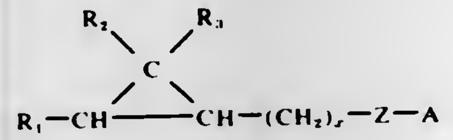
Filed July 22, 1975, Ser. No. 598,133

Claims priority, application Israel, July 22, 1974, 45320

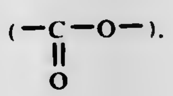
Int. Cl.² A61K *31/25;* **C12K** *9/00;* **C07C** *69/00*

U.S. Cl. 424—307 **16 Claims**

1. Compounds capable of functioning as membrane mobility agents in plant and animal cells and having a structure represented by the formula



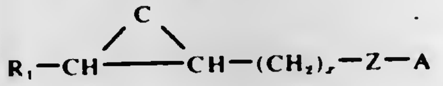
in which A represents a polyalkoxyalkyl hydrophilic chain; Z represents an ester linkage



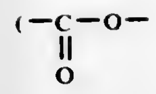
$$(-\underset{\underset{O}{\|}}{C}-O-).$$

R_1 represents a straight-chain alkyl group or a straight-chain alkyl group interrupted by one or more cyclopropyl groups; R_2 and R_3 each represent either hydrogen, lower alkyl, or a halogen group; and x represents an integer from 2 to 10.

7. A method for altering the mobility of membrane components in animal and plant cells to biologically alter such cells in their response to external stimuli which comprises treating such cells with an effective amount of at least one compound having a structure represented by the formula



in which A represents a polyalkoxyalkyl hydrophilic chain; Z represents an ester linkage



$$(-\underset{\underset{O}{\|}}{C}-O-).$$

R_1 represents either a straight-chain alkyl group or a straight-chain alkyl group interrupted by one or more cyclopropyl groups; R_2 and R_3 each represent either hydrogen, lower alkyl, or a halogen group; and x represents an integer from 2 to 10.

4,001,429

1-CYCLOPROPYL-1-PHENYL-ω-AMINO-1-ALKANOLS AND 1-LOWER-ALKYLACYL DERIVATIVES AS ANALGETICS

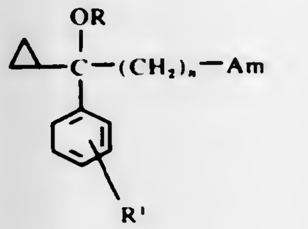
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 456,940, April 1, 1974, Pat. No. 3,928,426, which is a division of Ser. No. 221,804, Jan. 28, 1972, abandoned. This application Apr. 28, 1975, Ser. No. 580,106

Int. Cl.² A61K *31/22, 31/445*

U.S. Cl. 424—311 **3 Claims**

1. A process which comprises administering to a living animal body for its analgesic effect a compound selected from those having the formula



wherein;

- A*m* is lower-alkylamino and di-lower-alkylamino,
- R is lower alkanoyl,
- R¹ is selected from halogen, hydrogen, lower-alkoxy, lower-alkyl, and trifluoromethyl,
- *n* is selected from two and three, and the pharmaceutically acceptable acid addition salts thereof.

4,001,430

N-T-BUTYL-α-TRICHLOROPHENOXYBUTYRAMIDES AND THEIR USE AS MITRICIDES

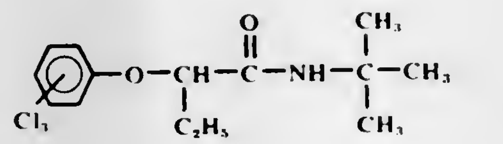
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,728

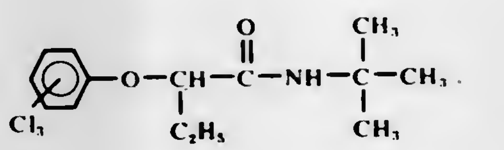
Int. Cl.² A01N *9/20, 9/24;* **C07C** *103/75*

U.S. Cl. 424—324 **8 Claims**

1. A compound having the formula



5. A method of controlling mites comprising applying to said mites a miticidally effective amount of a compound having the formula



4,001,431

DERIVATIVES OF THE 1,2-DIARYLETHYLENE- AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hermann Teufel, Kelkheim, Taunus; Wilhelm Bartmann, Neuenhain, Taunus; Ernold Granzer, Kelkheim, Taunus, and Josef Musil, Konigstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

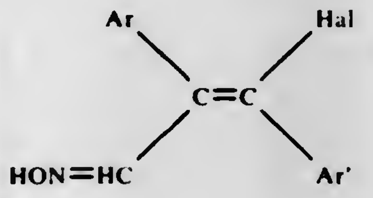
Filed Mar. 7, 1975, Ser. No. 556,221

Claims priority, application Germany, Mar. 9, 1974, 2411325; Feb. 22, 1975, 2507685

Int. Cl.² A61K *31/15*; C07C *131/00*

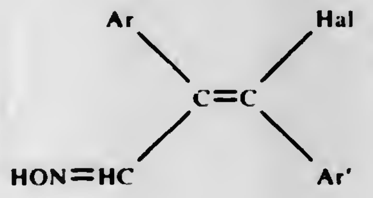
U.S. Cl. 424—327 3 Claims

1. A 1,2-diaryl-ethylene of the formula



wherein Hal is chlorine or bromine and Ar and Ar' are each phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy, and halogen, or one of Ar and Ar' is phenyl and the other is substituted phenyl.

3. A method for treating disorders of purine metabolism, hyperlipidemiae, or both conditions, in a patient suffering therefrom, which method comprises administering an effective amount of at least one compound selected from the group consisting of compounds of the formula



wherein Hal is chlorine or bromine and Ar and Ar', which are the same or different, are phenyl or phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy, and halogen.

4,001,432

METHOD OF INHIBITING THE GROWTH OF BACTERIA BY THE APPLICATION THERETO OF CAPPED POLYMERS

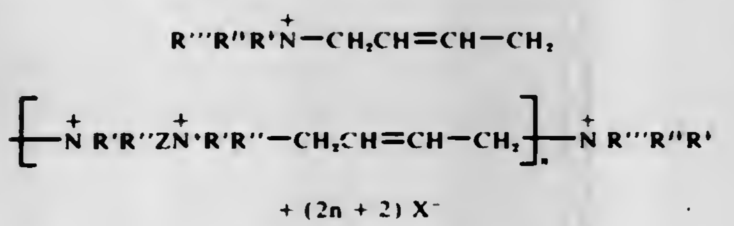
Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Apr. 17, 1975, Ser. No. 568,899

Int. Cl.² A01N *9/20, 9/24, 9/00, 9/22*

U.S. Cl. 424—329 1 Claim

1. A method of inhibiting the growth of bacteria which comprises applying to said bacteria an inhibitorily effective amount of the compound



$$R'''R''R'\overset{+}{N}-CH_2CH=CH-CH_2$$

$$\left[-\overset{+}{N}R'R''Z\overset{+}{N}R'R''-CH_2CH=CH-CH_2-\right]_n-\overset{+}{N}R'''R''R'$$

$$+ (2n+2)X^-$$

wherein R' and R'' are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms, (b) hydroxy or dihydroxy derivatives of R' and R'', (c) benzyl, and (d) benzyl having at least one alkyl group bonded to the benzene ring, with the total sum of alkyl carbon atoms attached to the benzene ring being less than 7; wherein R''', R'' and R' are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms and (b) hydroxyalkyl; wherein Z consists of 1 to 3 aliphatic divalent radicals, each of which has 2 to 10 carbon atoms with each aliphatic radical having 0 to 2 double bonds and 0 to 2 hydroxy substituents; wherein X is selected from the group consisting of chlorine and bromine; and wherein *n* is an integer of about 2 to about 30.

4,001,433

QUATERNARY AMMONIUM COMPOUNDS USEFUL AS ANTIFIBRILLATORY AGENT

Robert Arthur Maxwell, Armonk, N.Y., and Frederick Charles Copp, London, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 48,489, June 22, 1970, abandoned. This application Apr. 1, 1974, Ser. No. 457,229

Claims priority, application United Kingdom, July 23, 1969, 31686/69; Dec. 4, 1969, 59230/69

Int. Cl.² A61K *31/14*

U.S. Cl. 424—329 27 Claims

1. A method for the treatment or suppression of cardiac arrhythmias in a mammal which has had cardiac arrhythmias and which is in need of said treatment or suppression comprising the administration to said mammal of a non-toxic, effective anti-arrhythmic treatment or suppression amount of a pharmaceutically acceptable non-toxic salt of the N-m-methoxybenzyl-N,N-dimethyl-N-ethyl-ammonium cation.

4,001,434

METHOD OF SLOWING SUBLIMATION OF SUBLIMABLE MATERIAL

Yoshinobu Nakai, 2-5-2 Komagome, Toshima, Tokyo; Shin'ichiro Nakajima, 1-511-5 Tsudanuma, Narashino, Chiba, and Yoshimitsu Iida, 1-25-7 Oui, Kija, Tokyo, all of Japan

Filed Mar. 12, 1975, Ser. No. 557,870

Claims priority, application Japan, Sept. 13, 1974, 49-104900

Int. Cl.² A01N *5/00*

U.S. Cl. 424—361 3 Claims

1. The method of slowing sublimation of a sublimable pharmaceutical material consisting essentially of mixing the sublimable material with beta-1, 4-glucan, and pulverizing the mixture.

4,001,435

PROCESS FOR PREPARING FOODS AND DRINKS

Mamoru Hirao, and Yoshinori Sato, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Filed July 7, 1969, Ser. No. 839,689

Claims priority, application Japan, July 8, 1968, 43-47650

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 13 Claims

1. A process for preparing foods and drinks sweetened mildly, and protected against discoloration, Strecker's reaction, and moisture absorption, which comprises: adding α-1,6-glucosidase and β-amylase, under such conditions and in a quantity sufficient to produce straight chain amylose, to enzymatically liquefied starch which consists essentially of amylopectin thereby producing straight-chain amylose; and subjecting the resulting amylose to the action of β-amylase and purifying and drying to obtain high purity maltose in crystalline powder form of 90– 95% maltose; and then adding said high purity crystalline maltose powder to foods and drinks as the essential added sweetener.

4,001,436

BEVERAGES

John Clark, St. Michael, Barbados, assignor to Banks Barbados Breweries Limited, Bridgetown, Barbados

Filed July 25, 1975, Ser. No. 599,033

Claims priority, application United Kingdom, Aug. 3, 1974, 34293/74

Int. Cl.² A23L *2/00*; C02D *1/00*

U.S. Cl. 426—29 15 Claims

1. A method of producing a soft drink product comprising the steps of (a) procuring a sugar solution containing glucose and fructose, (b) mashing malted grain in water, (c) allowing malt action in the mash to convert starch into maltose with protein breakdown into amino acids, (d) converting the maltose into glucose to provide a converted aqueous malt extract, and (e) mixing the sugar solution with the converted malt extract.

4,001,437

PROCESS FOR MAKING AND FLAVORANTS FROM MILK PRODUCTS AND COMPOSITIONS CONTAINING SAME

Kurt Jaeggi, Dubendorf; Victor Krasnobajew, Zollikerberg; Peter Weber, Greifensee, and Jost Wild, Uster, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 5, 1973, Ser. No. 422,034

Claims priority, application Switzerland, Dec. 18, 1972, 18494/72; Oct. 16, 1973, 14660/73

Int. Cl.² A23L *1/23, 1/231*

U.S. Cl. 426—34 17 Claims

1. A process for the manufacture of substances having the flavor character of baked goods or meat, which process comprises heating to temperatures between 90° C. and 180° C. for 15 minutes to 2 hours a liquid product obtained from a member selected from the group consisting of full cream milk, skim milk, whey, yoghurt and buttermilk, by enzymatic proteolysis and lactic acid fermentation, said enzymatic proteolysis having been carried out for a time sufficient to clarify an aqueous suspension of said liquid product, using proteolytically active enzymes (proteases) of vegetable, animal or microbial origin which are capable of clarifying aqueous suspensions of said milk products in less than 24 hours in weakly acid, neutral or weakly basic aqueous media at temperatures between 30° and 60° C, and said lactic acid fermentation having been carried out using bacteria of the genus Lactobacilli or Streptococci in aqueous medium in a temperature range between 30° and 45° C up to a final pH of ca. 4.5 of the aqueous medium, with the proviso that yoghurt is subjected only to enzymatic proteolysis.

4,001,438

FLAVOR COMPOSITION FOR USE IN ORALLY UTILIZABLE COMPOSITIONS

Don Marmo, Farmingdale, and Frank Louis Rocco, Richmond Hill, both of N.Y., assignors to International Flavors & Fragrances Inc, New York, N.Y.

Continuation-in-part of Ser. No. 514,947, Oct. 15, 1974, Pat. No. 3,920,849. This application Aug. 12, 1975, Ser. No. 603,933

Int. Cl.² A23L *1/222*

U.S. Cl. 426—96 3 Claims

2. The method of preparing a flavoring comprising:

1. Admixing
   a. From about 3 up to about 7 parts by weight of a non-confined hydrophobic flavor oil; and
   b. From about 0.1 up to about 1 part by weight of a solid suspending agent selected from the group consisting of colloidal silica, xanthan gum and ethyl cellulose having a particle size of from about 0.008 up to about 0.030 microns, a surface area of from about 150 up to about 400 m²/cm and a density of from about 2.0 up to about 3.0 lbs/cu. ft.,

   thereby forming a first suspension; and
2. Admixing said first suspension with from about 3 up to about 7 parts by weight of a hydrolytically releaseable flavor oil physically entrapped in an edible solid material selected from the group consisting of gum acacia, gelatin, modified food starch and dextrin, said solid material having a particle size of from about 5 microns up to about 400 microns

   thereby forming a second suspension, said physically entrapped flavor oil being organoleptically compatible with said non-confined hydrophobic flavor oil.

4,001,439

METHOD OF PRODUCING ICE CREAM IN INDIVIDUAL SLICED FORM

Nick Zonni, 6311 Southwind Drive, and Marco Zonni, 10420 Lundene Drive, both of Whittier, Calif. 90601

Filed May 3, 1976, Ser. No. 682,715

Int. Cl.² A23G *9/04*

U.S. Cl. 426—101 8 Claims

1. A method of producing ice cream in individual sliced form, comprising the steps of:

providing a pair of matching molds, said molds having an elongated compartment formed therein to receive the ice cream, one of said molds being the top mold and the other said mold being the bottom mold;

depositing at least one layer of soft ice cream in said compartment of each mold to a point below the open edge of each mold, wherein a space is arranged between the layer of ice cream and the open edge thereof;

positioning a plurality of a fruit product in one of said molds, said fruit being arranged longitudinally therein in a contiguous manner;

freezing said ice cream disposed in said molds;

adding another soft layer of ice cream within said space in said molds after freezing;

joining said molds together allowing the soft layers of ice cream to co-mingle;

freezing said ice cream to form a single elongated ice cream bar; and

slicing said ice cream bar into a multiplicity of slices having a predetermined thickness.

4,001,440

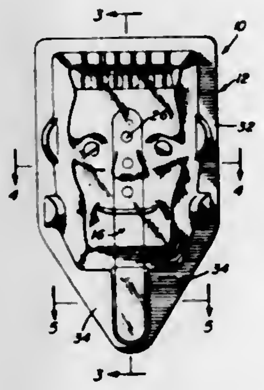
FREEZABLE CONFECTION PACKAGE

Earl Hoyt, Ramsey, N.J., assignor to Welch Foods Inc., Westfield, N.Y.

Filed July 24, 1974, Ser. No. 491,528

Int. Cl.² A23G *1/00*

U.S. Cl. 426—104 11 Claims



1. A freezable confection package comprising a wrapper, said wrapper including a planar back sheet and a front sheet formed to define a confection accommodating and molding chamber with the planar back sheet, an elongated handle substantially narrower than said chamber projecting outward from the interior of, at a point central to one edge of, said chamber and terminating in a free outer end, said handle, within the chamber, paralleling the planar back sheet in spaced relation thereto centrally within the chamber, and

outward of the chamber, being offset relative to the portion in the chamber and being received between said front and back sheet in overlying contact with said back sheet, said sheets being sealed to each other about the chamber and outward projecting portion of the handle to define a closed chamber, said sheets forming a rigidifying web on each side of said handle diverging from the outer end of the handle to the full width of said chamber edge to form generally triangular rigididying gussets, said sheets additionally forming an outwardly projecting planar second rigidifying web about the remaining edges of said chamber integral with said rigidifying gussets, and a room temperature, liquid confection enclosed within said chamber, said liquid being freezable to solid state in a home freezer, said formed front sheet being configured to define a design simulation over the chamber which is reproduced on said confection enclosed therein.

4,001,441

MEAT ANALOG

Alexander L. Liepa, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1970, Ser. No. 100,549

Int. Cl.² A23J *3/00*

U.S. Cl. 426—104 **38 Claims**

1. A process of making meat analogs which comprises forming a dry protein mix wherein the protein is a water hydratable heat-coagulable protein, adjusting the moisture content of the dry mix to form a dough-like protein wet mix, sheeting the protein wet mix to form a coherent workable protein dough sheet, cutting the sheet to form fiber-like strands, aggregating the strands into a desired fiber alignment, and stabilizing the fibers to form a coherent fiber mass resembling meat in appearance, texture, and eating quality.

4,001,442

COLLAGEN-CONTAINING PREPARATIONS

Bruno Stahlberger, Buchs, Switzerland, and Werner von Dach, Balzers, Liechtenstein, assignors to Elastin-Werk Aktiengesellschaft, Triesen, Liechtenstein

Filed July 17, 1974, Ser. No. 489,097

Claims priority, application Germany, July 18, 1973, 2336561

Int. Cl.² A22C *13/00;* **C08L** *89/06*

U.S. Cl. 426—105 **45 Claims**

1. A preparation which comprises collagen and a precondensate, which precondensate comprises

a. one or more structural units derivable from a compound containing at least one amino group, and

b. one or more structural units derivable from a compound containing at least one aldehyde group, or one or more structural units derivable from a polyhydroxy compound which precondensate is also reacted with a compound containing an aldehyde group, said preparation containing at least 39% but at most 90% by weight of precondensate, based on the weight of collagen plus precondensate.

4,001,443

PACKAGE AND METHOD FOR PACKAGING AND STORING CUT LEAFY VEGETABLES

Bhalchandra Anantray Davé, Glendora, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 656,921, Feb. 10, 1976, abandoned. This application Feb. 24, 1976, Ser. No. 660,895

Int. Cl.² A23L *3/34;* **A23B** *7/14;* **B65B** *25/04*

U.S. Cl. 426—106 **10 Claims**

1. A method of increasing the storage life of cut leafy vegetables comprising (1) contacting said cut vegetables for from about 5 to about 20 seconds with an aqueous solution having from about 70 to about 150 volume parts per million of chlorine, a buffered pH of from about 5 to about 7 and a temperature ranging from about 45° to 60° F., (2) removing the adhered moisture of said aqueous solution from said cut vegetables, (3) without further chemical treatment and prior to storage placing said cut vegetables into a sealable package of a flexible sheet material having a water vapor transmission rate of from about 0.02 to about 3 grams per 100 square inches per 24 hours per mil at 100° F and 90 percent relative humidity, a nitrogen gas permeability of about 0.1 to about 3.0, an oxygen gas permeability of about 0.3 to about 10 and a carbon dioxide permeability of from about 0.3 to about 35, said gas permeabilities being measured in cubic centimeters per 100 square inches per 24 hours per mil at standard temperature and pressure, (4) partially evacuating air from said package in an amount sufficient to collapse the package wall about the vegetables but without damaging said vegetables, (5) sealing said package, and (6) storing said package at a temperature from about 35° to about 45° F. and a relative humidity of about 85 to about 100 percent.

4,001,444

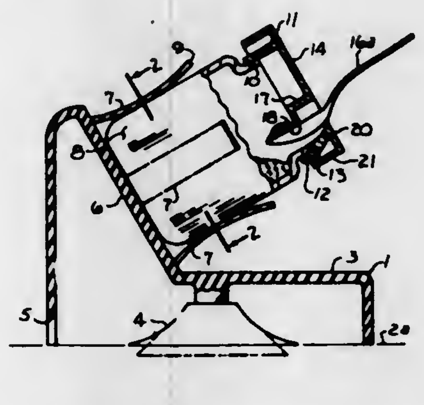
BABY FOOD FEEDER

William A. Clarke, 1001 Linden Ave., Erie, Pa. 16505

Filed Jan. 10, 1975, Ser. No. 539,999

Int. Cl.² B65D *85/72, 47/40*

U.S. Cl. 426—110 **6 Claims**



1. In combination with a jar of baby food having a rim at its top and removable closure on said rim, a cover substituted for said closure, said cover having:

means for mounting it on said jar rim, a front face transverse to the axis of the jar and spaced axially outward from said jar rim and having a mouth spaced axially outward from said jar rim, said mouth having a generally straight lip and another lip concave with respect to said straight lip, said mouth providing a spoon access opening with a loose fit for the bowl of a spoon through which the bowl of a spoon may be dipped into the contents of the jar with the convex side of the bowl of the spoon presented to said concave lip and with the concave side of the bowl of the spoon presented to said straight lip, a spoon leveling means recessed axially inward from said straight lip and spaced axially inward from said mouth for scraping excess food from the concave side of the bowl of the spoon as it is withdrawn through said mouth, and a concave wall extending axially inward from said concave lip to said jar rim for catching and draining into said jar food scraped from said spoon, said lips cooperating to scrape excess food from the concave and convex sides of said spoon when the bowl of said spoon is inserted through said mouth, dipped into the food in the jar to pick up food in the bowl and then withdrawn through said opening.

4,001,445

PRESERVED MEAT

Derek Horrocks, Knossington; Keith Buckley, and Alan John Vernon, both of Melton Mowbray, all of England, assignors to Pedigree Petfoods Limited, Melton Mowbray, England

Filed May 7, 1973, Ser. No. 357,598

Claims priority, application United Kingdom, May 11, 1972, 22196/72

Int. Cl.² A23B *4/14;* **A23L** *3/34*

U.S. Cl. 426—250 **5 Claims**

1. A method of preserving undenatured proteinaceous material selected from the group consisting of raw animal tissue, raw meats, fish, meat offals and meat-like protein products, which method consists essentially in:

providing said material in an undenatured naturally moist condition;

treating said material when containing active enzymes to inhibit enzyme activity without cooking;

infusing into said material at a temperature within the range of −25° to +40° C sufficient edible water-soluble solute to impart a water activity in the range of 0.75 to 0.85 and stabilize the material against microbiological spoilage; and

packing said material with said sufficient solute and in an undenatured condition substantially in the absence of oxygen thereby maintaining the natural raw meat appearance and texture of said material.

4,001,446

COLOR STABILIZED PRODUCT AND PROCESS

Larry Lee Hood, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 28, 1975, Ser. No. 626,285

Int. Cl.² A23L *1/27;* **A22C** *11/00;* **A23K** *1/04, 1/10*

U.S. Cl. 426—250 **21 Claims**

1. A process for forming a stabilized red color in an animal protein source containing iron comprising:

A. obtaining at least one animal protein source selected from the group consisting of meat, blood, and a meat by-product;

B. forming a slurry, dispersion, or suspension of the protein source;

C. adding at least one edible reducing agent to the protein source wherein the reducing agent comprises up to 2% by weight of the protein source, and whereby the iron content of the protein source is maintained in the ferrous state;

D. agitating the slurry dispersion, or suspension of the protein source;

E. reacting the protein source with carbon monoxide sufficiently to achieve at least 10% saturation to form a retort- and color-stabilized protein source; and

F. recovering the retort- and color-stabilized protein source.

4,001,447

2-HYDROXYMETHYL-THIAZOLE-5-CARBOXYLIC ACID DERIVATIVES

André Poittevin, Vaires-sur-Marne, and Michel Hardy, Maisons-Alfort, both of France, assignors to Roussel-UCLAF, Paris, France

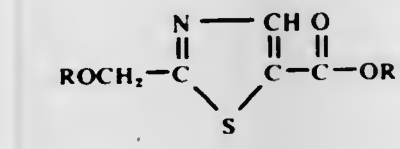
Filed Oct. 15, 1975, Ser. No. 622,635

Claims priority, application France, Oct. 29, 1974, 74.36080

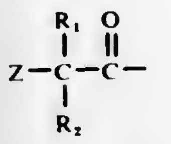
Int. Cl.² C07D *277/34*

U.S. Cl. 424—270 **20 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkylcarbonyl of 2 to 5 carbon atoms, benzoyl, phenyl optionally substituted with at least one halogen and



$$Z-\underset{R_2}{\overset{R_1}{C}}-\overset{O}{\overset{\|}{C}}-$$

R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, Z is selected from the group consisting of phenyl and phenoxy optionally substituted with at least one halogen and R' is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and alkali metals, alkaline earth metals and aluminum salts.

15. A hypolipemiant composition comprising an hypolipemiantly effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

16. A method of reducing the amount of sanguine lipids in warm-blooded animals which comprises administering to warm-blooded animals an hypolipemiantly effective amount of at least one compound of claim 1.

4,001,448

BEVERAGE MIX AND METHOD OF MANUFACTURING SAME

Thomas P. Finucane, Hartsdale, N.Y.; Theodore J. Kovacic, Downers Grove, and John R. Wisler, Westmont, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 360,212, May 14, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,702

Int. Cl.² A23L *2/00*

U.S. Cl. 426—285 **7 Claims**

1. The method of manufacturing a free flowing dry beverage mix containing a flavor, a color, and from about 1 to 6 grams of a food acid for each quantity of mix for preparing one quart of beverage, the food acid selected from the class consisting of citric, malic and mixtures thereof, which method comprises: incorporating as an ingredient of the dry beverage mix from about 1 to 3 grams of a mixture of mono-and dicalcium phosphates for each quantity of mix for preparing one quart of beverage, wherein the dicalcium phosphate is present at a level between 4% and 10% by weight of the mixture of phosphates.

4,001,449

INTERMEDIATE MOISTURE ANIMAL FOOD HAVING IDENTIFIABLE MEAT AND EGG COMPONENTS

Eugene H. Reardanz, and Jerry N. Boudreau, both of Kankakee, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,789

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23K *1/14;* **A23L** *1/32*

U.S. Cl. 426—332 **9 Claims**

1. A process for preparing a shelf-stable, intermediate-moisture meat and egg animal food adapted to be packaged without resort to sterilization or refrigeration, said animal food having a moisture content of from 15 percent to 30 percent and having a substantially neutral pH of from about 6.0 to 8.0, comprising:

a. forming a mixture of proteinaceous meaty materials and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture, and heating said mix at a temperature above about 150°F to prepare a first shelf-stable meat component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;

b. extruding the meat component prepared in(a) to desired shape;
c. forming a mixture of 5 percent – 45 percent egg on a dry basis, 10 to 40 percent added water, 5 percent – 50 percent vegetable protein, an effective level of an edible binder material, and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture and heating said mixture at a temperature above about 150°F to prepare a second shelf-stable egg component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;
d. extruding the egg component prepared in(c) to desired shape;
e. blending said meat component and said egg component in desired ratios in a manner which avoids a substantial loss of identity of each component; and
f. pressing said mixture of(e) whereby the meat and egg components are bound together into a desired shape.

4,001,450
METHOD OF PACKAGING CARBONATED BEVERAGES IN FLEXIBLE CONTAINERS

Andrew George Ford, Hitchin, and Ronald Augustus Hudson, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

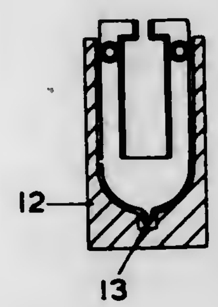
Continuation-in-part of Ser. No. 749,500, Aug. 1, 1968, abandoned. This application Apr. 24, 1972, Ser. No. 246,992

Claims priority, application United Kingdom, Aug. 1, 1967, 35334/67

The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.

Int. Cl.² B65B *31/02*

U.S. Cl. 426—410 5 Claims



3. A method of packaging a carbonated beverage that comprises providing an individual, flexible, tubular plastics-film container closed in a gas-tight manner except at a filling opening, inflating the container by means of carbon dioxide supplied through said filling opening to a pressure such that the container attains substantially the size desired in the final package, filling the container by displacing a major part but less than the whole of the carbon dioxide therein with the carbonated beverage to be packed supplied through said opening, and sealing the filling opening of the container, both the filling and the sealing being carried out while at least the major part of the container is kept substantially at its final size, and relaxation of the walls thereof is prevented, by continuously maintaining a greater pressure inside the container than outside the walls thereof until sealing has been completed, the prevention of relaxation of said walls during filling and sealing enabling a full charge of beverage to be supplied to the container while leaving a gas space adjacent said filling opening whereby the seal can be made between dry plastics surfaces.

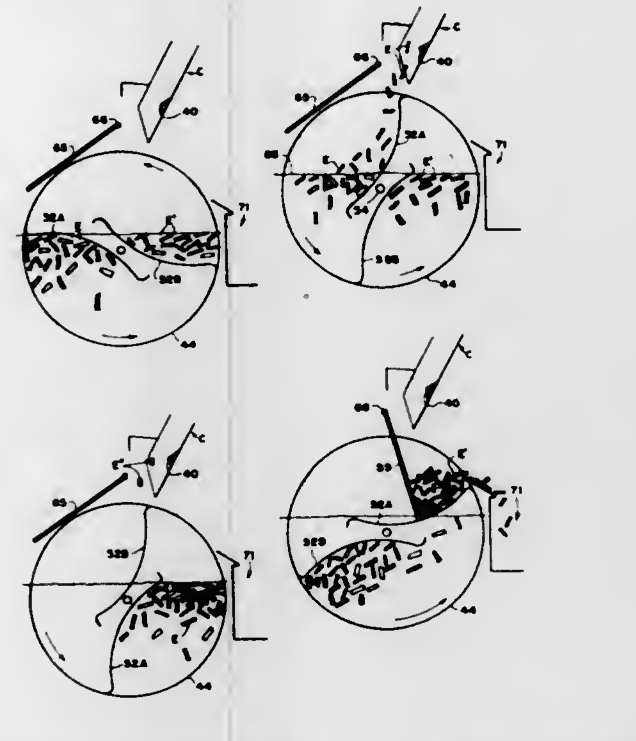
4,001,451
PROCESS FOR DEEP FAT FRYING COMESTIBLES IN AN AUTOMATIC DEEP FAT FRYER

John L. Veeneman; Marion E. Thomas, and Harry R. Deveraux, all of Idaho Falls, Idaho, assignors to American Potato Company, San Francisco, Calif.

Continuation of Ser. No. 379,298, July 16, 1973, abandoned, which is a division of Ser. No. 251,611, May 8, 1972, Pat. No. 3,776,126. This application May 7, 1975, Ser. No. 575,325

Int. Cl.² A23L *1/10*

U.S. Cl. 426—438 6 Claims



1. A process for deep fat frying comestible bodies comprising the steps of:
a. forming said bodies of desired size;
b. providing within an imperforate container a drum-shaped basket having a perforate cylindric wall extending more than 180° and having an open top, said basket having first and second opposed overlapping arcuate segments mounted for rotation about a center axis corresponding to about the center axis of said basket, said segments each having a corresponding radius of curvature;
c. supplying cooking oil heated to about 350° F to said container in an amount sufficient to cover comestible bodies when held submerged by said arcuate segments when in a horizontal position;
d. introducing a first lot of said formed comestible bodies into said cooking oil while said first arcuate segment is in substantially vertical position;
e. rotatably advancing said first segment through one and one quarter revolutions to provide tumbling agitation of said comestible bodies and advance said comestible bodies to a position where the first arcuate segment holds said comestible bodies submerged in said oil to partially cook them;
f. interrupting said rotatable advancement for a time sufficient to complete the cooking of said comestible bodies within said oil;
g. further advancing said first segment about 30° until the second arcuate segment is above the oil surface so as to allow a previous lot of comestibles thereon to be drained of excess oil;
h. discharging said previous lot of drained comestible bodies by sweeping them peripherally from the upper surface of said second segment;
i. further advancing said second segment to a substantially vertical position to allow the introduction of a second uncooked lot of comestible bodies while said first lot continues to cook;
j. further advancing said second segment through one and one quarter revolutions to a point where said second segment is in a horizontal position allowing said first and second lots to further cook;
k. further advancing said second segment about 30° to a point where said first lot of completely cooked comestible bodies on said first segment is above the oil surface and allowed to drain;
l. discharging said first lot of cooked comestible bodies from said first segment by sweeping them peripherally from the upper surface thereof;
m. advancing said first segment about 60° to the position described in step d); and
n. repeating process steps d) through i) to produce subsequent lots of cooked comestible bodies.

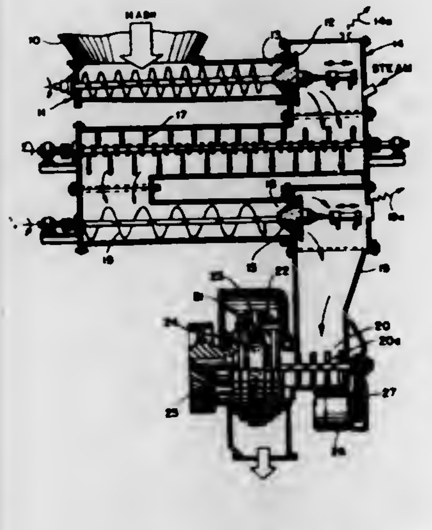
4,001,452
METHOD OF PREPARING ANIMAL FOOD PELLETS

Merl A. Williams, Craigville, Ind., assignor to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Sept. 10, 1975, Ser. No. 612,242

Int. Cl.² A23L *1/01*; A23K *1/00*; B29C *23/00*

U.S. Cl. 426—454 2 Claims



1. In a method of preparing animal food pellets wherein cooked mash under atmospheric pressure is forced through a die, the steps of cooking said mash under superatmospheric pressure, reducing the pressure on said mash to atmospheric, radially forcing said mash through orifices of a rotating die to form deaerated rods of substantialy uniform consistency across successive transverse planes and characterized by the substantial absence of fractures on the lagging side of the rod and thereafter transversely severing the rods to form pellets.

4,001,453
SWEETENING COMPOSITIONS

Ulrich Huber, Zurich; Nicolas Kosslakoff, Dubendorf, and Bruno Vaterlaus, Feldmeilen, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Sept. 19, 1974, Ser. No. 507,659

Claims priority, application Switzerland, Oct. 5, 1973, 14249/73; Aug. 14, 1974, 11131/74

Int. Cl.² A23L *1/22*

U.S. Cl. 426—533 8 Claims

1. A sweetening composition which comprises a dihydrochalcone sweetening agent selected from the group consisting of neohesperidin dihydrochalcone, naringin dihydrochalcone and hesperetin dihydrochalcone glucoside, and at least two parts by weight of an additive which is a member of the group consisting of glucono-delta-lactone and gluconic acid, or a physiologically acceptable salt of either of said members, per each part by weight of said sweetening agent, whereby the sweetening effect of said agent becomes apparent substantially instantly.

4,001,454
FLAVORING FOODS WITH 8-METHYL-NON-2YNOL AND ITS DERIVATIVES

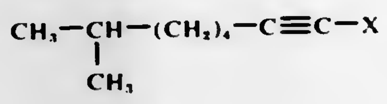
Henri Jindra, Geneva, Switzerland, and William Patrick Clinton, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 28, 1975, Ser. No. 581,451

Int. Cl.² A23L *1/226*

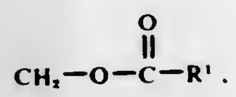
U.S. Cl. 426—534 13 Claims

1. A process fpr enhancing the woody flavor of foodstuffs comprising adding thereto a compound selected from the formula:

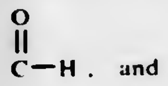


$$CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-(CH_2)_4-C\equiv C-X$$

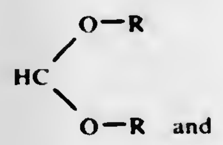
Where X is selected from the group consisting of CH_2OH.



$$CH_2-O-\overset{\displaystyle O}{\overset{\|}{C}}-R^1 .$$



$$\overset{\displaystyle O}{\overset{\|}{C}}-H . \text{ and}$$



$$HC\begin{array}{l}\diagup O-R\\ \diagdown O-R\end{array} \text{ and}$$

where R′ is hydrogen, lower alkyl or substituted lower alkyl
and R is alkyl or substituted lower alkyl
in a small but effective amount to give a woody flavor.

4,001,455
SWEETENING COMPOSITIONS

Anthony Laurence La Via, East Brunswick, and John Anthony Hill, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 22,687, March 25, 1970, abandoned. This application Feb. 5, 1974, Ser. No. 439,778

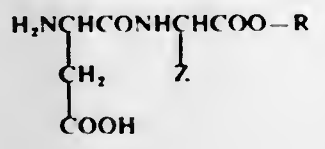
The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² A23L *1/236*

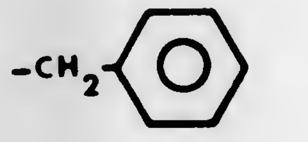
U.S. Cl. 426—548 2 Claims

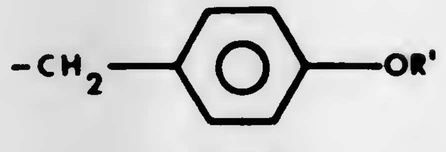
1. A method of masking the aftertaste of saccharin, which comprises adding to the saccharin a dipeptide ester of the formula

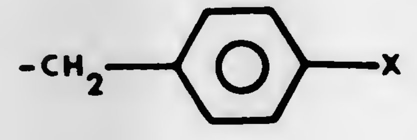


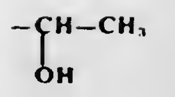
$$H_2N\underset{\underset{\displaystyle COOH}{|}}{\underset{\underset{\displaystyle CH_2}{|}}{CH}}CONH\underset{\underset{\displaystyle Z}{|}}{CH}COO-R$$

wherein Z is:
—R









$-\underset{OH}{CH}-CH_3$

or

$-(CH_2)_nS(O)_mR$

wherein R is an alkyl radical of up to 6 carbon atoms, or an alkyl-aryl or alicyclic radical of up to 10 carbon atoms, R′ is hydrogen or an alkyl radical of up to 6 carbon atoms, *m* is 0 or 2, *n* is 1 or 2, and X is halogen, the dipeptide ester being present in an amount from at least about that amount effective to mask the aftertaste of saccharin and not above about its threshold level of taste.

4,001,456

LOW CALORIE SWEETENING COMPOSITION AND METHOD FOR MAKING SAME

Martin Glicksman, Valley Cottage, N.Y., and Bartley N. Wankier, Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 55,561, July 16, 1970, Pat. No. 3,761,288. This application Aug. 13, 1973, Ser. No. 387,848

The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **8 Claims**

1. A method for producing a rapidly soluble sweetening composition comprising the steps of forming an aqueous solution of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester, said bulking agent being selected from the group consisting of organic acids, hydrolyzed starch materials and sugars, said aqueous solution containing less than one part L-aspartyl-L-phenylalanine methyl ester per part of bulking agent, and spray drying the solution at a feed concentration of not less than about 50% solids in a spray dryer apparatus having an inlet air temperature of about 350° F to about 500° F.

4,001,457

METHOD OF MAKING A GASIFIED CONFECTION

Joseph L. Hegadorn, Ridgewood, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed July 1, 1976, Ser. No. 701,835

Int. Cl.² A23G *3/00*

U.S. Cl. 426—572 **9 Claims**

1. A method of making a carbonated candy which comprises:

a. obtaining a hot candy melt,

b. introducing the hot melt into a first pressure vessel,

c. introducing a gas at superatmospheric pressure into the first pressure vessel so that the gas is dispersed within the hot melt,

d. introducing a gas at superatmospheric pressure into a second pressure vessel which has polished inner surfaces at a value equivalent to the pressure within the first pressure vessel, the first and second pressure vessels having a connecting line with valve means between the first vessel and the bottom of the second vessel,

e. transferring the gasified hot melt to the second pressure vessel through the connecting line by opening said valve means and then creating a pressure differential between the two vessels, said differential being effected by regulating the superatmospheric pressure in the second pressure vessel at a value lower than the superatmospheric pressure in the first pressure vessel and venting the top of the second pressure vessel,

f. isolating the second pressure vessel while continuing to maintain a superatmospheric pressure,

g. cooling the second pressure vessel so that the gasified hot melt becomes a gas-containing solid matrix,

h. venting the second pressure vessel which causes the matrix to shatter into multiple fragments, and

i. opening the second pressure vessel to allow the product to be removed.

4,001,458

FRESH LEMON-FLAVORED ALCOHOL BEVERAGE AND METHOD OF PREPARATION

Giuseppe Murolo, New York, N.Y., assignor to Sabastiano Monte; Anya Rejnarowycz and Giuseppe Murolo, all of New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,589

Int. Cl.² C12G *3/06*

U.S. Cl. 426—592 **1 Claim**

1. A method for preparing a stable, alcoholic composition having a fresh lemon flavor which comprises (1) adding from about 0.5% to 10% fresh lemon peel to 200 proof ethyl alcohol; (2) permitting this mixture to stand at ambient temperature for approximately 24 hours; and (3) thereafter adding sugar to control sweetness and water to control the proof of the composition.

4,001,459

FIBROUS PROTEIN MATERIALS

Myung Ki Kim, Tarrytown, and Joaquin Castro Lugay, Thornwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 18, 1974, Ser. No. 480,987

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23J *3/00*

U.S. Cl. 426—656 **12 Claims**

1. A method for preparing a texturized protein material comprising:

a. preparing a mixture comprising heat coagulable protein and water;

b. cooling the mixture to freeze the water into elongated ice cyrstals and to separate the protein into well-defined, well-ordered, substantially independent zones;

c. freeze drying the frozen mass resulting from the operation of step (b); and

d. heating the resulting freeze dried material to coagulate the protein.

12. A texturized protein material having a well-defined, well-ordered structure comprised of substantially independent protein fibers, the material being prepared according to the process of claim 1.

4,001,460

LIGHT MICROSCOPY PROCESSING METHOD

Thomas D. Kinney, 3120 Devon Road, Durham, N.C. 27707, and John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 22705

Division of Ser. No. 463,055, April 22, 1974, Pat. No. 3,892,197. This application Mar. 5, 1975, Ser. No. 555,392

Int. Cl.² A01N *1/02*

U.S. Cl. 427—2 **7 Claims**

1. A method for processing a plurality of individual specimens of tissue to be separately contained while being simultaneously bathed for varying lengths of time in successive selected tissue solutions including melted paraffin so as to fix, dehydrate and clear the specimens preparatory to embedding, comprising:

a. separating the specimens to be processed into groups;

b. installing and physically isolating each group having at least one specimen per group in a respective uniform tissue receptacle which is porous to the extent of having for each of said solutions at least some portion through which the solution may be transferred;

c. installing a plurality of such receptacles in a temperature

controlled and electrically heated processing chamber having a pressure sealable top cover and then sealing the cover;

d. with the receptacles installed, the cover sealed and with the chamber positioned in proximity to a plurality of closed vented containers, each containing a particular tissue processing solution, including melted paraffin in a heated temperature controlled state, selectively and independently connecting each container to the chamber to bring the solutions including the paraffin, with the paraffin being the last solution, in a predetermined sequence to the chamber and for each such solution in the sequence:

1. establishing a vacuum condition in the chamber and
2. establishing a temperature condition in the chamber for maintaining each such predetermined volume at a selected temperature appropriate to such solution,
3. terminating the vacuum and retaining the solution for a predetermined time at a predetermined pressure and temperature, and
4. at the end of each such period of predetermined time, increasing the pressure in the chamber and thereby forcing the used solution back to its respective said container by pressure such that the selected solutions and melted paraffin are separately and independently pumped by application of vacuum and pressure to said chamber and are exchanged with each group of specimens while such specimens are confined in the chamber, held stationary and physically isolated.

4,001,461

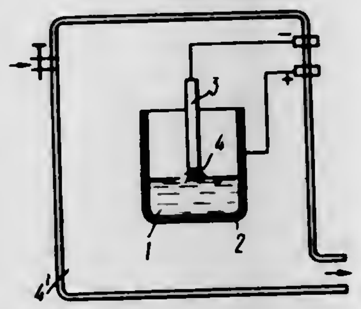
METHOD OF PRODUCING ELECTRODE UNITS FOR PLASMATRONS

David Grigorievich Bykhovsky, Konjushenny pereulok 1/6, kv. 18, Leningrad, U.S.S.R.

Filed Mar. 30, 1973, Ser. No. 346,661

Int. Cl.² B23K *9/04, 9/00*

U.S. Cl. 427—37 **4 Claims**



1. In a method of producing electrode units for plasmatrons, which includes the melting of metal intended for molding an electrode holder, providing a tungsten electrode for melting the metal by the aid of a D-C arc, dipping the electrode into the melt, and withdrawing the electrode and the solidified metal as an electrode unit, the improvement comprising the steps of using the tungsten electrode to act as a cathode; striking the arc prior to the electrode dipping step; maintaining the arc while the electrode is in the melt; and extinguishing the arc after the dipping step but before the withdrawal of the electrode unit.

4,001,462

PROCESS FOR COATING SURFACES HAVING A BASE OF EPOXY RESINS MODIFIED BY UNSATURATED ACIDS AND COATINGS OBTAINED BY MEANS OF SAID PROCESS

Marie Francoise Blin, Antony; Gilbert Gaussens, Saint-Mande, and Francis Lemaire, Clamart, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 11, 1971, Ser. No. 142,277

Claims priority, application France, May 13, 1970, 70.17473

Int. Cl.² B05D *3/06*

U.S. Cl. 427—44 **2 Claims**

1. A method of coating with a coating compound which is hardenable under the action of ionizing radiations consisting essentially on an epoxy resin having hydroxyl groups modified by a stoechiometric excess of from 150 to 250% of unsaturated carboxylic acids as a result of reaction of the COOH groups of the acids with the epoxy bridges of the resin and as a result of esterification of the hydroxyl groups of said resin and has a number of olefinic double bonds on the order of 0.1 to o.3 per 100 g. of resin wherein said compound is applied directly to a substrate to be coated with a layer which has a thickness within the range of 10 to 100 microns and which is then dried by irradiation.

4,001,463

PROCESS AND APPARATUS FOR THE MANUFACTURE OF RIGID MAGNETIC DISCS

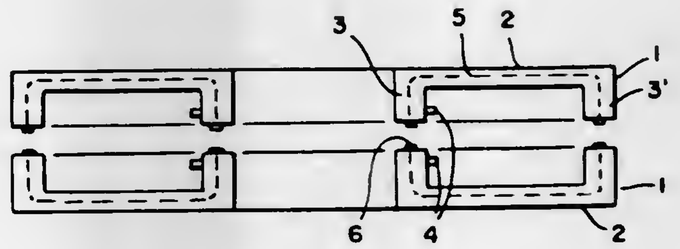
Dieter Schaefer, and Herbert Motz, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 21, 1975, Ser. No. 597,684

Claims priority, application Germany, July 22, 1974, 2435096

Int. Cl.² B05D *3/14;* **B05B** *5/00*

U.S. Cl. 427—48 **7 Claims**



1. In a process for the manufacture of magnetic discs by applying a coating of a pourable fluid dispersion containing finely divided anisotropic magnetic particles in a solution of a binder in an organic solvent, to rigid circular flat base discs of a non-magnetic material, having a circular aperture in the middle, orienting the magnetically anisotropic particles in the layer of dispersion in a preferred direction parallel to the plane of the base disc, converting the coating to a solid hard magnetic layer by drying and curing and subsequently grinding and polishing the magnetic coating, the improvement which comprises: introducing the whole base disc coated with the still fluid magnetic dispersion immediately after applying the coating into the median plane of a uniform magnetic D.C. field produced by the flow of current in conductors so arranged that they run, on both sides of the disc, parallel to the plane of the disc and radially from the central aperture of the disc to the periphery of the disc, the current flowing in opposite directions in the conductors located on either side of the disc, thereby orienting the magnetically anisotropic particles parallel to the plane of the disc and tangentially to its circumference, and, with the disc still in the magnetic field, solidifying the coating.

5. An apparatus for the magnetic orientation of anisotropic magnetic particles dispersed in a solution of a curable binder in an organic solvent, the dispersion being applied to a rigid

circular flat disc of a non-magnetic material having a circular hole at the middle, and the preferred direction of particle orientation being parallel to the plane of the disc and tangential to its circumference, the apparatus comprising conductors which produce a magentic field and which bound a zone of magnetic flux on all sides, the conductors being arranged in the form of a toroidal coil which is split into two halves in the median plane in order to receive the coated circular flat disc, which two halves have contacts, to conduct current, on the surfaces facing each other at the inner and outer peripheries of the coil and means inside the toroidal coil which hold the disc, carrying the coating of magnetic dispersion, in the median plane of the toroidal coil.

4,001,464

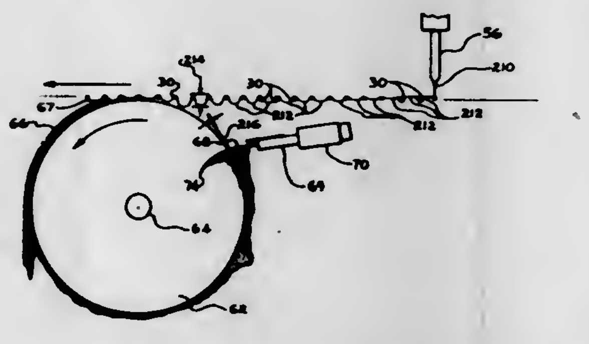
PROCESS FOR FORMING A SOLDER BAND

Ray Charles Doutrich, Lebanon, and Richard Eugene Fry, York, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1975, Ser. No. 572,833

Int. Cl.^{2} B05D *5/12*

U.S. Cl. 427—58 **6 Claims**



4. A process for forming a solder band about a segment of an electrical element comprising, transporting a plurality of elements along a feed path with at least one segment of each element extending transversely of the feed path, extruding a continuous ribbon of a solder paste composition onto said segment of each element, festooning the continuous ribbon of solder paste between adjacent elements to provide a layer of solder paste composition on the sides of each element, and transporting the elements and festoonery onto a surface of an application wheel to apply solder paste compositions to the underside of each element, cutting any excess solder paste composition adhering to the underside of each element as the elements are transported from the surface of the application wheel, heating the segment of each element and the solder paste composition to flow the solder on each element, and cooling the molten solder to form a fused band of solder about said segment of each article.

4,001,465

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICES

Juergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 28, 1975, Ser. No. 554,164

Claims priority, application Germany, Mar. 1, 1974, 2409910

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} H01L *21/76, 27/04*

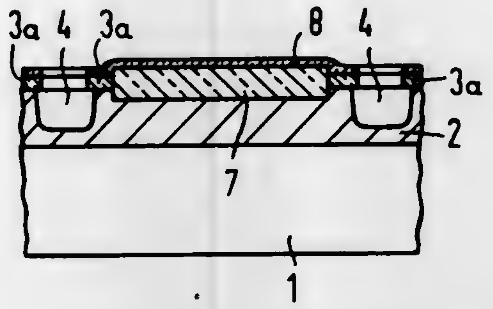
U.S. Cl. 148—187 **11 Claims**

1. In a process for producing a semiconductor device wherein a trench-like recess is formed in the surface of a Si crystal, a heat-resistant oxidation-blocking layer is applied onto the Si surface at least along one edge of said recess and the Si surface within said recess free of said oxidation-blocking layer is coated with a relatively thick SiO_2 layer via thermal oxidation, the improvement comprising:

confining said heat-resistant oxidation-blocking layer to a strip running directly along the edge of said recess;

applying a layer of SiO_2 directly onto the Si surface at the edge of said oxidation-blocking strip facing away from said recess, said layer of SiO_2 projecting into said Si surface more deeply than said oxidation-blocking strip; and

subjecting the so-obtained structure to thermal oxidation conditions sufficient to grow a relatively thick SiO_2 layer onto the uncovered Si surface within said recess.



4,001,466

PROCESS FOR PREPARING PRINTED CIRCUITS

Anthony James Shaul, Wokingham, and Edward Russell Wood, Twyford, both of England, assignors to Formica International Limited, London, England

Division of Ser. No. 419,475, Nov. 27, 1973, Pat. No. 3,925,138. This application Oct. 23, 1975, Ser. No. 625,007

Int. Cl.^{2} H05K *3/00;* **C09J** *7/00;* **C23C** *3/02*

U.S. Cl. 427—96 **5 Claims**

1. A process for preparing a printed circuit comprising an insulating substrate carrying a metal layer or pattern, the process consisting essentially of the steps of:

1. substantially fully curing a mixture consisting essentially of (a) an etchable synthetic rubber polymer which, in the substantially fully cured state, is attackable by a chemical etchant solution and (b) a first thermosettable resin, to give a selectively etchable and substantially non-adhesive layer consisting essentially of said rubber and the thermoset resin,
2. superimposing said layer on a fibrous substrate which consists essentially of at least one sheet or web, said sheet or web being impregnated with a second thermosettable resin,
3. consolidating the assembly so produced and curing said second thermosettable resin by heating under pressure to provide an insulating substrate comprising said selectivity etchable layer on the fibrous substrate,
4. chemically etching the surface of said selectively etchable layer, and
5. forming a metal layer or pattern on the etched surface by electroless deposition.

4,001,467

METHOD FOR PRODUCING ZINC ANODE

Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

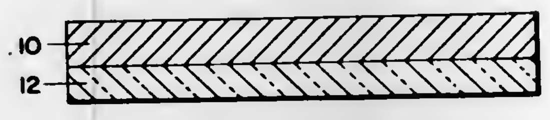
Division of Ser. No. 408,925, Oct. 23, 1973, Continuation-in-part of Ser. No. 199,216, Nov. 16, 1971, abandoned. This application Feb. 24, 1975, Ser. No. 552,709

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} H01M *13/06*

U.S. Cl. 427—123 **4 Claims**

1. A method for producing an anode assembly which comprises the steps of swelling an aqueous polymer latex with a solvent miscible with water, mixing the swollen latex polymer particles with zinc dust, coating an electrically conductive resin substrate with the thus-formed suspension of zinc dust in an aqueous latex of swollen particles of a binder polymer, the amount of the binder polymer being about 0.5 to 5 weight percent based on the weight of the zinc, and drying the coating to form an adherent zinc coating on the substrate.



4,001,468

METHOD FOR COATING SAND CORES AND SAND MOLDS

Michael J. Skubon; John J. Spiwak, both of Columbus, and Rodney L. Naro, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 464,572, April 26, 1974, Pat. No. 3,922,245. This application Aug. 13, 1975, Ser. No. 604,330

Int. Cl.^{2} B29C *1/04, 1/10*

U.S. Cl. 427—134 **2 Claims**

1. A method of reducing the amount of atmospheric moisture absorbed by a sand core or sand mold comprising coating the exposed surfaces of said mold or core with a wash comprising:

a. an organic liquid solvent having a kauri-butanol value of at least 36;
b. a suspending agent;
c. powdered refractory material selected from the group consisting of graphite, coke, mica, silica, aluminum oxide, magnesium oxide, talc, and zircon flour; and
d. an organic polymer selected from the group consisting of vinyl toluene/butadiene copolymer, styrene/butadiene copolymer, vinyl toluene/acrylate copolymer, styrene-/acetylene copolymers, and acrylate homopolymers,

the ratio by weight of organic polymer to organic liquid solvent being between about 1:50 and about 1:200 and the ratio by weight of powdered refractory to organic liquid solvent being between about 1:2.5 and 1:3.5.

4,001,469

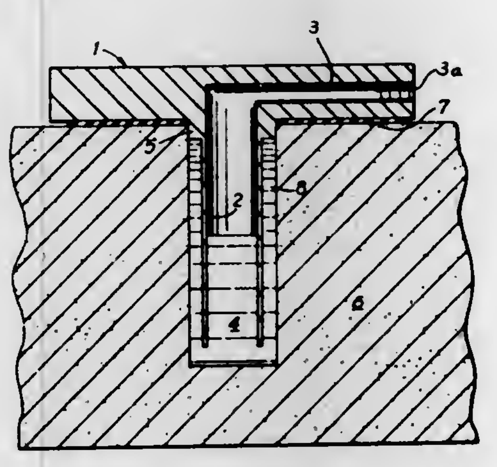
METHOD OF SEALING POROUS MATERIAL DEFINING A RECESS

Jay A. Harvey, East Amherst, N.Y., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,775

Int. Cl.^{2} B05C *7/00*

U.S. Cl. 427—238 **2 Claims**



1. A method of sealing the pores surrounding the interior walls of a recess in a porous material with a thermoplastic impregnating fluid which comprises:

a. partially filling said recess with the thermoplastic impregnating material in a fluid condition in amount compatible with the desired extent of impregnation;
b. inserting for a distance substantially to but short of the bottom of the recess a tubular element substantially smaller in outside diameter than the interior size of the recess to thereby leave an annulus between said tubular means and such recess;
c. centering said tubular element in the recess during insertion by inserting in the recess a flange means attached to and concentric with the tubular element and of substantially the same size and shape as that of the interior of the recess which will be in contact therewith when the tubular element is inserted in the recess;
d. pressure sealing the tubular element and flange means with respect to the top surface through which the recess extends by bearing against said top surface a gasket coextensive with a plate, which is substantially co-planar with said top surface of the porous material and in contact therewith when the tubular element is inserted in the recess, and substantially larger than the interior size of the recess to at least the desired radial extent of impregnation of the thermoplastic material; and
e. forcing the thermoplastic impregnating fluid into the pores surrounding the recess of the porous material by means of pressurized gas which is transmitted to said fluid through a conduit in said plate which communicates with said tubular element.

4,001,470

PROCESS AND BATH FOR THE METALLIZATION OF SYNTHETIC-RESIN

Klaus Schulze-Berge, Remscheid-Luttringhausen, Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Germany

Filed Apr. 16, 1975, Ser. No. 568,733

Claims priority, application Germany, Apr. 18, 1974, 2418654

Int. Cl.^{2} C23C *3/02*

U.S. Cl. 427—304 **9 Claims**

1. In a process for the electroless metallization of a synthetic-resin body, especially a body composed of an ABS resin, whereby the surface of the body is treated with an activation bath containing a metal-deposition catalyzing metal salt of a platinum group metal or gold, a protective colloid and at least one carboxylic acid, and thereafter the activated surface is treated with a chemical metallizing bath, the improvement wherein:

said activation bath contains as the protective colloid, 0.1 to 20 g/liter of gelatin, gum arabic or mixtures thereof;

said activation bath contains, as said carboxylic acid, 1 to 100 g/liter of a polybasic olefinic carboxylic acid;

the pH of the activation bath is adjusted to a value of 1 to 3 with an inorganic acid; and

the treatment with the chemical metallizing bath is effected without an acceleration treatment of the activated surface in a period up to two minutes.

4,001,471

THERMOPLASTIC SEAM BETWEEN JUXTAPOSED EDGES OF BLANK MATERIAL

Kenneth Francis Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Filed May 28, 1975, Ser. No. 581,671

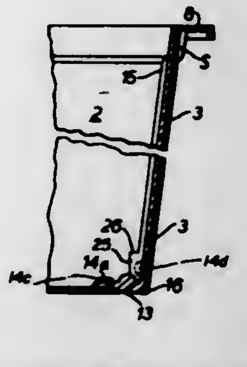
Claims priority, application United Kingdom, June 26, 1974, 28442/74

Int. Cl.^{2} B32B *3/04, 3/20;* **B65D** *5/42*

U.S. Cl. 428—60 **3 Claims**

1. A composite article comprising a seam joining edge regions of sheet material, the seam being formed from thermoplastic material which has been injection moulded in situ in relation to those edge regions, the moulding spanning those

edge regions and being bonded to each and having over one of said edge regions at least and extending along that edge region a part which is of greater thickness than that part of the moulding overlying the adjacent edge.



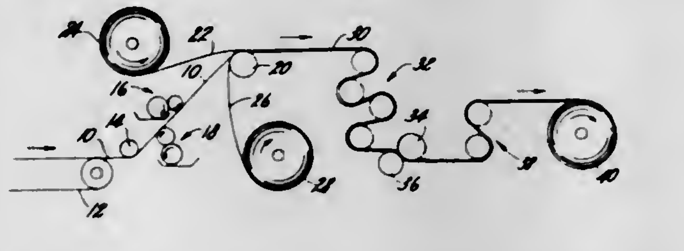
4,001,472
NONWOVEN REINFORCED CELLULOSIC MATERIAL AND METHOD OF PREPARATION

Gordon D. Thomas, and Jerome L. Schwoerer, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 177,782, Sept. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 792,211, Jan. 13, 1969, abandoned. This application Feb. 25, 1974, Ser. No. 445,798

Int. Cl.² B32B *5/10, 5/12, 5/14, 29/02*

U.S. Cl. 428—109 **6 Claims**



1. A soft, limp nonwoven scrim reinforced cellulosic product comprising a cellulosic layer adjacent to and in laminar relationship with a scrim material having crossed sets of threads with open windows therebetween, said cellulosic layer having a pattern of spaced compressed regions disposed adjacent to and extending across both scrim threads and windows with ply attachment between said scrim and cellulosic material being effected by adhesive at only intermittent points on the surface of said scrim material disposed adjacent compressed regions of the cellulosic layer, said cellulosic layer between said compressed regions being in its uncompressed state to provide fluid transmitting channels adjacent to and extending across both the scrim threads and windows, and to provide bulk, an embossed surface texture, and enhanced absorbency hand and limpness.

4,001,473
SOUND ATTENUATING STRUCTURAL HONEYCOMB SANDWICH MATERIAL

Billy G. Cook, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 19, 1976, Ser. No. 659,339

Int. Cl.² B32B *3/12*

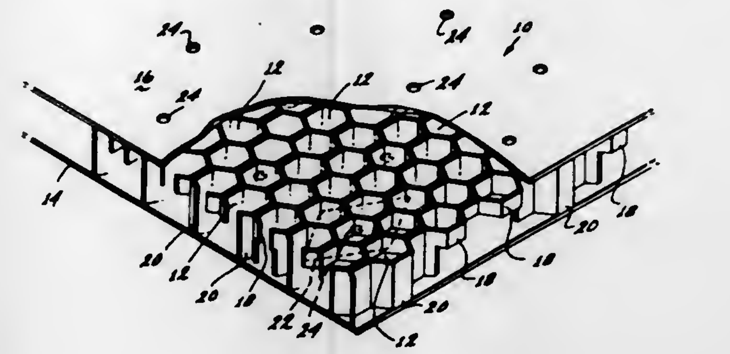
U.S. Cl. 428—116 **6 Claims**

1. A sound attenuating structural honeycomb sandwich material comprising:

an imperforate face sheet:

a honeycomb core structure having a multiplicity of adjacent cells, arranged in groups, the cells within said groups have inner walls of a length shorter than the thickness of said core thereby forming enclosed multiple cell areas, said imperforate face sheet being attached to the faying edges of said core adjacent said enclosed multiple cell areas; and

a perforated face sheet attached to the faying edges of said core remote from said imperforate face sheet and wherein each perforation of said perforated face sheet communicates only with one of said enclosed multiple cell areas.



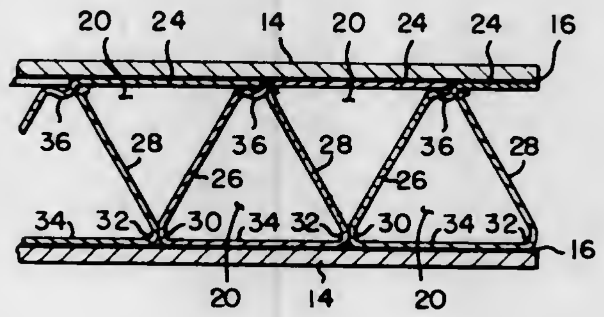
4,001,474
HONEYCOMB PANEL CELLULAR STRUCTURE HAVING TRIANGULAR CELLS

Ralph F. Hereth, Port Orchard, Wash., assignor to Wilkins & Associates, Inc., Tacoma, Wash.

Filed Aug. 26, 1974, Ser. No. 500,642

Int. Cl.² B32B *3/12*

U.S. Cl. 428—116 **10 Claims**



1. A honeycomb cellular structure comprising a plurality of serially arranged triangular cross-section cell segments individually formed and secured together, each said cell segment including three flat sides forming three tip portions therebetween, a substantially flat leg portion projecting from one of said tip portions in a plane parallel to a plane defined by the flat side extending between the remaining said tip portions, said leg porion extending for a sufficient distance to directly contact the corresponding one tip portion of the next succeeding cell segment, said one tip portion including a recessed area for receiving the terminus of a leg portion of an immediately adjacent cell segment, said leg portions of all cell segments being substantially coplanar and a tip portion in the plane opposite said one tip portion of each cell segment from which the leg portion projects being in contact with a tip portion of the next succeeding cell segment.

4,001,475
ABLATIVE SURFACE INSULATOR

Joseph W. Chambers, Woodland Hills, Calif., and Lester E. McTaggart, Jackson, Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

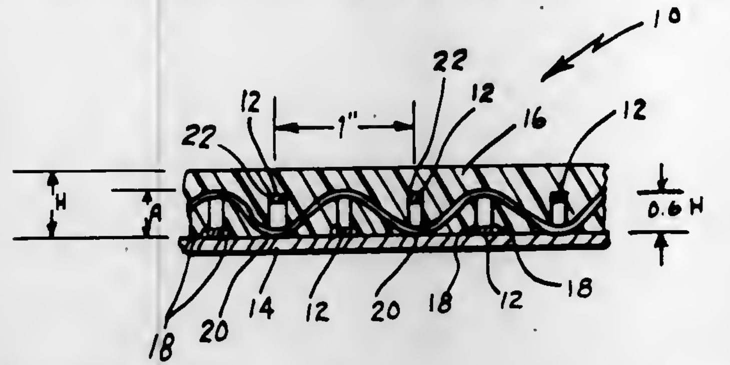
Filed May 9, 1974, Ser. No. 468,330

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² B32B *1/00*

U.S. Cl. 428—175 **4 Claims**

1. An ablative surface insulation for withstanding extreme temperature comprising a plurality of interwoven strips of metal capable of withstanding temperatures in excess of 700°F fixedly secured to a base material which is incapable of withstanding said extreme temperature, said strips being formed in a convoluted design producing a diagonal matrix having nodes and peaks, said nodes of said strips in one direction matching said peaks in another direction, a silicone elastomeric insulating material molded to and encompassing said plurality of strips and said convoluted strips having a pitch of approximately 1 inch and having an amplitude equal to approximately 0.6 the height of said insulating material.



4,001,476
MANUFACTURE OF FLOAT GLASS

William Ramsey Maltman, Prescot, and Colin Robert Howard, Liverpool, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

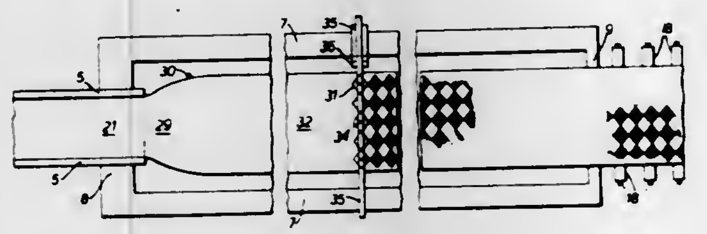
Division of Ser. No. 287,716, Sept. 11, 1972, Pat. No. 3,850,605. This application Aug. 20, 1974, Ser. No. 498,927

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Claims priority, application United Kingdom, Sept. 17, 1971, 43507/71

Int. Cl.² C03B *18/02;* **C03C** *21/00;* **B32B** *15/08, 17/06*

U.S. Cl. 428—209 **36 Claims**



1. Patterned glass having patterned surface modification produced by a process comprising locating in contact with the surface of the glass which is at a temperature at which it is electrically conductive, a molten body of an electrically conductive material for modifying the glass which body is shaped to a configuration progenitive of a pattern to be introduced into the glass, effecting relative movement between the shaped molten body and the glass, connecting an electrical supply to the molten body and to the glass, and switching that supply to engender electrically a predetermined ionic migration between the molten body and the glass in a time period during said relative movement, said time period being defined by a supply pulse width of the switched supply which is related to the speed of said relative movement and is sufficient to produce a pattern element of modified glass in said glass surface which pattern element exhibits its derivation from the configuration of the molten body.

4,001,477
FLAME RESISTANT CLOTH

James Economy, Eggertsville; Francis J. Frechette, Tonawanda, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 107,484, Jan. 18, 1971, abandoned, which is a division of Ser. No. 764,935, Oct. 3, 1968, Pat. No. 3,628,995. This application July 12, 1973, Ser. No. 378,760

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² D03D *25/00;* **D04B** *1/16*

U.S. Cl. 428—224 **6 Claims**

1. A flame resistant fabric comprising infusible fibers of cured resin condensation products of phenols and aldehydes blended with fibers selected from the group consisting of animal fibers, polyamide fibers, polyacrylonitrile fibers, flurocarbon fibers, glass fibers, mineral fibers, cotton fibers, rayon fibers, polyester fibers, polyolefin fibers, polyvinyl fibers, and mixtures thereof.

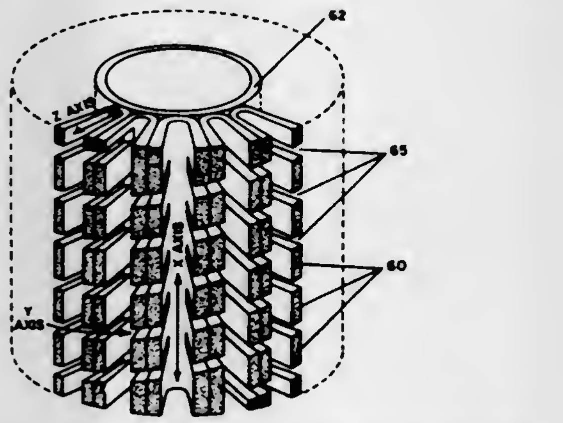
4,001,478
THREE-DIMENSIONAL FABRIC MATERIAL

Robert W. King, Chelmsford, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of Ser. No. 675,367, Oct. 16, 1967, abandoned. This application Jan. 24, 1972, Ser. No. 220,510

Int. Cl.² D06M *17/00*

U.S. Cl. 428—257 **3 Claims**



1. A filamentary three-dimensional material comprising:

a. a group of filaments oriented substantially parallel to each other on a Z axis in two groups of intersecting rows defining an X axis and a Y axis;

b. a second group of filaments woven on said X axis extending through said oriented filaments in courses which are at an angle to said Z axis;

c. a third group of filaments woven on said Y axis extending through said oriented filaments in course contiguous with said X axis courses; and

d. said filaments being sized and spaced relative to each other such that the filaments on each axis are compressed into close frictional contact with the adjacent filaments on each other axis to bind said material into an integral structure having a density of at least 30% of the density of said filaments.

4,001,479
NOVEL NAPHTHALATE POLYESTER FIBERS, AND THEIR END USES

Isao Hamana; Yoshio Fujiwara, and Shiro Kumakawa, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 400,905, Sept. 26, 1973, abandoned, which is a continuation of Ser. No. 242,636, April 10, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,639

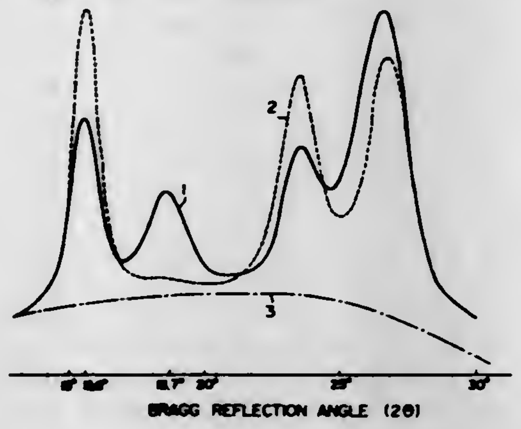
Claims priority, application Japan, Aug. 2, 1971, 46-58124; Apr. 14, 1971, 46-23677

Int. Cl.² B32B *27/04*

U.S. Cl. 428—272 **6 Claims**

1. An electric insulating material consisting of a fibrous

cloth, said fibrous cloth being obtained by heat-treating a fibrous cloth consisting mainly of naphthalate polyester fiber consisting of a naphthalate polyester containing at least 85 mol % of ethylene-2,6-naphthalate units and having an intrinsic viscosity of 0.3 to 1.0, said fiber having a diffraction intensity ratio (R) between a Bragg reflection angle $2\Theta = 18.7°$ and $2\Theta = 15.6°$, as determined by the X-ray diffraction method in the range of 0.15 to 1.73, such that the heat-treating time and temperature satisfy the following equations (1) and (2)



$$T\text{-}200 \geqq 70\ e^{-2\log 10^{t}} \qquad (1)$$
$$T\text{-}200 \leqq 70\,[1-e^{-2(4-\log 10^{t})}] \qquad (2)$$

wherein T is the heat-treating temperature in degrees Centigrade, t is the heat-treating time in seconds, and e is the base of a natural logarithm,

4,001,480
ENCAPSULATION PROCESS UTILIZING MICROORGANISMS AND PRODUCTS PRODUCED THEREBY

Joseph L. Shank, Matteson, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Aug. 16, 1974, Ser. No. 498,208

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² B41M *5/02;* **C12D** *13/08*

U.S. Cl. 428—411 **20 Claims**

1. An encapsulation process comprising the steps of: growing a fungus under conditions that produce a fungus having a fat content of about 40 to 60% by weight, passing a fat-soluble substance into the fat within the grown fungus by placing said fungus into contiguous contact with said substance to thereby encapsulate said substance, said fat-soluble substance being passively retained within said fat and not being a natural constituent of the fungus; and harvesting said encapsulated substance.

3. The process of claim 1, wherein the fat-soluble substance is a dye, a lubricant, a flavor, an aroma, or an adhesive.

4,001,481
SUPERCONDUCTIVE ELEMENTS AND METHOD FOR PRODUCING THE SAME

Yoshinobu Tarutani, Kokubunji; Ushio Kawabe; Mitsubiro Kudo, both of Hamura, and Sadanori Taguchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 5, 1973, Ser. No. 403,883

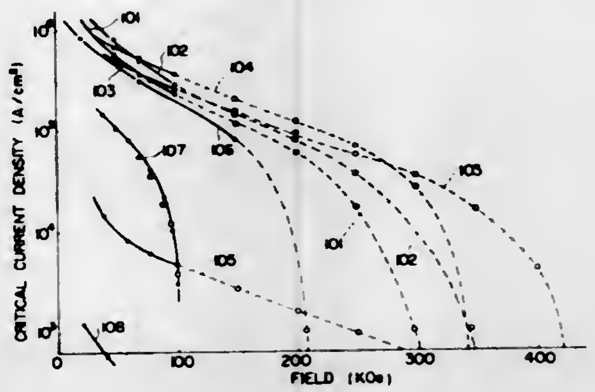
Claims priority, application Japan, Oct. 6, 1972, 47-99801; Jan. 10, 1973, 48-5217

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B05D *5/12;* **B32B** *15/04;* **C23C** *13/02*

U.S. Cl. 428—469 **19 Claims**

1. A superconductive element comprising a substrate, at least one face portion of which is composed of alumina, and a layer of a superconductive material formed to cover said face portion composed of alumina, said superconductive material consisting essentially of an intermetallic compound selected from the group consisting of a compound represented by the formula $Nb_j(Al_{1-x}Ge_x)$ in which the value of j is within a range of from 2.3 to 4.0 and the value of x is within a range of from 0 to 0.5, and a compound represented by the formula $Nb_k(Ga_{1-x}Al_x)$ in which the value of k is within a range of from 2.3 to 4.9 and the value of x is within a range of from 0 to 0.5.



4,001,482
PREPARATION OF VINYL HALIDE-CONTAINING POLYMERS

Peter A. Schwab, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 30, 1975, Ser. No. 572,983

Int. Cl.² C08F *2/18, 2/44, 14/06*

U.S. Cl. 526—73 **12 Claims**

1. A method of preparing vinyl halide-containing polymers, which contain a reduced amount of unreacted vinyl halide, by an improvement in the suspension polymerization of a monomer selected from the group consisting of a vinyl halide and a mixture of a vinyl halide and a monomer copolymerizable therewith, said improvement comprising polymerizing the monomer in the presence, of about 0.1 to about 10 parts, per 100 parts of monomer, of a plasticizer, at a temperature in the range of about 38° to about 71° C., to a conversion level of at least 60 percent, thereupon increasing the temperature about 14° to about 62° C., with the additional characteristic that the increased polymerization temperature does not exceed 100° C.

4,001,483
DENTAL SEALANT FOR AMALGAM RESTORATIONS

Henry L. Lee, Jr., and Jan A. Orlowski, both of P.O. Box 3836, South El Monte, Calif. 91733

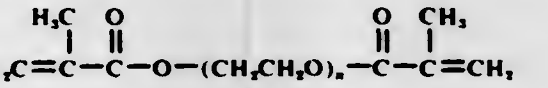
Filed Oct. 22, 1974, Ser. No. 516,886

Int. Cl.² C08F *218/02*

U.S. Cl. 526—270 **1 Claim**

1. A composition for use as a dental sealant, for sealing the dental margin between a tooth structure and an amalgam restoration, that is characterized by good ability to penetrate a space between the tooth structure and the amalgam restoration, and that is packaged in two separate packages, each of which remains in its curable state as packaged but that upon mixing one with the other upon application to a dental margin, cures in about two minutes at room temperature, and that as mixed comprises a curable composition of:

a. an alkylene glycol dimethacrylate of the formula



$$H_2C{=}C(CH_3){-}C({=}O){-}O{-}(CH_2CH_2O)_n{-}C({=}O){-}C(CH_3){=}CH_2$$

wherein n is an integer from 2 to 4, inclusive;

b. a polymerization initiator;

c. a polymerization accelerator; and

d. an additive secondary monomer selected from the group consisting of
  glycidyl methacrylate and
  tetrahydrofurfuryl methacrylate, in the concentration from about twenty percent to about seventy percent based upon total weight of the composition,

the (b) and (c) components being present in minor, effective amounts, and the balance of the composition being essentially the dimethacrylate.

4,001,484
TRANSPARENT SOLVENT AND HEAT RESISTANT TERPOLYMER COMPOSITIONS

Il H. Song, Lombard, Ill., assignor to The Richardson Company, Des Plaines, Ill.

Filed May 20, 1974, Ser. No. 471,488

Int. Cl.² C08F *220/14*

U.S. Cl. 526—329 **2 Claims**

1. A transparent, solvent resistant, high heat terpolymer composition comprising the reaction product of (a) a vinyl aromatic monomer selected from the group consisting of α-methylstyrene, 2-methylstyrene and tertiary butylstyrene, (b) methyl methacrylate, and (c) acrylonitrile or methacrylonitrile monomers polymerized at polymerization conditions to produce a terpolymer having a weight ratio of said vinyl aromatic to methyl methacrylate to acrylonitrile or methacrylonitrile units of from about 30 to 35: 55 to 65: and 5 to 10 respectively, said composition having less than about 0.5 percent by weight unreacted monomer of any of the initial reactants, said composition being further characterized by having an annealed heat distortion temperature at 264 psi greater than 250° F. as determined by ASTM D-648-72 test.

4,001,485
PROCESS FOR SPINNING ACRYLIC POLYMERS

Luigi Patron, Venice; Pier Luigi Mazzuco, Favar Veneto (Venice); Favato Veneto, Mestre; Enzo Trevisan, Mestre (Venice), and Ennio Niero, Mirano (Venice), all of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed Nov. 26, 1974, Ser. No. 527,259

Claims priority, application Italy, Nov. 29, 1973, 31931/73

Int. Cl.² D01F *6/18;* **C08F** *220/42*

U.S. Cl. 526—341 **9 Claims**

1. In a process for the wet-spinning of acrylic polymers wherein a spinning solution of an acrylic polymer in an organic solvent consisting essentially of dimethylacetamide is extruded through a spinneret into a coagulating bath consisting essentially of water and dimethylacetamide in a ratio between 30:70 and 60:40 by weight, and wherein the filaments thus obtained are washed, stretched and heat treated, the improvement wherein the coagulating bath contains from 0.03% to 3% by weighht of acetic acid and has added thereto an alkaline compound so as to bring about a pH value greater than 5.

4,001,486
LATEX COAGULANT FOR EMULSION BREAKERS

Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed June 11, 1975, Ser. No. 586,111

Int. Cl.² C08F *6/22*

U.S. Cl. 528—492 **6 Claims**

1. A method for coagulating synthetic rubber particles from a synthetic rubber latex using a water-soluble epichlorohydrin-dimethylamine copolymer of molecular weight 200 to 2,000 comprising the steps of:

A. Adjusting the pH of the synthetic rubber latex within the range of 1.5 to 7.0;

B. Adding an amount of the epichlorohydrin-dimethylamine copolymer sufficient to coagulate the synthetic rubber latex with the mole ratio of epichlorohydrin to dimethylamine being within the range of from 0.75 to 0.98;

C. Thoroughly dispersing the epichlorohydrin-dimethylamine copolymer within the synthetic rubber latex for a period of time sufficient to form coagulated rubber particles; and,

D. Recovering the coagulated synthetic rubber particles.

ELECTRICAL

4,001,487

SYSTEM FOR SUPPLYING CURRENT TO A GROUP OF HIGH-CURRENT RESISTANCE FURNACES THROUGH A PLURALITY OF TRANSFORMERS

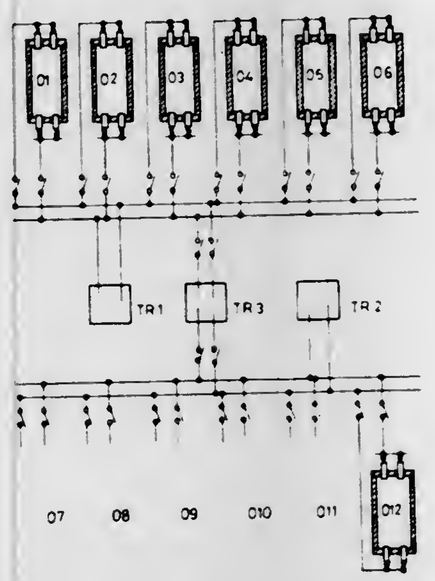
Otto Schumacher, Biberbach, and Hans Jonas, Gersthofen, both of Germany, assignors to Sigri Elektrographit GmbH, Augsburg, Germany

Filed July 1, 1975, Ser. No. 592,217

Claims priority, application Germany, Aug. 13, 1974, 2438742

Int. Cl.^{2} F27D *11/04*

U.S. Cl. 13—24 **5 Claims**



1. System for supplying current to a group of high-current resistance furnaces which comprises a number of transformers switchingly connectible in sequence individually and in a plurality thereof in parallel to selective furnaces of the group thereof, the group of furnaces being subdivided into two subgroups of furnaces, each of said subgroups having one of said transformers associated therewith, and said number of transformers including a third transformer selectively switchingly connectible in parallel to the one and the other of the two subgroups of furnaces.

4,001,488

APPARATUS FOR FEEDING CHARGE TO AN ELECTRIC SMELTING FURNACE

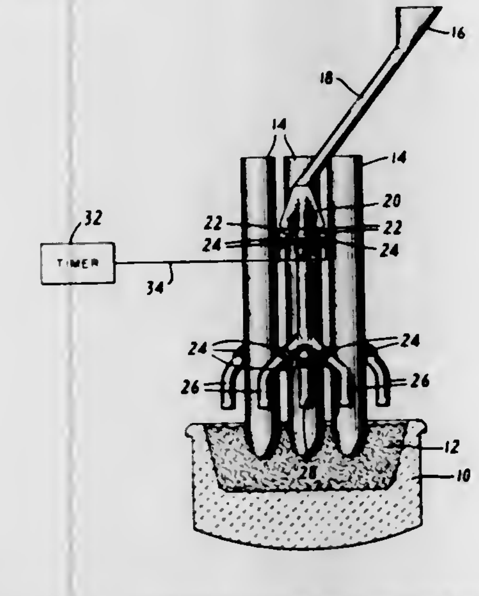
William Bruff, and Ole Andreas Kongsgaarden, both of Vagsbygd, Norway, assignors to Elkem-Spigerverket, Oslo, Norway

Filed Dec. 19, 1975, Ser. No. 642,379

Claims priority, application Norway, Dec. 19, 1974, 4581/74

Int. Cl.^{2} F27D *3/10*

U.S. Cl. 13—33 **6 Claims**



1. An electric smelting furnace comprising:

a. a furnace pot adapted to contain a charge;

b. a plurality of electrodes adapted to extend into the charge within said furnace pot;

c. apparatus for feeding particulate charge material of varying particulate size to said charge, said apparatus comprising:

  i. a single hopper for said particulate charge;

  ii. a single feed chute having first and second ends, the first end being connected to the hopper;

  iii. a plurality of charging chutes each of which has first and second ends, the first end of each of which is in communication with the second end of said feed chute;

  iv. a valve associated with each said charging chute towards the first end thereof, each said valve being operative between a first position in which the said charging chute is substantially obstructed and a second position in which said charging chute is substantially unobstructed;

  v. means for sequentially operating each said valve.

4,001,489

SUBMARINE POWER CABLE GROUNDING MEANS AND METHOD

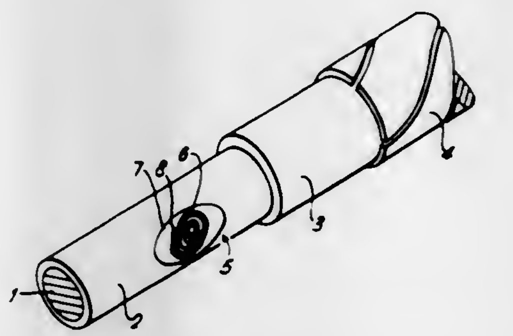
Jack Raymond Pedersen, Ekholt, and Lars Arthur Aanerud, Strommen, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,239

Claims priority, application Norway, Dec. 17, 1974, 4544/74

Int. Cl.^{2} H01B *7/14, 9/02;* **H05K** *3/00*

U.S. Cl. 174—10 **13 Claims**



11. A power cable having a core surrounded by at least one layer forming a metallic sheath for said core and at least one layer of insulating material surrounding said metal sheath and at least one armoring layer around said insulated layer and means for electrically interconnecting said metal sheath and said armoring layer comprising: electrically conductive grounding means consisting of at least one metal wire electrically connected to said metal sheath prior to the application of said insulating layer, said metal wire leading from said metal sheath through a sealed hole formed in said insulating layer and electrically connected to said armoring layer.

4,001,490

STRIP BUS BAR FOR TERMINAL POSTS

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 480,899, June 19, 1974, abandoned. This application July 1, 1975, Ser. No. 592,139

Int. Cl.^{2} H01R *31/08, 5/04*

U.S. Cl. 174—88 R **10 Claims**

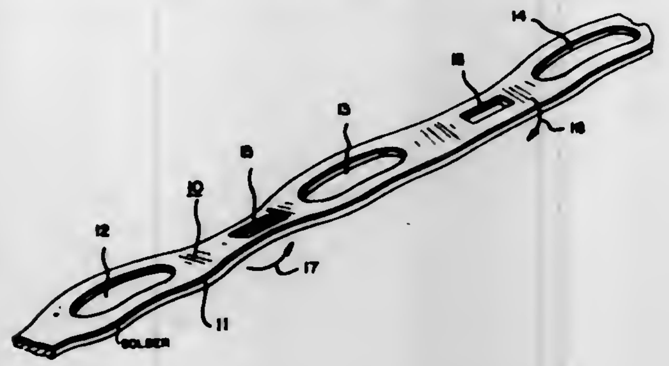
9. A bus bar for electrically connecting together a plurality of terminal posts mounted upon a base in a predetermined pattern and comprising:

a first layer of conductive material having a first and a second plurality of holes formed therein in a pattern which corresponds to the pattern of the terminal posts upon which said bus bar is to be mounted;

each of said first plurality of holes being sufficiently large to provide complete electrical separation between the bus bar and the terminal posts to be passed therethrough;

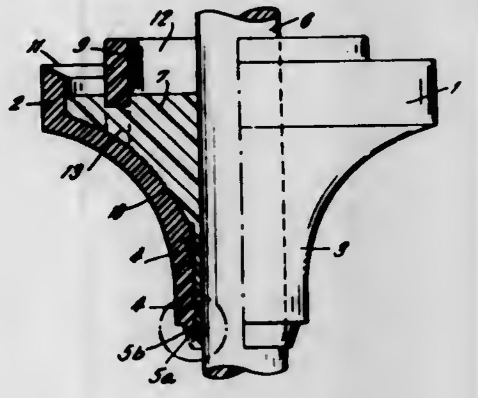
the sections of said bus bar immediately surrounding successive ones of said second holes being bent in opposite rotational directions primarily about an axis substantially coincident with the main longitudinal axis of said bus bar;

each of said second holes in said rotationally bent sections of said bus bar being of a size and configuration to provide physical interference between the edges of said second holes and the terminal posts to be passed therethrough to create opposing torque forces upon said terminal posts to be passed therethrough.



4,001,491
ONE OR MULTI-PART COMPOSITE UMBRELLA-SHAPED INSULATOR

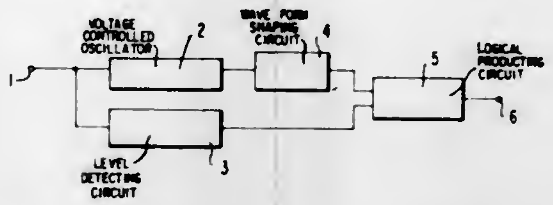
Ewald Bauer, Wunsiedel, Germany, assignor to Rosenthal Technik AG, Bavaria, Germany
Filed Nov. 6, 1975, Ser. No. 629,644
Claims priority, application Germany, Apr. 29, 1975, 2519007
Int. Cl.^{2} H01B *17/60, 19/00*
U.S. Cl. 174—209 **9 Claims**



1. A composite insulator, comprising:
an elongated support trunk;
a hollow, generally umbrella-shaped casting mould comprised of a synthetic material and extending annularly around and being gap spaced from said trunk; said mould narrowing gradually from said umbrella shape to a tubular socket part around said trunk; centering aids internally of said socket part for defining a gap space between said socket part and said trunk; means sealing said mould at the end thereof beyond said socket part;
a cavity including said gap space being defined between said mould and said trunk;
a hardenable synthetic material at least partly filling said cavity; said hardenable synthetic material having similar elastic and thermal properties to said mould synthetic material, and said mould being integrally joined to and being a nonremovable part of said insulator.

4,001,492
HALF TONE REPRODUCING PROCESS IN FACSIMILE

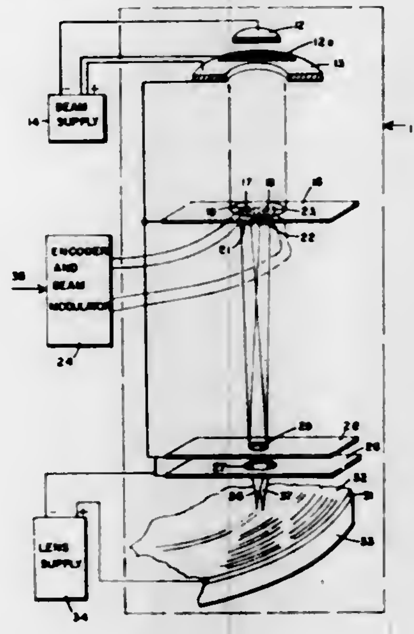
Matsumi Suzuki, and Toshi Itoh, both of Tokyo, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1973, Ser. No. 330,071
Claims priority, application Japan, Feb. 8, 1972, 47-13317
Int. Cl.^{2} H04N *1/38*
U.S. Cl. 358—283 **2 Claims**


VOLTAGE CONTROLLED OSCILLATOR
2
WAVE FORM SHAPING CIRCUIT
4
5
LOGICAL PRODUCTING CIRCUIT
1
6
LEVEL DETECTING CIRCUIT
3

1. Half tone reproducing circuitry in a facsimile system comprising a means for pulse frequency modulating the image signal of an image including half tone, and a pulse eliminating means for eliminating those pulses from the pulse frequency modulated signal occurring during the white portion of the image signal; and a means for applying the output signal from said pulse eliminating means to an image recording device to reproduce the image including half tone, said pulse eliminating means comprising threshold means responsive to said image signal for developing a control signal which is at a first level when said image signal is non-white and at a second level when said image signal is white; and means responsive to the pulse frequency modulated signal and said control signal for eliminating said pulses occurring during said white portion of said image signal when said control signal is at said second level.

4,001,493
SINGLE LENS, MULTI-BEAM SYSTEM AND METHOD FOR HIGH RESOLUTION RECORDING OF INFORMATION ON A MOVING RECORDING MEDIUM AND ARTICLE

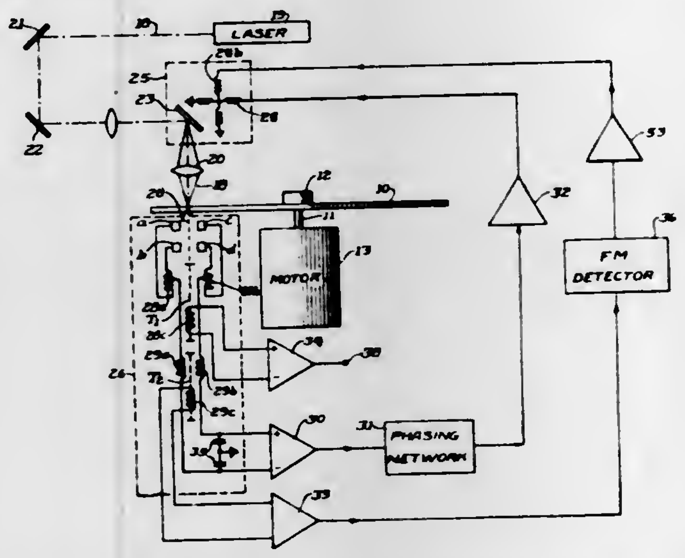
Donald R. Cone, Palo Alto, Calif., assignor to Nihon Denshi Kabushiki Kaisha and Sharp Kabushiki Kaisha, both of, Japan
Filed Sept. 3, 1974, Ser. No. 502,558
Int. Cl.^{2} H04N *5/76*
U.S. Cl. 358—127 **9 Claims**



1. In a method for electron beam recording of wideband information on a recording medium, providing a recording electron beam directed along a path, forming spaced beams by intercepting said beam with an object mask having spaced apertures formed therein, selectively and independently controlling the positioning of each of said electron beams as a function of the information to be recorded, focusing said beams on the recording medium by a single electromagnetic lens to image the beams leaving said lens on said recording medium and moving said recording medium to expose sequential portions of said medium to said electron beams.

4,001,494
PHOTORECEPTOR MATRIX FOR OPTICAL VIDEO PLAYBACK SYSTEM

Robert Adler, Northfield, and John L. Rennick, Elmwood Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Nov. 1, 1974, Ser. No. 519,897
Int. Cl.^{2} H04N *5/76;* **G11B** *7/00*
U.S. Cl. 358—127 **8 Claims**

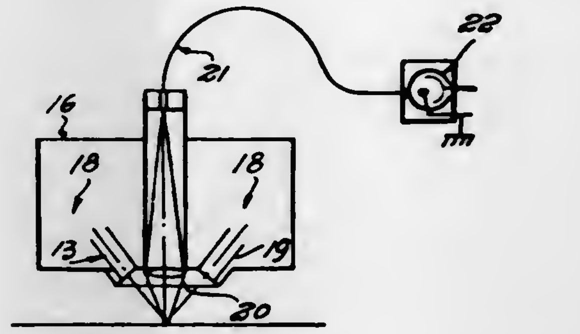


1. In an optical readout system for scanning a video record with a reading beam of energy to derive information stored in a track on said record, a photoreceptor matrix comprising:
four photoreceptors a, b, c and d with (a,b) arranged as a tandem pair along the direction of said track and with (c,d) also arranged as a tandem pair along the direction of the track, said pairs being symmetrically disposed on opposite sides of a reference plane that extends along the direction of said track and is coincident with the axis of said beam and tangent to said track at the point where it is scanned by said beam, with photoreceptors a and c having a leading relationship relative to said reading beam and photoreceptors b and d having a lagging relationship thereto; and
first circuit means coupled to all of said photoreceptors for differentially combining the output signals thereof of said photoreceptors to develop a radial error correction signal $(a+b)-(c+d)$ having a polarity and amplitude related to the sense and degree of radial tracking misregistration.

4,001,495
DEVICES FOR THE COPYING OF IMAGES BY SEQUENTIAL SWEEPING

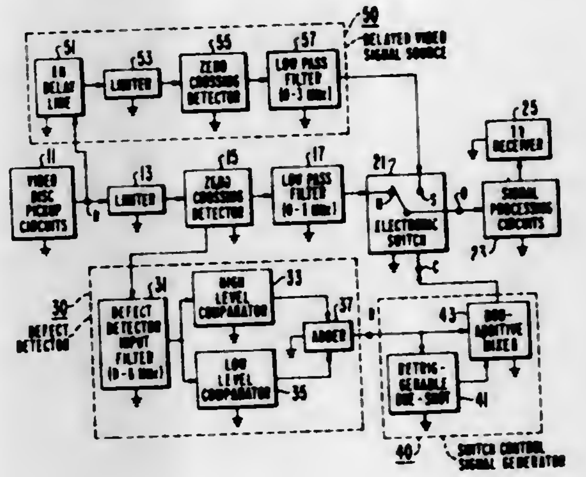
Julio G. Tauszig, Buenos Aires, Argentina, assignor to A. B. Dick Company, Chicago, Ill.
Filed June 19, 1975, Ser. No. 588,312
Claims priority, application Argentina, July 15, 1974, 254689
Int. Cl.^{2} H04N *1/06, 1/24*
U.S. Cl. 358—294 **5 Claims**

1. A device for copying indicia from an original document onto recording material to produce a stencil for reproducing copies therefrom, by scanning the original document and burning the image in accordance therewith into the recording material including a support for the original and the stencil recording material, optical means for scanning the original, means for converting a light image produced by said optical means into electrical signals and means coupled electrically to said converting means for burning said image into said stencil recording material in accordance with said signals, wherein said optical means includes in combination:
housing means defining first and second channels, the second channel being cylindrically shaped with a light reflecting wall and extending inwardly of said housing from a first outer wall at a predetermined angle with respect thereto, adjacent which an original document is placed for copying, said second channel intersecting said first channel transversely with respect thereto, lamp means mounted in said first channel, said second channel being open throughout the length thereof between said lamp and said document so that light from said lamp passes unfocused from said lamp to said document, at least a portion of said light being reflected by said channel means said housing mans defining a third channel adjacent said second channel extending from said first outer wall into said housing substantially perpendicular to the plane of said outer wall, light focusing means and light receiving means mounted in said third channel, said light receiving means being coupled to said converting means, said second and third channels being positioned relative to each other so that said unfocused light from said lamp passes through said second channel onto said indicia of said original document and the light image of said indicia passes through said third channel and is focused onto said light receiving means.



4,001,496
DEFECT DETECTION AND COMPENSATION APPARATUS FOR USE IN AN FM SIGNAL TRANSLATING SYSTEM

Jon Kaufmann Clemens, Skillman; Jack Selig Fuhrer, Princeton Junction, and Michael David Ross, Somerdale, all of N.J., assignors to RCA Corporation, New York, N.Y.
Continuation of Ser. No. 477,102, June 6, 1974, abandoned. This application July 9, 1975, Ser. No. 594,429
Int. Cl.^{2} H04N *5/76;* **G11B** *9/06*
U.S. Cl. 358—127 **14 Claims**



1. In a signal translating system including a source of carrier waves the instantaneous frequency of which is subject to variation over a given deviation range in accordance with the amplitude of a desired signal of a given bandwidth, said source

being randomly subject to occasions of defective operation during which the apparent instantaneous frequency of said carrier waves departs from said given deviation range; frequency modulation detecting means coupled to said source, said detecting means including a zero-crossing detector, and a low pass filter, coupled to said zero-crossing detector and having a passband substantially limited to said given bandwidth, for providing a demodulated signal having an amplitude normally corresponding to the amplitude of said desired signal but subject to spurious amplitude variations during said occasions of defective operation; signal utilization means; and means for normally supplying the demodulated signal output of said low pass filter to said signal utilization means; a defect detection and compensation system comprising, in combination:

means coupled to said zero-crossing detector for deriving an output signal having an instantaneous amplitude which varies within a range of levels between first and second amplitude levels in response to variations of said instantaneous frequency within said given deviation range, and which departs from said range of levels in response to departures of said instantaneous frequency from said given deviation range;

voltage level comparison means responsive to the output signal provided by said deriving means for developing impulses in response to departures of said output signal from said range of levels; and

means responsive to the impulses developed by said voltage level comparison means for disabling said demodulated signal supplying means.

4,001,497

MONITORING OF WELDING

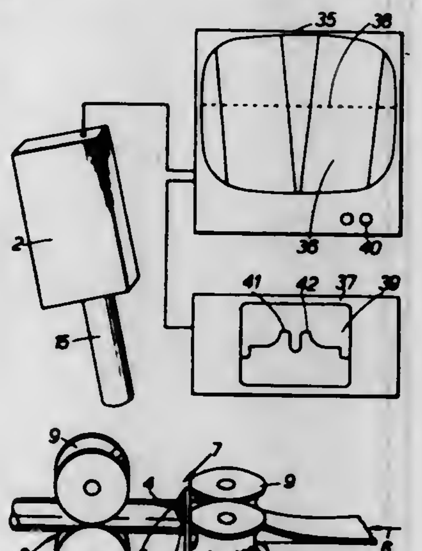
Clive James Arthur Bosworth, Kettering, England, assignor to British Steel Corporation, London, England

Filed May 24, 1974, Ser. No. 473,042

Claims priority, application United Kingdom, June 18, 1973, 28873/73

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 358—101 **5 Claims**



1. In a method of controlling thermal profiles across metal surfaces to be welded together in a continuous welding process, the improvement which comprises the steps of viewing, by means of a television camera, the surfaces just prior to their being welded together and transmitting electrical signals representative of the thermal and visual images of the viewed surfaces from the camera to a cathode ray tube to produce an image of said viewed surfaces, deriving a signal from a raster line of said cathode ray tube and applying that signal as an input to an oscilloscope to produce on said oscilloscope a visual wave form representative of the thermal profile existing across said viewed surfaces, observing said visual wave form and, in response to that observation, controlling heating means applied to said surfaces to adjust said thermal profile to a desired form.

4,001,498

VIDEO MIXING AND/OR KEYING SYSTEM

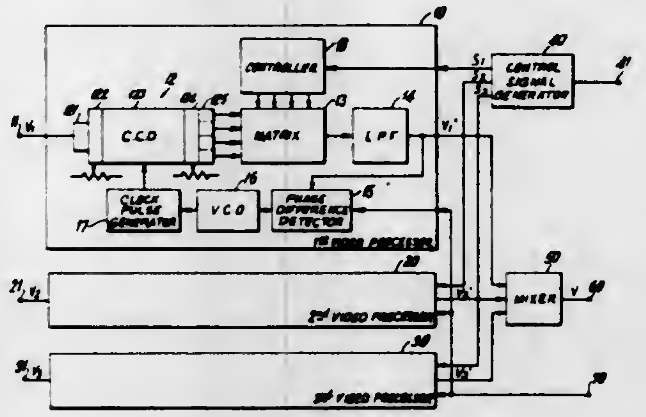
Masanobu Morishita; Hidehiko Inoue; Takao Ando, and Mitsuru Kawasaki, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 602,150

Claims priority, application Japan, Aug. 7, 1974, 49-90493

Int. Cl.^{2} H04N *5/22*

U.S. Cl. 358—160 **5 Claims**



1. A video mixing and/or keying system in which a plurality of video signals are mixed and/or keyed, said system comprising:

a plurality of signal processors for respectively producing a corresponding plurality of controlled video signals from said plurality of video signals,

a source of control signals, and

means for mixing said controlled video signals from said signal processors,

said signal processors each including a charge-coupled device for delaying one of said video signals in response to a driving pulse; means for producing a phase difference signal representative of the phase difference between said delayed video signal and a reference signal, the frequency of said driving pulse being controlled by said phase difference signal; and means including means for converting the charge transferred in said charge-coupled device for controlling the amplitude of said delayed video signal in response to an assigned one of said control signals.

4,001,499

DISPLAY SYSTEMS

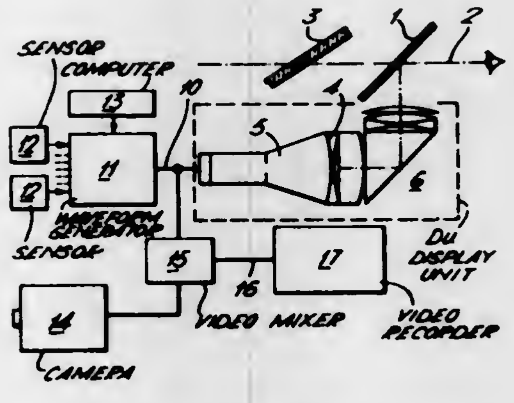
Kenneth J. Dowell, Edgware, England, assignor to Smiths Industries Limited, London, England

Filed Mar. 26, 1975, Ser. No. 562,365

Claims priority, application United Kingdom, Mar. 29, 1974, 14073/74

Int. Cl.^{2} H04N *7/02*

U.S. Cl. 358—93 **7 Claims**



1. In a head-up display system which is for use in a aircraft and which includes a partially-transparent reflector for mounting in the line-of-sight of the pilot of the aircraft so that the pilot's view of a scene external to the aircraft is along said line-of-sight through said reflector, means for generating electric video signals in accordance with a display for presentation to the pilot, displaying means, and signal-supply means for supplying said electric video signals to said displaying means, said displaying means responding to said electric video signals supplied thereto by said signal-supply means to project an image of said display onto said reflector so as to present said generated-display image in said line-of-sight against the background of the said external scene through said reflector, the improvement wherein the system also includes further electric signal-generating means for generating further electric video signals in accordance with a scene viewed thereby, means mounting the said further electric signal-generating means to view substantially the same external scene as viewed by the pilot along said line-of-sight through said reflector, said mounting means mounting said further signal-generating means out of said line-of-sight to view said scene apart from said reflector whereby said further electric video signals generated by said further electric signal-generating means represent said external scene devoid of said generated-display image, signal-combining means responsive both to the said further video signals generated by said further signal-generating means and to the said first-mentioned video signals supplied to said displaying means by the first-mentioned signal-supply means, said signal-combining means combining the said further and first-mentioned electric video signals with one another to derive combined electric video signals corresponding to said external scene having the said generated display superimposed thereon, and electric video-signal recording means for recording utilizing said combined video signals for subsequent playback reproduction.

4,001,500

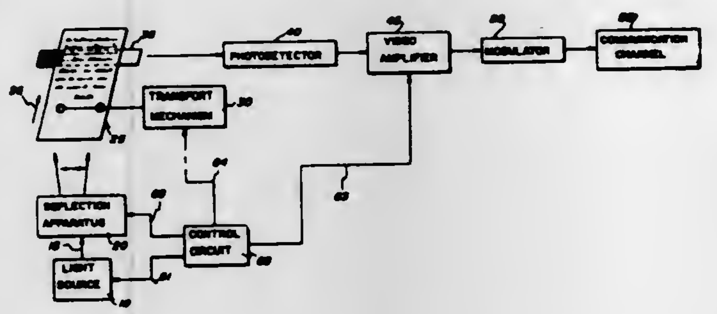
AMPLIFIER FOR USE IN A DOCUMENT SCANNING SYSTEM

Lawrence P. Lavery, Fairport, and David R. Shuey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1974, Ser. No. 525,694

Int. Cl.^{2} H04N *3/10, 5/16*

U.S. Cl. 358—282 **9 Claims**



1. In a document scanning system including means for repetitively sweeping a beam of light generated by a light source along a line-like scanning station in a scanning direction and a retrace direction, means for turning off said light source during the interval that said light beam is moving in said retrace direction, means generating a retrace signal during said interval, and photosensitive means positioned at said scanning station to collect light reflected from a document at said scanning station and provide an electrical signal proportional to the amount of said reflected light, amplification means for providing an output signal representative of the information content of a scanned document, said amplification means comprising

current amplifier means coupled to said photosensitive means for amplifying said electrical signal,

black level adjustment means operative in response to said retrace signal for controlling the output of said current amplifier means so as to compensate for leakage current from said photosensitive means, and

background control means responsive to variations in the output of said current amplifier means for adjusting the range of said variations to a predetermined range to compensate for differences of background of different scanned documents.

4,001,501

SIGNAL PROCESSING CIRCUITS FOR CHARGE-TRANSFER, IMAGE-SENSING ARRAYS

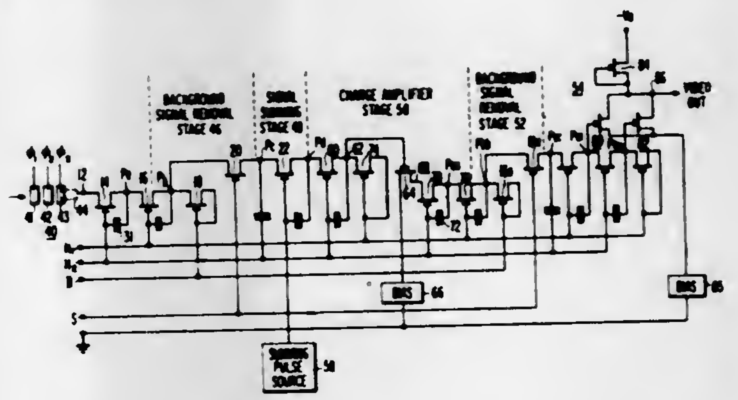
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 356,324, May 2, 1973, Pat. No. 3,876,952. This application Sept. 18, 1974, Ser. No. 507,217

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.^{2} H04N *3/14;* H01L *29/78, 31/00;* H01J *39/12*

U.S. Cl. 358—160 **2 Claims**


BACKGROUND SIGNAL REMOVAL STAGE 46
SIGNAL SUMMING STAGE 48
CHARGE AMPLIFIER STAGE 50
BACKGROUND SIGNAL REMOVAL STAGE 52
VIDEO OUT
BIAS 66
SUMMING PULSE SOURCE 58

1. A method for improving the contrast among a plurality of charge signals concurrently produced by a corresponding plurality of radiation sensors of an image sensing array, each charge signal representing the intensity of a different element of the scene being viewed by said array, comprising the steps of:

discarding that portion of each charge signal which is lower than a given amplitude level corresponding to a given background signal level;

employing the remainder of each charge signal as the signal representing the radiation received by the radiation sensor producing that signal; and

increasing the signal intensity at the expense of signal resolution by combining into a single charge signal, each group of N such remainder signals derived from N adjacent radiation sensors, respectively, where N is an integer greater than one.

4,001,502

STRAYLIGHT COMPENSATION CIRCUIT AND BLANKING CIRCUIT FOR SAME

Frederik Johannes van Roessel, Upper Saddle River, N.J., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 564,732, April 3, 1975, abandoned. This application June 24, 1975, Ser. No. 589,765

Int. Cl.^{2} H04N *5/16*

U.S. Cl. 358—165 **6 Claims**

1. A blanking circuit for a video signal having video and blanking portions, said circuit comprising an inverting amplifier having an input means for receiving said signal and an output; an output terminal; a first diode coupled between said output terminal and said amplifier output, means for providing feedback coupled between said diode and said amplifier input means; means for maintaining said feedback during said blanking portion coupled between said diode and said amplifier input, and means coupled to said diode and having input means for receiving a blanking signal for biassing said diode to clip said signal at a reference potential during the blanking portion and for biassing said diode at some other potential during the video portion.

4,001,503

TEMPERATURE-RISE PREVENTIVE APPARATUS FOR TELEVISION RECEIVER PARTS

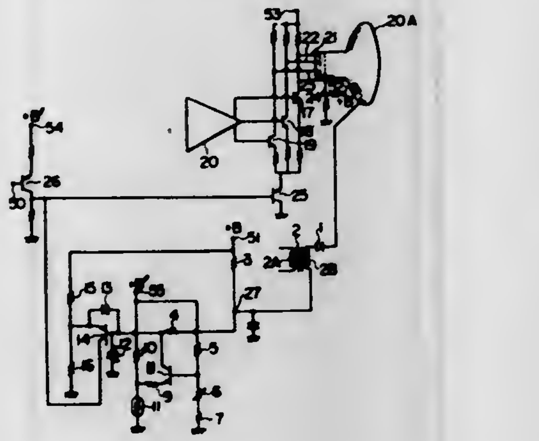
Yoshihisa Nomoto, Tokyo; Shigeru Takegami, Yokohama; Koichi Nakakubo, Yokohama, and Takao Yoneyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,953

Claims priority, application Japan, Oct. 16, 1973, 48-116178

Int. Cl.² H04N *5/44*; H01J *31/26, 29/52*

U.S. Cl. 358—243 **13 Claims**



13. A temperature-rise preventive apparatus for parts of a television receiver comprising:

a temperature-rise detecting device provided in the television receiver for producing an output signal which varies in accordance with the temperature-rise in said receiver when it exceeds a predetermined temperature value;

an average beam current reduction device coupled with the output signal of said detecting device for reducing the average beam current of said receiver in accordance with the output signal below the value of the average beam current prior to the predetermined temperature value being exceeded, whereby the greater the temperature-rise, the less the average beam current becomes, thereby preventing the temperature in said receiver from rising.

4,001,504

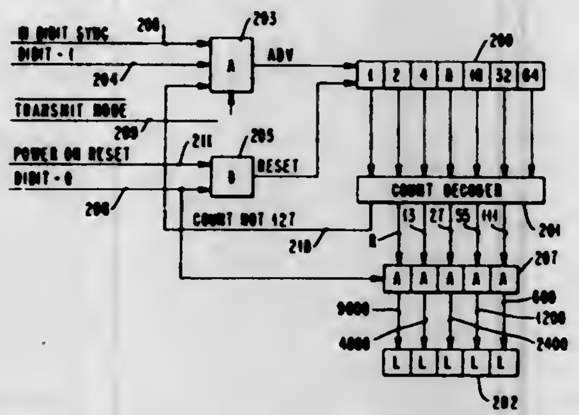
AUTOMATIC TERMINAL DATA RATE SELECTION

Thomas Allen Hendrickson, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1975, Ser. No. 585,001

Int. Cl.² H04L *15/00*

U.S. Cl. 178—68 **5 Claims**



1. In a variable-speed data transmission system wherein a primary terminal transmits digital data messages to receiving terminals at one of a plurality of discrete digit-transmission speeds in a set of uniquely related speed, each said message containing a control character interspersed with other information signals, said character having a unique digital signal composition which is different at each said speed and distinguishable at each said speed from compositions of all other signals utilized in said system at any of said speeds, the improvement comprising

first means incorporated within a said receiving terminal for detecting said unique control character by detecting one of said unique signal compositions thereof, and second means for responding to said detected one of said unique signal compositions to set the digit-reception speed of said receiving terminal,

whereby said receiving terminal is automatically selfadjusted to recognize the speed at which the digits of said data messages are being transmitted and thereby adjusted to intelligibly receive said digits.

4,001,505

SPEECH SIGNAL PRESENCE DETECTOR

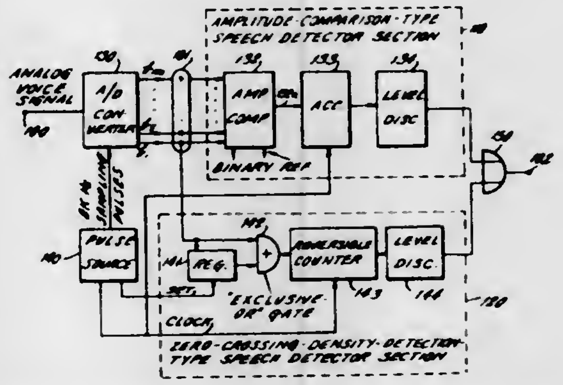
Takashi Araseki, and Kazuo Ochiai, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,644

Claims priority, application Japan, Apr. 8, 1974, 49-39723

Int. Cl.² G10L *1/04*

U.S. Cl. 179—1 SC **9 Claims**



1. A speech detector adapted to detect a speech signal on a telecommunication channel, comprising:

input means for receiving an input digital speech signal supplied in the form of successive parallel codes having a repetition rate determined by the sampling frequency for said speech signal, each of said parallel codes comprising a sign bit indicating the polarity of a coded amplitude of the speech signal and a plurality of bits representing the magnitude of the sampled analog signal;

a first speech detector section coupled to said input means for detecting the presence of said speech signal depending on the comparison of the parallel-code-represented analog value with a threshold code representing predetermined analog level;

a second speech detector section coupled to said input means in parallel with said first speech section for detecting the presence of said speech signal depending on the occurrence of a change in at least one of said sign bits and the direction in which the parallel-code-represented analogue value varies; and

an OR circuit coupled to both said first and second speech detector sections for leading their outputs to an output terminal as a voice detection output; wherein said second speech detector section comprises first means coupled with said input means for deriving at least one of said sign bit changes and direction changes in the parallel-code-represented analog value to deliver a first binary output, second means coupled with said first means responsive to said first binary output to deliver a second binary output every time said first binary output has two successive different binary digits, third means for accumulating said second binary output, and fourth means coupled with said third means for delivering a third binary output every time the accumulated value at said third means exceeds a first threshold value, and wherein the output of said first speech detector section and said third binary output led through said OR circuit serves as said voice detection output.

4,001,506

HOME INTERCOM TELEPHONE SET

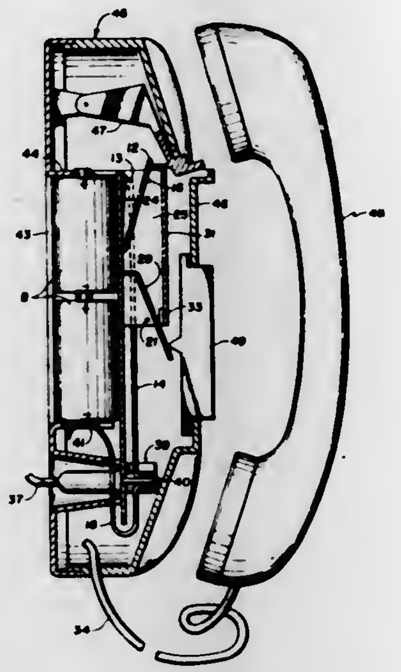
Horst Brandstatter, Vestner Str. 7, Zirndorf, Germany

Continuation of Ser. No. 509,540, Sept. 26, 1974, Pat. No. 3,924,073. This application Oct. 8, 1975, Ser. No. 620,595

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.² H04M *1/02, 1/08*

U.S. Cl. 179—1 H **1 Claim**



1. A telephone for use in an intercom system having a similar second telephone, the telephone comprising:

a prefabricated unit comprising a supporting plate having attached thereto electrical connecting lines including dimensionally stable wire stirrups forming a first, second and third pair of contact pins;

a case enclosing said electrical connecting lines and detachably secured to said supporting plate;

a ringing unit electrically connected to said electrical connecting lines;

a receiver having assembled therein a speaking unit comprising a microphone and a loudspeaker electrically connected to said electrical connecting lines,

wherein said receiver is removably held by said case; means for connecting a current source to said electrical connecting lines;

means for electrically connecting the second telephone to said electrical connecting lines;

an electrically conductive selector device selectively movable into and out of contact with said first pair of contact pins to establish or break electrical connection therebetween, wherein said selector device comprises a first spring element normally biased out of contact with said first pair of contact pins;

a ringing key for energizing the ringing unit of the second telephone when said ringing key is actuated, wherein said ringing key cooperates with said selector device to move said selector device against its normal spring bias and into contact with said first pair of contact pins when said ringing key is actuated;

an electrically conductive switching device selectively movable into contact with said second and third pairs of contact pins to selectively establish electrical connection between contact pins of each said pair, wherein said switching device comprises a second spring element normally biased into contact with said third pair of contact pins; and

a reversing key having a first position for connecting said ringing unit into an electrical circuit including the selector device of the second telephone and a second position for connecting said speaking unit into an electrical circuit including the speaking unit of the second telephone when its reversing key is in the second position and for connecting said selector device into an electrical circuit including the ringing unit of the second telephone when its reversing key is in its first position, wherein said switching device and said receiver cooperate with said reversing key to move said reversing key into its first position when said receiver is held by said case and establish electrical connection between said second pair of contact pins by moving said switching device against its normal bias and to move said reversing key into its second position when said receiver is removed from said case and establish electrical connection between said third pair of contact pins by permitting said switching device to move according to its normal bias.

4,001,507

METHOD AND APPARATUS FOR TELEPHONE SYSTEMS FOR FACILITATING DATA TRAFFIC BETWEEN THE SUBSCRIBER STATIONS AND A CENTRAL DATA PROCESSOR

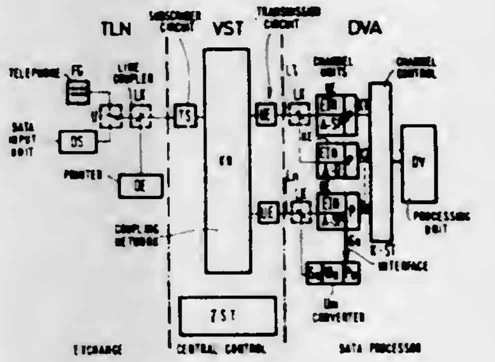
Franz Bonk, and Wolfgang Burger, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 277,510, Aug. 3, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,497

Claims priority, application Germany, Aug. 6, 1971, 2139546

Int. Cl.² H04M *11/06*

U.S. Cl. 179—2 DP **4 Claims**



1. In apparatus for telephone systems interoperating with a data processor wherein data communication takes place between individual telephone subscriber stations having both telephone sets and printers and said data processor, said data being available upon demand at said data processor both in audio form and a form suitable for control of said printer, the improvement comprising:

a plurality of subscriber line means connected, respectively, to each said subscriber station, and to both the telephone set and the printer thereat, and to a single output channel of said data processor and

means for transmitting said data in said form suitable for controlling said printer following transmission of the same data in audio form.

4,001,508

MESSAGE COMMUNICATION SYSTEM FOR TELEPHONE LINES

Richard C. Johnson, Dayton, Ohio, assignor to Communications International Corporation, Dayton, Ohio

Filed Sept. 17, 1975, Ser. No. 614,203

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 D **11 Claims**

1. A communications system adapted for delivering prerecorded messages over a plurality of telephone lines, comprising:

A. a corresponding plurality of tape decks, each of said tape decks having:

i. a play control input;

ii. a first playback transducer for providing a first audio output signal; and

iii. a second playback transducer for providing a second control output signal;

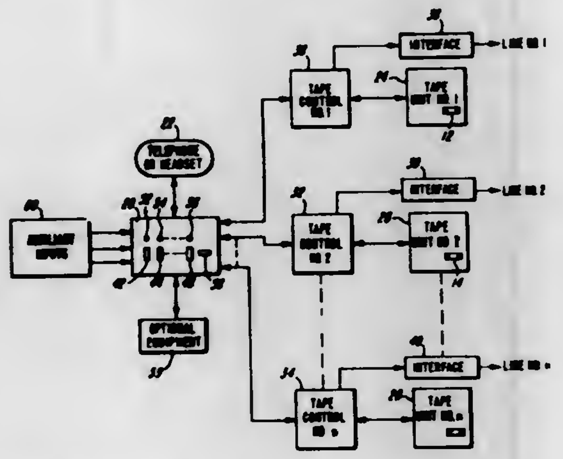
B. a prerecorded tape for each of said tape decks, each said tape having recorded thereon;

i. at least one message on a first track thereof; and

ii. a first control signal recorded as a first predetermined frequency tone burst on a second track thereof, said first control signal occurring after the completion of said message;

said first and second transducers being adapted to sense the audio and control signals recorded, respectively, on said first and second tracks;

C. a telephone calling instrument;



D. a control unit including:

i. selection means for selectively coupling said telephone calling instrument to each of said telephone lines; and

ii. signaling means for selectively issuing an operation control signal; and

E. control means for each one of said tape decks, said control means including:

i. first means responsive to the operation control signal for applying a play signal to said play control input of the one of said tape decks associated therewith; and

ii. second means responsive to the operation control signal for coupling the first audio output signal from said one tape deck to its corresponding telephone line.

4,001,509

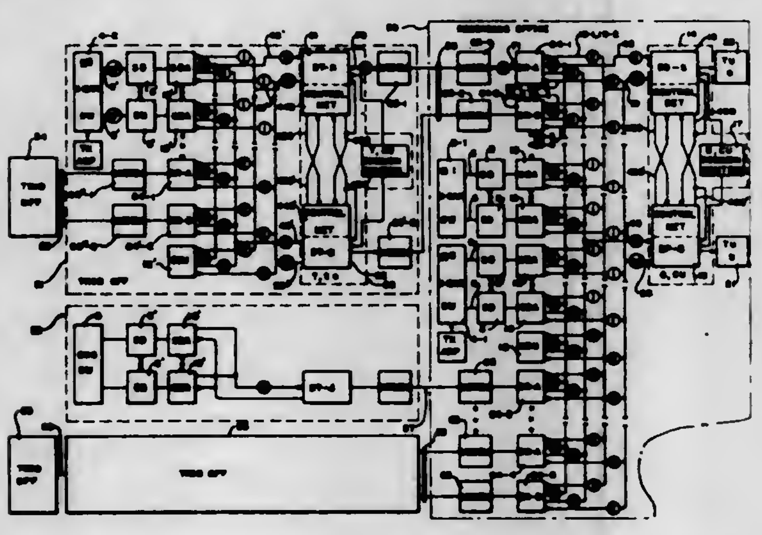
REMOTE OFFICE MESSAGE METERING SYSTEM

John C. McDonald, Los Altos; Gary C. Henrickson, Palo Alto; Alan K. Taylor, and William A. Settle, both of San Jose, all of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Jan. 30, 1975, Ser. No. 545,489

Int. Cl.² H04M *15/12*

U.S. Cl. 179—7.1 R **25 Claims**



1. A message metering apparatus for metering the usage of a telephone system by a plurality of subscriber units and for transmitting data indicating usage between a first office and a remote second office comprising,

in a first office,

means for generating signals to provide data indicating usage of the telephone system by each of said subscriber units,

memory means for storing said data,

data link means for transferring said data from said first office to a second office,

first control means for controlling transfer of said data from said memory means over said data link means,

in a second office,

data receiver means for storing said data transferred over said data link means,

data path means for tranferring said data,

storage means for storing said data transferred over said data path means,

second control means for controlling transfer of said data from said data receiver means over said data path means.

4,001,510

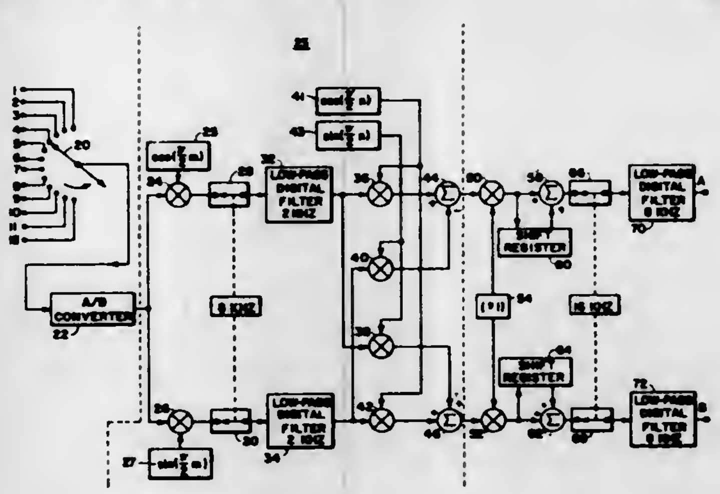
DIGITAL MODULATOR AND DEMODULATOR SYSTEM FOR FDM TELEPHONY

Francis Keith Reed, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 7, 1975, Ser. No. 593,892

Int. Cl.² H04J *1/04*

U.S. Cl. 179—15 FD **15 Claims**



1. A communications system for multiplexing and demultiplexing a plurality of space division channel signals comprising:

modulating means having an output signal, further comprising,

means for sampling the plurality of space division channel signals to sequentially supply samples of said channel signals;

first means for digitizing said sequential samples of said channel signals;

first means for converting said digitized samples of said channel signals to frequency division multiplex signals according to a predetermined mathematical algorithm utilizing sine and cosine function multipliers having only values of −1, 0 and +1;

second means for converting said frequency division multiplex signals to analog signals;

first means for frequency converting said analog signals to a higher predetermined output signal frequency range;

demodulating means, further comprising;

means for receiving and frequency converting said signals of higher frequency range to a predetermined lower frequency range;

second means for digitizing said signals of lower frequency range;

third means for converting said digitized lower frequency signals into a plurality of of digitized space division channel signals according to a predetermined mathematical algorithm utilizing sine and cosine function multipliers having only values of −1, 0 and +1;

fourth means for converting said digitized space division channel signals to analog signals, and

transmitting means for communicating said modulating means output signal to said demodulating means.

4,001,511

CHANNEL BOARD FOR TELEPHONY TRANSMISSION EQUIPMENT USING SINGLE SIDE BAND MULTIPLEXING

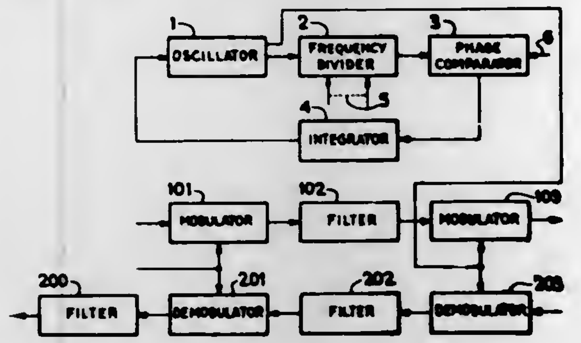
Claude Buchholtzer; Pierre Deman; Michel Drobecq, and Pierre Oger, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 27, 1975, Ser. No. 608,241

Claims priority, application France, Sept. 3, 1974, 74.29954

Int. Cl.² H04J *1/08*

U.S. Cl. 179—15 FS **11 Claims**



1. A channel board for a telephony transmission equipment using single side band multiplexing for forming groups, including primary groups, of telephone channels, said channel board comprising a support and on this support: a modulating branch for frequency translating a voice frequency channel and a demodulating branch for translating again to voice frequency a previously frequency translated telephone channel, said modulating branch including in series a premodulation modulator, a filter, and a second modulator, said demodulating branch including in series an input demodulator, a filter and a further demodulator; and a frequency generator for selectively delivering at least all the carrier currents necessary for translating a premodulated telephone channel into any desired position in a primary group, said frequency generator being of the phase locked loop type, including an oscillator having a control input and a circuit having an input coupled for receiving the wave generated by said oscillator and an output connected to said control input of said oscillator, said circuit including a variable frequency divider for dividing the frequency of said wave, said frequency divider having control inputs for controlling the value N of the divisor of the division effected by said frequency divider and an output, and a phase comparator having a first input coupled to the output of said frequency divider and a second input for receiving a reference frequency, for comparing the phases of the output signal from said frequency divider and of said reference frequency; said premodulation modulator and said further demodulator having respective carrier inputs for receiving a signal at a fixed frequency, said second modulator and input demodulator having respective carrier inputs coupled for receiving said wave.

4,001,512

AUTOMATIC TELEPHONE NUMBER IDENTIFICATION CIRCUIT

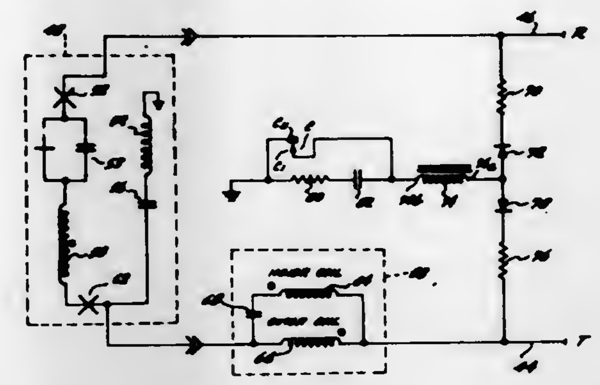
Darryl F. Proctor, Redmond, and Peter T. Skelly, Issaquah, both of Wash., assignors to Proctor & Associates Company, Redmond, Wash.

Filed July 16, 1975, Ser. No. 596,397

Int. Cl.² H04M *15/36*

U.S. Cl. 179—17 A **24 Claims**

1. An identification circuit for use with automatic number identification apparatus in a communication system which includes a central office and a plurality of remote stations, each of said remote stations being connected to said central office by a communication line pair, at least one communication line pair in said communication system being common to first and second remote stations, said one communication line pair being split at a point along the length thereof into first and second branches, said first branch being connected to said first remote station, said first branch, said first remote station and said one communication line pair forming a first communication line loop, said second branch being connected to said second remote station, said second branch, said second remote station and said one communication line pair forming a second communication line loop, said identification circuit comprising:



signal sensing means for detecting the presence of a dc loop current in said second communication line loop, and providing an output in response thereto;

circuit means operative to cause a signal imbalance on said one communication line pair when said circuit means is connected to said second communication line loop; and,

means responsive to said output from said signal sensing means for connecting said circuit means to said second communication line loop.

4,001,513

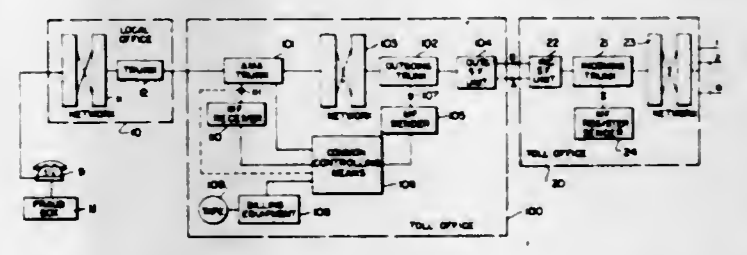
METHOD AND APPARATUS FOR THE DETECTION OF FRAUDULENT TOLL TELEPHONE CALLS

David Charles Naylor, Georgetown, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed July 31, 1975, Ser. No. 600,649

Int. Cl.² H04M *15/12*

U.S. Cl. 179—18 DA **11 Claims**



1. In a telephone system comprising an originating office, and a destination office connected to said originating office via a transmission path, said originating office comprising a toll call processing system and an automatic message accounting system including at least one automatic message accounting trunk circuit connected to said call processing system, and wherein control signalling between said offices comprises using the predetermined presence or absence of a single frequency signal on said transmission path including a proceed-to-send signal transmitted from said destination office to said originating office, a method of detecting a fraudulent toll telephone call comprising the step of detecting a supervisory signal at the automatic message accounting trunk circuit, said supervisory signal corresponding to a second proceed-to-send signal from the destination office.

4,001,514

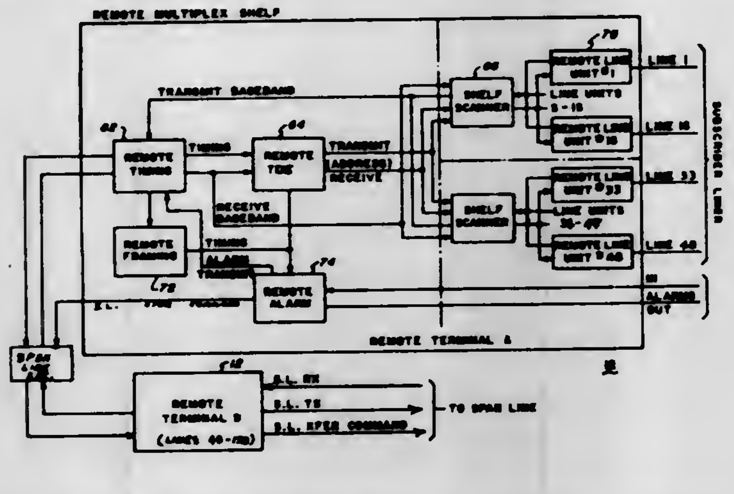
SUBSCRIBER DIGITAL MULTIPLEXING SYSTEM WITH TIME DIVISION CONCENTRATION

Walter Kenneth Wurst, Guelph, Canada, assignor to ITT Canada, Limited, Toronto, Canada

Filed Dec. 9, 1974, Ser. No. 530,954

Int. Cl.² H04M *7/14*

U.S. Cl. 179—18 FC **10 Claims**



9. A time division concentrator for switching a plurality of lines through respective channels of a bi-directional multiplexer from a central office to subsidiary remote offices, including in said central office a channel memory having a position permanently associated with each channel for temporarily storing in each position the address of a line transmitting or receiving on said channel, a line status memory comprising a plurality of positions each permanently associated with a line for storing an indication of the status of the associated line, means for scanning said line status memory in a receive information mode, to complete a status scan cycle of the lines of the concentrator, a last-look line memory with a position for each line to temporarily store respective indications of the results of the last scan of the memory, means responsive to completion of a scan of said line and line status memories for transferring said line status and last-look memories to a transmit mode to initiate a second scan of said memories, comparing the scanned status in said status memory with a last-look line status memory for initiating a demand for a channel on a difference found in said comparison.

4,001,515

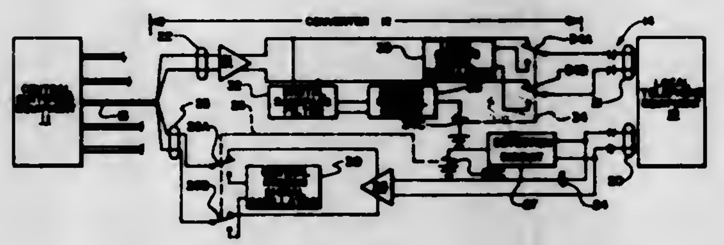
INTERFACING UNIT FOR TELEPHONE NETWORKS

Plato Zorzy, Marblehead, Mass., assignor to Astreon Corporation, Lowell, Mass.

Filed Nov. 21, 1974, Ser. No. 525,755

Int. Cl.² H04M *1/00*

U.S. Cl. 179—18 HB **10 Claims**



1. An interface unit for coupling voice and ringing signals between local telephone equipment and central switching equipment wherein the frequency of the ringing signals transmitted and received by the central switching equipment differs from the frequency of the ringing signals transmitted and received by the local telephone equipment, said interface comprising:

- A. a first channel for coupling the voice and ringing signals from the central switching equipment to the local equipment, said first channel including:
  - i. switching means having a normal state and an active state,
  - ii. amplifier means for receiving voice and ringing signals from the central switching equipment, said switching means, in a normal state, coupling the output signals from said amplifier means to the local telephone equipment.
  - iii. a local ringing signal oscillator circuit for transmitting a ringing signal at the same frequency as the local telephone ringing signal frequency, said switching means, in an active state, coupling output signals from said local ringing signal oscillator circuit to the local telephone equipment, and
  - iv. means including a digital bandpass filter for
  - iv. discriminating ringing signals from the central switching equipment thereby to shift said switching means to the active state, said discriminating means being connected to the output of said amplifier means, and
- B. a second channel for coupling the voice and ringing signals to the central switching equipment from the local equipment including
  - i. switching means having a normal state and an active state,
  - ii. amplifier means for receiving voice signals from the local switching equipment, said switching means, in a normal state, coupling output signals from said amplifier means to the central switching equipment,
  - iii. a central ringing signal oscillator circuit for transmitting a ringing signal at a frequency corresponding to the central switching equipment ringing signal frequency, said switching means, in an active state, coupling output signals from said central ringing signal oscillator circuit to the central switching equipment, and
  - iv. detecting means for shifting said switching means to an active state in response to the receipt of a ringing signal from the local telephone equipment.

4,001,516

APPARATUS FOR FEEDING AND CONTROLLING RINGING CURRENTS IN TELECOMMUNICATION SYSTEMS

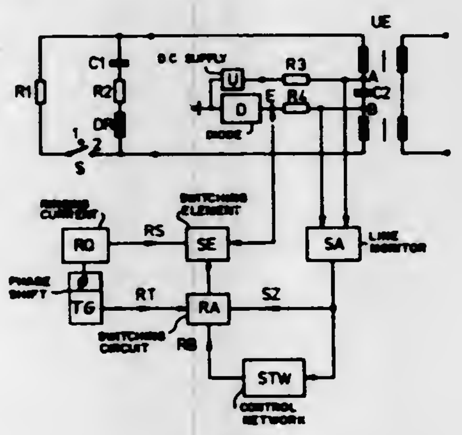
Günther Weisigk, Zurich; Karlheinz Schmah, Adliswil, and Harald Berger, Zurich, all of Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Aug. 21, 1975, Ser. No. 606,385

Claims priority, application Switzerland, Sept. 24, 1974, 12916/74

Int. Cl.² H04M *3/02*

U.S. Cl. 179—84 R **35 Claims**



1. In apparatus for feeding ringing currents from a ringing current supply (RQ) to line circuits, and for controlling ringing currents in said line circuits, in telephone and other telecommunication systems having an exchange equipped with a source of supply voltage (U), and having subscriber circuits equipped with a ringing circuit capacitor (C1), the improvement comprising in combination:

- means including a junction (E) for feeding ringing currents to line circuits;
- means connected between said feeding function (E) and a pole of the source of supply voltage (U) for preventing short-circuiting of ringing currents;

- an electronic switching device (SE) including semiconductive means for discharging said ringing circuit capacitor (C1) and semiconductive switching means having a control electrode and being connected between the ringing current supply (RQ) and the feeding junction (E); and
- means (RA) connected to the control electrode of the switching device (SE) for causing the switching device (SE) to switch ringing currents on the off instantly and to discharge said ringing circuit capacitor (C1).

4,001,517

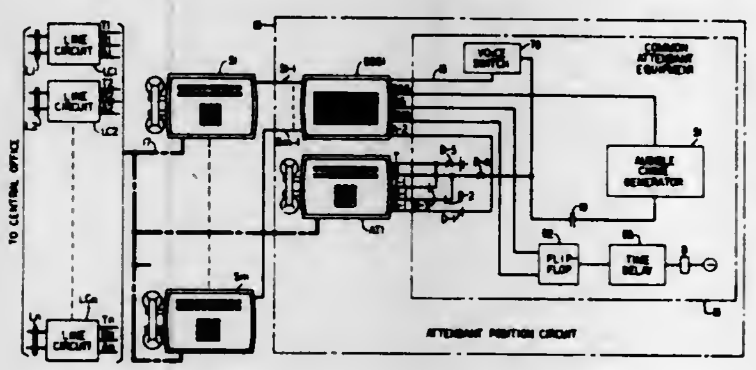
DIRECT STATION SELECTION HOLD ARRANGEMENT

Richard Henry Bidlack, Boonton; Wayne Jay Egan, Eatontown, and Steven Gary Miller, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 3, 1975, Ser. No. 628,076

Int. Cl.² H04M *1/00*

U.S. Cl. 179—99 **13 Claims**



1. In a key telephone system, a direct station selection arrangement comprising:

- a plurality of key telephone station sets;
- at least one attendant position circuit, wherein said attendant position circuit comprises:
- a communication handset,
- a plurality of dedicated communication paths corresponding on a one-to-one basis to each of said plurality of key telephone station sets for connecting said attendant position circuit to said key telephone station sets,
- a plurality of direct station selection key means connected on a one-to-one basis to each of said plurality of dedicated communication paths,
- wherein each said key telephone station set has associated therewith:
- a loudspeaker,
- means for amplifying voice signals appearing on said dedicated communication path corresponding to said key telephone station set,
- means for applying said amplified signals to said loudspeaker; and
- wherein each of said direct station selection key means is operable for establishing a communication path from said attendant communication handset through said direct station selection key means and via said corresponding dedicated communication path to the key telephone station set corresponding to said direct station selection key means such that any voice signal generated at said communication handset is applied to said loudspeaker at said key telephone station set.

4,001,518

DISCRETE FOUR-CHANNEL DISC REPRODUCING SYSTEM

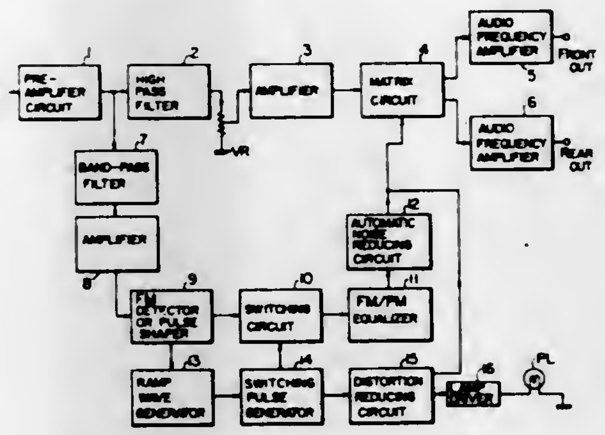
Yukio Sugimoto, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1975, Ser. No. 556,875

Claims priority, application Japan, Mar. 12, 1974, 49-28709; Mar. 28, 1974, 49-35333; Apr. 10, 1974, 49-41269; Apr. 10, 1974, 49-41270

Int. Cl.² G11B *3/00, 3/78*

U.S. Cl. 179—100.4 ST **7 Claims**



1. A four-channel stereophonic reproducing system for reproducing a CD-4 type four-channel record wherein a composite signal obtained from a first main channel signal constituted by a sum combination of first and second audio signals and a first subchannel signal constituted by a frequency or phase modulation of a difference combination of said first and second audio signals on a predetermined sub-carrier is recorded in one sound groove, and also wherein another composite signal obtained from a second main channel signal constituted by a sum combination of third and fourth audio signals and a second sub-channel signal constituted by a frequency or phase modulation of a difference combination of said third and fourth audio signals on a predetermined sub-carrier is recorded on another sound groove, said system comprising:

- means for reproducing a main channel signal and a sub-channel signal having a sub-carrier from each of said first and second composite signals recorded on said four-channel record;
- detector means for detecting said sub-channel signals reproduced by said reproducing means;
- matrix means for matrixing said main channel signals reproduced by said reproducing means and output signal from said detector means to produce four discrete stereophonic audio signals;
- a noise elimination switching circuit provided between said detector means and said matrix means;
- control means including a ramp wave generating circuit for converting the sub-channel signals from said detector means into triangular wave signals, and a switching pulse generating circuit responsive to the output of said ramp wave generating circuit for generating a switch pulse of a pulse width corresponding to an interval when a dropout of sub-carriers appears in said detected sub-channel signals, said control means on-off controlling said noise elimination switching circuit by the output of said switching pulse generating circuit to prevent application of the output of said detector means to said matrix means during the appearance of sub-carrier dropout; and
- distortion reducing means including a time constant circuit, said distortion reducing means being responsive to the output of said control means for attenuating an entire frequency band or at least a high frequency band of the output of said noise elimination switching circuit for a time period determined by the time constant circuit which is longer than the period of appearance of the sub-carrier dropout.

4,001,519
PICK-UP CARTRIDGES FOR GRAMOPHONE RECORDS

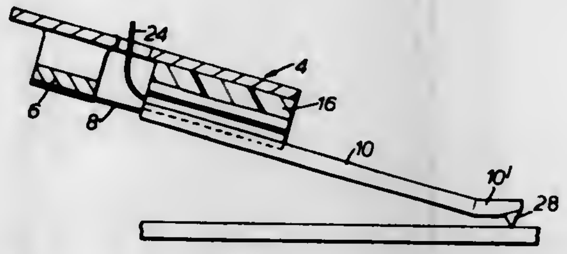
Alexander R. Rangabe, 'Stoneacre', Denmead, Portsmouth, Hampshire, England

Filed Nov. 22, 1974, Ser. No. 526,237

Claims priority, application United Kingdom, Nov. 23, 1973, 54415/73

Int. Cl.^{2} H04R *19/06, 9/12*

U.S. Cl. 179—100.41 G **13 Claims**



1. A pick-up cartridge comprising, a body shell, a low mass stylus assembly having a short rigid stylus arm, a stylus tip mounted adjacent a forward end of the stylus arm a substantial part of the length of the stylus arm extending from the rear end thereof being straight and the stylus tip being located in the vicinity of the axis of the straight part of the arm and a resilient wire substantially shorter in length than the stylus arm fixedly attached at its forward end to the stylus arm so as freely to support the stylus arm and having at least a major portion thereof in alignment with the stylus arm, a mounting member provided on the body shell and supporting the rear end of the resilient wire with the stylus assembly inclined forwardly away from the body shell, and transducer means responsive to movement of the stylus arm mounted in the body shell at a location so as to be wholly between the stylus tip and the resilient wire.

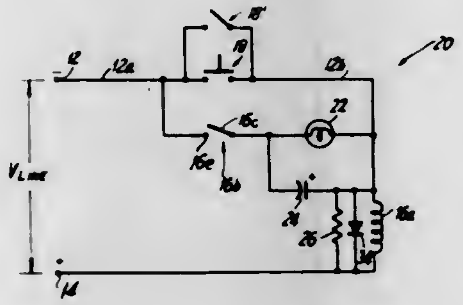
4,001,520
HOLD CIRCUIT FOR TELEPHONES

Herbert H. Waldman, 1739 52nd St., Brooklyn, N.Y. 11204, and Kalju Meri, 60-67 70th St., Maspeth, N.Y. 11378

Filed Feb. 20, 1975, Ser. No. 551,285

Int. Cl.^{2} H04M *1/00*

U.S. Cl. 179—81 R **18 Claims**



1. A hold circuit for at least one pair of telephone lines connected to at least one telephone instrument, the telephone lines requiring a predetermined current flow therethrough to "hold" and seize the same, and exhibiting a higher voltage when all handsets of all associated telephone instruments connected to the pair of telephone lines are "on hook" and a lower voltage when a handset of any of the associated telephone instruments is "off hook," where said higher and lower telephone line voltages may vary in magnitude, the hold circuit comprising a pair of terminals adapted to be connected to a pair of telephone lines; latching means connected to said terminals for inhibiting said predetermined current flow through the hold circuit in a first mode and for permitting at least said predetermined current to flow through the hold circuit in a second mode; manually actuable switching means connected to said latching means for actuating the latter into said second mode when said switching means is manually actuated to thereby cause the hold circuit to seize the telephone lines and said latching means reverting to its said first mode when a handset of any of the associated telephone instruments is subsequently rendered "off hook," where the hold circuit automatically releases its seizure of the telephone lines, load means consisting of at least visual indicator means, a capacitor connected in parallel with said load means, the latter parallel combination being connected in series with said latching means, said load means being effective to insure that a voltage developed across said capacitor causes said latching means to become deenergized and resultant release of the telephone lines by the hold circuit upon subsequently removing any associated telephone handset "off the hook."

4,001,521
SIGNAL IDENTIFICATION SYSTEM

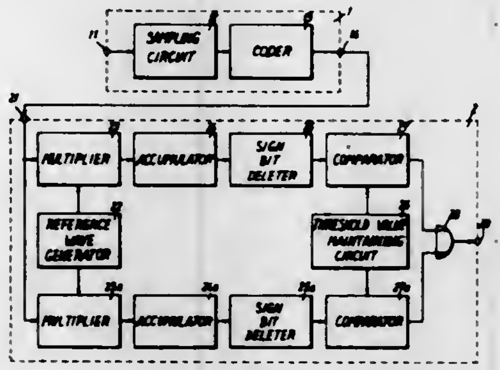
Yasuo Fukata, Mitaka, and Ryoichi Hatsumi, Nagareyama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 14, 1975, Ser. No. 577,155

Claims priority, application Japan, May 17, 1974, 49-55050

Int. Cl.^{2} H04M *1/50*

U.S. Cl. 179—84 VF **4 Claims**



1. In a signal identification system receptive in use of a pulse train representative of an analog signal for detecting a specified frequency component of the analog signal represented by the input pulse train, the improvement of the system comprising:

- input terminal means receptive of an input pulse train representative of an analog signal;
- pulse generation means for generating two reference wave pulse trains each periodic at a specified frequency of a frequency component of the analog signal but displaced in phase by $\pi/2$ from each other;
- two multipliers each connected to said input terminal means and said pulse generation means for receiving and multiplying said input pulse train by said two reference wave pulse trains to each develop an output signal equal to the product of the respective received signals;
- two accumulators each connected to a respective one of said two multipliers for accumulating a respective one of the output signals developed by said two multipliers;
- threshold means controllable for producing an output signal representative of a certain threshold value;
- two comparators each connected to a respective one of said accumulators and both connected to said threshold means for developing an output to identify the presence of said analog signal component of the specified frequency when the absolute value of at least one of the accumulated values exceeds said threshold value; and
- threshold value control means connected to said input terminal means and said threshold means for controlling the threshold value represented by the output signal of said threshold means in accordance with an average DC level of the input pulse train for rendering the outputs developed by said comparators independent of amplitude variations of the input pulse train.

4,001,522
RIBBON TYPE LOUDSPEAKER

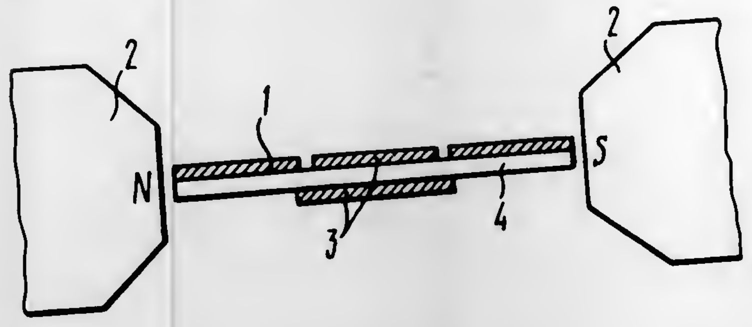
Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabyana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6, korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,417

Claims. priority, application U.S.S.R., Jan. 14, 1975, 2090005

Int. Cl.^{2} H04R *9/02*

U.S. Cl. 179—115 V **1 Claim**



1. A ribbon type loudspeaker comprising:

a. permanent magnets defining a magnetic system; a working gap between pole pieces of said permanent magnets;

b. at least one sound reproducing ribbon extending in the working gap between the pole pieces of said permanent magnets; and a dielectric backing of said sound reproducing ribbon, conductive strips of said sound reproducing ribbon applied onto said dielectric backing parallel with one another, with spaces left therebetween, longitudinally of said sound reproducing ribbon.

4,001,523
RIBBON LOUDSPEAKER

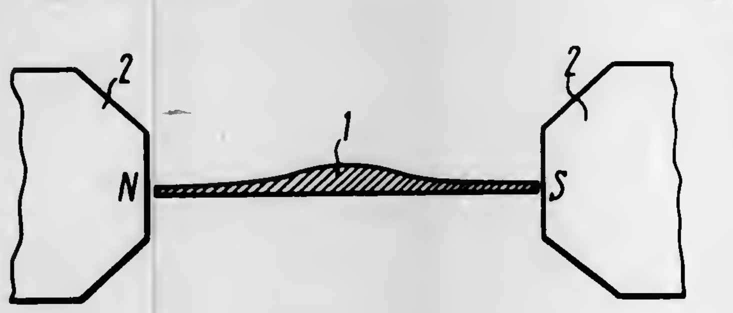
Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabiana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6 korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,545

Claims priority, application U.S.S.R., Jan. 14, 1975, 2090005

Int. Cl.^{2} H04R *9/02*

U.S. Cl. 179—115 V **1 Claim**



1. A ribbon type loudspeaker comprising:

a. permanent magnets defining a magnetic system, a working gap being defined between pole faces of said permanent magnets; and

b. at least one ribbon for sound reproduction having an electrically conductive portion received in said working gap between the pole faces of said permanent magnets, said electrically conductive portion having its thickness increasing from the edges of said sound reproducing ribbon, disposed adjacent to the pole faces of said permanent magnets, toward a maximum at the central portion of said sound reproducing ribbon.

4,001,524
APPARATUS FOR TRANSMITTING AND RECEIVING PULSES

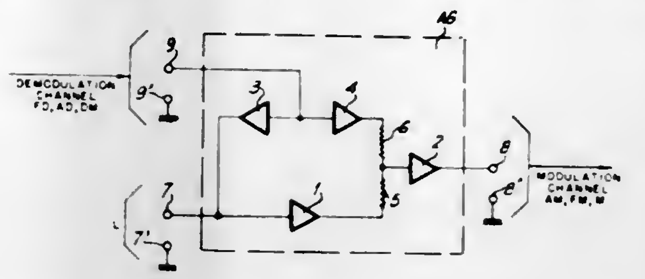
Lucien Pierre Emile Prudhon, Soisy, Seine, and Jean Pierre Georges Charil, Clamart, both of France, assignors to Association des Ouvriers en Instruments de Precision, Paris, France

Continuation of Ser. No. 319,168, Dec. 28, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,575

Claims priority, application France, Jan. 4, 1972, 72.00102; Dec. 8, 1972, 72.43763

Int. Cl.^{2} H04B *1/58*

U.S. Cl. 179—170 T **23 Claims**



1. In a PCM telecommunication system, in combination;

a subscriber line provided with a first terminal;

a modulation channel for signals originating at said subscriber line, said modulation channel being provided with a second terminal;

a demodulation channel for signals to be transmitted to said subscriber line, said demodulation channel being provided with a third terminal;

duplexing means for coupling said channels to said subscriber line while decoupling said channels from each other, said duplexing means comprising a resistance network forming an incoming-signal path from said third terminal to said first terminal, an outgoing-signal path from said first terminal to said second terminal, and a balancing-signal path from said third terminal to said second terminal for cancelling the transmission of signals from said demodulation channel to said modulation channel via said incoming-signal and outgoing-signal paths in series; and

signal-amplifying means including at least one amplifier inserted between said third terminal and said network for preventing the transmission of signals from said first terminal to said third terminal via said incoming-signal path

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4,001,525
ARRANGEMENT FOR TESTING TELECOMMUNICATION REPEATERS

Allan Kendrick Edwards, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,507

Claims priority, application United Kingdom, Dec. 3, 1974, 52248/74

Int. Cl.^{2} H04B *1/60*

U.S. Cl. 179—175.31 R **18 Claims**

1. An arrangement for in-line testing of a telecommunication repeater of the digital regenerator type comprising:

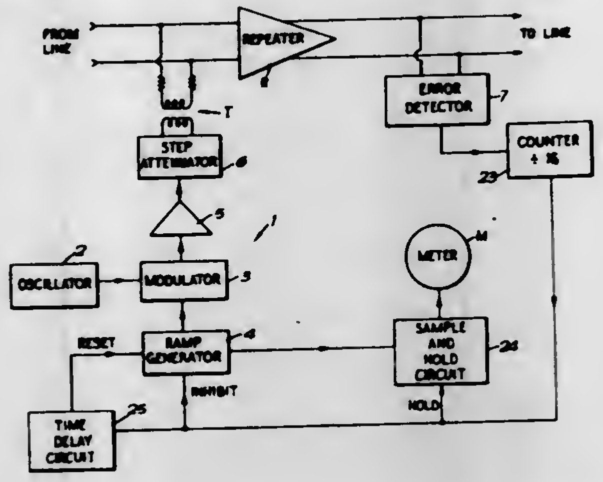
a transmission line for transmitting a digital signal;

a repeater under test coupled into said transmission line to regenerate said digital signal;

a noise generator to generate a noise signal of steadily increasing amplitude;

an impedance transformer coupled to said noise generator and the input of said repeater to superimpose said noise signal on said digital signal;

an error detector coupled to the output of said repeater to produce an error output signal when the amplitude of said noise signal has increased until errors are produced in said digital signal at the output of said repeater; and first means coupled to the output of said error detector and said noise generator, said first means being responsive to



said error output signal for sampling and measuring the voltage amplitude of a signal in said noise generator and to reset said noise generator to zero.

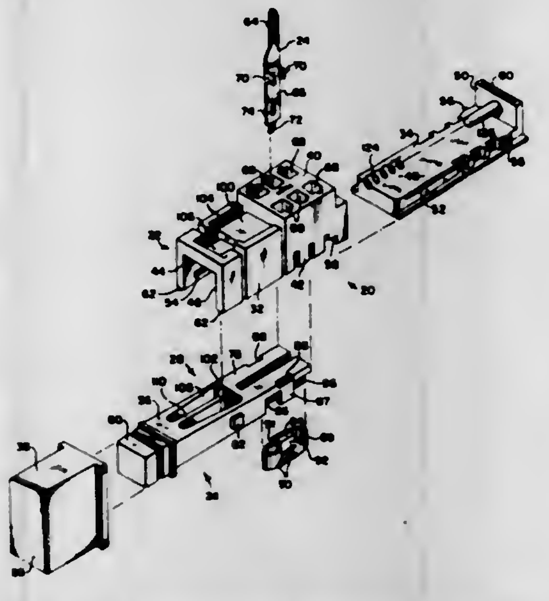
4,001,526
ALTERNATE ACTION SWITCH

Harry W. Olson, Woodridge, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed July 12, 1974, Ser. No. 487,977

Int. Cl.² H01H *15/24*

U.S. Cl. 200—16 D **3 Claims**



1. A switch assembly comprising in combination:

a housing including a main housing member and a housing cover, said main housing member defining an elongated cavity having open ends and an open side wall, said housing cover being engageable with said main housing member for closing said open side and the second of said open ends;

an actuator mounted for sliding movement along said cavity between alternate positions and insertable into said cavity through said open side, said actuator having an operating portion extending from said cavity through a first of said open ends for manual operation of said actuator, said actuator including a plurality of contact recesses formed therein;

a plurality of switch contacts mounted in said contact recesses, said switch contacts including loop portions disposed in said contact recesses and a latch arm extending from said loop portion and engageable with said actuator;

spring means in said cavity for biasing said actuator;

an indexing mechanism defined on said actuator and on said housing for releasably retaining said actuator in said alternate positions; and

a plurality of terminals insertable into said cavity through said housing for engagement by said switch contacts.

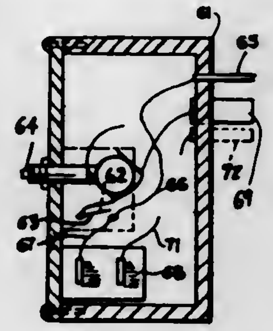
4,001,527
ELECTRICAL TIMER-SWITCH

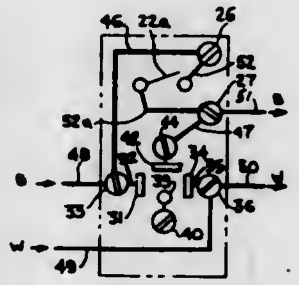
Stephen Joseph Hulshizer, 14 Cedar Hill Road, Hatfield, Pa. 19440

Continuation-in-part of Ser. No. 475,741, June 3, 1974, abandoned, which is a division of Ser. No. 337,831, March 5, 1973, Pat. No. 3,828,224. This application June 13, 1975, Ser. No. 586,732

Int. Cl.² H01H *43/00, 9/00*

U.S. Cl. 200—38 FB **8 Claims**





1. A timer-switch comprising an enclosing casing; an electrical switch supported therein having two electric switch contacts and a movable electricity conducting element for electrically connecting and disconnecting said switch contacts; a clock motor also supported within the casing; mechanical connecting means from the clock motor to said movable conducting element to operate it at a predetermined interval and thereby electrically connect and disconnect said switch contacts; a first prong and a second prong supported by the casing and constituting a pair of conventionally disposed prongs projecting from the casing for entry in a conventional wall electrical outlet; a third prong supported by the casing and projecting in an unconventional position outside of said pair of prongs, a wire connecting said third prong to one of said switch contacts and another wire connecting the other switch contact to said first prong, whereby closure of said switch by said movable element electrically connects said third prong to said first prong.

4,001,528
TIMING MECHANISM

Kenneth E. Deane, Beech Grove; Thomas F. Ring, and Bernard Malott, both of Indianapolis, all of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 21, 1975, Ser. No. 560,986

Int. Cl.² H01H *43/00*

U.S. Cl. 200—38 R **9 Claims**

1. A timer comprising:

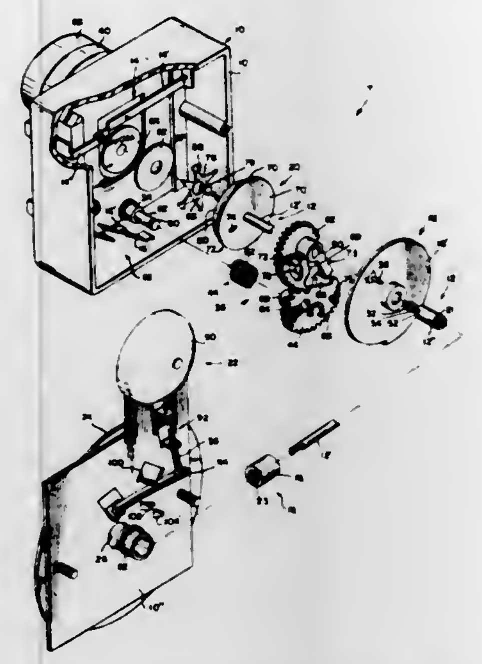
a. a housing,

b. shaft means rotatably journalled in said housing, said shaft means including first and second concentric shafts, said first shaft axially displaceable with respect to said second shaft,

c. constant speed motor drive means carried by said housing and coupling means coupling said motor drive means to said second shaft said coupling means including cooperating noncircular gear means one of which is fixedly carried by said second shaft, the other fixedly carried by an output shaft of said constant speed motor drive means,

d. a first switch means carried by said housing,

e. switch opening and closing means axially displaceable in a first direction in response to an axial displacement of said first shaft so as to open or close said first switch means, and actuator means responsive to the rotation of said second shaft to axially displace said switch opening and closing means in an opposite direction in a programmed sequence so as to open or close said first switch means in accordance with said programmed sequence, and



f. cam means carried by said second shaft and second switch means carried by said housing opening and closing in response to rotation of said cam means.

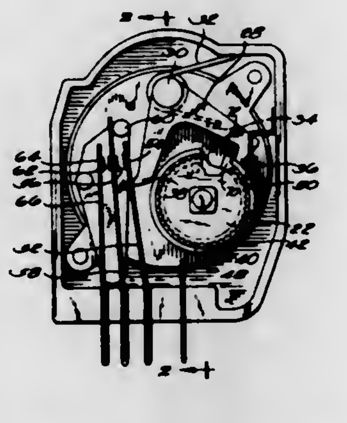
4,001,529
PERCENTAGE TIMER

Joseph J. Mahon, Libertyville, Ill., assignor to The Singer Company, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,303

Int. Cl.² H01H *7/08, 43/10*

U.S. Cl. 200—39 R **10 Claims**



1. A timer including a motor driving a shaft,

a disc cam mounted on and driven by said shaft and being axially movable relative to the shaft,

means biasing the cam to a first position,

a lever including a cam follower biased into engagement with the perimeter of the cam when the cam is in said first position,

means for moving the cam axially on said shaft to a second position in which position the cam moves out from under said follower and the lever moves inwardly of the cam along a face of the cam and engagement of the follower with said face prevents return of the cam to said first position under influence of the cam biasing means,

a switch actuated by said lever when the follower moves inwardly,

and means for returning the follower to the perimeter of said cam and the cam to said first position.

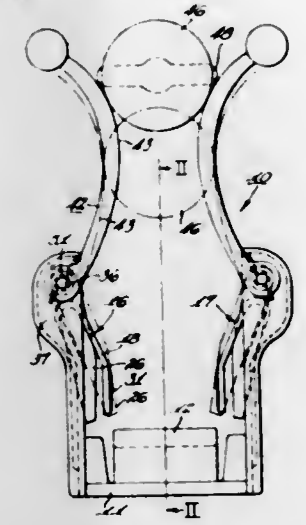
4,001,530
ICE BREAKING DEVICE FOR DISCONNECT SWITCH CONTACT ASSEMBLIES

Calvin E. Redfern, Portland, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 11, 1975, Ser. No. 639,809

Int. Cl.² H01H *31/00*

U.S. Cl. 200—48 A **9 Claims**



1. In a disconnect switch having a contact blade arm movable between an open and a closed position, the contact blade arm including a contact portion,

a contact assembly having a pair of contact sets arranged in spaced apart relationship to receive the contact portion of said blade arm therebetween,

mechanical ice removing means carried by at least one of said contact sets to remove ice from the associated contact set prior to said contact portion of said blade arm entering into contact engagement with said contact sets, and

operating means actuated by the said contact blade arm to operate said ice mechanical removing means.

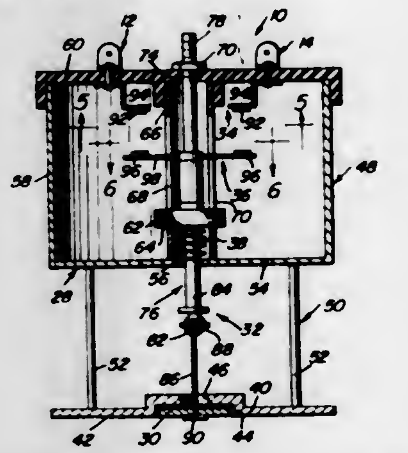
4,001,531
WATER ALARM SWITCH

James R. Crockett, Sr., 3327 Zuni Circle, Las Vegas, Nev. 89109

Filed May 22, 1975, Ser. No. 579,891

Int. Cl.² H01H *29/00*

U.S. Cl. 200—61.04 **7 Claims**



1. A water responsive switch, comprising, in combination:

a. a support frame;

b. a water-soluble element arranged abutting the frame;

c. a member anchored on the water-soluble element and arranged biasing the element against the frame;

d. two electrical contact means, with one of the contact means, being affixed to the frame and the other of the contact means affixed to the member, the member being arranged extending toward the one of the contact means, both of the contact means including a pair of spaced points, the points of one of the contact means matched with the points of the other of the contact means for mating engagement by the points when the switch is in its closed mode, and lugs connected to the points of the one of the contact means for connecting the one of the contact means into an external electrical alarm circuit, a contactor blade affixed to the member with the points of the other of the contact means being mounted on the blade and electrically connected together for bridging the points of the one of the contact means when the switch is in its closed mode; and

e. resilient means engaging the member and the frame for biasing the member toward the one of the contact means and bringing the other of the contact means into contact means into contact with the one of the contact means whenever the water-soluble element is loosened and releases the member, the member being arranged for movement relative to the frame.

4,001,532
SEAT BELT BUCKLE SWITCH HAVING SLIDABLE ACTUATOR AND BRIDGING CONTACT WIRE

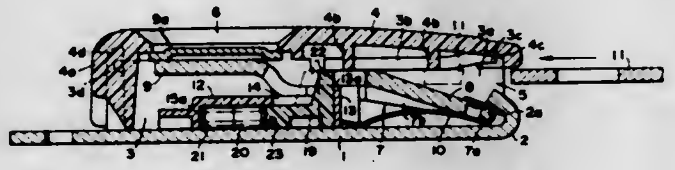
Tatsushi Kubota, and Akinori Fujiwara, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Aichi and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai, Aichi, both of, Japan

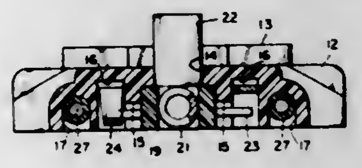
Filed June 20, 1975, Ser. No. 588,632

Claims priority, application Japan, June 21, 1974, 49-73597[U]

Int. Cl.² H01H *3/16, 1/36;* **A44B** *19/00*

U.S. Cl. 200—61.58 B **5 Claims**





1. A seat belt buckle having a switch assembly comprising:

a bottom plate having a pair of upstanding walls extending from the opposite sides thereof respectively;

a buckle cover adapted to be snugly fitted on and fixed to said bottom plate to constitute together with said bottom plate a buckle casing having an internal space therein, said buckle casing being provided at one end thereof with an opening for the insertion of a tongue plate, said buckle cover being provided in the top wall thereof with a slot for the unlocking manipulation on said tongue plate inserted through said insertion opening;

a switch bracket having an open bottom and fixed to said bottom plate within the internal space of said buckle casing, and including a pair of stationary contact strips secured to said switch bracket, and a longitudinal guide slot bored in the top wall of the switch bracket;

a slider mounted to said switch bracket to be slidable relative to said switch bracket in the longitudinal direction thereof and having a contact pin extending therethrough and protruding from the opposite side surfaces thereof in a direction substantially normal to the longitudinal axis thereof, an upstanding knob formed at the front end of said slider and projecting through the longitudinal guide slot bored in said switch bracket into an interference contact position with said tongue plate to be inserted and a longitudinal cut-out formed between a pair of side wall portions of the rear end of said slider;

a coiled compression spring means disposed between the inner end of said cut-out in said slider and the rear wall of said switch bracket for urging said slider normally to be maintained in one of two predetermined positions, whereby with the insertion of said tongue plate through said insertion opening of said buckle casing, said knob is engaged and urged by the leading end of said tongue plate to be moved along said guide slot and simultaneously said slider being moved in a parallel direction with the movement of the inserted tongue plate relative to said switch bracket to the other of said predetermined position against the force of said spring means thereby bringing said protruding contact pin to the other of said predetermined positions; and

a locking lever for locking said tongue plate in inserted position, said locking lever being provided with means for receiving an unlocking force imparted thereto for the purpose of unlocking said inserted tongue plate from the locked position.

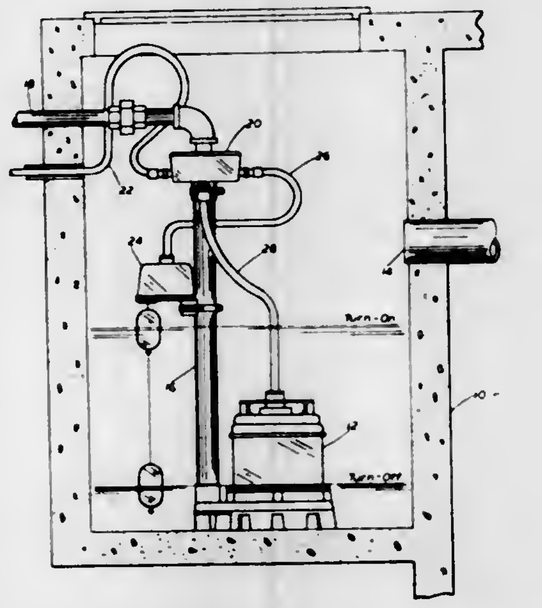
4,001,533
SEALED LEVEL CONTROL SWITCH FOR SUMP PUMPS

William James Conery, and Donald D. Smith, both of Ashland, Ohio, assignors to Robert M. Keener, Ashland; McNeil Corporation, Akron and George T. Buskirk, Hayesville, all of Ohio

Filed Jan. 20, 1975, Ser. No. 542,228

Int. Cl.² H01H *35/18*

U.S. Cl. 200—84 C **4 Claims**



1. In a control for an electrically powered sump pump, a sealed non-magnetic material housing having power leads connected to the interior thereof and being adapted to be positioned within a sump at an upper portion thereof, said housing having a downwardly open cup-shaped section and a base section extending across the open end of said cup-shaped section, and characterized by a normally open microswitch connected to said power leads to control current flow, said microswitch having a spring control arm extending therefrom for movement in a vertical plane and for closing said switch when said control arm is moved toward said switch, said housing having a downwardly facing tubular recess formed therein directly vertically below said control arm, said housing base section having a wall portion extending vertically upwardly to form said recess which is open at its lower end and closed at its upper end, a pair of cooperating permanent magnet and magnetic members the first of which is secured to said control arm and the second of which is positioned in said recess for controlled vertical movement therein, said magnet and magnetic members being positioned in adjacent but spaced vertical relation, a non-magnetic coil spring engaging the second of said members to urge it toward the upper end of said recess, a non-magnetic cable attached to said second member, and displacement weight means attached to spaced portions of said cable to pull said second member downwardly and release the switch arm to open said switch under low water conditions and enable said switch to be closed under high water conditions that permit said second member to move to a point adjacent the upper end of said recess and have attraction between said members pull said control are downwardly.

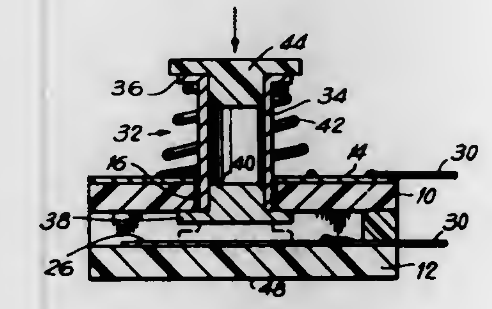
4,001,534
SWITCH ASSEMBLIES

James E. Temple, 24 Spruce Ave., Bethpage, N.Y. 11714

Filed June 27, 1975, Ser. No. 591,156

Int. Cl.² H01H *13/52*

U.S. Cl. 200—160 **11 Claims**



1. An electrical switch structure comprising a pair of electrically non-conductive sheets and an electrically non-conductive spacer means situated between and engaging said sheets to maintain them apart from each other with inner surfaces of said sheets respectively directed toward each other, one of said sheets being formed with an opening passing therethrough and said spacer means being clear of an inner surface region of said one sheet which surrounds said opening thereof as well as an inner surface region of the other sheet which is directed toward said opening of said one sheet, an elongated electrically conductive switch-operating means extending freely through said opening of said one sheet so as to be movable with respect to said one sheet and having inner and outer, electrically conductive enlarged head ends larger than said opening and respectively situated at opposite sides of said one sheet, and said inner electrically conductive enlarged head end being situated between said sheets, said inner head end having a thickness smaller than the space between said sheets so as to be movable in said space between said sheets, electrically conductive spring means surrounding said elongated switch-operating means and extending between said one sheet and said outer enlarged head end of said switch-operating means for urging said inner enlarged head end thereof toward said inner surface region of said one sheet which surrounds said opening thereof, and a pair of electrically conductive coatings forming part of an electrical circuit, one of said coatings being carried by an outer surface of said one sheet in engagement with said electrically conductive spring means and the other of said coatings being carried by one of said inner surface regions of said sheets to be engaged by said inner enlarged head end of said switch-operating means, whereby said switch-operating means may be moved in opposition to said spring means to displace said inner enlarged head end away from said one sheet toward said other sheet to change the relationship between said inner enlarged head end of said switch-operating means and said other coating so as to change the condition of a circuit of which said coatings form a part.

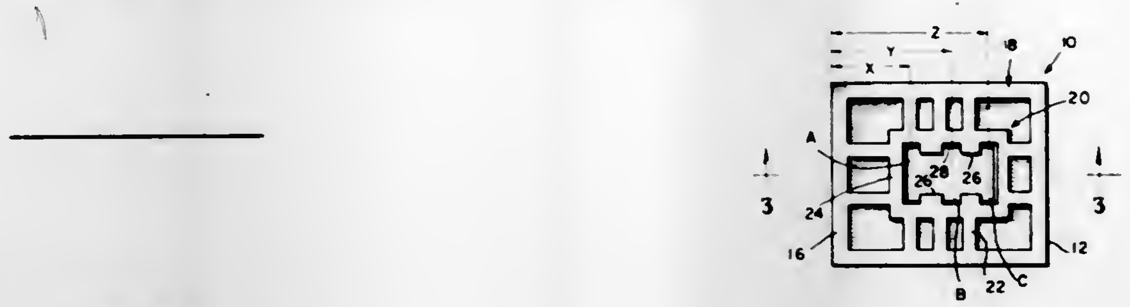
4,001,535
MULTI-STATION PUSH BUTTON FOR GAS SWITCHES

Charles E. Scott, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 11, 1975, Ser. No. 600,241

Int. Cl.² H01H *13/14*

U.S. Cl. 200—340 **4 Claims**



1. A multi-station push button comprising:

a. an outer case having side walls,

b. a compartment carried within said case having at least two side walls in spaced parallel relationship,

c. means attached to and distinguishable from said compartment side walls which by itself divides said compartment into successive in-line adjacent stations for receiving any one of plurality of switch actuators with various center distances therebetween, said means located along said compartment side walls such that a first station is disposed a predetermined distance from one wall of said case side walls, the next two of said stations being spaced from said first station in-line such that the ratios of the distance from the centerlines of said next two in-line stations to said one wall to the distance from the centerline of said first station to said one wall are about 1.5 and 2.0 respectively.

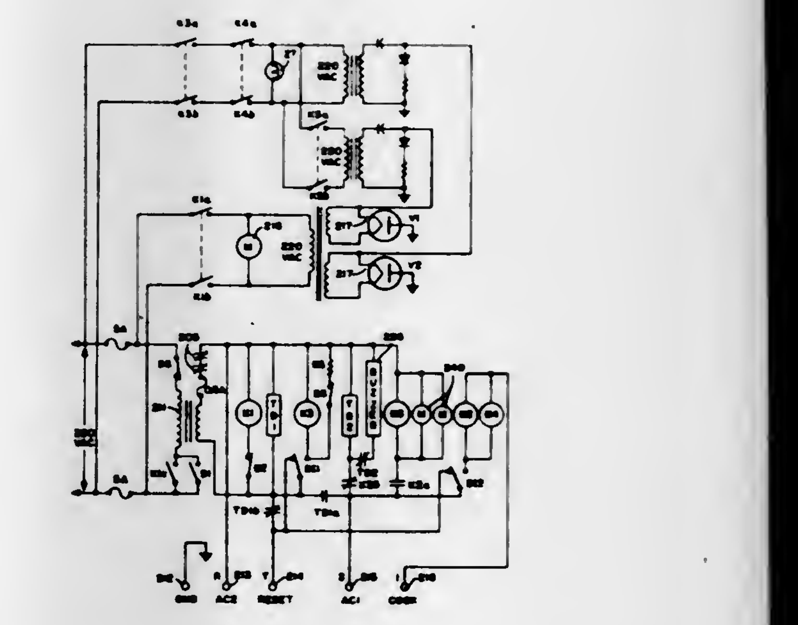
4,001,536
MICROWAVE OVEN CONTROLS

Mark Edward Eberhardt, Jr., Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Feb. 14, 1975, Ser. No. 549,922

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **12 Claims**



1. A control circuit for controlling the operating cycle of an appliance comprising:

oscillator means for providing an oscillating signal which alternates between two voltage levels,

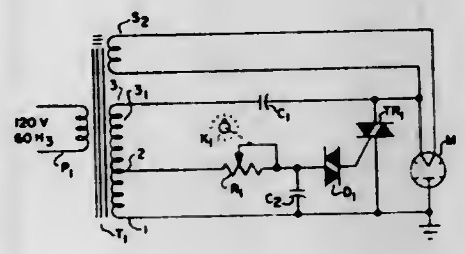
a plurality of touch plate means receiving said oscillating signal, each said touch plate means providing said oscil-

lating signal at its output when untouched and providing at its output a modified oscillating signal when touched. said modified oscillating signal having an increased minimum voltage level.
detector means connected to the outputs of said plurality of touch plate means for detecting application of an oscillating signal having an increased minimum voltage level, and
timing means connected to said detector means for setting the operating cycle of said appliance in response to the touching of one of said plurality of touch plate means.

4,001,537
POWER CONTROLLER FOR MICROWAVE MAGNETRON

Robert Virgil Burke, and Thomas Eugene Hester, both of Fort Wayne, Ind., assignors to Litton Systems, Inc., Huntington, Ind.

Filed July 24, 1975, Ser. No. 598,865
Int. Cl.² H05B ***9/06***
U.S. Cl. 219—10.55 B **8 Claims**

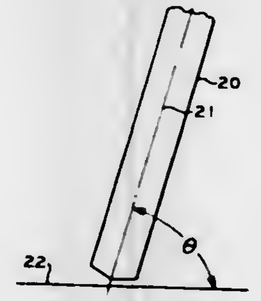


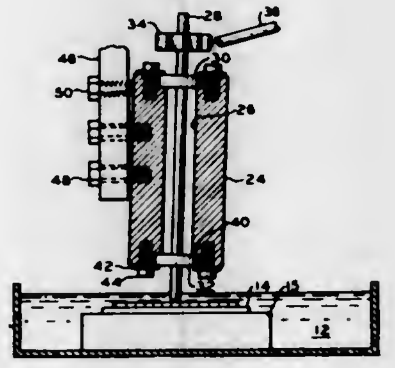
1. An adjustable power operating circuit for a microwave magnetron in a microwave oven, said magnetron having an anode terminal and a pair of heater-cathode terminals, and possessing unidirectional current-conducting characteristics between the anode and cathode thereof and operative to generate microwave frequency energy responsive to the application of a voltage of magnitude V_m volts between the anode and cathode thereof in which the polarity of such voltage is negative at said cathode, comprising:
a high leakage reactance transformer containing a primary winding, a low voltage secondary winding and a high voltage secondary winding;
said primary winding being adapted for connection to an AC voltage source, which voltage is sinusoidally varying in polarity and of a period T;
said low voltage secondary winding being connected in circuit with said heater terminals for supplying current thereto;
said high voltage secondary winding for stepping up the voltage of said primary to a high AC voltage V_s, where V_s is less than V_m volts, appearing thereacross;
said high voltage secondary winding including a tap for providing a low AC voltage representative of the high AC voltage across said secondary winding;
capacitor means;
means connecting said secondary winding, said capacitor means and said magnetron in electrical series circuit;
electronic switching means, said electronic switching means having first and second main current-conducting terminals and a gate terminal, and possessing the characteristic of being responsive to a trigger voltage applied to its gate electrode for switching into an electrically conductive state substantially instantaneously relative to one-half the period of said AC source and which restores to the electrically nonconductive state responsive to the instantaneous value of current therethrough reducing to zero;
said first and second main terminals being connected, respectively, in circuit with said anode and cathode terminals, respectively, of said magnetron to place said electronic switching means in shunt of said magnetron;
phase shifting circuit means having an input and an output for introducing a phase shift between an AC signal applied at said input and an AC signal as appears at said output, said phase shifting circuit including:
adjustable means for permitting selective adjustment of the amount of said phase shift;
an accessible positionable control member;
scale means associated with said control member for visually representing power levels as a function of the position of said positionable control member; and
means coupling said control member to said adjustable means to permit adjustment of said adjustable means as a function of the position of said control member;
means connecting said input of said phase shifting circuit to said tap on said secondary for providing an AC voltage to said input;
triggering means coupled to said gate terminal and to said output of said phase shifting network responsive to the output of said phase shifting network attaining a predetermined level during each AC cycle at a time when voltage at the magnetron heater-cathode is positive relative to the anode for providing a trigger voltage pulse at least once during each AC cycle to said gate terminal of said electronic switching means; whereby said capacitor may be charged to a voltage during the half cycle of AC which voltage is additive with the voltage V_s in the next succeeding half cycle and the sum of which voltages is at least equal to V_m volts.

4,001,538
METHOD AND APPARATUS FOR PRODUCING SMOOTH SURFACES

Arnold Michalski, Piedmont, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Apr. 17, 1975, Ser. No. 569,331
Int. Cl.² B23P ***1/08***
U.S. Cl. 219—69 M **24 Claims**



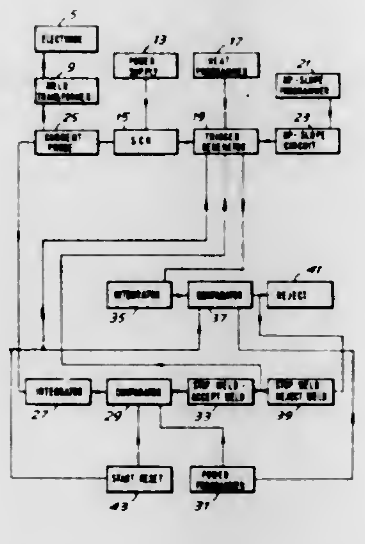


1. A method for producing a continuously smooth surface on a metal workpiece having an irregular surface comprising a nonsmooth area bordered by a smooth area, which method comprises:
electrically removing metal from said nonsmooth area and said bordering smooth area by subjecting said areas to electrical discharge machining with one end of an electrode which is rotating about its axis and which is inclined at an acute angle, measured between said electrode axis and said workpiece, within the range of from 85° to 89.4°; and
thereby blending said nonsmooth area into said smooth area.

4,001,539
CONTROL SYSTEMS FOR WELDING MACHINES

Adriano Franchi, and Paolo Brandani, both of Tavarnelle Val Di Pesa (Florence), Italy, assignors to Axis S.p.A., Tavarnelle Val Di Pesa (Florence), Italy

Filed Nov. 12, 1974, Ser. No. 523,278
Claims priority, application Italy, Nov. 13, 1973, 9679/73
Int. Cl.² B23K ***11/24***
U.S. Cl. 219—110 **4 Claims**

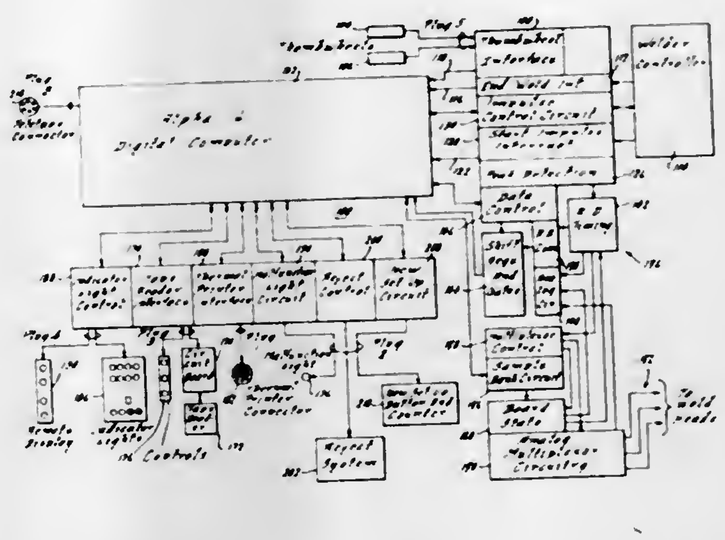


1. In a welding machine having welding electrodes an electronic control system comprising
an electrical supply source,
a current control unit connected to supply current from said supply source to the welding electrodes and having a control input for controlling current fed to the welding electrodes,
a pulse generator connected to supply control pulses to said control input of said control unit so that by varying the phase shift of the pulses, the current fed to the welding electrodes is also varied,
sensing means connected to sense the instantaneous current consumed by the welding electrodes and arranged to provide an output in dependence thereon,
integrating means connected to receive the output from said sensing means and arranged to provide an output indicative of the total current supplied to the welding electrodes,
means for generating a reference signal,
comparison means for comparing the reference signal with the output from said integrating means and operative when equality is reached to inhibit the supply of control pulses from said pulse generator to the current control unit, and simulating means having
first means connected to receive a signal from said pulse generator and operative in response thereto to provide an output representative of the total power that the welding electrodes would be expected to consume as a result of the control pulses,
second means responsive to the output of said first means and said reference signal and operative to generate an output when equality is detected, and
third means responsive to the output of said second means and said comparison means to generate a fault indicating signal and to inhibit said pulse generator when the output of said second means occurs prior to the output of said comparison means.

4,001,540
WELDING MONITORING AND CONTROL SYSTEM

Charles J. Drake, Detroit, and John F. Farrow, Ypsilanti, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Dec. 18, 1974, Ser. No. 534,341
Int. Cl.² B23K ***11/24***
U.S. Cl. 219—110 **10 Claims**



1. In combination, a welding control system and a pulse welder having a welding cycle including heat portions and and cool portions, the pulse welder including at least one welding head, a source of welding pulses, a standard control circuit connected between the source and the welding head for controlling the application of alternate of the heat and cool portions to a welding load by controlling the number of welding pulses fed to the load during the heat portion and the duration of the cool portion, the standard control circuit including means for generating a series of clock pulses for controlling the duration of the heat and cool portions of the welding cycle of the load by counting a preselected number of clock pulses in the heat and cool portions of the cycle, and means connected to the standard control circuit for altering the duration of the heat and/or cool portions of the cycle cunted by the standard control, the improvement comprising start means for sensing the start of the weld, sensing means for sensing a first set of voltage and current characteristics flowing in the load during a heat portion, means for generating a standard impedance characteristic from said sensed first set of voltage and current characteristics flowing in the load and storing said standard characteristic, an interface circuit connected to the current and voltage sensing means and said impedance characteristic generating means for feeding the voltage and current signals to said impedance characteristic generating means, said sensing means sensing and feeding a second set of voltage and current characteristics to said impedance characteristic generating means, said generating means generating a sensed impedance characteristic from said second set for each pulse in said second set of said voltage and current characteristics, means for comparing said sensed impedance characteristics of each pulse of the weld with the standard impedance characteristic and generating an altering signal for each pulse in said second set when the sensed impedance characteristic is not within the standard characteristics, altering means connected to the standard control for altering the heat and/or cool portions to maintain said sensed impedance characteristic within limits of said standard characteristic, and new standards generating circuit means for generating a new standard impedance characteristic from said second set of voltage and current characteristics and said first set of characteristics, and means for altering the weight of said standard characteristic relative to each sensed impedance characteristic.

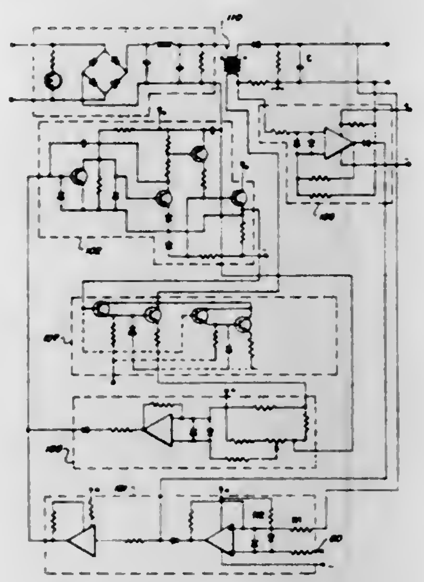
4,001,541
FLASH FUSING SYSTEM WITH ENERGY CONTROL

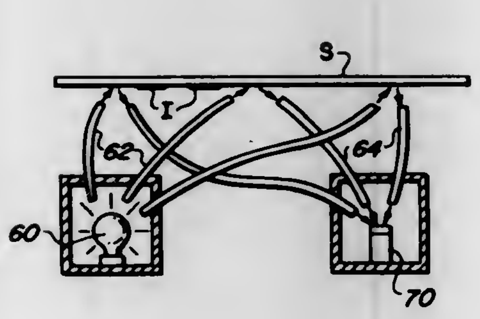
Gilbert J. Hatch, Walworth, N.Y.; Richard C. Johnson, Pasedena, Calif., and Ihor Kulbida, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 11, 1975, Ser. No. 585,944

Int. Cl.² G03G *15/20*

U.S. Cl. 219—216 **5 Claims**





1. An improved flash fusing system for fusing toner images onto support material comprising:
flash lamp means,
means for advancing support material bearing loose toner images along a path past said flash lamp means;
a power supply means coupled to said flash lamp means including a transformer means having a secondary winding coupled to a chargeable capacitor means for energizing said flash lamp means and means for sensing the energy on said capacitor means; and
sensing means for sensing the density of toner images on the copy sheets advanced and producing signals directly proportional to the total reflectivity of the toner images and transmitting said signals to the power supply means for controlling the charge on said capacitor means to a predetermined level.

4,001,542
METHOD AND APPARATUS FOR FORMING A STREAM FEEDER

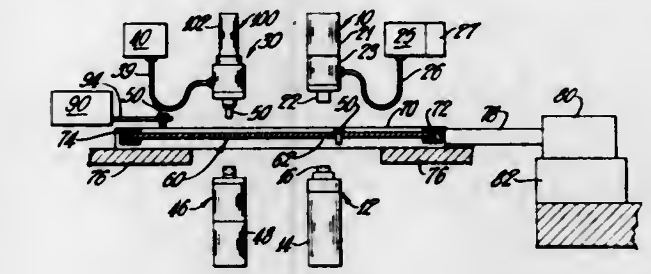
Ronald O. McCormick, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 13, 1975, Ser. No. 586,837

Int. Cl.² B23K *11/00*

U.S. Cl. 219—117 R **18 Claims**

1. The method of forming an orificed container for flowing streams of molten glass comprising:
a. successively punching apertures through a plate with each of the apertures being punched through the plate from the same first side; and
b. deforming the plate immediately adjacent each of the apparatus at the second side of the plate before punching succeeding apertures from the first side to such an extent that bowing of the plate otherwise occurring from the punching is essentially negated, thereby keeping the plate flat.



4,001,543
APPARATUS FOR A LASER WELDING OF A PIPELINE, PARTICULARLY SUITABLE FOR APPLICATION ON PIPE-LAYING SHIPS

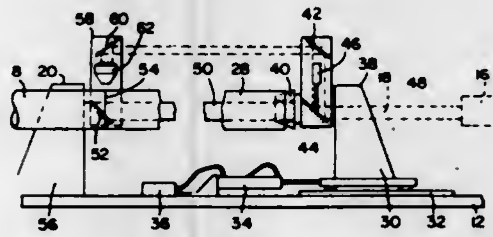
Ottavio Bove, San Donato Milanese; Galeazzo Grossi, Spino D'Adda, both of Italy, and David William Kirkley, Kingston upon Thames, England, assignors to Saipem S.p.A., Milan, Italy and BOC Limited, London, England

Filed Apr. 11, 1975, Ser. No. 567,107

Claims priority, application Italy, Apr. 11, 1974, 21279/74; Mar. 13, 1975, 21222/75

Int. Cl.² B23K *26/00*

U.S. Cl. 219—121 L **26 Claims**



1. An apparatus for welding a pipe spool to a pipeline from the inside and/or from the outside of the pipe spool to be welded, particularly suitable for application on pipelaying ships or barges, which apparatus comprises a stand fixed relative to the pipeline for supporting and securing one end of the pipeline; means for aligning a pipe spool with the secured pipeline end and for maintaining one end of the spool in contact with the pipeline end; means for holding the axis of the spool coaxial with that of the pipeline; at least one laser source arranged to direct a beam of coherent radiation along the axis of the pipeline, and means for rotating at least one reflecting surface positioned in the path of the beam so that the laser beam, after reflection from the surface falls substantially radially on the abutting pipe ends and is caused to make at least one complete revolution about the pipeline axis, the energy of the beam being such that it is able to weld the abutting pipe ends together by fusion.

4,001,544
APPARATUS FOR FIXING ELECTROPHOTOGRAPHIC IMAGES

Paul Heinzer, and Helmut Wulz, both of Zurich, Switzerland, assignors to Wifo Wissenschaftliches Forschungs-Institut A.G., Zurich, Switzerland

Filed Nov. 8, 1974, Ser. No. 522,127

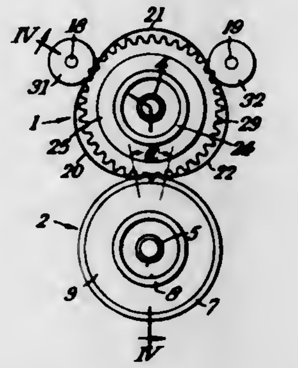
Claims priority, application Switzerland, Nov. 16, 1973, 16142/73; Oct. 4, 1974, 13384/74

Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **22 Claims**

1. An apparatus for fixing electrophotographic images carrying toner powder imposed on image-bearing sheets which

comprises, a housing, a fixing roller rotatably mounted in said housing, a counter roller rotatably mounted in said housing, means for rotating the counter roller and the fixing roller associated therewith, said fixing and counter rollers being disposed substantially parallel with respect to each other and defining therebetween a nip for the passage of said sheets between said rollers, said rollers having tubular shells which remain in contact with said sheets throughout their passage through said nip and the shell of said fixing roller being made of a thin, resiliently deformable material of high thermal conductivity, a heating means disposed within the fixing roller and pressure means for urging the shell of said fixing roller towards the counter roller and operative to deform said shell to provide, in the absence of a sheet in said nip, a zone of contact between the shells of said rollers which extends over a substantial angular range.



4,001,545
DEVICES FOR CONTROLLING THE HEATING OF FUSER ROLL APPARATUS

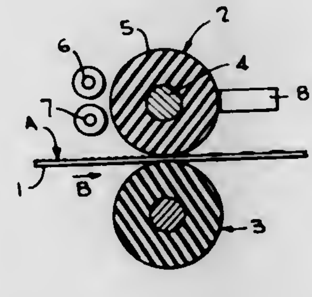
Kenichi Wada, Sakai; Yuji Enoguchi, Higashiosaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai, and Hiroshi Murasaki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1975, Ser. No. 581,437

Claims priority, application Japan, June 15, 1974, 49-68288

Int. Cl.² G03G *15/20*

U.S. Cl. 219—216 **5 Claims**



1. Apparatus for controlling the heating of fuser roll mechanisms in an electrophotographic copying machine, comprising:
a pair of rollers including a fuser roll and a pressure roll for passage therebetween of a supporting sheet bearing toner powder image thereon;
at least first and second heating means for heating substantially the entire surface of said fuser roll to temperatures suitable for fusing the toner image on the supporting sheet, said first heating means being mounted along the axis of said fuser roll to heat at least the central portion of said fuser roll and said second heating means being mounted concentrically and transversely to the axis of said fuser roll to heat at least the end portions of said fuser roll;
at least first and second detecting means for detecting surface temperatures of said fuser roll, said first detecting means being adapted to detect the temperature of the central portion of said fuser roll and said second detecting means being adapted to detect the temperature of the end portions of said fuser roll; and
control means connected to said first and second detecting means for controlling said first and second heating means individually whereby substantially the entire surface of said fuser roll is maintained at said suitable temperature.

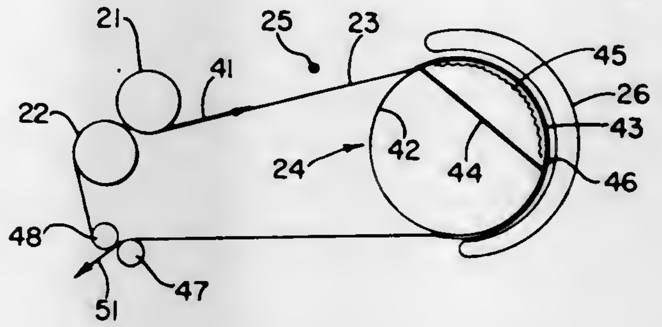
4,001,546
FILM THERMAL PROCESSING

Olof C. Johnson, Jr., Chelmsford; Robert E. Whitney, and Dieter K. Froehling, both of Burlington, all of Mass., assignors to Eikonix Corporation, Burlington, Mass.

Filed July 14, 1975, Ser. No. 595,892

Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **9 Claims**



1. Thermal developing apparatus comprising,
electrically and thermally conductive drum means having a heated developing segment,
belt means relatively moveable with respect to said drum means for carrying film to be developed across said heated developing segment,
and means for establishing an electrostatic field for producing electrostatic forces and static electricity on the belt means that keep the film to be developed in firm contact with said belt means as the latter carries the film around a portion of said drum means including said developing segment to uniformly develop the film.

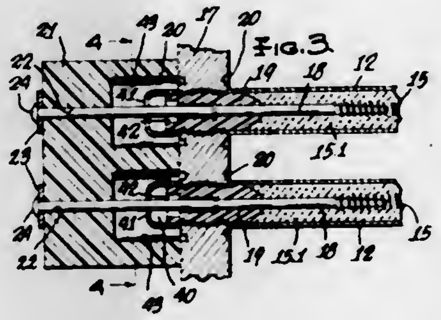
4,001,547
ELECTRIC HEATING ELEMENTS

Alben C. Boggs, and Robert D. Shirey, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 642,682

Int. Cl.² F24H *1/00*

U.S. Cl. 219—322 **9 Claims**



1. In an electric immersion heating element having a metal sheath, a resistance conductor within said sheath and electrically insulated therefrom, said resistance conductor having a terminal end partly within an outer end portion of said sheath and extending outwardly of an open end of said sheath at said end portion, said heating element also having a metallic mounting member mechanically and electrically connected to said sheath at said outer end portion, said mounting member being connectable to the metal wall of a grounded container in electrical continuity therewith, said mounting member supporting said sheath for extension through an opening in said wall so that an inner portion of said sheath is immersed in fluid within said container, the improvement comprising:

means for protecting said heating element from damage in the event the latter is subjected to voltage which is in excess of its range of normal operating voltage, said protecting means comprising a spark gap between said sheath outer end portion and said terminal end of said resistance conductor, said gap being of a size to conduct voltage only when said conductor terminal end is subjected to voltage beyond the range of the normal operating voltage of said heating element, whereby the voltage so conducted is harmlessly led to ground via said sheath, said mounting member and said container, without damage to said heating element.

4,001,548

HEATING APPARATUS FOR THE HEAT TREATMENT OF YARNS

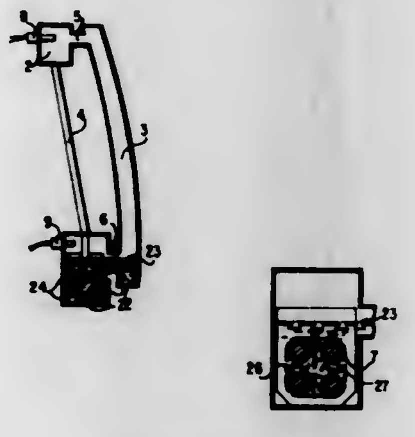
Karl Bauer, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Sept. 20, 1974, Ser. No. 507,779

Claims priority, application Germany, Sept. 26, 1973, 2348371

Int. Cl.² H05B *3/00*; **F27B** *9/08*; **D02J** *13/00*; **F28D** *15/00*

U.S. Cl. 219—388 **7 Claims**



1. Heating apparatus for the heat treatment of synthetic yarns having a substantially closed liquid-vapor system operable under the vapor pressure of an evaporable and condensable heat-transfer medium, comprising an evaporator member extending in axial direction of the apparatus, filled at least partly with liquid heat transfer medium; electric resistance heating elements extending axially through said member; a plurality of yarn-heating, substantially vertical tubes having heat conductive, yarn-heating surfaces heatable by the vapors of the heat transfer medium for the heat treatment of the yarns passing along said surfaces; a condenser above and positioned substantially parallel to the evaporator member, for collecting the condensed heat transfer medium vapors; branch tube means for the communication of all of the respective tubes with both the evaporator member and the condenser for flow of vaporized heat transfer material from said evaporator member to the condenser through said tubes; and at least one return line for returning condensate collected in the condenser to the evaporator member, the improvement comprising at least several, axially spaced, baffleplate walls positioned transversely in the evaporator member with openings therein through which extend said heating elements, passage means providing liquid communication between the spaces in said evaporator member between the baffle plates, the baffle-plate walls extending upwardly beyond the phase boundary between the liquid heat transfer medium and the vapor space in said evaporator member, and said baffle plate walls being at least substantially coextensive with the entire, liquid moistened, cross section of the evaporator member which is axially traversed by said heating elements for effectively damping any local pressure waves created between the adjacent baffle-plate walls.

4,001,549

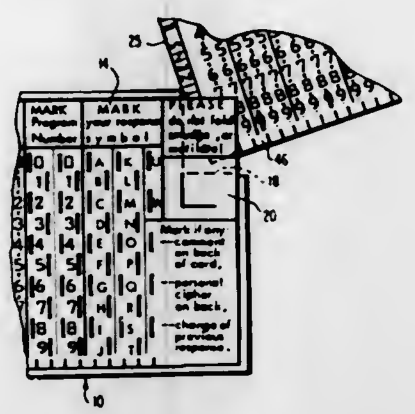
MARKING DOCUMENT AND TEMPLATE ASSEMBLY AND METHOD OF MAKING THE ASSEMBLY

Edward J. Corwin, 200 Central Park South, Apt. 15B, New York, N.Y. 10019

Continuation-in-part of Ser. No. 151,676, June 10, 1971, abandoned. This application May 26, 1972, Ser. No. 257,298

Int. Cl.² G06K *19/06*

U.S. Cl. 235—61.12 R **3 Claims**



1. In combination:

a. A document having a plurality of vertical data columns and a column of sequential indicia identifying a plurality of horizontal document rows, each data column comprising a plurality of vertically-spaced marking areas corresponding to respective ones of said sequential indicia and adapted to be manually marked, the marking areas corresponding to vertically adjacent ones of said indicia being located on opposite sides of an imaginary vertical line dividing said data column into two marking columns, and the vertically adjacent marking areas in each marking column being vertically displaced from each other by a distance substantially equal to the vertical dimension of a marking area; the marking areas corresponding to respective ones of said indicia being horizontally aligned in respective ones of said document rows; and

b. A marking template assembly for use with said document and comprising: a document-supporting base member, a template hinged to one end of said base member and adapted to overlie a document supported on said base member, a plurality of vertical template columns corresponding to said data columns on said document, and two columns of horizontally staggered marking openings in each template column, the positions of said openings corresponding to the positions of the marking areas on said document; said base member being substantially rectangular and further comprising an upstanding rim formed on all four sides thereof to form a cavity for receiving the document and aligning the marking areas on the document with the marking openings in the template.

4,001,550

UNIVERSAL FUNDS TRANSFER AND IDENTIFICATION CARD

Vernon L. Schatz, 250 Sunset Ridge Road, Northfield, Ill. 60093

Filed Dec. 4, 1975, Ser. No. 637,712

Int. Cl.² G06K *5/00*, *19/06*; **G11C** *11/02*

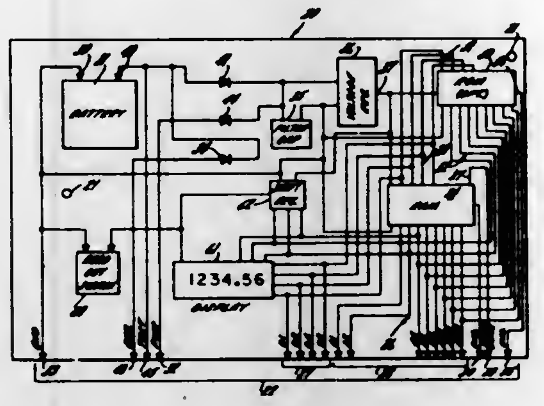
U.S. Cl. 235—61.7 B **13 Claims**

1. In a universal funds transfer and identification card for use with electronic terminals adapted to perform transactions and produce signals for carrying out and recording said transactions, the improvement comprising, random access memory means in said card for storing information including the following changeable information:

account balance,

total amount of transactions since last update of card,

and date of last update; connecting means along a single edge of said card adapted to mate said terminal for coupling signals between said card and said terminal, and means coupling said connecting means to said random access memory means for selectively addressing fields within said memory means and transferring data between addressed fields and said terminal, whereby said card serves as an up to date record of said account.



4,001,551

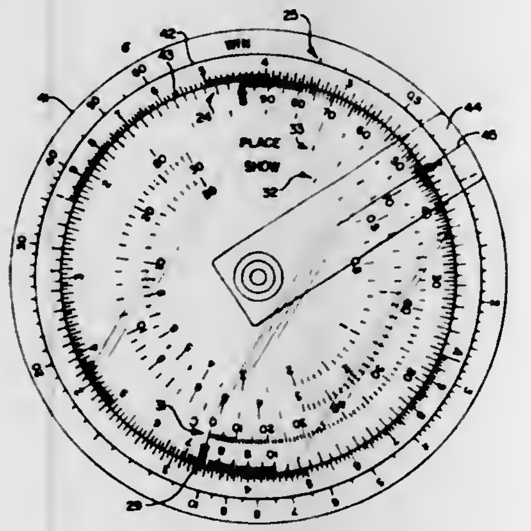
CALCULATOR

Paul A. Hirsimaki, 4106 Decatur St., Hyattsville, Md. 20781

Continuation-in-part of Ser. No. 450,758, March 13, 1974, abandoned. This application Nov. 1, 1974, Ser. No. 520,155

Int. Cl.² G06G *1/10*

U.S. Cl. 235—70 A **8 Claims**



1. A calculator for calculating the odds for a selected entrant in a predetermined wagering pool for one of the different winning positions in the pari-mutuel system of wagering from a knowledge of the total amount of money wagered in said predetermined wagering pool and the amount of money wagered on each of the pool profit sharing entrants, comprising:

a first member having first indicia thereon representative of amounts wagered on each said entrant and the total amount wagered in said pool;

a second member movable relative to said first member, said second member having second indicia thereon for cooperating with said first indicia to determine the percentage of said total amount wagered on one or more of said entrants, said second member further including odds indicia representative of at least one of said different winning positions;

a third member movable relative to said first and second members, said third member having indicia thereon representative of the percentage of amounts wagered on the other entrant or entrants sharing said predetermined wagering pool with said selected entrant, said third indicia including an index; and

a cursor movable relative to said first, second, and third members, said cursor having a hairline thereon, said first, second, third, and odds indicia being positioned on said calculator such that when said total amount wagered in said predetermined pool as shown on said first indicia is set adjacent the one hundred percent index on said second indicia, the third indicia index is set adjacent the amount wagered on said selected entrant as shown on said first indicia, and the cursor hairline is set on the percentage of preselected pool-sharing wagers for entrants expected to share in the pool with the entrant of interest on said third indicia, the odds for said selected entrant will be indicated by said hairline on said odds indicia.

4,001,552

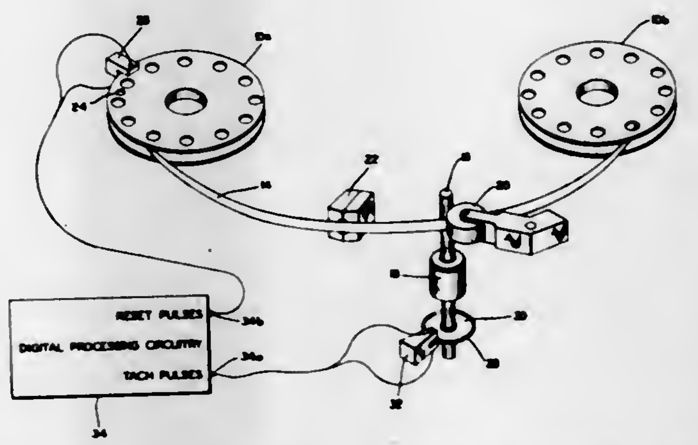
METHOD AND APPARATUS FOR MEASURING WEB MATERIAL WOUND ON A REEL

Ronald M. Muller, Brandywine, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 4, 1975, Ser. No. 565,289

Int. Cl.² H03K *21/18*

U.S. Cl. 235—92 DN **17 Claims**



1. Apparatus for identifying a number of layers of a thin, flexible web material wound on a reel as the reel is rotated, said web having a thickness t, comprising first pulse generating means synchronized with the rotation of said reel to generate one pulse upon each revolution of said reel; second pulse generating means synchronized to movement of segments of said web relative to said reel for generating one pulse per segment, each of said segments having a length $2\pi t$ along the length of said web and each layer of said web on said reel having a $2\pi t$ length difference from the previous adjacent web layer; said second pulse generating means further synchronized with said segments of said web to generate a difference of one pulse upon each additional revolution of said reel; and means for receiving said pulses from said first and second pulse generating means and converting said pulses to a signal identifying said number of layers.

4,001,553

COUNTER ARRANGEMENT AND ASSOCIATED TEST CIRCUIT FOR AN ELECTRONIC TIMING DEVICE

Bruce L. Troutman, Long Beach, and Emory N. Yount, Fullerton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 17, 1975, Ser. No. 614,106

Int. Cl.² H03K *21/30*

U.S. Cl. 235—92 MS **10 Claims**

1. An electronic counting circuit having means by which to test the accuracy of said circuit during a first mode of operation and to count the number of signals applied to said circuit during a second mode of operation, said counting circuit including:

clock terminal means to receive a clock signal having an operating frequency,

counter means comprising a plurality of divider stages, each of said stages having a respective input and output terminal thereof,

said clock terminal means connected to the input terminal of a first of said divider stages,

utilization means connected to the output terminal means of each of said divider stages and responsive to the frequency of the respective signals thereat in order to provide an indication as to the accuracy or the signal count of said counting circuit,

control means connected between said clock terminal means and said counter means and adapted to selectively connect said clock terminal means to the respective input terminal of a second and succeeding ones of said plurality of divider stages in said first mode of operation so that each of said divider stages concurrently divides the operating frequency of said clock signal, and

said control means adapted to selectively connect the output terminal of each of said plurality of divider stages to the input terminal of a succeeding one of said divider stages in said second mode of operation so that each of said divider stages successively divides the operating frequency of said clock signal.

4,001,554

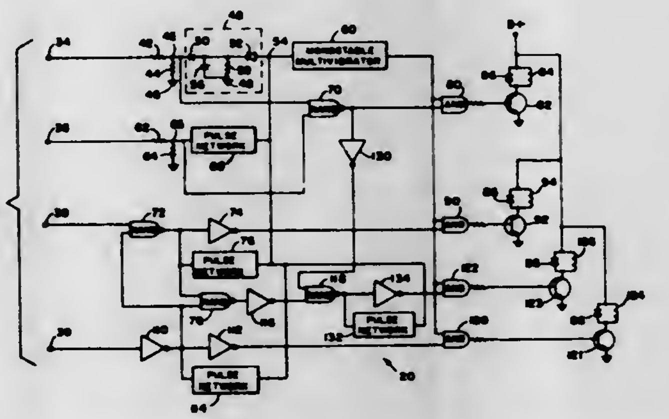
MODE CONTROL COMPUTER INTERFACE

Kilmer L. Hall, Decatur; Allen E. Davis, and Robert L. Peck, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1975, Ser. No. 626,681

Int. Cl.² G06G *7/48*

U.S. Cl. 235—150 5 Claims



1. In a computer network wherein plural computers must be simultaneously activated and deactivated, the improvement of a mode control interface for providing simultaneous operation of said computers, and comprising: a plurality of control circuits coupled between a first of said computers and other of said computers, each of said control circuits being responsive to a voltage input to provide an isolated voltage output pulse of predetermined time duration; a control switch coupled to said control circuits for providing activating power to said interface; a first of said control circuits being an AND gate having first and second inputs, first and second series connected inverters coupled between the said first computer and said first input of said AND gate, a transistor switch coupled to the output of said AND gate, a relay coupled in series with said transistor and the activating power from said control switch, and a control of said relay coupled to other of said computers for coupling power therethrough when activated by said relay; and a monostable multivibrator having an output connected to the second input of said AND gate for providing a predetermined signal pulse width thereto and having the input thereof coupled between said series connected inverters for receiving an activating pulse therefrom.

4,001,555

SIGNAL PROCESSING APPARATUS

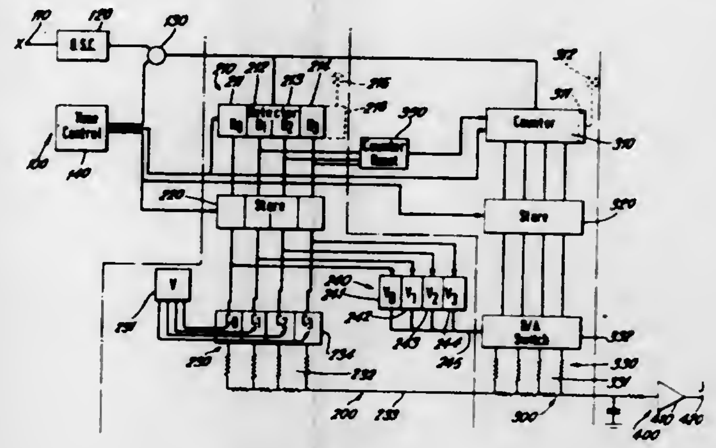
Peter Stanley Levis, Bramhall, and Geoffrey Shepherd, Oldham, both of England, assignors to Ferranti, Limited, Hollinwood, England

Filed Sept. 5, 1975, Ser. No. 610,848

Claims priority, application United Kingdom, Sept. 6, 1974, 38948/74

Int. Cl.² G06G *7/28*

U.S. Cl. 235—150.53 14 Claims



1. Signal processing apparatus for weighting an input signal in accordance with a predetermined mathematical transfer function represented by a plurality of straight lines each of which intersects the next at a separate brak-point, the apparatus comprising control means operable to define a succession of sampling periods of equal duration, input means responsive to an input signal in digital form comprising an oscillator operable to provide a continuous train of pulses at a constant repetition frequency such that the number of pulses generated during a sampling period represents the magnitude of the input signal, detection means defining the number of pulses corresponding to each successive break-point and responsive to the number of pulses occurring during a sampling period to produce a break-point signal identifying the highest break-point defined by said number of pulses, means responsive to the break-point signal to produce a gradient signal indicative of the slope of the straight line joining the said identified break-point to the next higher break-point, programmable counting means including a counter operable in each sampling period to count the number of oscillator pulses occurring in excess of the number identifying the break-point and produce an output after a preset number of pulses have been counted, gating means operable to pass pulses from the oscillator to the counter and to the detection means and responsive to the output from the counter to inhibit passage of the oscillator pulses for the remainder of the sampling period, means responsive to the number of pulses counted and to the gradient signal to provide an intermediate signal representative of the product of the input signal, in excess of the break-point, and the slope of the straight line section, and output means operable to deliver an output signal representative of the sum of the break-point signal and the intermediate signal.

4,001,556

COMPUTER CONTROLLED PNEUMATIC RETRACTABLE SEARCH SENSOR

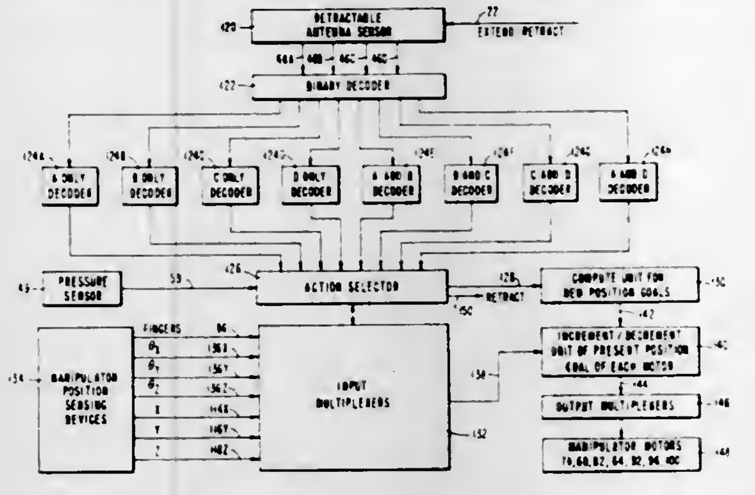
George A. Folchi, Yorktown Heights; Sherman S. Wang, Mohegan Lake, both of N.Y.; Peter M. Will, Norwalk, Conn., and Moshe M. Zloof, White Plains, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,930

Int. Cl.² B25J *9/00*; **G06F** *15/46*

U.S. Cl. 235—151 11 Claims

1. A mechanical manipulator comprising fingers for grasping a workpiece, an extendible sensing device on said fingers which includes a long, thin whisker antenna, means for extending said whisker antenna, means for detecting contact or proximity of said whisker antenna with said workpiece, means for withdrawing said whisker antenna from interference with said workpiece, means responsive to said detecting means to adjust the control movements of the manipulator fingers, and means for controlling extension and retraction of said whisker antenna.



4,001,557

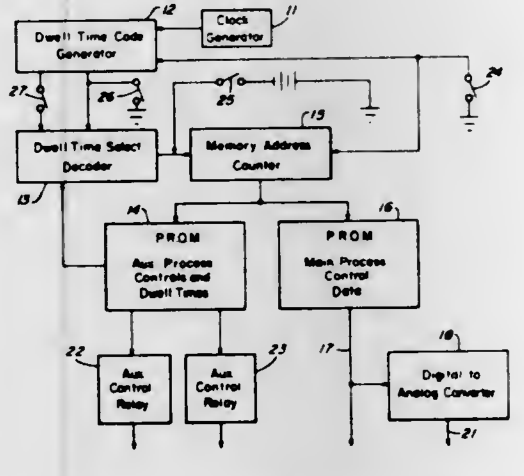
STORED PROGRAM DIGITAL PROCESS CONTROLLER

Dwight L. Stephenson, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 14, 1975, Ser. No. 621,894

Int. Cl.² G05B *19/02*; **G05D** *23/00*; **G06F** *15/46*

U.S. Cl. 235—151.1 1 Claim


Dwell Time Code Generator
Clock Generator
Dwell Time Select Decoder
Memory Address Counter
PROM Aux Process Controls and Dwell Times
PROM Main Process Control Data
Aux Control Relay
Aux Control Relay
Digital to Analog Converter
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1. Digital process controlling apparatus comprising:

a clock generator;

a dwell time code generator connected to said clock generator for providing a plurality of pulse frequencies;

dwell time select decoder connected to said dwell time code generator selecting desired pulse frequencies;

memory address counter means in circuit with said dwell time select decoder for converting said pulse frequencies to memory addresses;

a first programmable read only memory having an input from said memory address counter and an output to said dwell time select decoder for setting dwell times corresponding to memory addresses;

a second programmable read only memory having an input from said memory address counter having process variables stored therein at addresses coinciding with the corresponding dwell times stored in said first programmable read only memory;

process control means connected to the output of said second programmable read only memory; and,

an auxiliary process control relay connected to the output of said first programmable read only memory.

4,001,558

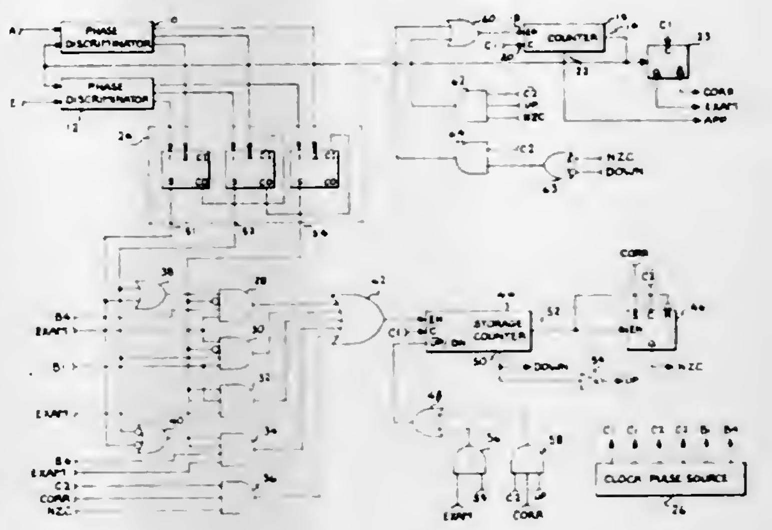
AVERAGE PHASE POSITION CIRCUIT

Leroy U. C. Kelling, Waynesboro, Va., assignor to General Electric Company, New York, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,293

Int. Cl.² G05D *3/04*

U.S. Cl. 235—151.11 6 Claims



1. In a numerical control machine tool system including two position transducers for a single axis of motion, and wherein the phase of a feedback signal from a transducer is indicative of tool position, apparatus for phase averaging position feedback signals derived from each transducer to produce a resultant position signal, said apparatus comprising:

a source of clock pulses;

counter means responsive to said clock pulses for producing the resultant position signal and a reference signal at clocked intervals;

a first phase discriminator having a first input terminal connected to receive a first position feedback signal from one of the position transducers and having a second input terminal connected to receive said reference signal, said first phase discriminator producing a first signal proportional to the phase difference between the first position feedback signal and said reference signal;

a second phase discriminator having a first input terminal connected to receive a second position feedback signal from the other of the position transducers and having a second input terminal connected to receive said reference signal, said second phase discriminator producing a second signal proportional to the phase difference between the second position feedback signal and said reference signal;

summing means connected to receive said first and second signals and responsive thereto to produce a third signal proportional to the difference therebetween;

error storage means;

gating means for periodically transferring said third signal to said error storage means;

control means connected between said error storage means and said counter means, said control means being responsive to said third signal stored in said error storage means to periodically adjust the clocked interval of said counter means to thereby control the phase relationship between said reference signal and the first and second position feedback signals by application of a gating signal to said counter means.

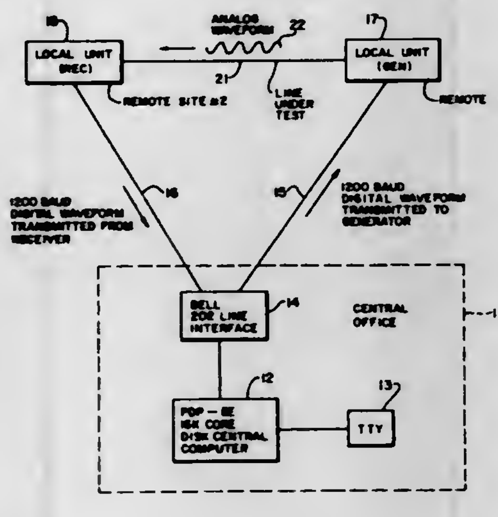
4,001,559
PROGRAMMABLE MEASURING

Deane C. Osborne; John M. Harrison, both of Epsom, and Alfred K. Hillman, Jr., Suncook, all of N.H., assignors to Northern Telecom, Inc., Waltham, Mass.

Filed Dec. 16, 1974, Ser. No. 532,746

Int. Cl.² G08C *25/00;* **G06F** *15/20*

U.S. Cl. 235—151.31 **13 Claims**



1. Apparatus for measuring characteristics of a communication channel comprising,

- means defining a communication channel for exchanging information signals between the ends of the communication channel,
- means defining a programmable local unit at one end of said communication channel for exchanging signals with said communication channel,
- central digital computing means for exchanging digital signals with said programmable local unit,
- means defining a communications link between said digital computing means and said programmable local unit for exchanging digital data signals therebetween,
- said programmable local unit including means responsive to the digital signals from said digital computing means for providing an analog signal waveform for transmission over said communication channel and means responsive to the received test analog signal transmitted over said communication channel for converting the received analog signal into a representative digital signal that is transmitted to said digital computing means to enable the latter to determine transmission characteristics of said communication channel.

4,001,560
APPARATUS FOR OPERATION SELECTOR CIRCUITS, ESPECIALLY TARIFF SELECTOR CIRCUITS IN ELECTRONICALLY OPERATED TAXIMETERS

Carl Ib Peder Larsen, Slagelse, Denmark, assignor to Haldex Aktiebolag, Sweden

Filed May 29, 1974, Ser. No. 474,212

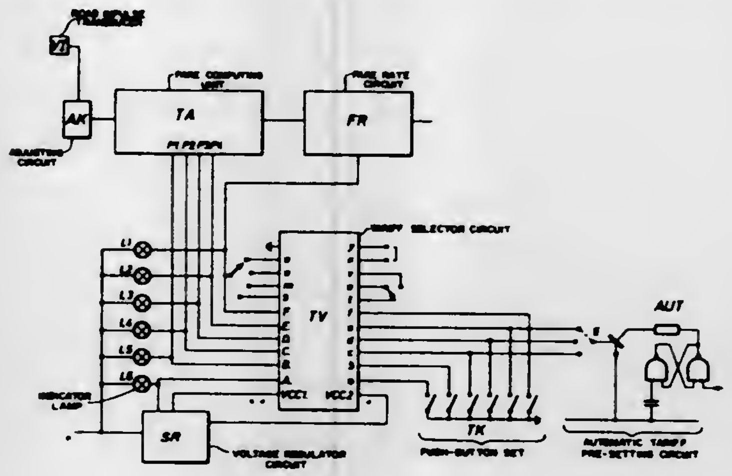
Claims priority, application Sweden, May 30, 1973, 7307691

Int. Cl.² G07B *13/10*

U.S. Cl. 235—151.32 **6 Claims**

1. In an electronic taximeter of the type having a fare computing unit for computing a fare at a rate determined by logic signals applied thereto; a tariff selector circuit responsive to operating signals for developing and applying fare determining logic signals to said fare computing unit; and an operation switching unit operable to apply selected operating signals to said selector circuit for selectively developing fare determining logic signals; wherein said selector circuit comprises:

- logic circuit means responsive to said operating signals for developing logic signals corresponding to different ones of said operating signals applied thereto; and
- output circuit means receptive of said logic signals for developing said logic signals as tariff selector circuit output signals for controlling the fare computing unit, said output circuit means being responsive to a received logic signal for maintaining a stable condition while developing the received logic signal as an output signal and thereafter maintaining the output signal even in the absence of the received logic signal; and during intermittent application of the received signal, and developing a different output signal only upon receiving a different logic signal.



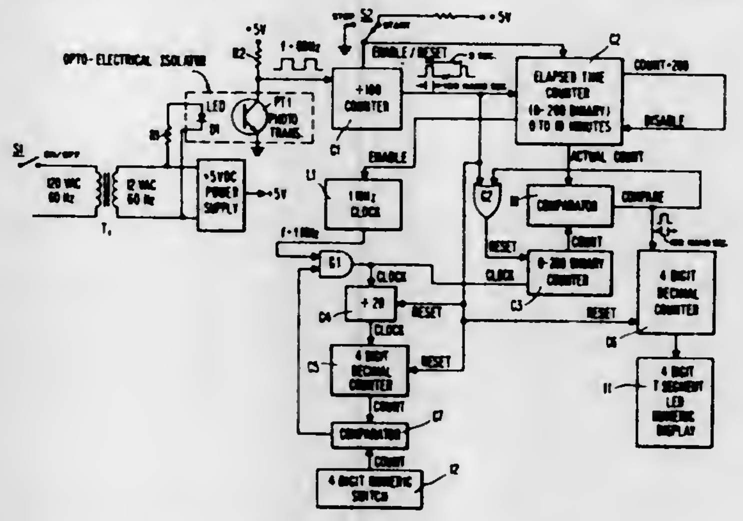
4,001,561
DEVICE FOR MEASURING AND INDICATING READING SPEED

William J. Quaintance, 8605 Cheltenham Ave., Philadelphia, Pa. 19118

Filed Sept. 4, 1975, Ser. No. 610,173

Int. Cl.² H03K *21/36, 21/18*

U.S. Cl. 235—151.32 **4 Claims**



1. A reading rate indicator comprising:

- elapsed time counting means;
- input data entry means to allow the entry of a number corresponding to the number of words of text to be read;
- computation means to operate on the output of the elasped time counter and the input data entry means to compute a number representative of a reading rate in words per minute;
- display means to display the results of the computation.

4,001,562
SPEED SENSING DEVICES

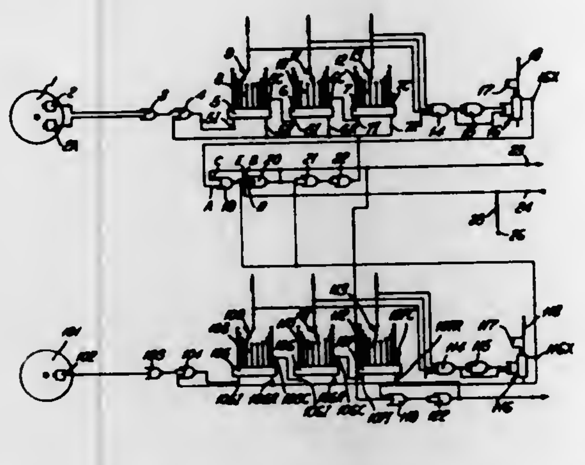
John McEnery, Herne Bay, England, assignor to Molins Limited, England

Filed Sept. 5, 1975, Ser. No. 610,782

Claims priority, application United Kingdom, Sept. 9, 1974, 39188/74

Int. Cl.² G01P *3/50;* **H03K** *21/00*

U.S. Cl. 235—151.32 **3 Claims**



1. A speed sensing device comprising a first sensor adapted to emit electric sensing pulses at a rate proportional to the speed at which a member moves past said sensor, a second sensor adapted to emit electric pulses at a rate proportional to the speed at which a reference member moves past said second sensor, and first and second pulse counters connected to receive and accumulate the sensing pulses and the reference pulses respectively, each of said counters being adapted to emit an output signal whenever a respective preselected number of pulses has been received by that counter since its last previous resetting and both said counters being arranged to be reset whenever an output signal is emitted by either counter.

4,001,563
COMMUNICATION SYSTEM FOR DISSEMINATING CODED DIGITAL DATA IN ANALOGUE FORM UTILIZING AN ORTHOGONAL TRANSFORMATION

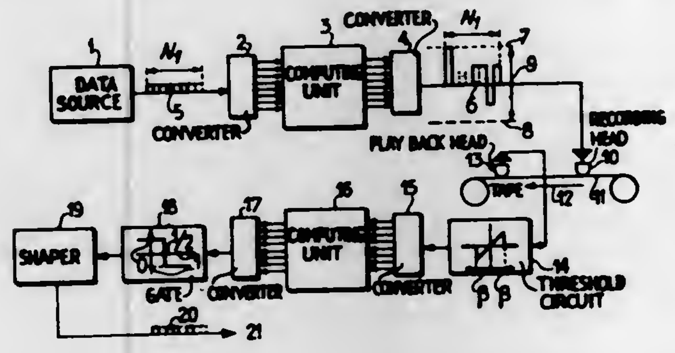
Phillippe Bied-Charreton; Francois Le Carvennec, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 524,270, Nov. 15, 1974. This application Sept. 17, 1975, Ser. No. 614,159

Claims priority, application France, Sept. 17, 1974, 74.31424

Int. Cl.² G06F *7/38;* **G11B** *5/09*

U.S. Cl. 235—152 **10 Claims**



1. A communication system for the dissemination of digital data constituted by a succession of 0 and 1 bits coming from a data source, said communication system comprising: grouping means fed from said data source for grouping said bits in the form of vectors of N binary components, orthogonal Walsh Hadamard transformation means receiving the vectors having said binary components and converting them into orthogonal vectors each having N analogue components, analogue means arranged for disseminating said orthogonal vectors, a compensating circuit adapted for detecting the amplitude fluctuations experienced by said orthogonal vectors in said analogue means, said compensating circuit comprising a storage circuit, having an output, for temporarily storing characteristic values of said amplitude fluctuations, reverse transformation means receiving the disseminated orthogonal vectors, available at the output of said analogue means and means for reconstituting said succession of bits from the reconstructed vectors of N binary components furnished by said reverse transformation means, said means for reconstituting said succession of bits comprising a reshaping means operating at an adjustable decision level, said reshaping means having an adjusting input coupled to the output of said storage circuit, said decision level being adjusted according to said characteristic values.

4,001,564
COMMUNICATION SYSTEM FOR DISSEMINATING CODED DIGITAL DATA IN ANALOGUE FORM UTILIZING AN ORTHOGONAL TRANSFORMATION

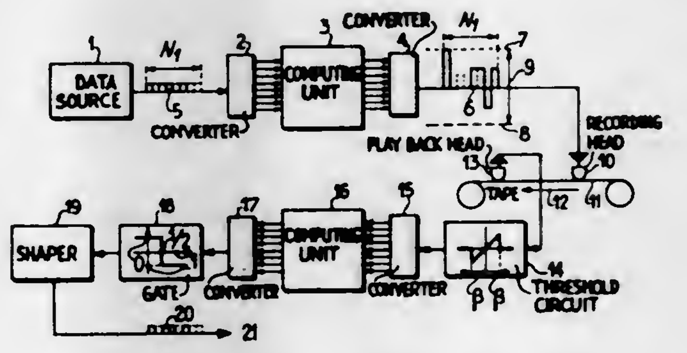
Philippe Bied-Charreton; Francois Le Carvennec, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 15, 1974, Ser. No. 524,270

Claims priority, application France, Nov. 16, 1973, 73.40880

Int. Cl.² G06F *7/38*

U.S. Cl. 235—152 **10 Claims**



1. A communication system for the dissemination of digital data constituted by a succession of 0 and 1 bits coming from a data source, said communication system comprising: grouping means fed from said data source for grouping said bits in the form of vectors of N binary components, orthogonal transformation means receiving the vectors having said binary components and converting them into orthogonal vectors each having N analogue components, analogue means arranged for disseminating said orthogonal vectors, reverse transformation means receiving the disseminated orthogonal vectors, available at the output of said analogue means, and means for reconstituting said succession of bits from the reconstructed vectors of N binary components furnished by said reverse transformation means.

4,001,565
DIGITAL INTERPOLATOR

Hisasi Kawai, Toyohashi, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1975, Ser. No. 579,159

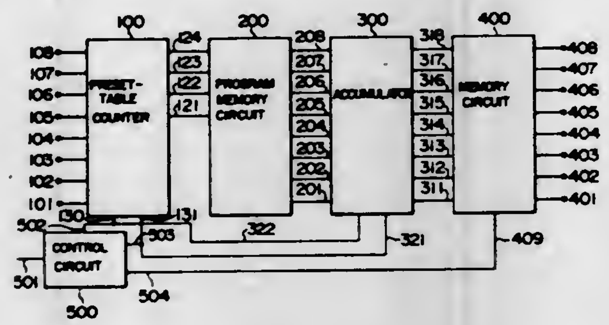
Claims priority, application Japan, June 25, 1974, 49-72939

Int. Cl.² G06F *15/34*

U.S. Cl. 235—152 **7 Claims**

1. A digital interpolator for determining $f(X)=y$ for a value of $X_1 < X < X_2$ and $X-X_1=n$ and $X_2-X=m$ where $f(X_1)=Y_1$ and $f(X_2)=Y_2$ are known values comprising a counter (**100**) having inputs of the variable X and a clock pulse input with the output of said counter changing in proportion to the number of clock pulses, a program memory circuit (**200**) connected to said counter and addressed by an output of said counter for repeated selective readout of predetermined pro-

gram values of $f(X_1)$ and $f(X_2)$ in response to clock pulses, an accumulator (**300**) connected to said program memory circuit for accumulating the output of said program memory circuit, a control circuit (**500**) connected to said accumulator and said counter for supplying a predetermined number of clock pulses to each of them, said accumulator accumulating a value



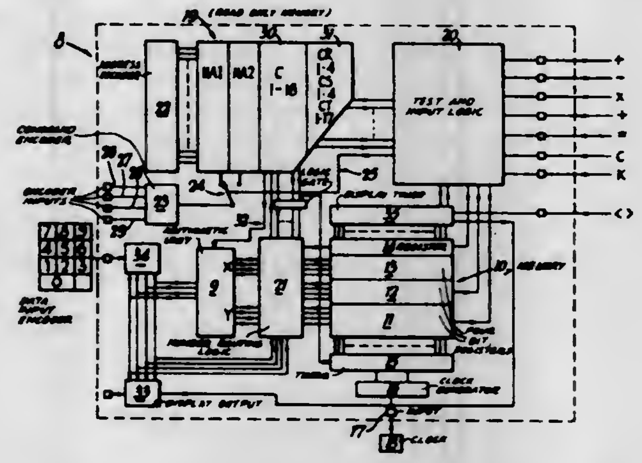
of $n.f(X_1)+m.f(X_2)$ after said predetermined number of clock pulses, and a memory circuit (**400**) connected to said accumulator for storing the output digits of said accumulator which are at and higher than Nth digit position where $A^N=n+m$ and A is the radix of the number system utilized, whereby the output of said program memory circuit is divided by $N=n+m$ so that an interpolated value

$$f(X)=\frac{n\cdot f(X_1)+m\ f(X_2)}{n+m}$$

is determined by a digital proportional division technique.

4,001,566
FLOATING POINT CALCULATOR WITH RAM SHIFT REGISTER

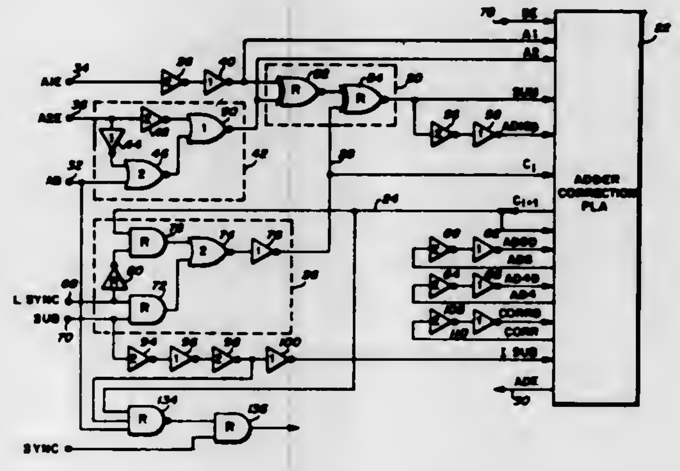
George Earley Stevenson, Kircaldy, Scotland, assignor to Pico Electronics Limited, Glenrothes, Scotland
Continuation of Ser. No. 165,908, July 26, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,363
Claims priority, application United Kingdom, Mar. 19, 1971, 7372/71
Int. Cl.² G06F *7/52*
U.S. Cl. 235—159 **26 Claims**



1. A floating-point calculator circuit comprising: input means for the input of numerical data to the circuit; a plurality of registers including write and read lines and including a plurality of digit storage locations for storing numerical data in BCD form and each of said registers being a random-access static memory; an arithmetic unit for operating on numerical values stored in said registers; controllable data paths connecting said input means and said arithmetic unit to said registers; reversible-direction timing means for sequentially and reversibly addressing the digit storage locations of each of said registers; and distinct digit transfer means for controlling data shifts in each of said registers, the respective digit transfer means being coupled to the write and read lines for transferring a digit from one of the digit storage locations to one of the adjacent ones of the digit storage locations for multiplication and division by ten operations, the direction of transfer depending upon the momentarily existing direction of operation of the timing means.

4,001,567
BDC CORRECTED ADDER

Richard B. Simone, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed July 21, 1975, Ser. No. 597,567
Int. Cl.² G06F *7/50*
U.S. Cl. 235—170 **7 Claims**



1. A BCD corrected adder having an addition mode and a subtraction mode, comprising:

a. a serial adder circuit responsive to each bit of two bytes and to a formerly generated bit carry for generating a sum and a present bit carry;

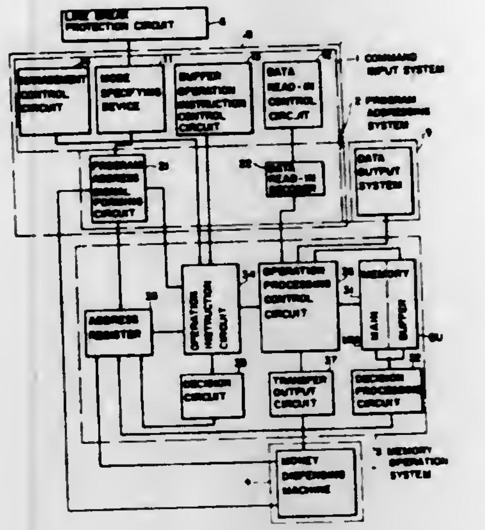
b. first means for generating a present byte carry whenever a present bit carry does not exist at the output of said adder during the addition of the most significant bit of a first byte and the most significant bit of a second byte, the result of which addition exceeds the decimal number ten in the addition mode;

c. second means for generating a correction signal in response to the presence of one of said present carries during said addition in the addition mode, and for generating said correction signal in response to the absence of said present bit carry during the addition of the most significant bit of a minuend byte and the most significant bit of the 2's complement of a subtrahend byte in the subtraction mode; and

d. logic means connected to said serial adder and said first and second means responsive to the presence of said correction signal for generating simultaneously with the generatiion of said byte carry from said first means, each bit of a byte which is equal to the summation of said first byte, said second byte, and a byte equivalent to the decimal number six in the addition mode, and for generating simultaneously with the generation of said byte carry from said first means each bit of a byte which is equal to he summation of said minuend byte, the 2's complement of said subtrahend byte, and a byte equivalent to the decimal number ten in the subtraction mode.

4,001,568
MONETARY RECEIPT AND PAYMENT MANAGING APPARATUS

Nobuhiro Iizuka, and Hideto Shigemori, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan
Filed Dec. 16, 1974, Ser. No. 533,469
Claims priority, application Japan, Dec. 29, 1973, 49-3791
Int. Cl.² G06F *15/02, 15/30*
U.S. Cl. 235—156 **4 Claims**



1. A monetary receipt and payment managing apparatus comprising:

a. transaction classification designating means for designating a transaction classification from among the transactions of monetary receipt, payment, exchange and change, for a transaction to be carried out;

b. transaction item designating means for designating a detailed transaction item for the transaction classification thus designated;

c. numerical data inputting means for inputting numerical data for the transaction item thus designated;

d. start commanding means for commanding starting of the apparatus for carrying out transactions based on input information inputted by said transaction classification designating means, transaction item designating means, and numerical data inputting means;

e. a buffer memory section coupled to said numerical data inputting means, said transaction classification designating means and said transaction item designating means and comprising a plurality of memory circuits which operate to store the numerical data inputted by said numerical data inputting means separately according to the transaction classification and transaction item inputted by said transaction classification designating means and transaction item designating means;

f. a main memory section coupled to said buffer memory section for storing the sum of transaction contents which have been stored in said buffer memory section;

g. money dispensing means in which money with a plurality of monetary denominations is stored, and for dispensing when necessary an amount of money according to the contents of said buffer memory section;

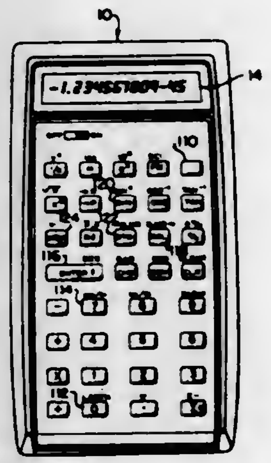
h. a program memory section for storing operation programs provided separately according to the transaction classifications; and

i. an operation control section to which said aforementioned means and sections are coupled for, when the starting of transaction is commanded by said start commanding means, operating to select a necessary operation program according to the contents of said transaction classification designating means, transaction item designating means, and buffer memory section, to effect a predetermined operation process according to the program thus selected, and for summing and renewing the contents of said main memory section on the basis of the contents of said buffer memory section, and for causing said money dispensing means to dispense a necessary amount of money when necessary,

whereby the apparatus collectively manages a variety of monetary transactions carried out by a teller with respect to cash and other than cash such as checks and bills.

4,001,569
GENERAL PURPOSE CALCULATOR HAVING SELECTIVE DATA STORAGE, DATA CONVERSION AND TIME-KEEPING CAPABILITIES

Peter D. Dickinson, Monte Sereno; Thomas E. Osborne, San Francisco; France Rode, and Allen J. Baum, both of Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 364,570, May 29, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,144
Int. Cl.² G06F *5/02*
U.S. Cl. 235—156 **10 Claims**



1. An electronic calculator comprising:

an input unit including a plurality of manually operable non-numeric and numeric keys for entering information and numbers into the calculator;

a first memory unit coupled to the input unit and including a first storage register for storing a first number in units of decimal degrees having an integer portion and a decimal portion received therefrom, said integer portion referring to all digits to the left of the decimal in conventional decimal notation and said decimal portion referring to all digits to the right of the decimal in conventional decimal notation;

a processing unit coupled to the input unit and the first memory unit and including means for converting the first number to a second number having first, second, and third parts representing said first number in units of degrees, minutes, and seconds respectively by multiplying the decimal portion of the first number by a preselected factor to provide a first result having an integer portion and a decimal portion and for multiplying the decimal portion of the first result by said preselected factor to provide a second result having an integer portion and a decimal portion; and

an output display unit coupled to the processing unit for providing a visual display of the second number;

said first part of the second number being the integer portion of the first number and appearing to the left of the decimal in said visual display;

said second part of the second number being the integer portion of the first result and appearing in said visual display as the first two digits to the right of the decimal;

said third part of the second number being the integer portion of the second result and appearing in said visual display as the second two digits to the right of the decimal.

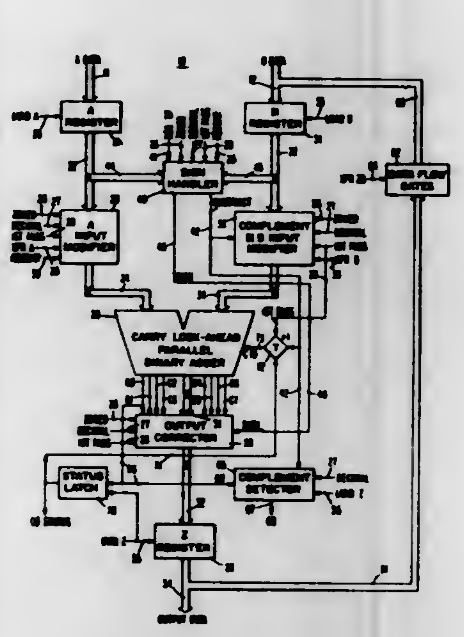
4,001,570
ARITHMETIC UNIT FOR A DIGITAL DATA PROCESSOR

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1975, Ser. No. 587,797

Int. Cl.² G06F *7/385*

U.S. Cl. 235—174 **14 Claims**



1. An arithmetic unit for performing arithmetic operations with multidigit binary coded numbers in zoned format wherein each multidigit number is comprised of a sequence of binary bits which is subdivided into alternate zone fields and digit fields, such arithmetic unit comprising:
  - binary arithmetic circuitry for arithmetically combining two multibit binary bit sequences to produce an output multibit binary bit sequence representing the results of the arithmetic operation;
  - first modifier circuitry for receiving a first multidigit zoned binary coded number and causing any nonzero bits in the zone fields thereof to assume a binary value of zero and supplying the resulting number to a first input side of the binary arithmetic circuitry;
  - second modifier circuitry for receiving a second multidigit zoned binary coded number and causing any zero bits in the zone fields thereof to assume a binary value of one and supplying the resulting number to a second input side of the binary arithmetic circuitry;
  - and third modifier circuitry coupled to the output side of the binary arithmetic circuitry for producing an output binary bit sequence wherein the bits in each zone field position therein have the proper zone code values.

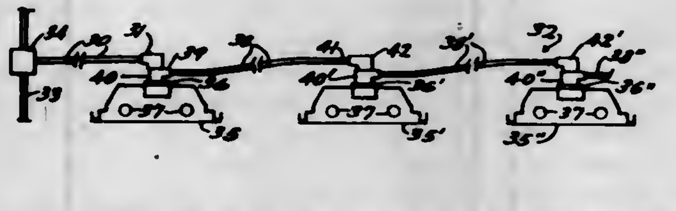
4,001,571
LIGHTING SYSTEM

Myron D. Martin, Conyers, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed July 26, 1974, Ser. No. 492,252

Int. Cl.² F21S *7/00;* **H05B** *33/02*

U.S. Cl. 240—9 R **15 Claims**



1. A system for lighting a floor area in a building comprising, in combination, a plurality of lighting fixtures supported by a ceiling structure to supply light to the floor area, each fixture having mounted thereon a plurality of lamps, at least one lighting circuit for energizing said lamps and a plural terminal first connector having terminal means wired to supply power to said lighting circuit, said fixtures being arranged into at least one branch circuit with a plurality of said fixtures in such branch circuit, a plurality of plural conductor branch circuit cable means, one branch circuit cable means connecting a plurality of circuits between each two adjacent fixtures in a branch circuit to distribute power to said fixtures, each branch circuit cable means having an end terminating in a second connector having first and second terminal means each connected to said plurality of conductors and an end terminating in a third connector having terminal means connected to said plurality of conductors, said first terminal means on a second connector on a cable means and said terminal means on a first connector on a fixture cooperating for connecting at least two of said conductors in such cable means to the lighting circuit in such fixture when such second and first connectors are connected together, said second terminal means on a second connector on a cable means and said terminal means on a third connector on another cable means cooperating for interconnecting corresponding conductors in such cable means when such second and third connectors are connected together, and means for applying electrical power between at least two of the cable conductors in each branch circuit.

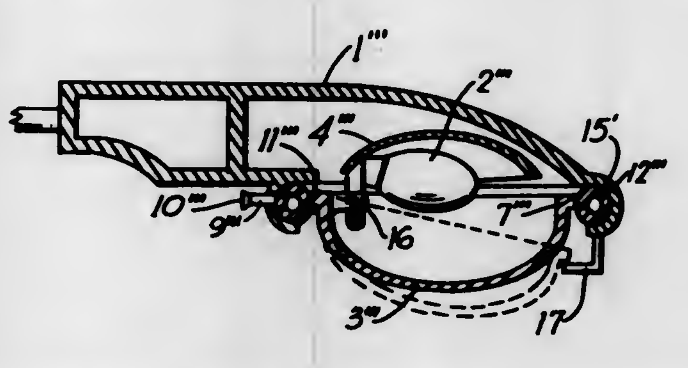
4,001,572
DUSTPROOF AND AIRTIGHT LUMINAIRES

Marcel Stein, 560 Riverside Drive, New York, N.Y. 10027

Continuation of Ser. No. 468,891, May 10, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 603,197

Int. Cl.² F21S *1/10*

U.S. Cl. 240—25 **6 Claims**



1. In a luminaire including a light-transmissive cover having a first peripheral edge and at least one of a reflector and a housing overlying said cover when in a closed configuration of said luminaire and defining therewith an enclosure for containing a fluid and an illumination source therein, one of said reflector and housing having a second peripheral edge conforming to the shape of said first peripheral edge, said illumination source having the characteristic of producing heat when actuated whereby the pressure of said fluid within said enclosure is increased, the improvement which comprises: an arcuate peripheral member extending from one of said reflector and said housing and spaced from and extending beyond said cover, said peripheral member and said edge overlapping to define a gasket-retaining space, and an inflatable hollow gasket received in said gasket-retaining space and extending around the perimeter of said cover, said gasket being effective when inflated to exert a substantially transverse force acting on said cover, said gasket thereby being effective to reduce the net transverse tension stresses in said cover and to create a substantially airtight seal between said cover and one of said reflector and housing.

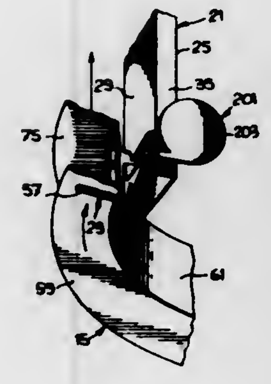
4,001,573
LIGHTING POLE

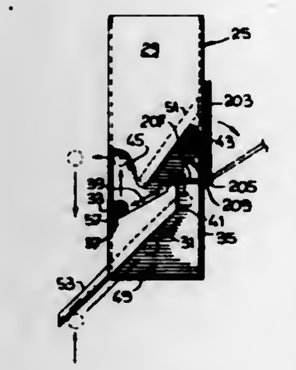
Roger Derasp, 1825 Bules, Longueuil, Quebec, Canada

Filed Mar. 17, 1975, Ser. No. 559,304

Int. Cl.² F21V *21/38*

U.S. Cl. 240—64 **10 Claims**





1. A lighting structure comprising:
  - a. a pole;
  - b. a support means carried by the upper end of the pole;
  - c. a light-carrying structure encircling the pole;
  - d. a first fixed suspension means carried by the support means;
  - e. a second fixed suspension means carried by the light-carrying structure whereby the first and second fixed suspension means are interengageable to detachably suspend the light-carrying structure from the support means; and
  - f. cable means extending from the support means to the light-carrying structure for raising and lower the light-carrying structure on the pole whereby, prior to engagement of the first and second fixed suspension means, the cable means is circumferentially offset with respect to the first suspension means in order to provide a slight rotation of the light-carrying structure about the pole during the engagement and disengagement of the first and second suspension means with each other.

4,001,574
SUSPENSION FIXTURE

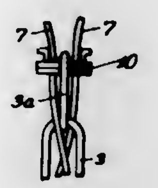
David H. Porter, and Douglas Bray, both of Fort Atkinson, Wis., assignors to Thomas Industries, Inc., Fort Atkinson, Wis.

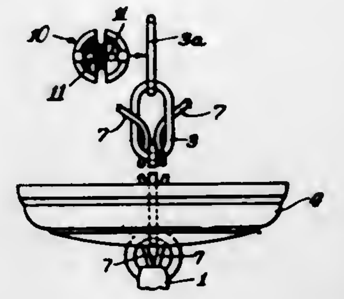
Filed Sept. 12, 1975, Ser. No. 612,904

Int. Cl.² F21V *21/00*

U.S. Cl. 240—78 E **5 Claims**

1. For use with a ceiling outlet box having side walls and an open bottom and having diametrically disposed screw sockets on the inside of opposite side walls, a mounting strap having a downwardly extending laterally offset central portion including notches and integral lateral horizontal wings, said wings having mounting slots adapted to register with said screw sockets, screws cooperating with said slots in the wings and adapted to cooperate with the said screw sockets of the box for releasably mounting said strap on the open side of said box, said strap having upwardly extending end portions adapted to engage the ceiling outside the box, a suspension chain carrying a suspension fixture on the lower end of the chain and having a top oblong terminal link, a hanger, said chain being attached to the hanger at its upper end, said hanger having a restricted central portion embraced by the uppermost link of the suspension chain, and said hanger having one or more axially extending openings for conductor wires, conductor wires extending through said openings and extending along links of the chain to the suspended fixture, a canopy having a central screw-threaded hole, said hanger being externally screw-threaded to engage the internal screw threads of the said canopy, and the hanger having at its upper end outwardly extending lugs adapted to be passed through the mounting strap and turned on its longitudinal axis to anchor it to said strap, the hanger having at its upper end wings which may be extended through said notches in the mounting strap and rotated out of register with said notches to hold the fixture in suspension.





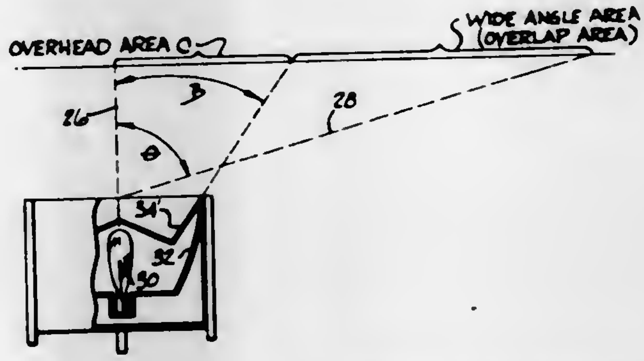
4,001,575
LUMINAIRE AND LUMINAIRE ARRANGEMENT FOR LIGHTING THE CEILING WITHIN A ROOM

Daryl Dean Sullivan, and Herbert Arnold Odle, both of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 27, 1975, Ser. No. 581,329

Int. Cl.² F21V *7/09, 21/06*

U.S. Cl. 240—81 LD **16 Claims**



1. A luminaire for indirectly lighting a room by directly lighting the ceiling within said room, said luminaire comprising:
  - a. a housing located within said room below said ceiling and including an opening for the passage of light from within said housing, said opening facing substantially vertically upward in the direction of zenith;
  - b. means supporting said housing such that said opening faces the direction of zenith;
  - c. reflector means connected with and positioned within said housing;
  - d. refractor means connected with said housing and extending across and closing said opening;
  - e. a light source connected with and located within said housing, some of the light from said source passing directly to and through said refractor means extending across said opening and some of said light being reflected off of said reflector means and thereafter passing to and through said refractor means to said ceiling; and
  - f. said refractor means redirecting said light such that a

portion thereof passes therethrough in the direction of zenith and a portion at wide angles with zenith whereby to light areas on said ceiling directly above said housing and laterally spaced from said housing, said refractor means including

i. an outer circumferential segment including the outer periphery of said refractor means and an inner circumferential periphery in said housing and spaced from said light source, said outer circumferential segment extending inwardly from its outer periphery to its inner periphery at an acute angle with zenith, and

ii. a central segment joining the inner periphery of said outer segment and positioned between said light source and opening, said central segment being in the shape of an inverted cone having its apex located above the uppermost edge of said light source.

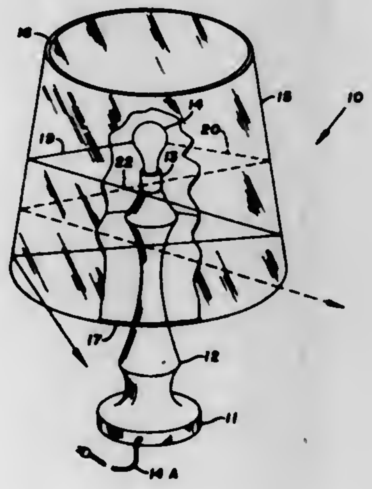
4,001,576
LAMP SHADE

Stephen A. A. Goddard, 616 E. 19th St., Minneapolis, Minn. 55404

Continuation of Ser. No. 448,936, March 7, 1974. This application Aug. 25, 1975, Ser. No. 607,208

Int. Cl.^{2} F21V *1/00*

U.S. Cl. 240—108 B **6 Claims**



1. In combination with a lamp structure having a base, a lamp receiving means, lamp illuminating means within said receiving means, and self-supporting shade means disposed in enveloping relationship about said illuminating means, said shade means comprising:

a. frame means receiving and structurally supporting a lamp enveloping film defining a generally continuous annular ring about said illuminating means with open ends at opposed ends thereof; and

b. said lamp enveloping film comprising a generally transparent film having a semi-transparent reflective metallic coating adherently applied to at least one surface thereof and being characterized in that said coating is partially reflective and partially transparent to incident lamp radiation, with the metallic coating reflecting tungsten filament lamp radiation in a range of about 94% to 98% of total incident radiation, balance of from about 2% to 6% being transmitted through said lamp enveloping film.

4,001,577
METHOD AND APPARATUS FOR ACOUSTO-OPTICAL INTERACTIONS

Andres Albanese, Matawan, N.J., and Calvin F. Quate, Los Altos Hills, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 5, 1975, Ser. No. 637,947

Int. Cl.^{2} G02F *1/33, 2/00;* H04B *9/00*

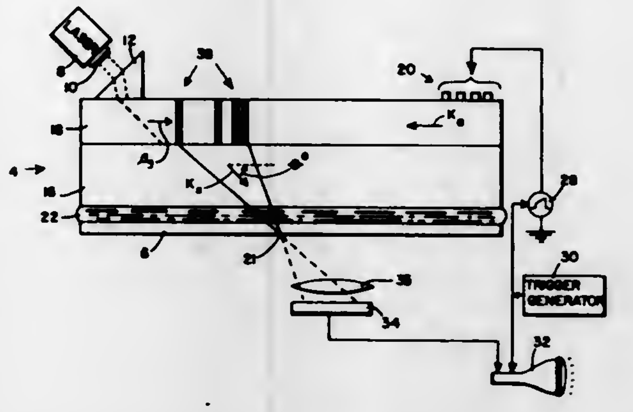
U.S. Cl. 250—199 **39 Claims**

1. Apparatus for interacting substantially coherent, monochromatic light with surface acoustic waves, comprising:

a. optical wave guide means for propagating light therein;

b. an acoustic surface wave propagating medium positioned such that surface acoustic waves propagated therein interact with the light in the optical wave guide means; and

c. chirp generator means connected to the acoustic surface wave propagating means for generating and propagating chirped surface acoustic waves in the acoustic surface wave propagating medium, said surface acoustic waves form periodic variations in the index of refraction of the optical wave guide means and thereby interact with said light.



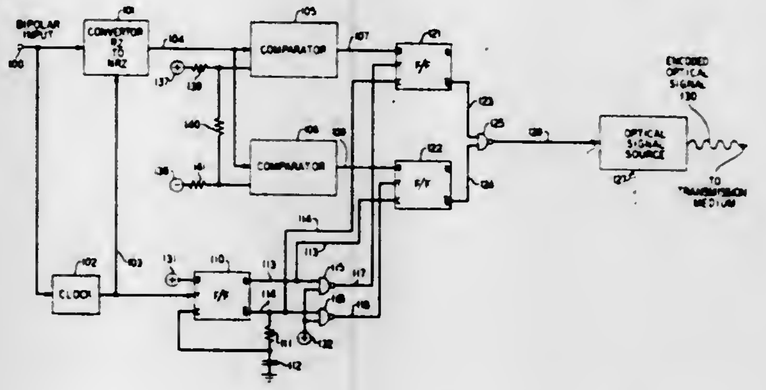
4,001,578
OPTICAL COMMUNICATION SYSTEM WITH BIPOLAR INPUT SIGNAL

John Stone Cook, Rumson, and Stewart David Personick, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 1, 1975, Ser. No. 601,049

Int. Cl.^{2} H04B *9/00*

U.S. Cl. 250—199 **11 Claims**



1. An optical transmission system for use with a bipolar input signal having positive, zero, and negative voltage levels to represent logic states, said transmission system comprising an optical signal source having a control input which can be energized to produce a modulated optical signal, and means responsive to said bipolar signal for developing a binary signal at the control input of said optical signal source having two identical bits of one value to represent said positive level, two identical bits of the opposite value to represent said negative level, and a pair of opposite-valued bits to represent said zero level.

4,001,579
DEVICE FOR CONTROLLING COMPOSITE CIGARETTE FILTER RODS

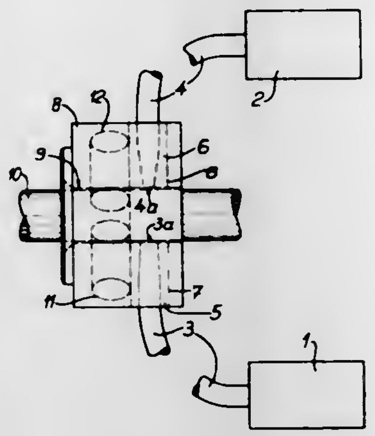
Jean-Pierre Lebet, Montreux, and Joel Ducommun, Chavannes, both of Switzerland, assignors to Baumgartner Papiers S.A., Switzerland

Filed Mar. 10, 1975, Ser. No. 557,028

Claims priority, application Switzerland, Mar. 13, 1974, 3484/74

Int. Cl.^{2} G01D *21/04*

U.S. Cl. 250—223 R **7 Claims**



1. A control device for a filter manufacturing machine, comprising:

means for passing an elongate composite fiber rod along a path longitudinal of the rod;

a light source having a first elongate optical fiber bundle receiving light from the source to transmit the received light along the fibers from the source to and through a free end of the first bundle into the rod;

photo-detection means having a second elongate optical fiber bundle leading to the photo-detection means, from a free end of the second bundle receptive of incident light to transmit the incident light to the photo-detection means, the free end of the second bundle extending over a lesser width along said path than the free end of the first bundle thereby enabling detection of a clearer and greater amplitude light signal; and

means for holding the free ends of the first and second bundles adjacent said path, opposite one another, to direct said light from the source through the first bundle into and through an inside portion of the rod, and, as incident light from the composite rod and responsive to a composition of the inside portion thereof, into and through the second bundle and to the photo-detection means for actuating a controlled device in response to said composition.

4,001,580
SCINTILLATION SCANNER

Alfonso W. Mehrbrodt; Walter F. Mog, both of Brecksville, and Carl J. Brunnett, Willowick, all of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 3, 1971, Ser. No. 149,744

Int. Cl.^{2} G01T *1/20*

U.S. Cl. 250—363 S **13 Claims**

1. A scintillation scanner comprising:

a. a housing and frame structure;

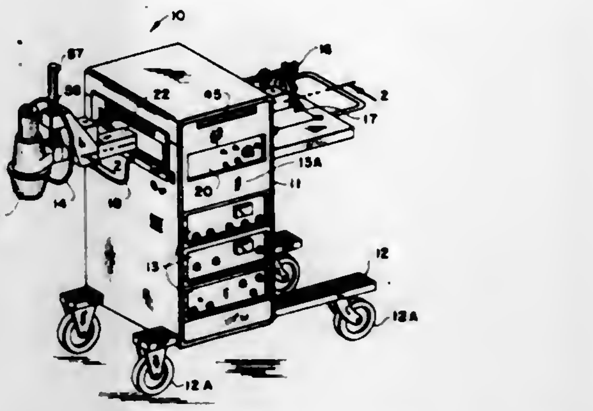
b. an imaging structure mounted on the housing and frame structure and including a scintillation-responsive signal emitting means;

c. a drive assembly interposed between said structures for driving said signal emitting means over an area to be studied;

d. media support means carried by one of said structures and adapted to carry an image producing media;

e. media stimulating means carried by the other of said structures and adapted to stimulate a media carried by said media support means in response to signals from said signal emitting means; and.

f. dead time correction means for shifting said media means relative to each other to compensate for relative movement between said media means during the time delay between the time when a scintillation is received by said signal emitting means and the time when the media is caused to be stimulated by said media stimulating means.



4,001,581
DEVICE FOR DETECTING A MOVING OBJECT

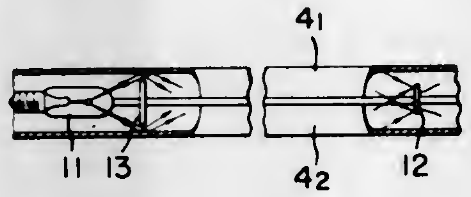
Shinji Murata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 493,854, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 351,999, April 17, 1973, abandoned. This application Mar. 10, 1976, Ser. No. 665,400

Claims priority, application Japan, Apr. 28, 1972, 47-50931

Int. Cl.^{2} H01J *5/02*

U.S. Cl. 250—239 **19 Claims**



1. A device for detecting the presence of a moving object comprising:

light source means disposed in the vicinity of a side of a transporting path of said object,

light receiving means disposed at an opposite side of said light source means with respect to said transporting path,

reflecting means disposed between said light source means and said light receiving means having facing and spaced apart reflecting surfaces to provide a straight-line light path connecting said light source means and said light receiving means, said object being transportable along the transporting path between the reflecting surfaces of said reflecting means, and

a non-transparent member disposed in said straight-line path for preventing the light of said light source means from directly reaching said light receiving means and permitting only the light repetitively reflected between the reflecting surfaces of said reflecting means to reach said light receiving means.

4,001,582
LOCAL SURFACE ANALYSIS

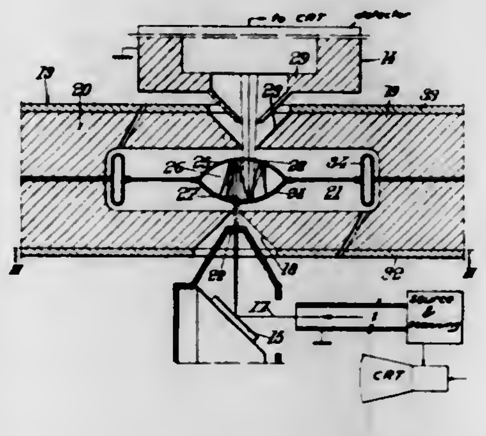
Raimond Castaing, Paris; Guy Blaise, Clichy, and Roger Quettier, Le Plessis-Robinson, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 20, 1975, Ser. No. 588,706

Claims priority, application France, June 28, 1974, 74.22722

Int. Cl.² H01J *37/26*

U.S. Cl. 250—288 **15 Claims**



1. A process for a local chemical analysis of a target sample, including the steps of sputtering particles from an elemental area of the surface of the target, subjecting the particles sputtered from said elementary area to successive adsorptions and desorptions on wall means heated to a high temperature for ionizing said particles with a probability independent of the nature of the target and dissociating said particles, and subjecting the ionized and dissociated particles to mass spectrometry analysis.

4,001,583
COVALENTLY BOUND BIOLOGICAL SUBSTANCES TO PLASTIC MATERIALS AND USE IN RADIOASSAY

M. James Barrett, Philadelphia, Pa., assignor to SmithKline Instrument, Inc., Sunnyvale, Calif.

Filed Oct. 4, 1974, Ser. No. 511,952

Int. Cl.² G01T *1/161;* G01N *31/00*

U.S. Cl. 250—303 **16 Claims**

1. A method of covalently binding a biological substance to a plastic material which comprises reacting the inside surface of said plastic material with an aliphatic primary amine or diamine, then treating said surface with glutaraldehyde followed by coupling said biological substance to the glutaraldehyde treated surface.

4,001,584
AUTOMATIC SAMPLE CHANGER

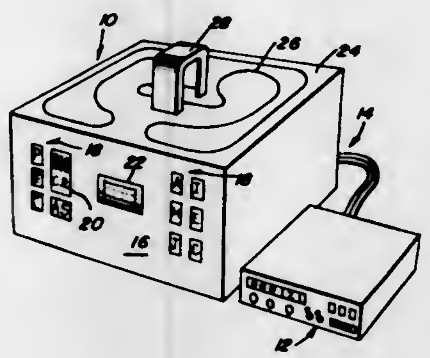
Anthony A. Mueller, Florence; Frank W. Bao, Crestview Hills, and Stephen D. Parker, Erlanger, James L. Hummeldorf, Morningview, all of Ky., assignors to Actus, Inc., Florence, Ky.

Continuation of Ser. No. 504,743, Sept. 10, 1974, abandoned. This application Oct. 29, 1975, Ser. No. 626,923

Int. Cl.² G01T *1/00*

U.S. Cl. 250—328 **35 Claims**

1. An automatic sample changer for transporting a plurality of test samples along a track, and for sequentially studying the characteristics of the samples being tested in a testing region remote from the track, the sample changer comprising: conveyor means for sequentially associating the samples with the testing region; a continuous elongated track which directly encounters said conveyor means at one location along its length; a plurality of independent transport means sequentially positioned along substantially the entire length of said track, each of which is adapted to associate with a sample; and indexing means for associating with said plurality of transport means to advance the samples associated therewith along said continuous track, said indexing means comprising a rotatable hub having a plurality of extensions thereon each of which contacts and moves a plurality of said transport means at spaced locations along said track.



4,001,585
SAMPLE CONVEYORS

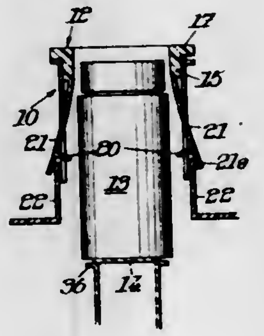
Yves Coutarel, Montrouge, France, assignor to Intertechnique S.A., Plaisir, France

Filed July 1, 1975, Ser. No. 592,328

Claims priority, application France, July 5, 1974, 74.23518

Int. Cl.² G01T *1/00;* B65G *65/00*

U.S. Cl. 250—328 **15 Claims**



12. A sample conveyor for an automatic radioactivity measuring system, comprising a plurality of cassette carriers, means for moving said carriers consecutively along a closed path passing at a transfer station, each carrier being constructed to receive a cassette having sample receiving locations distributed at equal intervals in a row, said carrier being constructed to receive a plurality of different types of cassettes having different spacings between said locations, all said spacings being multiples from each other, and said means for moving the carriers being constructed to optionally move said carriers past the transfer station with steps equal to anyone of said spacings.

4,001,586
THICK FILM SENSOR AND INFRARED DETECTOR

Anthony V. Fraioli, Setauket, N.Y., assignor to Plessey Incorporated, Melville, N.Y.

Filed May 9, 1975, Ser. No. 576,011

Int. Cl.² G01J *1/00*

U.S. Cl. 250—345 **17 Claims**

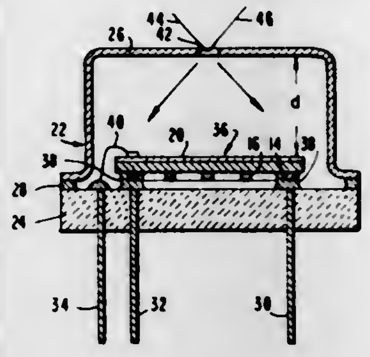
1. A temperature sensor comprising:

a self-supporting film of an oxidic material having a high temperature coefficient of resistance;

a pair of fired-on conductive electrodes in the form of closely-spaced, parallel interdigitated fingers on a first major surface of said film;

a third electrode of low thermal mass substantially covering the other major surface of said film; and

means for connecting said three electrodes into a circuit.



4,001,587
COLOR INDICATOR-DOSIMETER OF IONIZING RADIATION

Georgy Mitrofanovich Panchenkov, Leninsky prospekt, 67, kv. 133; Leonid Leonidovich Kozlov, Stoleshnikov pereulok, 9, kv. 18; Alexandr Alexandrovich Molin, ulitsa Molodezhnaya, 3, kv. 482; Zinaida Fedorovna Ershova, ulitsa Vavilova, 52, korpus 4, kv. 289; Lev Mikhailovich Mikhailov, ulitsa Raspletina, 17, korpus 2, kv. 49; Albert Genrikhovich Juzvyak, Teply stan, 2 miktroraion, korpus 27, kv. 252, all of Moscow; Rail Bakirovich Valitov, ulitsa Bljukhera, 18, kv. 7, Ufa; Vyacheslaw Petrovich Churov, ulitsa Zheleznodorozhnaya, 14, kv. 9, Stterlitamak, and Mikhail Petrovich Grinev, Leningradsky prospekt, 71, kv. 61, Moscow, all of U.S.S.R.

Filed Oct. 24, 1975, Ser. No. 625,513

Int. Cl.² G01N *5/00*

U.S. Cl. 250—474 **3 Claims**

1. A color indicator-dosimeter of ionizing radiation, comprising from 70 to 100 parts by weight of a thermoplastic polymer, from 10 to 40 parts by weight of a plasticizer, from 0.5 to 3.0 parts by weight of a stabilizer and two dyes compatible with said polymer, one of said dyes being incorporated in the color indicator-dosimeter to the extent of from 0.007 to 0.01 part by weight and having a G value of decolorization in said polymer of from 0.05 to 0.1 molecule/100 eV, with the absorption maximum thereof lying in the 450 to 590 nm spectral range, whereas the other of said two dyes is incorporated in the color indicator-dosimeter to the extent of from 0.015 to 0.03 part by weight and has a G value of decolorization in said polymer of from 0.15 to 1.5 molecule/100 eV, with the absorption maximum thereof lying in the 600 to 720 nm spectral range.

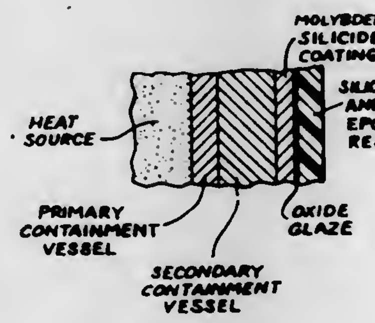
4,001,588
RADIOACTIVE HEAT SOURCE AND METHOD OF MAKING SAME

Norbert Bernard Elsner, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed July 17, 1975, Ser. No. 517,877

Int. Cl.² G21G *4/00*

U.S. Cl. 250—493 **13 Claims**


MOLYBDENUM SILICIDE COATING
SILICA FRIT AND Sb IN EPOXY RESIN
HEAT SOURCE
PRIMARY CONTAINMENT VESSEL
OXIDE GLAZE
SECONDARY CONTAINMENT VESSEL

1. A radioactive source of heat which is suitable for use as a part of a nuclear battery for implantation in a human being, which source comprises

a radioactive isotope,

a containment vessel encapsulating said isotope and having sufficient strength to contain any gaseous products of radioactive decay,

a high-temperature-resistant diffusion coating layer which is formed predominantly of refractory metal silicides disposed exterior of said containment vessel, and

an outer layer of ceramic oxide material disposed exterior of said diffusion coating layer, which outer layer provides a substantially continuous ceramic oxide layer upon exposure to high-temperature oxidizing conditions and thereby protects said containment vessel.

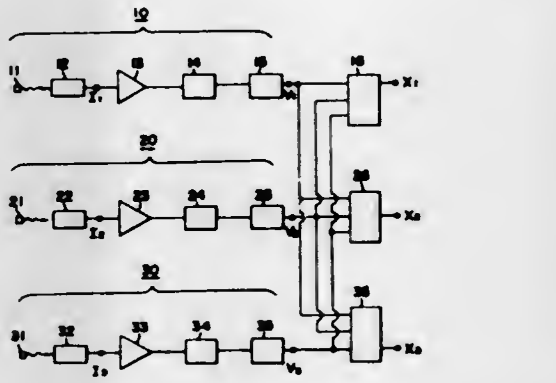
4,001,589
RADIOMETRIC ANALYZER WITH PLURAL RADIATION SOURCES AND DETECTORS

Sumitaro Arima, Sendai; Minoru Oda, Amagasaki; Kyoichi Miyashita, Amagasaki, and Mamoru Takada, Amagasaki, all of Japan, assignors to Tohoku Electric Power Company, Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 432,235, Jan. 10, 1974. This application Apr. 17, 1975, Ser. No. 569,143

Int. Cl.² G01T *1/16*

U.S. Cl. 250—336 **2 Claims**



1. A radiometric analyzer for measuring the masses per unit volume X1, X2, and X3 of a material by radiation comprising:

a first radiation source for bombarding the material with a first radiation;

a first radiation detector for receiving the first radiation after bombardment with respect to the material;

a second radiation source for bombarding the material with a second radiation;

a second radiation detector for receiving the second radiation after bombardment with respect to the material;

a third radiation source for bombarding the material with a third radiation;

a third radiation detector for receiving the third radiation after bombardment;

a first linear calibration circuit connected to receive the output of the first radiation detector for generating an output signal V1;

a second linear calibration circuit connected to receive the output of the second radiation detector for generating an output signal V2;

a third linear calibration circuit connected to receive the output of the third radiation detector for generating an output signal V3;

a first four fundamental rules operator for generating an output indicative of X1;

a second four fundamental rules operator for generating an output indicative of X2;

a third four fundamental rules operator for generating an output indicator of X3;

means connecting the output signal V1 of the first linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

means connecting the output signal V2 of the second linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

means connecting the output signal V3 of the third linear calibration circuit to the inputs of the first, second and third four fundamental rules operators;

X1 being determined by the first four fundamental rules operator from the relationship:

$$X_1=\frac{1}{\Delta}\left[\left(\frac{a_{22}a_{33}-a_{32}a_{23}}{K_1}\right)\times V_1-\left(\frac{a_{12}a_{33}-a_{32}a_{13}}{K_2}\right)\right.$$

$$\left.\times V_2+\left(\frac{a_{12}a_{23}-a_{22}a_{13}}{K_3}\right)\times V_3\right]$$

X_2 being determined by the second four fundamental rules operator from the relationship:

$$X_2=\frac{1}{\Delta}\left[\left(\frac{a_{21}a_{33}-a_{31}a_{23}}{K_1}\right)\times V_1+\left(\frac{a_{11}a_{33}-a_{31}a_{13}}{K_2}\right)\right.$$

$$\left.\times V_2+\left(\frac{a_{11}a_{23}-a_{21}a_{13}}{K_3}\right)\times V_3\right]$$

X_3 being determined by the third four fundamental rules operator from the relationship:

$$X_3=\frac{1}{\Delta}\left[\left(\frac{a_{21}a_{32}-a_{31}a_{22}}{K_1}\right)\times V_1+\left(\frac{a_{11}a_{32}-a_{31}a_{12}}{K_2}\right)\right.$$

$$\left.\times V_2+\left(\frac{a_{11}a_{22}-a_{21}a_{12}}{K_3}\right)\times V_3\right]$$

wherein

$$\Delta=\begin{vmatrix} a_{11} & a_{12} & a_{13}\\ a_{21} & a_{22} & a_{23}\\ a_{31} & a_{32} & a_{33}\end{vmatrix}$$

wherein a_{11}, a_{12}, a_{13}, a_{21}, a_{22}, a_{23}, a_{31}, a_{32} and a_{33} and K_1, K_2 and K_3 are constants and

wherein V_1, V_2 and V_3 are defined as follows:

$$V_1=K_1\,(a_{11}X_1+a_{12}X_2+a_{13}X_3)$$
$$V_2=K_2\,(a_{21}X_1+a_{22}X_2+a_{23}X_3)$$
$$V_3=K_3\,(a_{31}X_1+a_{32}X_2+a_{33}X_3).$$

4,001,590

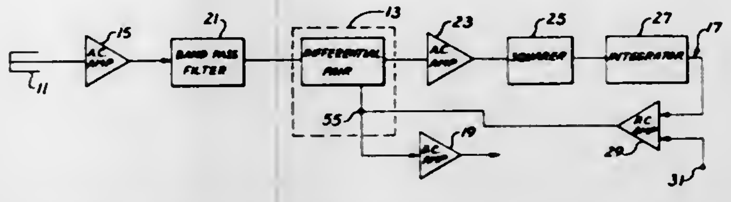
RADIATION FLUX MEASURING DEVICE

Ernesto Corte, La Jolla, Calif., and Pradeep Maitra, New Delhi, India, assignors to General Atomic Company, San Diego, Calif.

Division of Ser. No. 393,444, Aug. 31, 1973, Pat. No. 3,916,193. This application Jan. 31, 1975, Ser. No. 545,973

Int. Cl.² G01J *1/00*; G06G *7/24*

U.S. Cl. 250—336 **3 Claims**



1. A radiation flux measuring device comprising, a radiation detector for producing an output having an a-c component representing radiation flux, a differential pair of transistors having a first input to one of said transistors, a second input to both of said transistors, and an output at the other of said transistors, means for applying the output of said radiation detector to said second input of said differential pair, a feedback loop connected from said output of said differential pair to said first input thereof for maintaining the output of said differential pair constant, said feedback loop including squaring and integrating means, and means for providing an output representing the signal at first said input.

4,001,591

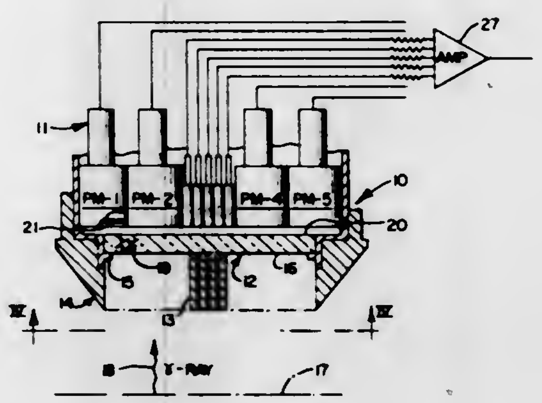
SCINTILLATION CAMERA AND HEAD THEREFOR HAVING MEANS FOR IMPROVING RESOLUTION OVER A LIMITED FIELD OF VIEW

Dan Inbar, Haifa, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed July 11, 1975, Ser. No. 595,163

Int. Cl.² G01T *1/20*; G02B *5/00*

U.S. Cl. 250—363 S **17 Claims**



1. A head for a scintillation camera comprising:

a. a scintillating crystal having an input surface exposed to radiation stimuli for producing light events at spatial locations corresponding to spatial locations of the interactions of the stimuli with the crystal, and an output surface opposite the input surface;

b. a plurality of photomultipliers each having a photocathode facing the output surface of the crystal and producing an output signal when a light event occurs; and

c. means mounting the photomultipliers in two different groups, a first group forming a cluster of n_1 photomultipliers whose photocathodes have a total area of A_1, and a second group forming an array of n_2 photomultipliers whose photocathodes have a total area A_2 wherein n_1/A_1 is greater than n_2/A_2.

4,001,592

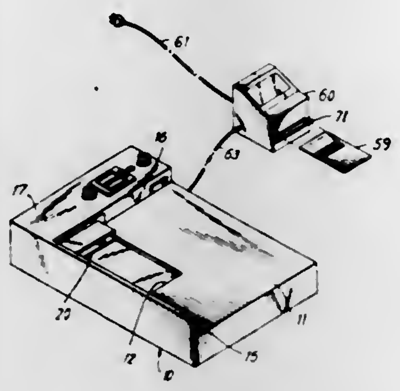
FILM IDENTIFICATION APPARATUS

Seymour Katz, Glen Cove, and Victor R. Brown, West Hempstead, both of N.Y., assignors to IPCO Hospital Supply Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 565,583, April 7, 1975, Pat. No. 3,959,657. This application Jan. 28, 1976, Ser. No. 653,127

Int. Cl.² G03B *41/16*

U.S. Cl. 250—476 **11 Claims**



4. Apparatus for placing identifying indicia on film within a cassette, the apparatus comprising, in combination:

- a cassette supporting member;
- an electroluminescent panel carried by the supporting member, the panel having a protruding tab portion in position to extend within a cassette received by said member;
- indicia means removably disposed on the protruding tab portion of the electroluminescent panel;
- a control circuit connected to the electroluminescent panel for energizing said panel, to illuminate the same and thereby expose the film within the cassette with the information on the indicia means; and
- indicia applying means electrically connected to the control circuit for imprinting information on said indicia means, said indicia applying means including an opening for receiving said indicia means, and means automatically responsive to the receipt of said indicia means in said opening for simultaneously applying said information thereto and activating said control circuit to condition the same for the energization of said panel.

4,001,593

AXIAL TOMOGRAPHIC SCANNER HAVING MEANS FOR SUPPORTING X-RAY SOURCE CABLES

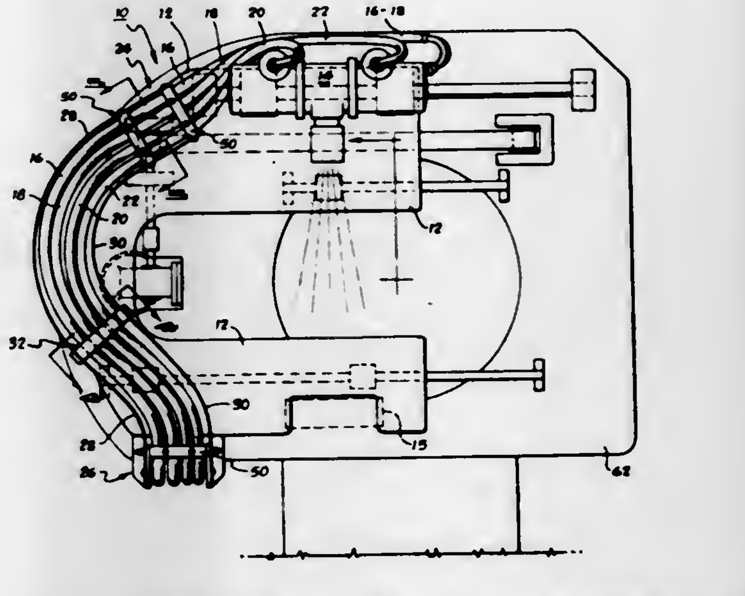
James C. Wing, Los Altos, and Jack V. White, Los Gatos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 20, 1975, Ser. No. 623,848

Int. Cl.² A47B *3/10*; A45F *3/00*; H05G *1/10*

U.S. Cl. 250—522 **10 Claims**

5. An axial tomographic scanner comprising axial tomographic means for collecting a plurality of sets of data corresponding to the transmission or absorption of a plurality of beams of penetrating radiation through a planar slice of an object being analyzed including means to locate an object to be analyzed, source and detector means mounted on a yoke for directing one or more beams of penetrating radiation through the object from said source to said detector means, said source having a plurality of flexible cables connected thereto, means to rotate said yoke and said source and said detector means mounted thereon about the object whereby a plurality of sets of data corresponding to the transmission or absorption of the object of the plurality of beams of penetrating radiation are collected, and means for supporting a plurality of flexible cables leading to said source, said cable supporting means comprising first bracket means mounted on said yoke adjacent said source for restraining cable movement, second bracket means mounted on said yoke remote from said source for restraining cable movement, and means disposed between said first and said second bracket means for maintaining said cables passing therethrough in a gradual arc while preventing undue flexing of said cables, said cable maintaining means comprising a pair of flexible elongated bands extending on opposite lateral sides of those portions of said flexible cables extending from said first bracket means to said second bracket means and a cable guide, one lateral end of said cable guide securely engaging one of said bands and the other lateral end of said cable guide surrounding a portion of said other band whereby lateral movement of said bands is restrained, said cable guide having transverse side portions connecting said lateral ends which serve to prevent transverse movement of said cables and said bands passing therebetween, whereby said pair of bands and those portions of said cables extending between said first and said second bracket means are maintained in a generally thick planar, arcuate configuration during all rotational movements of said yoke and translational movements, if any, of said source.



4,001,594

METHOD FOR CONTROLLING THE QUANTITY OF EXPOSURE IN PHOTOGRAPHIC PRINTING

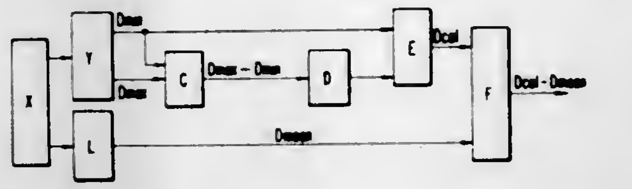
Taizo Akimoto; Takaaki Terasita, and Shigeru Watanabe, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 20, 1975, Ser. No. 588,984

Claims priority, application Japan, June 21, 1974, 49-71636

Int. Cl.² G01N *21/30*

U.S. Cl. 250—559 **4 Claims**



1. In a method for measuring the transmission density of a negative film to generate a control signal for controlling the quantity of exposure in photographic printing, the method for controlling the quantity of exposure in photographic printing comprising the steps of:

- photoelectrically detecting a plurality of optical densities in a principal portion of the negative film,
- discriminating among the photoelectrically detected optical densities the maximum value and the minimum value of the optical density,
- calculating the difference between said maximum value and said minimum value,
- non-linearly converting said calculated difference, and
- adding the non-linear conversion of said calculated difference and the discriminated minimum value to control the quantity of printing exposure.

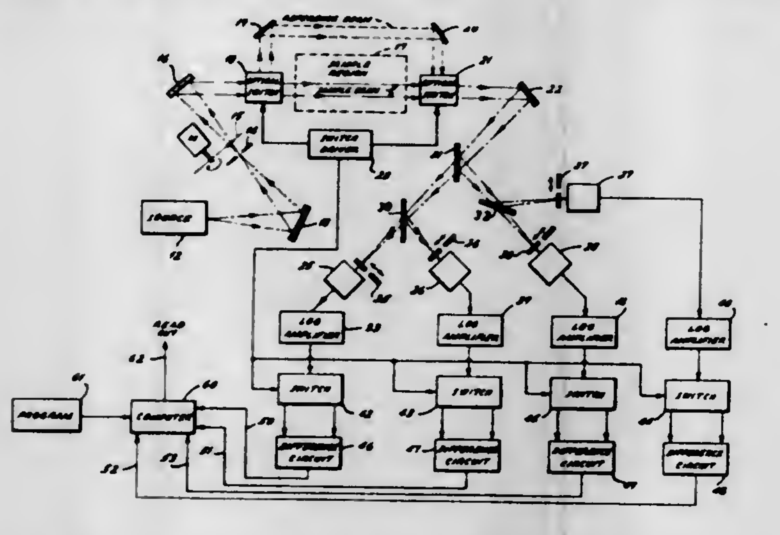
4,001,595
MULTIPLE WAVELENGTH TRANSMISSOMETER

Elias Reisman, Orange, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 23, 1975, Ser. No. 570,603

Int. Cl.² G01N *21/26, 15/02*

U.S. Cl. 250—575 **5 Claims**



1. A transmissometer for evaluating the particulate matter in a sample region, said transmissometer comprising:

means for generating radiant energy, said radiant energy characterized as having substantial energy content in at least a plurality of wavelengths extending over a broad portion of the spectrum,

means for forming said radiant energy into a beam,

means for passing said beam through said sample region, said beam being selectively attenuated at different ones of said wavelengths as a function of the quantity, nature, and size of the particles present in the portion of the sample region traversed by said beam,

a plurality of radiant energy detectors,

means for illuminating said plurality of radiant energy detectors from the beam emerging from said sample region,

means associated with each detector in said plurality for limiting the spectral response of said detector to a narrow portion of said spectrum, each detector being limited to a different portion of said spectrum,

means for establishing a plurality of sets of values, each set being representative of the predicted amplitude of signals derived from the outputs of said detectors for a selected size distribution and mass concentration of particulate matter in said sample region, and

means for comparing signals derived from the outputs of said detectors with selected ones of said sets, thereby to provide an indication of the size distribution and mass concentration of particulate matter in said sample region.

4,001,596
WAVE AND CURRENT OPERATED POWER GENERATING DEVICE

Earl D. Kurtzbein, 711 W. 46th St., Vancouver, Wash. 98663

Filed Oct. 3, 1974, Ser. No. 511,772

Int. Cl.² F03B *13/12*

U.S. Cl. 290—53 **3 Claims**

1. A wave and current power generating device, comprising:

a. a pair of elongated hollow hulls connected together in laterally spaced, parallel relation, said hulls including compartments arranged to be filled with air to float the hulls and to be filled with water to sumberge the hulls,

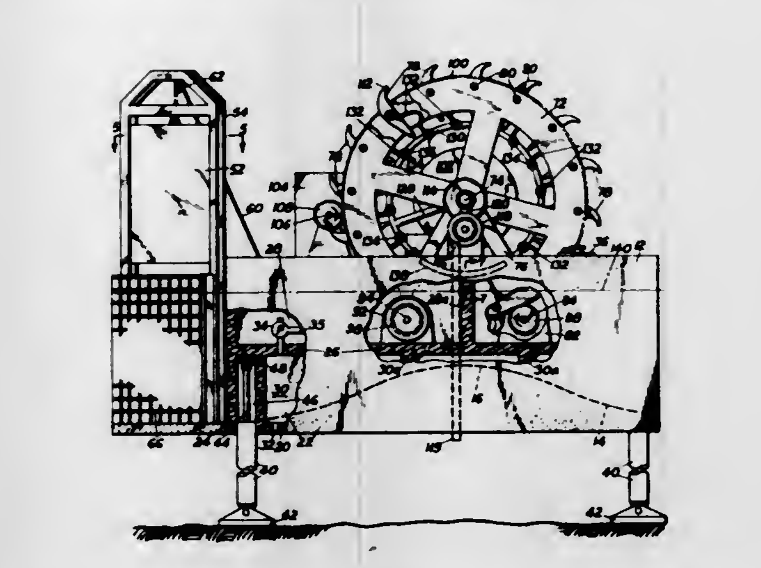
b. pump means on one of the hulls communicating with the hull compartments for filling the latter selectively with air and with water,

c. a floor extending between said hulls below the top thereof forming an open top water passageway therebetween having inlet and outlet ends,

d. a water wheel cupported for rotation on said hulls with a portion of the water wheel projecting into said water passageway between said inlet and outlet ends, said water wheel comprising

1. a pair of upstanding circular wheel members spaced apart laterally and extending into said water passageway adjacent the inner sides of the hulls, and
2. vanes extending transversely between said wheel members for rotating the latter under the influence of water moving through said passageway,

outwardly projecting gear teeth on the outer periphery of at least one of said circular wheel members,



f. electric generator means mounted on the hull adjacent said peripheral gear teeth,

g. gear means on said generator means meshing with the gear teeth on the periphery of said circular wheel member, and

h. a plurality of vertically extensible legs on the hulls extending adjustably below the latter for support on a submerged surface, for adjusting the depth of the floor of the water passageway between the hulls relative to the water level.

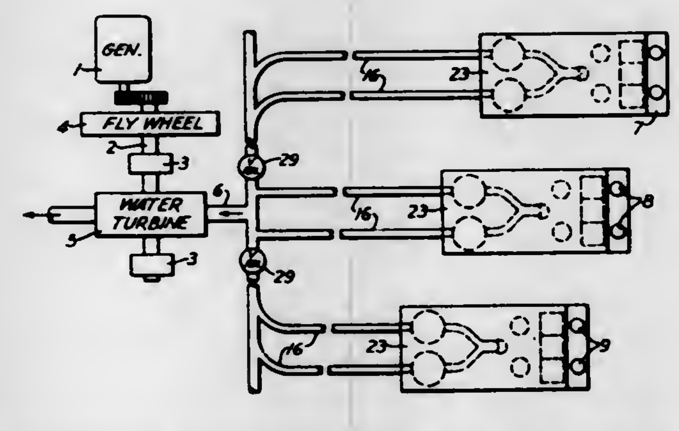
4,001,597
ELECTRIC POWER GENERATING SYSTEM

Albert L. Graff, 32 Wilson St., Pittsburgh, Pa. 15223

Filed June 20, 1975, Ser. No. 588,804

Int. Cl.² F03B *13/12*

U.S. Cl. 290—53 **5 Claims**



1. An electric power generating system comprising an electric generator, a turbine operatively connected with the generator for driving it and having an inlet, a plurality of base members seated on an ocean bed adjacent the shore and having shore ends and off-shore ends, normally expanded upright compression cylinders mounted on the shore ends of said base members, each cylinder having a fluid inlet and an outlet, check valves for the cylinder inlets and outlets to direct flow of fluid through the cylinders in only one direction, conduits connecting the cylinder outlets with said turbine inlet, rigid pressure plates above said base members and the cylinders thereon and inclined downwardly from their shore ends to their opposite ends, means hinging the lower end of each pressure plate to the underlying base member on a horizontal axis, whereby waves passing over the pressure plates will force their upper ends down to compress the cylinders to force fluid through said conduits to said turbine, and means including a coil spring inside each cylinder for expanding it and raising the overlying pressure plate after each wave has passed over them, said base members being located in such positions on the ocean bed that said pressure plates will be depressed in succession to provide substantially constant flow of fluid to the turbine.

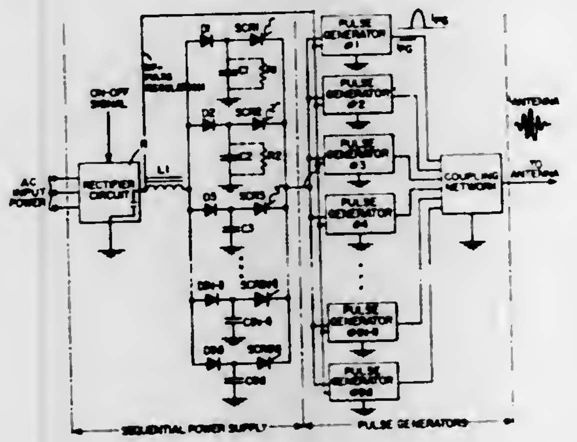
4,001,598
SEQUENTIAL POWER SUPPLY AND METHOD FOR RF PULSE GENERATION

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Dec. 29, 1975, Ser. No. 644,623

Int. Cl.² H03K *3/00*

U.S. Cl. 307—106 **16 Claims**



1. A method of RF pulse generation, that comprises, charging a plurality of energy storage sources; sequentially discharging the sources to provide successive energy bursts; simultaneously transferring the energy of each burst to a further plurality of energy storage sources; and, following such transfer, sequentially discharging the further energy storage sources and generating successive cycles of an overall RF pulse corresponding to each burst.

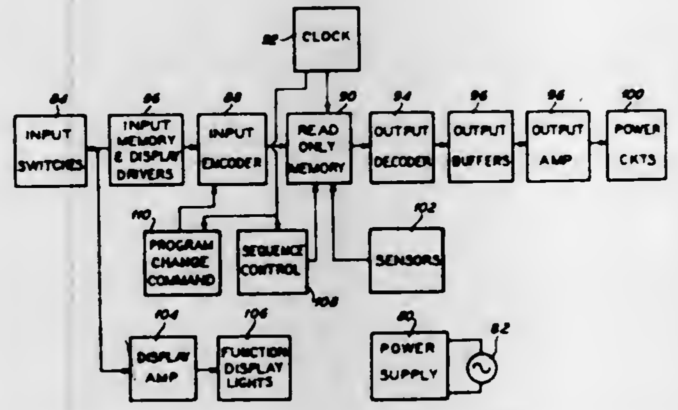
4,001,599
APPLIANCE PROGRAMMER WITH INTEGRATED CIRCUIT

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 17, 1974, Ser. No. 506,838

Int. Cl.² H01H *7/00, 43/00*

U.S. Cl. 307—141 **8 Claims**



1. In an appliance which performs a plurality of operations, an electronic control for stepping the appliance through an operating program which comprises a sequence of the operations, said electronic control comprising:

a clock having a plurality of outputs for supplying electrical timing pulses at a plurality of discrete intervals;

a sequence control connected to said clock for establishing a sequence of operations, the timing of said operations being controlled by selected timing pulses;

a memory circuit connected to said sequence control and to said clock for generating a sequence of output signals;

a plurality of output circuits connected to said memory circuit for performing said sequence of operations in response to said sequence of output signals;

a source of reference potential and at least a single terminal for connection thereto;

program modifying means connected to said clock and said terminal and having an output connected to said memory circuit, said program modifying means comprising gating means which is enabled at the start of the program to be responsive to the electrical potential at said terminal to pass a timing pulse from one of said clock outputs to the memory circuit, said timing pulse operating on said memory circuit in place of one of said selected timing pulses.

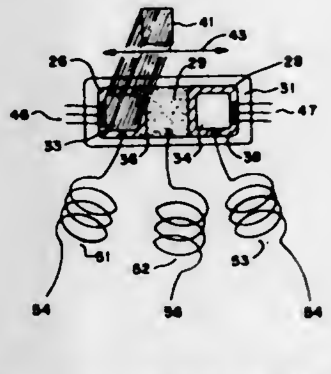
4,001,600
INTERCONNECTING CIRCUIT FOR EBS DIODES AND METHOD

Philip S. Carter, Jr., Palo Alto, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Filed June 2, 1975, Ser. No. 582,621

Int. Cl.² H01J *23/16*

U.S. Cl. 307—149 **12 Claims**



1. An EBS source, for coupling energy to a load at a radio frequency operating range, wherein the source is of the type utilizing an electron beam to illuminate beam surfaces of plural EBS diodes capable of assuming first and second states in response to said excitation comprising electron beam means for alternatively illuminating said diodes in a predetermined manner, first and second EBS diodes arrayed to receive said beams, said diodes being electrically series connected in phase at said operating frequency range, said diodes each having a radio frequency generating state when illuminated and a back-biased state including a finite capacitance thereacross when non-illuminated, load coupling means connected across said series connected diode combination, a power supply, isolation means connected between said diode combination and said supply for providing voltage and current to each diode and providing isolation between said diodes and between said diodes and said supply at said operating frequency range, so that when said first diode is illuminated the radio frequency energy generated is coupled via the finite capacitance of the second diode to said load, and when said second diode is illuminated the radio frequency energy generated is coupled via the finite capacitance of the first diode to said load.

4,001,601

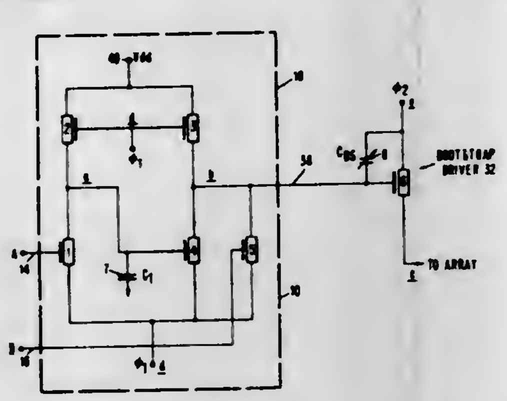
TWO BIT PARTITIONING CIRCUIT FOR A DYNAMIC, PROGRAMMED LOGIC ARRAY

Stanley Everett Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,734

Int. Cl.² H03K *19/08, 19/34, 17/10, 17/56*

U.S. Cl. 307—205 **9 Claims**



1. An input decoder for a two-bit partitioning circuit of a programmed logic array, comprising:

a first stage including two field effect transistors (FETs) having a respective first one of their electrode terminals connected to a common first node, and a first capacitive means including a capacitor having one side connected to said first node, with the gate of a first FET in said first stage being connected to a first primary input line to the two-bit partitioning circuit;

a second stage including three FETs, each having a first one of their electrode terminals connected to a common second node, a first of said three FETs having its gate connected to said first node and its second electrode terminal connected to a third node together with both a second electrode terminal of said first FET in said first stage and a second electrode terminal of a second FET in said second stage, said second FET in said second stage having its gate connected to a second primary input line to the two-bit partitioning circuit, and the second FET in said first stage and a third FET in said second stage having their gates connected to said third node for receiving a phase voltage and having their respective second electrode terminals connected to a voltage source; and

bootstrap driver means including a FET having its gate connected to said second node, said bootstrap driver means including second capacitive means with a capacitance which is much greater than the capacitance of said first capacitor such that the discharge speed of said first stage is much faster than that of said second stage, said FET of said bootstrap driver means providing one of four outputs of said two-bit partitioning circuit: whereby a signal is caused to propagate through the two stages in one clock cycle, with the only power dissipation being essentially that required to charge the two capacitive means.

4,001,602

ELECTRONIC ANALOG DIVIDER

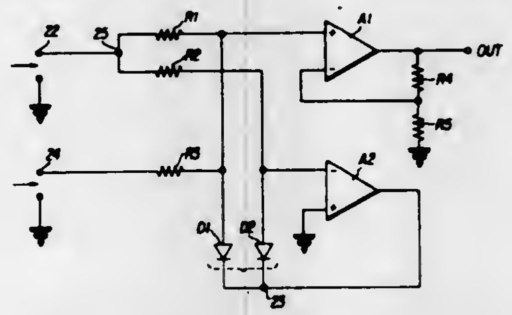
Arthur G. Birchenough, Brookpark, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,968

Int. Cl.² G06G *7/12, 7/16*

U.S. Cl. 307—229 **8 Claims**

1. A divider circuit comprising a pair of resistors, a pair of diodes, each resistor being connected in series with a corresponding diode and the two series circuits thereby formed being connected in parallel, the resistors connected to form one junction of the parallel circuits, means for applying to said one junction a current proportional to a desired denominator in the exponential voltage-current characteristic of the diode, whereby the current through the diodes is proportional to said denominator, means for applying to one of said diodes an incremental current proportional to a desired numerator, and an amplifier, one input to said amplifier comprising the connection between said other diode and its corresponding resistor, the output of said amplifier being connected to the diode junction of said parallel circuits, and the other amplifier input being connected to a common terminal.



4,001,603

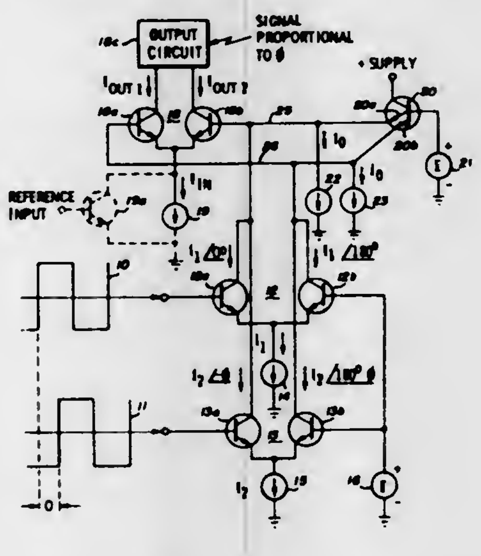
EMITTER LOAD SWITCHING CIRCUIT

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 25, 1976, Ser. No. 661,103

Int. Cl.² H03K *5/20;* **H03B** *3/04*

U.S. Cl. 307—232 **10 Claims**



1. A circuit for responding to a plurality of square waveform signals of differing phase to obtain a signal having phase information representative of the combined signals, said circuit comprising:

means for accomodating a first signal input and a second signal input, each of said signal inputs being of approximately square wave form and having a particular phase,

means for providing opposite polarity representations of at least one of said first and second input signals,

means for processing said opposite polarity representations to derive an output that has information representative of the combined input signal phases, said means for processing having at least one output terminal and two input terminals, and

load means coupled to said two input terminals of said means for processing said opposite polarity representations, said load means having a logarithmic voltage response as a function of current and a constant combined load response at said two input terminals.

4,001,604

PEAK VALUE DETECTOR

Jack G. Parks, Troy, and Gordon J. McInnes, Clarkston, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,671

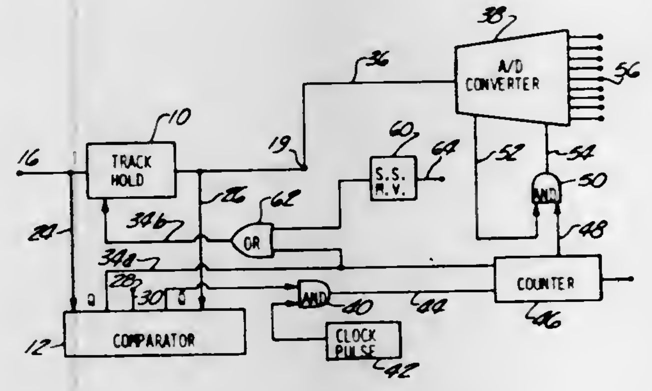
Int. Cl.² H03K *5/13, 13/02, 5/153, 17/60*

U.S. Cl. 307—235 A **5 Claims**

1. A circuit for detecting peaks in a time-variant analog signal and converting same to digital form, comprising:

a track-hold unit having an input (16) adapted to receive the time-variant signal, a signal storage means (18), a bistable gated switch (14), having a gate terminal, for alternately conducting the time-variant signal to the storage means or isolating the storage means from the time-variant signal, and output terminal (19) continuously connected to the storage means for delivering the stored signal;

a comparator for comparing the time-variant signal and stored signal, said comparator having a first input terminal (24) connected to said track-hold unit input terminal (16), a second input terminal (26) connected to said track-hold unit output terminal (19), a first output terminal producing a first logic output signal (Q) when the time-variant signal exceeds the stored signal, and producing at a second output terminal a second logic output signal ($\bar{Q}$) when the stored signal equals or exceeds the time-variant signal;



circuit means (34*a* and 34*b*) responsive to said first logic output signal for applying said first logic signal to the gate terminal of said bistable switch, whereby said switch (14) is in its conducting state only when the time-variant signal exceeds the stored signal; a converter (38) for converting the stored time-variant signal at said track-hold unit output (19) to digital form; said converter having convert-control circuitry (50, 52, 54);

an additional circuit means (44 and 48) coupled to said comparator second output terminal for applying said second logic output signal ($\bar{Q}$) to said convert control circuitry whereby the converter is put into the convert mode only when the stored signal equals or exceeds the time-variant signal.

4,001,605

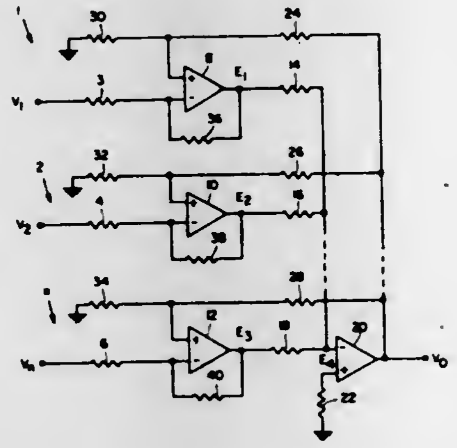
VOTER CIRCUIT INCLUDING AVERAGING MEANS

Francis J. Thomas, West Paterson; Albert Kirchhein, Montvale, and Donald J. Porawski, Bayonne, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 29, 1975, Ser. No. 617,548

Int. Cl.² H03K *5/20;* **G06G** *7/12*

U.S. Cl. 307—235 F **9 Claims**



1. Apparatus voting on a plurality of input signals for providing an output signal, comprising:

a plurality of amplifier means, each of which receives one of the plurality of input signals at a first input terminal and provides an output signal at an output terminal;

other amplifier means connected at a first input terminal to the output terminal of each of the plurality of amplifier means and connected at an output terminal to a second input terminal of each of the plurality of amplifier means, and voting on the plurality of input signals for providing the output signal at said output terminal; and

means connected to the output terminals of each of the plurality of amplifier means and to the first input terminal of each of the plurality of amplifier means for averaging the plurality of input signals over a predetermined range, with the voting occurring outside of said range.

4,001,606

ELECTRICAL CIRCUIT

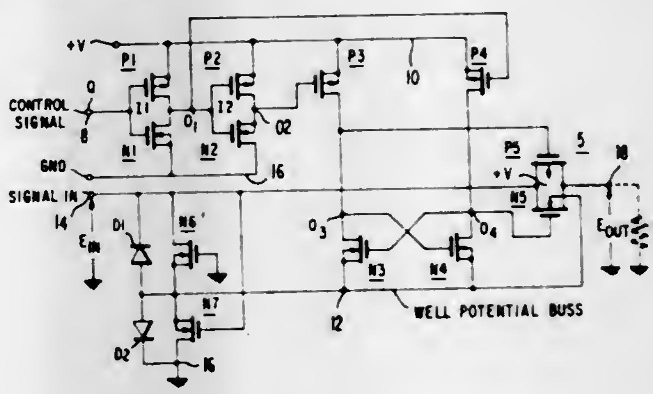
Andrew Gordon Francis Dingwall, 208 Riverview Drive, Somerville, N.J. 08876

Filed June 3, 1975, Ser. No. 583,285

Claims priority, application United Kingdom, June 5, 1974, 24900/74

Int. Cl.² H03K *17/60, 17/06, 17/30, 3/286*

U.S. Cl. 307—251 **18 Claims**



1. An electrical circuit including:

a signal input point and a signal output point;

a transistor having first and second electrodes defining the ends of a conduction path and a control electrode, said first electrode being connected to said signal input point, and said second electrode being connected to said signal output point; said transistor being turned on in response to a signal applied between its control electrode and said first electrode of given relative polarity and greater than a given amplitude; and

means for selectively turning off said transistor including means connected between said signal input point and said control electrode and responsive to values of the input signal of a sense and amplitude tending to turn the transistor on for applying a signal of the same sense to the control electrode of said transistor and of an amplitude such as to overcome said tendency whereby said transistor is maintained in a non-conducting condition.

4,001,607

DRIVE CIRCUIT FOR A GATE SEMICONDUCTOR DEVICE

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 585,209

Int. Cl.² H03K *17/72;* **H01J** *29/76*

U.S. Cl. 307—252 C **3 Claims**

1. A drive circuit for a gated semiconductor device, comprising:

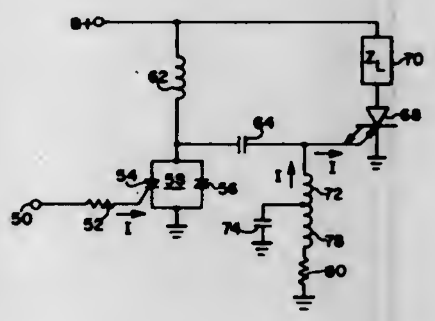
a source of direct current potential;

switching means for providing first and second conduction states;

a gated semiconductor device;

first capacitance means coupled to said switching means and a gate electrode of said gated semiconductor device for providing a first gate current in response to said first conduction state;

a first inductance means coupled to said source of direct current potential and said switching means for storing energy during said first conduction state to be utilized to enhance a second gate current and the replenishment of energy in said first capacitance means during said second conduction state;



means including a second inductance coupled to said gate electrode and reference potential for storing energy during said first conduction state to be utilized to further enhance said second gate current during said second conduction state; and

second capacitance means coupled to said second inductance and to reference potential and forming a resonant circuit with said second inductance and said first capacitance means for commutating said switching means to switch from said first conduction state to said second conduction state.

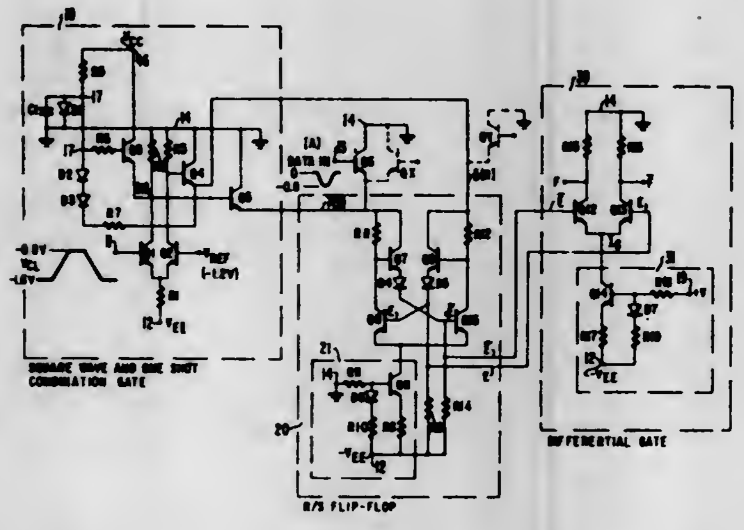
4,001,608
ECL SWITCHING CIRCUIT FOR PRODUCING NONCOMPLEMENTARY, TIME COINCIDENT SIGNALS

Borys Zuk, New Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,608

Int. Cl.² H03K *17/00*

U.S. Cl. 307—268 **9 Claims**



1. In combination with a differential stage having first and second inputs and first and second outputs, the improvement comprising:

means for producing a relatively short width pulse at said first output when its potential makes a transition from a first to a second level and the potential at the second output makes a transition from said second level to said first level including:

a. a first means having a control electrode and having a conduction path connected between said first output and a point of fixed potential for reestablishing said first level at said first output when said conduction path is conductive;

b. a delay network, coupled to the control electrode of said first means, for delaying the turn on of said conduction path until a set time after said delay network is enabled; and

c. clamp means coupled between said second output and said delay network for disabling said delay network and preventing conduction through said conduction path when the potential at said second output is at said second level and for enabling said delay network when the second output is at said first level.

4,001,609
CMOS POWER-ON RESET CIRCUIT

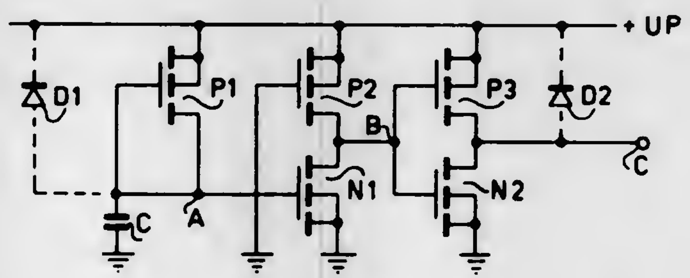
Klaus Sickert, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,704

Claims priority, application Germany, July 11, 1974, 2433328

Int. Cl.² H03K *5/01, 1/00, 5/153*

U.S. Cl. 307—268 **1 Claim**



1. An automatic reset circuit, comprising

a common power supply line;

an output terminal;

a first enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to said second electrode of said first MOSFET;

a second enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to ground;

a third enhancement mode p-type MOSFET having a first electrode connected to said common power supply line, a second electrode, and a gate connected to said second electrode of said second MOSFET;

a fourth enhancement mode n-type MOSFET having a first electrode connected to said second electrode of said second MOSFET, a second electrode connected to ground, and a gate connected to said gate of said first MOSFET;

a fifth enhancement mode n-type MOSFET having a first electrode connected to said second electrode of said third MOSFET and to said output terminal for providing a predetermined voltage level upon activation of said common power supply line, a second electrode connected to ground, and a gate connected to said gate of said third MOSFET; and

a diode connected between said common power supply line and said output terminal.

4,001,610
TIME DELAY CIRCUIT

Floyd S. Griffin, Fort Walton Beach, Fla., assignor to Ordnance Research, Inc., Fort Walton Beach, Fla.

Filed June 30, 1975, Ser. No. 592,025

Int. Cl.² H03K *17/26, 17/56, 5/13*

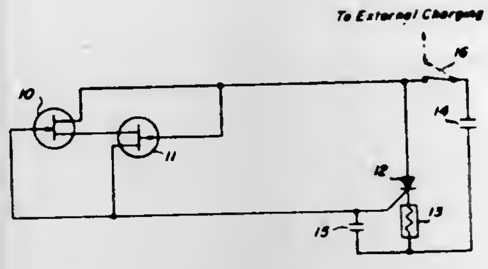
U.S. Cl. 307—293 **7 Claims**

1. An electric timing circuit comprising in combination:

a threshold value switch including an N-channel F.E.T. and a P-channel F.E.T. having their drain-source path connected in series, the gate electrodes of each connected to the drain of the other and their source electrodes connected together;

a voltage sensitive element;

a self contained voltage source; and



means connecting said source, said element and the drain-source path of said F.E.T.s in a series circuit.

4,001,611
ASYNCHRONOUS DELAY CIRCUIT

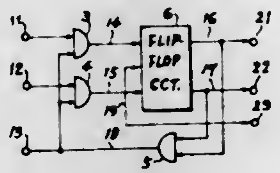
Tatsuo Maruyama, Tokyo, and Hiroshi Sasaki, Kashiwa, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jan. 8, 1976, Ser. No. 647,584

Claims priority, application Japan, Jan. 10, 1975, 50-5000

Int. Cl.² H03K *5/13, 19/34, 3/29*

U.S. Cl. 307—293 **10 Claims**



1. An asynchronous delay circuit comprising:

a flip-flop circuit having two input terminals, two output terminals and a control terminal;

two input information terminals for receiving two logical inputs;

two gates respectively connected between said two input information terminals and the two input terminals of said flip-flop circuit;

first control means connected to the output terminals of said flip-flop circuit and said two gates for applying the two logical inputs to the two input terminals of the flip-flop circuit through said two gates to store the logical inputs in the flip-flop circuit only when the flip-flop circuit is previously established to an empty state where logical values of the two outputs of said flip-flop circuit are coincident with each other;

control terminal means for receiving an external control signal; and

second control means connected between said control terminal means and said control terminal of said flip-flop circuit for forcing said flip-flop circuit to said empty state in response to said external control signal.

4,001,612
LINEAR RESISTANCE ELEMENT FOR LSI CIRCUITRY

Takaaki Aoki, Kanagawa, Japan; Paul Evrenidis, Raleigh, N.C.; Ryo Igarashi, Shiga, Japan, and Seiki Ogura, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,469

Int. Cl.² H01L *27/02, 29/66*

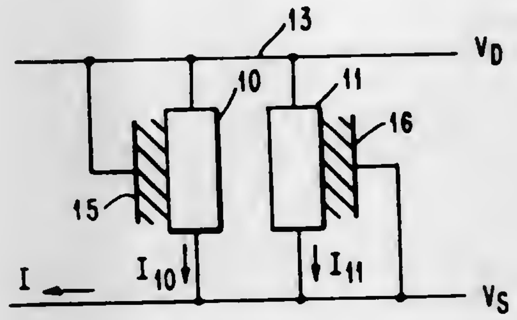
U.S. Cl. 307—304 **2 Claims**

1. A constant resistance integrated circuit configuration for a semi-conductor chip, said circuit comprising:

two substantially similar depletion mode field effect transistors, each having a source and a drain electrode connected by a conductive region;

a conductive area on said chip connected to said drain electrodes of both said transistors to form a drain connection;

a second conductive area on said chip connected to said source electrodes of both said transistors to form a source connection;



a pair of gate electrodes, each forming a part of one of said transistors with each gate electrode adjacent to and insulated from an associated one of said conductive regions to control the flow of current therein;

a conductor connecting one of said gate electrodes to said drain connection; and

another conductor connecting the other of said gate electrodes to said source connection.

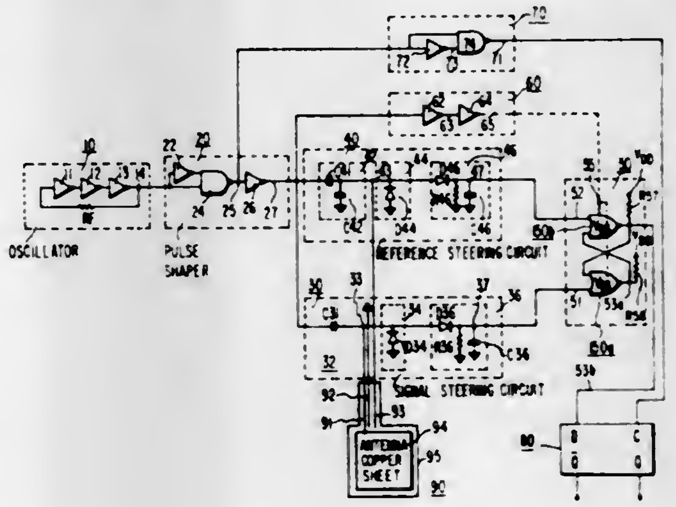
4,001,613
PROXIMITY SENSING CIRCUIT

Vernon Elton Hills, Hightstown, and Leesui Wu, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,780

Int. Cl.² H03K *17/00;* **G08B** *13/00*

U.S. Cl. 307—308 **14 Claims**



1. The combination comprising:

a first terminal for the application thereto of sampling signals;

first and second circuits, each circuit having an input connected to said first terminal and an output;

a sensor responsive to external stimuli connected to said first circuit for varying the response of the first circuit to said sampling signals; and

comparator means connected to the outputs of said first and second circuits for comparing the output signals produced at the outputs of said first and second circuits;

said comparator means including a regenerative circuit having at least two input terminals, an output terminal, and two power terminals for the application therebetween of an operating potential; one of said two input terminals being connected to the output of said first circuit and the other one of said two input terminals being connected to the output of said second circuit; and means for applying an operating potential to said power terminals of said regenerative circuit at a rate corresponding to that of said sampling signals for sensing the signals present at the outputs of said first and second circuits during a sampling signal and for producing at the comparator output terminal a signal indicative of which of the two signals has the greater magnitude.

4,001,614

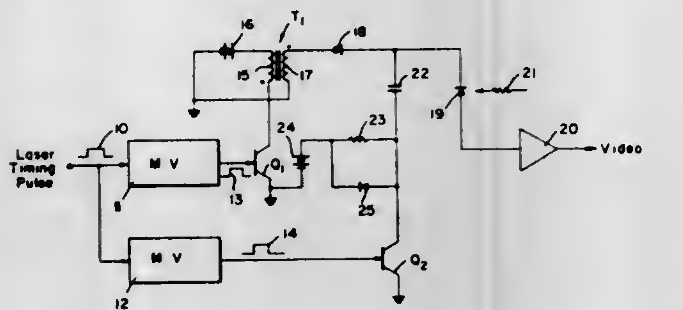
BIAS CIRCUIT FOR A PHOTO-AVALANCHE DIODE

Rodney J. Dahlinger, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 27, 1975, Ser. No. 608,113

Int. Cl.² H03K *1/12*

U.S. Cl. 307—311 **5 Claims**



1. A photo-avalanche diode bias circuit comprising:
- a. a photo-avalanche diode for receiving a light signal and generating an electrical output in response thereto;
- b. capacitor means for providing a bias voltage for said diode, said diode being connected to a first plate of said capacitor means in shunt circuit relationship with said capacitor means;
- c. energy supply circuit means for charging said capacitor means to a voltage level with respect to ground which is equal to the avalanche breakdown voltage of said diode in response to a first timing pulse; and
- d. reference voltage circuit means connected to the second plate of said capacitor means for reducing said diode bias voltage provided by said capacitor by a predetermined amount to a level with respect to ground which is below that of said avalanche breakdown voltage of said diode in response to a second timing pulse.

4,001,615

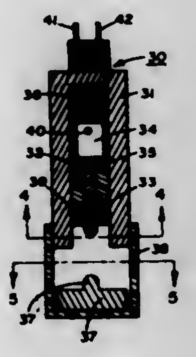
ELECTRICALLY ACTUATED PIEZOELECTRIC HIGH VOLTAGE IMPACT MECHANISM

Don A. Berlincourt, Chagrin Falls, Ohio

Filed May 7, 1973, Ser. No. 357,647

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.3 **29 Claims**



1. An electrically actuated impact type piezoelectric mechanism comprising:

piezoelectric element means effective to provide an electrical spark source in response to mechanical actuation thereof;
frame means of magnetic material;
coil means;
hammer means; disposed such that actuation of coil means from a low voltage electrical power source causes impact of the hammer against adjacent end means of piezoelectric element means as the magnetic circuit is essentially closed;
in combination with burner system means comprising:
at least one air-fuel mixture burning device;
at least one electrode tip means connected electrically to the high voltage output of the piezoelectric mechanism and located adjacent to at least one air-fuel mixture burning device;
electric switch control means to connect and disconnect electric power to coil means of the piezoelectric mechanism.

4,001,616

GROUNDING OF OUTER WINDING INSULATION TO CORES IN DYNAMOELECTRIC MACHINES

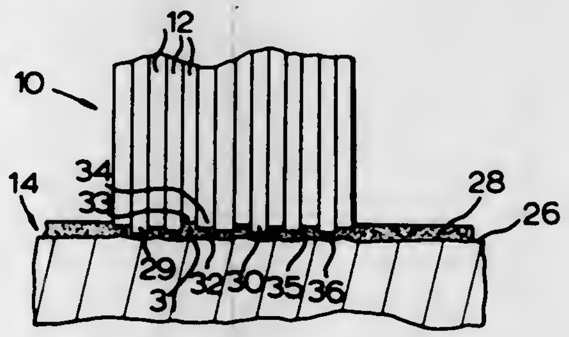
Palmer Lonseth; Neil Robertson Selkirk, and Hubert Gerald Panter, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Feb. 10, 1975, Ser. No. 548,835

Claims priority, application Canada, Feb. 18, 1974, 192819

Int. Cl.² H02K *15/12*

U.S. Cl. 310—45 **4 Claims**



1. A core and coil structure for a dynamoelectric machine comprising a stack of laminations formed with slots for receiving sides of coils; and a winding of coils having sides disposed in said slots and end turns projecting from the core stack, each one of said coil sides having at least one conductor strand encased in a hard, unyielding jacket of insulating materials and the jacket of insulating materials covered by a hard, unyielding, semiconducting armor jacket; variations in the laminations and the surface of said armor jacket defining voids between the armor jacket and the slot wall; the improved means for conducting electric charge from said armor jacket to said core stack comprising a pressure deformable, semiconducting material located continuously between said armor jacket and said slot wall, said semi-conducting material being deformed by pressure into said voids and having an electrical resistance low enough to conduct electric charge from said armor jacket to said core stack and high enough to avoid significant eddy current flow between core laminations; and, wherein said semi-conducting material is a room temperature vulcanizing silicone resin filled with fine particle graphite and/or lamp black in an amount that gives the filled resin an electrical resistance within an approximate range of 1000 to 80,000 ohms per square.

4,001,617

ROTARY ELECTRICAL MACHINES COMPRISING A SUPERCONDUCTIVE WINDING

Lionel Boyer, Alfortville, France, assignor to Agence Nationale de Valorisation de la Rechereche (ANVAR), France

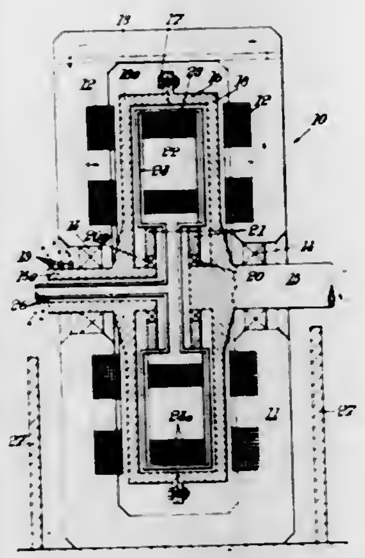
Filed May 29, 1975, Ser. No. 581,756

Claims priority, application France, June 7, 1974, 74.19671

Int. Cl.² H02K *9/00*

U.S. Cl. 310—52 **9 Claims**

1. In a rotary electrical machine comprising: a superconductive field winding located in a cryostat, mounted for rotation around an axis, and producing a field rotating at the same speed as the field winding when direct current circulates therein; stator windings arranged to produce a field rotating at the same speed as the field winding when poly-phase currents flow therethrough and cooperating with the field winding; and electrically conductive rotary means carried by a mechanical power transmission shaft and disposed between the field winding and the stator windings through which flow, during operation, currents for producing a field which counteracts the torque exerted on the field winding, the improvement comprising a flat annular winding constituting the field winding and supplying a field the field lines of which are substantially parallel to the axis of rotation of the field winding in the space between the field winding and the stator windings, said stator windings axially straddling the field winding and being separated therefrom by said electrically conductive means.



4,001,618

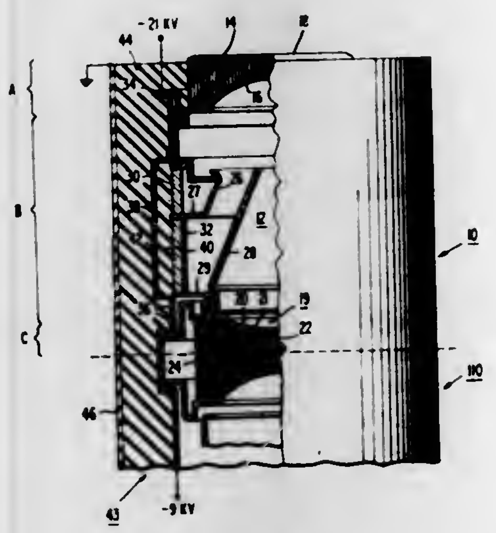
ELECTRON DISCHARGE IMAGE TUBE WITH ELECTROSTATIC FIELD SHAPING ELECTRODE

Paul Warren Kaseman, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 545,154, Jan. 29, 1975, abandoned. This application Nov. 10, 1975, Ser. No. 630,652

Int. Cl.² H01J *39/04, 31/50*

U.S. Cl. 313—94 **9 Claims**



1. An electron discharge tube including:
- a. an input portion including an electron emissive cathode capable of emitting electrons as an electron-image in response to a radiation image impinging thereon.
- b. an output means for receiving said electron-image and for providing a read-out of said electron-image; said output means including an electron-image receiving member in spaced-apart facing relation to said cathode;
- c. hermetically sealed envelope means fixably supporting and electrically isolating said cathode and said output means at opposing ends of a tubular envelope portion whereby an electron accelerating cavity extends within the interior of said tubular envelope means between said cathode and said electron-image receiving member;
- d. an electron lens system capable of accelerating electrons emitted from said cathode to impinge upon a surface portion of said electron-image receiving member as an electron-image; said electron lens system including at least two electrically isolated electron focussing electrodes secured within said cavity at opposing ends of the tube by said envelope means; said focussing electrodes being electrically isolated from each other by a tubular insulating member of said tubular envelope portion having an interior wall surface facing said cavity within said tube;
- e. a tubular electrostatic field shaping electrode extending coaxially about the entire interior wall surface of said tubular insulating member facing said cavity; said field shaping electrode being capable of substantially preventing electron bombardment of said interior wall surface by divergent electrons and of substantially avoiding, during operation of the tube, spurious output signals resulting from the generation of positive ions from that surface as a consequence of such electron bombardment; and
- f. a housing surrrounding said envelope means; said housing including a conductive shield which coaxially surrounds said envelope means and said field shaping electrode; said shield being capable of establishing a ground plane electrically isolated from electrical potentials which may be applied to said focussing electrodes, field forming electrode, said cathode, and said receiving member.

4,001,619

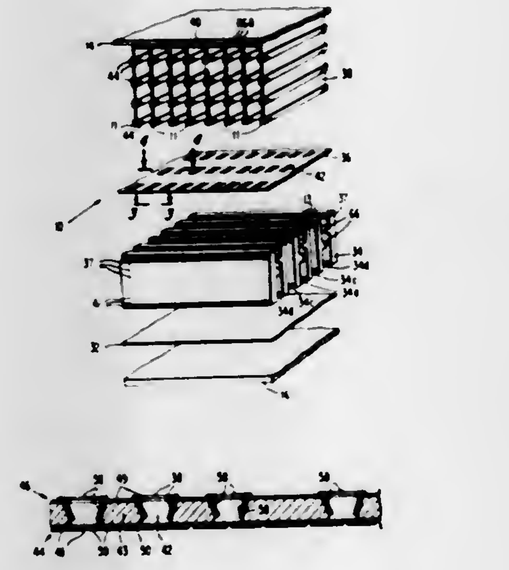
MODULATION MASK FOR AN IMAGE DISPLAY DEVICE

John Guiry Endriz, Plainsboro, and Carmen Anthony Catanese, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,502

Int. Cl.² H01J *43/00*

U.S. Cl. 313—105 R **24 Claims**



1. A substantially planar modulation mask for an area cathode cathodoluminescent image display device, which comprises:

- a metal sheet having a plurality of substantially identical apertures which are disposed in parallel rows and columns,
- a plurality of segmented charge sensing pads disposed on but insulated from one surface of said metal sheet with at least one of said sensing pads in abutting relation with each of said apertures, each one of said sensing pads being disposed between said columns of apertures and extending for less than the full number of said rows of apertures, said sensing pads including a portion which extends beyond said abutting apertures, said extended portion including a material having a high secondary emission ratio, and
- a plurality of substantially parallel modulating electrodes disposed on but insulated from the other surface of said metal sheet with each one of said modulating electrodes extending around one of said parallel columns of apertures.

4,001,620

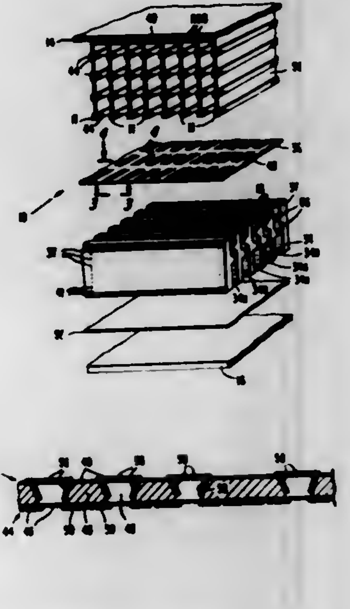
MODULATION MASK FOR AN IMAGE DISPLAY DEVICE

John Gairy Endriz, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,631

Int. Cl.^{2} A01J *43/00*

U.S. Cl. 313—105 R 28 Claims



1. A substantially planar modulation mask for an area cathode cathodoluminescent image display device, which comprises:

- a metal sheet having a plurality of substantially identical apertures which are disposed in parallel rows and columns,
- a plurality of segmented charge sensing pads disposed on but insulated from one surface of said metal sheet with at least one of said sensing pads in abutting relation with each of said apertures, each one of said sensing pads being disposed between said columns of apertures and extending for less than the full number of said rows of apertures, said sensing pads including a portion which extends beyond said abutting apertures, said extended portion including a material having a high secondary emission ratio, and
- a plurality of substantially parallel modulating electrodes disposed on but insulated from the other surface of said metal sheet with each one of said modulating electrodes extending around one of said parallel columns of apertures.

4,001,621

INCANDESCENT LAMP HAVING A REFLECTING DOME AND SPHEROCONICAL ENVELOPE

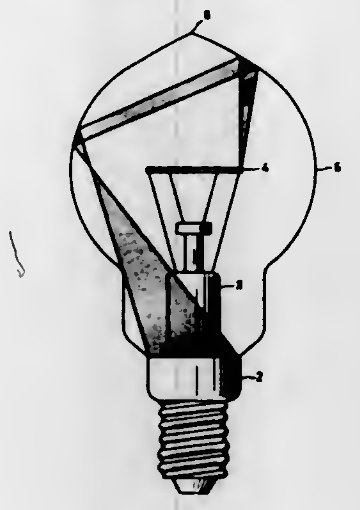
Henri Pacé, Bures-sur-Yvette; Marcel Lavedrine, Garches, and Jean Berdou, Bois-Colombes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1975, Ser. No. 596,661

Claims priority, application Spain, Dec. 24, 1974, 433316

Int. Cl.^{2} H01K *1/32*

U.S. Cl. 313—113 4 Claims



1. An incandescent lamp which comprises: a filament, a cap and an envelope cooperating with said cap and having a reflecting dome, said envelope including means to divert substantially all the rays issuing from the filament which fall on said dome to experience at least two reflections before reaching said cap.

4,001,622

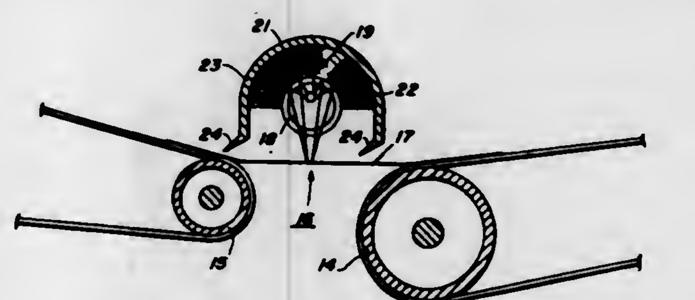
DIRECTIONAL SOURCES OF ELECTROMAGNETIC RADIATION

Michael L. Howell, Park End, near Lydney, England, assignor to Rank Xerox Ltd., London, England

Filed Oct. 3, 1974, Ser. No. 511,823

Int. Cl.^{2} H01J *5/16;* H05B *1/00*

U.S. Cl. 313—113 2 Claims



1. An electromagnetic radiation source mounted within a container transparent to the radiation of the source;

- a reflecting material within which the container is partially embedded, said reflecting material comprising a ceramic fiber felt material;
- a shield on the side of the reflecting material remote from the container;
- said shield defining a mouth opening in one direction, through which the radiation can pass, both edges of the shield being inclined in a second direction inclined to said first direction so as to guide material passing across said mouth out of said mouth.

4,001,623

ARC TUBE FOR HIGH-PRESSURE MERCURY/METAL HALIDE LAMP

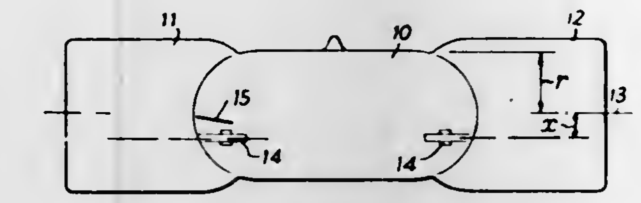
Donald Arthur Howles, and Robert Brian Page, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Mar. 18, 1975, Ser. No. 559,536

Claims priority, application United Kingdom, Mar. 20, 1974, 12410/74

Int. Cl.^{2} H01J *61/068, 61/20, 61/30*

U.S. Cl. 313—184 5 Claims



1. In a high-pressure mercury/metal halide discharge lamp for operation in a horizontal position, said lamp having an arc tube comprising a bulb closed at each end by a press seal and containing discharge electrodes, the bulb having a wall which is symmetrical about a plane generally parallel to the press seals, the improvement wherein the bulb wall has a part-cylindrical portion having a cylinder axis lying in said plane, said portion being below said cylinder axis when the lamp is in its horizontal operating position, and said discharge electrodes are positioned in alignment with one another in said plane and offset in the same direction below said cylinder axis to lie between the cylinder axis and said part-cylindrical wall portion.

4,001,624

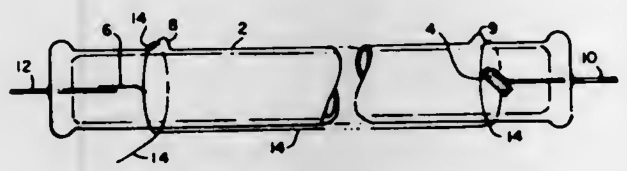
SOFT GLASS FLASHTUBE

Robert J. Cosco, Amesbury; Roger T. Hebert, Peabody, and Paul E. Gates, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Salem, Mass.

Filed June 6, 1975, Ser. No. 584,425

Int. Cl.^{2} H01J *65/00*

U.S. Cl. 313—185 16 Claims



1. A wall-stabilized flashtube comprising:

- an hermetically sealed, light-transmitting envelope formed of a soft glass tubing;
- a rare gas in said envelope; and
- a pair of electrodes in said envelope between which an arc discharge path is defined during operation of said flashtube, the length of said arc path being at least double the inside diameter of said envelope tubing whereby said discharge is wall-stabilized, the maximum loading of said flashtube being about 10 joules per square centimeter of the interior surface area of said tubular envelope for flash durations of about 250 microseconds or less as measured between the one-third-of-peak points of the light output pulse.

4,001,625

HIGH-PRESSURE DISCHARGE LAMP HAVING A METAL LEAD THROUGH CONDUCTOR

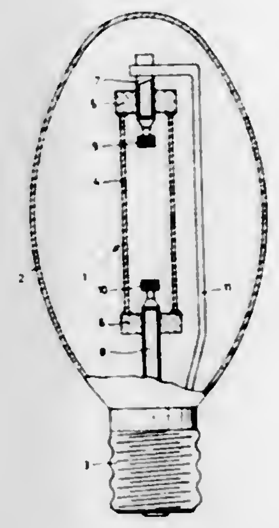
Bralt Renze Schat, and Abraham Timmermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 332,120, Feb. 13, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,740

Claims priority, application Netherlands, Feb. 21, 1972, 7202270

Int. Cl.^{2} H01J *61/30, 61/36*

U.S. Cl. 313—220 4 Claims



1. A discharge lamp which comprises: an elongated generally tubular discharge tube formed of a material which is primarily aluminum oxide; a pair of disc-shaped closure members disposed at each end of said tube, each of said closure members having a passage-way therethrough and being formed of an aluminum oxide cermet; a pair of generally tubular lead-through conductors disposed in axially aligned relationship, each extending through said closure members, said cermet having a coefficient of thermal expansion intermediate the coefficient of thermal expansion of said conductors and said discharge tube, said discharge tube conductors being disposed in sealing engagement directly with said closure member.

4,001,626

HIGH PRESSURE TIN HALIDE DISCHARGE LAMP

Peter Cornelis Drop; Willy Joseph Catharina Endevoets; Antonie Peter Lambertus van Elji, and Alexander Gray Jack, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,057

Claims priority, application Netherlands, Nov. 26, 1973, 7316101

Int. Cl.^{2} H01J *61/18*

U.S. Cl. 313—229 7 Claims

1. A high pressure tin halide discharge lamp having a discharge vessel provided with electrodes between which the discharge is maintained during operation, and comprising a filling of a quantity of rare gas as a starter gas and furthermore percubic cm of contents of the discharge vessel between 0 and 50 mg of mercury and at least 1 μmol of at least one of the halides of tin, characterized in that the discharge vessel comprises at least one of the substances selected from the group consisting of elemental indium, bismuth, lead, gallium and zinc and the halides of said elemental substances to correct the color point of the radiation emitted by the lamp and means for generating a magnetic field during operation which counteracts the upward curvature of the discharge arc.

4,001,627

METHOD OF PREPARING CONDUCTRON-TYPE PHOTOCONDUCTORS AND THEIR USE AS TARGET MATERIALS FOR CAMERA TUBES

Shmuel Mardix, Kingston, R.I.; Paul M. McIlvaine, West Willington, Conn., and Sol Nudelman, Tucson, Ariz., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Division of Ser. No. 437,775, Jan. 30, 1974, Pat. No. 3,950,272. This application Nov. 5, 1975, Ser. No. 629,012

Int. Cl.² H01J *31/00*

U.S. Cl. 313—385 **11 Claims**

1. In a camera tube which employs a photo-responsive target, the improvement which comprises employing as said target a photoconductive element characterized by a photoresponse in the visible and near infrared region to about 1.6μ wherein said photoconductive element comprises a solid, transparent and conductive surface, a layer of epoxy resin as a binder, and a coating of photoconductive silver sulfide said element being characterized both by a resistivity on the order of 1 × 10^6 ohm-cm. and having a photoresponse in the visible and near infrared regions, and wherein said photoconductive silver sulfide is prepared by a method comprising the following steps:

a. reacting an excess of silver cation in an aqueous acidic solution with an organic sulfur compound to provide a microcrystallite suspension predominantly comprising photoconductive beta-silver sulfide in the reaction solution, said reaction carried out at a temperature of from about 0°–15° C.;

b. reacting excess silver cation in the reaction solution with an inorganic source of sulfide ion to provide for the overgrowth of silver sulfide on the microcrystallites; and,

c. recovering the photoconductive silver sulfide produced thereby.

4,001,628

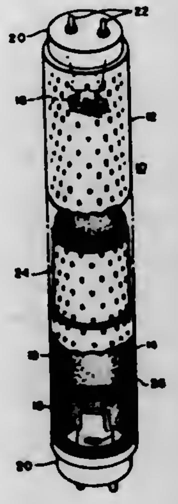
LOW-PRESSURE FLUORESCENT DISCHARGE DEVICE WHICH UTILIZES BOTH INORGANIC AND ORGANIC PHOSPHORS

Frederick M. Ryan, Loyalhanna Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,075

Int. Cl.² H01J *61/35, 61/48*

U.S. Cl. 313—487 **14 Claims**



1. A low-pressure, positive-column fluorescent lamp comprising an elongated visible-radiation-transmitting glass envelope which encloses a discharge-sustaining filling comprising mercury and inert starting gas, electrodes operatively positioned within said envelope proximate the ends thereof and adapted to sustain therebetween an operating discharge which generates ultraviolet radiations to which said envelope is substantially opaque, inorganic phosphor means carried on the interior surface of said envelope and operable to convert ultraviolet radiations generated by said operating discharge into visible radiations of predetermined wavelength, organic phosphor means carried on the outer surface of said envelope, said organic phosphor means operable to convert at least some of the wavelengths of the radiations passing through said envelope into longer wavelength visible radiations, said organic phosphor means occupying only a predetermined proportion of the outer surface of said envelope to intercept only a predetermined proportion of the total radiations passing through said envelope, said organic phosphor means having a predetermined thickness to provide a predetermined operational life for effective radiation conversion, and the blend of radiations passing through said envelope and converted to longer wavelength radiations by said organic phosphor means plus those radiations passing through said envelope and not converted to longer wavelength radiations providing light suitable for purposes of illumination.

4,001,629

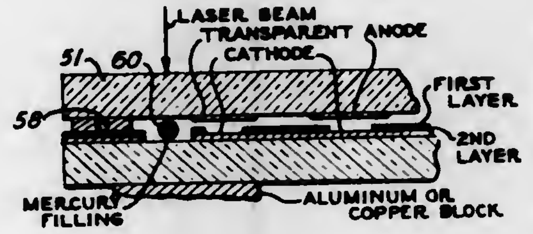
SEGMENTED GAS DISCHARGE DISPLAY PANEL

Stephen C. Thayer, Lewistown, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed Aug. 26, 1974, Ser. No. 500,225

Int. Cl.² H01J *61/067, 61/30, 61/36, 61/66*

U.S. Cl. 313—517 **3 Claims**



1. In a gas discharge display panel having a pair of rigid, spaced apart members defining parallel flat boundaries between which information to be displayed is generated by plural discrete discharges between selected energized electrodes and a gas in said panel, the improvement in spacer sealant means for sealing the gas between said boundaries, framing the information display area and spacedly joining said rigid members wherein said spacer sealant is constituted by a first portion comprised of a fused screened on frit incorporating therein a plurality of discrete dimensionally uniform nonconductive spacer beads fusible at a higher temperature than said frit, said first portion having a pair of ends spaced apart to define a tubulationless vacuumization and gas fill port between said boundaries, and a second portion comprised of a gob of spacer free dielectric material bridging the said spaced apart ends of said first portion and completing said seal.

4,001,630

SELECTIVELY DAMPED TRAVELLING WAVE TUBE

Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 465,260, April 29, 1974, abandoned. This application July 17, 1975, Ser. No. 596,643

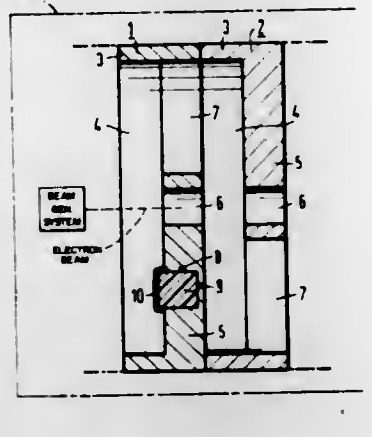
Claims priority, application Germany, May 21, 1973, 2325716

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **6 Claims**

1. In a delay line for a travelling wave tube of the type having a periodicallly alternating magnetic field for guiding an electron beam produced by a beam generating system, said delay line comprising a plurality of partitions dividing said delay line into a plurality of cells positioned one behind the other in the direction of the electron beam, and at least one chamber resonator including damping material and coupled to at least one of the cells and having a resonant frequency that is approximately equal to a predetermined interference frequency, the partitions having axially aligned openings for passage of the electron beam and coupling openings positioned at 180° from one partition to the next, the improvement therein comprising:

a recess in at least one of the partitions defining the chamber resonator located opposite the coupling opening for that partition and having a resonant frequency whose most energetic oscillations corresponds at least approximately to the frequency of an interference mode which is above the operational frequency band, said recess comprising a blind bore extending partially through the partition axially parallel to the longitudinal axis of the delay line.



4,001,631

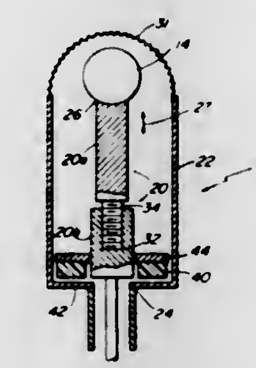
ADJUSTABLE LENGTH CENTER CONDUCTOR FOR TERMINATION FIXTURES FOR ELECTRODELESS LAMPS

William McNeill, Carlisle; Joseph Lech, Westford; Paul Haugsjaa, Acton, and Robert Regan, Newton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 570,109, May 21, 1975, Pat. No. 3,943,403. This application Nov. 17, 1975, Ser. No. 632,328

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **11 Claims**



1. A light source including:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting substance, the envelope enclosing a volatile fill material which emits light upon breakdown and excitation, the lamp having a complex impedance in the operating condition,

c. a termination fixture coupled to the source, the fixture having an inner conductor and outer conductor disposed around the inner conductor, the conductors, having a first end which is coupled to the source and the inner conductor having a second end which couples power to the lamp, and

d. means for changing the effective length of the inner conductor so that the termination fixture matches the complex impedance of the lamp during the operating condition to an output impedance of the power source.

4,001,632

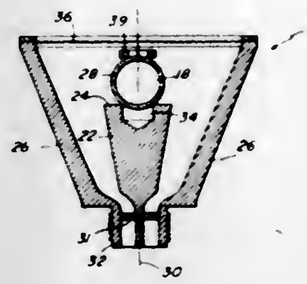
HIGH FREQUENCY EXCITED ELECTRODELESS LIGHT SOURCE

Paul Osborne Haugsjaa, Acton, and Robert James Regan, Needham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 21, 1975, Ser. No. 570,113

Int. Cl.² H05B *41/24*

U.S. Cl. 315—39 **21 Claims**



1. A light source including:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting material and a volatile fill material disposed within the envelope, the fill material emitting light upon vaporization, partial ionization and excitation, and

c. a termination fixture coupled to the source, the fixture including an inner conductor and an outer conductor disposed around and insulated from the inner conductor, the conductors having dimensions such that the lamp may be located in the high field region at the ends of the inner and outer conductors to form a lossy open circuit termination for the high frequency power which when applied initiates breakdown, vaporization and excitation of the fill material within the lamp.

4,001,633

DEVICE PROVIDED WITH A GAS AND/OR VAPOR DISCHARGE TUBE

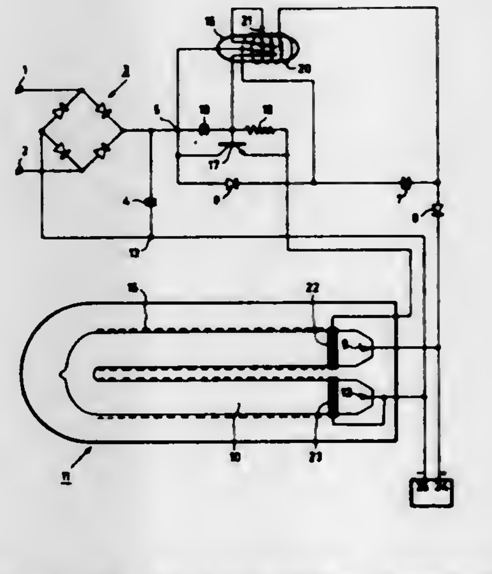
Hendricus Franciscus Joannes Jacobus van Tongeren; Jan Evert van der Werf, and Jean Johan Heuvelmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,280

Claims priority, application Netherlands, May 2, 1974, 7405871

Int. Cl.² H01J *17/34*

U.S. Cl. 315—47 **9 Claims**



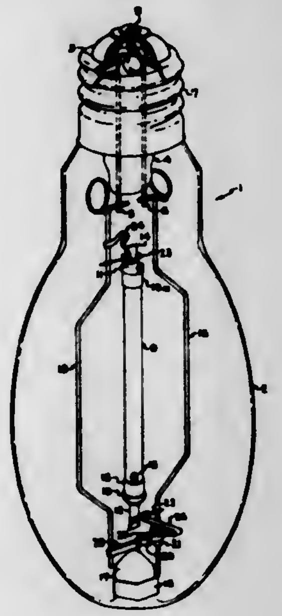
1. Discharge tube apparatus which comprises: first and second input terminals, a discharge tube having first and second electrodes, an electric heating element which extends along at least part of the length of the tube and means for

controlling said electric heating element to maintain said tube at a temperature such that said tube is substantially maintained in the positive parts of the voltage-current characteristics of said tube, said means for controlling being provided with a control member which in the operating condition of the discharge tube mainly responds to variations of the effective value of the current flowing through the tube to control the current flowing through the heating element.

4,001,634
DISCHARGE LAMP HAVING THERMAL SWITCH STARTER

Eugene K. Corbley, Cleveland Hts., Ohio, and Richard L. Collister, Jr., Missoula, Mont., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,217
Int. Cl.² H01J *61/56*
U.S. Cl. 315—73 **12 Claims**



1. A vapor discharge lamp of the type adapted to be operated from an inductive ballast comprising:

an outer vitreous envelope domed at the distal end and having a base attached to the near end, and a pair of lead-in wires sealed into said envelope and connected to said base;

an arc tube having electrodes sealed therein and containing a charge of vaporizable metal and inert starting gas, said arc tube having at one end a sealed-off metal tube serving as a reservoir for excess vaporizable metal;

a mounting frame within said envelope comprising one side rod extending from one lead-in wire along the length of the arc tube towards the dome end of said envelope;

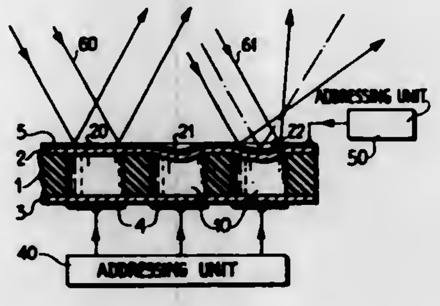
said arc tube having a connection from the electrode at the distal end to said side rod, and a connection from the electrode at the near end to the other lead-in wire, one of said connections being formed by a control conductor attached directly to said sealed-off metal tube reservoir;

and a thermal switch comprising a bi-metal member having its restrained end fastened to said control conductor and its free end adapted to engage a contact connected to said other connection whereby to short circuit said arc tube at starting, said bi-metal having a thermal mass in relation to its electrical resistance low enough that it is quickly deflected by self heating caused by short circuit current therethrough in order to open said contacts and start said arc tube.

4,001,635
ELECTRO-OPTICAL CONVERTER AND AN OPTICAL INFORMATION RECORDING SYSTEM COMPRISING SUCH A CONVERTER

Luigi d'Auria; Jean-Pierre Huignard; Jean Philippe Reboul, and Francois Le Carvennec, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 10, 1975, Ser. No. 585,581
Claims priority, application France, June 14, 1974, 74.20713
Int. Cl.² G11C *13/08;* **G02F** *1/31*
U.S. Cl. 315—169 R **6 Claims**

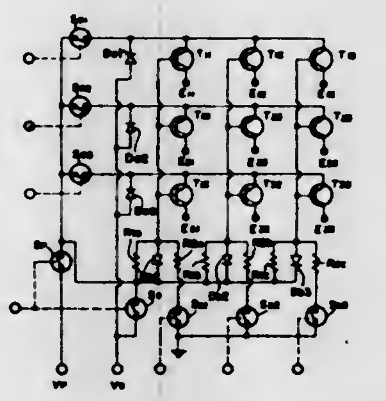


1. An electro-optical converter comprising: a substrate, with two parallel faces, wherein holes are made providing apertures on said two faces; two dielectric layers respectively arranged on said two faces, at least one of said layers being a flexible reflective diaphragm, a gas being arranged in the cells limited by said holes and said dielectric layers; two sets of electrodes respectively arranged on said two dielectric layers above said apertures, each set being formed by parallel electrodes in a direction making an angle other than zero with the electrodes of the other set; supply means for selectively supplying said electrodes in order to ionize the gas contained in the cells located between two electrodes supplied and to produce electrical charges which, in a first step, when deposited on said dielectric layers, produce electrostatic forces which deforms locally said flexible diaphragm and which, in a second step, neutralize electrical charges created in said first step, said supply means being adapted for receiving recording and erasing electrical control signals for respectively controlling said first and second steps.

4,001,636
AC DRIVE DISCHARGE TYPE DISPLAY APPARATUS

Hiroshi Tottori, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,787
Claims priority, application Japan, Oct. 16, 1973, 48-116192
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **2 Claims**



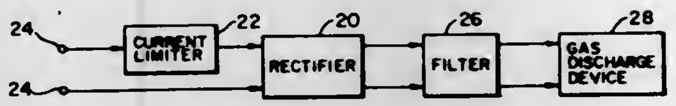
2. An AC drive type display apparatus which comprises:
a discharge type panel having a plurality of electrodes,
a drive circuit for the electrodes comprising:

a plurality of transistors T11, T12, T13, T21, T22, T23, T31, T32 and T33,
a plurality of diodes D*a*1, D*a*2, D*a*3 and D*b*,
a resistor R_2,
a plurality of switches S*a*1, S*a*2, S*a*3, S*b*1, S*b*2, S*b*3, SQX, SPX and SSX,
a first turn off pulse EQX,
a second turn off pulse EPX,
a sustaining drive voltage ESX,
a bias voltage source VB,
means connecting EQX to a first terminal of D*b* through SQX,
means connecting EPX to the first terminal of D*b* through SPX,
means connecting ESX to the first terminal of D*b* through SSX,
means connecting a second terminal of D*b* of the bases of T11, T21 and T31 through S*b*1, to the bases of T12, T22 and T32 through S*b*2 and to the bases of T13, T23 and T33 through S*b*3,
means connecting the first terminal of D*b* to the emitters of T11, T12 and T13 through D*a*1, to the emitters of T21, T22 and T23 through D*a*2 and to the emitters of T31, T32 and T33 through D*a*3,
means connecting the first terminal of D*b* to a first terminal of VB,
means connecting a second terminal of VB to the emitters of T11, T12 and T13 through R2 and S*a*1, to the emitters of T21, T22 and T33 through R2 and S*a*2 and to the emitters of T31, T32 and T33 through R2 and S*a*3,
means connecting an output terminal E11 to the collector of T11,
means connecting an output terminal E12 to the collector of T12,
means connecting an output terminal E13 to the collector of T13,
means connecting an output terminal E21 to the collector T21,
means connecting an output terminal E22 to the collector of T22,
means connecting an ouput terminal E23 to the collector of T23,
means connecting an output terminal E31 to the collector of T31,
means connecting an output terminal E32 to the collector of T32, and
means connecting an output terminal E33 to the collector of T33.

4,001,637
LAMP BALLAST

George W. Gray, West Palm Beach, Fla., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed June 12, 1975, Ser. No. 586,251
Int. Cl.² H05B *41/16*
U.S. Cl. 315—205 **14 Claims**



1. For use in a circuit for coupling an electrical vapor lamp to a cyclic electrical power source, a ballast comprising in series:

first substantially non-inductive, non-dissipative, capacitive, current limiting means having an input couplable to said source;

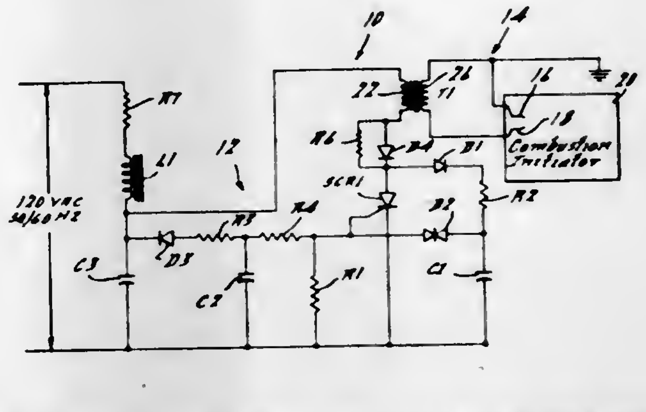
rectifying means connected to the output of said current limiting means; and

filter means having an input connected to the output of said rectifying means, and an output connectable to said lamp.

4,001,638
IGNITION SYSTEM

Frederick T. Bauer, and Frederick J. Geary, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 29, 1974, Ser. No. 528,158
Int. Cl.² H05B *37/02;* **F23Q** *3/00*
U.S. Cl. 315—209 SC **7 Claims**

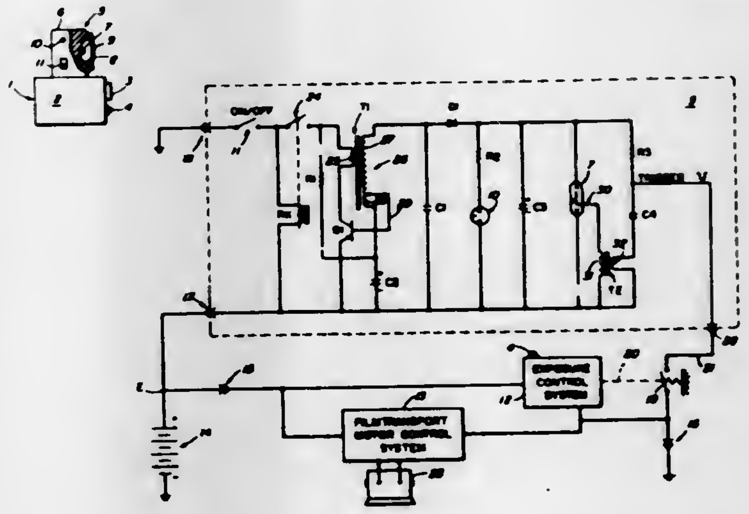


1. In an ignition system, the combination comprising plasma generating means adapted to be connected to a main line source of AC current, and combustion initiation means operatively connected to said plasma generating means, said plasma generating means including a silicon controlled rectifier having an anode, a cathode and a gate, a transformer having a primary winding and a secondary winding, a first capacitor, a first diode and a first resistor, said primary winding and said first diode being connected in series with said anode and said cathode, said first resistor being connected in parallel with said first diode, said first capacitor being connected in parallel with said anode and said cathode through said primary winding, said plasma generating means also incuding trigger means, said trigger means including said silicon controlled rectifier, second and third resistors, a second diode, a second capacitor and a trigger diode, said second resistor, said second diode, said second capacitor and said trigger diode being connected across said anode and said cathode of said silicon controlled rectifier, said third resistor being connected to said gate.

4,001,639
PREFERENTIAL POWER DISTRIBUTION SYSTEM FOR BATTERY POWERED CAMERA HAVING ELECTRONIC FLASH UNIT

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 404,033, Oct. 5, 1973, abandoned, which is a division of Ser. No. 320,602, Jan. 2, 1973, Pat. No. 3,810,212. This application Apr. 7, 1975, Ser. No. 565,426
Int. Cl.² H05B *37/00*
U.S. Cl. 315—241 P **7 Claims**



1. An electronic flash unit, of the type connectable to a

battery, comprising a gas discharge tube, a capacitor connected to said tube, a voltage converter connected to said capacitor and responsive to applied current to charge said capacitor, and a relay responsive to the voltage of the battery for supplying current from the battery to said voltage converter when the voltage of the battery goes above a first value and continuing to supply current from the battery to said voltage converter until the voltage of the battery goes below a second value lower than said first value in which said relay includes a winding connected so that the current level through the winding is directly proportional to the battery voltage together with contacts which close when said winding is energized by a first current elevel, said contacts opening when the current through said winding falls to a second level below said first level.

4,001,640

SINGLE TRIGGER PHOTOGRAPHIC STROBE UNIT

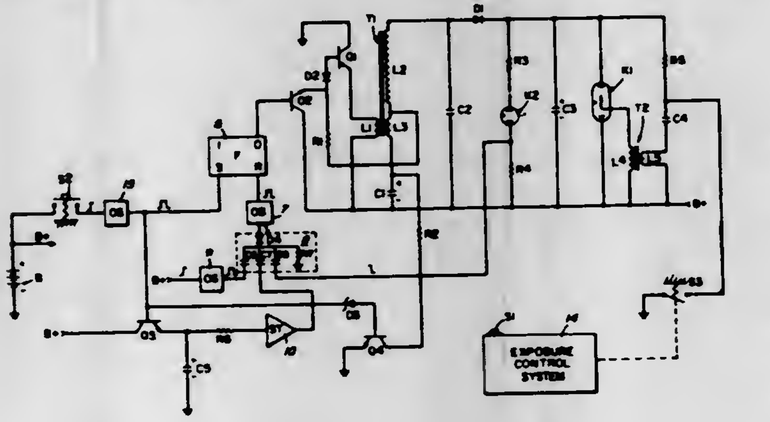
Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 320,447, Jan. 2, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,503

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.^{2} H05B *41/29*

U.S. Cl. 315—241 P **15 Claims**



14. An electronic flash operating system comprising a storage capacitor, charge control means settable to a first state and a second state for supplying charging current to said capacitor in said first state, manually operable means for setting said charge control means to said first state, and means responsive to the discharge of said capacitor for setting said charge control means to said second state.

4,001,641

HORIZONTAL DEFLECTION SYSTEM

Martin Fischman, Seneca Falls, and Jesse H. L'Hommedieu, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,405

Int. Cl.^{2} H01J *29/70, 29/76*

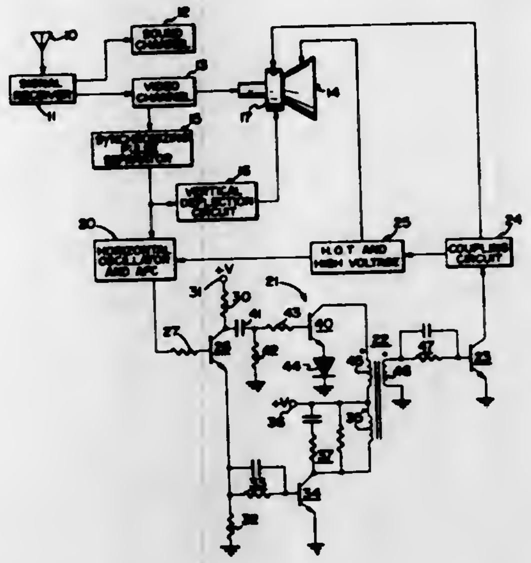
U.S. Cl. 315—408 **9 Claims**

1. In a horizontal deflection system for a television receiver having an oscillator for providing a signal synchronized with a received composite video signal and a deflection yoke associated with a cathode ray tube, a deflection circuit comprising:

a horizontal output transistor having an output electrode connected in circuit with said deflection yoke for providing a sawtooth deflection current thereto;

first and second semiconductor drivers connected to said oscillator; and

a transformer having an output winding connected to an input electrode of said horizontal output transistor, a first input winding connected to said first semiconductor driver and having a low coupling coefficient with said output winding for providing a sawtooth drive current from said output winding to said input electrode sufficient to cause said horizontal output transistor to conduct in saturation in response to energization of said first input winding by said first semiconductor device, and a second input winding connected to said second semiconductor driver and having a high coupling coefficient with said output winding for causing a reverse current to flow from said input electrode to rapidly switch said horizontal output transistor to a non-conducting state.



4,001,642

ANTI-LOCK VEHICLE BRAKE SYSTEMS

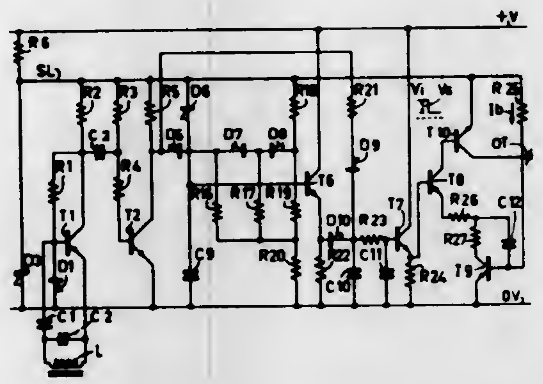
Derek Robert Skoyles, and Denis Sharp, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 368,953, June 11, 1973, abandoned. This application May 5, 1975, Ser. No. 574,615

Claims priority, application United Kingdom, June 19, 1972, 28587/72

Int. Cl.^{2} B60T *8/10, 8/02*

U.S. Cl. 317—5 **1 Claim**



1. A wheel slip detector for an anti-lock vehicle brake system, said detector comprising means for producing a d.c. signal the amplitude of which is a function of wheel speed, means for establishing a reference rate of change signal which is representative of a selected value of wheel deceleration, and means for determining over a range of wheel speeds a selected percentage of the instantaneous amplitude of said d.c. signal, said selected percentage of the instantaneous amplitude being proportional to the actual wheel speed and means to produce an output for anti-lock braking control in response to change in the instantaneous amplitude of said d.c. signal greater than said selected percentage and at a rate of change in excess of said reference rate of change parameter, said means for establishing a reference rate of change signal comprises a Miller capacitor which is connected to be discharged by the action of a transistor, and said means for determining a selected percentage of the instantaneous amplitude of said d.c. signal comprises a resistance divider chain which is connected effectively at one end to receive said d.c. signal and at the other end to the collector of said transistor, said capacitor being connected between the base of said transistor and a point on said divider chain at which said selected percentage of the d.c. signal is present.

4,001,643

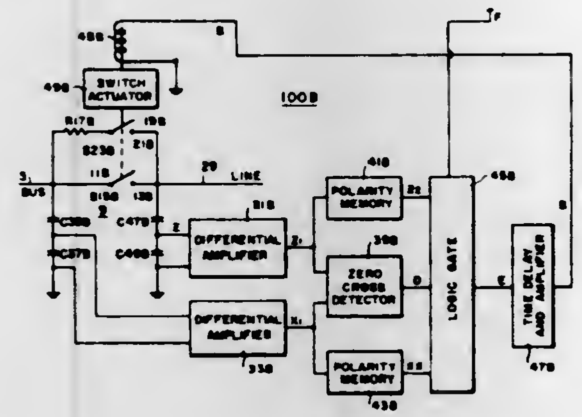
METHOD AND APPARATUS FOR A POWER CIRCUIT BREAKER CONTROLLER

Harold C. Ramberg, Canby, and Alvin C. Legate, Beaverton, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,005

Int. Cl.^{2} H01H *7/16*

U.S. Cl. 317—11 E **7 Claims**



1. A programable method for limiting the voltages surges on a high voltage alternating current power line upon closure of a main contact switch which is connected in parallel with a single normally preinsertable resistor comprising the steps of:

first continuously monitoring the polarity of the bus voltage and trapped line charge voltage on both sides of said main switch at the time said switch is opened;

second comparing the monitored polarities against each other and when of equal polarity, operatively inserting said resistor into the power line before closure of said main switch; and then

predetermining the time of closure of said main switch when the voltage difference between its bus and line sides will be near zero and then effectively by-passing the inserted preinserted single resistor by closure of the main contact switch.

4,001,644

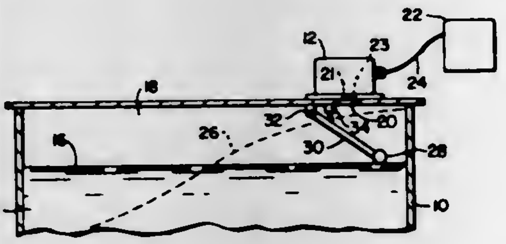
SUDDEN PRESSURE RELAY HAVING SEISMIC PROTECTION

Robert C. Lingenfelter; Curtis L. Moore, and James J. Kunes, all of Sharon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1975, Ser. No. 562,617

Int. Cl.^{2} H02H *7/04*

U.S. Cl. 317—14 G **8 Claims**



1. Stationary electrical apparatus having a tank containing a fluid dielectric with a gas space located above the level of the fluid dielectric.

a sudden pressure relay system including detecting means for detecting a sudden increase in gas pressure within the tank and activating a circuit in response thereto, said detecting means including means for making the detecting means insensitive to relatively slow increases in gas pressure within the tank and

defeating means for preventing activation of said circuit by the detecting means when the sudden increase in gas pressure is caused by an abrupt change in the dielectric level due to a seismic disturbance.

4,001,645

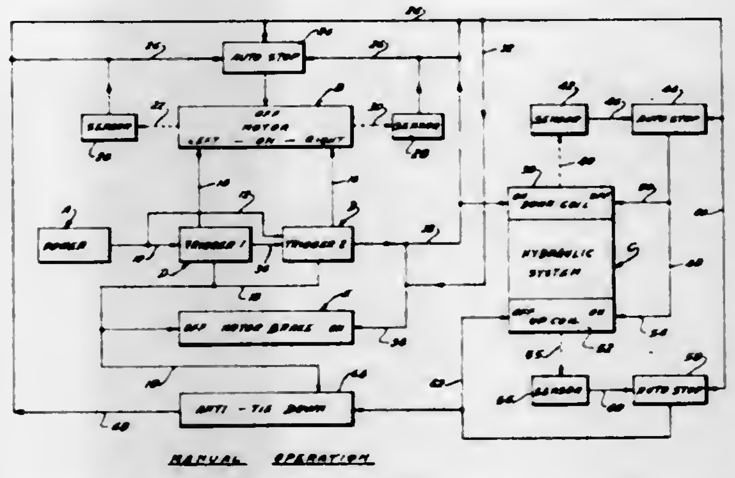
DIE PRESS CONTROL APPARATUS

Edgar Haas, New York, N.Y., and Edward Kottsieper, Dresden Mills, Maine, assignors to Herman Schwabe, Inc., New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,906

Int. Cl.^{2} H01H *47/00*

U.S. Cl. 318—17 **15 Claims**



1. Apparatus for controlling the movement of a member in a first sense and a second sense comprising first means for moving the member in first and second directions in the first sense and second means for moving the member in first and second directions in the second sense and first and second switch means operatively connected to said first and second moving means and actuatable separately to energize said first means to move the member in said first direction in said first sense and said second direction in said first sense, respectively, and actuatable jointly to energize said second means to move the member in said first direction in said second sense.

4,001,646

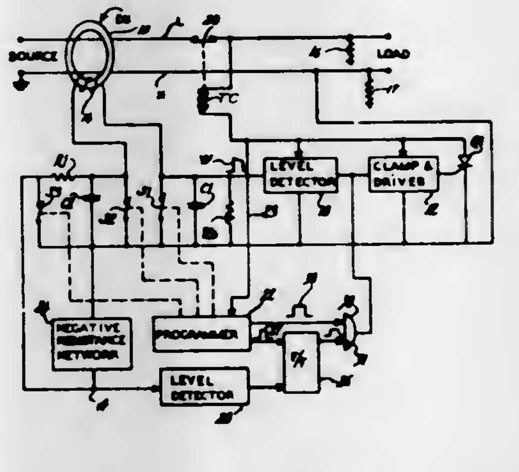
GROUND FAULT CIRCUIT INTERRUPTER UTILIZING A SINGLE TRANSFORMER

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 16, 1975, Ser. No. 586,864

Int. Cl.^{2} H02H *3/26*

U.S. Cl. 317—18 D **19 Claims**



1. A ground fault circuit interrupting device for monitoring an electrical distribution circuit including a line conductor and a neutral conductor grounded at the source and interrupting the circuit in the event of a ground fault on the line con-

ductor resulting in a ground fault current exceeding a predetermined current value and a ground fault on the neutral conductor of a resistance below a predetermined resistance value, said device comprising, in combination:

A. a differential current transformer having
  1. a first winding for connection in series with the line conductor,
  2. a second winding for connection in series with the neutral conductor,
  3. a third winding in which is developed a fault signal proportional in amplitude to the ground fault current occasioned by a ground fault on the line conductor;

B. first means monitoring the amplitude of said fault signal and initiating circuit interruption when said fault signal amplitude exceeds a first predetermined threshold level correlated to said predetermined current value;

C. second means connected with said third winding to form therewith a tank circuit, the resistive impedance of a neutral ground fault being reflected into said tank circuit via said second winding;

D. a negative resistance network connected to shock excite said tank circuit and develop therein a ringing oscillation, said negative resistance network operative to increase the rate of change of the Q of said tank circuit for variations in neutral ground fault resistance about said predetermined resistance value and to establish a negative Q in said tank circuit for a neutral ground fault resistance equalling said predetermined resistance value, whereby the operation of said tank circuit is regenerative for neutral ground fault resistances equal to and greater than said predetermined resistance value; and

E. third means monitoring the amplitude of said ringing oscillation during a prescribed time period succeeding shock excitation of said tank circuit to detect a neutral ground fault having resistance below said predetermined resistance level, whereupon to initiate circuit interruption.

4,001,647

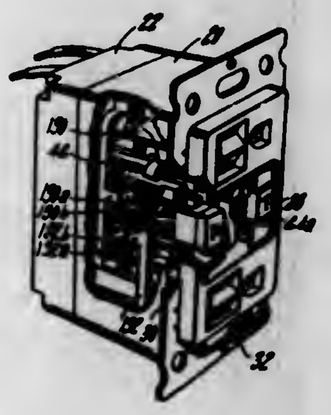
GROUND FAULT RECEPTACLE WITH UNITARY SUPPORT OF GFCI MODULE AND SWITCHING MECHANISM

Keith W. Klein, Simsbury, and Joseph M. Palmieri, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,850

Int. Cl.² H01H *73/06*

U.S. Cl. 317—18 D **10 Claims**



1. In an electrical receptacle having a base and cover, wherein at least one socket means is incorporated in the base and accessible through a front wall thereof for reception of an appliance cord plug, and wherein stationary contacts electrically connected to the socket means are mounted in the base, a ground fault circuit interrupter assembly comprising, in combination:

A. a support plate having means for cooperating with the base in positionally mounting said plate in the base proximate its junction with the cover, said plate having a front surface for disposition in spaced, parallel relation to the front wall of the base and a rear surface;

B. a ground fault circuit interrupter module including a differential current transformer having a wound toroidal core and a pair of conductor segments extending through the central aperture of said core, a circuit board, electronic components mounted on said board in electrical interconnection, and leads connected between said transformer and said circuit board;

C. first means integrally formed with said plate in outstanding relation with its rear surface providing a cavity accommodating said transformer;

D. second means integrally formed with said plate in outstanding relation with its rear surface supporting said board in spaced, parallel relation with said rear surface;

E. a pair of spaced pedestals integrally formed with said plate in outstanding relation with its front surface;

F. a mounting block secured on said pedestals; and

G. a switch operating mechanism including an arm mounted by said block for movement between a closed circuit position and an open circuit position, movable contacts carried by said arm, leads connecting said movable contacts to said conductor segments, a latch detaining said arm in its closed circuit position, and a solenoid mounted by said block and electrically connected to said circuit board, said solenoid having a plunger arranged to engage said latch and release said arm for movement to its open circuit position;
  1. whereby the receptacle is capable of being tested for operability in affording ground fault protection prior to positionally mounting said assembly in said base.

4,001,648

GROUND FAULT DETECTOR

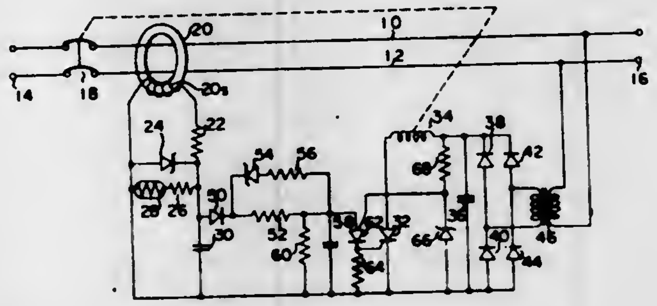
Katsumi Taketa; Hirotoshi Nitta, and Eiichi Sato, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 468,150, May 8, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,626

Claims priority, application Japan, May 19, 1973, 48-56181

Int. Cl.² H02H *3/30*

U.S. Cl. 317—18 D **2 Claims**



1. A ground fault detector device comprising:

a zero phase-sequence current transformer, electrically connected to an electric circuit path which includes an electrically energized circuit interrupter, to detect a ground fault current flowing through the electric circuit path to provide an output current in response to the fault current; a half-wave rectifier for rectifying the output current from said transformer; a semiconductor switching element rendered conductive in response to said half-wave rectified output current from said zero phase-sequence current transformer; electromagnetic circuit means energized by a voltage in said electric path and responsive to the conduction of said semiconductor switching element to energize said circuit interrupter connected in said electric path to open said electric path; and circuit means including a resistor having a relatively high magnitude of resistance, a capacitor connected in cascade with said resistor and a constant voltage element having a voltage dependent impedance connected across said resistor, said circuit means applying through said resistor the half-wave rectified output current from said current transformer less than a predetermined magnitude to gradually increase a potential across said capacitor to a predetermined magnitude whereupon said semiconductor switching element is put in its conducting state to energize said circuit interrupter, said constant voltage element responding to the half-wave rectified output current from said current transformer in excess of the first-mentioned predetermined magnitude to instantaneously increase the current flowing to said capacitor to put said semiconductor switching element in its conducting state.

4,001,649

TEMPERATURE MONITORING OF SEMICONDUCTORS

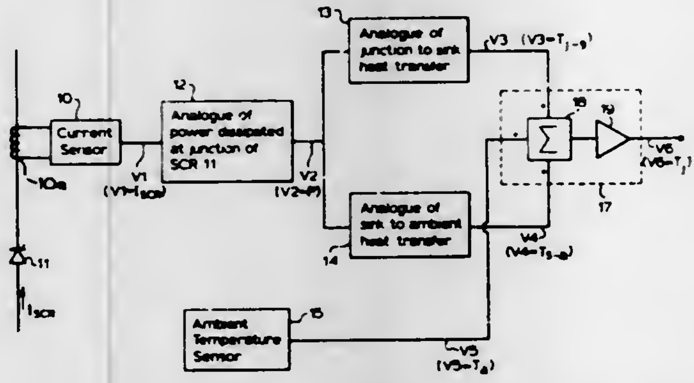
John A. I. Young, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 30, 1975, Ser. No. 645,323

Claims priority, application Canada, Dec. 3, 1975, 241111

Int. Cl.² H02H *5/04, 7/14*

U.S. Cl. 317—41 **14 Claims**


10
Current Sensor
10a
11
I_SCR
V1 (V1=I_SCR)
12
Analogue of power dissipated at junction of SCR 11
V2 (V2=P)
13
Analogue of junction to sink heat transfer
V3 (V3=T_j-s)
14
Analogue of sink to ambient heat transfer
V4 (V4=T_s-a)
15
Ambient Temperature Sensor
V5 (V5=T_a)
Σ
18
19
17
V6 (V6=T_j)

1. A circuit for monitoring the temperature of a junction of a semiconductor device comprising:

a. means to produce a first signal proportional to the power dissipated at the junction of the semiconductor device;

b. first means responsive to said first signal to produce a second signal proportional to the difference between the junction temperature and the temperature of a heat sink associated with said device;

c. second means responsive to said first signal to produce a third signal proportional to the difference between the heat sink temperature and ambient temperature;

d. means to produce a fourth signal proportional to the ambient temperature; and,

e. combining means to combine said second, third and fourth signals to provide an output signal proportional to said junction temperature.

4,001,650

METHOD AND APPARATUS FOR ULTRASONIC TRANSDUCER PROTECTION

Jack Romain, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Sept. 2, 1975, Ser. No. 609,310

Int. Cl.² H02H *5/04*

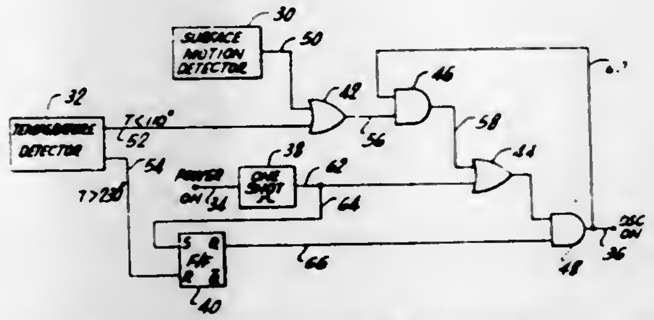
U.S. Cl. 317—41 **19 Claims**

5. Apparatus for the automatic protection of an ultrasonic transducer which is operated immersed in a liquid, said apparatus comprising:

surface motion detection means coupled to the transducer and operable to generate an electrical signal when the surface motion of the liquid exceeds a predetermined threshold level;

transducer temperature detection means, including means for generating a first temperature signal if the transducer temperature exceeds a first predetermined value, and means for generating a second temperature signal if the transducer temperature exceeds a second predetermined value greater than the first predetermined value; and

electrical means coupled with said surface motion detection means and said temperature detection means, for switching the transducer to an off condition if the transducer temperature exceeds the first predetermined value and no surface motion is detected, or if the transducer temperature exceeds the second predetermined value;



whereby the transducer is permitted to remain in an on condition if its temperature is below the first predetermined value, even if there is no surface motion, in order to permit adjustment of the transducer without its being automatically turned off when surface motion stops.

4,001,651

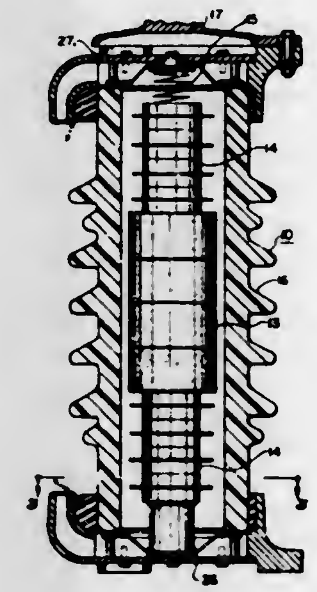
STATION LIGHTNING ARRESTER WITH DUAL RUPTURE DIAPHRAGMS FOR GAS PRESSURE RELEASE

Stanley Scott Kershaw, Jr., Greendale, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 5, 1975, Ser. No. 574,410

Int. Cl.² H02H *3/22*

U.S. Cl. 317—61 **10 Claims**



1. A surge arrester comprising a hollow porcelain body, top and bottom pieces sealing said porcelain body, gap assemblies in series with negative resistance elements, said gap assemblies and negative temperature coefficient resistance elements centered in said porcelain body, a top terminal of the surge arrester having a solid plate and a dished metal diaphragm sealed to seal off said hollow core of said surge arrester, the dished metal diaphragm in communication with a passageway cast in the top end piece of said surge arrester, the bottom end of said surge arrester having a dished metal diaphragm sealing said gap assemblies and negative resistance elements, said dished metal diaphragm in communication with a passageway whereby the gases may be freely vented on rupture of the dished metal diaphragm, a bottom end piece affixed to the bottom sealing portion of said surge arrester arranged to blow off on a buildup of excessive pressure within the surge arrester.

4,001,652

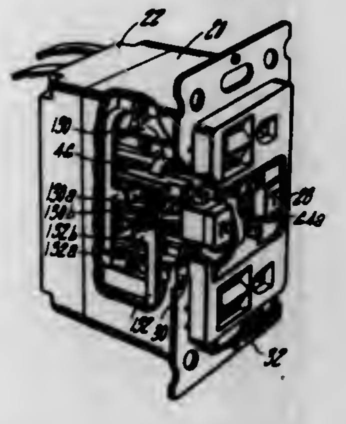
GROUND FAULT RECEPTACLE WITH IMPROVED STATIONARY CONTACT MOUNTING AND BACKING

Keith W. Klein, Simsbury, and Joseph M. Palmieri, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,998

Int. Cl.² H01H *73/06*

U.S. Cl. 317—112 **7 Claims**



1. An electrical receptacle equipped to provide ground fault protection, said receptacle comprising, in combination:
A. insulative, generally rectangular housing consisting of
  1. a base having sidewalls and providing a housing front wall, and
  2. a cover having sidewalls and providing a housing rear wall;
B. a pair of spaced sockets, each including
  1. a pair of slots formed in said housing front wall, and
  2. a stab connector within said housing aligned with each said slot for achieving electrical contacting engagement with the prongs of an appliance cord plug inserted through said slots;
C. means forming a separate cavity in said base accommodating each said connector:
D. a pair of elongated, rigid busbars, each said busbar having its ends affixed to corresponding connectors of each said sockets;
E. a conductive strap affixed to each said busbar at locations intermediate their ends and extending transversely therefrom;
F. a stationary contact carried by each said strap adjacent its free end;
G. an operating mechanism mounted within said housing, said mechanism including
  1. a pair of movable contacts, and
  2. an arm carrying said movable contacts for movement between positions of electrical engagement and disengagement with respect to said stationary contacts, and
H. a GFCI module within said housing and controlling said operating mechanism such as to achieve disengagement of said stationary and movable contacts in the event of a ground fault.

4,001,653

APPARATUS FOR MECHANICALLY ASSISTING THE INSTALLATION AND REMOVAL OF AN ELECTRICAL DEVICE WITH RESPECT TO A SWITCHBOARD

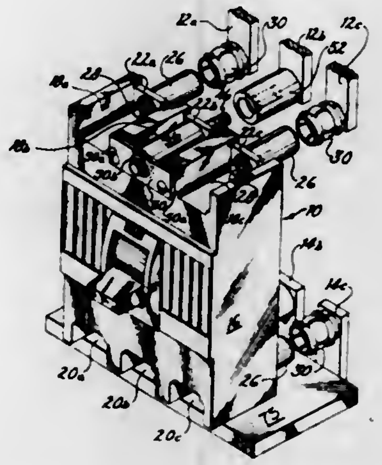
William F. Olashaw, Plainville, and Frederick D. Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,639

Int. Cl.² H02B *1/04*

U.S. Cl. 317—119 **16 Claims**

1. Apparatus for mechanically assisting the installation and removal of an electrical device with respect to a piece of electrical equipment, at least one set of associated device and equipment terminals being equipped with stab connector parts for plug-in electrical interengagement; said apparatus comprising, in combination:
A. first and second threadedly engageable parts;
B. at least one remaining device terminal unequipped with a stab connector part;
C. means retaining said first part in operative, registered relation with said remaining device terminal, said retaining means acommodating rotational motion of said part while limiting movement thereof relative to the device in the directions of movement of the device during installation and removal with respect to the electrical equipment;
D. at least one remaining equipment terminal associated with said remaining device terminal and likewise unequipped with a stab connector part; and
E. means fixedly mounting said second part to the electrical equipment in electrical connection with said remaining equipment terminal;
F. whereby, with said parts threadedly engaged, rotation of said first part in one direction forcibly draws the device toward the electrical equipment to electrically engage the associated stab connector parts, said parts also ultimately clamping said remaining device terminal in electrical connection with said remaining equipment terminal, and rotation of said first part in the opposite direction forcibly withdraws the device from the equipment to disengage the associated stab connector parts.



4,001,654

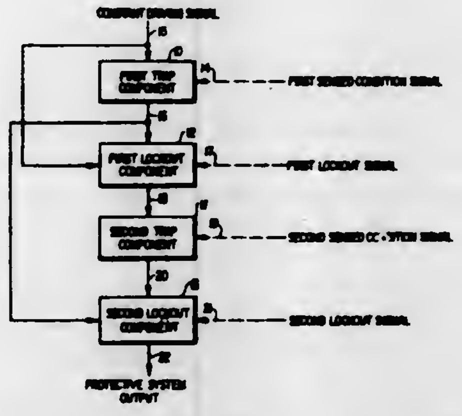
TESTABLE PROTECTIVE SYSTEM

Mark A. Davis, Orchard Park; Markus A. Eggenberger, and Jens Kure-Jensen, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 31, 1975, Ser. No. 600,835

Int. Cl.² H02H *3/00;* **H01H** *47/00*

U.S. Cl. 317—135 R **4 Claims**



1. In a testable protective system for detecting variations in a sensed condition of an operating system and taking action to protect said operating system, the combination of:
a first trip responsive to said sensed condition and providing an output indicative of variations of said sensed condition;
a first lock-out component serially connected to the output of said first trip component, said first lock-out component including means for making the output of said protective system independent of the output of said first trip component when the first trip component is being tested;
a second trip component serially connected to the first lock-out component, said second trip component responsive to said sensed condition and providing an output indicative of said sensed condition;
a second lock-out component serially connected to the output of said second trip component, said second lock-out component including means for making the output of said protective system independent of the output of said second trip component when the second trip component is being tested;
wherein, said first and second trip components each comprise logical AND means; and,
said first and second lock-out components each comprise logical means performing the logical function characterized by the Boolean expression:

$$A\bar{C} + BC = D$$

where D is the output of the logical means and A, B and C are inputs thereto.

4,001,655

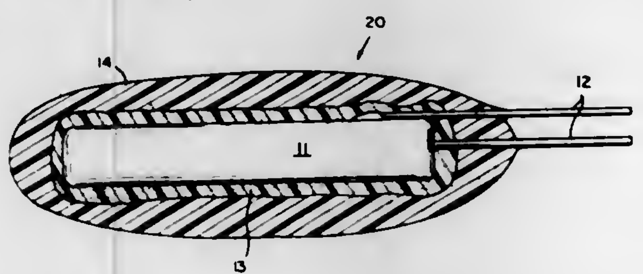
COMPRESSIBLE INTERMEDIATE LAYER FOR ENCAPSULATED ELECTRICAL DEVICES

Gerald A. Voyles, Indianapolis, and William D. Davies, Greencastle, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 10, 1974, Ser. No. 432,181

Int. Cl.² H01G *9/00;* **H01L** *23/28;* **H02G** *13/08;* **H05K** *5/00*

U.S. Cl. 317—230 **12 Claims**



1. A compressible and electrically insulative intermediate layer between a surface of an electrical component means and a protective coating, the intermediate layer including resin binder with void areas and solid filler material dispersed in the binder and over the surface of the electrical component means to help relieve compressive forces and other stresses that may be experienced by the electrical component means, the intermediate layer consisting of an effective amount up to about 25 wt.%, the remainder essentially solid filler selected from asbestos, mica, fibrous glass, calcined kaolin, silicon dioxide, nylon fiber, orlon, talc or mixtures thereof.

4,001,656

CAPACITOR HAVING A PLURALITY OF ANODE RISERS FOR LOW IMPEDANCE AT HIGH FREQUENCY

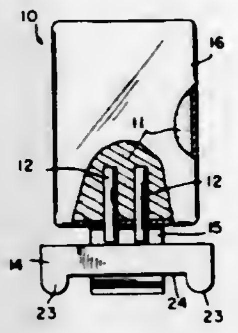
Gerald A. Voyles, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Dec. 27, 1974, Ser. No. 536,812

Int. Cl.² H01G *9/00, 9/16;* **H01L** *23/28*

U.S. Cl. 317—230 **11 Claims**

1. A capacitor having low impedance at high frequency input signals comprising a body including a dielectric oxide film-forming metal containing anode with a myriad of intercommunicating voids, a cathode contacting the body, and a plurality of individual anode risers contacting the anode, each of the anode risers extending from the anode in substantially the same direction.



4,001,657

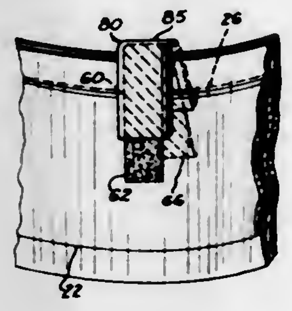
CAPACITORS HAVING INTEGRAL DISCHARGING MEANS

William M. Robinson, New Bedford, Mass., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.

Filed Apr. 16, 1975, Ser. No. 568,730

Int. Cl.² H01G *4/40*

U.S. Cl. 317—256 **16 Claims**



1. An electric capacitor comprising a winding of first and second electrodes and first and second strips of dielectric material separating said first and second electrodes forming a capacitor roll, and a resistive strip included as an integral part of the capacitor roll with first and second terminal portions of the resistive strip in physical and electrical contact with areas of said first and second electrodes, respectively, said resistive strip including a further portion connecting said first and second portions and extending as a loop about a lateral edge portion of at least one convolution of the winding and part of said further portion extending partway across the width of at least one of said electrodes, said capacitor having means electrically insulating said further portion of the resistive strip from the electrodes including means insulating said part of said further portion from the electrode or electrodes across which said part extends so that said resistive strip extends between the electrodes for discharging electrical energy that may be stored in the capacitor when it is disconnected from a source of power.

4,001,658

OSCILLATOR FOR NON-SINUSOIDAL MOVEMENTS

Helmuth Frenk, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Germany

Continuation-in-part of Ser. No. 460,680, April 15, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,544

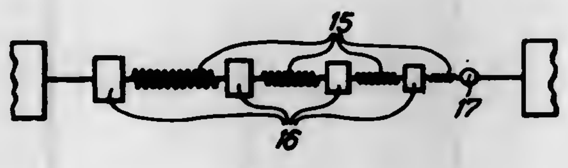
Claims priority, application Germany, Apr. 16, 1973, 2319224

Int. Cl.² H02K *33/00*

U.S. Cl. 318—37 **9 Claims**

1. A mechanical oscillator for generating a non-sinusoidal oscillatory motion by harmonic synthesis of a plurality of substantially sinusoidal oscillations, the oscillator comprising a plurality of mechanically intercalated resilient oscillatory

systems each comprising respective exciter drive means (15) drivingly coupled to a mechanically oscillatable element (16),



each oscillator system having a respective natural frequency chosen in accordance with Fourier analysis of the oscillatory motion to be synthesized.

4,001,659

APPARATUS FOR SPINNING A MICROELECTRONIC SUBSTRATE

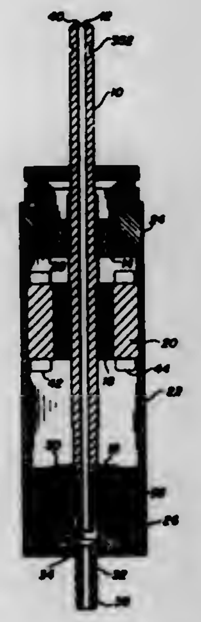
Vern D. Shipman, Garland, Tex., assignor to Headway Research, Inc., Garland, Tex.

Filed Sept. 12, 1974, Ser. No. 505,582

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H02K *33/00*

U.S. Cl. 318—119 **12 Claims**



1. Apparatus for spinning a microelectronic substrate, comprising:

a base for receiving and holding said substrate,

a two-phase motor having a first winding and a second winding and including a rotor coupled to said base, and

a control circuit including means for initially applying a phase reversing, low frequency voltage to the second winding of said motor and a DC voltage to the first winding to generate a reversing magnetic field and impart an oscillatory motion to the rotor, said control circuit further including means for timing the oscillatory motion of the rotor and applying a high frequency running voltage to the first and second windings to generate a revolving magnetic field to impart a rotating motion to said base.

4,001,660

REGULATING THE TORQUE OF AN INDUCTION MOTOR

Thomas A. Lipo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,009

Int. Cl.² H02P *5/40*

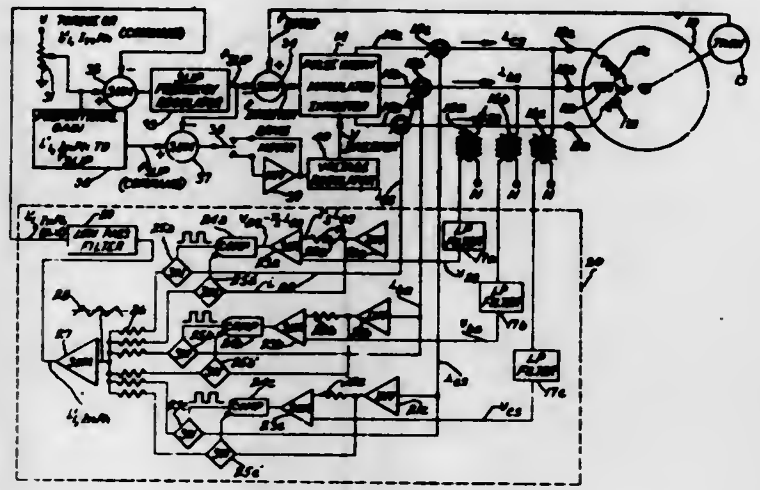
U.S. Cl. 318—227 **7 Claims**

1. A motor control circuit for regulating the torque of an induction motor having a stator winding and stator resistance comprising

a power converter for supplying adjustable frequency and amplitude voltage to a plurality of stator supply lines suitable for connection to said stator winding,

sensing means for continuously generating a plurality of instantaneous current and voltage sensor signals indicative of each instantaneous per phase stator supply line current and voltage,

first means for combining said instantaneous sensor signals for each phase to derive a modified voltage signal indicative of the respective stator voltage compensated for the voltage drop across said stator resistance, and second means responsive to the modified voltage signal for each phase and the respective instantaneous current sensor signal for deriving a modified in-phase component of stator current signal representative of the component of stator current in phase with the compensated stator voltage, and



feedback control means for utilizing said modified in-phase component of stator current signal and command signals representing the desired torque and slip frequency to derive therefrom control signals for said power converter which are effective to regulate the torque of the induction motor.

4,001,661

ONE-TOUCH ACTION TYPE POWER WINDOW

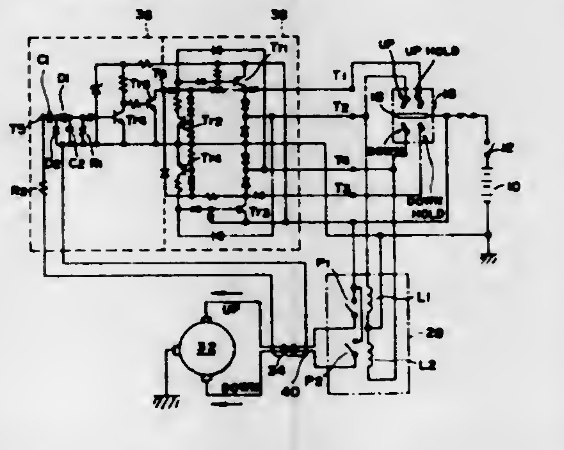
Gosaku Terabayashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 30, 1975, Ser. No. 592,079

Claims priority, application Japan, Feb. 6, 1975, 50-14887

Int. Cl.² H02P *3/08*

U.S. Cl. 318—264 **6 Claims**



1. A one-touch action type power window, comprising in combination:

a. A change-over switch connected to a power source and having a movable contact returnable automatically to a neutral position upon removal therefrom of an operating force and UP HOLD and DOWN HOLD contacts located opposingly on opposite sides of said movable contact;

b. a reversible motor connected to said UP and DOWN contacts to drive a window operator to raise or lower the window glass;

c. a retaining circuit having an input terminal connected to said UP HOLD and DOWN HOLD contacts and an output terminal to said motor and adapted to hold said motor in an actuated state upon closing said change-over switch on said UP contact or DOWN contact and after said change-over switch is opened by removal therefrom of an operating force;

d. detecting means located close to a wire through which the operating current of said motor flows and adapted to generate a voltage varying in response to variations occurring in the magnetic field around said wire ,due to interruptions of said operating current; and

e. a control circuit having an input terminal connected to said detecting means and an output terminal to said retaining circuit and adapted to detect the rotational speed of said motor from said voltage variations and to actuate said retaining circuit only when said rotational speed of said motor is above a predetermined value.

4,001,662

VARIABLE CONTROL CURRENT GENERATOR ARRANGEMENT

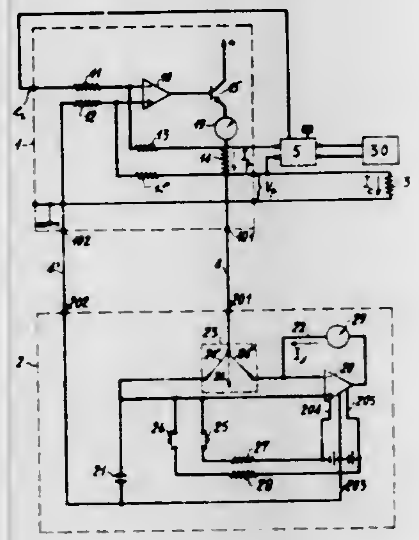
Jacques J. Le Gallais, Viry Chatillon, France, assignor to Societe Controle Bailey, Clamart, France

Filed Feb. 21, 1975, Ser. No. 551,547

Claims priority, application France, Feb. 28, 1974, 74.06912

Int. Cl.² G05B *9/02*

U.S. Cl. 318—564 **2 Claims**



1. A variable control current generator arrangement for remotely controlling the current applied to a load component such as a servo motor comprising:

a main variable current generator connected to the terminals of said load component;

said main variable current generator comprising a first operational amplifier having input resistors connected to the input terminals thereof and a transistor amplifier cascaded with said first operational amplifier and having an output circuit including an output resistor and said load component;

feedback resistors respectively connecting the terminals of said output resistor to the input terminals of said first operational amplifier, the ratio between the input resistor values and the ratio between a feedback resistor value and the value of the serially connected output resistor and other feedback resistor being substantially equal, whereby said main variable current generator injects into the load component a current proportional to the voltage applied across its input resistors;

a second operational amplifier arranged in unity follower fashion;

an analog voltage store means permanently connected to the first input of said second operational amplifier; and

an inverter switch means selectively connecting the terminals of said load component to said analog store means and to the second input of said second operational amplifier, whereby the analog voltage store means stores the voltage drop across the load component and the second operational amplifier applies to the load component a current equal to the current applied thereto before the switching of the inverter switch means.

4,001,663

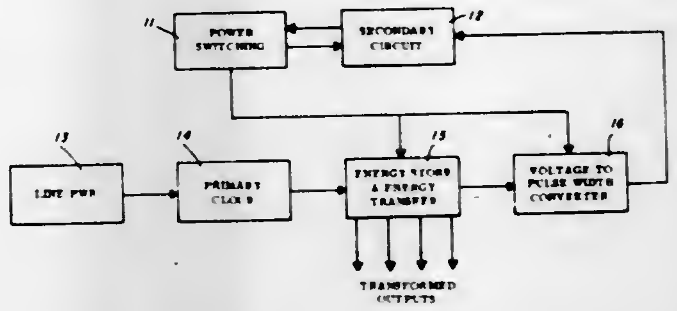
SWITCHING REGULATOR POWER SUPPLY

William Edward Bray, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 3, 1974, Ser. No., 502,703

Int. Cl.² G05F *1/64*; **H02P** *13/24*

U.S. Cl. 321—2 **39 Claims**



1. A switching regulator power supply for connection to a DC source of rectified AC power with a regulation cycle having an energy storage cycle and an energy transfer cycle, comprising:

a. timing means, for continuously providing a predetermined time period for the energy storage and a predetermined time period for the energy transfer cycle;

b. power switching means, connected to one side of the DC source and connected to the timing means to close and provide power during the energy storage cycle and to open during the energy transfer cycle;

c. a transformer having a primary winding with one end connected to the other side of the DC source and the other end connected to the power switching means to permit current to flow in one direction during the energy storage cycle and in the other direction during the energy transfer cycle and at least one secondary winding biased to permit current flow only during the energy transfer cycle;

d. indicating means operatively connected to the secondary winding to provide electrical signals indicative of secondary electrical power parameters the electrical signals including an end regulation cycle signal; and

e. first direct current coupling means, connected to the indicating means and to the timing means to couple the RCE signal to the timing means, the timing means being responsive to the RCE signal for adjusting the time of the energy storage cycle to a finite time more than zero.

4,001,664

D.C. POTENTIAL MULTIPLIER

Tom M. Hyltin, Dallas, Tex., assignor to Seiko Instruments Incorporated, Torrance, Calif.

Filed Mar. 3, 1975, Ser. No. 554,488

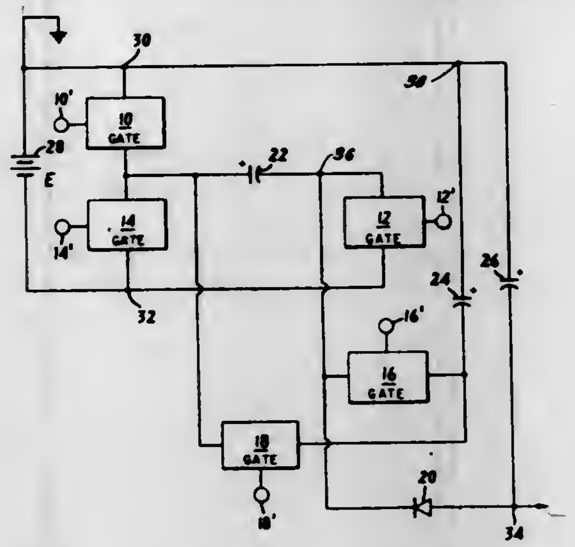
Int. Cl.² H02M *3/155*

U.S. Cl. 321—15 **7 Claims**

1. A D.C. potential multiplier for multiplying the potential of a source comprising:

a first potential multiplying circuit connected to the source for multiplying the potential of the source, the first potential multiplying circuit including only one first capacitor;

a sequentially operated second potential multiplying circuit connected to the first potential multiplying circuit for multiplying the potential from the first potential multiplying circuit to provide an output potential from the potential multiplier, the second potential multiplying circuit including the first capacitor and only one other, second capacitor; and means for switchably connecting the first capacitor into the first and second potential multiplying circuits to time



share the first capacitor between the potential multiplying circuits and provide substantially four times the potential of the source.

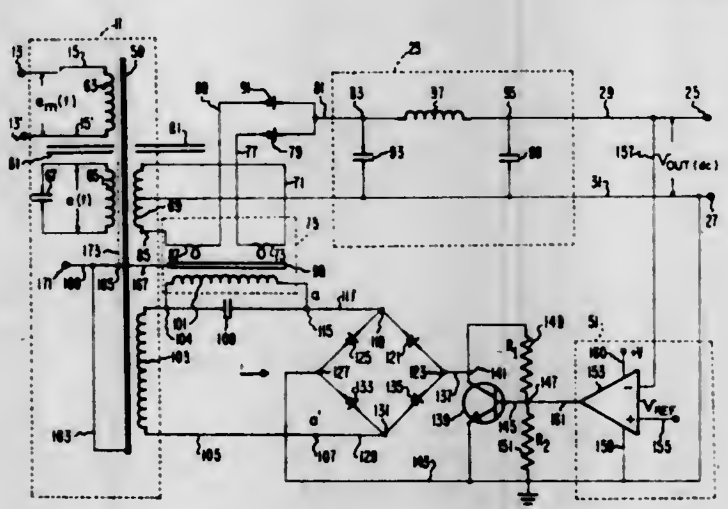
4,001,665
HIGH EFFICIENCY POWER SUPPLY HAVING A REACTIVE BUCK AUTOMATIC D.C. VOLTAGE REGULATOR

Daniel A. Wisner, Milan; Flavius A. Mathamel, Allen Park, and Truman T. Schmalzriedt, Westland, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 569,673

Int. Cl.² G05F *1/64*; H02P *13/04*

U.S. Cl. 321—18 **19 Claims**



1. A high-efficiency regulated power supply comprising:

ferroresonant transformer means for transforming an alternating current input signal, said ferroresonant transformer means including a core means, a primary input coil means coupled about said core means for receiving said alternating current input signal, a secondary coil means coupled about said core means and responsive to the alternating current input signal received by said primary coil means for generating a transformed secondary signal, a third coil means coupled about said core means and including a capacitor means connected in parallel across said coil means and tuned with said third coil means near the input frequency of said alternating current input signal for establishing ferroresonant and a centrally tapped winding within said secondary coil means having a central tap lead coupled to ground wwith one end of said centrally tapped secondary winding being serially connected to a first buck transformer secondary winding means and the other end of said centrally tapped secondary winding being serially coupled to a second buck transformer secondary coil means;

output means coupled to said secondary coil means for receiving said transformed secondary signal and outputting a regulated DC output signal, said output means including compensation means for varying said transformed secondary signal to ensure that said regulated DC output signal remains constant, said compensation means includes an auxiliary buck transformer means having a buck transformer secondary winding means connected in series with said secondary coil means for controllably bucking said transformed secondary signal and a buck transformery primary control winding means for controlling the amount of buck produced by said buck transformer secondary winding means, and said output means further includes an LC filter network for producing a DC output signal and rectifying diode means for coupling said buck transformery secondary winding means to said output filter means; and

reactive control means responsive to real time changes in the alternating current input signal, in the parameters of the power supply itself, and in the load for simultaneously and rectively controlling said compensating means, said alternating current input signal and said transformed secondary signal for ensuring that said regulated DC output signal remains constant while minimizing power losses within said power supply.

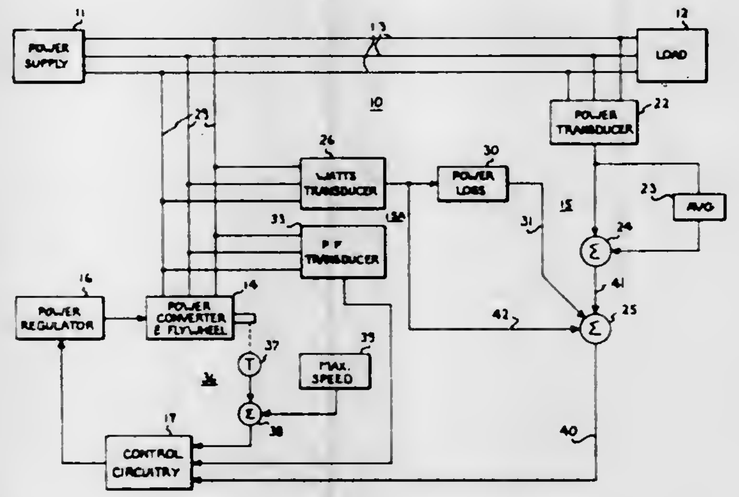
4,001,666
LOAD PEAK SHAVER POWER REGULATING SYSTEM

K. Pascoe Grenfell, Delanson, N.Y., assignor to General Electric Company, Salem, Va.

Filed Apr. 3, 1975, Ser. No. 564,734

Int. Cl.² H02K *7/02*

U.S. Cl. 322—4 **7 Claims**



1. A power regulating system for a cyclically varying load comprising:

a. main power supply means connected to said load, said main power supply means being capable of supplying average power to said cyclically varying load and having a predetermined range about the average power within which range power excursions of short durations may permissibly occur;
b. means for measuring instantaneous power flow to said load;
c. means for measuring power to said load over a predetermined interval to obtain average power flow to said load;
d. means for comparing instantaneous power flow to said load with average load power to produce a difference signal representative of instantaneous power excursions from the average load;
e. auxiliary power supply means connected to said main power supply means; and,
f. means responsive to said difference signal for regulating said auxiliary power supply means to continuously generate or absorb power in a predetermined percentage of the excursions of instantaneous power from average power.

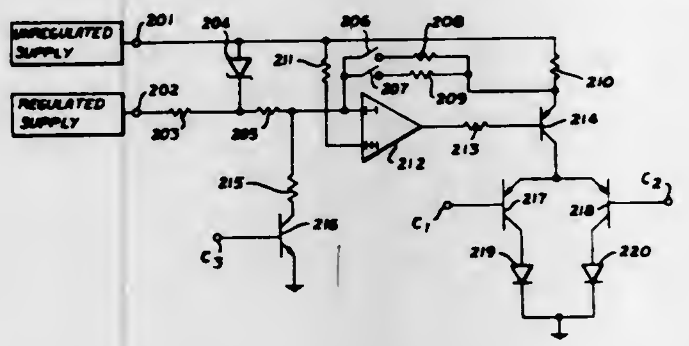
4,001,667
CONSTANT CURRENT-PULSE LED DRIVE CIRCUIT

Robert E. Bober, Framingham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 462,696, April 22, 1974, Pat. No. 3,902,806. This application May 2, 1975, Ser. No. 574,184

Int. Cl.² G05F *1/20*

U.S. Cl. 323—1 **2 Claims**



1. A circuit for supplying current drive to a plurality of light-emitting diodes, which may each require different drive-current, said circuit being capable of use with an oximeter system, said circuit comprising at least one electrical power supply, means for generating a series of current pulses from said supply, means for controlling the magnitude of each of said pulses of said series to be constant and equal to only certain other pulses of said series, according to the respective drive-current requirements of the light emitting diodes, and means for sequentially and cyclically applying said constant magnitude pulses to said plurality of diodes so that each of said diodes is energized only by pulses having the same magnitude.

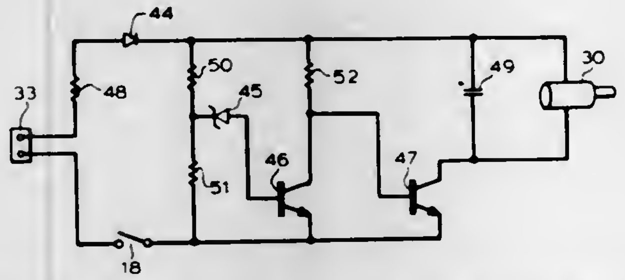
4,001,668
ELECTRIC SHAVER OPERABLE FROM A WIDE RANGE OF SUPPLY VOLTAGES

Robert E. Lewis, Peach Bottom, Pa., assignor to Schick Incorporated, Lancaster, Pa.

Filed Nov. 16, 1973, Ser. No. 416,591

Int. Cl.² G05F *5/00*

U.S. Cl. 323—19 **12 Claims**



1. In an electrical appliance of the type including a DC motor operable from an applied unidirectional current having a predetermined nominal voltage level, circuit means for operating said motor from an alternating current source having a predetermined range of voltage levels, said circuit means comprising, in combination:

energy storage means including a capacitor for producing from a series of applied current pulses having a predetermined peak voltage amplitude a unidirectional current at said predetermined nominal voltage level of said motor for application to said motor;

means including a switch device having main electrodes coupled between said alternating current source and said energy storage means and a control electrode for supplying current from said alternating current source to said energy storage means, the conduction state of said switch device being dependent on a control effect applied to said control electrode; and

control circuit means responsive to the instantaneous voltage level of said alternating current source for applying a control effect to said control electrode, said control effect rendering said switch device conductive to apply current from said alternating current source to said energy storage means during those portions of the alternating current cycle when the instantaneous voltage level of said alternating current does not exceed said predetermined peak voltage amplitude, and non-conductive during those portions of the alternating current cycle when the instantaneous voltage level of said alternating current exceeds said predetermined peak voltage amplitude.

4,001,669
COMPENSATING BRIDGE CIRCUIT

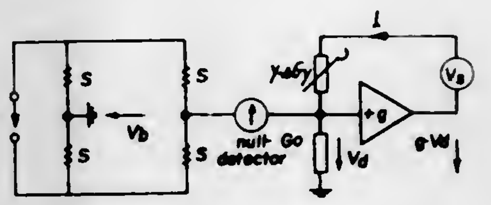
Arnfried Preuss, Bordesholm, Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

Filed Feb. 21, 1975, Ser. No. 551,942

Claims priority, application Germany, Mar. 1, 1974, 2409840

Int. Cl.² G01R *17/10*

U.S. Cl. 323—75 C **15 Claims**



1. A compensating bridge circuit for measuring physical quantities comprising:

a. an unbalanced Wheatstone bridge having a quantity-dependent voltage at an output thereof,
b. an ohmic potential divider means which produces a divisional voltage for compensating said quantity-dependent voltage,
c. said divider means including two resistant means one of which is variable,
d. means feeding an input voltage to the Wheatstone bridge, and
e. means providing a supply voltage to the potential divider means,
f. said supply voltage being composed of said bridge input voltage and said divisional voltage whereby, when the circuit system is balanced, the relationship between an input quantity x and a balancing quantity y is linear.

4,001,670
STATIC REACTIVE POWER GENERATING APPARATUS

Laszlo Gyugyi; John Rosa, and Eric J. Stacey, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1975, Ser. No. 575,888

Int. Cl.² H02J *3/18*

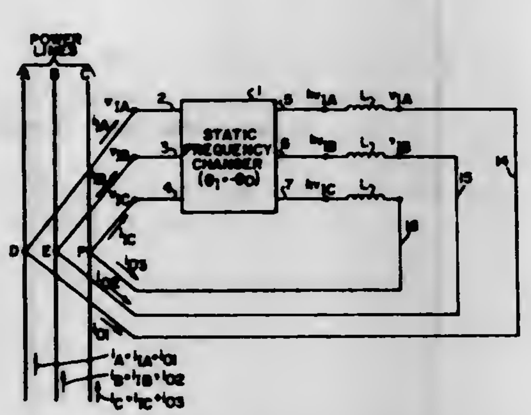
U.S. Cl. 323—108 **7 Claims**

1. A reactive power generator coupled to an alternating current power system of given frequency including at least one alternating voltage source and a load, comprising:

a static frequency converter havng input and output terminals and including a plurality of controllable static switching devices connected between said input and output terminals, said input terminals being connected to said alternating current power system;

impedance means connected between said output terminals and said input terminals; and

control means for turning said static switching devices ON and OFF selectively and sequentially at predetermined instants of time to connect said input terminals to said output terminals in predetermined sequence for predetermined time intervals, and to derive at said output terminals an alternating voltage wave resulting from selected segments of the alternating voltage wave of said alternating current power system, with said output terminal voltage wave having the same frequency as said power system voltage wave and having a difference in magnitude from the voltage of said power system voltage wave in an amount determined by said control means so that an alternating reactive input current flows from said alternating current power system into said input terminals and an alternating reactive output current flows from said output terminals into said alternating current power system through said impedance means the phase angle between said alternating reactive input current and the associated power system alternating voltages wave being opposite to the phase angle between said alternating reactive output current and the associated output terminal alternating voltage wave, whereby said reactive input current and said reactive output current are summed up directly at said input terminals to supply reactive power to said alternating current power system in an amount which is twice the volt-ampere throughput of said reactive power generator, the nature and amount of said supplied reactive power being determined by said voltage difference.

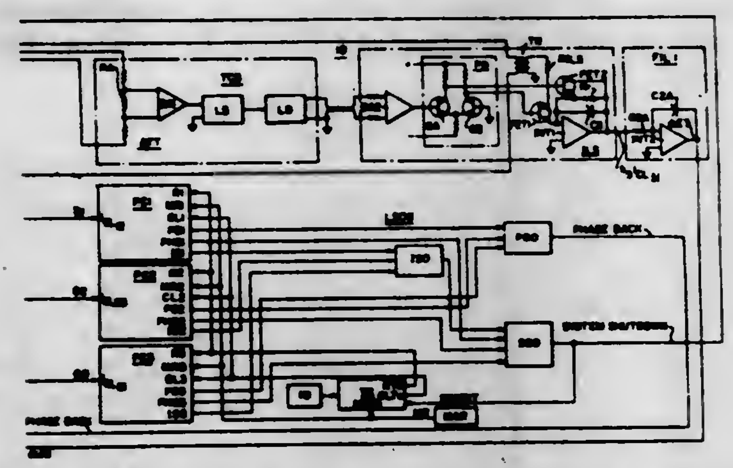


4,001,671

APPARATUS FOR PROVIDING FEEDBACK TO ELIMINATE A DC COMPONENT IN THE OUTPUT OF A STATIC VAR GENERATOR

Laszlo Gyugyi; Michael B. Brennen, and Eric J. Stacey, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,919
Int. Cl.^{2} H02J ***3/18***
U.S. Cl. 323—119 **4 Claims**



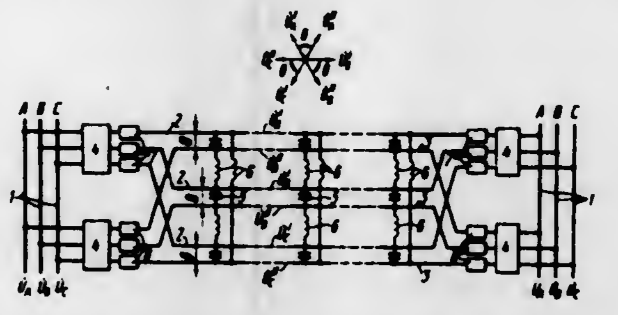
1. A reactive power generator connected in parallel to the input of an AC system in which AC current flows for supplying compensating reactive power to said AC system, comprising:
- switched reactive power supply means for supplying said compensating reactive power to said AC system for a portion of each one half cycle of said current in said AC system;
- control means interconnected with said AC system and said reactive power supply means for periodically determining the amount of compensating reactive power which is necessary in said AC system during said half cycle to achieve compensation and for switching said reactive power supply means to a state which provides said necessary compensating reactive power to said AC system;
- conduction sensing means connected to said switched reactive power supply means for determining the time interval that said portion of said one half cycle of said compensating reactive power is being supplied to said AC system,
- voltage integrating means connected in circuit relationship across said reactive power supply means to generally sense the instantaneous voltage at said input of said AC system, said voltage integrating means also being connected in circuit relationship with said conduction sensing means, said voltage integrating means integrating said instantaneous voltage during each one half cycle of said current in said AC system for said time interval for thus determining the direct current component of power supplied by said switch reactive power supply means; and
- feedback means interconnected to said voltage integrating means and said control means for providing a signal which is related to said direct current component of said power in said control means to cause said control means to act to switch said reactive power means on at a different time to reduce said direct current component of said power in said reactive power means.

4,001,672

POLYPHASE AC POWER TRANSMISSION ARRANGEMENT WITH HOMOGENEOUS PHASES

Vitaly Mikhailovich Postolaty, ulitsa Demokraticheskaya, 6/1, kv. 58, Kishinev; Valentin Andreevich Venikov, ulitsa Novoslobodskaya, 67-69, kv. 62; Jury Nikolaevich Astakhov, ulitsa Gotvalda, 10-2, kv. 10, both of Moscow; Georgy Vladimirovich Chaly, bulvar Negrutsi, 5, kv. 12, and Lev Pavlovich Kalinin, ulitsa Stefana Velikogo, 51a, kv. 35, both of Kishinev, all of U.S.S.R.

Filed Mar. 19, 1975, Ser. No. 559,876
Claims priority, application U.S.S.R., Mar. 21, 1974, 2006496
Int. Cl.^{2} G05F ***1/68***
U.S. Cl. 323—124 **7 Claims**



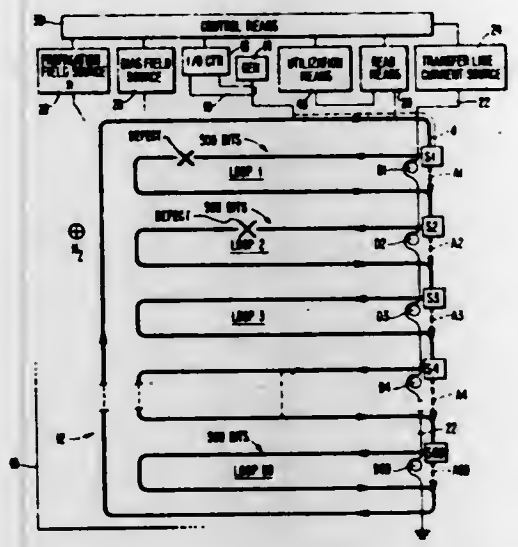
1. An alternating current power transmission arrangement, comprising at least two polyphase lines with homogeneous phases, said homogeneous phases having conductors separated by a minimum distance permissible for interphase overvoltages, phase control units at terminals of electric power transmission, the voltages of said homogeneous phases being shifted relative to each other to an angle differing from zero by said phase control units at the terminals of electric power transmission, said power transmission being controlled as a function of the power transmitted by a control system, the phase shift control improving the efficiency, duty and technical-economical parameters of the electric power transmission.

4,001,673

METHOD OF TESTING AND REPAIRING MAGNETIC BUBBLE DOMAIN CHIP

Gerald George Barrett, San Jose, Calif.; Louis Michael Hornung, and Calvin Coolidge Jones, Jr., both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,421
Int. Cl.^{2} G01R ***33/12***
U.S. Cl. 324—34 R **9 Claims**



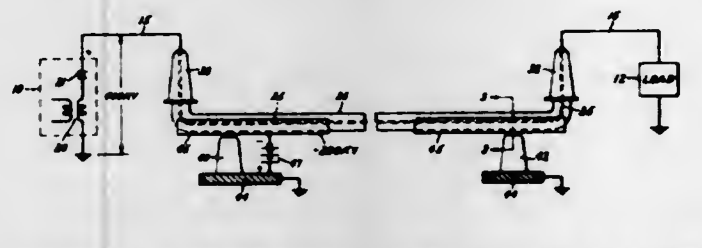
1. A method of testing loops of a serial magnetic bubble domain chip having a propagation field applied thereto, and a repair station adjacent the entrance and exit of each of said loops, each repair station being initially loaded with a bubble domain creating shorting paths bypassing said loops, said method comprising:
- a. sequentially generating a chain of bubble domains and propagating said chain until one of said bubble domains making up said chain is positioned adjacent said entrance of each of said loops;
- b. transferring said bubble domains contained in said repair stations out of said repair stations into corresponding loops for propagation along said loops;
- c. transferring said bubble domains positioned adjacent said entrance of said loops into said repair stations for recreating said shorting paths; and
- d. reading said bubble domains that were transferred into said loops and propagated along said loops and along said shorting paths, after emergence from said loops.

4,001,674

METHOD OF TESTING THE VOLTAGE WITHSTAND ABILITY OF A HIGH VOLTAGE D-C CABLE AT A VOLTAGE HIGHER THAN ITS NORMAL OPERATING VOLTAGE WHILE CARRYING CURRENT

Harold N. Schneider, Springfield, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed July 29, 1975, Ser. No. 600,034
Int. Cl.^{2} G01R ***31/12***
U.S. Cl. 324—54 **3 Claims**



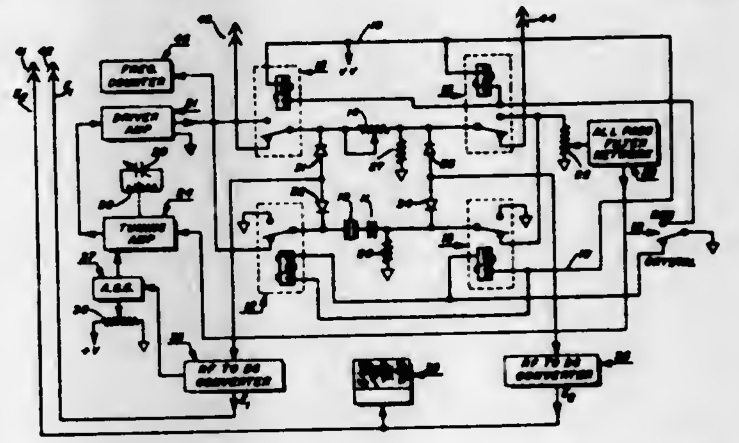
1. A method of testing a high voltage d-c cable at a voltage higher than its normal operating voltage while said cable is carrying current from its normal source of energization, said d-c cable comprising: a conductor for carrying said current that is normally operated at a predetermined voltage and polarity with respect to ground, a metal sheath surrounding said conductor that is normally at ground potential, and dielectric material between said conductor and said sheath that is stressed by the voltage present between said conductor and said sheath, said method comprising the steps of:
- a. disconnecting said sheath from ground and providing insulation between said sheath and ground,
- b. electrically biasing said sheath to a predetermined bias voltage with respect to ground, said bias voltage being of an opposite polarity with respect to ground as the normal operating voltage of said source,
- c. energizing said conductor with current and test voltage derived from said normal source, said test voltage being of the same polarity with respect to ground as said normal operating voltage and of a magnitude approximating that of said normal operating voltage, whereby the difference between said test voltage and said bias voltage is applied to said dielectric material, and
- d. monitoring the condition of said dielectric material after said conductor has been energized as in (c) and said difference voltage has been applied to said dielectric material so as to determine whether said dielectric material can withstand said difference voltage without a breakdown while said conductor is carrying said current.

4,001,675

TEST SET FOR MEASURING IMPEDANCE AND POWER DISSIPATION OF A CRYSTAL

John R. Veleber, Towaco, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Sept. 22, 1975, Ser. No. 615,380
Int. Cl.^{2} G01R ***29/22, 27/00***
U.S. Cl. 324—56 **2 Claims**



1. In a crystal test set of the type comprising an oscillator circuit which includes a crystal under test, an all pass filter network, and an a.c. driver amplifier connected to form a closed loop; means for adjusting the frequency of the oscillator circuit to cause the crystal to resonate; an adjustable substitution resistor; and means for inserting the resistor in the oscillator circuit in place of the crystal; the improvement comprising,
- a. means automatically maintaining the driver amplifier output voltage at a predetermined constant level,
- b. means developing a d.c. voltage E_1 equal to the output voltage of the driver amplifier which is applied to the crystal,
- c. means developing a d.c. voltage E_2 equal to the output voltage of the crystal,
- d. a differential amplifier receiving the voltages E_1 and E_2 and producing a difference voltage (E_1-E_2) which is the voltage across the crystal,
- e. a voltage multiplier circuit,
- f. circuit elements applying the voltages (E_1-E_2) and E_2 to said multiplier circuit, said circuit producing an output voltage (E_2-E_2) (E_2) which voltage is proportional to power dissipated in the crystal,
- g. read out means having a scale calibrated in milliwatts and in ohms,
- h. a d.c. voltage reference source,

i. means for connecting said read out means to the output of said multiplier circuit, and

j. means for connecting said read out means and said substitution resistor in series across the said voltage reference source.

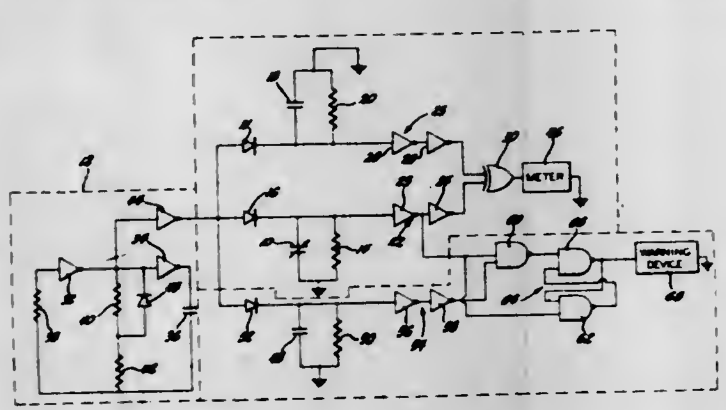
4,001,676
SOLID-STATE THRESHOLD DETECTOR

John W. Hile, Birmingham, and Paul R. Rabe, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1975, Ser. No. 608,076

Int. Cl.² G01R ***27/26***

U.S. Cl. 324—60 CD **2 Claims**



1. A threshold detector circuit for providing an indication of a critical magnitude of a condition, the circuit comprising:

a first circuit having a first reactor and a first resistor, at least one of which varies in accordance with the magnitude of the condition to define a first time constant determined by the magnitude of the condition, the first time constant varying in a predetermined sense from a critical time constant when the magnitude of the condition is critical;

a reference circuit having a second reactor and a second resistor defining a reference time constant equal to the critical time constant;

means effective to repeatedly set a predetermined voltage across the first and second reactors in unison, the voltage across the first and second reactors varying after each repeated setting at rates determined by the respective time constants of the first and reference circuits;

means responsive to the voltage across the first reactor effective to produce a first series of digital pulses, each digital pulse in the first series being coincident with a respective time period that the voltage across the first reactor varies in a predetermined sense from a predetermined voltage value which is attained during each cycle;

means responsive to the voltage across the second reactor effective to produce a second series of digital pulses, each digital pulse in the second series being coincident with a respective time period that the voltage across the second reactor varies in a predetermined sense from the predetermined voltage value which is attained during each cycle;

a logic gate means coupled to the means responsive to the voltage across the first reactor and the means responsive to the voltage across the second reactor and responsive to the sequence of termination of the digital pulses in the first and second series effective to generate a digital output signal which is initiated upon the termination of a digital pulse in one of the first and second series of digital pulses and terminated by the termination of the other one of the digital pulses in the first and second series when the sequence of termination of the digital pulses in the first and second series of digital pulses represents a time constant of the first circuit varying in the predetermined sense from the critical time constant; and

indicator means responsive to the output signal for providing an indication of the critical magnitude of the condition.

4,001,677
DEVICE FOR THE ELECTRICAL DETERMINATION OF TWO-DIMENSIONAL CO-ORDINATES OF A POINT

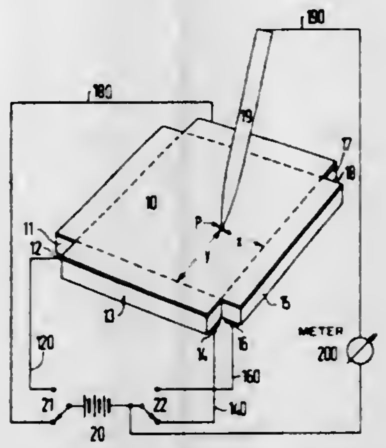
Peter Kleinschmidt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 2, 1975, Ser. No. 592,525

Claims priority, application Germany, July 5, 1974, 2432324

Int. Cl.² G01R ***27/02***

U.S. Cl. 324—65 R **6 Claims**



1. In a device for the electrical determination of two-dimensional coordinates of a point on a plate with a scanning device which contacts the plate, and in which the plate comprises a resistance layer of a material having a given electrical resistance, and in which pairs of contact strips are arranged on the plate, each strip of a pair of strips being connected to a respective pole of an electrical voltage source, and in which a potential is tapped at the contact point of the plate and the scanning device and represents a gauge for the relative position of the contact point in relation to the contact strips, the improvement therein comprising:

varistor layers between the contact strips and the plate, and

at least one voltage source for connection to the varistor layers for providing a voltage thereto which is greater than a threshold voltage at which the varistor layers pass from a state of low electrical conductivity into a state of greatly increased electrical conductivity.

4,001,678
DISPLACEMENT METERING WITH INDEPENDENT ANCILLARY FLOW

Robert H. Berg, 196 Clinton Ave., Elmhurst, Ill. 60126

Continuation-in-part of Ser. No. 470,396, May 16, 1974, abandoned. This application June 16, 1975, Ser. No. 587,287

Int. Cl.² G01N ***27/00***

U.S. Cl. 324—71 CP **23 Claims**

1. Displacement metering apparatus with two independently metered flows, especially adapted for use with a particle sensing instrument, comprising:

first, second and third fluid chambers;

coaxially aligned orifices in communicating series relationship comprising a first orifice connecting said first and second chambers and a second orifice connecting said second and third chambers;

means for effecting and metering filamentary flow from said first chamber seriatim through said orifices into said third chamber;

means for concurrently effecting and metering flow from said second chamber in sheathing laminar relation to said filamentary fluid flow and through said second orifice into said third chamber,

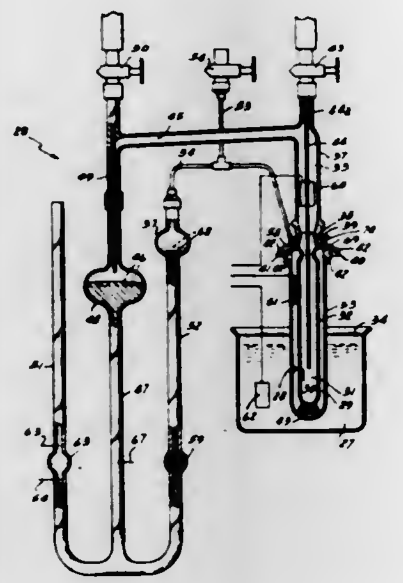
said means for effecting filamentary flow comprising a first tube connecting a communication with said third chamber and a first piston slidably mounted in said first tube;

said means for effecting a sheathing flow comprising a second tube connecting a communication with said second chamber and a second piston slidably mounted in said second tube; and

electric motor means connected to and concurrently operating said first and second pistons,

said electric motor means comprising an electric motor, and including a motor control connected to said electric motor,

said motor control comprising first means for energizing said electric motor to operate at a desired speed, second means for sensing a predetermined number of revolutions of said motor and generating a start signal for the particle sensing apparatus, third means for sensing a second predetermined number of revolutions after the start signal to generate a stop signal for the particle sensing apparatus, and fourth means connected to said first means for comparing actual motor speed with respect to the desired speed and causing said first means to adjust the energization of the motor.



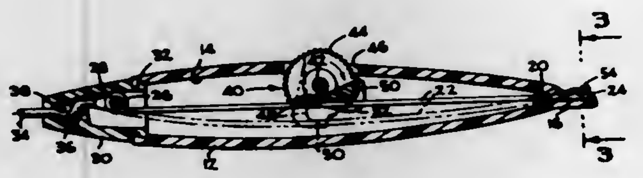
4,001,679
WEDGE ACTION ELECTRICAL TEST PROBE

William P. Cargile, 206 El Granada Blvd., Half Moon Bay, Calif. 94019, and W. Andrew Morrison, 12297 Via Roncole, Saratoga, Calif. 95070

Filed Feb. 19, 1975, Ser. No. 551,138

Int. Cl.² G01R ***31/02;*** **H01R** ***13/00***

U.S. Cl. 324—72.5 **7 Claims**



1. A probe for effecting temporary electrical connection to one of two spaced apart terminals comprising a housing having a wall defining a cavity, an elongate insulative body rigid with said housing, said housing having an opening communicating with said cavity defining a shoulder adjacent said body, a conductive spring wire having a distal end extending through said opening, a medial region residing within said cavity and a remote end remote from said distal end, means for fixing said remote end to said housing at a point remote from said insulative body, and means for biasing said conductive body pivotally outward of said insulative body to afford wedging action between the two spaced apart terminals, said biasing means comprising means disposed in said housing for laterally deforming said medial region of said conductive spring within said cavity, said shoulder being longitudinally limited so as to afford pivotal movement of said conductive member relative to said insulative member in response to deformation of said conductive spring by said deforming means.

4,001,680
DEVICE FOR MEASURING SMALL FREQUENCY DIFFERENCIES

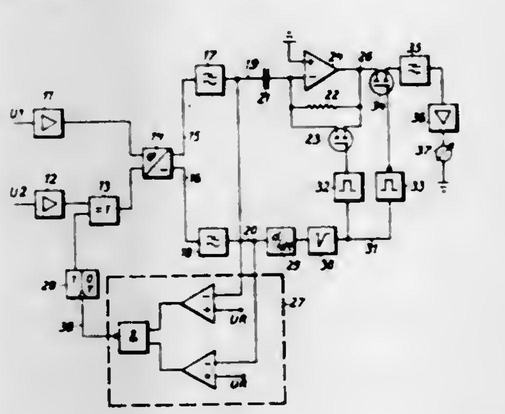
Per Gunnar Bylund, Spanga, and Bertil Lyberg, Norsborg, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 7, 1976, Ser. No. 647,173

Claims priority, application Sweden, Jan. 29, 1975, 7500935

Int. Cl.² G01R ***23/02***

U.S. Cl. 324—78 Z **7 Claims**



1. A device for measuring small frequency differencies of the kind where the AC voltages, the frequency difference of which is to be measured, are squared and applied to a phase detector, the output signal of which is a ramp voltage having an amplitude proportional to the phase difference, said ramp voltage being differentiated in a differentiating circuit to get a DC voltage proportional to the frequency difference, characterized by means for decreasing the time constant of the differentiating circuit during any transient change in the linear ramp voltage, by switch means connected between the output of the differentiating circuit and a following low-pass filter said switch being arranged to disconnect the low-pass filter from the differentiating circuit during the time the latter has a decreased time constant, and by a phase shifter connected before one of the inputs of the phase detector for shifting the phase of the corresponding AC voltage 180° as soon as the ramp voltage amplitude falls outside the linear range of the ramp.

4,001,681
VECTOR VOLTMETER

Cletus A. Hoer, and Glenn F. Engen, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,957

Int. Cl.² G01R ***25/00***

U.S. Cl. 324—83 R **7 Claims**

1. A vector voltmeter for measuring first and second signals comprising:

a. a first power divider connected to the first signal;

b. a first power detector fed by the first power divider;

c. a second power divider fed by the second signal;

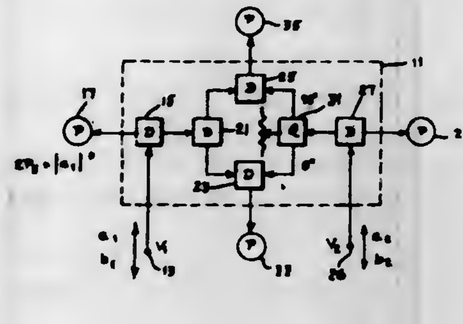
d. a second power detector fed by the second power divider;

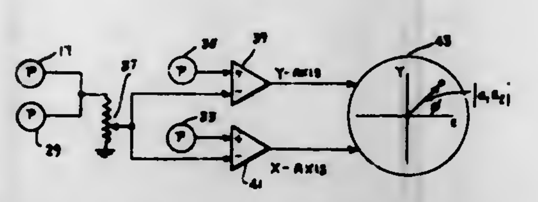
e. a third power divider fed by the first power divider;

f. a hybrid quadrature circuit fed by the second power divider and having a 0° phase output and a 90° phase output;

g. a fourth power divider fed by the third power divider and the 0° phase output of the hybrid quadrature circuit;

h. a third power detector fed by the fourth power divider;
i. a fifth power divider fed by the third power divider and



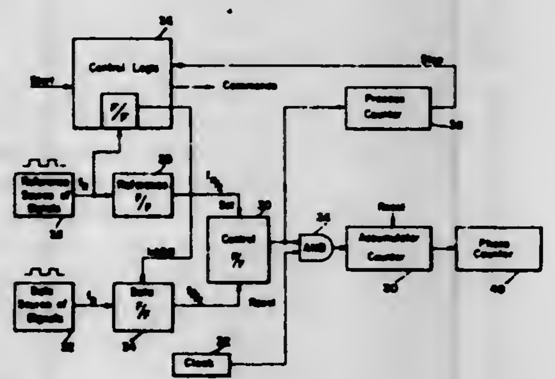


the 90° output of the hybrid quadrature circuit; and
j. a fourth power detector fed by the fifth power divider.

4,001,682
AMBIGUITY FREE DIGITAL AVERAGING PHASE METER

Richard E. Watt, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 293,107, Sept. 28, 1972, abandoned. This application Dec. 18, 1974, Ser. No. 530,691
Int. Cl.^{2} G01R *25/00*
U.S. Cl. 324—83 D **8 Claims**



8. A digital system for measuring the phase difference between corresponding transitions of applied first and second signals having substantially the same frequency and for eliminating the phase measurement ambiguities that exist when corresponding transitions thereof are nearly coincident, said digital system comprising:
- means for dividing the frequency of the applied first signal and the frequency of the applied second signal each by the same amount to produce respectively corresponding first and second output signals each having a corresponding lower frequency,
- means for receiving the first and second output signals and measuring the phase difference between corresponding transitions of said divided first output signal and said divided second output signal over a predetermined plurality of successive cycles of said output signals, said means including apparatus for accumulating all the successive phase measurements of said predetermined plurality of cycles, and
- means responsive to said first signal and coupled to said means for dividing, for inhibiting the producton of said second output signal for the first 180° of phase of said first signal during only the first cycle of said first signal during said plurality of successive cycles, whereby phase differences less than 180° have 360° added thereto for every cycle of said plurality of cycles

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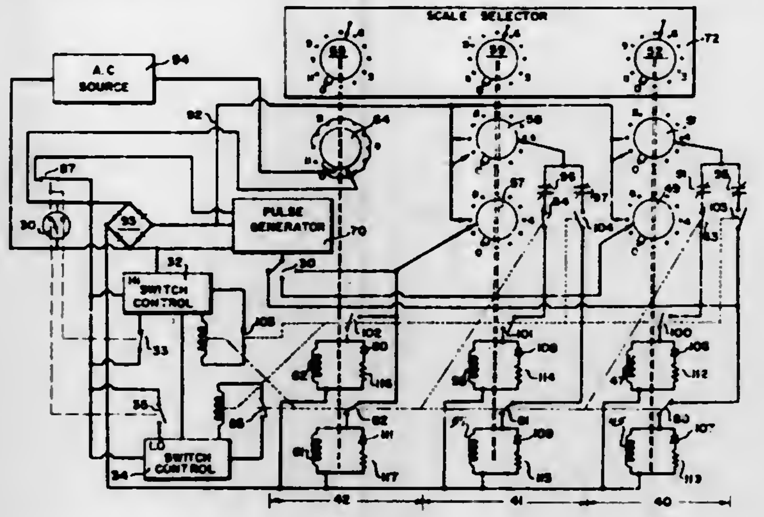
4,001,683
AUTOMATIC RANGE SELECTOR

Clyde E. McNeilly, Diamond Bar, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,878
Int. Cl.^{2} G01R *15/08*
U.S. Cl. 324—115 **6 Claims**

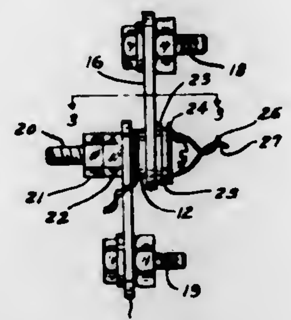


1. In a meter mechanism for indicating the value of an unknown parameter applied thereto, the mechanism including a scale with a plurality of ranges of values to which the meter mechanism can be made responsive at a particular instant, a range selector for developing an indication of the particular range of the scale which encompasses the value of the unknown parameter, and a scale selector coupled to the scale and the range selector and being responsive to the indication of the range selector to select the particular range of the scale and to make the meter mechanism responsive thereto, the improvement in the range selector, comprising: a meter relay coupled to said meter mechanism and being responsive to the value of the unknown parameter being outside the range to which the meter mechanism is then responsive to develop a high signal with the value of the unknown parameter of greater value and a low signal with the value of the unknown parameter of lesser value, and a plurality of stepping relays coupled in series to form a cascaded series of N relays, where N is an integer, said cascaded series being arranged in sequence from the first through the Nth relay, each of said N relays having a rotating portion with a number of contact positions, each combination of positions of all of the rotating portions of said stepping relays having associated therewith one of said ranges so that rotation of said rotating portion of any of said relays from one contact position to an adjacent contact position in one direction corresponds to ranges of increasing value and in the other direction corresponds to ranges of decreasing value, one of the contact positions of the first through said (N-1)th relays being a transfer position and said relays being so coupled to each other that with rotation of one of said rotating portions to the transfer position thereof in said one direction causes the rotating portion of the adjacent relay next higher in order in the order from said first through Nth relay to rotate to the next contact position thereof in said one direction and with rotation of one of said rotating portions to the transfer position thereof in said other direction causes the rotating portion of the adjacent relay next lower in order in the order from said first through Nth relay to rotate to the next contact position thereof in said other direction, a relay of said cascaded series being coupled to said meter relay and the scale selector and being responsive to said high signal to rotate the rotating portion thereof in said one direction to the next adjacent contact position and being responsive to said low signal to rotate the rotating portion in said other direction to the next adjacent contact position, the scale selector being responsive to the contact position of said rotating portion to make the meter mechanism responsive to the range associated with the combination of contact positions of said rotating portions.

4,001,684
CURRENT MEASURING SHUNT

David H. Fritts, 112 Beverly Place, Dayton, Ohio 45419

Filed Sept. 10, 1975, Ser. No. 612,069
Int. Cl.^{2} G01R *15/00*
U.S. Cl. 324—126 **2 Claims**

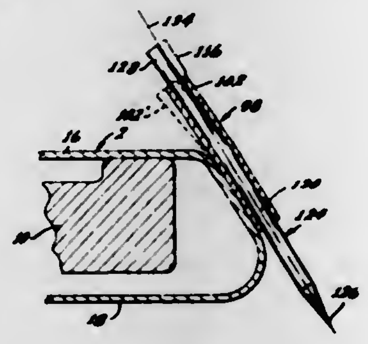


1. An inductively balanced shunt for measuring high frequency currents having a determined wavelength, comprising:
a. a first flat washer-shaped, non-magnetic, electrically conductive element having determined dimensions of outside diameter, inside diameter, and thickness. The magnitude of each of the said determined dimensions being less than approximately one-tenth the said wavelength, and the said washer having a determined first thickness resistance;
b. a second flat washer-shaped, non-magnetic, electrically conductive element having a determined outside diameter, a determined inside diameter, and a determined thickness, respectively, substantially the same as those of the said first washer-shaped element, and a determined second thickness resistance different in value from the said first thickness resistance;
c. means for axially aligning the said first and second washer-shaped elements, serially connecting the said first thickness resistance and the said second thickness resistance, and providing an electrical voltage connection contact at the said juncture; and
d. means for providing a current and a voltage contact to each of the said washer-shaped elements opposite the said juncture.

4,001,685
MICRO-CIRCUIT TEST PROBE

Jacques Leon Roch, Half Moon Bay, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Division of Ser. No. 447,865, March 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,844, Jan. 28, 1974, Pat. No. 3,939,414. This application Oct. 11, 1974, Ser. No. 514,017
Int. Cl.^{2} G01R *1/06, 31/02*
U.S. Cl. 324—158 P **10 Claims**

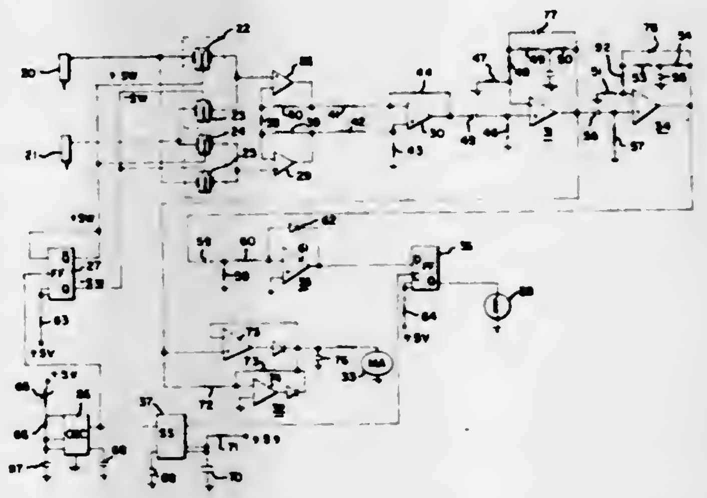


1. In a probe for testing integrated circuits which includes a support body, a probe tip positioned on the support body and conductive means to transmit an electrical signal to or from the probe tip, the improvement comprising:
- a probe tip which includes a thin-walled tube which is shaped and positioned to receive a needle;
- said thin-walled tube being bent at a bend line;
- said thin-walled tube being resiliently straightened when a needle is inserted within the tube with the straightening of the tube creating a frictional force between the tube and the needle, and
- said tube havng a strength and resiliency to provide resilient straightening of the tube when a needle is inserted in the tube without exceeding the elastic limit of said tube to provide a frictional force between said tube and the needle which is sufficient to maintain the position of the needle with respect to the probe tip when the needle is brought into probing contact with a semiconductor surface having an integrated circuit defined thereon.

4,001,686
ELECTRONIC CIRCUIT TESTING APPARATUS

Frank A. Radichel, Thornton, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed May 28, 1975, Ser. No. 581,537
Int. Cl.^{2} G01R *31/02, 31/08*
U.S. Cl. 324—158 R **9 Claims**



1. The method of locating a failing circuit connected by leads to a common node comprising:
- applying first and second voltage probes to adjacent points on one of the leads connected to said node,
- indicating the polarity of the voltage between said probes to determine the direction of current flow between said two points by setting a flip-flop in accordance with said direction of current flow,
- simultaneously measuring the current flow between said two points,
- successively applying said voltage probes to points on other leads connected to said node, and
- repeating said indicating and measuring steps to determine the direction and magnitude of current flow in each of said leads.

4,001,687
ANGULAR VELOCITY INDICATING APPARATUS

Morris Sorkin, Santa Monica, and Jeffrey A. Oicles, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

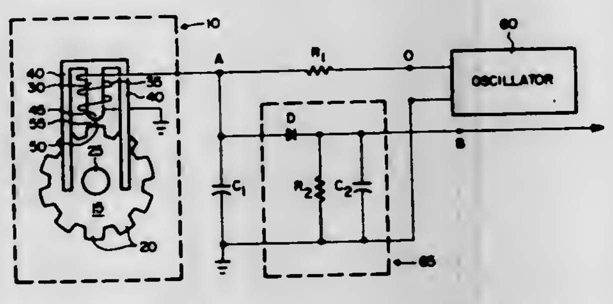
Continuation of Ser. No. 422,224, Dec. 6, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,591
Int. Cl.^{2} G01P *3/48*
U.S. Cl. 324—173 **8 Claims**

1. The apparatus for generating a pulse train whose pulse repetition rate is in fixed relationship to the rotational speed of a rotating element of the drive train of a motor vehicle, comprising, in combination:
A. oscillator means for generating a substantially constant-frequency alternating signal;
B. means for amplitude modulation of the signal from said oscillator means, the instantaneous envelope frequency of the modulation being in fixed relationship to the instantaneous rate of rotation of the element, said modula-

tion means comprising an electrical circuit responsive to the output of said oscillator means, said electrical circuit including:

1. variable inductance means, the rate of change of inductance of said variable inductance means being in fixed relationship to the instantaneous rate of rotation of the element, said variable inductance means comprising:
   - a. an object coupled to the rotating element of the motor vehicle drive train in such manner as to cause said object to rotate with an instantaneous rate of revolution in fixed relationship with the instantaneous rate of revolution of the element, said object having at least one projection oriented substantially radially with respect to the axis of revolution of said object, at least the extremity of said projection being of magnetic material;
   - b. an elongated center pole of magnetic material, said center pole oriented substantially radially to the axis of revolution of said object and substantially in the plane of revolution of said object, one end of said center pole being displaced from the axis of revolution of said object a sufficient distance to preclude contact between said projection and said end during rotation of said object; and
   - c. an electrically conductive coil surrounding said center pole and in electrical communication with the output of said oscillator means; and
2. a capacitor connected with said variable inductance means, the capacitance of said capacitor being selected to tune said electrical circuit to said oscillator frequency when the inductance of said variable inductance means is at a maximum value; and

c. means responsive to the modulated signal and adapted to generate a train of pulses in response thereto, the instantaneous repetition rate of said pulses being in fixed relationship to the modulation frequency.



4,001,688

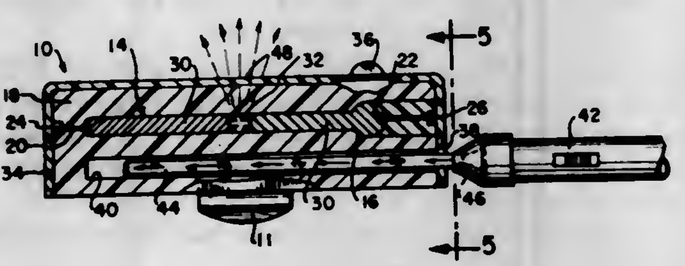
COULOMETER WITH END OF INTEGRATION COLOR CHANGE INDICATOR

Edward M. Marwell, Mount Kisco, and Jack C. Loh, White Plains, both of N.Y., assignors to Curtis Instruments, Inc., Mount Kisco, N.Y.

Continuation of Ser. No. 473,713, May 28, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,953

Int. Cl.^{2} G04F *8/00*

U.S. Cl. 324—182 10 Claims



1. In a coulometric device comprising a body of nonconductive material having a capillary bore therein, a liquid metal disposed within said bore and an electrolyte for dividing said liquid metal into two columns within said bore, and a pair of electrical contact means each in ohmic contact with one of said two columns for enabling the application of a potential difference between the two columns to effect the electroplating of liquid metal from one of said columns to the other of said columns, the improvement wherein said electrolyte contains a component which is inactive during electroplating of said liquid metal and which undergoes a redox reaction when the liquid metal is depleted from one of the columns, said redox reaction resulting in a visually detectable change in the color of the electrolyte and wherein at least a portion of said body is translucent whereby a change in the color of the electrolyte may be observed.

4,001,689

DEVICE FOR INDICATING THE DIRECTION OF ROTATION OF A BODY DRIVEN BY A ROTATING ELECTRICAL MACHINE

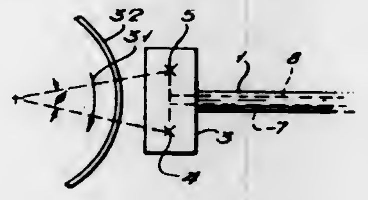
John Llewellyn Williams, Chester, and Phillip John Stokes, Liverpool, both of England, assignors to British Nuclear Fuels Limited, England

Filed July 2, 1975, Ser. No. 592,627

Claims priority, application United Kingdom, July 8, 1974, 30263/74

Int. Cl.^{2} G01R *33/02*; G01B *7/00*

U.S. Cl. 324—34 D 4 Claims



1. A device for indicating the direction of rotation of a body driven by a rotating electrical machine wherein the body and the machine are located within an enclosure, such device comprising:

a first inductive probe for positioning in proximity to the rotating body but outside said enclosure so as to interrupt magnetic lines of force generated by the electrical machine,

a second inductive probe for positioning in proximity to the rotating body but outside said enclosure so as to interrupt magnetic lines of force generated by the electrical machine, said second inductive probe being angularly spaced from first inductive probe so that signals produced by said probes differ in phase,

a detector circuit for sensing the difference in phase between the signals produced by said probes,

means for applying a selectively variable frequency signal to said detector circuit so as to provide variable discrimination for operating in differing speed ranges of said rotating body, and

an indicator connected to said detector circuit for indicating the direction of rotation of said body.

4,001,690

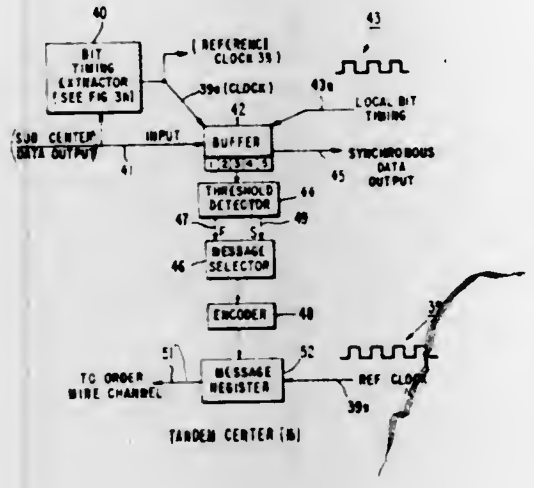
METHOD AND APPARATUS FOR COMPENSATION OF DOPPLER EFFECTS IN SATELLITE COMMUNICATION SYSTEMS

Alfred Mack, Cherry Hill, and Cameron Charles Schweitzer, Stratford, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,163

Int. Cl.^{2} H04B *7/19*

U.S. Cl. 325—4 8 Claims



1. In a system of the type wherein a transmitting station transmits signals to an orbiting satellite relay station to be relayed thereby to a receiving station, wherein said transmitting station is capable of transmitting said signals at a plurality of controllable transmission rates, wherein relative motion between said satellite and said stations causes transmission delays between said stations and said satellite manifesting thereby a read in rate to said receiving station that is different from the transmission rate from said transmitting station, said receiving station comprising:

storage means having at least three storage locations for reading in bits of digital data received from said transmitting station and storing said bits in a predetermined location assignment, each location capable of storing a data bit,

means for reading out of said storage means at a fixed rate data bits stored therein in a sequence corresponding to the sequence of receipt of said data bits, said fixed rate being intermediate said plurality of controllable transmission rates,

means for detecting a difference in the read in rate and the fixed read out rate of data in said storage means, and generating a first output signal when said difference is greater than said fixed rate and a second output signal when said difference is less than said fixed rate,

output means responsive to said first and second output signals of said detector means for generating first and second control signals for transmission via said satellite to said transmitting station,

said output means generating said first control signal in response to said detector means first output signal, whereby said first control signal causes said transmitting station to reduce its rate of transmission,

said output means generating said second control signal in response to said detector means second output signal, whereby said second control signal causes said transmitting station to increase its rate of transmission,

whereby said transmission delays between said transmitting and receiving stations and said satellite are minimized.

4,001,691

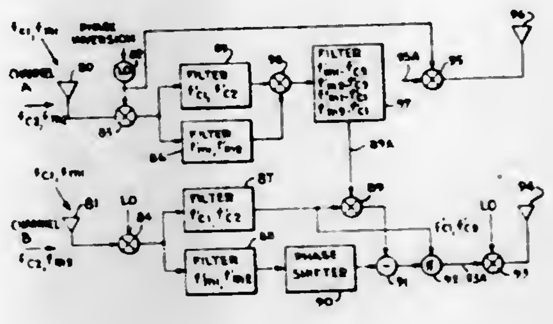
COMMUNICATIONS RELAY SYSTEM

Elliot L. Gruenberg, 6040 Boulevard East, West New York, N.J. 07093

Filed Jan. 30, 1975, Ser. No. 545,623

Int. Cl.^{2} H04B *7/14*

U.S. Cl. 325—14 14 Claims



1. In an electronic system for use in a communication system wherein there is radiated a plurality of information carrying electromagnetic first signals each having a radiating source and each having a radiated electromagnetic first reference signal, a transponder operative for receiving all of said electromagnetic signals and for radiating in response thereto a plurality of information carrying electromagnetic second signals corresponding respectively in information content to said first signals and a plurality of electromagnetic second reference signals corresponding respectively to said first reference signals, said transponder comprising, in combination:

a plurality of first antenna means each having output means and each operative for receiving said first signals and said first reference signals and for producing in response thereto a set of corresponding transmission line signals at its output means, and

transmission means coupled to the output means of all of said first antenna means and operative for producing from said set of transmission line signals said second reference signals as well as said second signals, each of said second signals having a spatial electromagnetic power density distribution having a peak value in the direction of each of said sources except for the source for its corresponding first signal for sources angularly spaced apart with respect to said transponder.

4,001,692

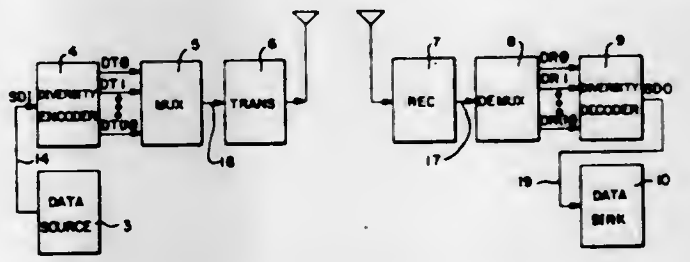
TIME DIVERSITY DATA TRANSMISSION APPARATUS

Robert B. Fenwick, Palo Alto, and Clinton R. Gilliland, Menlo Park, both of Calif., assignors to Barry Research Corporation, Sunnyvale, Calif.

Filed July 7, 1975, Ser. No. 593,690

Int. Cl.^{2} H04B *7/06*

U.S. Cl. 325—38 R 25 Claims



24. In a data transmission apparatus, the method comprising:

successively and asynchronously delaying an input data stream to form at least three transmitter data streams having time diversity said transmitter data streams asynchronous to said input data stream,

transmitting said transmitter data streams,

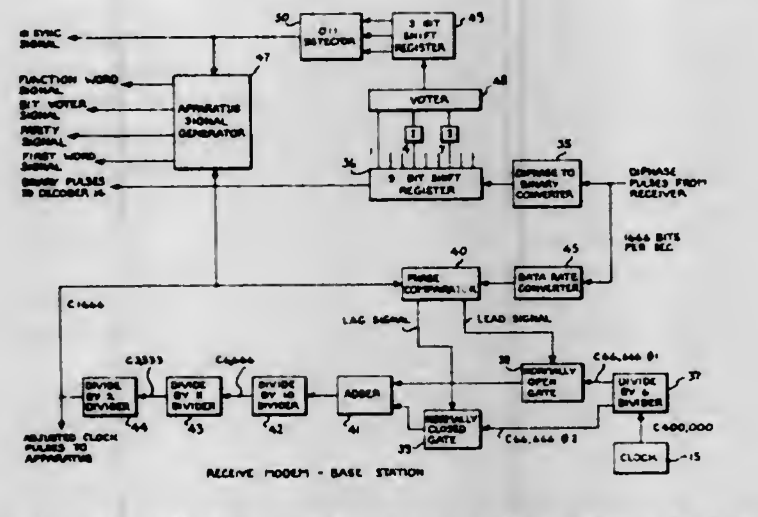
receiving the transmitted transmitter data streams to form responsively receiver data streams having time diversity,

successively delaying the receiver data streams to remove the time diversity and form at least three in-phase data streams,
summing the in-phase data streams to form a sum data stream,
comparing the sum data stream with a threshold to form an output data stream.

4,001,693
APPARATUS FOR ESTABLISHING COMMUNICATION BETWEEN A FIRST RADIO TRANSMITTER AND RECEIVER AND A SECOND RADIO TRANSMITTER AND RECEIVER

Bill L. Stackhouse, and Theodore E. Taylor, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 12, 1975, Ser. No. 576,801
Int. Cl.² H04L *7/00*
U.S. Cl. 325—58 **17 Claims**



1. For use in a radio communication system having at least a base station transmitter and receiver at one location and a mobile station transmitter and receiver at a second location, function control apparatus for establishing communication between said stations comprising:

a. means for for producing outbound messages having a sequence of binary bits at a first rate, each outbound message comprising a first synchronizing word of S bits, where S is an integer greater than two, a first address word, a second synchronizing word of S bits that is the binary inversion of said first synchronizing word, a second address word, a third synchronizing word of S bits that is the binary inversion of said first synchronizing word, and a command word;

b. means connected to said outbound message producing means and for connection to said base station transmitter for supplying said outbound messages thereto;

c. means for connection to said mobile station receiver for deriving said outbound messages transmitted by said base station transmitter and received by said mobile station receiver;

d. synchronizing means connected to said deriving means of said mobile station receiver for producing an in-synchronization signal in response to said first synchronizing word and said second synchronizing word of said received outbound messages each having a respective predetermined sequence of binary values and for producing an out-of-synchronization signal in response to a predetermined plurality of sequential synchronizing words of said received outbound messages each having a sequence of binary values that is different from its respective predetermined sequence of binary values;

e. means connected to said synchronizing means of said mobile station and connected to said deriving means of said mobile station for producing an inbound message in response to said in-synchronization signal and in response to said first and second address words of an outbound message having a predetermined sequence of binary values, said inbound message having a sequence of binary bits at a second rate that is greater than said first rate of said binary bits of said outbound messages, each inbound message comprising a synchronizing preamble, said first synchronizing word of S bits, said first address word, said second synchronizing word of S bits, said second address word, said third synchronizing word of S bits, and a response word;

f. means connected to said inbound message producing means and for connection to said mobile station transmitter for applying said inbound message thereto;

g. means for connection to said base station receiver for deriving an inbound message transmitted by said mobile station transmitter and received by said base station receiver;

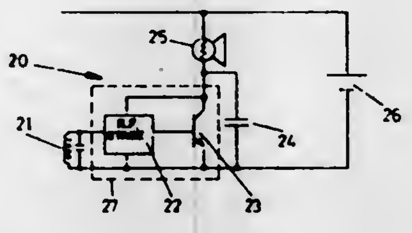
h. synchronizing means connected to said deriving means of said base station for determining the binary values of each group of N equally spaced bits in said synchronizing words of said inbound message, where N is an integer greater than two, and S/N is an integer greater than one; producing a bit representing the majority binary value of said N bits of each of said groups; and producing an in-synchronization signal in response to said representative bits having a predetermined sequence of binary values;

i. and utilizing means connected to said synchronizing means of said base station for utilizing said derived inbound message in response to said in-synchronization signal produced by said synchronizing means of said base station.

4,001,694
AUTOMATIC GAIN CONTROL CIRCUIT ARRANGEMENTS HAVING A PLURALITY OF STAGES OF AMPLIFICATION

David Latham Grundy, Saddleworth, and John Thompson, Manchester, both of England, assignors to Ferranti, Limited, Hollinwood, England

Continuation of Ser. No. 394,984, Sept. 7, 1973, abandoned. This application May 27, 1975, Ser. No. 580,566
Claims priority, application United Kingdom, Sept. 13, 1972, 42487/72
Int. Cl.² H04B *1/16*
U.S. Cl. 325—319 **7 Claims**

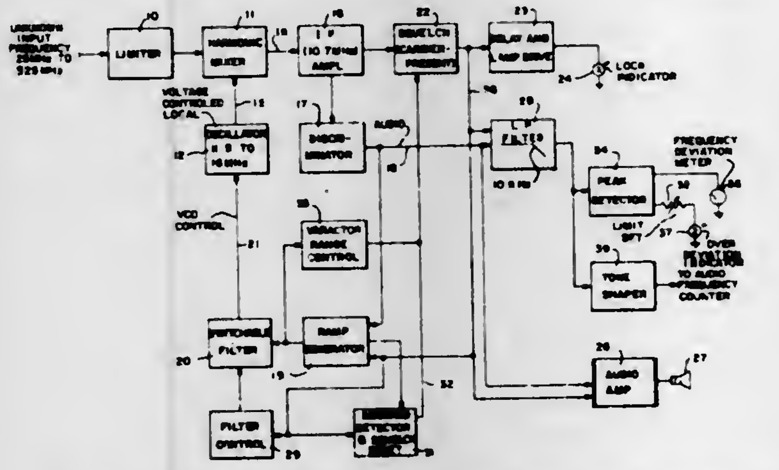


1. An automatic gain control circuit arrangement having a plurality of stages of amplification comprising a first amplifier stage having input signal terminals connected to receive input signals and supply terminals connected to receive a supply voltage, a voltage divider connected across a power source, said voltage divider including a first impedance means and a second impedance means, said first and said second impedance means being serially connected, said second impedance means functioning as a second amplifier stage, a capacitor connected across said supply terminals, means for operatively connecting said second impedance means to said first amplifier stage to thereby provide a second stage of amplification for said input signal, said first impedance means providing a load impedance for said second stage, said second impedance means having an impedance value which varies inversely with the mean level of the output level of the first amplifier stage and being connected across said supply terminals of said first amplifier stage such that the signal voltage gain of said first stage is related to the magnitude of the supply voltage whereby a change in the mean level of an output signal from the first amplifier stage, caused by a change in the mean level of an input signal to said first stage, causes the value of said second impedance means to change and thereby cause a change in the total value of the series connected first and second impedance means such that the voltage applied to said supply terminals varies inversely with the mean level of the output signal from the first amplifier stage.

4,001,695
AUTOMATIC DEVIATION ANALYSIS METER

Benny A. Hrbacek, and Lewis F. Grovenstein, Jr., both of Concord, Calif., assignors to Systron Donner Corporation, Concord, Calif.

Filed Mar. 24, 1975, Ser. No. 561,091
Int. Cl.² G01R *23/16*
U.S. Cl. 325—363 **6 Claims**



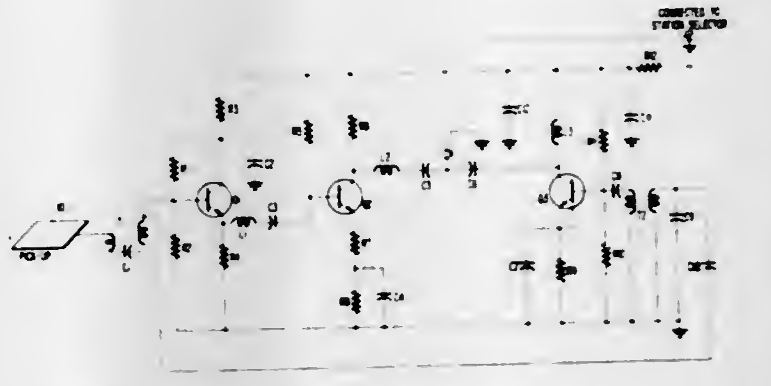
1. An automatic deviation analysis meter for indicating the frequency deviation of an unknown frequency modulated carrier signal comprising: automatic transfer oscillator means including a harmonic mixer, a voltage controlled oscillator (VCO) for producing a local oscllator (L.O.) signal, a negative feedback loop including said harmonic mixer coupled to and responsive to the L.O. signal of said VCO to produce an intermediate frequency (I.F.) signal, said loop including a discriminator coupled to said harmonic mixer and responsive to said I.F. signal for producing a d.c. voltage determined by any I.F. signal frequency change, said d.c. voltage driving said VCO after acquisition of said carrier signal; search means for scanning said VCO during a scanning mode and before acquisition of said carrier signal: means for controlling the frequency response of said loop and responsive to acquisition of said carrier signal for providing a relatively slow loop response to maintain the L.O. signal substantially constant with relatively low audio frequency modulation on said acquired carrier such means also coupling said search means to said VCO during said scanning mode and providing a fast response.

4,001,696
ELECTRONIC ANTENNA

George Louis Bannerman, P.O. Box 577, Sharon, Conn. 06069

Filed Aug. 2, 1974, Ser. No. 494,306
Int. Cl.² H04B *1/18*
U.S. Cl. 325—373 **3 Claims**

1. An electronic antenna adapted to be used wth the conventional radio receiver having at least one tunable RF circuit, said antenna being tuned by said tunable RF circuit, and comprising:
a concealable electromagnetic pick-up,
an input transformer having primary and secondary windings, said pick-up being connected to said primary winding of said input transformer, and
broad band RF pre-amplifier means having an input coupled to said secondary winding of said input transformer and an output coupled to said tunable RF circuit in said conventional radio receiver as a load for selectively amplifying only the frequencies to which said tunable RF circuit is tuned,
said conventional radio receiver being tunable over at least two different broadcast bands and including a separate tunable RF circuit for each broadcast band, said broad band RF pre-amplifier means comprising:
first pre-amplifier means directly connected to said secondary winding of said input transformer for amplifying signals in a first of said broadcast bands,
a first tuned circuit connected between the output of said first pre-amplifier means and the tunable RF circuit for the first broadcast band in said conventional radio receiver,
second pre-amplifier means coupled to said secondary winding of said input transformer for amplifying signals in a second of said broadcast bands, and
a second tuned circuit connected between the output of said second pre-amplifier means and the tunable RF circuit for the second broadcast band in said conventional radio receiver, and
said at least two broadcast bands being the AM and FM broadcast bands, respectively, and said first preamplifier means comprises:
a first transistor having a base, a collector and an emitter, said base being directly connected to said secondary winding of said input transformer, said first transistor being connected as a grounded collector stage,
a second transistor having a base, a collector, and an emitter, said second transistor being connected as a common emitter stage,
a high impedance coupling circuit including an inductor and a capacitor connected in series between the emitter of said first transistor and the base of said second transistor, and
a high-pass filter connected in the emitter circuit of said second transistor to attenuate frequencies below said AM broadcast band.



4,001,697
LINEAR A.C. MEASUREMENTS

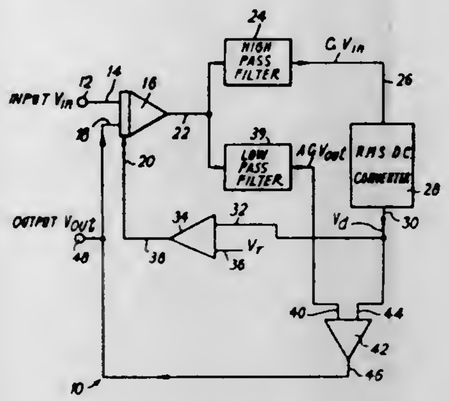
Paul Owen Withers, Swindon, and Eric Metcalf, Ropley, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 29, 1975, Ser. No. 609,320
Claims priority, application United Kingdom, Sept. 6, 1974, 39040/74
Int. Cl.² H02M *7/00;* **H03K** *5/00*
U.S. Cl. 328—26 **15 Claims**

1. An A.C. to D.C. conversion system comprising:
variable gain amplifying means for receiving and amplifying an A.C. input signal to be converted;
an A.C. to D.C. converter connected to receive the amplified A.C. signal from the variable gain amplifying means and arranged to convert the amplified A.C. signal to a first D.C. signal whose magnitude is dependent upon the magnitude of the amplified A.C. signal;
a first signal comparator arranged to compare the magni-

tude of the first D.C. signal with a reference magnitude and to produce a control signal dependent on the difference therebetween, the control signal being applied to the variable gain amplifying means to vary the gain thereof, whereby to change the magnitude of the amplified A.C. signal in the sense that tends to reduce the difference between the magnitude of the first D.C. signal and the reference magnitude; and

a second signal comparator arranged to compare the magnitude of said first D.C. signal with the magnitude of a second D.C. signal and to produce a D.C. output signal dependent upon the difference therebetween, said D.C. output signal being applied to and amplified by the variable gain amplifying means to produce the second D.C. signal and the second signal comparator being operative to maintain the magnitude of the second D.C. signal substantially equal to the magnitude of the first D.C. signal;



the ratio between the respective gains of the variable gain amplifying means for A.C. and D.C. signals being substantially constant, whereby the magnitude of the D.C. output signal is substantially linearly related to the magnitude of the A.C. input signal.

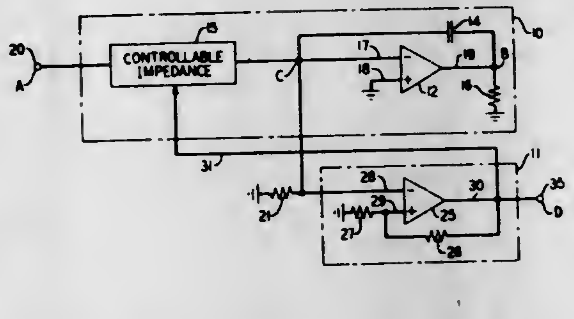
4,001,698
ANALOG TIMER INCLUDING CONTROLLABLE OPERATE-RECOVERY TIME CONSTANTS

Ralph Rabun Allred, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1975, Ser. No. 627,478

Int. Cl.² H03K *5/159*

U.S. Cl. 328—55 **8 Claims**



4. An analog timer of the type employed to generate an output pulse signal a predetermined time interval after application of an input pulse signal which includes an integrator circuit having a predetermined linear integration rate for developing a signal which is the mathematical integral of the input pulse signal, and a comparator circuit responsive to a difference between a signal developed by the integrator and a reference signal for generating the delayed output pulse, wherein the improvement comprises:

means connected in circuit with the integrator and being responsive to the output signal developed by the comparator for controlling changes in the integration rate of the integrator including controllable impedance means responsive to the applied input pulse signal and the comparator output signal for controllably changing the integrator integration rate in accordance with prescribed relationships of the applied input pulse signal and comparator output signal.

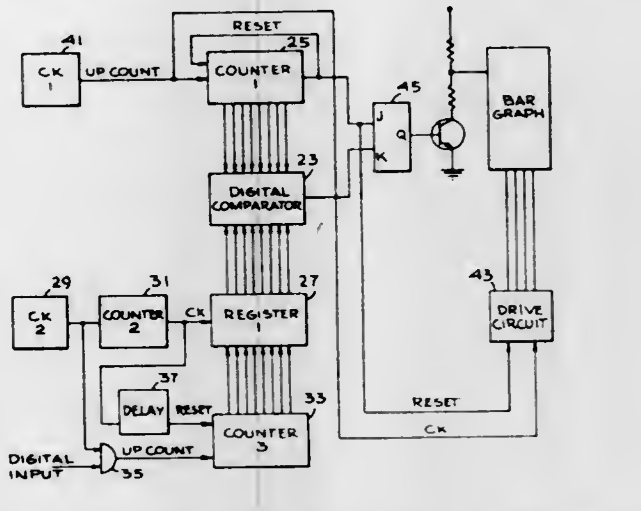
4,001,699
BAR GRAPH DIGITAL INTERFACE CIRCUIT

William Michael Denny, Santa Barbara; Russell Louis Hagen, Goleta, and Steve Ka-Lai Leung, Santa Barbara, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,326

Int. Cl.² H03K *13/258, 17/00*

U.S. Cl. 328—71 **8 Claims**



1. Display interface circuitry responsive to a selected logic state of a digital input signal for producing a control signal for controlling a bar graph display including a plurality of sequentially activated cathode segments cooperating with a single anode element comprising:

first count producing means for producing a first count indicating the particular cathode segment under activation at any time;

second count producing means for producing a second count proportional to the duration of said digital signal in said selected logic state; and

means for comparing said first count to said second count and producing said control signal upon their equivalence;

said second count producing means including:

first clock means for producing a first clock signal having a frequency equal to the product of the total number of said plurality of cathode segments and 2^N where N equals an integer 0, 1, 2, 3 . . . ;

logic means supplied with said first clock signal for producing sampling clock pulses when said digital signal is in said selected logic state; and

first counter means for counting said sampling clock pulses; and

said first count producing means comprising:

second clock means for producing second clock pulses of a frequency equal to the produce of the total number of said plurality of cathode segments and the number of times per second said plurality of cathode segments is to be sequentially energized;

second counter means for counting a number of said second clock pulses equal to the total number of said plurality of cathode segments and thereafter resetting;

said second count producing means further including:

third counter means driven by said first clock signal for counting to the product of 2^N and the total number of said plurality of cathode elements and thereupon producing a reset signal;

register means responsive to said reset signal for storing at least the high order count bits of said second counter means necessary to represent the total number of said plurality of cathode elements; and

delay means activated by said reset signal for resetting said second counter means after said storing.

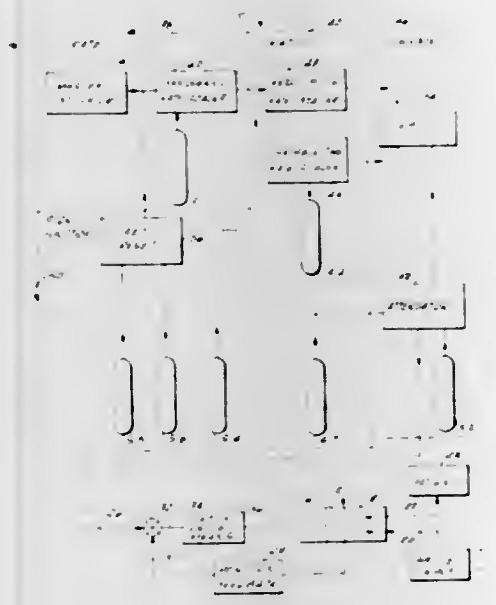
4,001,700
DIGITAL WAVEFORM GENERATOR FOR AUTOMATIC RESPIRATORY VENTILATORS

Albert M. Cook; Frank A. Engleman, Jr., and James G. Simes, all of Sacramento, Calif., assignors to Sutter Hospitals Medical Research Foundation, Sacramento, Calif.

Filed Apr. 16, 1974, Ser. No. 461,303

Int. Cl.² A03K *13/02;* **H03K** *21/18;* **A61H** *31/00*

U.S. Cl. 328—129 **31 Claims**



1. A system for digitally controlling an analog waveform signal to be used to control the respiratory cycle of a respirator in which the respiratory cycle has an inspiratory phase and an expiratory phase, the digital system comprising:

a. means for selecting a first input having a magnitude representative of a predetermined respiratory rate defining the duration for each respiratory cycle;

b. a digital respiratory rate circuit having means responsive to said first input for producing a first output comprising a series of time pulses having a frequency proportional to the magnitude of said first input;

c. means for selecting a second input having a magnitude representative of a predetermined respiratory ratio defining the duration of the inspiratory phase relative to the duration of the expiratory phase for each respiratory cycle, the magnitude of the second input being independent of the magnitude of the first input;

d. a digital respiratory ratio circuit for defining the inspiratory portion of each respiratory cycle, the ratio circuit having means responsive to the second input and to the output of the rate circuit for generating a second output comprising a constant number of timed pulses corresponding to the inspiratory phase of each respiratory cycle in which the portion of each cycle during which said constant number of pulses occur is proportional to said preselected respiratory ratio, and the frequency of said constant number of pulses is proportional to the frequency of pulses generated by the rate circuit, said constant number of pulses being independent of said preselected respiratory rate and ratio; and

e. means responsive to the output pulses from the respiratory ratio circuit for converting said pulses into an analog waveform signal having magnitude with respect to time which varies in proportion to said preselected respiratory rate and ratio.

4,001,701
CIRCUIT FOR COMBINING PULSE TRAINS

John B. Rosso, and Sheyrl Wayne Garrett, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 25, 1975, Ser. No. 616,789

Int. Cl.² G06G *7/02;* **H03K** *3/78*

U.S. Cl. 328—158 **3 Claims**

1. A circuit arranged to respond to a plurality of voltage pulse trains and generate a single voltage pulse train which is an addition of the plurality of trains, including;

a first circuit section connected to a first of the input pulse trains, including,

a. a pair of logic gate circuits connected as a cross coupled latch and connected to receive the pulses of the input to the section and generate an output logic 1,

b. a connection between the output of an independent, stable source of voltage pulses and the cross coupled latch through which a first of the edges of the pulses shifts the latch output to logic 0,

c. and a resistance divider circuit means capacitively connected to said latch and responding to only the shift in the latch output to logic 0 to generate a voltage pulse in the output of the circuit;

and a second circuit section connected to a second of the input pulse trains which generates a voltage pulse in the output of the circuit with the second of the edges of the pulses of the stable source of voltage pulses,

whereby the differential source pulses generates a pulse train output of the circuit from the plurality of input pulse trains.

4,001,702
HIGH SPEED FM AND AM DEMODULATOR

Barry M. Kaufman, Pine Brook, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Nov. 3, 1975, Ser. No. 628,569

Int. Cl.² H03D *3/00, 5/00*

U.S. Cl. 329—135 **8 Claims**

1. A high speed FM demodulator for demodulating an incoming carrier frequency, which demodulator comprises,

a. a quadrature all-pass network,

b. a notch filter tuned to the carrier frequency,

c. means applying the carrier signal to said network and said filter,

d. a first summing amplifier,

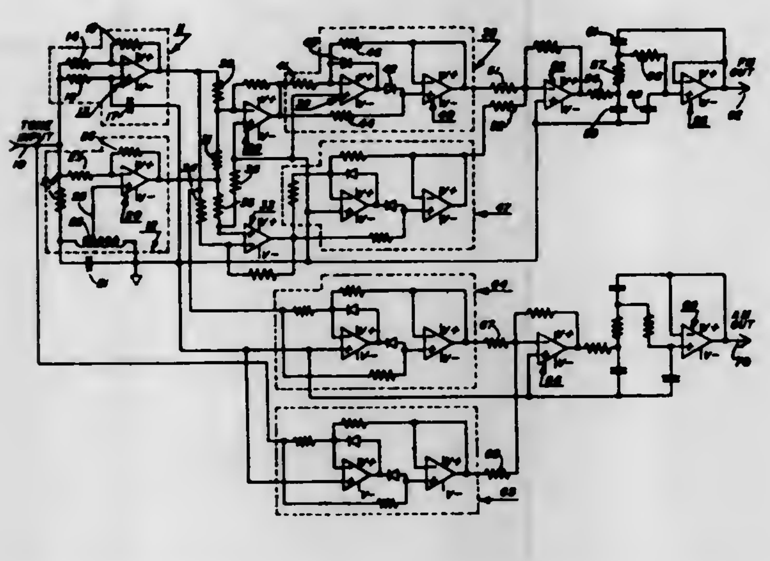
e. a first differencing amplifier,

f. means applying the outputs of said network and the notch filter to both the said first summing and said first differencing amplifiers,

g. first and second rectifiers,

h. means applying the output of said first summing amplifier to one of the said rectifiers,

i. means applying the output of said first differencing amplifier to the other of said rectifiers, and



j. a first combining amplifier to which the outputs of the said first and second rectifiers are applied.

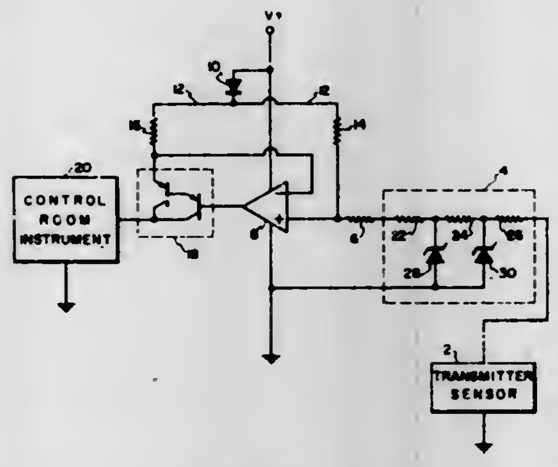
4,001,703
TRANSMISSION LINE INTERFACE CIRCUIT

Glenn Saul, Ambler, and Philip W. Bur, Horsham, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1975, Ser. No. 623,958

Int. Cl.² H03F *1/34*

U.S. Cl. 330—1 A **6 Claims**



1. A transmission line interface circuit for interfacing between a remote grounded transmitter and a control room instrument, said interface circuit comprising an operational amplifier having a first and a second input terminal,

means deriving a first input signal for application to said first input terminal of said operational amplifier, said first input signal being proportional to the current drawn by the transmitter,

a current control means connected to be responsive to the output of said operational amplifier, and

means deriving a second input signal for application to said second input terminal of said operational amplifier, said second input signal being proportional to the current drawn by said current control means, said second input signal being applied to said operational amplifier in feedback relation whereby the current controlled by said current control means is a mirror image of the current drawn by said transmitter.

4,001,704
LASER SOLAR CELL APPARATUS

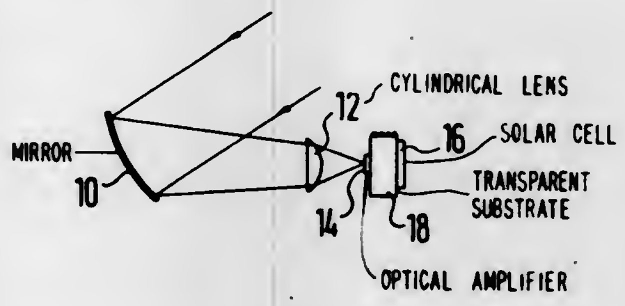
Hans-Gunter Danielmeyer, Hofingen; Jean Pierre Jeser, Stuttgart; Walter-Wolfgang Kruhler, Stuttgart; Karl-Heinz Thiemann, Stuggart, and Gunter Huber, Gerlingen, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Mar. 20, 1975, Ser. No. 560,149

Claims priority, application Germany, Mar. 25, 1974, 2414209

Int. Cl.² H01S *3/02*

U.S. Cl. 330—4.3 **1 Claim**



1. A laser arrangement for a high-doped optical amplifier element wherein said optical amplifier element has the form of a thin layer or fiber, and wherein a light pump is directed onto said layer or said fiber generally transversely to a surface of said layer or to the longitudinal axis of said fiber said layer or said fiber being provided on a transparent substrate, a solar cell being provided on the back side of said substrate in light receiving relationship to light passing through said layer or fiber.

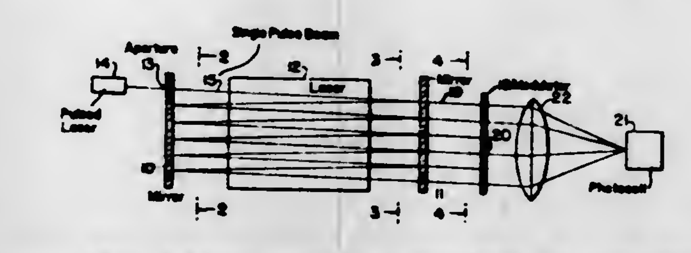
4,001,705
LIGHT SCANNING DEVICE

Brett Jason Sinclair, 150-11 72nd Road, Flushing, N.Y. 11367, and Harold Youngelson, 647 Academy St., New York, N.Y. 10034

Filed May 20, 1975, Ser. No. 579,271

Int. Cl.² H01S *3/00*

U.S. Cl. 330—4.3 **5 Claims**



1. A light scanning device comprising, in combination, mirrors set to reflect a beam of light therebetween, a laser having a lasing medium in the path of light between at least two of said mirrors, means introducing a pulse beam between said mirrors, said mirrors reflecting said beam therebetween with said beam with each passage between said mirrors being slightly deflected, means directing a portion of said beam from between said mirrors to thereby direct a sequential pattern of light beams from said scanning device, said lasing medium amplifying said beam during reflection between said mirrors, and a modulator modifying the sequential pattern of light beams directed from said light scanning device.

4,001,706
SINGLE-ENDED/PUSH-PULL CONVERTER

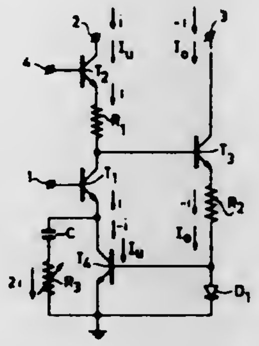
Albertus Prins, Moorebank, Australia, and Henri Jan Velo, Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,042

Claims priority, application Netherlands, Oct. 14, 1974, 7413448

Int. Cl.² H03F *3/04*

U.S. Cl. 330—14 **4 Claims**



1. A single-ended/push-pull converter for converting a single-ended input signal into a push-pull output signal, comprising a current mirror arrangement with a low-ohmic input circuit and a high-ohmic output circuit, the current in the output circuit bearing a fixed ratio to the current in the input circuit, a first transistor whose emitter circuit includes the output circuit of the current mirror arrangement and whose collector electrode is connected to a point of constant potential via the series connection of at least a first impedance and the base-emitter junction of a second transistor, of which second transistor the collector constitutes a first push-pull output, while an electrode of the first transistor constitutes the single-ended signal input, a third transistor of the same conductivity type as the first transistor, of which third transistor the emitter circuit includes a second impedance and the input circuit of the current mirror arrangement, and of which third transistor the base electrode is coupled to the collector electrode of the first transistor, and the collector constitutes a second push-pull output, and a d.c. blocking impedance which shunts the output circuit of the current mirror arrangement.

4,001,707
AMPLIFIER CIRCUIT

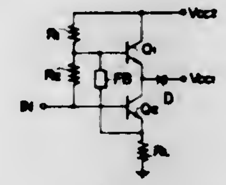
Shinsuke Iguchi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

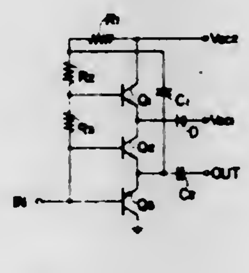
Filed July 22, 1974, Ser. No. 490,341

Claims priority, application Japan, Jan. 11, 1974, 49-5964; Feb. 8, 1974, 49-15453

Int. Cl.² H03F *3/04*

U.S. Cl. 330—18 **6 Claims**





1. A circuit comprising:

an input terminal to which input signals to be amplified are coupled;

an output terminal from which output signals are derived;

an amplifier circuit connected between said input and output terminals, for amplifying said input signals and supplying the amplified signals at said output terminal;

a first supply voltage terminal for supplying a first supply voltage to said amplifier circuit;

a second supply voltage terminal for supplying a second supply voltage to said amplifier circuit, the absolute value of said second supply voltage being greater than the absolute value of said first supply voltage;

first switching circuit means, connected between said first supply voltage terminal and said amplifier circuit, for coupling said first supply voltage to said amplifier circuit in response to said input signals being below a prescribed level and decoupling said first supply voltage to said amplifier circuit in response to said input signals being at least said prescribed level;

second switching circuit means which includes a control input, connected between said second supply voltage terminal and said amplifier circuit, for coupling said second supply voltage to said amplifier circuit in response to said input signals being at least at said presecribed level and decoupling said second supply voltage to said amplifier circuit in response to said input signals being below said prescribed level;

first resistive means connected between said second supply voltage terminal and said control input of said second switching circuit means;

second resistive means connected between said control input of said second switching circuit means and said input terminal; and

positive feedback means connected between said output terminal and said control input of said second switching circuit means.

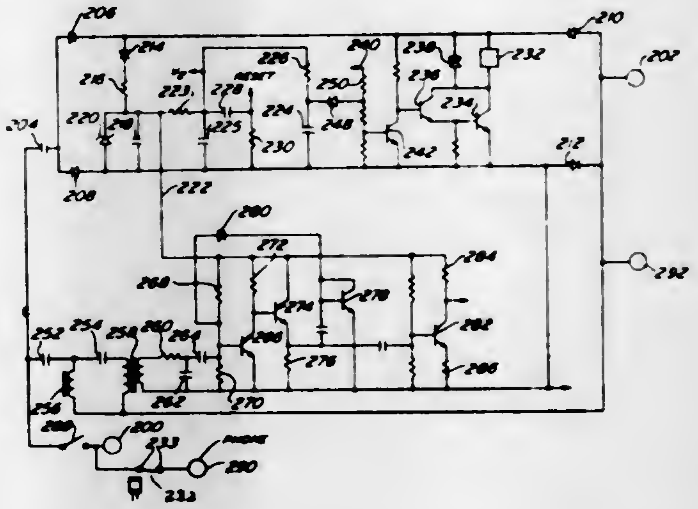
4,001,708
CODE-CONTROLLED RINGER ATTACHMENT FOR TELEPHONES INCLUDING A-PEAK-TO-PEAK GAIN CONTROLLED AMPLIFIER

Duane Ridgely Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Division of Ser. No. 496,450, Aug. 12, 1974, Pat. No. 3,936,617. This application Sept. 4, 1975, Ser. No. 610,127

Int. Cl.² H03G *3/30*

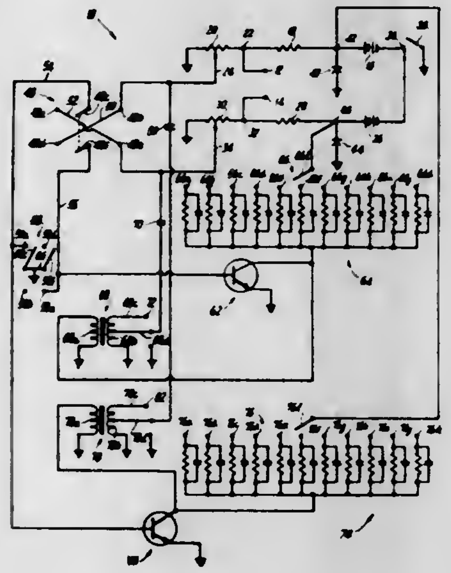
U.S. Cl. 330—29 **2 Claims**



1. A compression amplifier comprising a first transistor biased as an amplifier where the voltage gain is determined by emitter current which is inversely proportional to the base voltage, whereby any decrease in base voltage causes an increase in voltage gain, said first transistor being coupled through a second transistor connected as an emitter follower directly to a peak-to-peak detector circuit adapted to produce a decreasing voltage when the average peak-to-peak amplitude of the signal at the collector of said first transistor is greater than a threshold determined by said detector circuit

and to produce an increasing voltage when the average peak-to-peak amplitude of the signal at said collector is less than a threshold determined by said detector circuit, said detector circuit being coupled to the base of first transistor whereby the voltage gain of said first transistor is caused to adjust itself such that the peak-to-peak amplitude of the signal reproduced at the collector of said first transistor is substantially determined solely by the characteristics of said detector circuit.

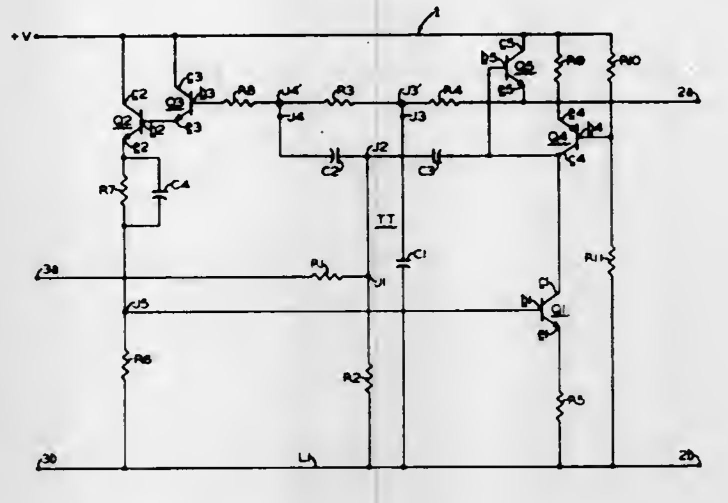
4,001,709
ACTIVE DUAL CHANNEL TUNING CONTROL
Matthew Clinkscales, 508 Cleveland St., Brooklyn, N.Y. 11208
Filed Sept. 30, 1975, Ser. No. 618,272
Int. Cl.² H03F *3/68*
U.S. Cl. 330—30 R **10 Claims**



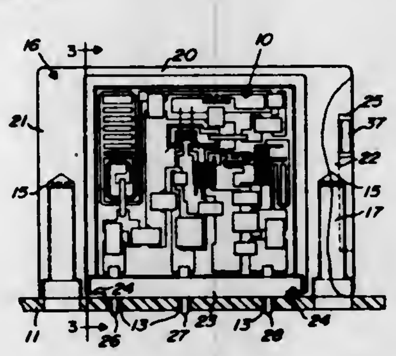
1. A dual channel tuning circuit comprising two input terminal means each for receiving a different informational electrical signal; an amplifier provided in each channel and having an input and an output; switching means between said input terminal means and said amplifier inputs for selectively reversing said input terminal means with respect to each of said amplifier inputs and for selectively inhibiting said signals from being applied to said amplifier inputs; adjustable impedance means associated with each amplifier; and feedback means provided between each amplifier output and one of said input terminals for enhancing the tuning and impedance matching to signal processing circuitry that follows when said impedance means is adjusted.

4,001,710
FAIL-SAFE ACTIVE BAND-PASS FILTER
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed May 27, 1975, Ser. No. 581,221
Int. Cl.² H03F *3/04*
U.S. Cl. 330—31 **8 Claims**

1. A fail-safe electronic filter for passing a signal having a preselected frequency comprising, an amplifier having an input and an output circuit, a feedback path including an R-C twin-T network connected from said output circuit to said input circuit of said amplifier, an isolation circuit connected between said output circuit of said amplifier and said R-C twin-T network to prevent an increase in the gain of said amplifier due to an increase of resistance in said R-C twin-T network, said R-C twin-T network is imperfectly nulled to provide regeneration at said preselected frequency and to provide degeneration at all other frequencies from said output circuit to said input circuit of said amplifier so that an output signal is only available on an output terminal during the presence of said preselected frequency signal at said input circuit of said amplifier and in the absence of a critical component or circuit failure in the fail-safe electronic filter.



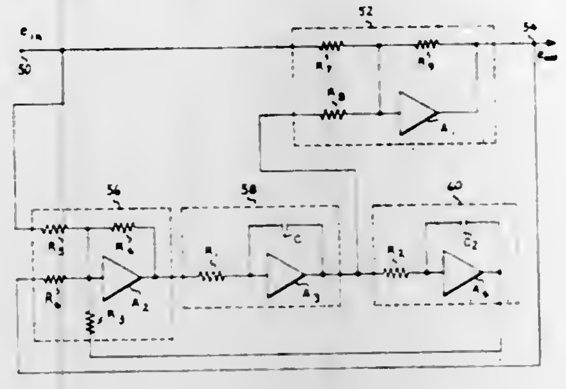
4,001,711
RADIO FREQUENCY POWER AMPLIFIER CONSTRUCTED AS HYBRID MICROELECTRONIC UNIT
William J. Knutson, Tamarac, and Daniel M. Smith, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 5, 1974, Ser. No. 492,306
Int. Cl.² H03F *1/00*
U.S. Cl. 330—66 **12 Claims**



1. A self-contained power amplifier module constructed as a plug-in hybrid microelectronic unit with integral heat sink including in combination:

- a flat ceramic substrate having a conducting coating on one side thereof and conductor means on the other side formed in a predetermined pattern to provide a plurality of conductor portions, and means connecting one portion of said conductor means to said conducting coating,
- terminal means connected to a plurality of portions of said conductor means for applying input signals thereto and deriving output signals therefrom,
- a semiconductor die having electrodes therewith secured to one portion of said conductor means, means connecting said electrodes to different portions of said conductor means,
- one of said conductor portions being shaped to form a flat faced inductor with severable tuning segments for controlling the inductance, and
- a conducting housing for said substrate having a portion for supporting said conducting coating and making direct electrical ground connection thereto, said housing serving as a heat sink by absorbing heat from said substrate by thermal conduction.

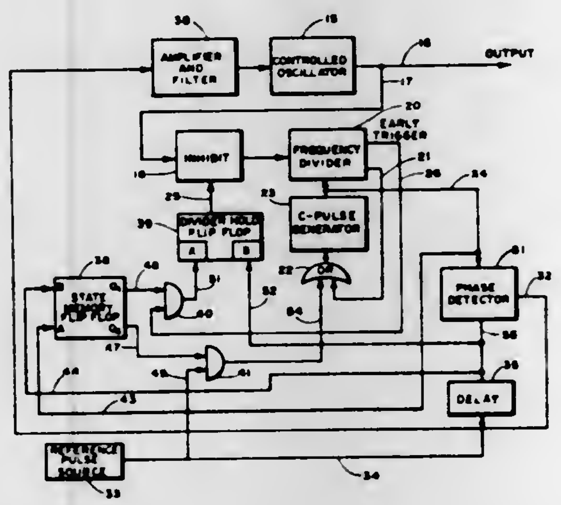
4,001,712
ACTIVE FILTER WITH INVERSE OPTION
George S. Chambers, Waynesboro, and L. Jubin Lane, Stuarts Draft, both of Va., assignors to General Electric Company, Salem, Va.
Filed Dec. 18, 1975, Ser. No. 642,018
Int. Cl.² H03F *1/36*
U.S. Cl. 330—85 **8 Claims**



1. An electronic filter circuit operable as either a band-reject or a band-pass filter having the same natural frequency of input signal comprising:

- a. a first summing circuit for providing an output signal in response to first, second and third signals applied thereto through, respectively, first, second and third input resistors;
- b. a first integrating circuit for providing an output in response to the output of said first summing circuit;
- a second integrating circuit for providing an output in response to the output of said first integrating circuit;
- a second summing circuit, responsive to said input signal and to the output of said first integrating circuit, to develop an output signal for said filter circuit; and,
- e. means for applying, respectively, as the signals applied to said first summing circuit through said first, second and third resistors, said input signal, the output from said second summing means, and the output of said second integrating means, said first and second resistors having first values when the filter circuit acts as a band-reject filter and having values interchanged from said first values when the filter circuit acts as a band-pass filter.

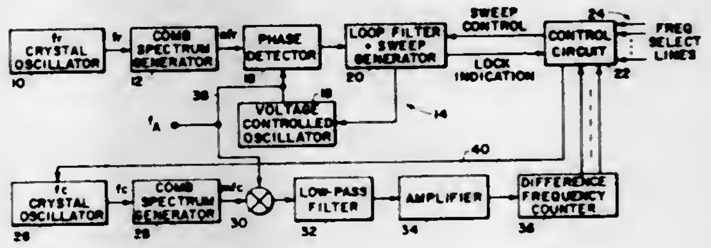
4,001,713
PHASE LOCK LOOP CIRCUIT
William F. Egan, Cupertino, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.
Filed Jan. 15, 1976, Ser. No. 649,421
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **3 Claims**



1. A phase lock circuit for an oscillator having an output comprising

- pulse generator means responsive to the output of said oscillator for producing controlled (C) pulses,
- a phase detector having one input connected to the output of said pulse generator means,
- a source of reference (R) pulses,
- means for producing delayed R-pulses and applying same to said phase detector whereby the phase detector compares C-pulses and delayed R-pulses and produces an output corresponding to phase differences therebetween,
- means to connect said output of the phase detector to said oscillator to correct changes in frequency of the latter relative to the frequency of said R-pulses,
- means responsive to said C-pulses and to said delayed R-pulses for temporarily disconnecting the output of said oscillator from said pulse generator means when the C-pulse frequency is greater than said R-pulse frequency whereby to cause the second of two successive C-pulses that would occur prior to an R-pulse to occur immediately after the R-pulse, and
- means responsive to said R-pulses for advancing the phase of the C-pulses when the C-pulse frequency is lower than said R-pulse frequency whereby to cause the second of two successive R-pulses that would occur without an intermediate C-pulse to be preceded by a C-pulse.

4,001,714
SEARCH AND CONFIRM FREQUENCY SYNTHESIZER
Francis K. Reed, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed Nov. 12, 1975, Ser. No. 631,349
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **3 Claims**



1. Search and confirm frequency synthesizer apparatus comprising:

- first means for generating a reference frequency signal;
- second means for generating a comparison frequency signal;
- first spectrum generator means coupled to said first means for producing a plurality of harmonics of the reference frequency signal;
- second spectrum generator means coupled to said second means for producing a plurality of harmonics of the comparison frequency signal;
- a voltage controlled oscillator;
- phase detector means having a first input coupled to said first spectrum generator means, and a second input coupled to the output of said voltage controlled oscillator;
- loop filter and sweep generator means having a first input coupled to the output of said phase detector means, and an output coupled to the input of said voltage controlled oscillator to provide a phase-locked loop for sequentially generating at the output of said voltage controlled oscillator progressively increasing or decreasing harmonic frequencies of said reference frequency signal;
- frequency mixing means coupled to the output of said second spectrum generator means and to the output of said voltage controlled oscillator for mixing the plurality of harmonics of the comparison frequency signal with each sequentially generated harmonic of the reference frequency signal;
- filtering means coupled to the output of said frequency mixing means for transmitting only the single, lowest frequency difference signal produced by said mixing means;

difference frequency counter means coupled to said filtering means for determining the frequency of said difference signal and for transmitting a numerical representation of the difference signal to a control circuit means; and

said control circuit means coupled to said difference frequency counter means, and said loop filter and sweep generator means, and having an input to receive an encoded frequency select input signal for comparing the numerical representation of the difference signal with the encoded frequency select input signal, and for controlling the operation of said phase-locked loop to produce an output signal having a frequency equal to a selected harmonic of said reference frequency signal.

4,001,715
VERTICAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVER SET

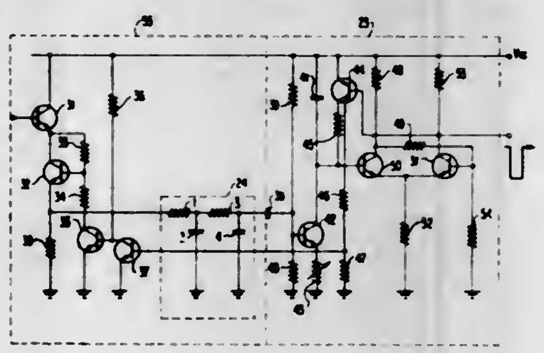
Hirokazu Fukaya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 8, 1975, Ser. No. 575,842

Claims priority, application Japan, May 8, 1974, 49-50953

Int. Cl.² H03B *3/06*

U.S. Cl. 331—20 **5 Claims**



1. A vertical deflection circuit for a television receiver comprising:

an input terminal receiving a composite synchronizing signal having a group of vertical synchronizing pulses;

means for producing a vertical trigger signal from said composite synchronizing signal fed through said input terminal;

a free-running oscillator capable of synchronous oscillation triggered by said vertical trigger signal, said free-running oscillator producing an output comprising vertical scanning period signals and vertical flyback period signals; and

a switching circuit located between said input terminal and said means for producing a vertical trigger signal, said switching circuit being adapted to prevent the application of said composite synchronizing signal to said means for producing a vertical trigger signal in response to said flyback period signals and to allow the application of said composite synchronizing signal to said means for producing a vertical trigger signal in response to said vertical scanning period signals.

4,001,716
VARIABLE FREQUENCY DIGITAL OSCILLATOR

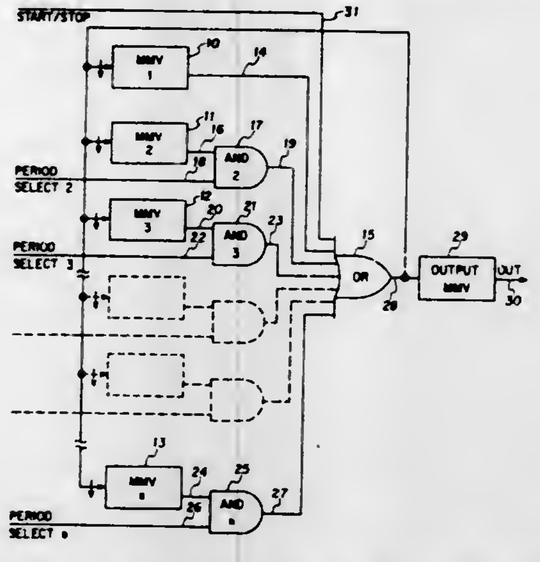
Ronald L. Swanson, and Lyle R. Strathman, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 17, 1976, Ser. No. 658,421

Int. Cl.² H03K *3/02*

U.S. Cl. 331—48 **9 Claims**

7. A digital oscillator comprising a plurality of retriggerable monostable multivibrators having discretely different output pulse widths, the output of the shortest pulse width one of said multivibrators comprising the output from said digital oscillator, feedback means applying the output of each multivibrator, exclusive of the output one of said multivibrators, as a triggering input to each of said multivibrators including the output one thereof, and means for initially triggering each of such multivibrators to develop an output from said output multivibrator the period of which is defined as the pulse duration time of the longest pulse width one of said multivibrators.



4,001,717
PULSE-FIRING POWER OSCILLATOR

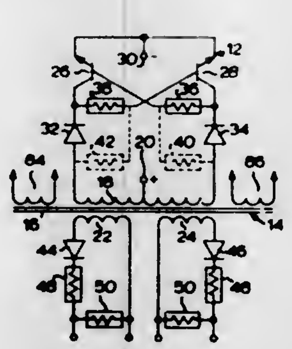
Alfred Max Hase, 6 Manorwood Road, Scarborough, Ontario, Canada

Filed May 30, 1975, Ser. No. 582,199

Claims priority, application Canada, Feb. 7, 1975, 219624

Int. Cl.² H03K *3/30*

U.S. Cl. 331—55 **10 Claims**



1. A pulse firing power oscillator for producing a series of sequential firing pulses for SCR's being used in inverters and the like, where said oscillator comprises:

a non-saturating iron core having hysteresis characteristic;

a primary winding on said core;

as many secondary windings on said core as there are firing pulses required during each 360 electrical degree operation of said pulse-firing oscillator; and a half-wave rectifier in series with each secondary winding;

said primary winding having a centre-tap;

a symmetrical circuit including at least a pair of switchable transistors, each connected other than at its base to one end of said primary winding so that said pair are in a back-to-back fashion, with the base of each of said pair of transistors being connected so that the base bias voltage for the one of said pair of transistors which is connected to one end of said primary winding is derived through a non-reactive connection from the other end of said primary winding; and

a source of direct current voltage connected between the centre-tap of said primary winding and a common connection between said pair of switchable transistors, which common connection is further away from said centre-tap than the bases of said transistors.

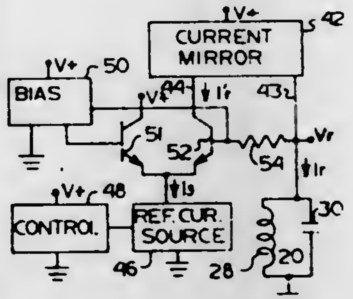
4,001,718
LINEAR OSCILLATOR FOR PROXIMITY SENSOR

Michael A. Wilson; Gordon E. Gee, both of Sarasota, and Fred J. Momparler, Bradenton, all of Fla., assignors to Electro Corporation, Sarasota, Fla.

Filed May 12, 1975, Ser. No. 576,897

Int. Cl.² G01R *33/12;* **G08C** *21/00*

U.S. Cl. 331—65 **.16 Claims**



1. In an oscillator having a series resonant circuit wherein the effective impedance and Q, and thus power loss at resonance, is a function of the distance of a part of the resonant circuit from a conductive body, the improvement comprising:

a source of current and voltage components of electrical power, the voltage component being substantially independent of changes of load impedance and Q; and

means for switching said power source across the resonant circuit, the power loss of said resonant circuit being directly proportional to the effective series resistance of the resonant circuit whereby current oscillations occur in said resonant circuit having an amplitude which varies inversely with the effective series resistance of the resonant circuit.

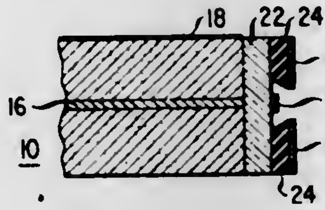
4,001,719
FABRICATION OF A SELF-ALIGNED MIRROR ON A SOLID-STATE LASER FOR CONTROLLING FILAMENTATION

Dan Charles Krupka, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 13, 1975, Ser. No. 604,089

Int. Cl.² H01S *3/02;* **G03C** *5/00*

U.S. Cl. 331—94.5 H **7 Claims**



1. In a process for making a solid-state junction laser, a method for fabricating a small-area high-reflectivity region on one of the output faces of said laser to cause the laser to operate in only its fundamental mode, said method comprising the steps of

depositing a positive photoresist layer on said one face,

positioning one end of a single-mode optical fiber adjacent said one face to maximize optical power coupling between said laser and said fiber, said fiber comprising a core whose cross-sectional area is relatively small and a cladding disposed about said core,

directing sensitizing radiation into other end of said fiber to propagate along the core of said fiber to expose the portion of said photoresist layer that is in line with the core of said fiber, the cross-sectional area of said exposed portion corresponding approximately to that of said core,

removing the exposed portion of said photoresist layer thereby to provide an opening through said layer for access to a small-area portion of the one face of said laser,

applying a high-reflectivity material to said remaining photoresist layer and through said opening onto said small-area portion of the one face of said laser, and

removing the remaining photoresist layer along with the high-reflectivity material applied thereto thereby to leave high-reflectivity material only on said small-area portion

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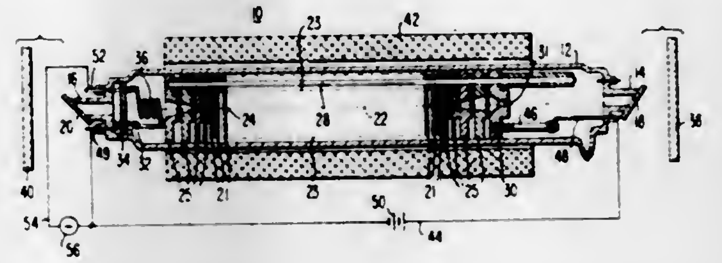
4,001,720
GAS LASER

Reno Raymond Carbonetta, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1975, Ser. No. 582,370

Int. Cl.² H01S *3/03*

U.S. Cl. 331—94.5 G **3 Claims**



1. A laser device comprising a closed envelope, a gaseous filling within said envelope, a longitudinally extending array of carbon discs within said envelope each disc having an aperture through the central portion thereof, said discs being equally spaced from each other, said apertures being round with substantially equal diameters, the centers of said apertures being aligned on a common axis to form a straight line bore through said array of discs, a cathode electrode and an anode electrode adjacent to opposite ends of said array of discs to form a gaseous discharge through said bore, a first reflector aligned with said common axis at one end of said envelope and a second reflector aligned with said common axis at the other end of said envelope, said reflectors forming with said bore an optical resonant cavity, the ratio of the pitch distance between adjacent discs and the diameter of said aperture being between 1.8 and 3.0.

4,001,721
FIELD EFFECT TRANSISTOR MILLER INTEGRATOR OSCILLATOR WITH TEMPERATURE COMPENSATING IMPEDANCE

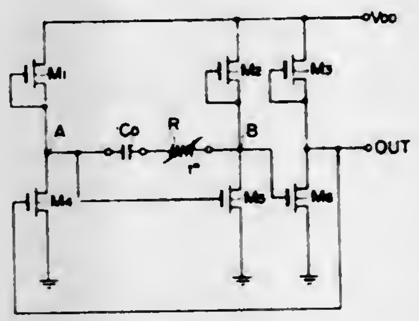
Minoru Fukuda, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 30, 1975, Ser. No. 627,281

Claims priority, application Japan, Oct. 30, 1974, 49-124399

Int. Cl.² H03K *3/353*

U.S. Cl. 331—111 **3 Claims**



1. In an oscillation circuit wherein a plurality of inverters each composed of an FET for a load and an FET for drive are connected in cascade, a capacitor is connected between an input and an output of at least one of said inverters to thereby construct a Miller integrator, and an output of the final-stage inverter is applied to an input of the first-stage inverter, an oscillation circuit characterized in that impedance means having a positive temperature coefficient is connected in series with said capacitor.

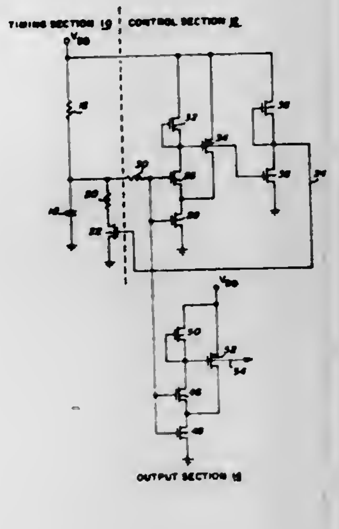
4,001,722
INTEGRATED CIRCUIT RELAXATION OSCILLATOR

Suman H. Patel, Sunnyvale, Calif., and Thomas Jones, Glasgow, Scotland, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1975, Ser. No. 578,517

Int. Cl.^{2} H03K *3/353*

U.S. Cl. 331—111 **6 Claims**



1. An oscillator comprising:
- a. a capacitor,
- b. a resistor connected in series with said capacitor and forming a conductive path for charging said capacitor,
- c. means for discharging said capacitor, and
- d. circuit means connected to said capacitor and having a relatively high trip point in a first state thereof wherein its output is at a relatively low level for disabling said discharging means while in said first state and a relatively low trip point in a second state thereof wherein its output is at a relatively high level for enabling said discharging means while in said second state, and further wherein said circuit means includes a first transistor having its input connected to said capacitor, and means responsive to the level of charge on said capacitor for biasing said first transistor with a first voltage which changes with and in the same direction as the charge on said capacitor, such that the trip point of the stage containing said first transistor is relatively high, and is further responsive to the conduction of said first transistor for biasing said first transistor with a second voltage which is substantially lower than the maximum amplitude of said first voltage.

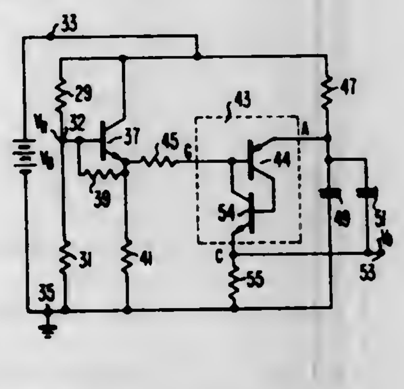
4,001,723
OSCILLATOR CIRCUITS

Abel Ching Nam Sheng, Morris Plains, and Max Edward Malchow, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,846

Int. Cl.^{2} H03K *4/50*

U.S. Cl. 331—111 **13 Claims**



1. A relaxation oscillator comprising:

first and second terminals across which an operating voltage may be applied;

resistive means;

a solid-state switch having a control electrode receptive of a control voltage for operating said switch, and first and second electrodes defining a main current carrying path enabled by turn-on of said switch, said second electrode being connected to said second terminal through said resistive means;

a source exhibiting a given source impedance for providing a reference voltage;

impedance transformation means coupled between said source and said control electrode for applying said reference voltage to said control electrode at a substantially lower impedance level, relative to said control electrode, than exhibited by said source;

a charging circuit connected between said two terminals, said circuit including a charge storage element for developing a voltage thereacross which increases as a function of time;

a discharging circuit for said storage element comprising means for applying the voltage developed thereacross between said first electrode and said second terminal, said voltage causing said switch to turn on when it reaches a first value, and said switch turning off when said voltage reduces to a second value; and

a regenerative feedback circuit comprising a capacitor coupled between said first and second electrodes for supplying current to said resistive means in a sense to turn off said solid-state switch, upon discharge of said charge storage element.

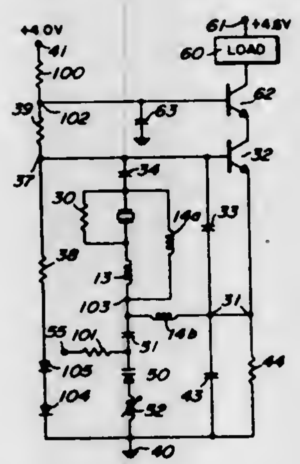
4,001,724
VARIABLE HIGH FREQUENCY CRYSTAL OSCILLATOR

Anthony F. Keller, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 25, 1975, Ser. No. 590,245

Int. Cl.^{2} H03B *5/36*; H03C *3/22*

U.S. Cl. 331—116 R **10 Claims**



7. An improved variable, high frequency crystal oscillator comprising:
- a. an oscillator having an electronic tank circuit including a crystal and a pair of capacitors which are connected in series as a capacitive voltage divider and are series coupled to said crystal, said crystal having a physical capacitance, C_o;
- b. first and second inductance means;
- c. means for coupling the first and second inductance means into the tank circuit for neutralizing the physical capacitance, C_o, of the crystal and for providing an impedance transformation between the crystal and the tank circuit operating as a load on the crystal; and
- d. impedance varying means coupled into the tank circuit for varying the frequency of oscillation thereof.

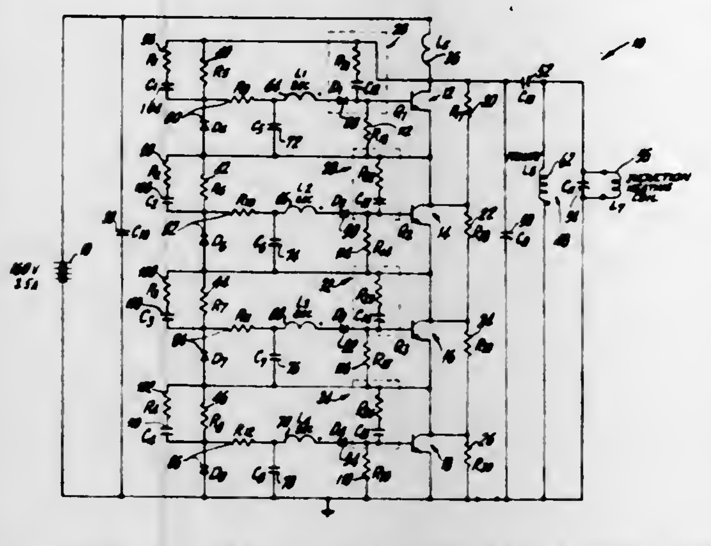
4,001,725
HIGH POWER R.F. INDUCTION HEATING GENERATOR

Melvin Rossnick, Bronx, N.Y., assignor to Lepel High Frequency Laboratories, Inc., Maspeth, N.Y.

Filed Dec. 12, 1975, Ser. No. 640,283

Int. Cl.^{2} H03B *5/12*; H05B *5/08*

U.S. Cl. 331—117 R **11 Claims**



1. A high power R.F. induction heating generator for inductively heating a load, comprising:

a plurality of transistors of the same type series connected in a self-excited class "C" oscillator configuration;

a tank circuit including a tank coil electrically coupled between the output of said transistors and the load, and having an impedance which matches the output impedance of said transistors for providing an oscillating R.F. voltage signal to the load; and

feedback transformer means including a primary winding and a plurality of secondary windings corresponding in number to said plurality of transistors, said primary winding being coupled to said tank circuit and said secondary windings being uniformly wound over said primary winding and coupled to the bases of said transistors to provide input voltages of equal phase and amplitude to each of said transistors for synchronizing the conduction and non-conduction periods of said transistors for delivering equal shares of the total power to the load.

4,001,726
HIGH ACCURACY SWEEP OSCILLATOR SYSTEM

Wayne H. Sandford, Jr., Warrington, and Albert M. Bates, Southampton, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1976, Ser. No. 651,876

Int. Cl.^{2} H03B *23/00*

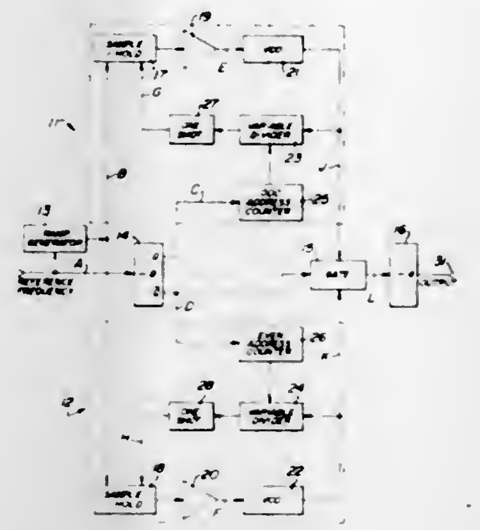
U.S. Cl. 331—178 **13 Claims**

1. A sweep oscillator system for producing a series of signals of incrementally higher frequencies and equal duration from a reference frequency signal comprising: selector means receiving the reference frequency signal for producing

a timing signal indicative of a preselected duration; first and second phase-locked loops connected to receive the reference

frequency signal and said timing signal for alternatively producing

respective output signals of the incrementally higher frequencies; and gating means receiving said output signals and said timing signal, for



combining said output signals and producing at the output thereof the series of signals.

4,001,727
POWER CONTROL CIRCUIT FOR A POWER OSCILLATOR

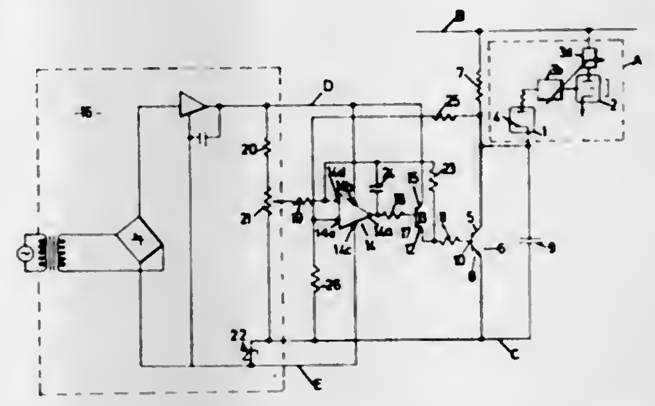
Barrington George Kennett, and Adrian Ernest Miller, both of Paignton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 7, 1975, Ser. No. 630,117

Claims priority, application United Kingdom, Dec. 3, 1974, 52247/74

Int. Cl.^{2} H03B *3/14*

U.S. Cl. 331—182 **4 Claims**



4. A power control arrangement for a power oscillator which arrangement includes a voltage catching diode connected to the grid of a power-oscillator tube, the catching voltage thereof being set by a shunt regulator comprising a differential amplifier with negative feedback applied from the cathode of said catching diode to one input and an adjustable reference potential applied to the other input, said negative feedback serving to maintain said catching voltage at the value set by said adjustable reference potential.

4,001,728
DIGITAL METHOD OF PULSE WIDTH MODULATION

Wolfger Schneider, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,258

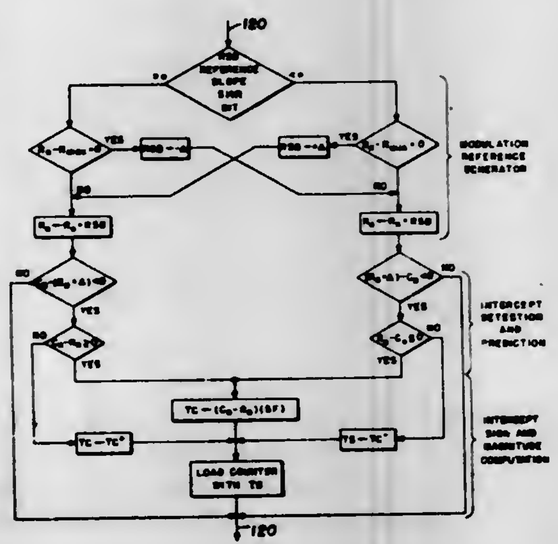
Int. Cl.^{2} H03K *7/08*

U.S. Cl. 332—1 **4 Claims**

1. A method for producing a binary pulse width modulated output signal from an amplitude modulated digital data signal having a fixed frequency in accordance with detected times of

interception between said digital data signal and a reference signal, said method comprising the steps of: generating with means said reference signal in the form of uniform amplitude incrementations each of constant time interval to approximate as linear analog ramp signal, and having selected maximum and minimum amplitudes,

comparing with means the value of said digital data signal at a selected interval to the values of said incremental reference signal at a first interval and a second subsequent interval for detecting if said data signal and said reference signal will intercept when said reference signal is incremented between the values corresponding to said first and said second subsequent intervals of said reference signal,


180
YES
MODULATION REFERENCE GENERATOR
INTERCEPT DETECTION AND PREDICTION
INTERCEPT SIGN AND MAGNITUDE COMPUTATION
LOAD COUNTER WITH TS
120

generating with means a correction signal whose value is proportional to the time interval between the beginning of said first interval of said reference signal and the time at which said digital data signal would intercept said approximated linear analog ramp signal if an intercept between said digital data signal and said reference waveform upon incrementation to the value corresponding to said second interval is detected, and

controlling with means the transition time of said binary pulse width modulated output signal from one binary state to its other binary state at each intercept depending upon the value of said proportional correction signal.

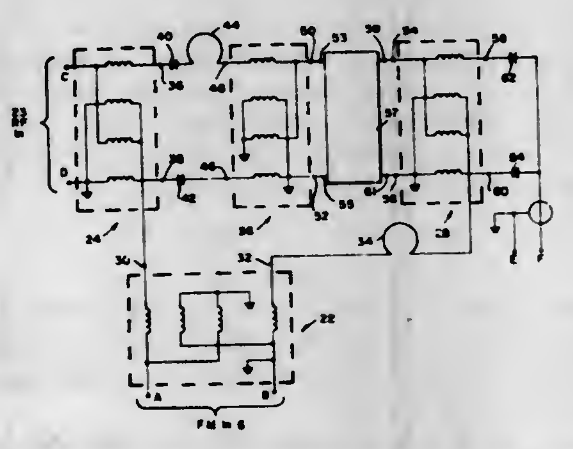
4,001,729
FM TO AM CONVERTER

Howard L. Weinberger, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1975, Ser. No. 563,888

Int. Cl.² H03C *1/50*

U.S. Cl. 332—1 **7 Claims**



1. An FM to AM converter comprising, in combination:

first, second, third, and fourth transformers, each of said transformers having primary and center tapped secondary windings;

first non-linear circuit means for coupling the secondary winding of said first transformer to the secondary winding of said second transformer, said second transformer having said center tap of said secondary winding coupled to a common terminal;

first means for coupling said primary winding of said second transformer to the primary winding of said third transformer, said second and third transformers both having one side of said primary winding coupled to said common terminal;

second means for coupling one side of said secondary winding of said fourth transformer to said center tap of said secondary winding of said first transformer;

third means for coupling the other side of said secondary winding of said fourth transformer to said center tap of said secondary winding of said third transformer, said fourth transformer having said center tap of said secondary winding coupled to said common terminal;

fourth means for applying a frequency modulated signal to said primary winding of said fourth transformer, said fourth transformer having one side of said primary winding transformer coupled to said common terminal;

fifth means for applying a radio frequency signal to said primary winding of said first transformer, said fourth transformer having one side of said primary winding coupled to said common terminal; and

second non-linear circuit means for extracting an amplitude modulated signal from said secondary of said third transformer.

4,001,730
VARIABLE DIRECTIONAL COUPLER HAVING MOVABLE COUPLING LINES

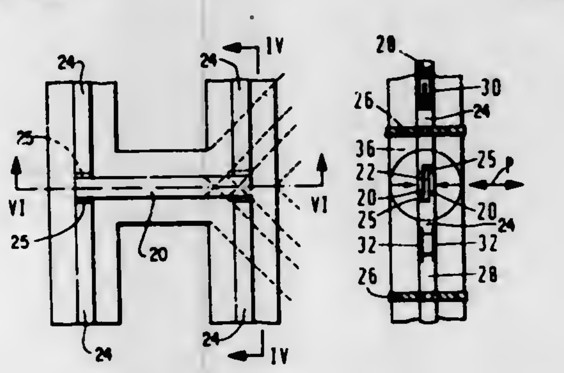
Georg Spinner, Erzgiessereistr. 33, 8 Munich 2, Germany

Filed July 16, 1975, Ser. No. 596,290

Claims priority, application Germany, July 16, 1974, 2434144

Int. Cl.² H01P *5/04, 5/18*

U.S. Cl. 333—10 **9 Claims**



1. A directional coupler for adjusting the coupling attenuation by varying the air gap between the coupling lines to be coupled, said coupler comprising:

a first coupling line; first coaxial connection lines connected at opposite ends of said first coupling line; said first coaxial connection lines each extending away from said first coupling line in respective directions such that said first coaxial connection lines are generally in a plane;

a second coupling line; second coaxial connection lines connected at opposite ends of said second coupling line; said second coaxial connection lines each extending away from said coupling line in respective directions such that said second connection lines are generally in said plane;

said first and second coupling lines being positioned near each other, extending generally in the same direction over their entire lengths and being positioned such that they are separated from each other by a gap that is generally located in said plane; said first and second coupling lines being located at opposite sides of said gap and at opposite sides of said plane;

mechanical adjusting means connected with at least one of said coupling lines for adjusting the width of said gap between said coupling lines by moving said coupling lines relative to each other transversely to said plane.

4,001,731
DEVICE FOR OPTIONALLY REALIZING TWO MUTUALLY COMPLEMENTARY FUNCTIONS

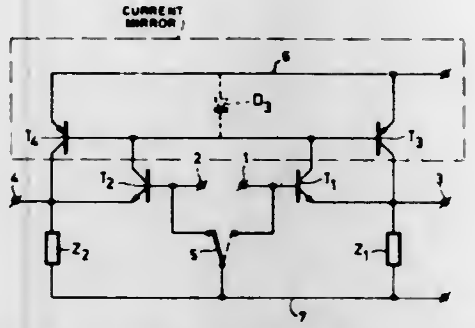
Robert Nestor Joseph Van Sluys, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,063

Claims priority, application Netherlands, Oct. 15, 1974, 7413514

Int. Cl.² H03G *7/06*

U.S. Cl. 333—14 **6 Claims**



1. A device for optionally realizing two mutually complementary transfer functions comprising a first and a second impedance, a first and a second emitter follower circuit means for optionally applying an input voltage applied to said emitter follower circuits across the first and the second impedances respectively, a selection means for optionally maintaining one of the two emitter follower circuits in the conducting state, the two impedances being included in two separate signal circuits, and a current mirror arrangement means for selectively coupling the current which is produced in the associated impedance by the conducting emitter follower circuit to the other impedance.

4,001,732
CALIBRATION OSCILLATORS FOR NOISE REDUCTION SYSTEMS

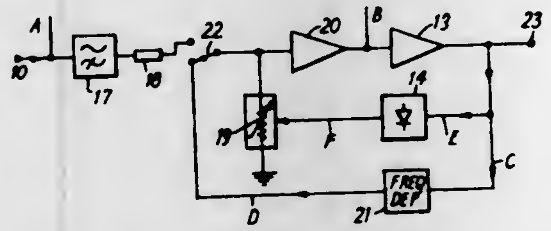
Kenneth James Gundry, London, England, assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Continuation of Ser. No. 434,507, Jan. 18, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,315

Claims priority, application United Kingdom, Jan. 23, 1973, 3497/73

Int. Cl.² H04B *1/64;* **H03B** *5/00*

U.S. Cl. 333—14 **3 Claims**



1. In a signal compressor for compressing the dynamic range of an input signal, comprising a signal channel, a variable gain means arranged to vary the gain of the signal channel at least within a restricted frequency band, so as to effect compression of the dynamic range of the input signal amplifying means and rectifying and smoothing means coupled to the signal channel downstream of the variable gain means to derive a control signal, and means applying the control signal to the variable gain means to reduce the said gain in response to increase of input signal level, the improvement comprising a selectively operable positive feedback circuit, and a first switch having a first connection mode for normal operation of the compressor and a second connection mode operable to render ineffective the input signal to the compressor and to place the circuit in an oscillator mode by coupling the positive feedback circuit from the output to the input of the amplifying means to establish a closed positive feedback loop, and an oscillator output terminal coupled to a point in the positive feedback loop, the parameters of the positive feedback circuit being such that a signal is provided at the output terminal, in the oscillator mode, with a stable amplitude such as to provide a calibration signal at a predetermined level within the operating range of the compressor, for feeding to a recording or transmission channel for the purpose of adjusting the channel gain, for proper complementary expansion of signals compressed by said compressor when said switch is in said first connection mode, the rectifying and smoothing means including a circuit causing the rectifying and smoothing means normally to respond more rapidly to abrupt changes in signal level than to non-abrupt changes, and comprising a further switch operative with the first switch to render the last said circuit inoperative in the oscillator mode, thereby to render the speed of response uniform for all signal changes.

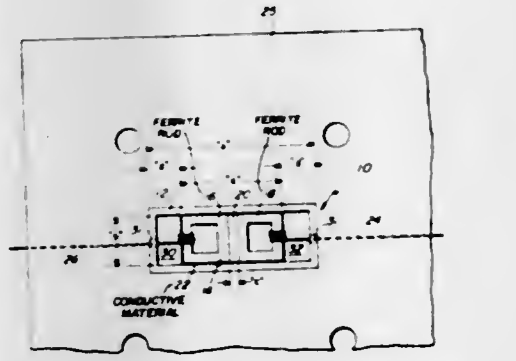
4,001,733
FERRITE PHASE SHIFTER HAVING CONDUCTIVE MATERIAL PLATED AROUND FERRITE ASSEMBLY

James D. Birch, Townsend; Max C. Mohr, Burlington, and Raymond C. Waterman, Jr., Townsend, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 18, 1975, Ser. No. 605,789

Int. Cl.² H01P *1/40*

U.S. Cl. 333—24.1 **4 Claims**



1. A radio frequency phase shifter comprising:

a. a rectangular waveguide structure;

b. a four sided ferrite assembly disposed in such waveguide structure, such ferrite assembly having plated on the four sides thereof a conductive material, two opposite ones of such four plated sides being in contact with the wide walls of the rectangular waveguide structure; and,

c. wherein opposite ones of the remaining plated sides are displaced from the narrow wall of such waveguide structure.

4,001,734
π-LOOP PHASE BIT APPARATUS

Richard W. Burns, Orange, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

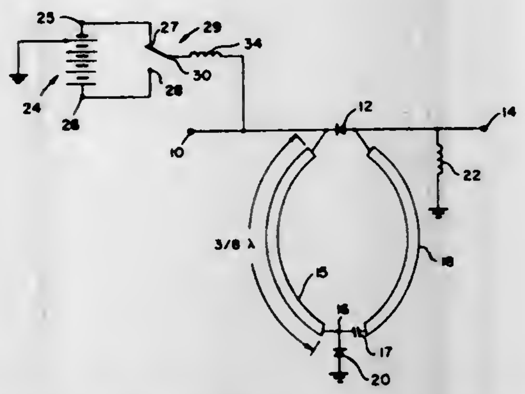
Filed Oct. 23, 1975, Ser. No. 625,271

Int. Cl.² H01P *1/18, 1/10;* **H03H** *7/34*

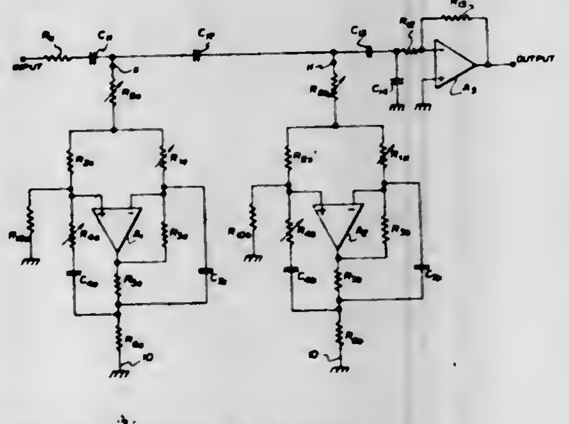
U.S. Cl. 333—31 R **7 Claims**

1. An apparatus for selectively introducing a predetermined phase shift in a signal, said apparatus comprising a signal input terminal and a signal output terminal, a first unidirectionally conducting device connected from said signal input terminal to said signal output terminal; a first segment of transmission line connected from said signal input terminal to a first junction, said first segment of transmission line being greater than one-quarter wavelength and less than one-half wavelength long at the frequency of said signal; a second segment of transmission line connected from said output terminal to said first junction, the length of said second segment of transmission line being substantially equal to that of said first segment;

a second unidirectionally conducting device connected from said first junction to a second junction maintained at a substantially fixed direct-current reference potential; and means connected to said first and second segments of transmission line for simultaneously reverse biasing said first and second unidirectionally conducting devices to provide a reference phase shift in said signal or for simultaneously forward biasing said first and second unidirectionally conducting devices thereby to selectively increase said reference phase shift by said predetermined phase shift.



4,001,735
SINGLE AMPLIFIER IMMITTANCE NETWORK
Rudolph Hon-Ching Cheng, and Jin-Twan Lim, both of Kanata, Canada, assignors to Northern Electric Company Limited, Montreal, Canada
Filed Nov. 20, 1975, Ser. No. 633,861
Int. Cl.² H03H *11/00*; H03F *1/36*
U.S. Cl. 333—80 R **8 Claims**



1. An immittance network comprising:
an input terminal and a common terminal;
an operational amplifier having an inverting input, a non-inverting input and an output;
first and second admittances (Y_1, Y_2) connected in series between said inverting and non-inverting inputs respectively;
a third admittance (Y_3) connected between said inverting input and said output;
fourth and fifth admittances (Y_4, Y_5) connected in series between said non-inverting input and said output respectively;
a sixth admittance (Y_6) connected between said common terminal and the junction of said fourth and fifth admittances (Y_4, Y_5);
a seventh admittance (Y_7) connected between said junction and said inverting input; and
an eighth admittance (Y_8) connected between the junction of the first and second admittances and the input terminal;
the values of said admittances having the relationship:

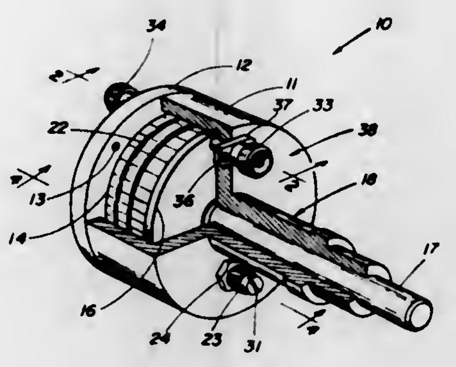
$$Z = \frac{1}{Y_8} +$$

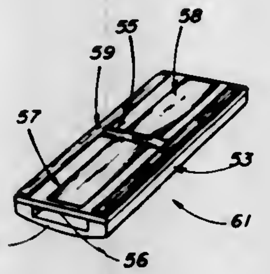
-continued

$$\frac{Y_2Y_5Y_7 + Y_2Y_3Y_4 + Y_2Y_3Y_5 + Y_2Y_3Y_7 + Y_2Y_3Y_6 + Y_3Y_4Y_6 - Y_1Y_4Y_5}{Y_3Y_4Y_6(Y_1 + Y_3)}$$

where: Z = the input impedance of the network across said terminals.

4,001,736
DIRECT CONTACT ROTARY ATTENUATOR
Bruce G. Malcolm, 4438 N. Kenmore Road, Indianapolis, Ind. 46226, and William P. Dawson, 9201 Central Ave., Indianapolis, Ind. 46240
Filed Dec. 30, 1975, Ser. No. 645,360
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 A **14 Claims**



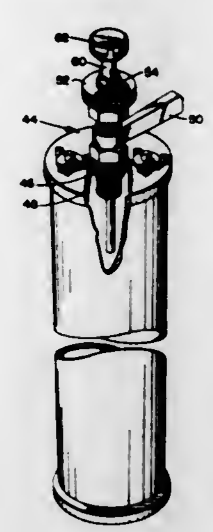


1. A rotary attenuator comprising:
a housing;
a rotor rotatably mounted in the housing and having an axis of rotation;
a plurality of attenuator elements mounted on the rotor, each said element having an attenuator pad and a first surface bearing a contact pad, electrically coupled to the attenuator pad, generally facing the axis of rotation;
a first contact member having a first surface generally facing away from the axis of rotation which touches a selected one of said contact pads, the contact member being positioned to touch other of said contact pads as the rotor is rotated relative to the housing; and
first connector means for coupling the contact member to external electronic circuitry and for mounting the contact member relative to the housing.

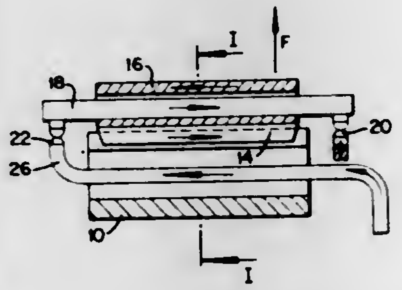
4,001,737
CAVITY TUNING ASSEMBLY HAVING COARSE AND FINE TUNING MEANS
James E. Scott, Austell, Ga., assignor to The United States of America as represented by the Field Operations Bureau of the Federal Communications Commission
Filed Oct. 24, 1975, Ser. No. 625,747
Int. Cl.² H01P *7/06*
U.S. Cl. 333—83 R **9 Claims**

1. In a tuned resonant frequency cavity having an outside cylinder, a top plate and a bottom plate connected to said cylinder, said top plate having a tapped center hole, the improvement in said tuned resonant frequency cavity comprising

means coupled to a smooth shaft for coarse tuning said cavity and a further means coupled to said smooth shaft for fine tuning said cavity said shaft extending through said tapped hole.



4,001,738
CIRCUIT INTERRUPTER HAVING AN ELECTROMAGNETIC REPULSION DEVICE
Claude Terracol, Eybens, and Pierre Schueller, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France
Filed June 30, 1975, Ser. No. 592,017
Claims priority, application France, July 12, 1974, 74.24460
Int. Cl.² H01H *75/10*, *77/10*
U.S. Cl. 335—16 **2 Claims**



1. A circuit interrupter having separable contacts and an electromagnetic repulsion device causing under predetermined fault-current conditions the separation of said contacts by imparting motion to a movable contact means of said contacts, said device comprising:
- a magnetic circuit having closely spaced apart confronting pole faces defining a linearly extending air gap of small width therebetween,
- terminal conductor means supplying current to said circuit interrupter and linked with said magnetic circuit in magneticfield generating relation therewith,
- said movable contact means supporting an elongated conducting induction plate extending lengthwise between said pole faces in said air gap when said movable contact means is in closed-circuit position,
- said movable contact means defining therein a main current path for the current flowing under normal-service conditions through said movable contact means in the closed-circuit position thereof, said main current path extending adjacent said air gap outside said magnetic circuit in non-linked relation therewith,
- said movable contact means further defining a conducting portion linearly coextensive with said induction plate and located outside said air gap and said magnetic circuit in nonlinked relation with the latter to provide a return path for currents induced in said induction plate in such a manner that an abrupt rising of said fault current and the resulting rising of the magnitude of the magnetic field generated in said air gap by said terminal conductor means induce in said induction plate a secondary current linking said magnetic field and tending to repel said induction plate from said air gap to cause said moveable contact means to move away from said magnetic circuit.

4,001,739
CIRCUIT BREAKER WITH BELL ALARM AND BREAKER LOCKOUT ACCESSORY
David B. Powell, and Vincent P. Acampora, both of Bristol, Conn., assignors to General Electric Company, New York, N.Y.
Filed Oct. 30, 1975, Ser. No. 627,148
Int. Cl.² H01H *77/06*
U.S. Cl. 335—34 **10 Claims**

1. An electric circuit breaker comprising, in combination:
A. a contact operating mechanism manually operable to ON, OFF and reset conditions;
B. a latching mechanism including latching means mounted for movement between latching and unlatching positions, said latching means, while in its latching position, latchably retain said operating mechanism in its ON and reset conditions;
C. an overcurrent trip unit;
D. a trip solenoid including a plunger movable upon energization of said solenoid under the control of said trip unit from an inactive position to an active position, said plunger in moving to its active position impacting against and shifting said latching means from its latching position to its unlatching position releasing said operating mechanism for automatic movement from its ON to its OFF conditions;
E. a lockout accessory associated with said latching mechanism,
  1. said accessory including a lockout member mounted for movement between inactive and active positions, said lockout member positioned to be shifted from its inactive position to its active position by said plunger as the latter shifts said latching means from its latching to its unlatching position, said lockout member, while in its active position, engaging said latching means to sustain the latter in its unlatching position, and
  2. a latching member operative to automatically latch said lockout member in its active position as it is shifted thereto by said solenoid.

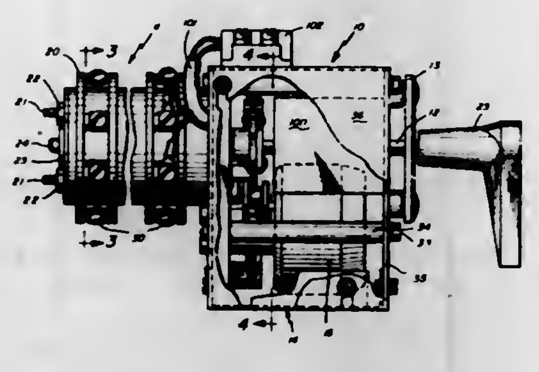
4,001,740
CONTROL SWITCH RELAY AND CONTROL CIRCUIT MEANS

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corporation, Weymouth, Mass.

Filed June 27, 1975, Ser. No. 591,170

Int. Cl.² H01H *3/28*

U.S. Cl. 335—73 **14 Claims**



1. A control switch comprising,

a switch shaft mounted for reciprocal rotational movement about its axis from a first rest position to a second clockwise position and a third counterclockwise position,

a cam profile means fixed to the shaft and having first and second cam surfaces,

means for retaining said cam profile means with said shaft in said first rest position,

and drive means comprising means for selectively engaging said first and second cam surfaces to drive said switch shaft to said second and third positions respectively.

4,001,741
LOW WORKING TEMPERATURE REED GLASSES

Otto Lindig, and Werner Sack, both of Mainz, Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jan. 28, 1976, Ser. No. 653,020

Claims priority, application Germany, Jan. 30, 1975, 2503783

Int. Cl.² C03C *3/08, 3/10;* **E05C** *7/06;* **H01H** *1/66*

U.S. Cl. 335—153 **15 Claims**

1. A glass having a thermal expansion coefficient (α) of 80.1 to 110.2 × 10^{-7}/° C. (20° –300° C), a transformation temperature (Tg) of between 428 and 488° C., a density (D) of 2.70 to 2.84 g/cc, a softening temperature (E_W) between 596° and 634° C. and a working temperature (V_A) between 792° and 863° C., said glass being produced from a melt having a composition expressed in percentages by weight as follows:

SiO_2	50.9	to	60.4,
B_2O_3	1.5	to	11.5,
Al_2O_3	2.5	to	5.3,
Li_2O	0.75	to	3.0,
Na_2O	6.0	to	15.0,
K_2O	0	to	3.8,
$Li_2O + Na_2O$	8.0	to	17.3,
$Li_2O + Na_2O + K_2O$	11.0	to	19.7,
CaO	0	to	1.5,
BaO	0	to	12.9,
ZnO	0	to	7.3,
PbO	0	to	17.5,
BaO + PbO	7.0	to	17.8,
Fe_2O_4	3.3	to	5.0,
F_2	0	to	0.7,
Sb_2O_3	0.05	to	0.1,
Sugar	0.05	to	0.1.

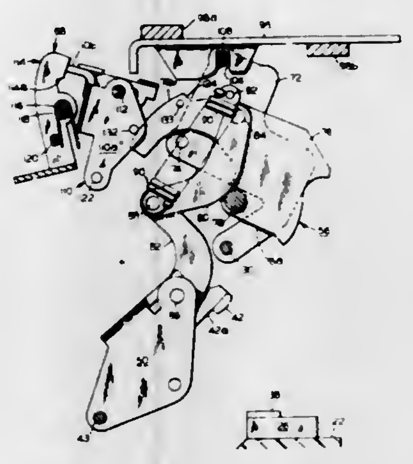
4,001,742
CIRCUIT BREAKER HAVING IMPROVED OPERATING MECHANISM

Charles L. Jencks, Avon, and Roger N. Castonguay, Bristol, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,149

Int. Cl.² H01H *9/20, 3/46*

U.S. Cl. 335--173 **10 Claims**



1. A multi-pole circuit breaker comprising, in combination:

A. a support;

B. a plurality of stationary contacts mounted by said support;

C. a plurality of movable contact arms pivotally mounted by said support,
  1. each said arm carrying a movable contact, and
  2. said arms ganged together for conjunctive pivotal movement between a common open circuit position and a common closed circuit position with said movable contacts electrically engaging corresponding stationary contacts;

D. a frame mounted by said support;

E. a cradle pivotally mounted by said frame for movement between reset and released positions;

F. a toggle linkage interconnecting said cradle and contact arms,
  1. said toggle linkage including first and second links pivotally interconnected by a knee joint, and
  2. said toggle linkage maintaining said contact arms in their open circuit position while collapsed and pivoting said contact arms to their closed circuit position when straightened;

G. a latching mechanism for latchably engaging said cradle as it is pivoted to its reset position;

H. an operating lever pivotally mounted by said frame, said lever drivingly engaging said cradle upon pivotal movement in a forward direction to pivot said cradle to its reset position;

I. a spring connected between said operating lever and said knee joint, said spring being progressively rotated as said lever is pivoted in its forward direction;

J. a reciprocating slide mounted by said frame, said slide coupled to pivot said lever in its forward direction and said cradle to its reset position during a forward slide stroke and to pivot said lever in a return direction enabling said spring to straighten said toggle linkage during a return slide stroke;

K. a rotary handle mounted by said support and drivingly connected to said slide, said handle driving said slide through its forward stroke during a forward handle crank and driving said slide through its return stroke during a return handle crank.

4,001,743
HEAVY DUTY AUTOMATIC CIRCUIT BREAKER

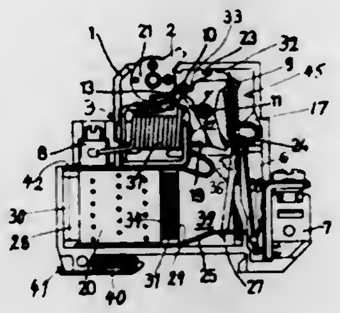
Hans Arnhold, Kaelberau, Germany, assignor to Firma Heinrich Kopp, Inhaber Theodor Simoneit, Kahl (Main), Germany

Filed May 8, 1975, Ser. No. 575,642

Claims priority, application Germany, May 14, 1974, 2423207; Feb. 6, 1975, 2504954

Int. Cl.² H01H *9/30*

U.S. Cl. 335—201 **15 Claims**



1. A heavy duty automatic circuit breaker comprising a housing of insulating material and electrical connector terminals supported in said housing, actuating means operably supported in said housing for manually operating said circuit breaker, a cocking and release mechanism arranged in said housing, contact means including a stationary contact member and a movable contact member arranged in said housing to form a circuit breaker path between said electrical connector terminals, arc quenching means arranged adjacent to said circuit breaker path in said housing, response means operatively arranged in said housing for cooperation with said actuating means, with said cocking and release mechanism and with said contact means, said movable contact member (5) comprising a single arm pivot contact, said stationary contact member (4) having a rear portion forming a first arc guide plate as part of said arc quenching means, a second arc guide plate also forming part of said arc quenching means, said second arc guide plate having an extension, pivot means on said extension of said second arc guide plate for supporting said single arm pivot contact at one end thereof, said single arm pivot contact having a free end opposite said one end, said free end being located substantially opposite said stationary contact member, and electrical connection means as part of said movable contact member, said electrical connection means being located substantially opposite said stationary contact member.

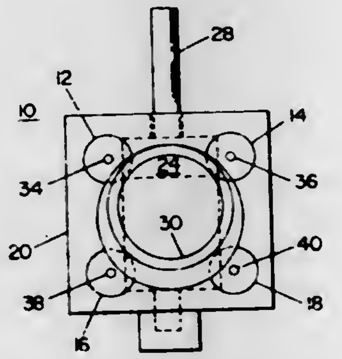
4,001,744
ELECTRICAL SWITCH

Richard A. Conrad, San Marcos, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed July 7, 1975, Ser. No. 593,739

Int. Cl.² H01H *9/02*

U.S. Cl. 335—205 **7 Claims**



1. An electrical switch comprising: in combination:

at least one pair of electrical contact elements;

a first pair of magnetic pole pieces naving a first air gap therebetween;

a second pair of magnetic pole pieces having a second air gap therebetween

controllable means for establishing a magnetic field in a selected one of the first and second air gaps, the controlliable means including:

a magnetic member;

support means for supporting the magnetic member in a first position between the first pair of pole pieces and a second position between the second pair of pole pieces;

means for supporting the first and second pair of magnetic pole pieces relative to the magnetic member such that when the magnetic member is in its first position, a magnetic field is established in one of the first and second air gaps and when the magnetic member is in its second position, a magnetic field is established in the other of the first and second air gaps; and

means for selectively moving the magnetic member between its first and second positions; an armature;

armature support means for supporting the armature such that it can move between a first position in contact with both of the first pair of pole pieces and a second position in contact with both of the second pair of pole pieces, whereby when the controllable means establishes a magnetic field in the first air gap, the armature is attracted to its first position, and when the controllable means establishes a magnetic field in the second air gap, the armature is attracted to its second position; and

circuit means responsive to the position of the armature for opening and closing an electrical circuit between the pair of electrical contact elements.

4,001,745
INTRUSION DETECTION TRANSDUCER

Roger John Goodman, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 5, 1975, Ser. No. 584,245

Int. Cl.² H01F *21/06, 27/28*

U.S. Cl. 336—20 **16 Claims**

1. A transducer, comprising:

a central core extending along an axis and having a length along said axis defined as *xl*, where *x* is at least two and *l* is a given length; and

a plurality of *n* wires, where *n* is an even integer of four or more, each of said wires being wound around different portions of said core to form *x* number of coils of a length of *l/n* and a distance *l* apart, center to center.

4,001,746
DIRECT-COOLED TAPE LAYER WINDING

Ove Tjernstrom, and Uno Zetterlund, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 27, 1975, Ser. No. 562,484

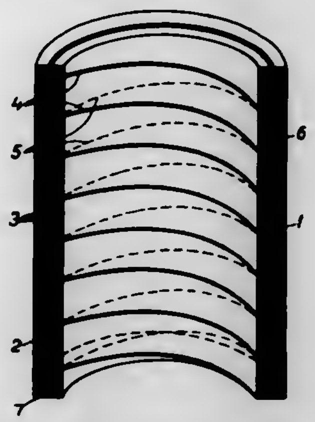
Claims priority, application Sweden, Apr. 24, 1974, 7405476

Int. Cl.² H01F *27/08*

U.S. Cl. 336—62 **1 Claim**

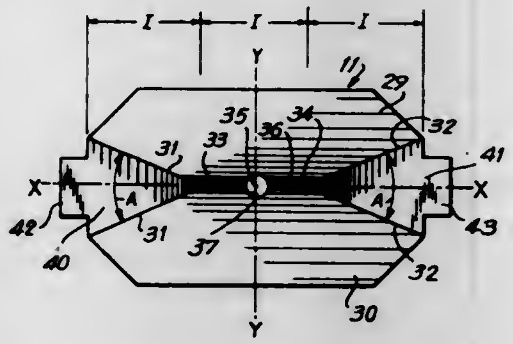
1. Direct-cooled tape layer winding for transformers, comprising a plurality of helically wound tape layers and at least one cooling layer (6) coaxial with the winding and arranged between two of the tape layers, said cooling layer having substantially the same total axial length as the winding, the cooling layer (6) being formed of a plurality of cooling tubes connected in a parallel bundle helically wound into a com-

plete layer with the inlet and outlet of the cooling layer at the ends of the winding, the width of the tape being an integral



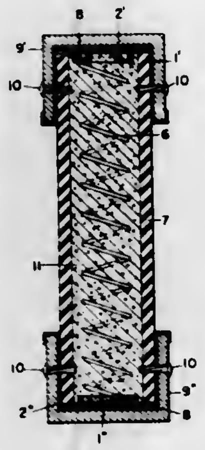
multiple of the height of a plurality of cooling tubes of the cooling conductor.

4,001,747
FLASHER SWITCH VANE STRUCTURE
Ricardo Limeres, Staten Island, and Alfred Osborn, Lindenhurst, both of N.Y., assignors to Ideal Corporation, Brooklyn, N.Y.
Filed June 23, 1975, Ser. No. 589,708
Int. Cl.² H01H *61/00, 71/18*
U.S. Cl. 337—136 **6 Claims**



1. A switch subassembly comprising a piece of resilient sheet metal deformed from a flat horizontal reference plane into a vane intrinsically biased to a predetermined natural posture, said vane having formed therein pairs of divergent creases which extend oppositely respectively from points spaced apart on the longitudinal axis of the vane to opposite lateral edges thereof and define between the creases of each pair an end panel normally sloped away from said plane at an acute angle thereto; said vane having between said pairs of creases wing panels which slope oppositely away from said plane at the opposite sides of said axis, and having between the said points an elastically transversely bowed central portion; a thermally expansible pull member extending centrally along said vane and having its ends fixed to opposite end portions of said end panels; said pull member being so tensioned that it normally holds said vane elastically buckled into an unnatural posture in which said central portion is spaced away from said pull member, said pull member being sufficiently expansible that when heated to relax its tension said vane will be snapped toward its natural posture by its intrinsic bias, thereby bringing said pull member into face-to-face contact with said central portion.

4,001,748
ELECTRIC FUSE HAVING HELICALLY WOUND FUSIBLE ELEMENT AND PROCESS FOR MANUFACTURING THE FUSE
Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.
Filed July 10, 1975, Ser. No. 594,863
Int. Cl.² H01H *85/04*
U.S. Cl. 337—159 **5 Claims**

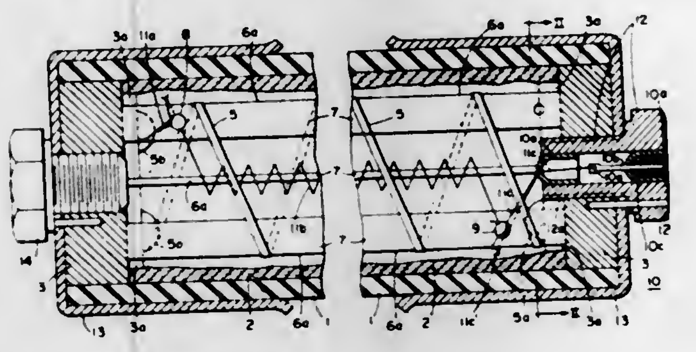


1. An electric fuse for elevated circuit voltages including
a. a tubular casing of electric insulating material;
b. a pair of ferrules each mounted on the outside of one of the ends of said casing for precluding the escape of arc products from said casing;
c. a pulverulent arc-quenching filler inside said casing;
d. a substantially helically wound fusible element inside said casing embedded in said filler and supported substantially by said filler only in absence of any fusible element-supporting mandrel means;
e. a pair of spiders of sheet metal each arranged in abutting relation to one of the pair of rims formed by the ends of said casing, each of said pair of spiders having tabs arranged between the outer surface of said casing and the inner surface of one of said pair of ferrules and conductively connected to one of said pair of ferrules, one of said pair of spiders having a plurality of relatively small bores arranged relatively remote from the center regions thereof and one of said pair of spiders having a relatively large aperture at the center region thereof;
f. a pair of washer-like metal disks conductively interconnected by said fusible element and each affixed to the axially inner surface of said center region of one of said pair of spiders, each of said pair of disks having a plurality of relatively small bores arranged relatively remote from the center region thereof in registry with said relatively small bores in said one of said pair of spiders and one of said pair of disks having a relatively large aperture at the center region thereof in registry with said relatively large aperture in one of said pair of spiders; and
g. the fit of each of said pair of disks inside said casing being so loose and the thickness of each of said pair of disks being so small as to allow the pressure of products of arcing prevailing at the ends of said casing to act against the end surfaces of said pair of ferrules.

4,001,749
ELECTRIC FUSE FOR ELEVATED CIRCUIT VOLTAGES
Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.
Filed Dec. 17, 1975, Ser. No. 641,665
Int. Cl.² H01H *85/30*
U.S. Cl. 337—244 **5 Claims**

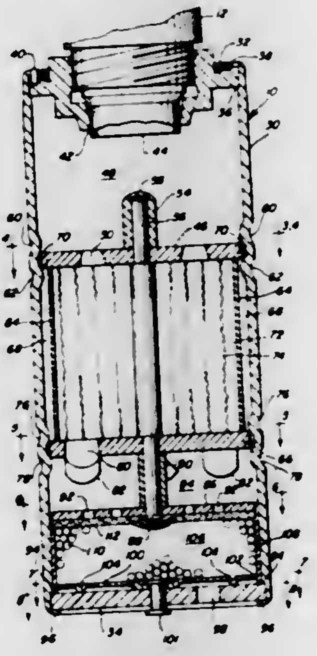
1. An electric fuse for elevated circuit voltages including
a. tubular casing of electric insulating material housing therein a granular arc-quenching filler;
b. a pair terminal elements closing the ends of said casing;
c. a spring-biased blown fuse responsive device arranged

immediately adjacent one of said pair of terminal elements;
d. first substantially helically wound low resistance fusible element means submersed in said filler conductively interconnecting said pair of terminal elements;
e. a second high resistance fusible element means submersed in said filler shunting at least a portion of said first fusible element means and arranged to control the operation of said blown fuse responsive device, said second fusible element means having a pair of spaced sections



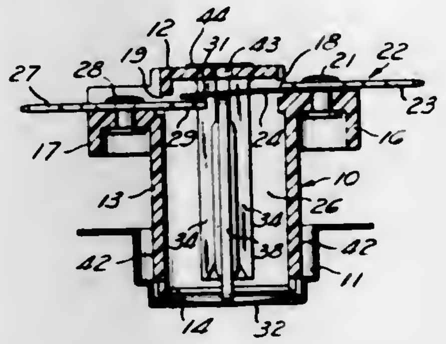
forming therebetween a voltage responsive breakdown spark gap;
f. a mandrel of electric insulating material having edges extending in a direction longitudinally of said casing and supporting said first fusible element means, said mandrel having a perforation, and each of said pair of spaced sections of said second fusible element means being threaded through said perforation in said mandrel at spaced points of said perforation so that said perforation in said mandrel forms said spark gap.

4,001,750
CORROSION RESISTANT MEANS IN EXHAUST CONTROL DEVICE FOR CIRCUIT INTERRUPTING DEVICES
Henry W. Scherer, Chicago, Mount Prospect, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.
Filed Sept. 2, 1975, Ser. No. 609,599
Int. Cl.² H01H *85/38*
U.S. Cl. 337—280 **27 Claims**



1. An exhaust control device for a circuit interrupter comprising:
a hollow housing having a corrosion resistant coating thereon;
an inlet end wall having an intake port formed therein for receiving a stream of hot exhaust gases incident to the operation of the circuit interrupter, said inlet end wall held in place within one end of said hollow housing by folding said hollow housing over said inlet end wall so that the corrosion resistant coating on said housing is not damaged;
at least one baffle for partitioning said hollow housing into a plurality of chamber for cooling and filtering the hot exhaust gases, for changing the flow of the hot exhaust gases, and for attenuating sound, said at least one baffle held in place within said hollow housing by the crimping of said hollow housing adjacent to said at least one baffle so that the corrosion resistant coating is not damaged;
an outlet end wall having a corrosion resistant coating thereon, and having one or more exit ports formed therein, for allowing the exhaust gases to escape to the atmosphere, said outlet end wall held in place within the other end of said hollow housing by folding said hollow housing over said outlet end wall so that the corrosion resistant coating on said housing is not damaged.

4,001,751
NON-RESETTABLE THERMOSTAT
Bernard S. Deubel, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio
Filed Oct. 22, 1975, Ser. No. 624,968
Int. Cl.² H01H *37/74*
U.S. Cl. 337—343 **9 Claims**

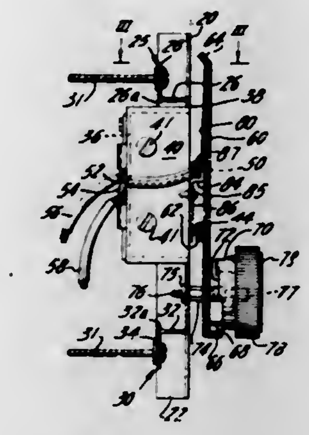


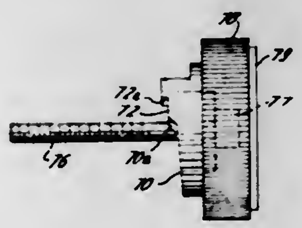
1. A bimetal snap disc thermal device comprising a one-piece molded cup shaped body providing an elongated switch cavity of substantially uniform cross section defined by an end wall and a side wall which extends to an open end, a pair of support projections extending outwardly in opposite directions from said side wall for supporting a switch, an opening in said side wall adjacent to each projection, a switch including contact and terminal means riveted to each projection and extending laterally through the associated opening into said cavity, a disc cup mounted on said body at said open end, a bimetal snap disc positioned by said disc cup at said open end, and a bumper in said body operating said switch in response to snap movement of said disc, said body providing opposed and laterally spaced guide channels in said side wall having a length at least substantially equal to the spacing therebetween, said bumper being generally rectangular and providing opposed sides positioned in said guide channels to guide and position said bumper.

4,001,752
CALIBRATING ADJUSTMENT OF THERMOSTAT
Herbert T. Hazleton, Brandon, Manitoba, Canada, assignor to Federal Pioneer Electric Limited, Toronto, Canada
Filed July 11, 1975, Ser. No. 595,220
Claims priority, application Canada, Nov. 18, 1974, 213923
Int. Cl.² H01H *37/20*
U.S. Cl. 337—368 **9 Claims**

1. A thermostat having a main support, an ambient temperature sensor, a switch controlled by the ambient temperature sensor, said switch and ambient temperature sensor being carried by the main support, and cam means for establishing the set-point of the thermostat and including a cam follower coupled to the sensor and a cam member having a lateral cam surface for determining the position of the cam follower to

adjust the set-point of the thermostat, and a support member rotatable about an axis and supported upright from the base plate and restrained from axial movement, said cam member





and said support member having cooperating male and female threaded portions affording relative rotation therebetween for causing displacement of the cam upon rotation of the support member.

4,001,753

THERMOSTAT HAVING STABLE MOUNTING SUPPORT

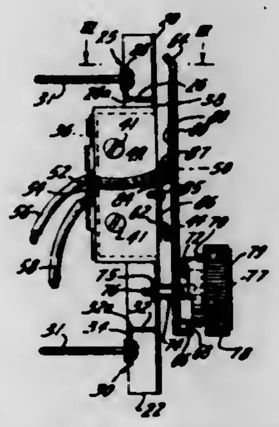
Herbert T. Hazleton, Brandon, Canada, assignor to Federal Pioneer Electric Limited, Toronto, Canada

Filed July 11, 1975, Ser. No. 595,222

Claims priority, application Canada, Dec. 17, 1974, 216159

Int. Cl.² H01H *37/04*

U.S. Cl. 337—380 **10 Claims**



1. A thermostat having a base plate including as integral portions thereof a support area, stiffening parts, a pair of mounting strips and pairs of stress-isolating junctions, an ambient temperature sensor, and a switch controlled by the ambient temperature sensor, said switch and ambient temperature sensor being carried by said support area of the base plate in calibrated relationship to each other, said stiffening parts extending upright from the support area of the base plate, said pairs of mounting strips extending parallel to and offset from the support area of the base plate, and a respective one of said pairs of stress-isolating junctions connecting the respective mounting strips proximate the ends thereof to different ones of the stiffening parts of the base plate.

4,001,754

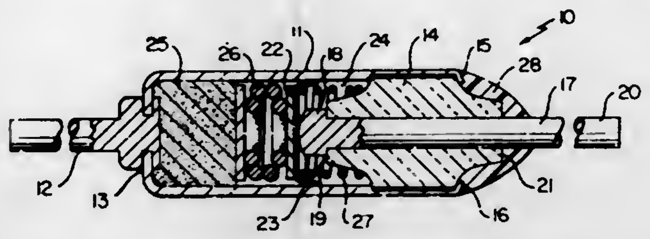
TEMPERATURE RESPONSIVE ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Emil Robert Plasko, Washington Township, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 21, 1974, Ser. No. 471,851

Int. Cl.² H01H *37/36*

U.S. Cl. 337—407 **9 Claims**



1. In a method of making a line of collapsible pellet thermal limiter constructions each having electrical switching means that changes its condition when its respective pellet melts by being heated to a certain temperature for the particular pellet and having an epoxy material sealing one end of a casing of said construction, said line of thermal limiter constructions including constructions that will have their respective pellets melt at temperatures at or below approximately 200° F and at or above approximately 370° F, the improvement comprising the step of disposing filler material in said epoxy material of each thermal limiter construction being made in said line only in the order of approximately 4% to approximately 6% by weight of said epoxy material whereby said filler material improves the effective seal life of said epoxy material of each thermal limiter construction being made in said line thereof.

4,001,755

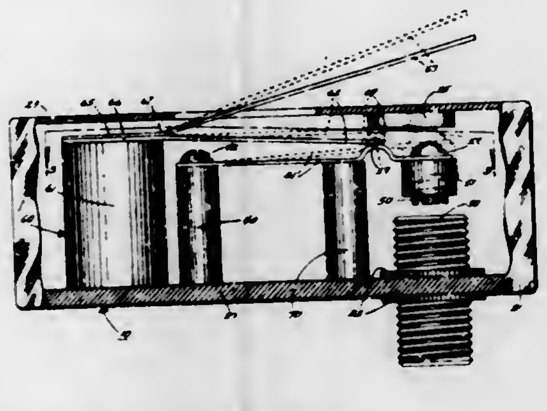
ACTUATOR APPARATUS

Oscar B. Noren, Grosse Pointe Farms, and Edmund J. Kwarsick, Detroit, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,440

Int. Cl.² H01L *43/00, 43/02*

U.S. Cl. 338—32 H **6 Claims**



1. Actuator apparatus comprising
a field-sensitive signalling element responsive to local magnetic field change and producing an electrical signal with each such change.
a body carried on a first pivot arm adapted for repetitive movement in a fixed path to and from first and second positions distal and proximal, respectively, to the field-sensitive element, said pivot arm in the absence of an activating force being biased by spring means to the first position, at least one of said field-sensitive element and body having magnetic field properties such that each cycle of the reciprocal movement of the body can be sensed by the field-sensitive element, thereby producing a single signal per cycle,
a second pivot arm carried on a resilient support and having a free end adapted to be moved under an actuating force in a fixed path in engagement with said first pivot arm to cause the body to move from the first position to the second position, and
lever means for applying actuating force to the second pivot arm to cause the body to move from the first position to the second.

4,001,756

MEASURING CELL FOR DETERMINING OXYGEN CONCENTRATIONS IN A GAS MIXTURE

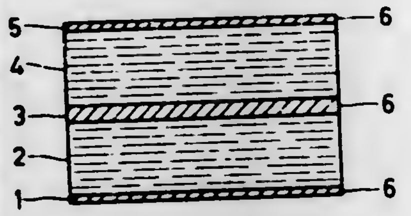
Leopold Heijne, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 23, 1975, Ser. No. 598,179

Claims priority, application Netherlands, Aug. 19, 1974, 7411044

Int. Cl.² H01L *31/00;* G01N *31/00*

U.S. Cl. 338—34 **3 Claims**



1. Measuring cell for determining oxygen concentrations in a gas mixture on the basis of a semiconductive oxide the electric resistance of which depends on the partial oxygen pressure, said cell comprising two measuring elements each comprising a semiconductive oxide, one element being doped to have n-type conductivity and the other being doped to have p-type conductivity, each of said elements having a high diffusion co-efficient for oxygen and having substantially equal activating energies, said elements being separated by a metal layer.

4,001,757

METHOD FOR DETECTING A REDUCING MATERIAL IN A GAS PHASE

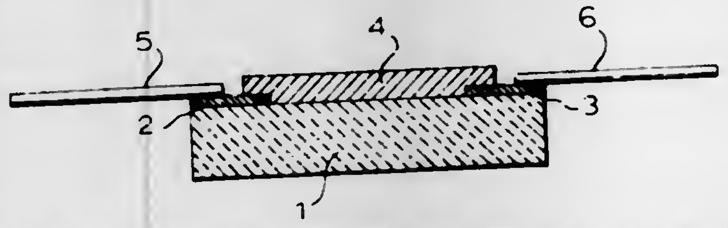
Tomi Sato, Neyagawa, and Yoshio Iida, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 12, 1974, Ser. No. 496,860

Claims priority, application Japan, Aug. 14, 1973, 48-91493

Int. Cl.² G01N *27/12*

U.S. Cl. 338—34 **6 Claims**



1. A gas sensor for detecting the presence of a reducing material in a gas phase, comprising a base of electrically insulating material, a pair of spaced electrodes on said base, and a body of solidified product comprised of partially dehydrated ferrous hydroxide on said base and bridging said electrodes and in electrical contact therewith.

4,001,758

STOICHIOMETRIC AIR/FUEL RATIO EXHAUST GAS SENSOR

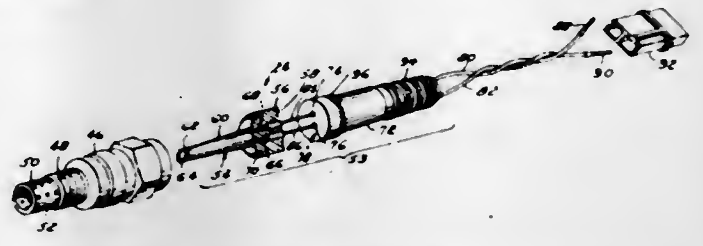
Michael J. Esper, Redford Township; Wells L. Green; Stanley R. Merchant, both of Garden City, and Charles M. Wells, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1975, Ser. No. 609,767

Int. Cl.² H01L *7/00*

U.S. Cl. 338—34 **7 Claims**

1. A partial pressure of oxygen sensor for insertion into the exhaust system of an internal combustion engine comprising in combination:
a mounting body formed of durable metallic material threaded on one end for securement to the exhaust system and having a bore extending therethrough;
a first ceramic body received within said mounting body bore and extending therethrough having a slotted tip, an oppositely positioned rear face, and a pair of passages extending away from said slotted tip to said rear face;
a wafer of partial pressure of oxygen responsive ceramic material received within said slotted tip and having a first pair of conductors attached thereto in spaced-apart relationship;



said conductors extending through said first ceramic body passages away from said slotted tip to a point proximate to said rear face;
a second ceramic body having a pair of passages extending therethrough arranged in abutting relationship with said first ceramic body rear face, said first ceramic body passages and said second ceramic body passages being in alignment;
a second pair of conductors received with said second ceramic body passages;
heat flowable material deposited in said passages proximate said rear face for connecting one end of said second pair of conductors to said first pair of conductors; and
electrical terminal means connected to the other end of said second pair of conductors.

4,001,759

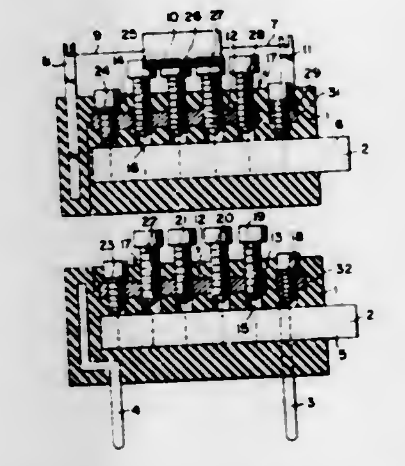
VARIABLE ELECTRIC RESISTOR DEVICE

David E. Bailey, Belleville, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 22, 1975, Ser. No. 643,244

Int. Cl.² H01C *13/00*

U.S. Cl. 338—68 **3 Claims**



1. A variable electric resistor device, comprising
a block of electrical insulating material;
a substantially elongated member of current resistive metal removably positioned in the insulating material;
a pair of electrically conductive termial leads each electrically connected to a corresponding end of the current resistive member;
a substantially elongated ancillary member of electrically conductive material embedded in the insulating material in spaced substantially parallel relation with the current resistive member;
a plurality of spaced transverse internally threaded bores formed through the ancillary member;

a plurality of spaced bores formed through the block extending from both sides of the internally threaded bores from the current resistive member to a surface of the block; and

a plurality of electrically conductive screws each threadedly coupled in a corresponding one of the threaded bores and extending in the corresponding bore thereof in a manner whereby selected screws are movable into electrical contact with the current resistive member.

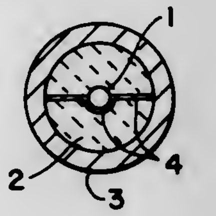
4,001,760
HEATING CABLES AND MANUFACTURE THEREOF
David Malcolm Howie, Carrying Place; Roy Victor W. McKenzie, Belleville, and James Ronald Snape, Brighton, all of Canada, assignors to Pyrotenax of Canada Limited, Trenton, Canada

Filed June 16, 1975, Ser. No. 587,161

Claims priority, application United Kingdom, June 21, 1974, 27623/74

Int. Cl.^{2} H01C *1/03*

U.S. Cl. 338—238 **6 Claims**



1. A mineral insulated heating cable, having the characteristic that for a given supply voltage the heat generated per unit length of the cable is substantially unaffected by the total length of the cable, comprising at least two metallic conductors, a metallic protective sheath, a body of compacted mineral insulating material filling said sheath and spacing the said conductors from one another and embedded in the compacted mineral insulating material and contacting each of the two said conductors throughout their lengths, at least one resistance element in the form of a thin layer consisting predominantly of resistive material which does not include an admixture of any significant amount of insulating material.

4,001,761
HELICAL RESISTOR AND METHOD FOR ASSEMBLING
Marvin E. Liebler, Tonawanda, and Eugene J. Lum, Williamsville, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1975, Ser. No. 591,246

Int. Cl.^{2} H01C *3/00*

U.S. Cl. 338—304 **6 Claims**

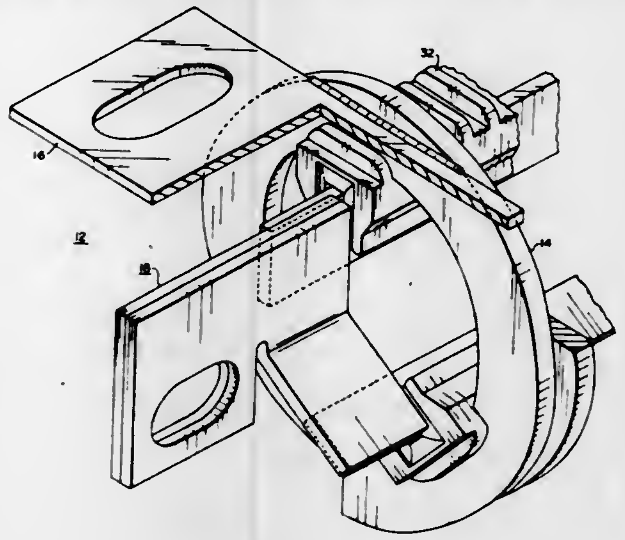
1. A resistor, comprising:

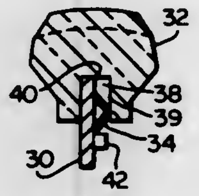
a helical resistance element; and

an internal support structure axially disposed within said helical resistance element, said support structure comprising:

a plurality of insulating assemblies, each of said assemblies comprising a support member, insulating means, and spring means cooperating with said support member and said insulating means to position said insulating means upon said support member, and

spreader means interiorly disposed within said resistance element and having a plurality of radially extending members attached to said support members and rigidly seating said insulating means against the interior of said resistance element.





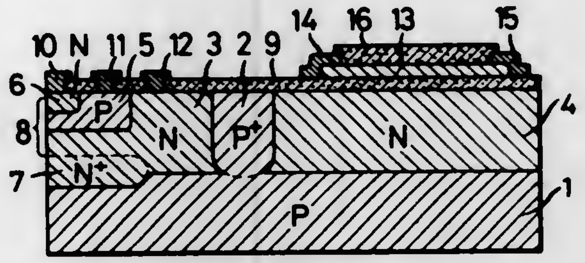
4,001,762
THIN FILM RESISTOR
Teruaki Aoki, Tokyo; Hisayoshi Yamoto; Masanori Okayama, both of Hatano; Yoshimi Hirata, Atsugi; Shuichi Sato, Chofu, and Takaaki Yamada, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 2, 1975, Ser. No. 582,618

Claims priority, application Japan, June 18, 1974, 49-69576

Int. Cl.^{2} H01C *1/012*

U.S. Cl. 338—309 **11 Claims**



1. A thin film resistor comprising:

a supporting member,

a polycrystalline silicon film containing oxygen in the range between 2 to 45 atomic percent formed on said supporting member, and

electrical contacts formed on spaced portions of said polycrystalline silicon film.

4,001,763
ELECTRONICALLY STABILIZED BEAM FORMER SYSTEM
Arent H. Kits van Heyningen, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 3, 1975, Ser. No. 546,373

Int. Cl.^{2} G01S *9/66, 7/54*

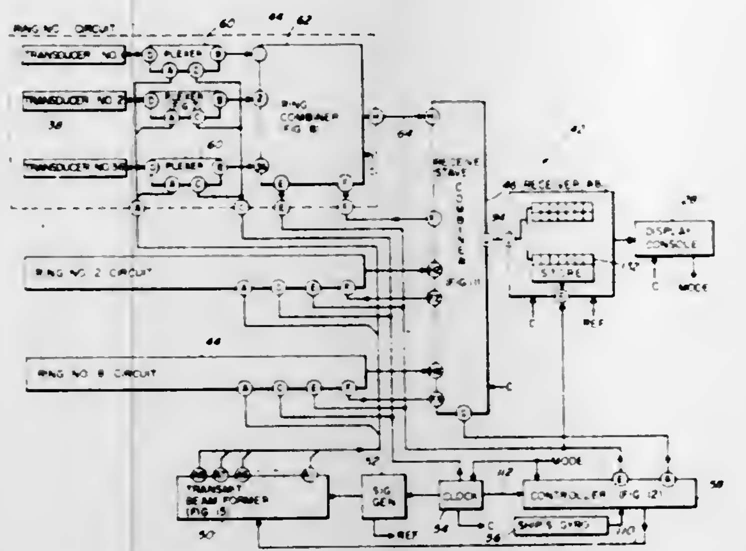
U.S. Cl. 340—3 PS **16 Claims**

5. In combination:

a plurality of radiating elements arranged in an array having symmetry about a central axis for providing beams of radiation oriented relative to said array by angles of tilt and bearing;

a plurality of storage units coupled to said plurality of radiating elements for providing a set of delays to signals coupled to said radiating elements for providing a beam of radiation having a predetermined angle of tilt, said storage units being addressable for providing other sets of signal delays corresponding to other angles of tilt; and

means coupled to said storage units for permuting a sequence of addresses to said storage units for altering the orientation of a beam of radiation at a rate higher than the bandwidth of said signals.

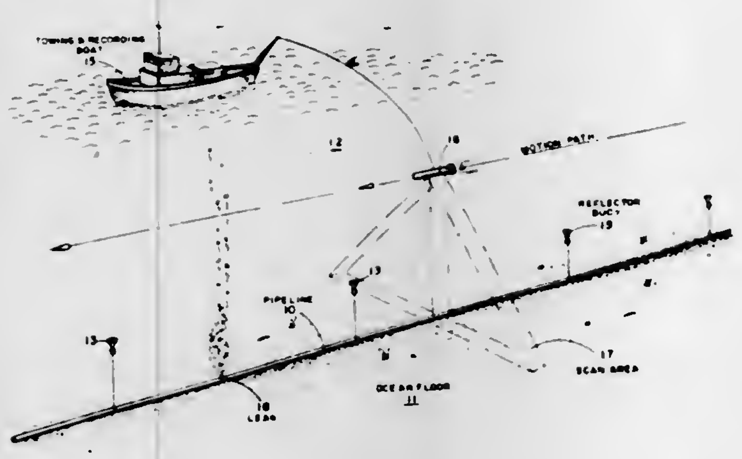


4,001,764
ACOUSTIC METHOD FOR DETECTING LEAKS FROM SUBMERGED PIPELINES
Warren E. Holland, and George R. Burrell, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 479,398, June 14, 1974, abandoned. This application June 17, 1975, Ser. No. 587,784

Int. Cl.^{2} G01S *9/66*

U.S. Cl. 340—3 R **29 Claims**



1. A method for detecting leaks of liquid being conducted through a submerged pipeline from said pipeline comprising the steps of:

directing acoustic waves along the path of said pipeline;

introducing fluid into said liquid-carrying pipeline;

recording the reflected acoustic waves; and

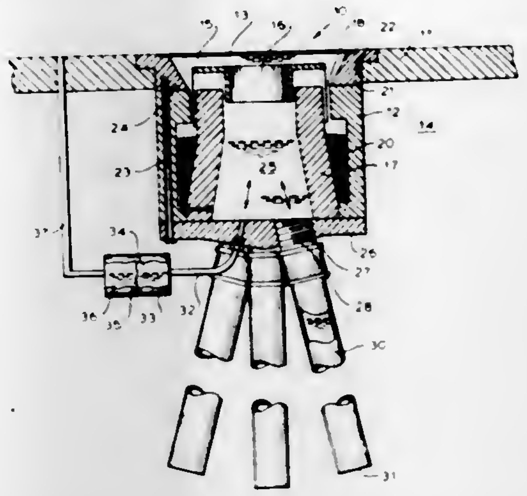
determining from said recorded waves the location of leaks of said liquid from said pipeline.

4,001,765
PRESSURE COMPENSATING SOUND TRANSDUCER APPARATUS
Claude C. Sims, Orlando, Fla., assignor to Marine Resources, Inc., Fern Park, Fla.

Filed Mar. 31, 1975, Ser. No. 563,845

Int. Cl.^{2} H04B *13/00*

U.S. Cl. 340—8 PC **10 Claims**



1. A low frequency pressure compensating sound transducer comprising in combination:

transducer casing adapted to be attached through a surface;

sealing diaphragm mounted to said casing for sealing an opening in said casing;

movable piston movably mounted in said casing;

piston driving means for moving said piston when actuated;

a liquid filled chamber formed by said casing and said piston driving means:

tubular liquid filled impedance matching means for matching the pressure on each side of said sealing diaphragm, said impedance matching means being openly coupled to said liquid filled chamber and said impedance matching means having flexible walls of predetermined area and compliance to provide pressure release to one side of said movable piston, whereby a pressure release for a low frequency underwater sound transducer operates without gas compensation; and

a tube coupled between open sea water and said liquid filled chamber whereby a low frequency pressure transducer can be of small size.

8. A pressure compensating sound transducer comprising in combination:

an underwater hull adapted to maintain substantially atmospheric pressure on the inside thereof and to withstand a higher pressure from the exterior thereof;

a transducer casing mounted through an opening in said hull;

a sealing diaphragm mounted to said transducer casing to seal the opening in said hull for isolating the interior of the transducer casing from the entry of sea water;

a movably mounted piston attached to the interior of said transducer casing;

piston driving means operatively connected to said piston for moving said piston when actuated to produce electrical signals;

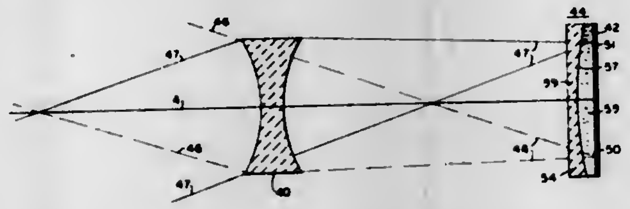
a liquid-filled chamber formed in said casing behind said piston driving means;

an impedance matching means having at least one hollow, elongated cylinder operatively coupled to said liquid-filled chamber and being filled with liquid, each said elongated cylinder extending into the interior atmospheric pressure of said hull and having stiff, flexible walls of predetermined area and compliance so as to flex upon an increase of the liquid pressure therein responsive to vibrations of said movable piston to provide a pressure release to one side of said movable piston whereby a pressure release for low frequency underwater sound transducers operates without gas compensation; and

coupling means connecting said liquid filled chamber inside said hull to the exterior of said hull, said coupling having a flexible membrane therein for isolating the liquid of said chamber from the sea water exterior of said hull for varying the pressure in said liquid filled chamber relative to the pressure surrounding said hull.

4,001,766
ACOUSTIC LENS SYSTEM

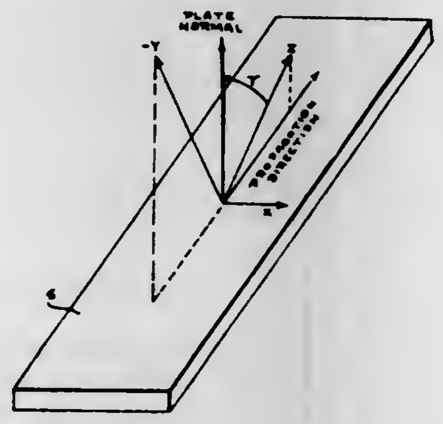
Michael J. Hurwitz, Wilkinsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 26, 1975, Ser. No. 553,403
Int. Cl.² H04B *13/00*
U.S. Cl. 340—8 L **7 Claims**



1. Acoustic lens apparatus comprising:
A. an acoustic lens normally operative to focus acoustic energy from points on an object surface onto a focal surface;
B. transducer means defining elemental transducers of an array;
C. a focal surface modifier including at least two adjacent elements having different indices of refraction disposed proximate said transducer array in the path of acoustic energy passing through said lens and operable to modify said focal surface to conform to a predetermined other surface shape;
D. said transducer array being positioned at said modified focal surface and having a shape to generally conform to said predetermined other surface shape.

4,001,767
LOW DIFFRACTION LOSS-LOW SPURIOUS RESPONSE $LiTaO_3$ SUBSTRATE FOR SURFACE ACOUSTIC WAVE DEVICES

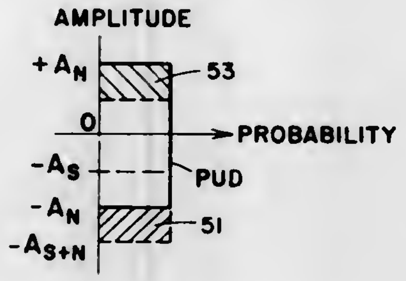
Andrew J. Slobodnik, Jr., Malden, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 18, 1975, Ser. No. 633,070
Int. Cl.² H01L *41/08*
U.S. Cl. 310—9.5 **1 Claim**



1. A surface acoustic wave device substrate member of single crystal lithium tantalate having an acoustic surface wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda = 0°, Gamma = 166.65(+0, −0.3)° and Theta = 90°.

4,001,768
DATA ACQUISITION, TRANSPORT AND STORAGE SYSTEM

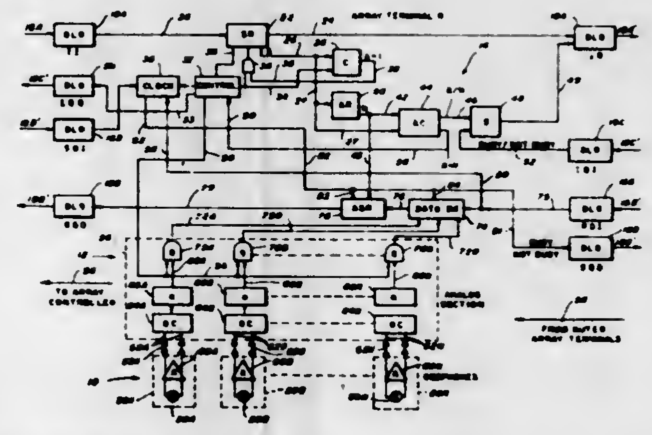
J. Robert Fort; James A. Westphal, both of Altadena, and C. Hewitt Dix, Pasadena, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.
Filed May 7, 1973, Ser. No. 358,077
Int. Cl.² G01V *1/24, 1/22*
U.S. Cl. 340—15.5 FC **18 Claims**



1. In a seismic prospecting system in which a series of sequential elastic wave signals are impressed on the earth, and detected at a plurality of spaced geophones as a plurality of received signals after being transmitted through the earth, the improvement in method of acquisition, transport and storage of said signals comprising:
a. amplifying each of the received signals to obtain a plurality of M amplified analog signals;
b. generating a plurality of M shifting functions having selected amplitudes;
c. adding each of said shifting functions to a different one of said amplified analog signals to obtain a plurality of M analog signals;
d. at first selected intervals of time converting each of said analog signals to axis-crossing-coded signals;
e. sampling at digitizing intervals said axis-crossing coded signals to form one bit digitized pulses and storing said pulses in parallel, in a parallel-to-serial converter means;
f. at second selected intervals of time, reading out in series, said stored pulses and transmitting them in series to a storage means as a train of binary bits.

4,001,769
DATA ARRAY NETWORK SYSTEM

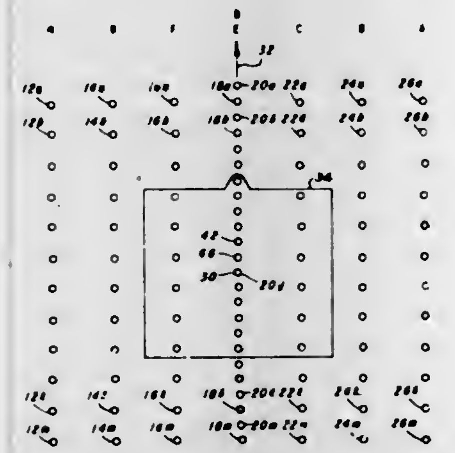
J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juilfs, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.
Continuation-in-part of Ser. No. 563,184, March 28, 1975, Pat. No. 3,938,073, which is a continuation of Ser. No. 358,097, May 7, 1973, Pat. No. 3,881,166. This application Oct. 28, 1975, Ser. No. 626,139
Int. Cl.² G01V *1/34*
U.S. Cl. 340—15.5 TS **18 Claims**



1. A data gathering system comprising:
a. a plurality of array terminals, each having a parallel to serial convertor means;
b. each array terminal having a plurality of conductor means, each connected to at least one detector so that said detectors can be positioned in selected spaced relation, to sense at least one physical parameter, and to produce an analog signal indicative of said parameter;
c. each array terminal having an input port and an output port, into each of which a multiple conductor cable is connected, said multiple conductors comprising signal and control conductors;
d means, including a plurality of selected lengths of said cable, to connect said array terminals in series connection, and to connect the last series of said terminals to array controller means, said signal conductors connecting said parallel to serial convertor means in adjacent terminals;
e. means, in said array controller means, to signal said terminals, by a coded signal on said control conductors;
f. a plurality of means in each array terminal, each one in circuit with one of said detector means to amplify, digitize to 1 bit said analog signal, and to store said digitized signals in said parallel to serial convertor means;
g. means, on command from said array controller means, to read out and transmit said 1 bit digitized signals, stored in said convertor means, to the convertor means in the next in series array terminal,
whereby said digitized signals are transmitted sequentially through each of said convertor means to said array controller means.

4,001,770
ROLL-A-LONG THREE-DIMENSIONAL COMMON DEPTH POINT EXPLORATION

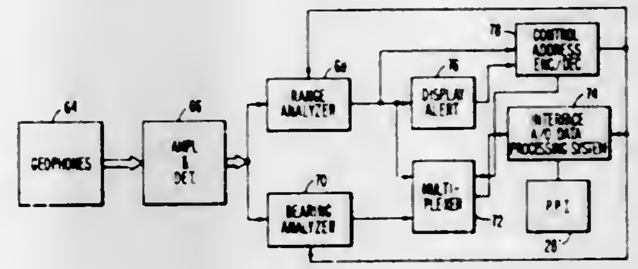
Helmut H. Hofer, Calgary, Canada, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed June 17, 1974, Ser. No. 479,929
Int. Cl.² G01V *1/20*
U.S. Cl. 340—15.5 MC **20 Claims**



1. The method of seismic exploration comprising:
a. locating a plurality of seismic detectors along a plurality of parallel lines at least one of said parallel lines being spaced apart from all others of said parallel lines and the spacing between any adjacent pair of detecors along one of said parallel lines being equal to that between any other adjacent pair of detectors along one of said parallel lines, said seismic wave detectors thereby forming a detector array.
b. locating at least two seismic wave transmitting stations at predetermined locations relative to said plurality of seismic wave detectors.
c. initiating seismic waves from said at least two seismic wave transmitting stations said seismic waves being received by said detectors,
d. defining a distance D and a number M where D is a submultiple of the spacing between any adjacent pair of detectors along one of said parallel lines and M is the ratio of said spacing to the distance D,
e. repeatedly moving said at least two seismic wave transmitting stations a distance D in a direction parallel to any of said plurality of parallel lines and at each M^{th} such move, moving said detector array by a distance equal to the spacing between adjacent pairs of detectors and in a direction parallel to any of said plurality of parallel lines.
f. after each movement thereof initiating additional seismic waves from said at least two seismic wave transmitting stations, and
g. repeating steps (e) and (f) until a desired length of seismic traverse has been covered to provide three-dimensional common depth point coverage along said seismic traverse.

4,001,771
INTRUDER DETECTING SECURITY SYSTEM

Herman Eugene Amrine, San Jose, and Richard Eugene Baker, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,153
Int. Cl.² G08B *13/00*
U.S. Cl. 340—16 R **20 Claims**



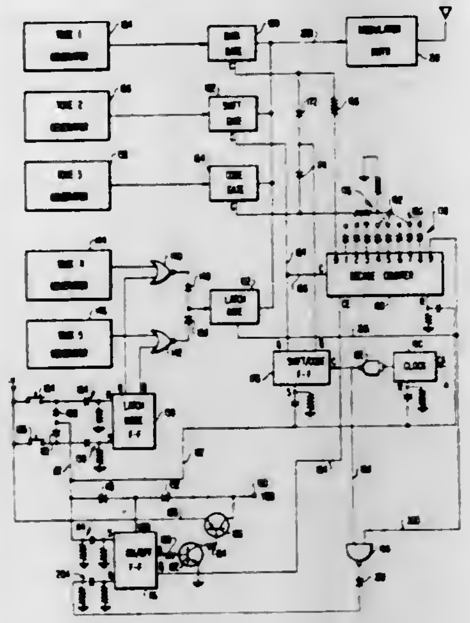
1. An intruder detecting security system for determining an intrusion across a boundary, comprising
a plurality of pairs of sensors responsive to waves propagated through geological and like substantially rigid materials with each pair having the sensors arranged operationally orthogonally of each other, and the pairs arranged substantially in line along said boundary,
analyzing circuitry connected to said sensors for determining the difference in the time for longitudinal and transverse waves set up by a single disturbance to travel from the disturbance to said sensors and
computing circuitry connected to said analyzing circuitry for resolving location of said disturbance.

4,001,772
CODED SIGNALING AND CONTROL SYSTEM

Truman W. Powell, Zephyrhills, Fla., and Jordan R. Davis, Lula, Ga., assignors to Truman W. Powell, Zephyrhills, Fla.
Filed July 30, 1975, Ser. No. 600,408
Int. Cl.² H04Q *9/12*
U.S. Cl. 340—171 PF **8 Claims**

1. A selective signaling and control system comprising a transmitting circuit including a first network for generating a start and reset signal at a first frequency, a second network for generating a shift and code word comprising a plurality of alternate second and third frequency tones representing shift and code bit signals, respectively, and a third network for generating a latch control signal at a frequency differing from said first, second and third frequencies; and a receiving circuit including first means responsive to said start and reset signal for assuming a data receive mode, second means responsive to said alternate shift and data bit signals to store said data bit signals to sequence, means comparing said stored data bit

signals with a preselected code and generating an output when the two are equal, and a network enabled by the output of the



comprising means to respond to said latch control signal for activating an output device.

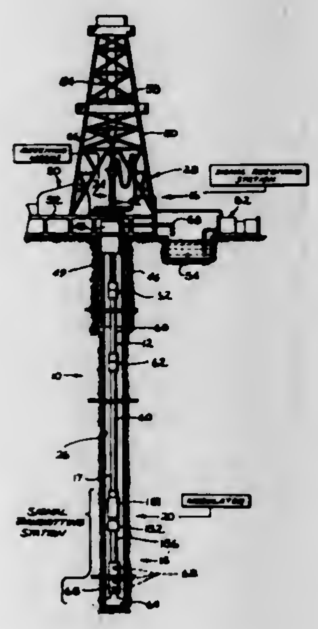
4,001,773
ACOUSTIC TELEMETRY SYSTEM FOR OIL WELLS UTILIZING SELF GENERATED NOISE

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Continuation-in-part of Ser. No. 396,403, Sept. 12, 1973, Pat. No. 3,906,434, which is a division of Ser. No. 113,147, Feb. 8, 1971, Pat. No. 3,790,930. This application July 28, 1975, Ser. No. 599,836

Int. Cl.² G01V *1/02, 1/40*

U.S. Cl. 340—18 LD **20 Claims**



1. In a wall drilling system, a method of communicating information between signal-transmitting and signal-receiving stations spaced along a drill string having an intervening length between said stations capable of sustaining acoustic waves within the substance of the string, comprising the steps of:

utilizing, for the communication of said information, acoustic waves that are already present in the drill string solely as an inherent consequence of conducting drilling operations in said system and which can propagate along said drill string, within the substance thereof, at least between said transmitting and receiving stations;

generating a modulating signal containing the information to be transmitted;

modulating said acoustic waves in said drill string at said transmitting station by said modulating signal according to a predetermined modulating mode to contain the information to be transmitted, all in such manner that resulting modulated acoustic waves then travel from said transmitting station to said receiving station through the substance of the drill string; and

receiving said modulated waves at said receiving station to recover said signal and its contained information.

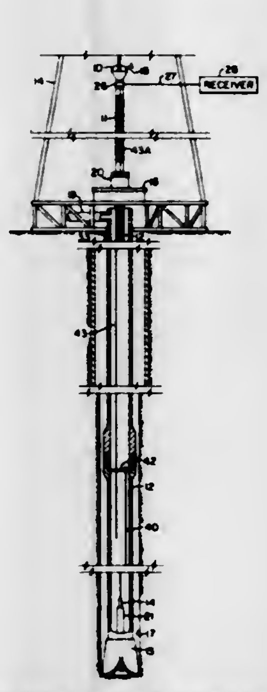
4,001,774
METHOD OF TRANSMITTING SIGNALS FROM A DRILL BIT TO THE SURFACE

Charles R. Dawson, and Richard J. Kostelnicek, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 8, 1975, Ser. No. 539,361

Int. Cl.² G01V *1/40, 1/22;* **E21B** *47/12*

U.S. Cl. 340—18 LD **20 Claims**



1. In a method of drilling a well wherein an electrical signal is transmitted between a subsurface location within said well and a location substantially at the surface, the improvement comprising:

transmitting said electrical signal by means comprising a first insulated conductor, electrically connected to transmitting means at one of said locations and extending through said well a substantial distance toward the other location;

receiving said electrical signal by means comprising a second insulated conductor extending from said other location through said well a sufficient distance so as to at least partially overlap the first said conductor; and

lowering the insulated conductor which extends through said well from said subsurface location further into said well, thereby reducing the overlap between said conductors, while continuing to transmit and receive said electrical signal.

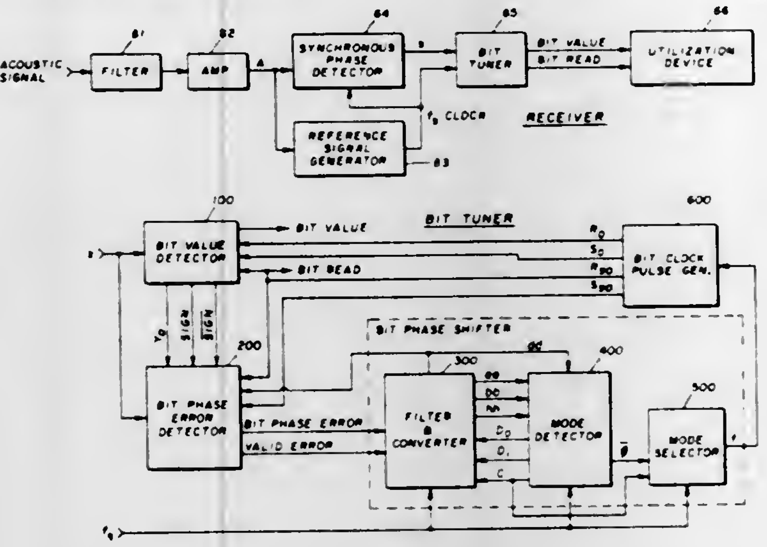
4,001,775
AUTOMATIC BIT SYNCHRONIZATION METHOD AND APPARATUS FOR A LOGGING-WHILE-DRILLING RECEIVER

James H. Sexton, Duncanville; Bobbie J. Patton, Dallas, and John W. Harrell, Duncanville, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 403,238, Oct. 3, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,318

Int. Cl.² G01V *1/40;* **H04L** *7/02*

U.S. Cl. 340—18 LD **14 Claims**



1. In the logging of a well having a downhole acoustic transmitter for transmitting upward through a drilling liquid inside a drill string an acoustic signal modulated between at least two modulation states so as to be encoded with information relating to a measured downhole condition, each modulation state being transmitted over a predetermined number of acoustic signal cycles which define a bit time interval; and an uphole receiver for demodulating the acoustic signal to produce an output signal representative of the modulation state of the acoustic signal over a bit time interval, the method of synchronizing the operations of the transmitter and receiver in transmitting and demodulating, respectively, the acoustic signal, comprising the steps of:

a. producing first and second clock pulses defining the expected boundaries and midpoint of the bit time interval, respectively,
b. sampling said acoustic signal from the expected midpoint of one bit time interval to the expected midpoint of the next succeeding bit time interval in response to said second clock pulses to produce a bit phase error signal having a first or second polarity dependent upon said second clock pulse occurring earlier or later, respectively, in time than the true midpoint of the bit time interval,
c. detecting changes in the modulation state of the acoustic signal during the sampling period from the midpoint of one bit time interval to the midpoint of the next succeeding bit time interval, and
d. phase shifting said first and second clock pulses earlier or later in time in accordance with the polarity of said bit phase error signal so as to be synchronized with the true boundaries and midpoint of the bit time interval, said phase shifting occurring only in response to the detection in step (c) of a modulation state change in the acoustic signal during the sampling period.

10. In a system for logging while drilling including a downhole acoustic transmitter for transmitting upward through a drilling liquid inside a drill string an acoustic signal modulated between at least two phase states in response to a measured downhole condition and a lack of change in phase representing a bit of a different character, each bit representation being transmitted over a predetermined number of acoustic signal cycles which define a bit time interval; and an uphole receiver for demodulating the acoustic signal to produce a synchronously rectified signal representative of the phase state of the acoustic signal, the improvement comprising:

a. means for producing a bit value pulse of a first state when the phase of said synchronously rectified signal changes at the end of a bit time interval and of a second state when the phase of said synchronously rectified signal does not change at the end of a bit time interval, the bit value pulse thereby indicating the value of the transmitted bit over a bit time interval,
b. means for producing a train of synchronizing pulses at the frequency of the acoustic signal,
c. a counter for counting said synchronizing pulses,
d. a generator for producing first and second clock pulses when the number of synchronizing pulses counted equals the number of acoustic signal cycles in a bit time interval, said first and second clock pulses defining, respectively, the expected time occurrence of the boundaries and midpoint of the bit time interval,
e. a first integrator responsive to said second clock pulse for integrating said synchronously rectified signal from the midpoint of one bit time interval to the midpoint of the next succeeding bit time interval, the output of said first integrator being a bit phase error signal of a first or second polarity if said second clock pulses are occurring earlier or later, respectively, in time than the true midpoint of the bit time interval, and
f. means for deleting pulses from or injecting additional pulses into said train of synchronizing pulses in response to the magnitude and polarity of said bit phase error signal to cause the output of said counter to reach a number equal to the number of acoustic signal cycles in a bit time interval later or earlier in time, respectively, whereby said generator produces said first and second clock pulses later or earlier in time so as to properly phase said first and second clock pulses with the true boundaries and true midpoint, respectively, of the bit time interval.

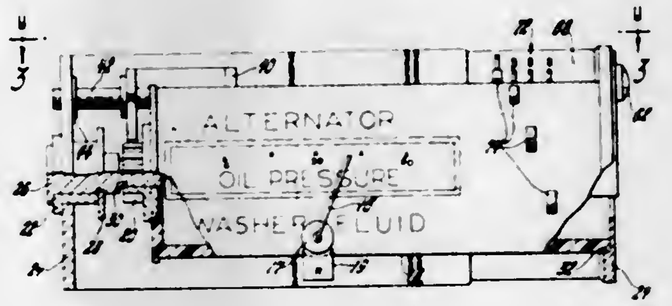
4,001,776
MULTIPLE INDICATION DISPLAY

John A. Carol, Jr., and Raymond J. Peterson, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1975, Ser. No. 601,596

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **4 Claims**



1. A multiple indication display to display singly any one of a number of measured conditions comprising

means to measure each of said conditions simultaneously and respectively;

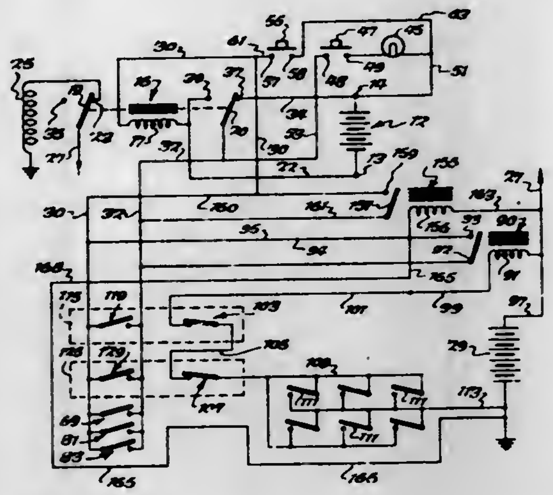
elements responsive to each of said means, respectively, when a specific condition attains a predetermined value indicative of abnormality;

a meter having a plurality of indicia operative in conjuncton with said means, respectively, to indicate the value of the individual measurement made by the same, said indicia being selectively displayed in relation to the meter, said meter having a single indicator registerable with the specific one of said indicia which is displayed to indicate the value of said condition,

means responsive to an indication of abnormality by one of said elements effective to display the corresponding indicia of said meter and to energize the indicator to effect an indication of the value of the abnormal condition.

4,001,777
TAXIMETER PROTECTION SYSTEM

Elmore Alexander, 726 Northampton St., Buffalo, N.Y. 14211
Continuation-in-part of Ser. No. 371,970, June 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 241,992, April 7, 1972, abandoned. This application June 21, 1974, Ser. No. 481,745
Int. Cl.² B60Q *1/26*
U.S. Cl. 340—68 **31 Claims**



1. A monitoring system for a vehicle for hire having a meter for registering the fare, said vehicle having an operating circuit including a storage battery, said monitoring system comprising:

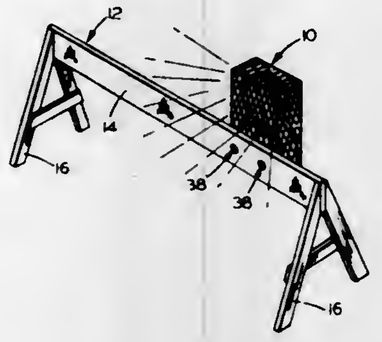
a. a source of direct current having a pair of terminals;
b. electrically controlled switching means connected to one terminal of said source, said switching means normally having a first state and operative to change to a second state when an electrical circuit is completed between said source and said switching means;
c. condition responsive switching means connected to the other terminal of said source and to said electrically controlled switching means, said condition responsive switching means being operative in response to abnormal conditions of said meter, said vehicle and said monitoring system to complete an electrical circuit between said source and said electrically controlled switching means;
d. said electrically controlled switching means including means connected to said source and said condition responsive switching means for disconnecting said condition responsive switching means from said other terminal of said source when said electrically controlled switching means is operated to minimize current drain from said source; and
e. a housing located in said vehicle and containing said source of direct current and said electrically controlled switching means of said monitoring system.

4,001,778
FLASHER LAMP/PROTECTIVE CONTAINER ASSEMBLY

Edward T. Ross, 110 Day St., Newington, Conn. 06111
Filed Oct. 9, 1973, Ser. No. 404,512
Int. Cl.² E01F *9/01*
U.S. Cl. 340—114 B **8 Claims**

1. A portable flasher assembly for mounting on barricades or the like comprising:

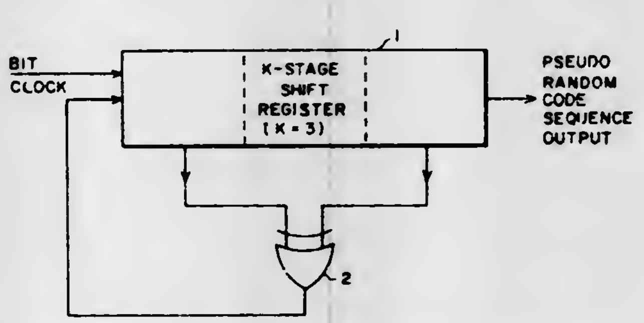
a. a flasher unit including a housing containing a power source and a lamp unit;
b. an impact resistant protective container extending about said flasher unit and having a multiplicity of interconnected sidewall portions and an endwall portion, said container providing a chamber receiving said flasher unit and open at one end to permit insertion and withdrawal of said flasher unit without disassembly of said unit, at least some of said wall portions being light transmitting to permit said lamp unit to send light rays outwardly therefrom:
c. lockable mounting means mounting said housing of said flasher unit to one sidewall portion within said container and accessible through a sidewall portion of said container so as to permit unlocking thereof and removal of said flasher unit for servicing; and



d. lockable fastening means extending outwardly from another one of said sidewall portions of said container member for fastening said flasher assembly to a barricade or like support member, said fastening means being adapted to provide locked assembly of said flasher assembly upon the associated support member.

4,001,779
DIGITAL ERROR CORRECTING DECODER

Maurice Leon Schiff, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Aug. 12, 1975, Ser. No. 603.994
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AV **18 Claims**



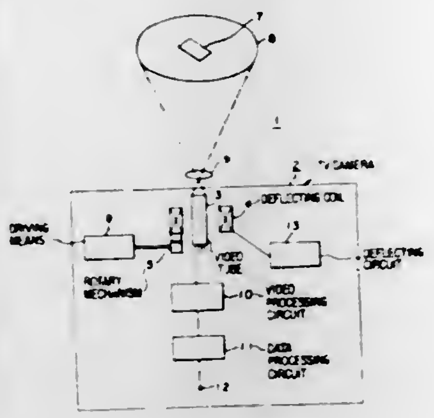
BIT CLOCK
K-STAGE SHIFT REGISTER (K=3)
1
PSEUDO RANDOM CODE SEQUENCE OUTPUT
2

1. A digital error correcting decoder comprising:

an input conductor for received digital data including a random sequence of (N + 1) code words having N pseudo random code words and one all logic "0" code word, each of said (N + 1) code words having N bits, where N is an integer greater than one;
first means to generate in a predetermined sequence each of said (N + 1) code words;
second means coupled to said input conductor and said first means to compare each bit of each of said received (N + 1) code words with each bit of all of said generated (N + 1) code words in said predetermined sequence;
third means coupled to said second means to detect the largest amplitude value resulting from said comparison of each bit of one of said receiver (N + 1) code words with each bit of all of said generated (N + 1) code words; and
fourth means coupled to said first means and said third means to select that one of said generated (N + 1) code words causing the detection of the largest amplitude value as an error corrected code word for said one of said received (N + 1) code words.

4,001,780
DATA READING APPARATUS

Tsuyoshi Kikukawa, and Tsutomu Hashimoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed July 23, 1975, Ser. No. 598,237
Claims priority, application Japan, Aug. 21, 1974, 49-95879; Jan. 8, 1975, 50-4776; Jan. 8, 1975, 50-4777; Jan. 8, 1975, 50-4778
Int. Cl.² G06K *9/04*
U.S. Cl. 340—146.3 D **3 Claims**

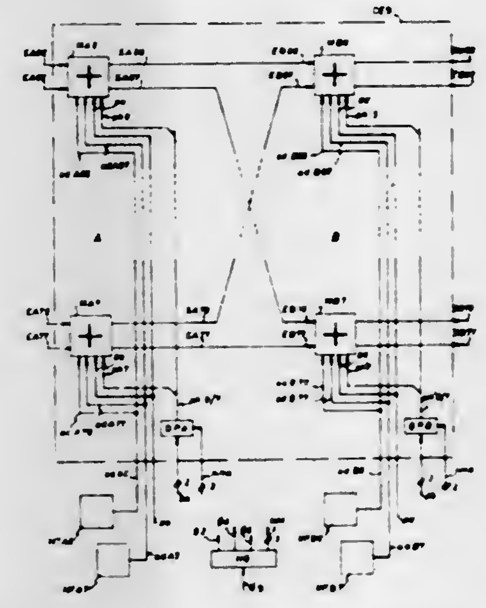


1. A data reading apparatus comprising:

a TV camera having a deflecting mechanism for reading codified data,
a deflecting signal generating circuit for generating a signal to be applied to the deflecting mechanism,
the deflecting signal generating circuit comprising:
an envelope signal generator,
a scan frequency generator,
an envelope positive and negative finding circuit,
a positive gate circuit,
a negative gate circuit,
a positive switch circuit comprising a forward current on circuit and a reverse current on circuit,
a negative switch circuit comprising a reverse current on circuit and a forward current on circuit,
a first diode,
a second diode,
a third diode,
a fourth diode,
a choke coil,
a coupling capacitor,
a resonation capacitor,
a horizontal deflecting coil,
means connecting the envelope signal generator to a first terminal of the choke coil and to the input of the envelope positive and negative finding circuit,
means connecting the scan frequency generator to a second input of the positive gate circuit and to a first input of the negative gate circuit,
means connecting a first output of the envelope positive and negative finding circuit to a second input of the negative gate circuit,
means connecting a second output of the envelope positive and negative finding circuit to a first input of the positive gate circuit,
means connecting the output of the positive gate circuit to the input of the forward current on circuit of the positive switch circuit and to the input of the reverse current on circuit of the positive switch circuit,
means connecting the output of the negative gate circuit to the input of the reverse current on circuit of the negative switch circuit and to the input of the forward current on circuit of the negative switch circuit,
means connecting the output of the forward current on circuit of the positive switch circuit to the cathode of the first diode,
means connecting the output of the reverse current on circuit of the positive switch circuit to the anode of the second diode,
means connecting the output of the reverse current on circuit of the negative switch circuit to the anode of the third diode,
means connecting the output of the forward current on circuit of the negative switch circuit to the cathode of the fourth diode,
means connecting a second terminal of the choke coil to the anode of the first diode, to the cathode of the second diode, to the cathode of the third diode, to the anode of the fourth diode and to a first terminal of the coupling capacitor,
means connecting the second terminal of the coupling capacitor to the resonation capacitor and to the horizontal deflecting coil,
means connecting the resonation capacitor and the horizontal deflecting coil in parallel.

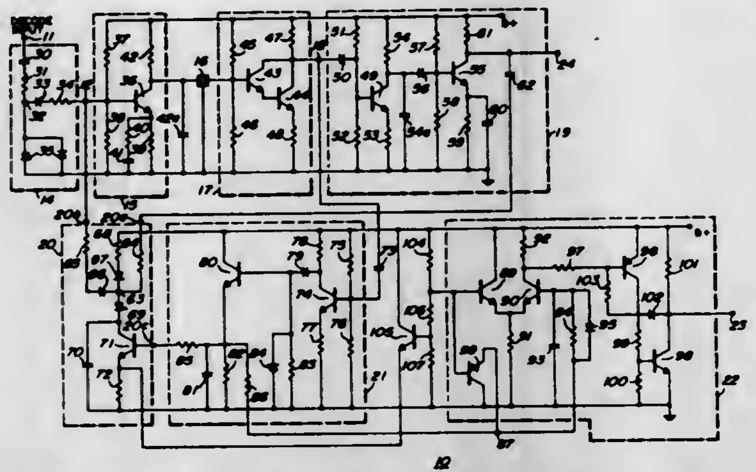
4,001,781
ELECTRONIC SWITCHING ELEMENT

Pierre Charransol; Jacques Hauri, both of Paris, and Serge Robert Fontana, Elancourt, all of France, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Feb. 18, 1975, Ser. No. 550,604
Int. Cl.² H04Q *3/60*; H04J *3/16*
U.S. Cl. 340—147 C **4 Claims**



1. A switching network for providing communication from a time division switching stage through a space division switching stage, wherein said space division stage is configured into a plurality of crosspoint matrices, each crosspoint matrix being formed by the intersection of input conductors and output conductors, and in which each of said input conductors is represented by a multiple bit address code, and in which said matrices are grouped within a plurality of modules, with each module having a plurality of commoned output conductors, a control conductor representing each output conductor within a matrix for receiving multiple-bit addresses corresponding to the addresses of input conductors accessible to said matrix, an address register for each said control conductor for storing said multiple bit addresses, a demultiplexer common to a plurality of said modules for receiving clock addressing signals, said demultiplexer forwarding said addressing signals to registers in a sequence, the registers of said groups being serially disposed relative to said demultiplexer for receiving addressing signals and switching enabling signals therefrom for switching a crosspoint responsive to the correlation of the multiple bit input address codes and the clocked addressing signals for an enabled module.

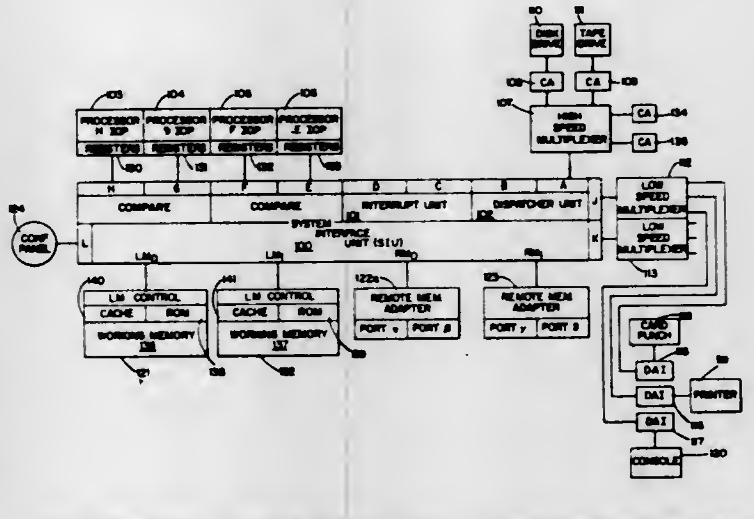
4,001,782
COMBINED ENCODER AND DECODER CIRCUIT
James Valery Motsinger, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 6, 1975, Ser. No. 629,336
Int. Cl.² H04Q *9/08;* **H03B** *3/04, 5/30;* **H04M** *11/02*
U.S. Cl. 340—171 R **11 Claims**



1. An improved combination encoder/decoder circuit arrangement for providing encoder output signals of a predetermined frequency while simultaneously detecting external input signals having the predetermined frequency and magnitudes above a predetermined value, said circuit arrangement comprising in combination:
- a closed loop oscillator having an input terminal, an output terminal, a frequency selective device coupled therebetween, and positive feedback means coupled between said output terminal and said input terminal for enabling said oscillator to generate signals of a predetermined frequency;
- negative feedback compensation means coupled to said oscillator for maintaining a substantially constant signal level at said oscillator output terminal for external signals applied to said input terminal having said predetermined frequency and magnitudes below predetermined value and for permitting an increase in the signal level at said oscillator output terminal for external signals having said predetermined frequency and magnitudes above said predetermined value; and
- decoder means coupled to said oscillator output terminal and having a decode output terminal for producing decode signals at said decode output terminal in response to the signal level at said oscillator ouput terminal exceeding said constant level by a predetermined amount;
- whereby a signal adaptable for encoding purposes is constantly provided at said oscillator output terminal while decode signals are simultaneously provided at said decode output terminal for external signals applied to said input terminal which have magnitudes above said predetermined value.

4,001,783
PRIORITY INTERRUPT MECHANISM
Earnest M. Monahan, Phoenix; Garvin W. Patterson, and Jaime Calle, both of Glendale, all of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Mar. 26, 1975, Ser. No. 562,315
Int. Cl.² G06F *9/18, 15/16*
U.S. Cl. 340—172.5 **11 Claims**

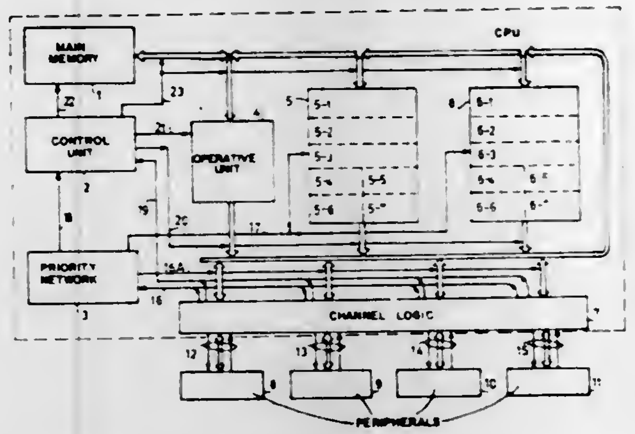
1. In a data processing system having a plurality of processors coupled to an interface unit via predetermined processor communication channels each processor being selectively controlled by selected ones of a first group of processes, said data processing system also having a plurality of peripheral devices also coupled to aid interface unit via predetermined peripheral channels for communicating with each other and with said processors, said data processing system further having monitoring means for monitoring request signals from a plurality of a second group of processes requesting control and vying with each other for control of one of said processors via one of said processor communication channels, each process and each peripheral channel being associated with a predetermined level of priority, a priority interrupt mechanism included in said interface unit for determining, before interrupting one of said selected first processes, the highest priority peripheral channel of a highest priority second process of said second group of processes requesting control of one of said processor communication channels, and for further determining whether or not said one of said first processes on said one of said processors has a higher priority than said highest priority peripheral channel of the highest priority second process requesting control of said one of said processors, said priority mechanism comprising:



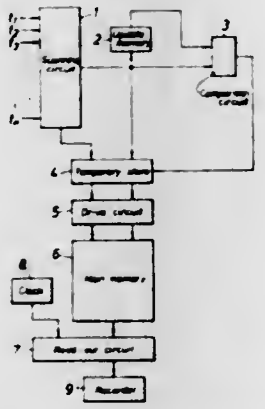
- a. first means responsive to said monitoring means for directing said request signals from said second group of processes to one of said processor communication channels requested by said second group of processes:
- b. second means, coupled to said first means, for determining the highest priority of said request signals from said second group of processes;
- c. third means for storing the priority level of said currently executing first process on said selectively controlled one of said processors;
- d. fourth means coupled to said second means for determining the highest priority level of each peripheral channel of said second group of processes requesting assignment to one of said selected processors; and,
- e. fifth means, coupled to said second, third and fourth means, for determining the higher priority level between said currently executing first process and the highest priority peripheral channel of said second process having said highest priority request.

4,001,784
DATA PROCESSING SYSTEM HAVING A PLURALITY OF INPUT/OUTPUT CHANNELS AND PHYSICAL RESOURCES DEDICATED TO DISTINCT AND INTERRUPTIBLE SERVICE LEVELS
Angelo Bardotti, Cesano Boscone (Milan), Italy, assignor to Honeywell Information Systems Italia, Milan, Italy
Filed Dec. 20, 1974, Ser. No. 534,963
Claims priority, application Italy, Dec. 27, 1973, 32162/73
Int. Cl.² G06F *3/04, 9/18*
U.S. Cl. 340—172.5 **3 Claims**

1. In a microprogrammed computer system having a plurality of input/output channels for connecting a central processor to peripheral units, apparatus which comprises:
- first means in said central processor for receiving interrupt requests from said peripheral units through said input-/output channels;
- second means said central processor coupled to said first means for assigning priority to said interrupt requests, said second means including first assignment means for assigning said interrupt request to priority classes based on the type of service requested by said interrupt request and second assignment means for assigning priority to said interrupt requests within each said priority class based on the input/output channel carrying said interrupt request; and
- a plurality of gating and storage means in said central processor, wherein groups of said plurality of gating and storage means are specifically dedicated to each of said priority classes of interrupt requests for enabling execution of the corresponding type of service, said groups of gating and storage means being responsive to said second means for enabling the execution of a service of another class having higher priority utilizing the one of said gating and storage means specifically dedicated to said higher priority class, wherein a one of said gating and storage means groups can execute a service associated with a one of said priority classes in parallel with execution of a service associated with a second of said priority classes by a second of said gating and storage means groups.

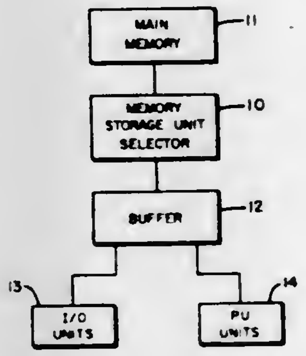


4,001,785
APPARATUS FOR MONITORING CHANGES OF MULTIPLE INPUTS
Ken Miyazaki; Kazutoshi Takahashi, both of Yokohama, and Mamoru Omino, Musashino, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Feb. 14, 1975, Ser. No. 550,076
Claims priority, application Japan, Feb. 15, 1974, 49-18944
Int. Cl.² G06F *11/00*
U.S. Cl. 340—172.5 **8 Claims**



1. An apparatus for monitoring a change in a multiplicity of inputs and comprising a scanning circuit for successively scanning a multiplicity of input points and for outputting binary information indicative of the status of each input point; an update memory for storing the scanned output corresponding to each input point; a comparison circuit for comparing the scanned output of a current cycle against the scanned output of the corresponding input points which was stored during a previous cycle in the update memory, thereby detecting any change in the status of the respective input points; a main memory including a plurality of memory elements which are detachable mounted on a printed substrate and each capable of outputting, when accessed, a binary code indicative of a letter, symbol, numeral or the like which is externally indicated on the memory element, the main memory thus carrying information indicative of the content of the individual input points which are stored in the plurality of memory elements; read-out means responsive to the detection of a change in the comparison circuit for making an access to the main memory at an address corresponding to the input point for which the change is detected; and a recorder for recording the information read out of the main memory and the status of the corresponding input point.

4,001,786
AUTOMATIC CONFIGURATION OF MAIN STORAGE ADDRESSING RANGES
Arthur F. Boehm, Roseville, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed July 21, 1975, Ser. No. 597,843
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **19 Claims**



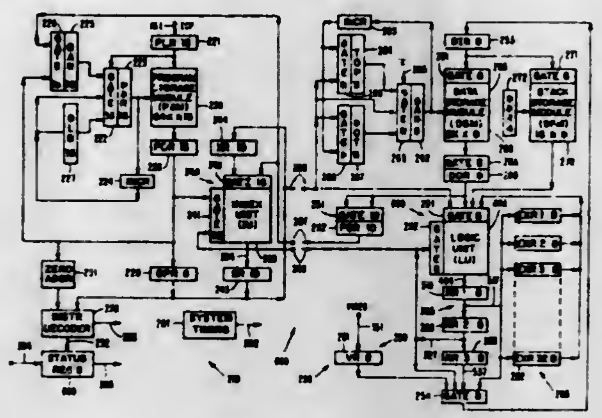
1. A system for use in data processing system for selecting one of a plurality of memory storage units which make up main memory, comprising in combination:
- a memory storage unit selector connected to each memory storage unit;
- first means for providing each memory storage unit selector with the size of the storage capacity of its associated memory storage unit;
- second means for providing each memory storage unit selector with a selected portion of the main memory address;
- each of said memory storage unit selectors accumulating its size input with the size input of the preceding memory storage unit selector and comparing the resulting accumulations with said selected portion of the main memory address to selected a memory storage unit when said selected portion of the main memory address falls within the range of the sizes accumulated in the associated memory storage unit selector.

4,001,787
DATA PROCESSOR FOR PATTERN RECOGNITION AND THE LIKE
Milton Jay Kimmel, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 272,698, July 17, 1972. This application Jan. 19, 1976, Ser. No. 649,937
Int. Cl.² G06F *1/02, 7/28, 9/20*
U.S. Cl. 340—172.5 **12 Claims**

1. A method for executing a plurality of different voting-logic functions in a data processor, said method comprising:
- accessing a plurality of program instructions, said plurality of instructions respectively containing specifications of a corresponding plurality of said data operands;
- accessing said plurality of data operands according to said specifications;
- entering successive ones of said plurality of data operands into a first a plurality of cascaded registers;

thereafter testing for the presence of a fixed value in the operand in said first register;

if said tested operand has a predetermined fixed value, pushing said successive operands from each successive register into the next succeeding register in said plurality of cascaded registers;



accessing a further program instruction, said further instruction containing a specification of a selectable one of said plurality of registers; and

gating to a common output the contents of said selectable one register, so that said output contains one of a plurality of different voting-logic functions of said operands, depending upon which of said plurality of registers it gated thereto in response to said further instruction.

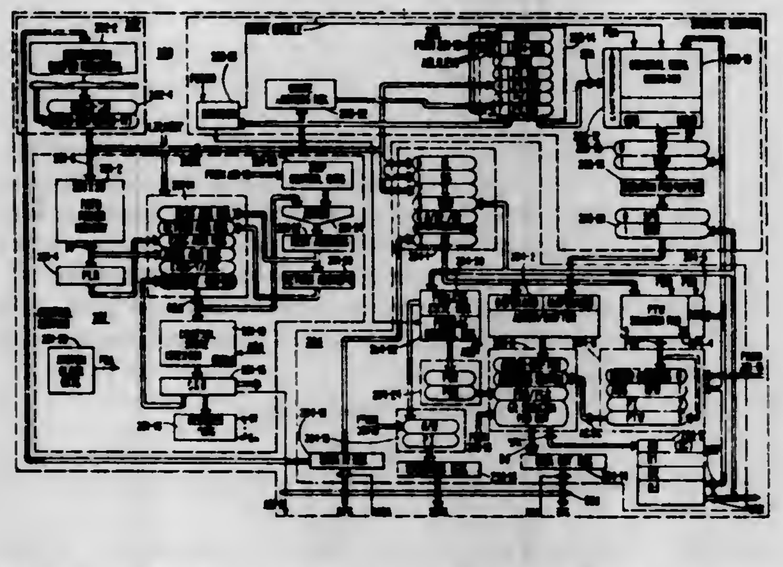
4,001,788
PATHFINDER MICROPROGRAM CONTROL SYSTEM

Garvin Wesley Patterson, Glendale, and Marion G. Porter, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,363

Int. Cl.² G06F *9/16, 9/19*

U.S. Cl. 340—172.5 **20 Claims**



1. A cyclically operable microprogram control system for use in an information handling system for generating subcommand signals for controlling systems operations required for processing program instructions, each program instruction including an operation code, said microprogram control system comprising:

a first store for storing address words, each including a plurality of addresses;

a second store for storing standard sequences of microinstruction words and execution sequences of microinstruction words;

each of said first and second stores including addressing means and output register means for providing access to said store contents and storage for said address and microinstruction words read from said first and second stores respectively; and,

selection means coupled to said output register means of said first and said addressing means of said second stores, said selection means receiving said plurality addresses of an address word read out from said first store in response to said operation code during the processing of said program instruction, said selection means applying selectively each of said plurality of addresses to said addressing means of said second control store for accessing microinstructions of said standard and execution sequences respectively for generating said signals during first and second phases of operation required for processing said program instruction.

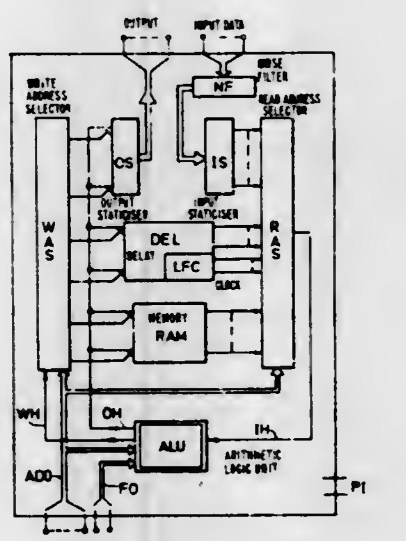
4,001,789
MICROPROCESSOR BOOLEAN PROCESSOR

Anthony William Sweet, Bishops Stortford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 23, 1975, Ser. No. 580,274

Int. Cl.² G06F *13/00, 13/06, 3/00*

U.S. Cl. 340—172.5 **8 Claims**



1. Electrical data processing equipment, comprising:

a plurality of inputs via which data to be processed is received;

a set of input staticisers coupled to said inputs for storing said data;

a plurality of outputs via which results can be extracted from said equipment;

a set of output staticisers coupled to said outputs, said out-put staticisers having applied thereto results of data processing operations performed by said equipment;

a random access memory for storing intermediate processing results

an instruction input via which instructions are received, each instruction including an address portion and a function portion;

first address selection means coupled to said address portion, said random access memory and said input staticisers for selecting data from said input staticisers to be processed and for retrieving data from said random access memory

a logic circuit coupled to said function portion and said first address selection means for processing data supplied by said first address selection means; and

second address selection means coupled to said address portion, said logic circuit, said output staticisers and said random access memory for applying outputs of said logic circuit to said output staticisers and said random access memory

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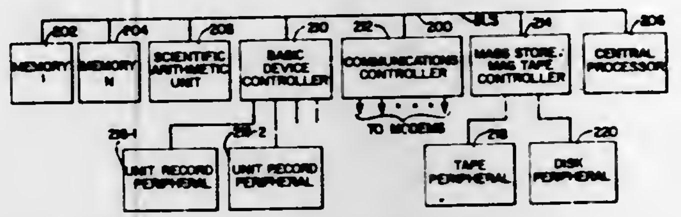
4,001,790
MODULARLY ADDRESSABLE UNITS COUPLED IN A DATA PROCESSING SYSTEM OVER A COMMON BUS

George J. Barlow, Tewksbury, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 30, 1975, Ser. No. 591,903

Int. Cl.² G06F *7/10*

U.S. Cl. 340—172.5 **11 Claims**



1. A data processing system comprising:

A. a plurality of control units, including first and second control units having identical unit addresses, said first and second units each having a plurality of device connection positions, each said position in said first unit having a different relative address, each said position in said second unit having a different relative address, said relative addresses of said first unit being identical to said relative addresses of said second unit whereby said first and second units have like designated positions,

B. a common electrical bus, connected to each of said units, for enabling the transfer of information, including data and addresses, wherein said addresses include said unit addresses and said relative addresses, to and from said units;

C. a plurality of peripheral devices;

D. means, included in said first unit, for coupling at least one of said devices with one of said like designated positions,

E. means, included in said second unit, for coupling at least another of said devices with another of said like designated positions, said another of said positions having a different relative address than said one of said positions;

F. means, included in both said first and second units, for receiving the address of said unit and the relative address of one of said positions; and

G. means, included in both said first and said second units, for responding to said unit address and said relative address, said first unit making a positive response if it receives said unit address and the relative address of said one of said positions, and said second unit making a positive response if it receives said unit address and the relative address of said another of said positions.

4,001,791
HOLOGRAPHIC STORAGE DEVICE

Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

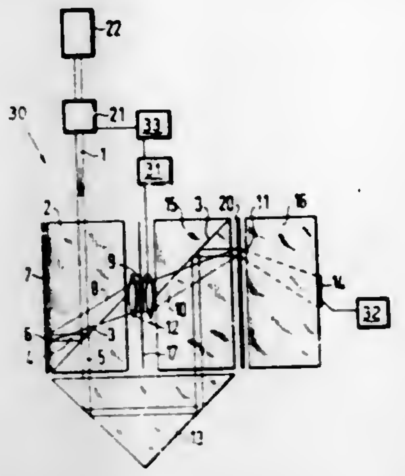
Division of Ser. No. 453,067, March 20, 1974, Pat. No. B453,067. This application Sept. 23, 1975, Ser. No. 615,935

Claims priority, application Germany, Mar. 29, 1973, 2315776

Int. Cl.² G11C *13/04*

U.S. Cl. 340—173 LM **12 Claims**

1. A device for recording information in a holographic storage and for retrieving the information from the storage, comprising a plurality of transparent bodies each having a plurality of flat surfaces, a storage medium disposed between a pair of said bodies which are arranged with adjacent flat surfaces being parallel, a detector matrix being arranged on a surface of one of said pair of bodies opposite the storage medium, a modulator matrix having a condenser-type optical system, said modulator matrix being disposed adjacent the flat surface of the other of said pair of bodies opposite said storage medium, an illumination hologram containing a plurality of sub-holograms spaced from the modulator matrix by one of said transparent bodies, a source providing a beam of coherent illumination directed at one of said bodies, means selectively deflecting the beam at different portions of the body so that the deflected beam is selectively projected on different portions of the storage medium during both recording and retrieving operations, and means directing a portion of the deflected beam onto a sub-hologram of the illumination hologram to create an illumination beam which is focused by the condenser-type optical system on the modulator matrix to form an object wave that is projected on the storage medium, said object wave being spatially modulated with the information to be recorded in a hologram.



4,001,792
DRIVE FIELD FOR CIRCULAR MAGNETIC DOMAIN DEVICES

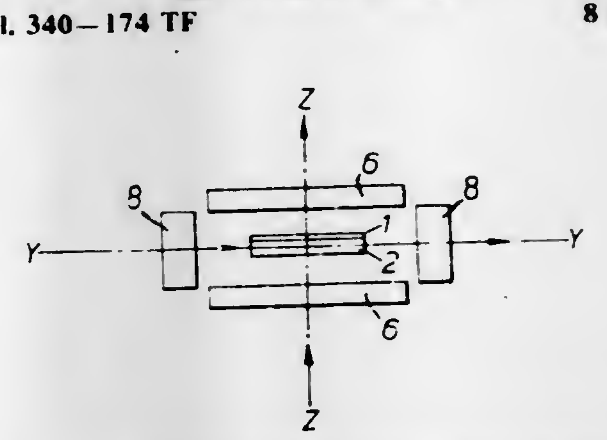
Michael Dennis Roy Tench, Blisworth, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,874

Claims priority, application United Kingdom, May 17, 1974, 22014/74

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **8 Claims**



1. A circular magnetic domain device which includes a first pair of bias magnets for applying a steady bias magnetic field in a direction normal to a major surface of the device's uniaxial magnetic layer, rotating magnetic field generating means for causing circular magnetic domains generated in the said layer to propagate within the layer along at least one path defined by a permeable circuit pattern formed on the said major surface, the generating means including two pairs of coils having their axes at right angles to each other and in the plane of the said major surface, one pair of coils being operable to provide an oscillating field which is unipolar and stops and starts at zero; and a second pair of bias magnets for applying a steady holding magnetic field in the direction of the magnetic field provided by the said one pair of coils, the steady bias magnetic field being applied to the uniaxial magnetic layer in the plane of the said major surface thereof.

4,001,793

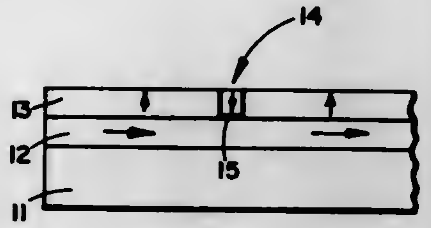
MAGNETIC BUBBLE DOMAIN COMPOSITE WITH HARD BUBBLE SUPPRESSION

Rodney D. Henry, Corona, and Paul J. Besser, Laguna Niguel, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 375,999, July 2, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,859

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **22 Claims**



1. A stratified composite comprising:

a non-magnetic, monocrystalline garnet substrate;

a bubble domain layer of an epitaxially grown monocrystalline magnetic garnet material, said bubble domain layer overlying said substrate, having a major surface and having sufficient uniaxial anisotropy to enable the formation of bubble domains therein;

a hard bubble suppression layer of an epitaxially grown monocrystalline magnetic garnet material, said hard bubble suppression layer overlying said substrate on the same side as said bubble domain layer, having a major surface, a thickness of less than about 0.5 μ and sufficient anisotropy to establish a net moment of magnetization substantially parallel to said major surface of said hard bubble suppression layer;

said bubble domain and hard bubble suppression layers having their major surfaces substantially parallel; and

said substrate supporting said layers along their major surfaces.

4,001,794

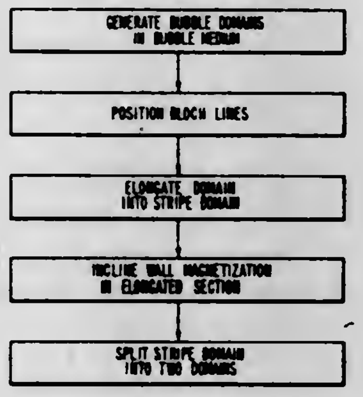
METHOD AND APPARATUS FOR CONTROLLED GENERATION OF WALL TOPOLOGY IN MAGNETIC DOMAINS

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,146

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **16 Claims**


GENERATE BUBBLE DOMAINS IN BUBBLE MEDIUM
POSITION BLOCH LINES
ELONGATE DOMAIN INTO STRIPE DOMAIN
INCLINE WALL MAGNETIZATION IN ELONGATED SECTION
SPLIT STRIPE DOMAIN INTO TWO DOMAINS

1. A process for controllably generating wall states in magnetic bubble domains in a medium supporting said domains, said wall states capable of representing data information, said process comprising the steps of:

a. generating a bubble domain in said medium;

b. positioning Bloch lines, if any, in said generated domain;

c. elongating said generated domain to obtain a stripe domain;

d. inclining the wall magnetization in the elongated section of said stripe domain substantially transverse to said domain wall; and

e. splitting said stripe domain into two bubble domains.

4,001,795

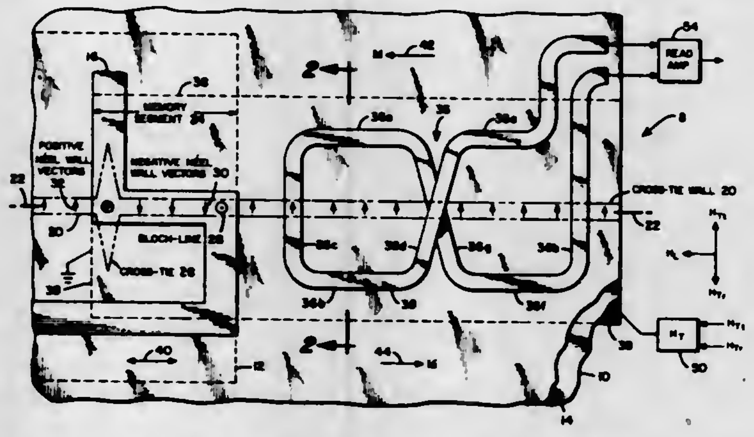
MAGNETO-INDUCTIVE READOUT OF CROSS-TIE WALL MEMORY SYSTEM USING HARD AXIS DRIVE FIELD AND NOISE CANCELLING SENSE LINE

David S. Lo, Burnsville, and Maynard C. Paul, Bloomington, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,817

Int. Cl.² G11C *11/02*

U.S. Cl. 340—174 TF **4 Claims**



1. In a cross-tie wall memory system in which bits of binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, in a cross-tie wall in a magnetizable layer having an easy axis and in which said binary data are serially propagated along said cross-tie wall by the interacting fields provided by associated drive lines, which drive lines have memory segments that are associated with associated memory cells in said magnetizable layer in which associated ones of said bits of binary data are stored as inverted Neel wall sections, a method of magneto-inductively reading out said bit-defining-Bloch-lines that are representative of stored binary data comprising:

aligning a noise cancelling sense line loop straddled about said cross-tie wall;

coupling a sense amplifier to said sense line loop;

coupling a hard axis drive field H_T to a bit-defining-Bloch-line that is stored in said memory segment;

driving said bit-defining-Bloch-line along said cross-tie wall, out of said memory segment and into said sense line loop;

sensing the passage of said bit-defining-Bloch-line out of said memory segment and into said sense line loop by said sense amplifier.

4,001,796

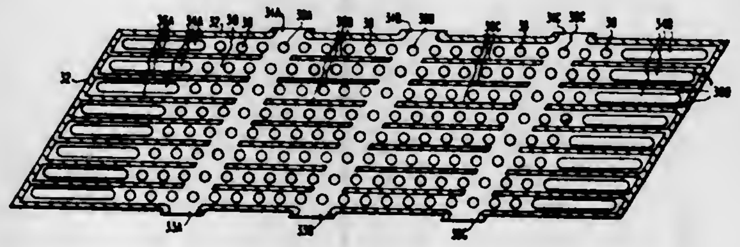
BUBBLE LATTICE STRUCTURE WITH BARRIER

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 494,940, Aug. 5, 1974, Pat. No. 3,930,244. This application June 16, 1975, Ser. No. 587,481

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **14 Claims**



1. A bubble lattice system comprising a plurality of substantially parallel rows of movable domains, said domains adapted to move from a first position to a second position in said row, and

a barrier positioned between two of said rows wherein said barrier maintains the relative position of said domains in said two rows adjacent said barrier as said domains move from said first position to said second position.

4,001,797

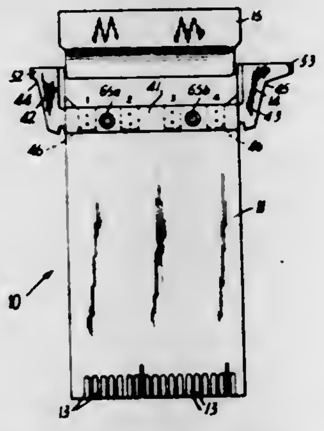
ANNUNCIATOR SYSTEM WITH DIRECT FIELD WIRING

Gerald H. Buss, Walworth; Chester H. Clarridge, Pittsford, and Daniel H. Hollands, Webster, all of N.Y., assignors to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,524

Int. Cl.² G08C *9/00*

U.S. Cl. 340—181 **8 Claims**



1. A terminal system for an annunciator or similar system comprising

a first printed circuit board which has thereon wires for a plurality of circuits, a top support member and a bottom support member each secured to said board at respectively near its top and bottom portions,

an elongated channel member secured to said first circuit board and having a bottom wall and two side walls, a plurality of connector members secured to said bottom wall and electrically connected to said first printed circuit board,

a plurality of module circuit boards each having conductive contact means near one of its sides which contact said connector members on said first printed circuit board, means on said two side walls of said channel member in facing relationship to removably position said module circuit boards,

an electrically insulative handle terminal block fastened to each of said module circuit boards at the side opposite said connector means, each of said handle terminal blocks having a handle portion, a plurality of conductive connector members, and means connecting each of said connector members to the wires on its module printed circuit board,

a plurality of electrically insulative field terminal block members, each terminal block member being removably fitted to each of said handle members, each having a plurality of inner conductive connector members which make electrical contact with said connector members of said handle and each having an outer conductive connector member to removably fasten field wiring thereto, said inner and outer conductive members being electrically connected and each of said field terminal block members having a plurality of faces parallel to each other and angled relative its bottom face, each of said faces carrying thereon one of said outer connector members.

4,001,798

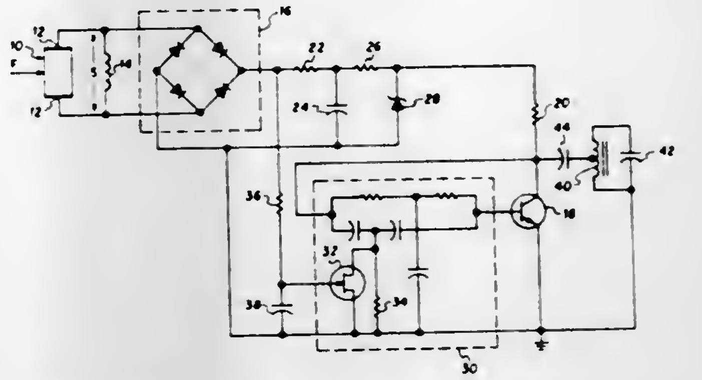
SELF-CONTAINED SENSOR

Roland L. Robinson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 18, 1975, Ser. No. 614,578

Int. Cl.² G08C *19/38*

U.S. Cl. 340—191 **1 Claim**



1. A self-contained sensor, comprising:

a transducer for converting a physical stimulus to an equivalent electrical signal;

a voltage controlled oscillator having a resistive-capacitive twin-T network in its feedback path, including a field effect transistor operated as a voltage controlled resistor in the middle leg resistor of said twin-T network;

circuit means for applying the equivalent electrical signal to said oscillator for powering it including means for rectifying and filtering the signal;

circuit means for frequency modulating the output of said oscillator by the equivalent electrical signal by applying it to said field effect transistor, including means for rectifying and filtering the signal, and

circuit means for transmitting the modulated output of said oscillator to a remote location.

4,001,799

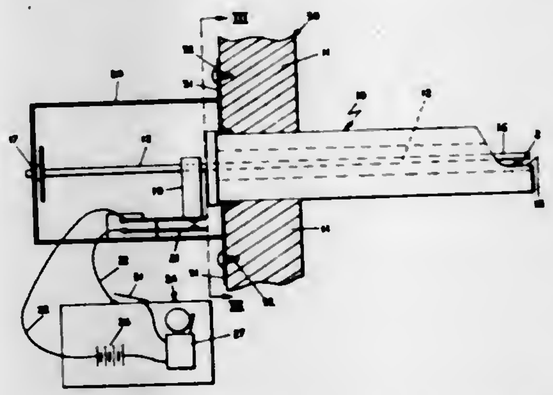
KILN ALARM

Dominic P. Sondy, 1609 Mills Ave., North Muskegon, Mich. 49445

Filed July 9, 1975, Ser. No. 594,329

Int. Cl.² H01H *37/76*; G08B *29/00*

U.S. Cl. 340—213 Q **10 Claims**



1. In combination with a kiln, an alarm system including:

an elongated member pivotally mounted outside the kiln and extending into the kiln;

a tube surrounding the extension of the elongated member into the kiln and having a partially removed end portion to provide an arced integral sector providing spaced mounting surfaces for horizontally supporting the ends of an elongated pyrometric cone used to support an end of the elongated member; and

a signaling device mechanically coupled to the elongated member and activated by downward sagging of the elongated member resulting from the deformation of said pyrometric cone.

4,001,800

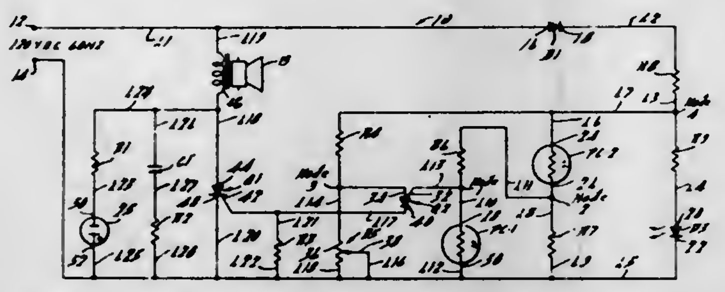
SMOKE DETECTING DEVICE

Jeffrey L. Franks, Holland, Mich., assignor to Gentex Company, Holland, Mich.

Continuation-in-part of Ser. No. 482,435, June 24, 1974, abandoned. This application May 19, 1975, Ser. No. 578,612

Int. Cl.² G08B *17/10*

U.S. Cl. 340—237 S **30 Claims**



1. In a smoke detector and alarm system, the combination including electrically activatable alarm means, an illuminating circuit including a light emitting diode, means providing a pulsating current supply for said light emitting diode whereby said light emitting diode emits pulsating light, a smoke sensing and compensation circuit including dual photo-electric means the electrical conductivity of each of which varies as a function of the amount of light impinging thereon, said dual photo-electric means being connected in series and being electrically connected to said means providing a pulsating current supply for said light emitting diode, said dual photo-electric means being mounted in proximity to said light emitting diode whereby light emanating from said light emitting diode impinges upon one of said dual photo-electric means at all times and impinges upon the other of said dual photo-electric means to change the conductivity of said other dual photo-electric means only when airborne particulate matter is present in the ambient atmosphere, solid state trigger means activatable in response to a differential in the conductivity of said dual photo-electric means, and solid state switching means controlling the activation of said alarm means and controlled by said trigger means.

4,001,801

AUTOMATIC LOW THROUGHPUT METERING APPARATUS FOR SELECTING AND CONTROLLING THE FLOW RATE OF LIQUIDS

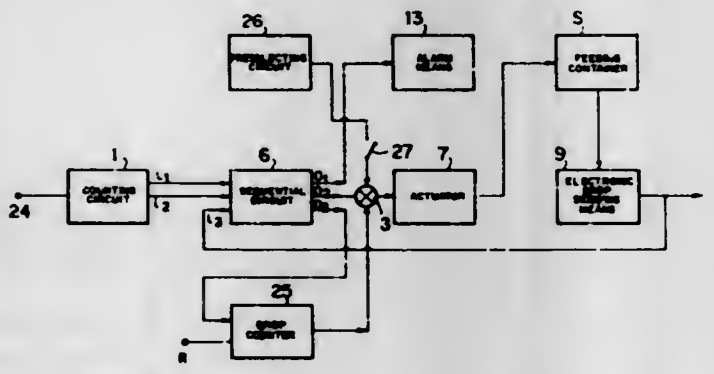
Camille Moulet, Le Cannet, France, assignor to Crinospital S.p.A., Palazzo Pignano, Italy

Filed Nov. 19, 1974, Ser. No. 525,063

Claims priority, application Italy, Nov. 21, 1973, 31502/73

Int. Cl.² G08B *21/00*

U.S. Cl. 340—239 R **5 Claims**



1. A metering apparatus for a liquid adapted to be placed between a liquid feeding container and a flow delivery line, comprising: an actuator for delivering liquid drops from the feeding container to the flow delivery line; a counting circuit, means for presetting said counting circuit to a desired flow rate of liquid drops deliverable to the flow delivery line, a control apparatus including a sequential circuit having an input coupled to said counting circuit and an output coupled to said actuator for controlling said actuator to deliver liquid drops, according to the preset rate, to the delivery line; means at the output of the metering apparatus for electronically sensing the actual delivered drops and providing an output proportional to the rate of drops actually delivered to the flow delivery line, said output being coupled to said sequential circuit and alarm means coupled to said sequential circuit and operable to cause an alarm in response to sensing a disparity between the rate of the drops delivered and the drop rate preset by said counting circuit, said counting circuit including an oscillator providing an output signal, a plurality of digital counters connected as frequency dividers for the output signal of the oscillator and a plurality of inverters connected to some outputs of the counters, a slider for presetting the delivery flow rate of the metering apparatus and connecting one of the outputs of the inverters to an input of the control apparatus, the two outputs of said counters having the highest frequencies being directly connected with two corresponding inputs of the control apparatus in order to clock the sequential circuit.

4,001,802

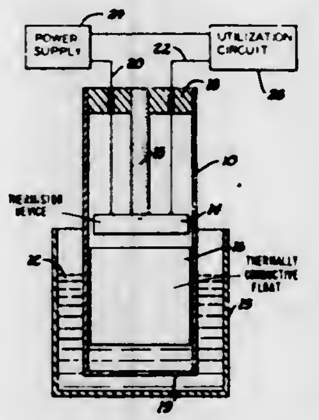
SOLID STATE THERMISTOR SWITCH

Douglas I. Fales, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1975, Ser. No. 601,597

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 A **2 Claims**



1. A condition responsive switch coupled with a current supply comprising

a thermistor means connected to the current supply to develop a relatively high temperature and one resistance value when exposed to a medium of low thermal conductivity and a lower temperature and a substantially different resistance value when exposed to a medium of relatively high thermal conductivity,

a solid state medium of high thermal conductivity having a first position in thermal contact with the thermistor means to effect cooling thereof and a second position out of thermal contact with the thermistor means to allow heating thereof,

means responsive to a condition for moving the solid state medium between said first position and said second position,

and, means responsive to the resistance value of the thermistor means to thereby indicate whether the solid state medium is in said first position or said second position thereby providing an indication of the condition.

4,001,803

LIGHTING DEVICES

Dominick A. Lombardo, 5 Cottage St., Norwalk, Conn. 06856

Filed Oct. 1, 1975, Ser. No. 618,380

Int. Cl.² G08B *21/00*

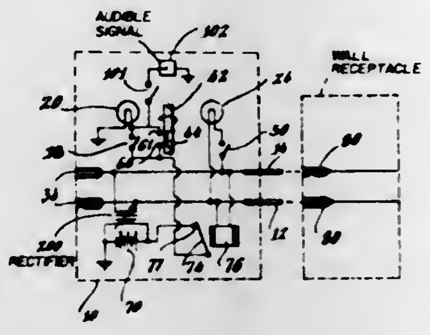
U.S. Cl. 340—248 B **24 Claims**

1. A lighting unit comprising a protective housing in which are positioned a main circuit terminating in a pair of connector prongs for insertion into corresponding conductive receptacles of an electrical power source, said prongs being selectively extendable from said unit parallel to each other by having one of their respective ends swung outward therefrom,

a first lighting circuit which is electrically connected to said main circuit and to a first lamp and includes a manually operable on-off switch positioned between said lamp and said main circuit,

a second lighting circuit which is isolated electrically from said main circuit and said first circuit and electrically interconnects a battery with a second lamp through a normally closed switch and through two switches which are in series with said normally closed switch and are in parallel with each other, one of which parallel switches is a manually operable on-off switch and the other of which switches is an on-off switch which is mechanically integrated with said prongs and closes simultaneously with said prongs being swung outward from said unit,

and a relay which is connected to said main circuit and causes said normally closed switch to open in response to energization of said main circuit.



4,001,804

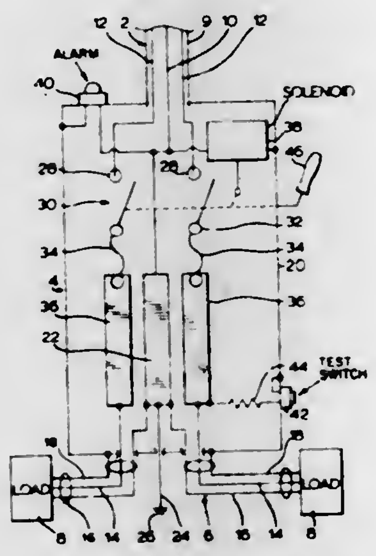
GROUND FAULT PROTECTION FOR ELECTRICAL POWER DISTRIBUTION SYSTEMS

Fred W. Irving, New Minas, Canada, assignor to I-T Safety Enterprises Limited, Berwick, Canada

Filed Nov. 25, 1974, Ser. No. 526,858

Int. Cl.² G08B *21/00*

U.S. Cl. 340—255 **15 Claims**



1. In an electrical installation having a supply main comprising a neutral conductor and at least one line conductor, a plurality of branch circuits, a service entry box establishing connection between the supply main conductors and the branch circuits and including manually operable switch means to interrupt the at least one line conductor, and a ground return system establishing a ground return path to the entry box in parallel with each of the branch circuits, the improvement wherein the ground return system and the service entry box are isolated from all neutral conductors in the installation, the switch means is biased to an open condition and includes latch means releasably to latch it in a closed condition, and the service entry box contains a solenoid electrically connected between the box and the neutral conductor and responsive to the passage of a predetermined current to release said latch means in the box.

4,001,805

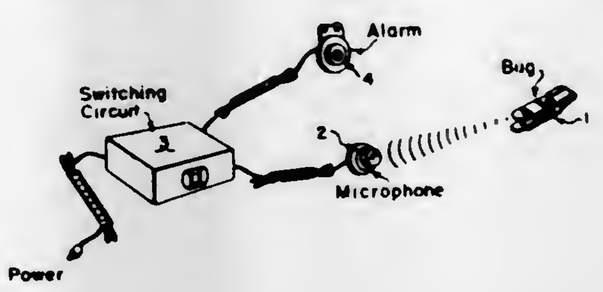
SOUND ACTIVATED ALARM SYSTEM

Alvin V. Golbe, 311 Lantana Ave., Englewood, N.J. 07631

Filed Apr. 3, 1975, Ser. No. 564,759

Int. Cl.² G08B *21/00*

U.S. Cl. 340—280 **7 Claims**



1. An alarm system for monitoring and responding to removal of an object from its proper place comprising:

a. a portable generator means for positioning between said object and an associated fixed support for the object, said generator means including:

  1. a base,
  2. a blade fixed at one end to the base with its other end free and normally disposed in a first position extending at an acute angle away from the base and movable to a second position engaging said base, said blade being armed upon restraining said free end in said second position by positioning between said object and support, said blade further being mechanically formed for generating an audible sound having a predetermined frequency upon movement of its free end from said second position to said first position upon removal of said object from said support;

b. circuit means including a source of electrical power;

c. signal means connected into said circuit means and responsive to said audible sound for providing an electrical output, said signal means being disposed remotely of said generator means; and

d. alarm means for signalling the removal of said object from said support, said alarm means included within said circuit means for actuation from a first state to an alarm state under control of said signal means.

4,001,806

DEFLECTION SIGNAL PRE-START CIRCUIT FOR A CONSTANT SPEED, STROKE-WRITE VECTOR DISPLAY SYSTEM

Charles William Sweeting, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1976, Ser. No. 647,230

Int. Cl.² G06K *15/20*

U.S. Cl. 340—324 A **7 Claims**

1. An improved constant speed stroke-write vector display system, of the type which includes,

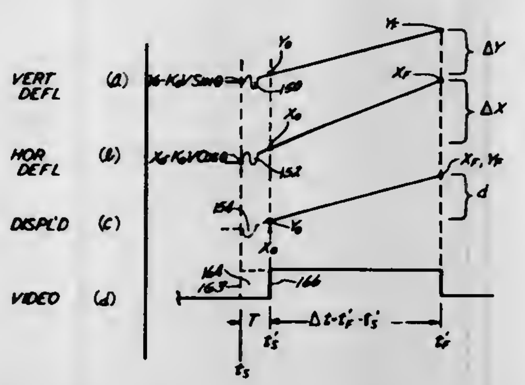
a CRT video display,

vector generator means for providing, a pair of start position signals and a pair of end position signals that together define the start position and end position of a vector in each of two orthogonal coordinates, a pair of rate magnitude signals which are proportional to the orthogonal components of the stroke vector deflection angle in each of the orthogonal coordinates, and a video start signal,

deflection means responsive to the vector generator, for providing deflection signals in each of the two orthogonal coordinates, each signal having an amplitude rate of change with time in dependence on a respective one of the rate magnitude signals, and each signal having a start value and a stop value in dependence on the respective start positon and end position coordinate signals in each of the two orthogonal coordinates,

a video means responsive to the vector generator and to the deflection circuits for providing a video gate signal beginning in response to the video start signal and ending in response to each of the deflection signals attaining a magnitude corresponding to the vector end position signals,

the improvement comprising:



delay means responsive to the gated video switch for delaying the video gate signal for a determined time interval and for applying the resulting delayed video signal to the CRT display; and

deflection offset means responsive to the vector generator for providing a pair of deflection offset signals, each corresponding to the start value of the deflection signals in a different one of the two orthogonal coordinates, and each having a magnitude which is proportional to and of a polarity opposite to the rate magnitude signal in a respective one of the orthogonal coordinates, said offset means summing each of the deflection offset signals to a related one of the deflection signals and providing the summed deflection signals to the CRT display.

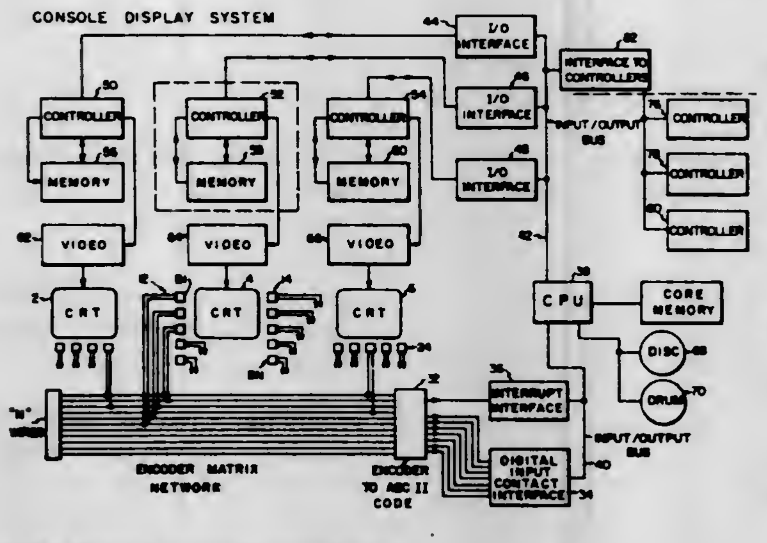
4,001,807
CONCURRENT OVERVIEW AND DETAIL DISPLAY SYSTEM HAVING PROCESS CONTROL CAPABILITIES

Renzo Dallimonti, Ambler, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 388,949, Aug. 16, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,321

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 A **10 Claims**



1. A display system comprising:

a display panel means having at least a first and a second display means having respective display faces for displaying a plurality of corresponding displays on each display face, said displays being interrelated and separately characterized wherein said first display means displays an overview of a plurality of variables, and said second display means displays a detailed display of one of the variables displayed on said first display means,

a plurality of separately actuable means associated with each of said display means, and

control means connected between said display means and said actuable means to control each of said plurality of dislay means in response to an actuated one of said actuable means whereby to select a detailed display for display on said second display means in response to said actuable means associated with said first and said second display means.

4,001,808
ELECTRONIC DEVICE FOR MONITORING POWER CONSUMPTION OF AN ELECTRO-OPTICAL DISPLAY

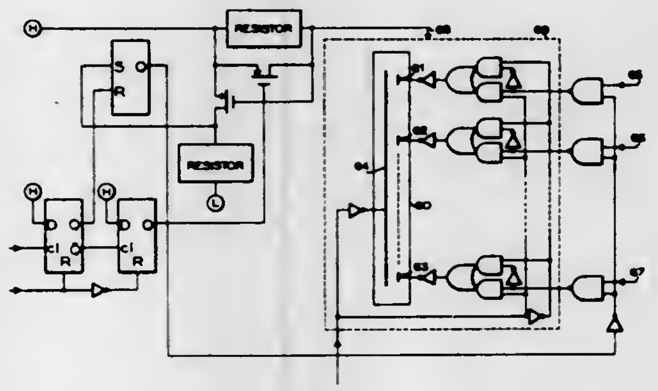
Heihachiro Ebihara, and Fukuo Sekiya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,197

Claims priority, application Japan, July 17, 1974, 49-81867

Int. Cl.^{2} G09F *9/32*

U.S. Cl. 340—336 **17 Claims**



1. An electronic device for use with electronic appliances, wherein said appliances include a battery cell for supplying electric power, a reference signal generator for generating a reference signal, logic circuitry responsive to said reference signal for supplying an operating signal for driving said display device, wherein said device comprises:

a detection circuit disposed between said battery cell and said driving circuit;

means within said detection circuit for monitoring power consumption of said driving circuit and thereby measuring the power consumption of said display device;

means within said detection circuit for generating a detection signal, when the power consumption exceeds a predetermined level.

4,001,809
DISPLAY DEVICE INCLUDING CIRCUITS FOR DRIVING LOADS SUCH AS ELECTROPHORETIC DISPLAYS

Kiyotake Fukui, Settsu, and Shuichi Ninomiya, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 379,337, July 16, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 543,007

Claims priority, application Japan, July 19, 1972, 47-72778; July 19, 1972, 47-72779

Int. Cl.^{2} G09F *9/32*

U.S. Cl. 340—336 **6 Claims**

1. A display device of the type which is required to be operated by both polarities of voltage supplied thereto, said display device comprising:

a display panel including a segmented electrode having a plurality of segmental electrodes, a common electrode, and an electrophoretic suspension sandwiched between said common electrode and each of said segmental electrodes;

a plurality of segment driving devices, one each connected to one of said segmental electrodes;

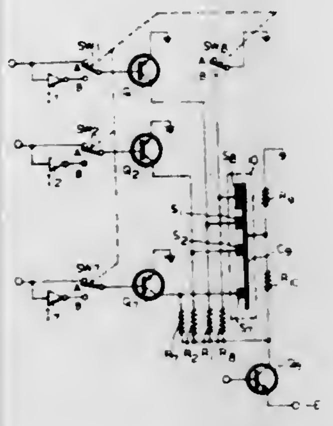
a voltage supply means for supplying a D.C. voltage to said display panel;

a display controlling device coupled in series with said voltage supply means and the respective segment driving devices and in series with said voltage supply means and said common electrode;

a first resistive element having two ends, one end being connected to each of said segmental electrodes;

a second resistive element having two ends, one end of said second resistive element being connected to said common electrode and a second end of said second resistive element being connected to a second end of said first resistive element;

a third resistive element having two ends, one end of said third resistive element being connected to said plurality of segment driving devices and a second end of said third resistive element being connected to said common electrode;



said display controlling device comprising means for providing a voltage across said segmental electrodes and said common electrode through said segment driving devices only when said display controlling device is in a short-circuited condition;

said electrophoretic suspension between said common electrode and one of said segmental electrodes being driven so as to display an indication when said display controlling device and one of said segment driving devices connected to said one of said segmental electrodes are in a short-circuited condition; and

said indication of said electrophoretic suspension being erased when said one of said segment driving devices reaches an open-circuited condition and said display controlling device returns to the short-circuited condition.

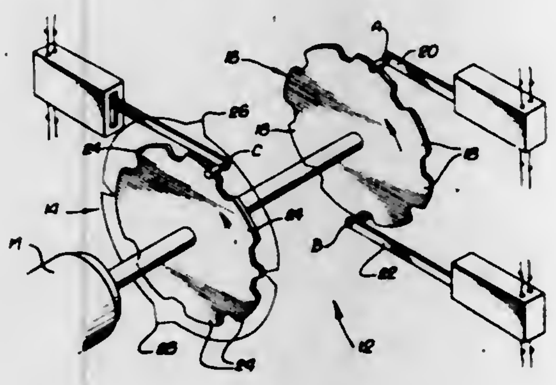
4,001,810
SEQUENCE REVERSING BORDER LIGHT DISPLAY

Roy Olsen, Rosemead, Calif., assignor to Superior Outdoor Display, Inc., Long Beach, Calif.

Filed Dec. 18, 1975, Ser. No. 641,838

Int. Cl.^{2} G08B *5/36*

U.S. Cl. 340—338 **2 Claims**



1. In an illuminated display:

a. a series of lights arrayed in a line,

b. three interruptible circuit means segregating the lights into three interpositioned groups;

c. first timing means for cyclically operating two of the circuit means so that the OFF periods of the corresponding groups are substantially out of phase;

d. second timing means for operating the third circuit means so that the lights of the third group have two cyclic modes, in one of which the OFF periods of said third group lead the OFF periods of said first group and follow the OFF periods of said second group and in the other of which the OFF periods of said third group follow the OFF periods of said first group and lead the OFF periods of said second group; and

e. common drive means for operating said timing means in synchronism whereby the apparent direction of movement of said series of lights cyclically changes notwithstanding uniform movement of said common drive means.

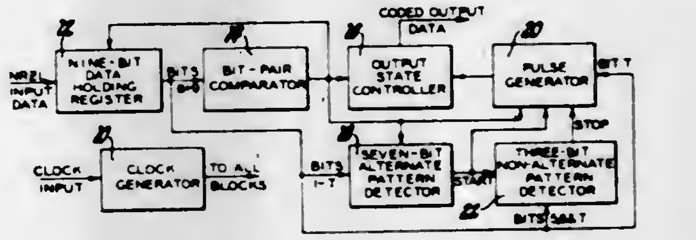
4,001,811
METHOD AND APPARATUS FOR CODING AND DECODING DIGITAL INFORMATION

Duane E. McIntosh, Palmyra, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1972, Ser. No. 221,693

Int. Cl.^{2} H03K *13/24*

U.S. Cl. 340—347 DD **7 Claims**



1. Apparatus for converting an input bit stream the data of which is contained in the level of the input bit stream, to an output bit stream wherein the content of the data is contained in the time of transition of the output bit stream relative to bit time of the output bit stream, said apparatus comprising:

storage means;

clock means for shifting said input bit stream into said storage means, said clock means including means for establishing the bit time of said output bit stream;

means responsive to said clock means for comparing the level of adjacent bits in said input bit stream and for developing a control signal having pulses which occur at a first time with respect to bit time upon detection of a discrete pair of adjacent bits at one logic level and at a second time with respect to bit time upon detection of a discrete pair of adjacent bits at a second logic level and for generating pulses separated by 1½ bit time intervals when at least seven bits between discrete pairs of like bits form an alternate bit pattern, the first pulse of said 1½ bit time interval pulses occurring either 2 or 2½ bit times following the pulse corresponding to the detection of the first of said discrete pairs of like bits depending upon which alternate bit pattern is formed, the last pulse of said 1½ bit time interval pulses occurring at least 2 bit times prior to a pulse corresponding to detection of the second of said discrete pairs of like bits;

and means responsive to the pulses in said control signal for developing an output bit stream having state transitions corresponding to each pulse in said control signal.

4,001,812
METHOD OF AND MEANS FOR QUANTIZING ANALOG-VOLTAGE SAMPLES

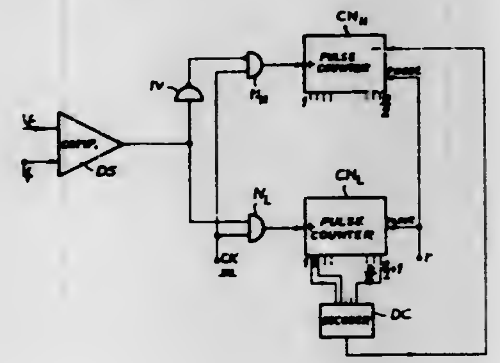
Giorgio Testa, Milan, and Mario Pozzi, Mozzate, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed May 15, 1975, Ser. No. 577,673

Claims priority, application Italy, May 15, 1974, 22728/74

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 NT **7 Claims**



1. In a signaling system including means for periodically sampling an analog voltage ranging between a lower limit V_{min} and an upper limit V_{max}, the combination therewith of analog/digital conversion means comprising:

an input capacitor chargeable with an analog-voltage sample at the beginning of a digitization interval T_x forming part of a recurrent sampling cycle;

a first constant-current generator connected across said input capacitor for linearly discharging same at a relatively high rate sufficient to reduce its voltage from said upper limit V_{max} to said lower limit V_{min} in not more than half said digitization interval T_x;

a source of forward-counting clock pulses of period

$$T = \frac{T_x}{2^{n/2} + 1}$$

timed to coincide with $2^{n/2}$ major quantum steps into which the voltage range $V_{max} - V_{min}$ is divided, each major quantum step being subdivided into $2^{n/2}$ minor quantum steps of uniform height, n being an even integer;

a second constant-current generator connected across said input capacitor for linearly charging same at a relatively low rate corresponding to a minor quantum step per clock pulse;

a supply of reference voltage corresponding to said lower limit V_{min};

discriminating means connected to said input capacitor and to said supply for comparing the capacitor voltage with said reference voltage;

first and second switch means controlled by said discriminating means for respectively actuating said first generator upon said capacitor voltage exceeding said reference voltage and said second generator upon said reference voltage exceeding said capacitor voltage, said first switch means being responsive to said clock pulses for terminating the discharge of said input capacitor by said first generator only after a whole number of pulse periods T upon said capacitor voltage dropping below said reference voltage to cause actuation of said second generator;

first binary counting means connected to be stepped by said forward-counting pulses under the control of said discriminating means during the discharging of said input capacitor by said first generator, thereby producing a first group of $n/2$ bits representing the number of major quantum steps counted;

second binary counting means connected to be stepped by said forward-counting pulses under the control of said discriminating means during the charging of said input capacitor by said second generator until said capacitor voltage substantially equals said reference voltage, thereby producing a second group of $n/2$ bits representing the number of minor quantum steps counted; and

circuit means connected to said first and second counting means for combining said first and second groups of bits into a binary word representative of the magnitude of said analog-voltage sample;

said second counting means having a capacity exceeding $2^{n/2}$ and being provided with decoding means for detecting a count of $2^{n/2}$, said first counting means being provided with a reverse-stepping input connected to said decoding means for reducing the count thereof by one upon said second counting means reaching the count of $2^{n/2}$.

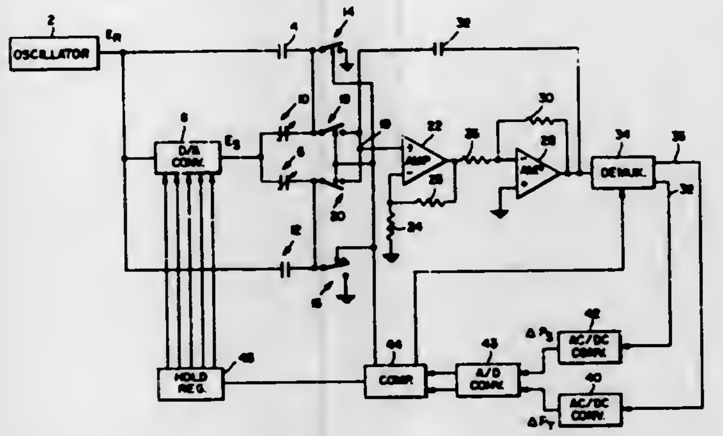
4,001,813
PRECISION CAPACITANCE TO DIGITAL CONVERSION SYSTEM

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed July 2, 1975, Ser. No. 592,585

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 R **6 Claims**



1. A capacitance to digital conversion system comprising:

a signal source for providing an alternating reference signal;

reference capacitor means connected to the signal source and driven by the reference signal therefrom;

a digital to analog converter connected to the reference signal source and driven by the reference signal therefrom for converting a digital signal to an analog alternating signal;

condition sensing capacitor means connected to the digital to analog converter and driven by the analog alternating signal therefrom;

means connected to the reference capacitor means and to the sensing capacitor means for providing an analog error signal related to the sensed condition when the currents through the reference and sensing capacitor means are other than equal and opposite said means including summing means connected to the reference and sensing capacitor means and responsive to the currents therethrough for providing an error signal;

means for amplifying the error signal; and

means connected to the amplifying means and to the summing means for feeding back the amplified signal to the summing means;

means for converting the analog error signal to the digital signal; and

means for feeding the digital signal to the digital to analog converter for conversion thereby to the analog alternating signal.

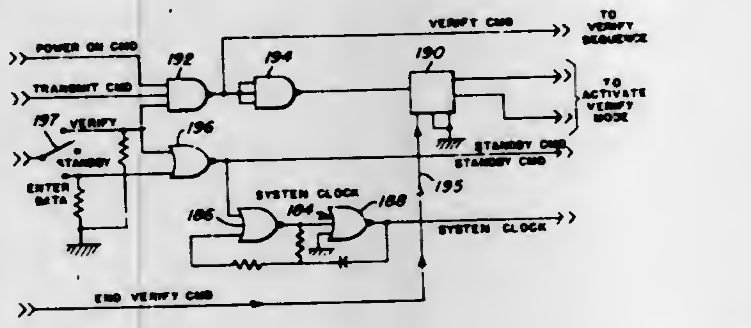
4,001,814
FIXED FORMAT MESSAGE ENTRY DEVICE WITH ELECTRONIC STORAGE AND EDITING

Derek S. Morris, Allenhurst, and Robert M. Braun, Eatontown, both of N.J., assignors to The United States of America as represented by the United States Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,643

Int. Cl.² G08C *1/00*

U.S. Cl. 340—365 R **11 Claims**



1. In a data entry and storage system comprising· display means including a multiplicity of indicator blocks each including a plurality of segments of fiber optic material bonded together and a like plurality of individual light-emitting diodes juxtaposed with corresponding ones of said segments;

selectable loosely bound format cards having openings therein through which said indicator blocks pass, said format cards each having a column of indicia imprinted thereupon for each of the indicator blocks to identify the significance of individual light-emitting diodes, said format cards being selected to establish each of the indicator blocks as an indicator of distinctive types of data;

storage means having a number of discrete storage locations;

keyboard means having a plurality of keys selectably actuated one at a time in sequence for presenting data to a distinct location of said storage means for each key actuation which data is in accordance with the particular item of columnar indicia to be selected for each of said columns in the order in which the columns are arranged on said format cards; and

means connected to said storage means for selectively energizing, for each indicator block, that individual light-emitting diode which corresponds to the actuated key to visually display the entered data.

4,001,815
ROTARY ELECTROMAGNETIC INDICATOR

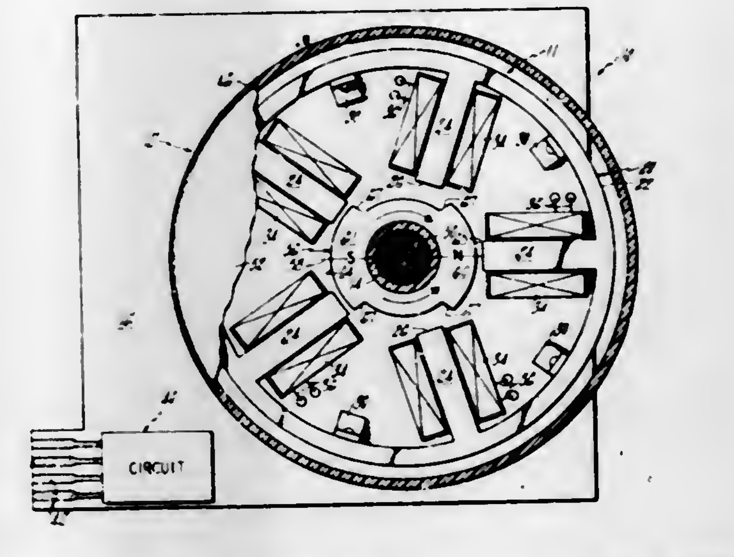
John G. Gamble, Simsbury, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 5, 1975, Ser. No. 584,218

Int. Cl.² G08B *5/00*

U.S. Cl. 340—373 **8 Claims**

1. In a rotary indicator comprising an indicating rotor having a permanent magnet with diametrically opposed north and south salient magnetic poles with two diametrically opposed pole faces respectively, each extending angularly substantially equally in both angular directions from a diametral axis of the rotor, a stator core having an uneven plurality of salient poles with pole faces respectively equiangularly spaced about the axis of the indicating rotor for magnetic cooperation with the north and south poles of the rotor permanent magnet, the stator pole faces having substantially the same angular width, a stator winding on each of the stator poles, each stator winding being adapted to be selectively energized for selectively magnetically positioning the indicating rotor in each of two 180° reverse indicating positions thereof with said diametral axis aligned with the respective stator pole face; the improvement wherein each of the two diametrically opposed pole faces of the rotor permanent magnet has an angular width greater than the equiangular spacing of the stator pole faces by an amount no greater than said angular width of the stator pole faces whereby any one of the stator windings can be selectively energized to align a selected rotor pole face with the respective stator pole face and to align the opposite rotor pole face with the opposite pair of stator pole faces.



4,001,816
ELECTRONIC CHIME

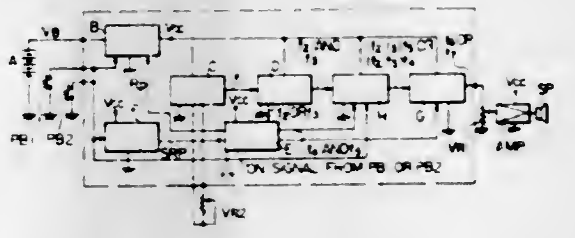
Kiyoshi Yamada; Kazushige Morisue, both of Hirakata; Hiroshi Shimomura, Ibaragi, and Yoshio Imamura, Kusatsu, all of Japan, assignors to Matsushita Electric Works, Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Jan. 19, 1976, Ser. No. 650,450

Claims priority, application Japan, Jan. 21, 1975, 50-9587

Int. Cl.² G08B *1/00*

U.S. Cl. 340—384 E **10 Claims**



1. An electronic chime comprising.
- a. a current source,
- b. at least a calling push button,
- c. a switching circuit connected to said current source and calling push button for feeding a supply voltage to all attached component circuits by an operation of said push button and interrupting said supply voltage upon receiving a resetting signal,
- d. an oscillating circuit for generating a standard frequency clock pulse upon receiving the supply voltage,
- e. a first frequency divider for generating at least two signals of different audible frequencies upon receiving said clock pulse from said oscillating circuit,
- f. an initial condition determining circuit for generating a one-shot pulse signal upon actuation of the push button,
- g. a second frequency divider receiving said at least two signals from said first frequency divider and one-shot pulse signal from said initial condition determining circuit and generating at least a rhythm determining pulse signal and a plurality of digital modulation signals, and further generating a resetting pulse to be applied to said switching circuit,
- h. a selective controlling circuit receiving said audible frequency signals from said first frequency divider and said rhythm determining pulse signal from said second frequency divider to alternately arrange the audible fre-

quency signals at a rhythm determined by the rhythm determining pulse signal,

i. a digital modulator for modulating said alternately arranged audible frequency signals from said selectively controlling circuit in response to said plurality of digital modulation signals from the second frequency divider,

j. an amplifier for amplifying said modulated signals from said digital modulator, and

k. a speaker for converting said modulated signals amplified to a chime sound.

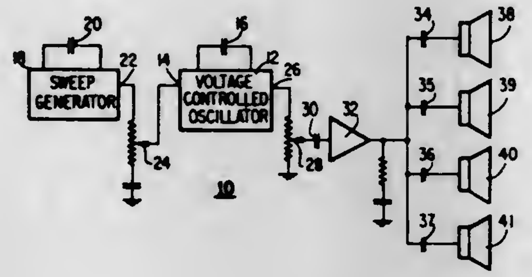
4,001,817
ULTRASONIC RODENT CONTROL DEVICE AND METHOD

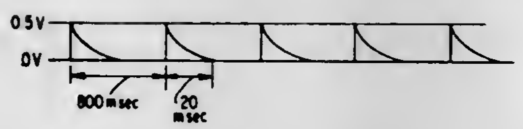
Robert L. Squires, Rantoul, Ill., assignor to American Electronics Corporation, Champaign, Ill.

Filed Oct. 23, 1974, Ser. No. 517,172

Int. Cl.^{2} G08B *3/00*

U.S. Cl. 340—384 E **18 Claims**





1. A signal generation apparatus for use in repelling rodents comprising:

control signal means operative repetitively and alternatively to develop a particular continuously variable control signal for a first predetermined time period and a particular fixed control signal for a second predetermined time period;

square wave generation means for generating ultrasonic square wave signals within a particular range of frequencies, said generation means being coupled to said control signal means and operative in response to said continuously variable control signal to continuously vary said square wave frequency over a particular frequency range during said first predetermined time period and operative in response to said particular fixed control signal to maintain a predetermined square wave frequency for said second predetermined time period and,

transducer means coupled to said square wave generation means for converting said square wave signals to sound waves.

4,001,818
DIGITAL CIRCUIT FAILURE DETECTOR

Frank Radichel, Thornton, and Richard Wirkkanen, Broomfield, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 22, 1975, Ser. No. 624,610

Int. Cl.^{2} G08B *21/00*

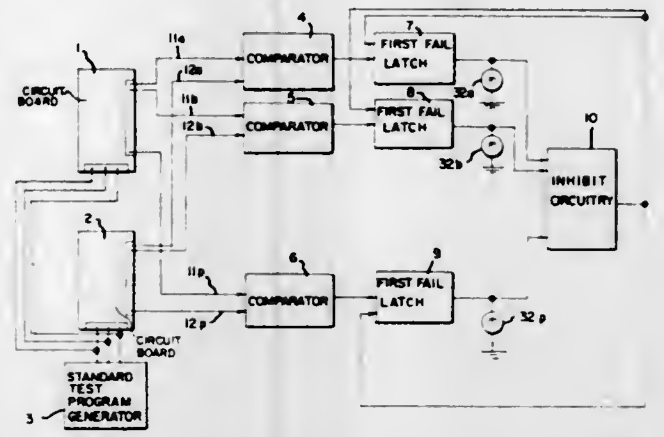
U.S. Cl. 340—415 **6 Claims**

1. A failure detector for circuit boards each having electronic circuits thereon at least some of which are serially connected so that an error signal caused by a failure of a circuit is propagated through successive circuits comprising:

a first set of lines connectable to the outputs of a plurality of circuits on a first circuit board,

a second set of lines connectable to the outputs of corresponding circuits on a second circuit board which is the same as said first circuit board,

a plurality of comparators, one for each line in said first set, corresponding lines in said first and second sets of lines being simultaneously applied to each comparator, each comparator producing an error output representing the difference between the outputs on corresponding lines of said first and second sets,



a plurality of first failure latches, one for each comparator, the error output of each comparator being applied to set the corresponding latch, and

inhibit circuitry responsive to the first occurring error output for inhibiting the further setting of first failure latches.

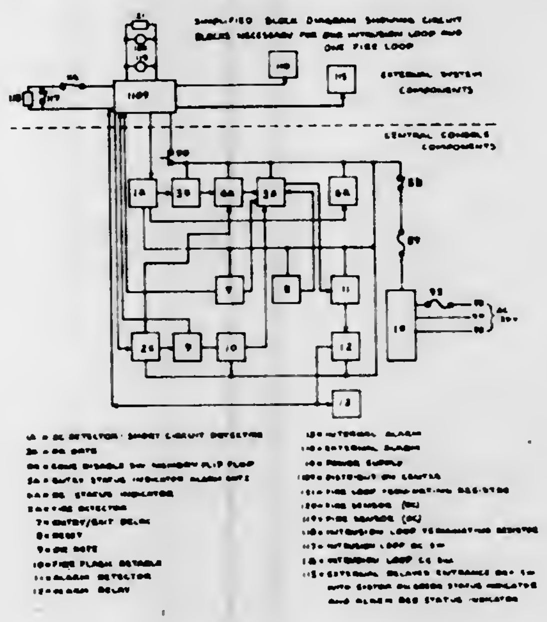
4,001,819
ALARM SYSTEM FOR COMBINED HAZARD DETECTIONS

James W. Wise, Oxon Hill, Md., assignor to Wise Security Corporation, Washington, D.C.

Filed Jan. 31, 1975, Ser. No. 545,829

Int. Cl.^{2} G08B *19/00*

U.S. Cl. 340—420 **32 Claims**



1. Alarm system comprising, in combination, first voltage source means for providing a first reference voltage, second voltage source means for providing a second reference voltage, third voltage source means for providing a detection voltage across a pair of terminals for a protective loop circuit within a protective zone, comparator means for comparing the voltage drop developed across said terminals with said first and second reference voltages, and alarm indicator means connected with said comparator means for producing an output signal if the voltage drop across said terminals is not intermediate said first and second reference voltages,

said comparator means comprising first comparator means for providing a signal output in response to detecting a voltage drop across said pair of terminals greater than both said first and said second reference voltages and second comparator means for providing a signal output in response to detecting a voltage drop across said terminals less than both said first and said second reference voltages,

each of said first comparator means and said second comparator means comprising an integrated circuit operational amplifier, said pair of terminals for a protective loop circuit within a protective zone being connected across both the positive input of one said integrated circuit operational amplifiers and the negative input of the other of said integrated circuit operational amplifiers, respectively, and said first and said second reference voltages being connected across the negative input of said one of said integrated circuit operational amplifiers and the positive input of said other of said integrated circuit operational amplifiers so that one or the other of said integrated circuit operational amplifiers will provide an output voltage signal if the voltage drop across said pair of terminals is not intermediate said first and said second reference voltages thereby to signal an alarm condition existing within said protective loop and so that an exceedingly small current is required through said protective loop and a very small voltage thereby to provide high sensitivity and safety with minimal operating expense and long battery life.

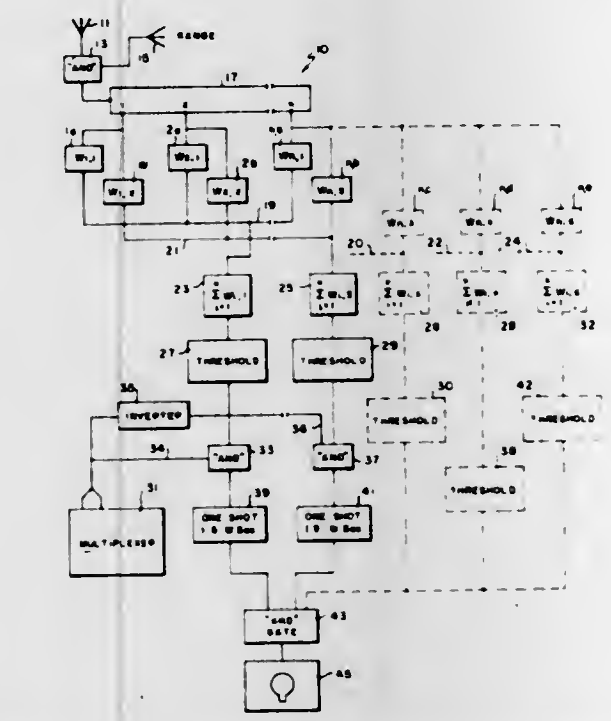
4,001,820
MULTIPLE HYPERPLANE RECOGNIZER

Erik Rosenbaum, Randallstown, and Edward G. Klimchak, Owings Mills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1971, Ser. No. 174,573

Int. Cl.^{2} G01S 7/66

U.S. Cl. 343—5 SA **7 Claims**



1. A multiple hyperplane radar signature recognizer, comprising:

a delay line;

said delay line having a series of "N" taps spaced along its electrical length;

means connected to said taps for scaling the outputs of said taps and generating a signal when said scaled outputs are above a threshold value;

a plurality of "and" gates connected to said scaling means;

each of said "and" gates corresponds to a respective antenna polarization;

means connected to said "and" gates for enabling each said "and" gate for discrete period of time; and

means connected to the outputs of said "and" gates for indicating the presence of output signals in all of said "and" gates during each "and" gate's respective enabling period.

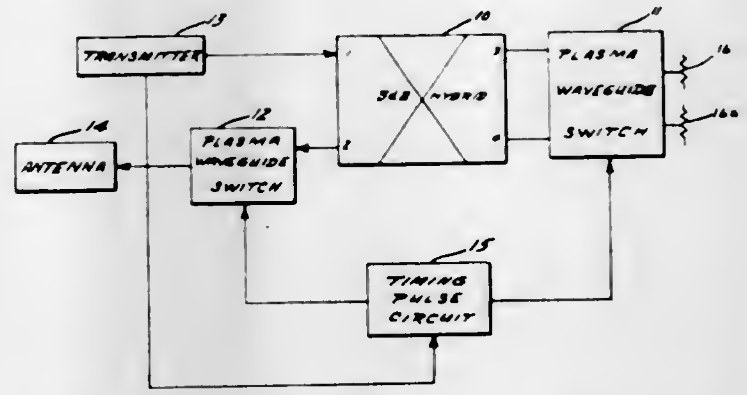
4,001,821
HIGH POWER MICROWAVE RADAR PULSE SHAPING SYSTEM

Theodore M. Nelson, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,490

Int. Cl.^{2} G01S *9/02*; **H01P** *5/18*; **H04B** *3/04*

U.S. Cl. 343—5 R **2 Claims**



1. A high power microwave radar pulse shaping system comprising a 3 dB microwave hybrid having first, second, third and fourth arms, a transmitting antenna, first and second plasma waveguide switches, each having an associated grid for the pulsing thereof for predetermined firing purposes, said first plasma waveguide switch connected to both of said third and fourth arms, said second plasma waveguide switch interconnecting said second arm and said transmitting antenna, means to pulse said first and second plasma waveguide switches at predetermined times, a microwave high power RF pulse transmitter delivering to said first arm a RF pulse, said RF pulse then being split equally by said 3 dB microwave hybrid into said third and fourth arms with the split pulses being chopped by said first plasma waveguide switch, resulting reflected pulses then being combined at said second arm with the combined pulse being chopped by said second plasma waveguide switch, the output pulse at the antenna having its sharp leading edge formed by the predetermined pulsing of said first plasma waveguide switch and its sharp falling edge formed by the predetermined pulsing of said second plasma waveguide switch.

4,001,822
ELECTRONIC LICENSE PLATE FOR MOTOR VEHICLES

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,765

Int. Cl.^{2} G01S 9/56

U.S. Cl. 343—6.5 SS **11 Claims**

11. A system for communicating information between a remote station and a vehicle comprising:

means, in said remote station, for transmitting coded interrogation signals to said vehicle and for receiving coded reply signals from said vehicle; and

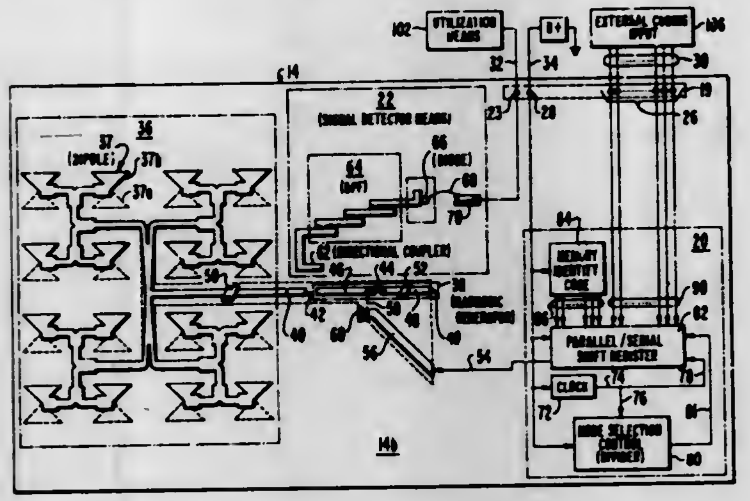
a unitary license tag, affixed to said vehicle, said tag including:

an antenna network, for receiving said interrogation signal and transmitting said reply signal,

a first transmission line coupled to said antenna network,

a non-linear device, coupled to said first transmission line and responsive to said interrogation signal and control signals applied thereto, for generating a signal at a harmonic frequency of said interrogation signal, said harmonic signal being transmitted by said antenna network as said reply signal,

encoder means, coupled to said non-linear device, for generating said control signals to said non-linear device, in



accordance with a preset code, whereby said harmonic signal is modulated in accordance with said preset code,

a second transmission line, directionally coupled to said first transmission line, and

a diode, coupled to said second transmission line and responsive to said interrogation signal, for detecting the coding of said interrogation signal.

4,001,823
PULSE RADAR METHOD AND SYSTEM

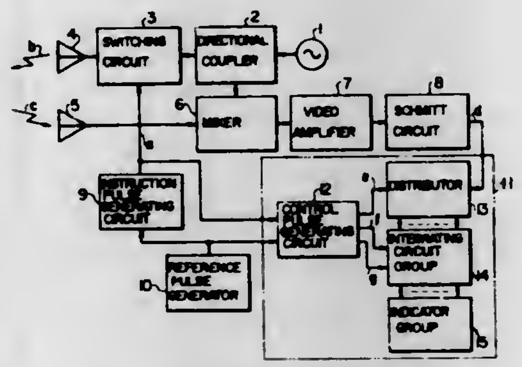
Takeshi Matsui, Kariya; Matatoyo Hinachi, Nagoya, and Masao Kotera, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 3, 1975, Ser. No. 619,474

Claims priority, application Japan, Oct. 5, 1974, 49-114855

Int. Cl.² G01S *9/06*

U.S. Cl. 343—7 A **5 Claims**



2. A pulse radar system comprising transmitter means for radiating a radar pulse in a predetermined direction and repeating said radiation of radar pulse at a predetermined frequency, receiver means for obtaining a received pulse by receiving a reflected signal of said radar pulse which has encountered and reflected from a target, and detecting means operative in synchronism with the radiation of said radar pulse from said transmitting means for detecting that the time elapsed between the radiation of said radar pulse and the reception by said receiving means of said received pulse corresponding to said radar pulse corresponds to one of preset time intervals and generating a detection signal, wherein the improvement comprises:

at least one integrating circuit means connected to said detecting means for integrating said detection signals in synchronism with said predetermined frequency and generating a confirmation signal when the resulting integrated value exceeds a predetermined level and simultaneously changing the rate of decrease of said integrated value to a reduced value; and

load means connected to said integrating circuit means for receiving said confirmation signal and indicating the detection of the presence of said target within a relative distance corresponding to said preset time interval.

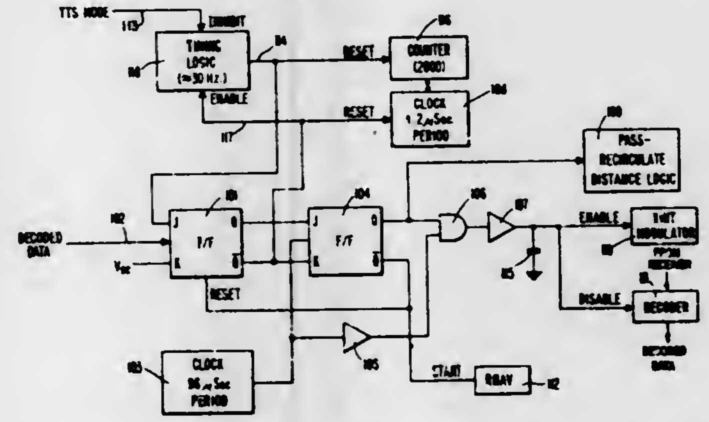
4,001,824
DME TIMING APPARATUS AND METHODS

John W. Bail, Fort Washington; Ronald Lee Powell, King of Prussia, and Frank Patterson Smith, 2nd, Dresher, all of Pa., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Apr. 28, 1975, Ser. No. 571,843

Int. Cl.² G01S *9/56*

U.S. Cl. 343—7.3 **11 Claims**



1. In an airborne DME transceiver, timing apparatus comprising:

a source of bipolar control signals having first and second output states, said first state occurring in response to a first energizing signal, said second state occurring automatically a fixed time after receipt of a second energizing signal;

means for detecting the time of receipt of a decoded DME pulse from a DME ground station; and

means, enabled by said first state and subsequent detection of a decoded DME pulse, and disabled by said second state, for respectively generating said first and second energizing signals, and for initiating a subsequent DME transission cycle.

4,001,825
PULSE RADAR APPARATUS

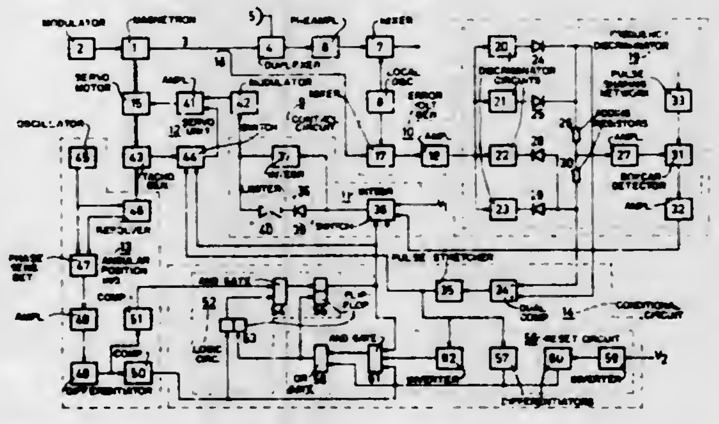
Bernhardus Walter Antonius Burgers, Haaksbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,469

Claims priority, application Netherlands, July 5, 1973, 7309382

Int. Cl.² G01S *9/02*

U.S. Cl. 343—7.5 **17 Claims**



1. Pulse radar apparatus comprising: a tunable transmitting device including movable tuning member operable for changing, within a defined frequency range, a momentary transmitter frequency f_z to a desired frequency f_{zo} which is tunable in two different positions of said member; a receiver device including a local oscillator operating at a frequency f_{lo} differing from the frequency f_{zo} about a fixed frequency f_o; a servo motor the shaft of which is coupled to said tuning member; an error voltage generator including a mixer supplied with f_z and f_{lo}, respectively, to produce a signal having a frequency Δf corresponding to the difference between f_z and f_{lo}, and including frequency discriminating means connected to the output of said mixer for deriving from said signal Δf both an error voltage proportional to the frequency difference between Δf and f_o, and frequency discriminating signals indicating the operation of the transmitter device within said defined frequency range; a source of an auxiliary voltage for a coarse adjustment of said servo motor; first switching means connected for passing in one switching position, said auxiliary voltage, and in the other switching position, said error voltage to said servo motor; an angular position indicator operatively coupled to the shaft of said servo motor to generate a signal indicating momentary angular position of said shaft; and a conditional circuit controlled by said frequency discriminating signals from said error voltage generator and by said signal from said angular position indicator to produce a first control signal applied to said first switching means to change said one switching position to said other switching position to provide a fine adjustment of said servo motor by said error voltage.

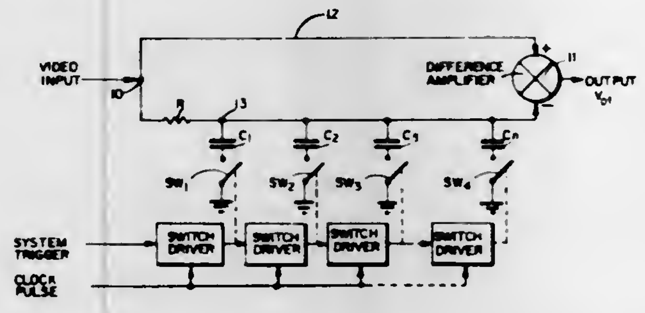
4,001,826
RANGE-GATED MOVING TARGET SIGNAL PROCESSOR

James A. Moulton, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 17, 1967, Ser. No. 639,238

Int. Cl.² G01S *9/42*

U.S. Cl. 343—7.7 **20 Claims**



1. A range-gated doppler processor having an input terminal and comprising

range-gated signal-averaging means responsively coupled to said input terminal for providing a time-averaged signal; and

first differential signal combining means responsively coupled to said input terminal and to said range-gated signal-averaging means for providing a non-zero frequency output.

4,001,827
CAMOUFLAGE MATERIAL

Erik W. Wallin, and Gunnar Lindquist, both of Gamleby, Sweden, assignors to Barracudaverken Aktiebolag, Djursholm, Sweden

Continuation of Ser. No. 568,424, April 16, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,310

Int. Cl.² H01Q *17/00*

U.S. Cl. 343—18 A **8 Claims**

1. In a camouflage material having radar-defeating capabilities and reflectance characteristics relative to visible and near visible electromagnetic radiations suitable for camouflaging under snow conditions, the combination of

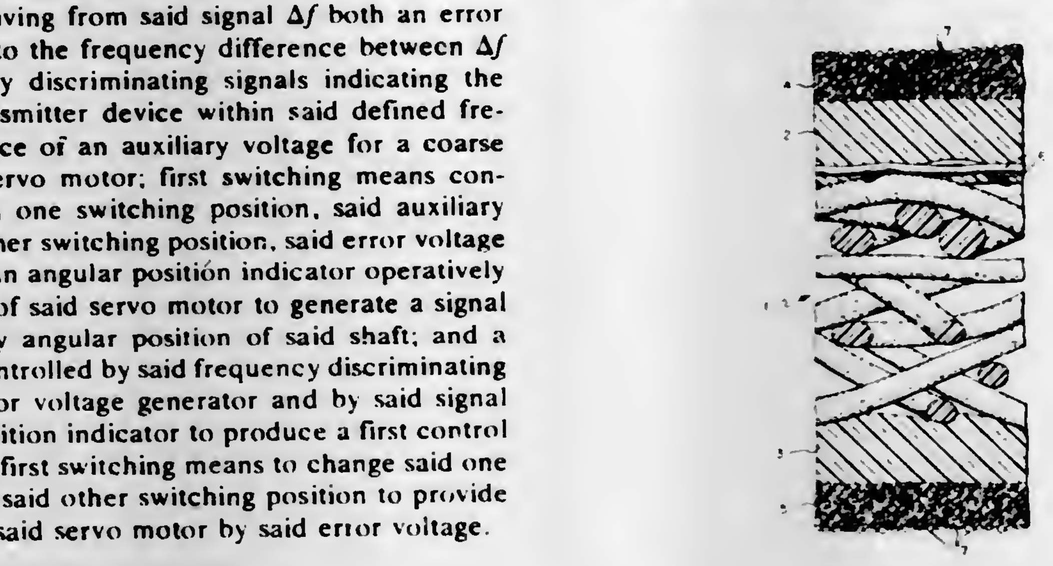
a flexible web having impedance characteristics which render the same radar-defeating;

a first flexible film covering and adhered to one surface of said web,

said first film being of a polymeric material and having at least one white pigment distributed therethrough in an amount equal to 5–50% of the total cured weight of said first film; and

a second flexible film covering and adhered to said first film,

said second film comprising a cured flexible binder heavily loaded with at least one white pigment which is highly reflective to light in the wavelength range of 3000–4000 Angstrom units,



individual particles of said at least one white pigment protruding from the exposed surface of said second film but being anchored therein,

the difference between the refractive index between said at least one pigment and said binder and the refractive index between said at least one pigment and air being such that said film reflects electromagnetic radiations within substantially the same range of wavelengths and to substantially the same extent as would said at least one pigment alone,

said camouflage material being adequately flexible at −40° C. to be draped in camouflaging fashion and being capable of being rolled and unrolled at −40° C. without delamination.

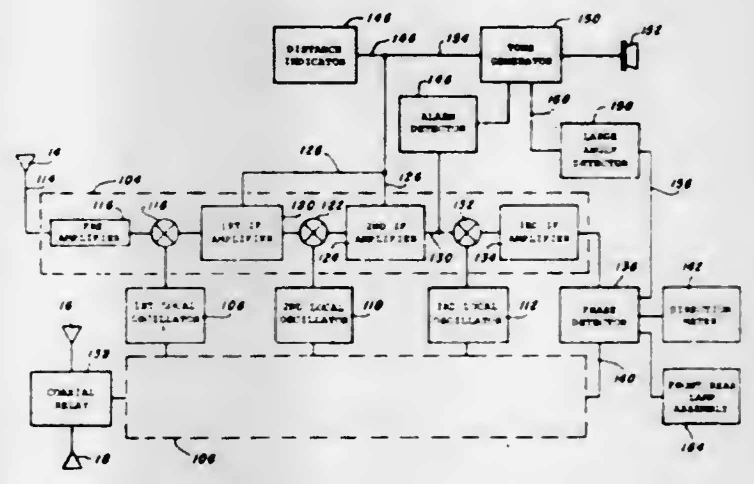
4,001,828
BEACON TRACKING RECEIVER

Jerry W. Culpepper, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1975, Ser. No. 563,983

Int. Cl.² G01S *5/02*

U.S. Cl. 343—113 R **4 Claims**

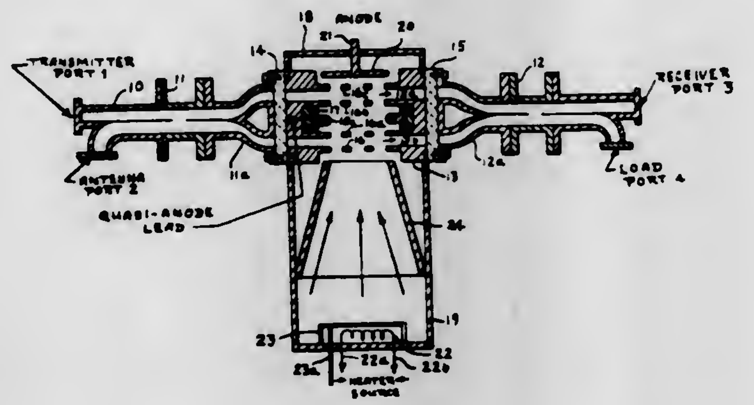


1. A receiver for receiving R.F. signals from a subminiature transmitter and producing signals indicative of the distance and position of the transmitter relative to the receiver comprising:

a. first, second and third omnidirectional antennae posi-

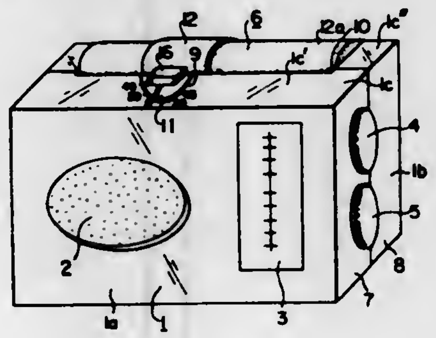
tioned preselectively on a movable support to detect transmitted R.F. signals;
b. first, second and third local oscillators for producing R.F. signals at preselected frequencies;
c. first and second triple conversion channels, each channel including a preamplifier, a first mixer coupled to the outputs of the preamplifier and first local oscillator for producing IF signals at a first preselected frequency, a first IF amplifier for amplifying the IF signals, a second mixer coupled to the outputs of the first IF amplifier and second local oscillator for producing second IF signals at a preselected frequency, a second IF amplifier for amplifying the second IF signals, an automatic gain control circuit coupled to the second IF amplifier and first IF amplifier for feeding back the output of the second IF amplifier to the first IF amplifier for increasing the response of the first amplifier to a wide dynamic range of input signals, a third mixer coupled to the outputs of the second IF amplifier and third local oscillator for producing third IF signals at a preselected frequency and a third IF amplifier for amplifying the third IF signals, said first triple conversion channel having its preamplifier input coupled to the first omnidirectional antenna and its automatic gain control circuit providing a distance measuring signal for a means for determining distance to the R.F. transmitter responsive to the strength of the detected R.F. signals;
d. a relay means for selectively coupling the second and third omnidirectional antennae to the preamplifier of the second triple conversion channel; and
e. a phase detector coupled to the outputs of the third IF amplifiers of the first and second triple conversion channels for comparing the phases of the R.F. signals from the first and second omnidirectional antennae detected signals to produce signals indicative of the left/right position of the R.F. transmitter relative to the receiver, and for comparing the first and third omnidirectional antennae detected signals to produce signals indicative of the front-/rear position of the R.F. transmitter relative to the receiver.

4,001,829
HIGH AVERAGE POWER MILLIMETER DUPLEXER
Harry Goldie, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 18, 1975, Ser. No. 606,040
Int. Cl.² H04B *1/44*
U.S. Cl. 343—180 **2 Claims**



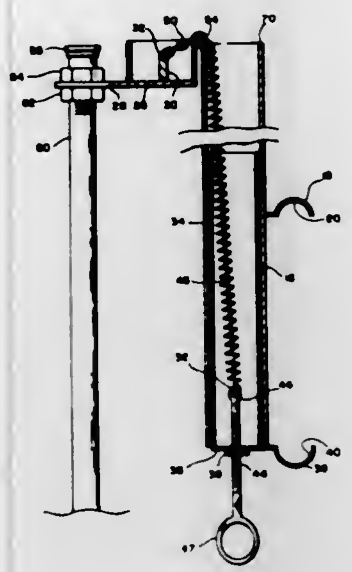
1. A high average power duplexer at millimeter wavelengths comprised of a single thyratron waveguide switch having a cathode electrode, a first anode electrode, and a grid control electrode, said grid control electrode being in the form of first and second hollow sections of first and second waveguides, respectively, said first and second waveguides being in a parallel and colinear relationship and interposed between said cathode electrode and said first anode electrode and each section having perforated sidewalls to permit the flow of electrons from said cathode electrode to said first anode electrode across said waveguide sections, said sections of waveguides being sealed into an envelope structure encompassing all of said electrodes and including first and second pressure windows closing said hollow first and second waveguides on points on either side of the perforated portions of said walls to complete said envelope, an ionizable gas in said envelope, said cathode electrode constituting an extended source of free electrons to provide a single beam, a convergence cone for increasing the density of said electrons in said waveguide sections relative to the density of said electrons at their source, said convergence cone positioned between said cathode electrode and said grid control electrode, a second anode electrode interposed between said first and second waveguides to aid in turn-on, first and second short slot hybrids forming a balanced four-port configuration, said first short slot hybrid being electrically connected to said first and second waveguides by way of said first window, and said second short slot hybrid being connected to said first and second waveguides by way of said second window, a transmitter port and an antenna port connected to said first short slot hybrid, and a receiver port and a load port connected to said second short slot hybrid.

4,001,830
RADIO RECEIVER SET WITH ROTATABLE ANTENNA
Satoshi Ishimaru, Kashiwara; Hiroshi Maeda, Sakai, and Tatsuto Mizukami, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 18, 1975, Ser. No. 605,322
Claims priority, application Japan, Aug. 20, 1974, 49-100172
Int. Cl.² H01Q *1/24*
U.S. Cl. 343—702 **5 Claims**



1. A radio receiver set having a rotary antenna device comprising:
a. a cabinet having a top plate with communicating circular and elongated recesses formed therein; a printed circuit board having a radio receiver circuit thereon located within said cabinet; a hollow cylindrical rotary body positioned within said circular recess; and a first mounting member secured within said cabinet, said rotary body being pivotably mounted to said first mounting member; and
b. a hollow antenna housing case positioned within said elongated recess; a ferrite rod antenna located within said antenna housing case and electrically connected to the radio receiver circuit on said printed circuit board; a second mounting member, said antenna housing case being pivotably mounted to said rotary body by said second mounting member to permit adjustment of the elevation angle of said antenna housing case with respect to said rotary body; and a click mechanism between said antenna housing case and said rotary body for positioning said antenna housing case at a selected elevation angle, said case being held at a selected elevation angle by said click mechanism when said case is withdrawn from said elongated recess and rotated with said rotary body with respect to said first mounting member.

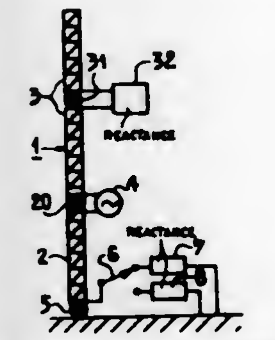
4,001,831
PORTABLE ANTENNA MOUNT FOR TRUCKS
Harold F. Harvey, Sand Springs, Okla., assignor to Millard F. Roberts, Tulsa, Okla., a part interest
Filed Aug. 1, 1975, Ser. No. 601,166
Int. Cl.² H01E *1/32*
U.S. Cl. 343—715 **6 Claims**



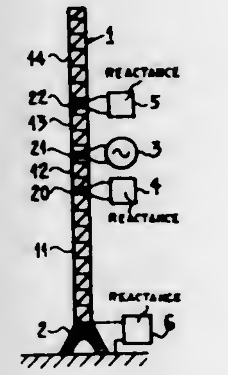
1. Antenna attachment means for removable attachment of a radio antenna to a vehicle rearview mirror mount and comprising:
a. an elongated outer sleeve member having a first mounting hook secured thereto.
b. an elongated inner sleeve member having one end thereof slidably disposed within the outer sleeve member, the opposite end having an end plate secured thereto and a second mounting hook secured thereto and disposed oppositely from the first mounting hook.
c. a cap plate removably secured to one end of the outer sleeve opposite the inner sleeve end plate and having means for attaching the radio antenna thereto.
d. yieldable means disposed within the sleeve member one end thereof being attached to the inner sleeve end plate and the opposite end being attached to the cap plate, the yieldable means having a hook secured thereto and spaced from the cap plate, said hook being engageable with the end of the outer sleeve when the cap plate is removed from the outer sleeve against the force of the yieldable means.

4,001,832
VERTICAL ANTENNA HAVING AN OFF-CENTER SUPPLY
René Chesneau, and Jean-Marc Martin, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Oct. 2, 1975, Ser. No. 619,038
Claims priority, application France, Oct. 4, 1974, 74.33529
Int. Cl.² H01Q *9/16, 9/34*
U.S. Cl. 343—747 **3 Claims**

1. A vertical antenna having an insulator at substantially one third of its height and a feed input comprising two terminals, said terminals being separated by said insulator, said height being substantially equal to 0.9λ, where λ is the wavelength corresponding to its operational frequency, in order to produce an inversion of the sign of the phase of the current above and under said feed input.

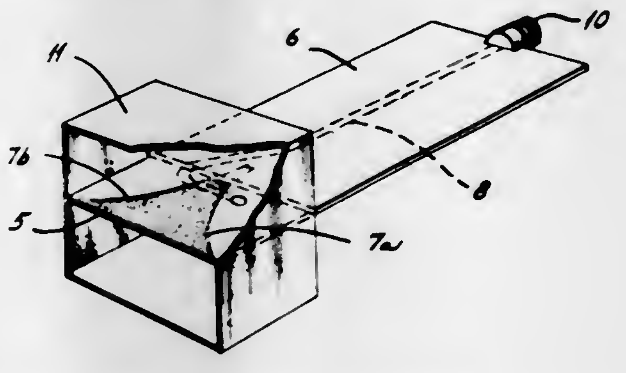


4,001,833
WHOLE WAVE VERTICAL ANTENNA
René Chesneau, and Jean-Marc Martin, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Oct. 3, 1975, Ser. No. 619,356
Claims priority, application France, Oct. 4, 1974, 74.33528
Int. Cl.² H01Q *9/34, 9/18*
U.S. Cl. 343—747 **4 Claims**



1. A whole wave vertical antenna having a feed input, comprising two terminals, above and near its middle point, and comprising first and second inductive reactances, each having two terminals, serially inserted in said antenna, respectively above and below said feed input, so as to determine, by means of an inversion of the phase of the currents on each side of said feed input, a curve of current distribution along the antenna delimiting with the axis thereof three successive regions of which the center one has a surface about one half of that of each of the other two.

4,001,834
PRINTED WIRING ANTENNA AND ARRAYS FABRICATED THEREOF
Terry M. Smith, La Honda, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.
Filed Apr. 8, 1975, Ser. No. 566,607
Int. Cl.² H01Q *9/28*
U.S. Cl. 343—754 **9 Claims**



1. A printed wiring antenna comprising:

at least one insulating substrate sheet having conductors bonded to both faces thereof,

a first conductor on a first face of said substrate having a relatively large area almost covering said first face, said first conductor having a tapered notch therein, said notch having a narrow end and increasing divergence toward the other end, said notch extending to have maximum divergence at one edge of said substrate, said maximum divergence being approximately equal to the width of said substrate and approximately equal to one electrial wavelength at the nominal operating frequency of said antenna, whereby the tapered conductors defined by said notch produce broadband antenna action when electrical energy is applied across said narrow portion of said notch,

a second conductor on a second face of said substrate contoured to act as a microstrip transmission line, said second conductor extending over said substrate opposite said first conductor which acts as a ground plane thereto to provide microstrip transmission line action,

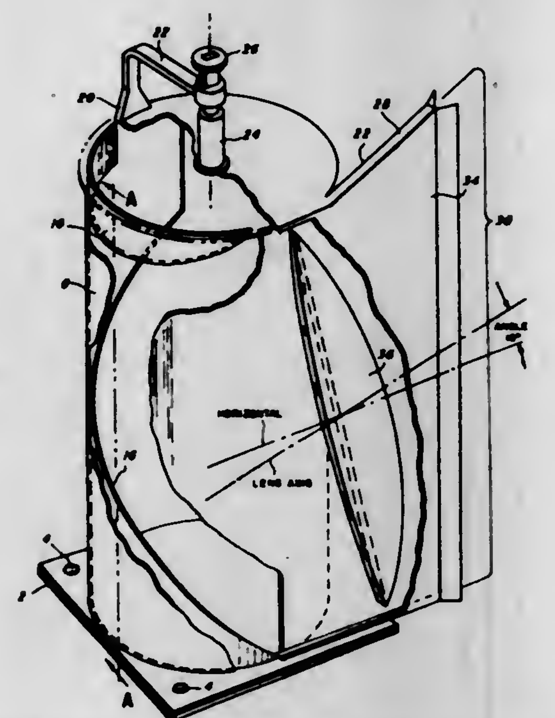
means coupled through said substrate for electrically connecting said line to said first conductor at a point located along said notch and

means for applying radio frequency energy between said second conductor and said first conductor.

4,001,835
SCANNING ANTENNA WITH EXTENDED OFF BROADSIDE SCANNING CAPABILITY

R. Thomas Dover, and Christian O. Hemmi, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 12, 1975, Ser. No. 576,919
Int. Cl.^{2} H01Q *3/18, 19/06*
U.S. Cl. 343—754 8 Claims



1. A wide angle microwave scanning antenna comprising:

a waveguide assembly of two parallel conductive sheets spaced apart for providing a path for microwaves therebetween,

said waveguide assembly having an input end for receiving microwave energy and a vertical output end for radiating said received energy in a pattern over a preselected range of elevation angles,

a microwave focal lens positioned between said parallel conductive sheets with its axis inclined from the perpendicular to the radiating aperture.

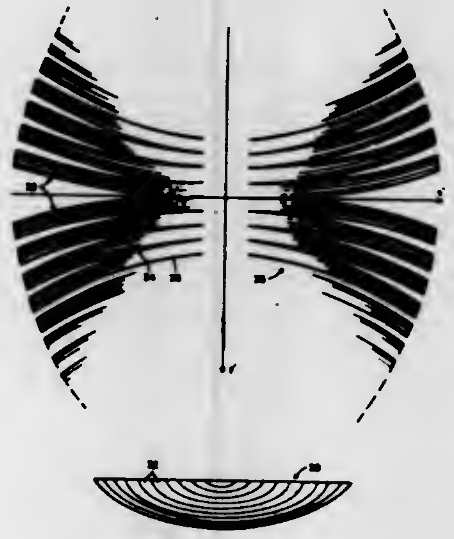
feed means for coupling microwave energy from a source of microwave energy into said input end of said assembly including a movable feed element positioned substantially in the focal path of said focal lens throughout a preselected range of movement, the location of said feed element controlling the elevation angle of said radiated energy, and

means coupled to said feed element for moving said element in said focal path.

4,001,836
PARABOLIC DISH AND METHOD OF CONSTRUCTING SAME

John S. Archer, Palos Verdes Peninsula, and Harry J. McCracken, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 28, 1975, Ser. No. 554,038
Int. Cl.^{2} H01Q *19/12*
U.S. Cl. 343—756 7 Claims



1. The method of constructing a parabolic dish of focal length F and comprising narrow segments disposed side by side whose projection onto a plane normal to the principle axis of the dish and containing x and y coordinate axes intersecting at an origin on the principle axis is a plane figure divided into narrow increments parallel to the x-axis and spaced along the y-axis and each having a side adjacent and parallel to the x-axis which intersects the y-axis at an axis intersection point and terminates in end points on the perimeter of the figure, said method comprising the steps of:

forming from relatively thin flexible sheet material an assembly of curved strips corresponding to said increments, respectively, and arranged side by side in the same order as said increments and each strip having a convex edge and an opposite concave edge, the convex edge of each strip conforming to a curve passing through said axis intersection point of said adjacent side of the corresponding increment and defined by the locus of points expressed by the parzmetric equations:

$$x = x_o + \frac{1/24F^2}{\left[1 + \left(\frac{y_o}{2F}\right)^2\right]} x_o^3 - \frac{1/640F^4}{\left[1 + \left(\frac{y_o}{2F}\right)^2\right]^2} x_o^5 + \ldots$$

$$y = \frac{y_o/8F^2}{\left[1 + \left(\frac{y_o}{2F}\right)^2\right]} \cdot x_o^2$$

where: x_o is any x coordinate value between and including the x coordinates of the end points of the adjacent side of the corresponding increment,

y_o is the y coordinate of the axis intersection point of the adjacent side of the corresponding increment,

and the spacing w between said convex and concave edges of each strip parallel to said y-axis is uniform and equal to

$$w = \sqrt{1 + \left(\frac{y_o}{2F}\right)^2} \; w'$$

where: w' is the width parallel to the y-axis of the corresponding increment;

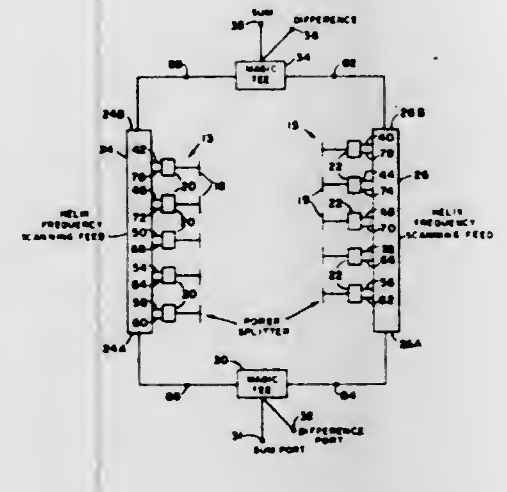
deforming said strips transverse to the plane of the strips to bring their adjacent convex and concave edges into contiguous relation wherein the strips conform to a parabolic curvature; and

joining the contiguous strip edges.

4,001,837
DUAL SCAN CORNER REFLECTOR ANTENNA

Kenneth M. Regenos, Palo Alto, and Normand Barbano, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1976, Ser. No. 647,694
Int. Cl.^{2} H01Q *3/26, 19/16*
U.S. Cl. 343—815 4 Claims

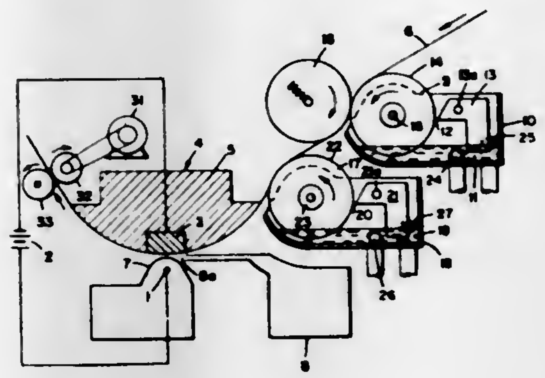


1. A dual scan corner reflector antenna beam forming network comprising: first and second planar microwave reflector surfaces disposed for forming a throat at an acute angle therebetween, a plurality of dipole antennas uniformly disposed in said throat for radiating and receiving microwave energy, a first helix frequency scanning feed coupled to a first portion of said dipole antennas for coupling microwave energy thereto, a second helix frequency scanning feed coupled to a second portion of said dipole antennas for coupling microwave energy thereto, first and second hybrid junctions coupled to both of said helix feeds for coupling microwave energy to and from respective ends of said feeds for providing simultaneous and independent radiation scanning operation of said antenna.

4,001,838
METHODS AND APPARATUS FOR CLEANING PAPER IN A HIGH SPEED ELECTROSTATIC PRINTING APPARATUS

Ronnie Joseph Maddox, San Jose, Calif., assignor to Electroprint, Inc., Cupertino, Calif.

Filed Apr. 1, 1974, Ser. No. 456,508
Int. Cl.^{2} G03G *21/00*
U.S. Cl. 346—153 46 Claims



1. Apparatus for controlling unwanted loose or easily lossened particulate matter on paper comprising:

means for edgewise transporting the paper along a path;

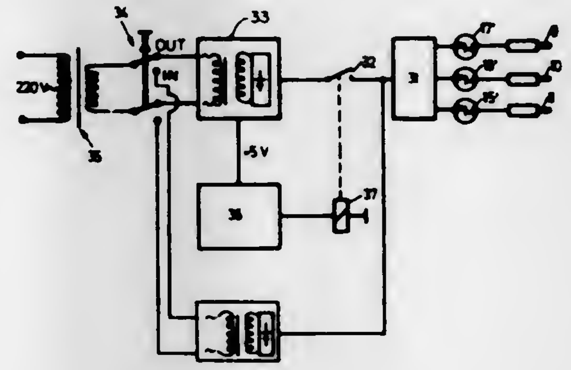
roller means positioned to engage one surface of the paper during transport along the path, said roller mounted for rotation such that its surface velocity substantially matches that of the paper at their respective points of engagment; and

means for wetting the paper-engaging surface of said roller means with a thin film of liquid to wet the paper tending to cause a portion of the particulate matter to be held on the paper surface and to cause another portion of the particulate matter to be removed from the paper surface by adhering to said roller means.

4,001,839
LIQUID JET RECORDER

Helmut Kraus, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 30, 1974, Ser. No. 511,031
Claims priority, application Germany, Oct. 2, 1973, 2349459
Int. Cl.^{2} G01D *15/18;* B41J *3/04*
U.S. Cl. 346—75 6 Claims



1. In a liquid jet recorder having at least one jet nozzle directed towards a recording carrier; and a pump connected to said jet nozzle for supplying recording liquid thereto; an electrical power supply for energizing said pump during recording periods of said recorder, the improvement comprising: a timer switch arrangement connected to said pump; and a switch having first and second positions, said switch connecting said power supply to said pump in said first position, said switch connecting said power supply to said timer switch arrangement in said second position, said timer arrangement being adapted to actuate said pump for short periods of time

when said recorder is in a non-recording state whereby recording liquid is pumped to said nozzle during non-recording intervals to avoid nozzle clogging.

4,001,840

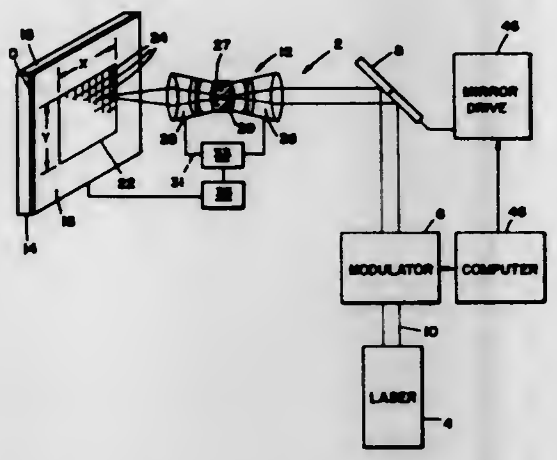
NON-PHOTOGRAPHIC, DIGITAL LASER IMAGE RECORDING

Carl H. Becker, Menlo Park; Herman Wong, Los Altos Hills, and William J. Kaspari, Portola Valley, all of Calif., assignors to Precision Instrument Co., Santa Clara, Calif.

Filed Oct. 7, 1974, Ser. No. 512,782

Int. Cl.^{2} G01D *15/14*

U.S. Cl. 346—76 L **4 Claims**



1. A real time, flat-field laser recording system employing an ablatable recording medium carried on a flat substrate comprising:
   - holding means for positioning the recording medium flat in a recording plane;
   - a diffraction limited twin objective having first and second spaced-apart, aligned lens means for focusing a laser beam in a diffraction limited spot in the focal plane of the first lens means and for projecting a diffraction limited, focused image of the spot in the recording plane irrespective of the relative angular inclination of the incoming beam relative to the twin objective;
   - means between the lens means of the twin objective filling the optical path between the lens means with a material having an index of refraction substantially equal to the index of refraction of the lens means;
   - a laser for emitting a laser beam;
   - means for modulating the laser beam; and
   - mirror means for angularly deflecting the laser beam with respect to the optical axis of the twin objective;
   - whereby such angular deflection of the laser by the mirror means causes a corresponding angular deflection of the focused image over the recording plane in corresponding X and Y directions while the modulation of the laser beam by the modulating means causes the formation of a two-dimensional ensemble of ablated holes in the recording medium at a line speed equal to the operating speed of the mirror means.

4,001,841

RECORDING HEAD ARRAY WITH PASSIVE POLE

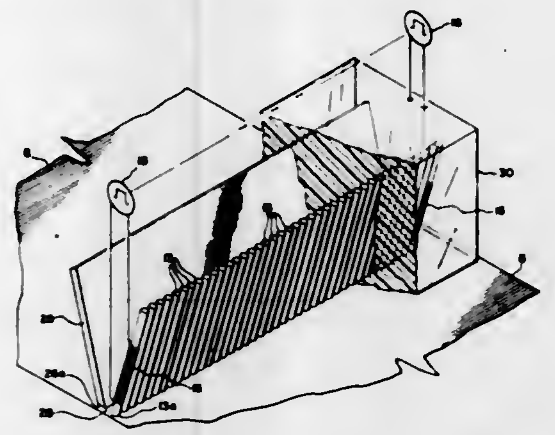
Ami E. Berkowitz, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,595

Int. Cl.^{2} G03G *19/00*; G11B *5/27*

U.S. Cl. 346—74.1 **11 Claims**

1. A magnetic recording head array comprising:
   - a flat sheet of magnetic material having a straight edge defining a first pole;
   - a compound second pole comprising a plurality of cores comprising straight pins of magnetic material, one end of each of said pins defining a pin pole, said pins being disposed in a plane forming an acute angle with said sheet and further being, at all points, separated from said sheet to define a gap therebetween, the permeability of said gap being substantially less than the permeability of said magnetic materials, said ends of said pins being further disposed on a straight line lying parallel to said edge of said sheet in a recording plane; and
   - a plurality of conductive windings wrapped on said cores.



4,001,842

APPARATUS FOR MAKING ELECTRO-LUMINESCENT SCREENS FOR COLOR CATHODE-RAY TUBES OF CONTINUOUS PHOSPHOR STRIPES

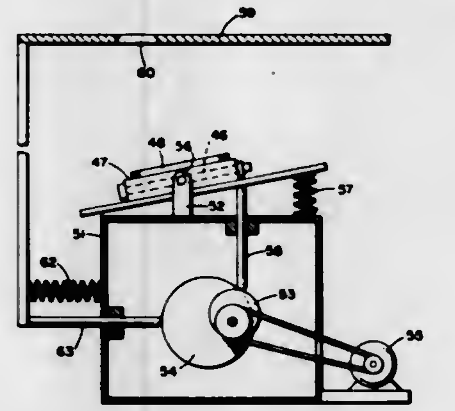
Takeshi Suzuki; Hiroshi Tanaka, both of Fukaya, and Masanori Akiyama, Honja, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 386,317, Aug. 7, 1973, Pat. No. 3,890,151. This application May 5, 1975, Ser. No. 574,639

Claims priority, application Japan, Aug. 7, 1973, 48-78420

Int. Cl.^{2} G03B *41/00*

U.S. Cl. 354—1 **10 Claims**



1. Apparatus for making an electroluminescent screen for a color cathode-ray tube comprising a plurality of separate color fields of continuous vertical stripes disposed on the viewing panel of said electroluminescent screen, each of said color fields being defined by exposing panel to light from a linear light source through a concave shadow mask attached to said panel, said shadow mask having a number of beam-passable apertures arranged in rows parallel with each other, the light projected from said light source through said mask apertures onto said panel producing a developable image on said panel, the apertures along the length of each of said rows being separated from each other by beam-intercepting bridge portions, comprising:
   - a. means for locating said light source at a predetermined position on the opposite side of said shadow mask for irradiating said shadow mask and projecting light from said source on an area of said panel in a pattern comprising images defined by the apertures of said shadow mask, said light source having a sufficient effective length in the lengthwise direction of the rows of the apertures to produce on said panel an image of each aperture so expanded in the lengthwise direction of the rows of the apertures as to overlap the image of each adjacent aperture in the lengthwise direction of each of the rows;
   - b. means for limiting the irradiated area on the shadow mask to a length covering a portion of the length of the rows of the apertures, the apertures within said lighted area having a nearly equal angle of inclination with respect to the vertical axis of said screen;
   - c. means cooperating with said limiting means for moving said irradiated area on the shadow mask along the length of the rows of the apertures; and,
   - d. means for controlling the inclination of said light source to keep the longitudinal axis thereof substantially parallel to a line drawn tangent to the shadow mask apertures in the irradiated area.

4,001,843

PHOTOGRAPHIC CONTROL SYSTEM WITH EVALUATION CONTROL

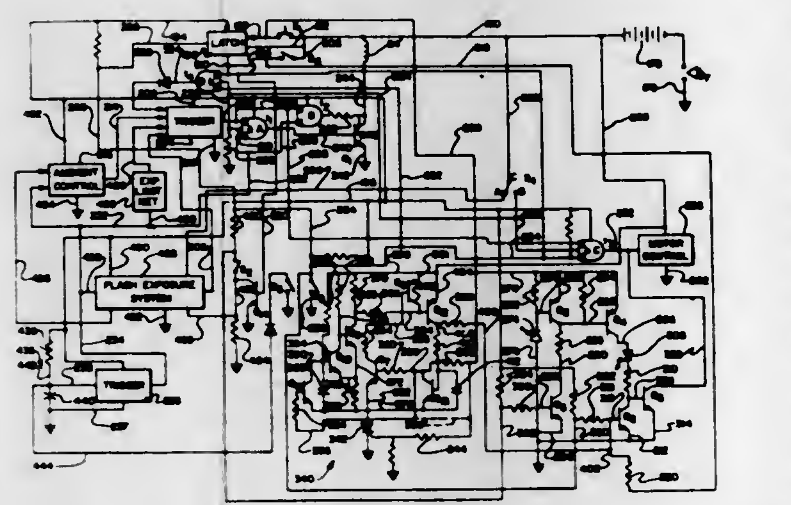
Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 424,556, Dec. 13, 1973. This application July 29, 1974, Ser. No. 492,774

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.^{2} G03B *7/00*

U.S. Cl. 354—23 D **38 Claims**



1. In an exposure control system actuable to automatically carry out a photographic exposure cycle effecting the exposure of photographic material in accordance with the brightness level of a scene, the improvement comprising:
   - detector means responsive to said scene brightness and having a signal condition in the presence of levels of brightness below a predetermined level;
   - selectively engageable inhibit means responsive to said signal condition for preventing the carrying out of a said exposure cycle when enabled upon actuation of said system; and
   - override means for suppressing said inhibit means enablement for a predetermined interval of time following an initial said actuation of said system.

4,001,844

EXPOSURE CONTROL SYSTEM

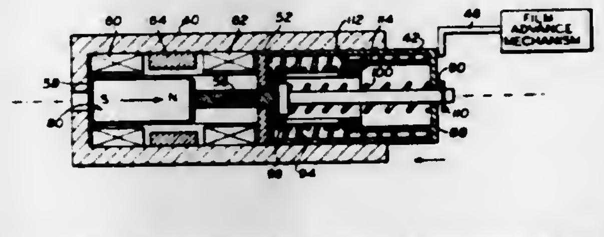
Richard D. McClintock, Washington Road, Woodbury, Conn. 06798

Filed Aug. 12, 1974, Ser. No. 496,765

Int. Cl.^{2} G03B *7/08, 9/62*

U.S. Cl. 354—51 **26 Claims**

1. A system for controlling the closing of a photographic camera shutter in response to initiation of shutter closure comprising exposure control means for detecting the available light level in the photographic field of view of the camera and providing an output control signal a predetermined time after said shutter closure initiation dependent on said detected available light level, power supply means operatively connected to said exposure control means for providing power to said exposure control means, said power supply means comprising magnetic generator means comprising an electric coil means and a magnetic means mechanically movable with respect to said coil means for providing an output signal for powering said exposure control means in response to said relative mechanical movement of said magnetic means with respect to said coil means, and storage means for storing said generated output signal until discharge of said storage means, said exposure control means output control signal comprising a predetermined quantity of said stored generated output signal, said exposure control means further comprising means for discharging said storage means to provide said output control signal dependent on said detected available light level and gating means operatively connected to said discharge means and responsive to a predetermined value of said discharge means output control signal for providing the quantity of stored generated output signal remaining on said storage means when said predetermined value is reached as a shutter closure signal, and solenoid means comprising a solenoid coil operatively connected between said gating means output and said camera shutter for holding said shutter open after said shutter closure initiation until said solenoid coil is energized, said solenoid coil being operatively connected to said exposure control means gating means output for receiving said shutter closure signal from said exposure control means gating means output, said shutter being responsive to said received shutter closure signal to cause said camera shutter to close as a result thereof, whereby power drain in said system is minimized until the camera shutter is closed, and said camera includes a film advance means for providing the film in the appropriate position for taking a photograph prior to said shutter closure initiation, said film advance means being operatively positioned adjacent said mechanically movable camera means for mechanically moving said means to fire said generator simultaneously with said film advance for providing a first stroke of said generator for providing said generator output signal for charging said storage means as a result of said film advance.



4,001,845

ELECTRICAL SHUTTER CIRCUIT FOR CAMERA

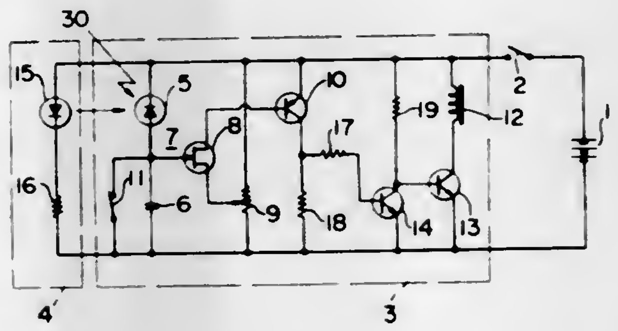
Yoshihisa Maitani, and Akihiko Hashimoto, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1975, Ser. No. 555,373

Claims priority, application Japan, Mar. 22, 1974, 49-32700[U]

Int. Cl.^{2} G03B *17/20, 7/08*

U.S. Cl. 354—51 **4 Claims**



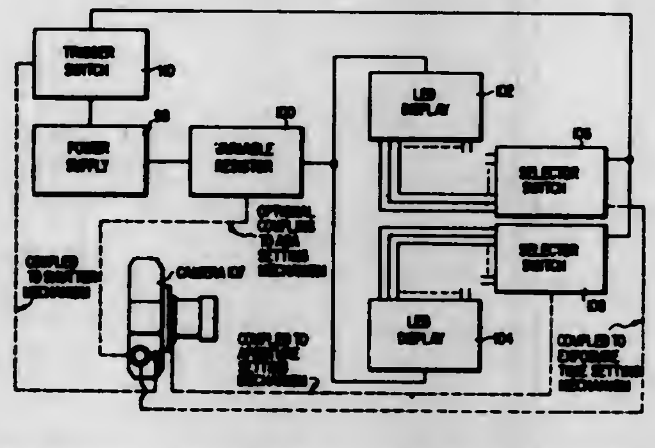
1. For use in preventing the premature exhaustion of a

battery in a camera, an electrical circuit assembly for the camera comprising a shutter assembly and a control circuit therefor which is responsive to a shutter opening operation for automatically controlling the closing of the shutter assembly, the shutter control circuit including a photoelectric transducer element responsive to light reflected from an object being photographed for generating an output which aids in determining a proper exposure period in accordance with the brightness of the reflected light, integrating means connected in electrical series with said transducer element and responsive to the output of said element for developing a signal increasing toward an output level at a rate controlled by the magnitude of said transducer element output; means responsive to the presence of said output level for closing said shutter assembly; and a photo-bias circuit having a light emitting element for irradiating the photoelectric transducer element with light of a given intensity; a battery type portable power source, switch means for simultaneously energizing the light emitting element and the transducer element from the power source when the shutter opening operation is initiated, said photo-bias circuit element being connected in series with a resistor element for selective connection across said power source and being energized immediately upon initiation of the exposure and remaining energized at a constant value throughout the entire exposure period and regardless of the length of the exposure period or the intensity of light reflected from the subject and picked up by the transducer element, the value of the resistance element maintaining the intensity of illumination constant to controlling the shutter control circuit to close the shutter assembly at a given period of time after a shutter opening operation which given period is greater than a maximum designated period for a normal photographing operation, in the event that light reflected from an object being photographed which is incident on the photoelectric transducer element, while the shutter assembly is open, is very weak or absent, so as to enable the shutter assembly to remain open at least long enough to permit the occurrence of a normal photographing operation.

4,001,846
RECORDING SYSTEM FOR PHOTOGRAPHIC CAMERAS

John J. Kauneckas, 2301 E Street, NW., Washington, D.C. 20037

Filed Aug. 9, 1974, Ser. No. 496,314
Int. Cl.² G03B *17/24*
U.S. Cl. 354—105 **13 Claims**



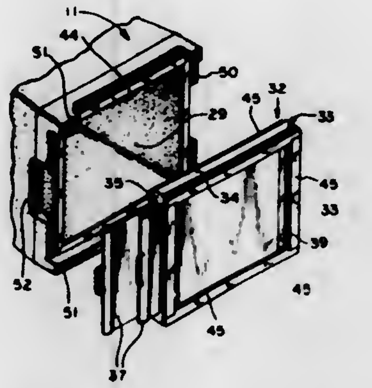
1. An improved system for automatically recording images representative of camera settings on photographic film comprising:

a film backing member of engaging said film within said camera,
display means mounted in said film backing member and including a plurality of light emitting electroluminescent devices adapted to record coded images on said film, said electroluminescent devices selectively energizable to form a plurality of said coded images;
light diffusing means including reflecting chambers formed in said film backing member associated with said light emitting electroluminescent devices for diffusing light emanating therefrom,
multiple position selector means designed to be coupled to said camera for movement with camera setting mechanisms for identifying selected settings thereof, said selector switch coupled to said display means for varying said coded images.

4,001,847
OSCILLOSCOPE CAMERA

Neal McGrath, Alexandria, Va., assignor to Illinois Nuclear Electronics, Inc., Addison, Ill.

Filed Sept. 2, 1975, Ser. No. 609,444
Int. Cl.² G03B *19/10*
U.S. Cl. 354—174 **8 Claims**

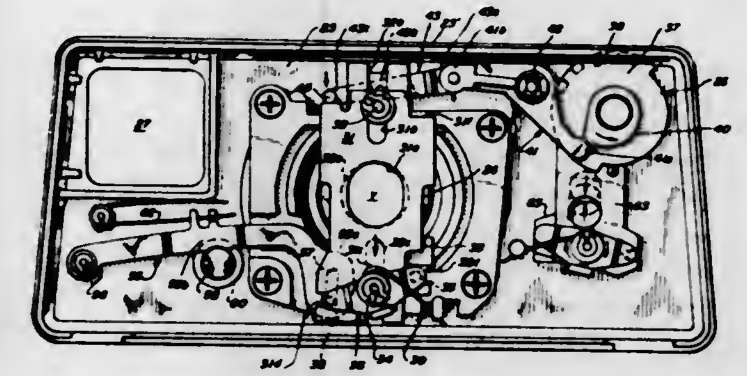


1. A camera for photographing a cathode-ray tube comprising a box having a lens mounted therein, a shielded opening on one side of the lens for attachment to a cathode-ray tube, a second shielded opening on the other side of the lens adapted to receive film means onto which an image may be received from the lens, said film means including a film cassette having peripherally mounted continuous magnetic means, and magnet means including a strip of resilient magnet material mounted on the box at said second shielded opening for receiving said magnetic means of said film cassette to magnetically mount the cassette on the box and to seal against light loss between the second opening and the cassette.

4,001,848
CAMERA CONSTRUCTION

Israel Nesson, Brighton, Mass.; Edwin E. Faris, Wyckoff, and Robert G. Palmer, Wayne, both of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

Filed June 12, 1975, Ser. No. 586,257
Int. Cl.² G03B *3/00, 13/02*
U.S. Cl. 354—196 **7 Claims**

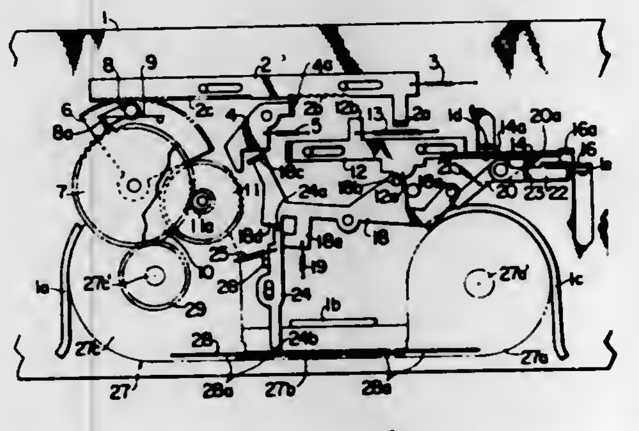


1. In a camera construction having a pair of iris blades mounted for simultaneous relative movement in opposite directions to define an iris opening of selected configuration, and control means for effecting movement of the iris blades; said control means comprising a manually adjustable first unit for effecting movement of the iris blades in response to the adjustment of said first unit, a second unit spaced from said first unit and manually adjustable independently thereof for effecting movement of the iris blades in response to the adjustment of said second unit, and a movable member common to said first and second units and independently movable thereby for imparting motion to the iris blades; said movable member including a link assembly having a lever adapted to engage one of the iris blades and effect movement thereof, said lever being mounted for pivotal movement about a plurality of selected pivotal axes, the pivotal axis selected for said lever being dependent upon which of said units is manually adjusted.

4,001,849
PHOTOGRAPHIC CAMERA FOR USE WITH FILM CARTRIDGE

Tamotsu Takahashi, Tokyo, Japan, assignor to Copal Company Limited, Toyko, Japan

Filed Apr. 9, 1975, Ser. No. 566,430
Claims priority, application Japan, Apr. 11, 1974, 49-41689
Int. Cl.² G03B *17/42*
U.S. Cl. 354—207 **3 Claims**



1. A photographic camera for the use of film cartridges comprising:

a base plate,
a setting member slidably mounted on said base plate and moved between its uncocked position and its cocked position,
a control lever pivotally mounted on said base plate and engaged with said setting member,
a sensing lever slidably and rotatably mounted on said base plate and engaged with said control lever,
a film cartridge capable of being mounted on said base plate and containing a film having perforations engageable with said sensing lever,
a lock member rotatably mounted on said base plate and operatively connected with said control lever, and
a release member movably mounted on said base plate and engageable with said lock member,
said release member being disposed and constructed for movement to return said setting member from its cocked position to its uncocked position only when said sensing lever engages with one of said perforations of said film, and
said sensing lever being disposed and constructed for disengagement from one of said perforations by said control lever when said setting member returns to its uncocked position from its cocked position.

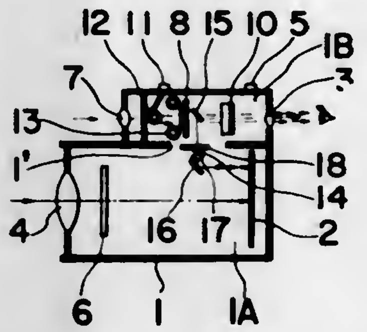
4,001,850
DATA RECORDING CAMERA

Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 20, 1975, Ser. No. 624,020
Claims priority, application Japan, Oct. 25, 1974, 49-123813
Int. Cl.² G03B *17/24, 13/02*
U.S. Cl. 354—219 **3 Claims**

1. In a camera comprising a film exposure system which includes an object lens system for focussing of image-wise light onto photosensitive film material provided in said camera and shutter means selectively movable to positions to permit or to prevent passage of said image-wise light onto said film material, a viewfinder system which is provided independently of said film exposure system and includes an eyelens permitting viewing of an object from which image-wise light may be directed by said object lens system onto said film material, and camera wall portions defining a film exposure system compartment and a viewfinder system compartment, the improvement comprising:

externally adjustable data specification means to selectively present different items of data,
first optical means for directing said image-wise light carrying said data content to said eyelens, whereby said data content is viewable in said viewfinder system,

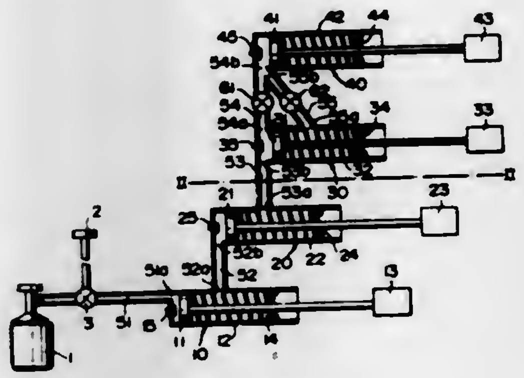


second optical means for directing said image-wise light carrying said data content onto a portion of said film material, whereby said data content may be recorded on said film material, and
gate means operatively coupled to said shutter system and movable to closed position and open position, said gate means being closed to prevent passage by said second optical means of said image-wise light onto said film material when said shutter means is closed, and being opened to permit passage of image-wise light onto said film material by said second optical means when said shutter means is opened, whereby content of said data specification means may be selectively recorded on said film material.

4,001,851
GAS PRESSURE DEVICE FOR DRIVING OPERATING MEANS IN A CAMERA

Toshihiro Kondo, Tokyo, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Photo Film Co., Ltd., both of, Japan

Filed Oct. 16, 1975, Ser. No. 622,853
Claims priority, application Japan, Oct. 16, 1974, 49-119047; Oct. 16, 1974, 49-119046
Int. Cl.² G03B *17/00*
U.S. Cl. 354—266 **20 Claims**



1. A device for sequentially driving a plurality of operating means in a camera comprising a plurality of operating members connected with operating means in a camera for actuating the same, a plurality of pressure conversion means each

including a movable member which convert gas pressure to a movement of the movable member, each said operating member being connected with a movable member so that the operating members are actuated by the pressure of the gas supplied to said pressure conversion means, a gas supply means for supplying a gas to said pressure conversion means, and a flow control means provided between the gas supply means and at least one of said pressure conversion means for controlling the rate of flow of the gas flowing into the pressure conversion means.

4,001,852
ROTATING AUGER ARRANGEMENT FOR PUMPING PROCESSING FLUID THROUGH A FILM DEVELOPING CONTAINER

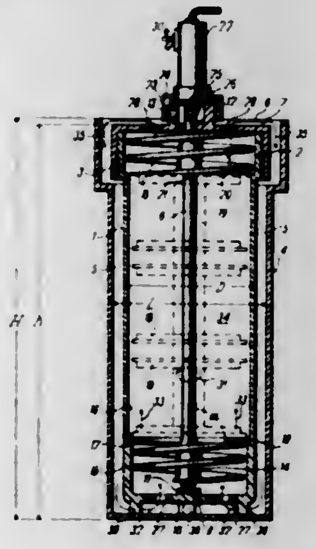
Kurt Gall, Welfenstr. 22, Suttgart-Birkach, Germany (7000)

Filed Dec. 9, 1975, Ser. No. 639,213

Claims priority, application Germany, Dec. 10, 1974, 2458276

Int. Cl.² G03D *17/00*

U.S. Cl. 354—313 **12 Claims**



1. An apparatus for developing photographic film, said apparatus comprising:

an outer vessel for holding a bath of film-treatment liquid;

a container receivable within said vessel and having a base and a removable cap each formed with at least one throughgoing hole for passage through said container of said liquid;

means in said container for holding said film between said base and said cap;

a rotatable shaft extending in said container from said base to said cap;

an auger secured to said shaft adjacent said base and having a pitch greater than 45°, whereby rotation of said shaft and auger displaces said liquid in said container; and

means for preventing light from entering said container through said holes and falling on said film.

4,001,853
PHOTO DEVELOPMENT INSERT

William B. Seagel, 16123 Pioneer Blvd., No. 15, Norwalk, Calif. 90650

Filed Aug. 11, 1975, Ser. No. 601,014

Int. Cl.² G03D *17/00*

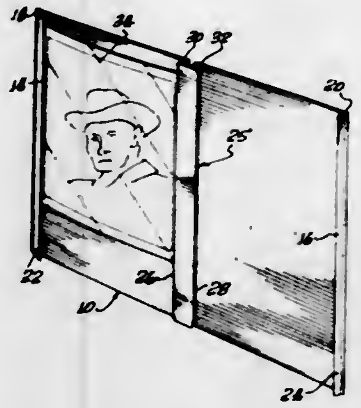
U.S. Cl. 354—315 **3 Claims**

1. A photographic developing insert jacket adapted to be inserted into a developing tank for processing photographic material comprising:

a relatively flexible, thin sheet of plastic material;

a pair of oppositely disposed leading edges formed as a first retaining means wherein prints or films are positioned therebetween;

wherein each of said first retaining means comprises a heat-treated crease line formed longitudinally adjacent to each of said leading edges, thereby forming a longitudinal lip member, said lip member being folded inwardly of said sheet, whereby said films or prints are inserted and retained therein; and



a second retaining means centrally positioned between said first retaining means and arranged in parallel relation thereto.

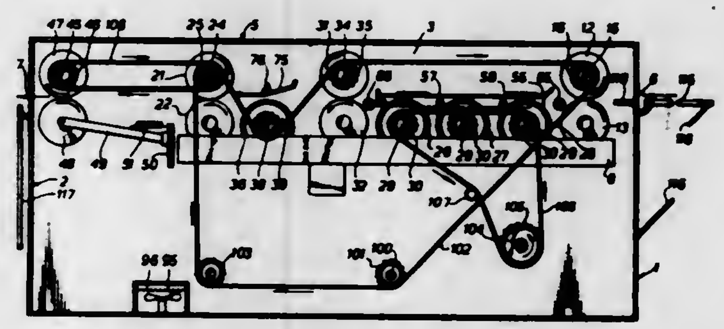
4,001,854
PLATE PROCESSING MACHINES

Alec James Formoy, South Ockenden, England, assignor to Vickers Limited, London, England

Filed Jan. 7, 1975, Ser. No. 539,170

Int. Cl.² G03D *3/08, 5/00*

U.S. Cl. 354—318 **10 Claims**



1. A machine for processing a lithographic printing plate carrying an image-wise exposed layer of light sensitive material, which machine comprises a support and, mounted on the support,

a. means for moving the plate with said layer face downwards along a straight path through the machine,

b. a first reservoir mounted beneath the path for containing developer,

c. a plurality of rotatably mounted processing rollers extending transversely of the path in brushing relationship with said layer and disposed within said first reservoir,

d. means for rotating all of the processing rollers in the same direction as that in which the plate moves and at a speed greater than the speed at which the plate is moved through the apparatus so that all of the processing rollers exert a brushing action on said layer in the same direction as that in which the plate moves along the straight path,

e. a flat plate member located above and extending transversely of the path to urge said layer of the plate against the processing rollers so that the processing rollers apply developer from the reservoir to said layer and agitate the developer in contact with said layer to develop the same, means for adjusting said plate member with respect to the support so that the distance between said plate member and the processing rollers may be adjusted to vary the pressure applied by the plate member to the plate as it moves along the path,

f. means located adjacent the path for removing developer from said layer,

g. a second reservoir for containing a desensitizing solution and mounted beneath the path downstream of the first reservoir,

h. a rotatably mounted desensitizing roller extending transversely of the path and disposed within said second reservoir beneath said path in brushing relationship with respect to the developed layer of the plate as the plate moves along the path,

i. means for rotating the desensitizing roller,

j. means for urging the developed layer of the plate against the desensitizing roller so that the desensitizing roller applies desensitizing solution from the second reservoir to the developed layer, and

k. means located adjacent to the path for drying the desensitized developed layer of the plate as the plate moves along the path.

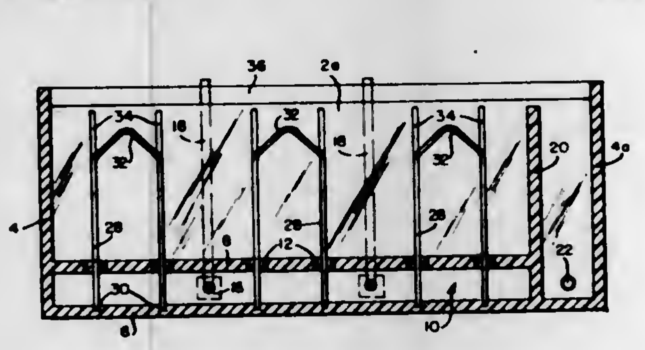
4,001,855
RAPID-FLOW WASHER FOR PHOTOGRAPHIC SHEET MATERIAL

Henry Gilmer Wilhelm, 723 State St., Grinnell, Iowa 50112

Filed Mar. 10, 1975, Ser. No. 556,919

Int. Cl.² G03D *3/02*

U.S. Cl. 354—324 **6 Claims**



1.

a. A washer for washing photographic material in sheet form comprising

b. a tank having a pair of rectangular parallel vertical side walls and end walls, and a horizontal bottom wall and open at the top,

c. a horizontal septum within said tank parallel to and spaced from the bottom wall to provide between itself and said bottom wall a single fluid distribution manifold, said septum being perforated with a large number of spaced small perforations for the passage of water,

d. a fluid supply means for supplying to said manifold a continuous stream of water under pressure sufficient for said stream to rise through said perforations to fill the tank,

e. a vertical septum near one of said end walls and parallel thereto, in water-tight edge contact with the two side walls and the bottom wall, the top edge of said vertical septum being below the top edges of the tank so that water rising in the tank flows over the top of said vertical septum and into the space between said vertical septum and its adjacent end wall without spilling over the top of the tank;

f. a fluid outlet nozzle near the bottom of said vertical space for continuous removal of said overflow water from the tank when the tank is supplied with said continuous stream of water;

g. said horizontal septum being provided with a number of spaced parallel rows of wire receiving apertures;

h. a number of sheet separating elements each shaped like an inverted U, made of stiff wire of a thickness so that the end of the U can fit freely but snugly into said wire receiving apertures;

i. said sheet separating elements being fitted into at least some of said apertures to form at least two parallel rows of said separating elements spaced sufficiently to support between them a sheet of photographic material such as a photo print on edge for washing;

j. said small perforations being located immediately adjacent said apertures and in line with a row of the U-shaped elements.

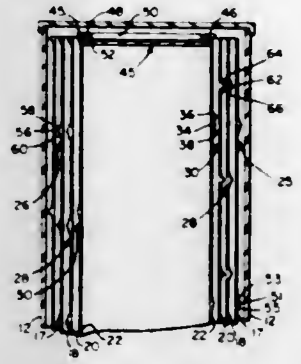
4,001,856
PHOTOGRAPHIC PROCESSING APPARATUS

Paul B. Stimson, Neck Road R.F.D. No. 4, Old Lyme, Conn. 06371

Filed Apr. 4, 1975, Ser. No. 564,995

Int. Cl.² G03D *13/02*

U.S. Cl. 354—331 **10 Claims**



1. A photographic processing apparatus comprising:

a. a tank having an internal cylindrical cavity for holding a solution;

b. at least first reel means and second reel means, each of said first and second reel means being a cylindrical member having open ends, said first reel means coaxially mountable within said internal cylindrical cavity, said second reel means coaxially mountable within said first reel means, said first reel means includes track means that defines a film guide and a film spacer, said second reel means including track means that defines a film guide and a film spacer;

c. a cap mounted to each open end of said second reel means for sealing said second reel means; and

d. means for sealing said tank, said first reel means and said sealed second reel means totally contained and sealed within said sealed tank.

4,001,857
DEVELOPING DEVICE

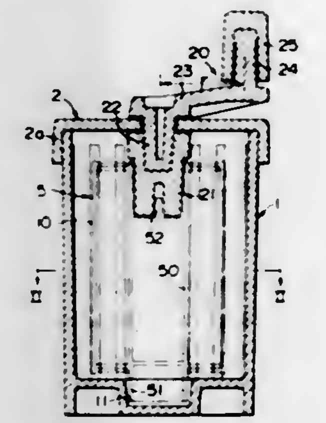
Masai Ikechi, and Kuniyuki Kusano, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 3, 1975, Ser. No. 546,764

Claims priority, application Japan, Feb. 4, 1974, 49-14586[U]

Int. Cl.² G03D *13/02*

U.S. Cl. 354—337 **13 Claims**



1. A developing device for developing a photographic film for still cameras, said device comprising

a film magazine containing a film wind-back spool on which the film is wound, said film magazine having a film outlet adapted for the passage of the film therethrough and said spool having an end portion which projects downwardly from said magazine,

a developing tank body having a cylindrical portion with an open upper end and a bottom portion to receive a developer liquid and the film magazine therein, and

a handle which has an engaging portion which releaseably engages said spool, said handle also having an arm portion radially extending outward from said engaging portion to be rotated by the hand so that said spool can be rotated back and forth and thereby effect development of said film by the developer liquid which passes into said magazine,

said cylindrical portion of the developing tank being provided on the inner surface thereof with a surface irregularity to be engaged with the film outlet of the film magazine to prevent the film magazine put therein from being rotated therein,

said bottom portion of the developing tank being provided at the center thereof with a recess to receive the downwardly projected end of the spool of the film magazine so that the entire bottom portion of said magazine is substantially adjacent to said bottom portion of the developing tank body to thereby optimize the usage of said developer liquid.

4,001,858

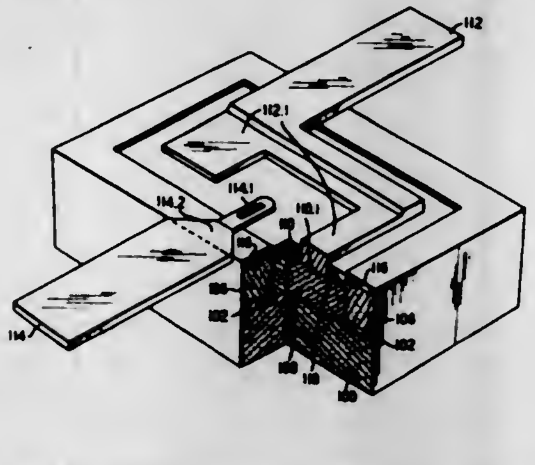
SIMULTANEOUS MOLECULAR BEAM DEPOSITION OF MONOCRYSTALLINE AND POLYCRYSTALLINE III(A)-V(A) COMPOUNDS TO PRODUCE SEMICONDUCTOR DEVICES

William Charles Ballamy, Reading, Pa., and Alfred Yi Cho, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 501,154, Aug. 28, 1974, Pat. No. 3,928,092. This application Aug. 29, 1975, Ser. No. 609,162

Int. Cl.^{2} H01L *29/92, 29/48, 29/56, 27/02*

U.S. Cl. 357—14 **12 Claims**



1. A GaAs semiconductor device comprising: a semi-insulating GaAs substrate; an insulative layer formed on a major surface of said substrate and having a window therein which exposes the underlying substrate; a monocrystalline GaAs first layer formed in said window and on said substrate; a monocrystalline GaAs second layer formed on said first layer; at least one high resistivity polycrystalline GaAs layer formed on said insulative layer so as to surround said first and second monocrystalline layers; a first electrical contact to said first layer; and a second electrical contact to said second layer.

4,001,859

PHOTO COUPLER

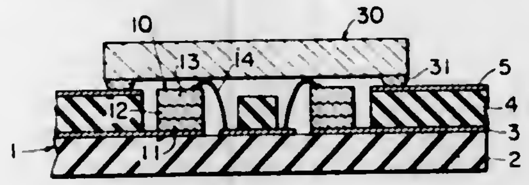
Tadahiko Miyoshi, Hitachi, and Yasutoshi Kurihara, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1976, Ser. No. 652,307

Claims priority, application Japan, Jan. 24, 1975, 50-9758

Int. Cl.^{2} H01L *31/12*

U.S. Cl. 357—19 **16 Claims**



1. A photo coupler comprising:

a. a first insulating substrate provided with a first conductive layer having a predetermined pattern on one surface thereof;

b. a second insulating substrate provided with a second conductive layer having a predetermined pattern on one surface thereof and a hole penetrating therethrough at a predetermined portion, said second insulating substrate being placed on said first insulating substrate so that the other surface of said second insulating substrate faces the one surface of siad first insulating substrate;

c. a light emitting diode mounted on said first insulating substrate in the hole of said second insulating substrate, one terminal of said light emitting diode being electrically connected with the first conductive layer on said first insulating substrate; and

d. a photo responsive device mounted on said second insulating substrate and covering the hole of said second insulating substrate so that the light sensitive surface of said photo responsive device faces said light emitting diode.

4,001,860

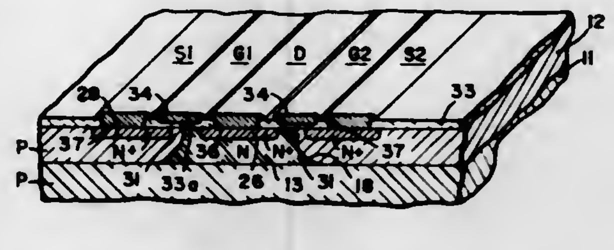
DOUBLE DIFFUSED METAL OXIDE SEMICONDUCTOR STRUCTURE WITH ISOLATED SOURCE AND DRAIN AND METHOD

Thomas P. Cauge, Mountain View, and Joseph Kocsis, Sunnyvale, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 415,110, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 274,442, July 24, 1972, abandoned, which is a continuation of Ser. No. 89,248, Nov. 13, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,355

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—23 **3 Claims**



1. In a metal insulator semiconductor structure, a semiconductor body of one conductivity type, an epitaxially grown layer of semiconductor material of uniform thickness ranging from 1–3 microns carried by the semiconductor body and being of opposite conductivity type so that there is a first PN junction between said body and said layer, said layer having a substantially planar surface, a layer of insulating material disposed on said surface, a first diffused region of said one conductivity type formed in and extending through said layer of semiconductor material and being defined by a second PN junction which extends from said surface through said layer of semiconductor material and down to said semiconductor body, said first region surrounding a portion of said layer to define a predetermined region and in such a manner so that said predetermined region gradually increases in width in cross-section as the predetermined region increases in depth and so that the bottom of the predetermined region is defined by said first PN junction and the sides are defined by said second PN junction, said predetermined region underlying a predetermined closed area on said surface, a second region of opposite conductivity type formed in said first region to a depth substantially less than the depth of the first region and being defined by a third PN junction which extends to the surface, said second region being in close proximity to the outer margin of the closed area and extending laterally in a direction away from the predetermined region, said second and third PN junctions serving to define a channel to precise length underlying said predetermined closed area, a third region of opposite conductivity type formed in said predetermined region and extending to said surface in said predetermined region and spaced from said first region, gate metallization disposed on said layer of insulating material and overlying said channel, source contact metallization extending through said layer of insulating material and making contact with said second region, and drain contact metallization extending through said layer of insulating material and making contact with said third region, said source and drain contact metallization being isolated from each other and the semiconductor body by said first and second PN junctions.

4,001,861

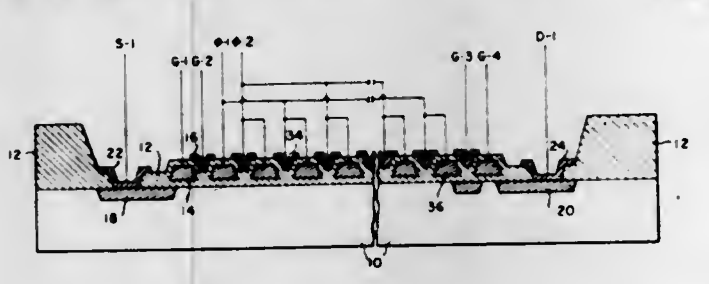
DOUBLE-LAYER, POLYSILICON, TWO-PHASE, CHARGE COUPLED DEVICE

James E. Carnes, Cranbury, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,052

Int. Cl.^{2} H01L *29/78, 29/04*

U.S. Cl. 357—24 **3 Claims**



1. In a two-phase, charge-coupled device comprising a semiconductor substrate, an insulating layer on one side of said substrate, and first rows of spaced, polysilicon, long gates alternating with second rows of long gates which overlap the adjacent first rows, said first rows being external to and said second rows being internal to said insulating layer, the improvement wherein said overlapping gates are fabricated from polysilicon material.

4,001,862

CHARGE TRANSFER DEVICE

Frederik Leonard Johan Sangster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

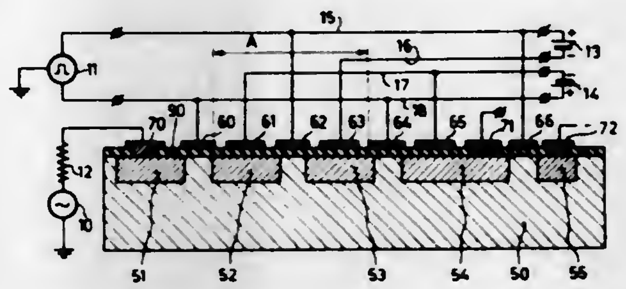
Continuation of Ser. No. 409,417, Oct. 25, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 630,990

Claims priority, application Netherlands, Mar. 19, 1973, 7303777

Int. Cl.^{2} H01L *29/78, 27/02*

U.S. Cl. 357—24 **16 Claims**

1. A charge transfer device comprising a series of stages each including first and second charge storing capacitances and at least one transistor having a control electrode and interconnecting by a main current path said first and second capacitances, said second capacitance of each stage constituting the first capacitance of the next stage, means for introducing mobile charge carriers representing signal information into at least one of the stages, and means for applying switching voltages to the control electrodes for causing serial transfer of mobile charge carriers representing signal information temporarily stored in capacitances to succeeding capacitances in a predetermined direction through the series of stages, at least one of the first and second capacitances of a plurality of said stages comprising means forming a first capacitance portion being responsive to the presence of stored signal carriers and having a high value when signal carriers are present and having a substantially lower value in the absence of signal carriers, said transistors being bipolar transistors having emitter, base and collector zones with the control electrode being the base zone of the transistor, said first capacitance portion comprising the junction capacitance between the base and collector zones and a further zone connected to one of the base and collector zones and increasing the base-collector junction capacitance, said other of the base and collector zones having an intermediate portion with a thickness and a doping concentration such that when the switching voltage is applied the intermediate portion can be depleted over its entire thickness resulting in said lower value of capacitance in the absence of signal carriers.



4,001,863

RESIN-SEALED TYPE SEMICONDUCTOR DEVICE

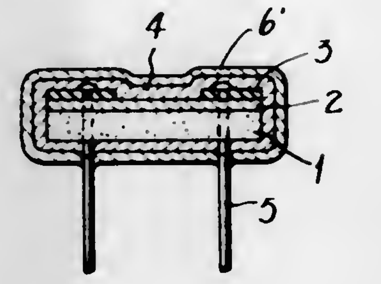
Yoshinori Kobayashi; Yoshitaka Shibata; Akira Hasegawa, all of Toyokawa, and Yoshiharu Iwatsuki, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1975, Ser. No. 640,375

Claims priority, application Japan, Dec. 19, 1974, 49-147257

Int. Cl.^{2} H01L *27/14, 31/00, 23/28, 23/02*

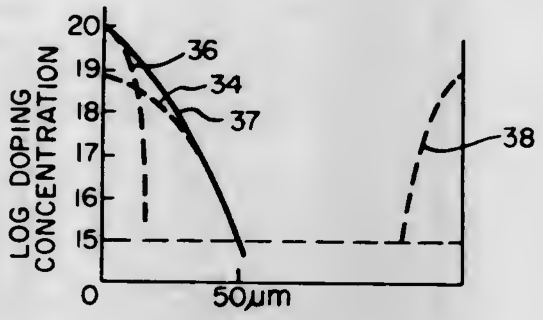
U.S. Cl. 357—30 **10 Claims**



1. A semiconductor device comprising a semiconductive element, a film underlayer of an epoxy resin material entirely covering said semiconductive element, a film outer layer of chlorinated polypropylene entirely covering said underlayer, and electric conductive means electrically connected to said semiconductive element and extending through said film underlayer and said film outer layer.

4,001,864
SEMICONDUCTOR P-N JUNCTION SOLAR CELL AND METHOD OF MANUFACTURE

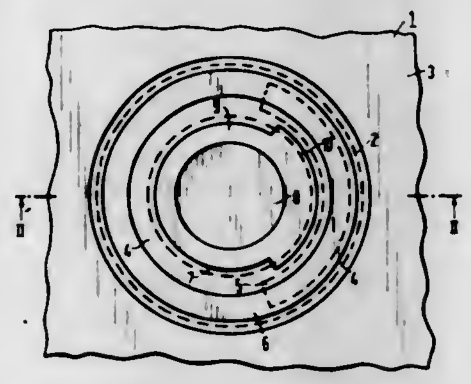
James F. Gibbons, 320 Tennyson Ave., Palo Alto, Calif. 94301
Filed Jan. 30, 1976, Ser. No. 653,761
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **14 Claims**

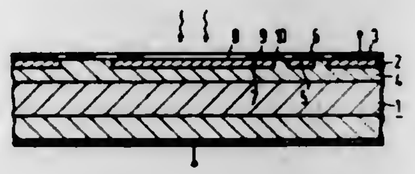


1. A solar cell formed of semiconductor material, said cell including an active region where carriers are generated by solar energy which impinges onto and penetrates the cell, means of forming a collecting junction in said cell cooperating with said active region to collect carriers generated in the active region of the cell, said cell including a portion which has a graded impurity concentration which extends over a substantial portion of said active region to form a built-in electric field whereby carriers generated in the graded portion of said active region are transported to said collecting junction primarily by drift in the electric field.

4,001,865
LIGHT CONTROLLABLE THYRISTOR

Peter Voss, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 14, 1975, Ser. No. 632,004
Claims priority, application Germany, Dec. 10, 1974, 2458401
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **5 Claims**

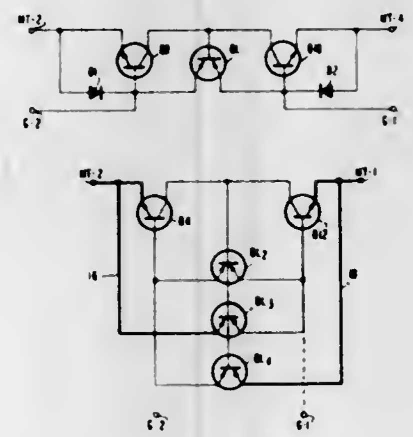




1. A light controlled thyristor comprising
- a semiconductor body including at least four zones of alternate types of conductivity, and a light exposure region;
- a first of said four zones being of one conductivity type and constituting a base zone carrying the other three zones,
- a second of said zones constituting a main emitter having an edge facing said exposure region,
- a third of said zones constituting a first auxiliary emitter and including said exposure region,
- the fourth of said zones located between said second and third zones and constituting a second auxiliary emitter having edges facing said main emitter and said exposure region, PN junctions being formed between each of said emitters and said first zone, effective edge lengths of said PN junctions being defined as those portions of the PN junction which lie opposite electrodes in contact with said first zone
- the ratio of the effective edge length of said second auxiliary emitter to the area of said exposure region and the ratio of the effective edge length of the main emitter to the edge length of the second auxiliary emitter selected to cause turn-on at said second auxiliary electrode and subsequently at said main electrode prior to turn-on at said first auxiliary electrode upon illumination of said exposure region.

4,001,866
MONOLITHIC, JUNCTION ISOLATED PHOTRAC

Bernard L. Kravitz, Forest Hills, and George R. Seaton, Northport, both of N.Y., assignors to Dionics, Inc., Westbury, N.Y. Continuation-in-part of Ser. No. 499,534, Aug. 22, 1974, Pat. No. 3,918,083, and a continuation-in-part of Ser. No. 616,040, Sept. 23, 1974. This application Oct. 16, 1975, Ser. No. 622,966
Int. Cl.² H01L *29/747*
U.S. Cl. 357—39 **8 Claims**

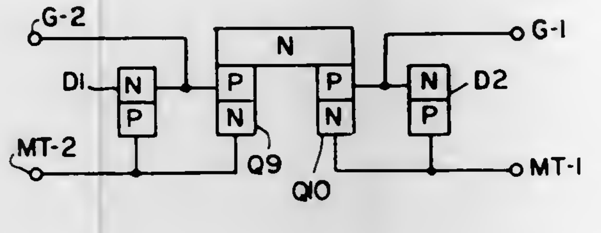


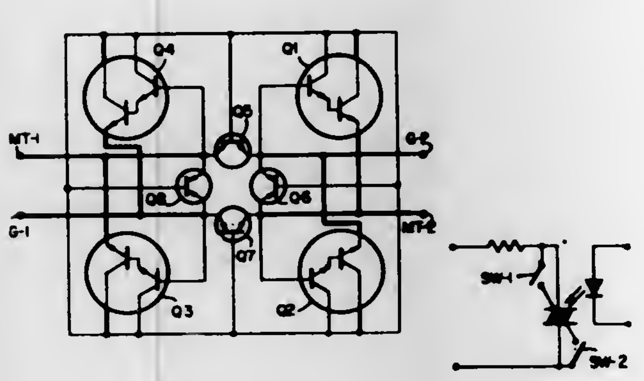
1. A monolithic, junction-isolated photrac comprising:
- a body of semiconductor material of a first conductivity type;
- a pair of transistors formed in said body and having said body as a common collector;
- a pair of zones of opposite conductivity type formed in said body adjacent said transistors;
- means for connecting the emitters of said transistor pair across a power source; and
- means connecting each said opposite conductivity zone to one said emitter.

4,001,867
SEMICONDUCTIVE DEVICES WITH INTEGRATED CIRCUIT SWITCHES

Bernard L. Kravitz, Forest Hills, and George R. Seaton, Northport, both of N.Y., assignors to Dionics, Inc., Westbury, N.Y. Continuation-in-part of Ser. No. 499,534, Aug. 22, 1974, Pat. No. 3,918,083. This application Sept. 23, 1975, Ser. No. 616,040
Int. Cl.² H01L *29/747*
U.S. Cl. 357—39 **17 Claims**

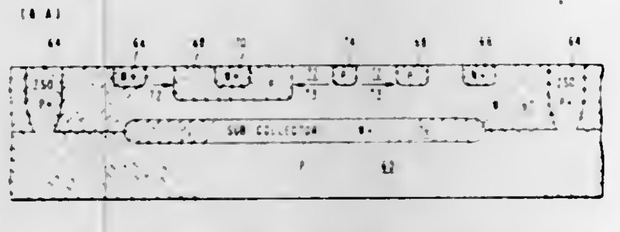
1. A photrac comprising:
- a pair of transistors in common collector configuration;
- a pair of diodes connected from base to emitter of each transistor;
- an inherently-formed, lateral, third transistor of opposite conductivity type from said pair of transistors and having, as a base, the collector of said pair; and
- means for connecting the emitters of said pair of transistors across a power source.





4,001,868
LATCHING DRIVER CIRCUIT AND STRUCTURE FOR A GAS PANEL DISPLAY

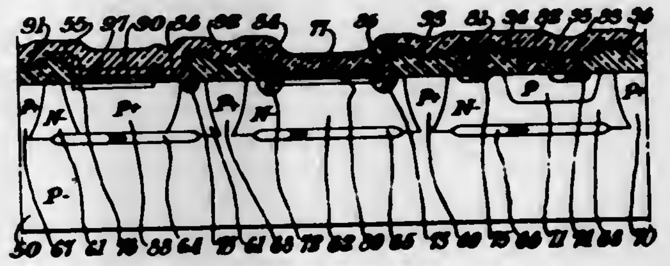
Robert Chao-Chuin Liang, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y. Division of Ser. No. 523,773, Nov. 14, 1974. This application Sept. 24, 1975, Ser. No. 616,477
Int. Cl.² H01L *29/74, 27/02, 27/10, 27/04*
U.S. Cl. 357—46 **6 Claims**



1. A latching, high voltage driver integrated circuit structure, comprising:
- A first P type semiconductor substrate;
- An N type epitaxial layer formed on the surface of said substrate;
- An isolation region formed in said epitaxial layer so as to enclose a first area of said epitaxial layer;
- said first area of said epitaxial layer being connected to a first control signal source;
- A first P type region within said first area of said epitaxial layer, having an open configuration enclosing a second area of said epitaxial layer within said first area and switchably connected to a low voltage source in response to a second control signal;
- A second P type region within said second area of said epitaxial layer, having a connection to a positive current source;
- An N type region within said first P type region connected to said low voltage source;
- A third P type region within said first area of said epitaxial layer and connected to an output node;
- Said epitaxial layer forming the collector of a first NPN transistor having said first P type region as its base and said N type region as its emitter;
- Said epitaxial layer forming the base of a first PNP transistor having said first P type region as its collector and said second P type region as its emitter;
- Said first NPN transistor and said first PNP transistor forming a silicon controlled switch device;
- Said epitaxial layer forming the base of a second PNP transistor having said first P type region as its collector and said third P type region as its emitter;
- A second NPN transistor formed in said epitaxial layer outside said isolation region, with its emitter connected to said third P type region, its base connected to said epitaxial layer within said isolation region, and its collector connected to a high voltage source;
- Said second NPN transistor and said PNP transistor forming a high voltage switch for alternately connecting said output node to said high voltage source or to said low voltage source;
- Whereby said first control signal will cause said silicon controlled switch to latch on thereby causing said high voltage switch to connect said low voltage source to said output node and said second control signal will cause said silicon controlled switch to latch off thereby causing said high voltage switch to connect said high voltage source to said output node.

4,001,869
MOS-CAPACITOR FOR INTEGRATED CIRCUITS

John L. Brown, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed June 9, 1975, Ser. No. 585,278
Int. Cl.² H01L *27/04, 29/94*
U.S. Cl. 357—51 **8 Claims**



1. In an integrated circuit including at least one bipolar transistor, at least one resistor and a MOS type capacitor, said integrated circuit being formed in a P-type silicon body having an epitaxial layer of N-type conductivity grown thereon, said transistor having been formed in a first portion of said epitaxial layer, said resistor having been formed by ion implantation of P-type impurities in a second portion of said epitaxial layer at the surface thereof, a silicon oxide film of a uniform thickness between 800 and 3000 angstroms having been grown over and covering said resistor, the improvement comprising said capacitor having one electrode consisting of a P-type region in a third portion of said epitaxial layer and extending to the surface thereof, said oxide film of said uniform thickness having also been grown over said P-type electrode region, and another electrode of metal lying over and being spaced from said P-type region by said film.

4,001,870
ISOLATING PROTECTIVE FILM FOR SEMICONDUCTOR DEVICES AND METHOD FOR MAKING THE SAME

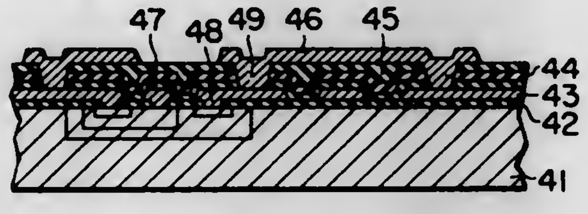
Atsushi Saiki, Musashimurayama; Kikuji Sato, Kokubunji; Seiki Harada, Hachioji; Terue Tsunoda, Tokyo, and Yoichi Oba, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 389,452, Aug. 20, 1973, abandoned. This application Nov. 30, 1973, Ser. No. 420,677

Claims priority, application Japan, Aug. 18, 1972, 47-82165

Int. Cl.² H01L *23/30*

U.S. Cl. 357—54 **20 Claims**



20. A semiconductor device which comprises an insulating film material in combination with a substrate, said insulating film being disposed on said substrate and said substrate being a material selected from the group consisting of a semiconductor material and an insulator material, said insulating film material comprising a polymer resin film obtained by reaction of an aromatic diamine, an aromatic diamine having a single aminocarbonyl group which is in an ortho position with respect to one of the amine groups and an aromatic tetracarboxylic acid dianhydride.

4,001,871
SEMICONDUCTOR DEVICE

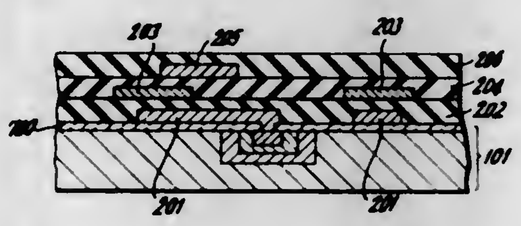
Hideo Tsunemitsu, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Division of Ser. No. 833,095, June 13, 1969, Pat. No. 3,988,214. This application Oct. 16, 1974, Ser. No. 515,228

Claims priority, application Japan, June 17, 1968, 43-41769; Dec. 28, 1968, 44-925

Int. Cl.² H01L *29/34, 23/28, 23/30;* **C25D** *5/02*

U.S. Cl. 357—54 **13 Claims**



2. A semiconductor device comprising a semiconductor substrate having a planar insulating layer located on a surface of said substrate; an oxide layer formed of the oxide of an anodizable material and having a planar top surface and a bottom surface in contact with said insulating layer; and a conductive layer comprised of said anodizable material and having a portion thereof in contact with a portion of said substrate and extending upwardly from the substrate surface through said insulating layer and into said oxide layer, said conductive layer having a top surface which is below the planar top surface of said oxide layer.

4,001,872
HIGH-RELIABILITY PLASTIC-PACKAGED SEMICONDUCTOR DEVICE

Heshmat Khajezadeh, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

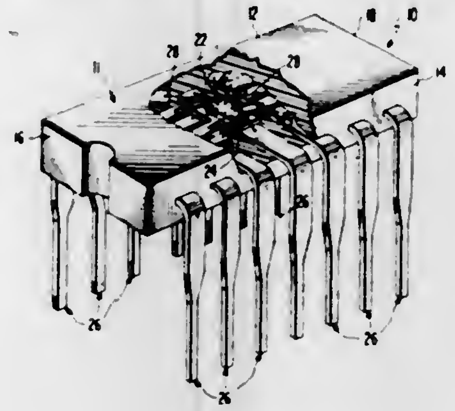
Continuation of Ser. No. 401,879, Sept. 28, 1973, abandoned. This application May 23, 1975, Ser. No. 580,286

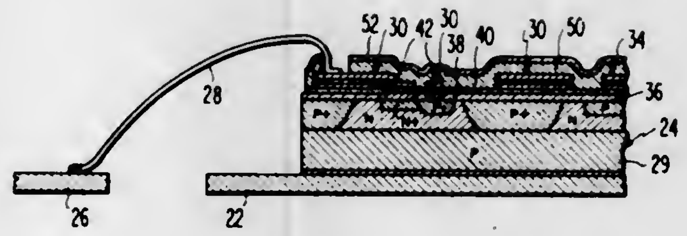
Int. Cl.² H01L *29/34, 23/48, 23/28, 23/30*

U.S. Cl. 357—54 **2 Claims**

1. A plastic-packaged semiconductor device having improved resistance to degradation in the presence of water vapor and corrosive atmospheres comprising

a body of silicon having a surface, PN junction-defining regions in said body adjacent to said surface, passivating means comprising a layer of silicon dioxide on said surfce and a silicon nitride layer on said layer of silicon dioxide, a metallization system comprising a plurality of conductors, each conductor comprising a first layer of titanium, a second layer, of platinum or palladium, and a third layer of gold, and a pyrolytically-deposited silicon dioxide protective coating having a thickness of at least 10,000 A over said metallization system,





a plurality of leads, each having a portion adjacent to said silicon body,

means for interconnecting said metallization system with said plurality of leads, and

a transfer molded body of polymeric material surrounding said silicon body, said interconnecting means, and parts of said leads, whereby the combination of the silicon dioxide protective coating and the surrounding transfer molded body of polymeric material protects the metallization system to prevent degradation thereof.

4,001,873
SEMICONDUCTOR DEVICE

Yasuya Kajiwara; Seiichi Nagai, and Hiroyasu Hagino, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1974, Ser. No. 535,209

Claims priority, application Japan, Dec. 26, 1973, 49-2156

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² H01L *29/04*

U.S. Cl. 357—59 **5 Claims**

1. In a semiconductor device of the type comprised of a semiconductor substrate having a first conductivity type and having a major surface; and a semiconductor region disposed within said substrate and having a second conductivity type opposite that of said first conductivity type, said semiconductor region having a surface portion terminating at and exposed at the major surface of said substrate and said semiconductor region jointly forming with said semiconductor substrate a PN junction defining the boundary therebetween, said PN junction having a surface portion terminating at the major surface of said substrate and defining the boundary between the surface portion of said semiconductor region of said second conductivity type and the major surface of said semiconductor substrate of said first conductivity type: the improvement which comprises: a substantially undoped polycrystalline silicon film disposed directly on the major surface of said semiconductor substrate and extending laterally thereon to overlie the major surface of said semiconductor substrate and to overlie the surface portion of said PN junction.

4,001,874
METHOD APPARATUS AND RECORD FOR DISTRIBUTING INFORMATION IN THE FORM OF COLOR IMAGES

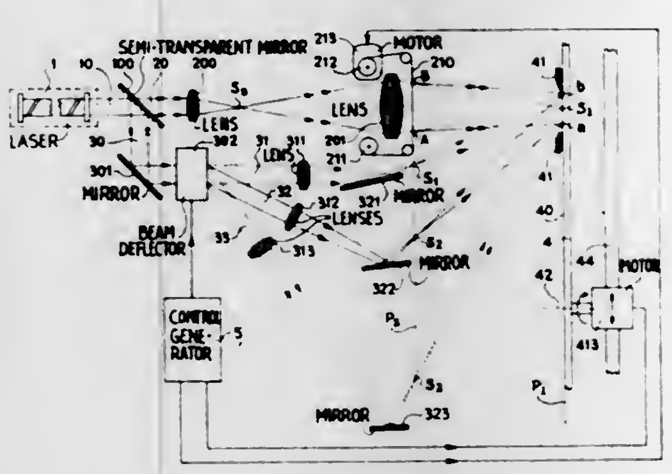
Jean Pierre Lacotte, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Sept. 13, 1974, Ser. No. 505,949

Claims priority, application France, Sept. 14, 1973, 73.33136

Int. Cl.² H04N *9/02;* **G03H** *1/28*

U.S. Cl. 358—2 **20 Claims**



7. A holographic apparatus for distributing information in the form of coloured images, comprising a holographic recording device which includes:

a source for emitting a coherent light beam;

optical splitting means for splitting said beam into an object beam and a reference beam, said object and reference beams having a fixed interference zone;

first step-by-step drive means for successively interposing, on the path of said object beam, associated images under the form of colourless transparencies, each set of three successive associated images being associated with one of said coloured images;

deflection means and optical focussing means cooperating to concentrate said reference beam at three fixed points, said three fixed points being located in the interposition plane of said transparencies;

second step-by-step drive means for displacing a photosensitive matrix in said interference zone;

and a control generator for synchronously controlling said deflexions means and said first step-by-step drive means at a first frequency, and said second step-by-step drive means at a second frequency, said first frequency being the treble of the first frequency.

4,001,875
RECORDING APPARATUS CODING CIRCUIT FOR AN IMAGE SIGNAL AND CORRESPONDING DECODING CIRCUIT

Guy Le Parquier, Paris, France, assignor to Thomson-CSF, Paris, France

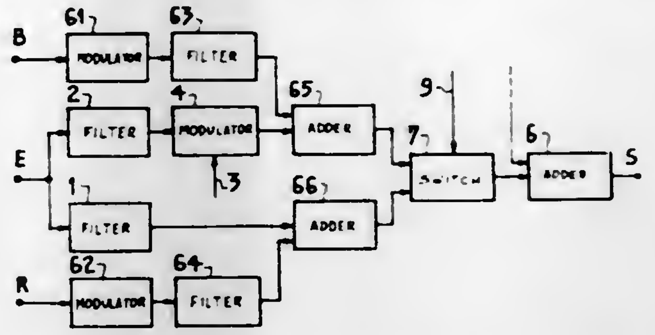
Filed Aug. 5, 1975, Ser. No. 602,012

Claims priority, application France, Aug. 9, 1974, 74.27763

Int. Cl.² H04N *9/42, 9/02, 5/76*

U.S. Cl. 358—4 **8 Claims**

1. A recording apparatus circuit for processing a television image signal before the recording thereof, said coding circuit comprising: filtering means for separating said image signal into first and second component signals respectively occupying a lower frequency band and a higher frequency band, said lower and higher frequency bands having equal widths; frequency translating means, including a modulator and an oscillator having an output, for translating said second component signal into said lower frequency band; switching means for alternately directing, each time for a duration equal to a predetermined whole number, not exceeding two, of field periods, to a single output said first component signal and the frequency translated second component signal; and means for adding bursts of the output signal from said oscillator to said frequency-translated second component signal during the horizontal fly back intervals. /



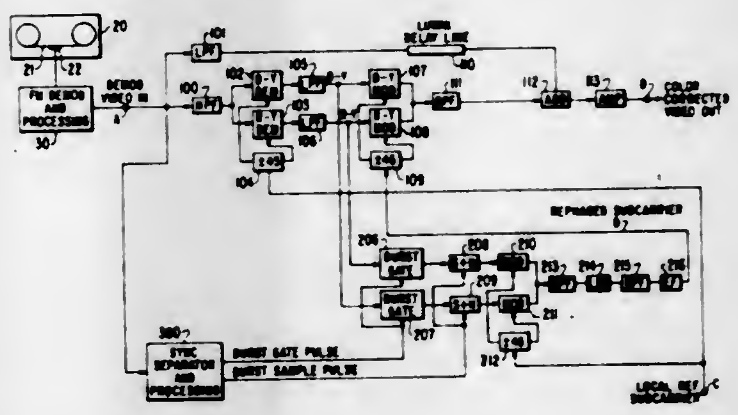
4,001,876
COLOR CORRECTION CIRCUIT FOR VIDEO RECORDERS

Jörg Schiess, Stallikon, and Theodor Ernst Bart, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 613,993

Int. Cl.² H04N *5/795*

U.S. Cl. 358—8 **12 Claims**



1. A signal processing system for correcting composite color television video signals including chroma and burst components, both of which contain phasing errors, comprising:

separating means for separating a chroma signal including chroma and burst components from said composite video signal;

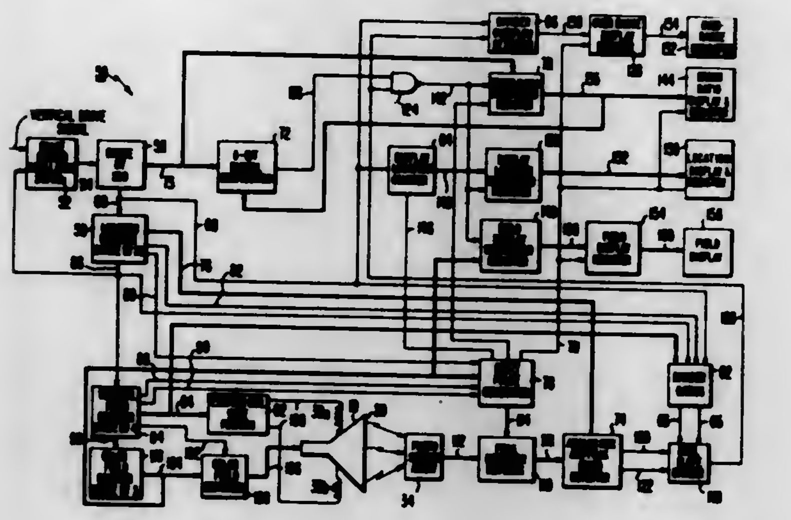
demodulating means coupled to said separating means for demodulating said chroma and burst components to baseband using a first subcarrier to provide a baseband chroma signal containing said burst phasing errors;

detector means coupled to said demodulator means for developing error signals from said demodulated burst component;

first modulating means coupled to said detector means for modulating said first subcarrier with said error signals to provide a second subcarrier rephased by said error signals; and

second modulating means coupled to said demodulating means for remodulating said chroma baseband components with said second subcarrier for providing a stabilized chroma signal.

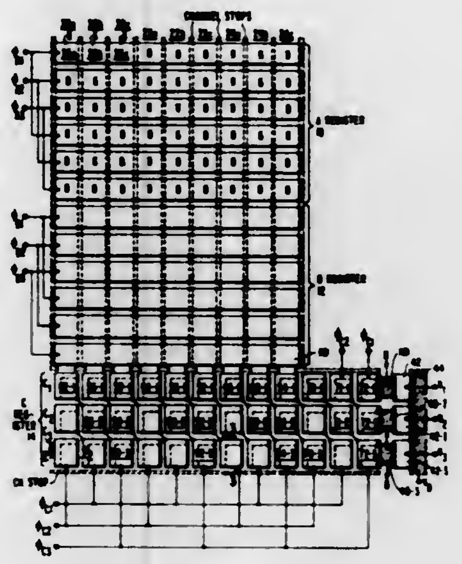
4,001,877
METHOD OF MEASURING COLOR PURITY TOLERANCE OF A COLOR DISPLAY TUBE
Theodore Frederick Simpson, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 26, 1975, Ser. No. 635,369
Int. Cl.² H04N *9/62*
U.S. Cl. 358—10 **14 Claims**



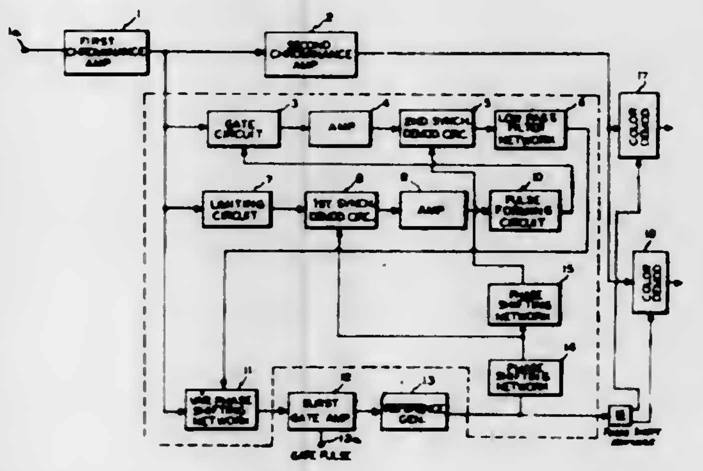
1. A method of measuring purity tolerance of a color display tube having at least two electron beams and a mosaic of recurring groups of luminescent deposits disposed on a screen, each group comprising at least two different color emitting deposits, each of said deposits being located at a nominal landing point of an associated electron beam on said screen, said method comprising the steps of:
- a. scanning one of said electron beams across at least a portion of said screen;
- b. detecting and measuring a reference color light output from the luminescent deposit located at the nominal landing point of said one electron beam within at least one group of said deposits;
- c. displacing the landing point of said one electron beam between at least two points about the nominal landing point;
- d. detecting and measuring a peak error color light output only from luminescent deposits within said one group having colors different from said reference color luminescent deposit;
- e. determining the value of the ratio of the peak error color light output to the reference color light output as an indication of the purity tolerance of said one electron beam within said one group; and
- f. repeating the recited steps (a) through (e) for each of the remaining electron beams.

4,001,878
CHARGE TRANSFER COLOR IMAGERS
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 19, 1975, Ser. No. 633,478
Int. Cl.² H04N *9/07*
U.S. Cl. 358—41 **9 Claims**

7. A color charge transfer imager system comprising, in combination;
- a charge transfer imaging array comprising Q columns and R rows of charge transfer elements, said columns being arranged in groups, with N adjacent columns in each group, where N is an integer greater than 1 and represents the number of different color components into which it is desired to resolve an image projected onto the array, the N columns of one row comprising the width of a resolution element of said array;
- color filter means adjacent to the image receiving surface of said array, said means comprising filters of different colors adjacent the different columns, respectively, of each group, and of the same color adjacent corresponding columns of the different groups;
- output register means;
- means for shifting each row of charge signals out of said array to said output register means, said means for shifting including means for separating each row into N parts, each part comprising the charge signals from the Q/N columns receiving a radiation image through filters for the same color, and each said part of a given row of information representing a different one of said color components; and
- means for serially reading out said output register means for producing, for each row read from said array, signals indicative of the N color components needed for reproducing that row.

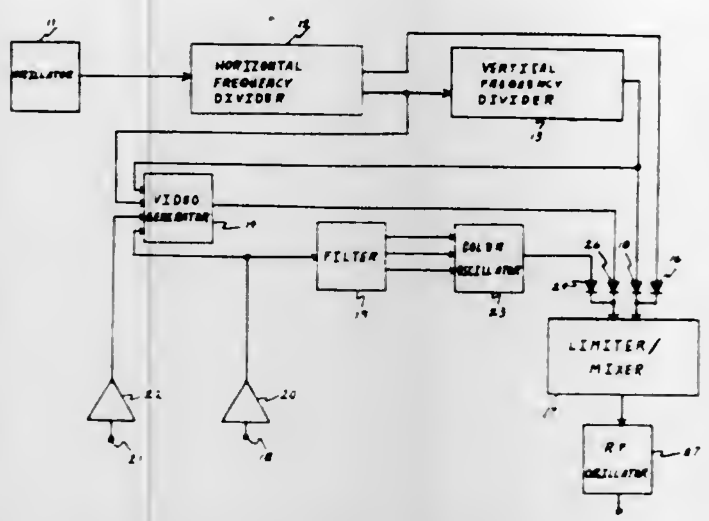


4,001,879
AUTOMATIC HUE-CONTROL APPARATUS FOR COLOR TELEVISION RECEIVERS
Yoshitomi Nagaoka, Neyagawa, and Michio Furuhashi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 17, 1970, Ser. No. 73,017
Claims priority, application Japan, Sept. 20, 1969, 44-74790; Sept. 20, 1969, 44-74799; Sept. 20, 1969, 44-75556; Apr. 20, 1970, 45-34164; Apr. 20, 1970, 45-34166
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976
Int. Cl.² H04N *9/12*
U.S. Cl. 358—28 **13 Claims**



12. In a color television system, the method of altering the hue parameter in a delivered signal comprising the steps of detecting the value of said parameter at which a time average characteristic of said delivered signal occurs and processing said signal so that said value represents a predetermined hue.

4,001,880
AUDIO TO VIDEO TRANSLATOR
Robert P. Delikat, 8516 Big Rock Road, Santee, Calif. 92071
Filed June 23, 1975, Ser. No. 589,438
Int. Cl.² H04N *5/38, 9/00*
U.S. Cl. 358—81 **5 Claims**

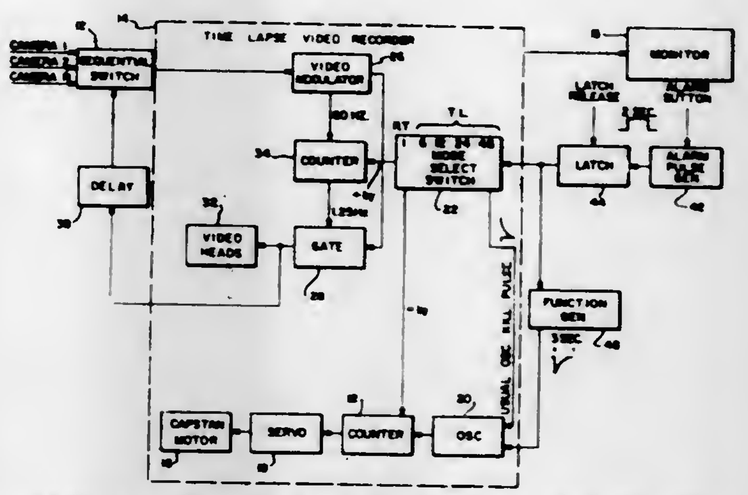


1. An audio to video translator comprising:
- a radio frequency oscillator, said radio frequency oscillator being tunable to at least one predetermined television channel frequency;
- vertical and horizontal sync pulse generator means coupled to said oscillator for modulation thereof;
- a video generator having at least first, second and third inputs and an output, said horizontal and vertical sync pulse generator means coupled to said first and second video generator inputs, respectively, and said video generator output coupled to said oscillator for blanking and unblanking modulation thereof; and
- an audio signal coupled to said third video generator input for varying said blanking and unblanking modulation of said oscillator.

5. An audio to video translator comprising:
- a radio frequency oscillator, said radio frequency oscillator being tunable to at least one predetermined television channel frequency;
- vertical and horizontal sync pulse generator means coupled to said oscillator for modulation thereof;
- a video generator having at least, first, second and third inputs and an output, said horizontal and vertical sync pulse generator means coupled to said first and second video generator inputs, respectively, and said video generator output coupled to said oscillator for blanking and unblanking modulation thereof;
- an audio signal coupled to said third video generator input for varying said blanking and unblanking modulation of said oscillator; and
- a color oscillator having an output coupled to said radio frequency oscillator for color modulation thereof, said audio signal being coupled to said color oscillator for modulation thereof.

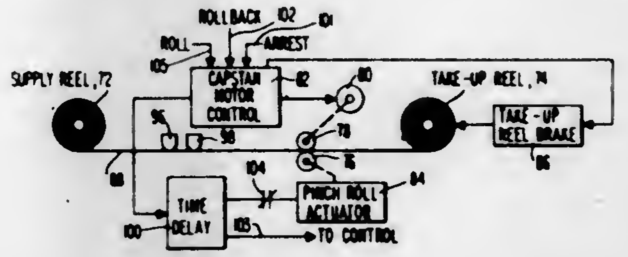
4,001,881
SWITCHED VIDEO RECORDING SYSTEM
David A. Folsom, Sudbury, Mass., assignor to QSI Systems, Inc., West Newton, Mass.
Filed Jan. 2, 1975, Ser. No. 538,006
Int. Cl.² H04N *5/785*
U.S. Cl. 360—5 **6 Claims**

1. In combination,
- A. a video recorder of a type having a real time operating mode wherein the video input to the recorder is applied continuously to the recorder video heads and the video tape is advanced at a selected relatively high speed and a time lapse operating mode in which the video input to the recorder is applied intermittently to the video recording heads when the heads are turned on by a video head gating signal and the tape is advanced at a selected relatively low speed and wherein the mode of the operation is selected by a manually operated mode select switch,
- B. a plurality of television cameras, each producing an output signal,
- C. a sequential switch connected between the television cameras and the recorder, said switch switching between the camera output signals on receipt of a switching signal so as to apply the output signals from the television cameras to the recorder on a time-shared basis, and



- D. means for deriving the switching signals from the video head gating signals developed in the recorder, said deriving means delaying each switching signal so that it occurs after the end of the gating signal from which it is derived, whereby the recorder records the pictures from the cameras as a repetitive series of frames on the recording tape and whereby the switch settles on each camera output signal in the sequence during the time that the head is turned off after the recorder has recorded the previous video signal pursuant to the head gating signal from which the switching signal was derived.

4,001,882
MAGNETIC TAPE EDITING, PREVIEWING AND ANIMATING METHOD AND SYSTEM
Anthony M. Fiori, Schwenksville; Robert T. Fiori, Lansdale, and Thomas C. Nicholas, III, Schwenksville, all of Pa., assignors to Spectra-Vision Corporation, Philadelphia, Pa.
Filed Mar. 12, 1975, Ser. No. 556,141
Int. Cl.² G11B *27/08, 27/14;* **H04N** *5/78*
U.S. Cl. 360—14 **22 Claims**



10. A magnetic tape editing system having at least an edit deck and another deck each having motor means capable of driving tapes or webs on said decks in reverse at the same constant speed as forward speed for use of intelligence, on said respective tape or web, and means whereby a magnetic tape on the deck may be edited or modified by a data web on the other deck, including monitor means for monitoring intelligence on said magnetic tape and on said data web, motor controls for said respective motor means for selectively energizing the respective deck motors in the forward or reverse direction, drive means driven by the respective motor means for engaging and driving the respective tape and web, and actuators for the drive means whereby the respective tape and web may be immediately engaged and almost instantaneously

driven at motor speed in either direction and immediately disengaged and almost instantly stopped, presettable timer means, means causing said presettable timer means to time the periods during which the respective tape and web are engaged beginning with engagement and ending with disengagement of the drive means, and means causing the actuator to respond to the respective timer means to stop said drive means, means to transfer monitoring from the intelligence on the magnetic tape to that on the data web, and means to transfer the intelligence at that point and thereafter from the data web to the magnetic tape.

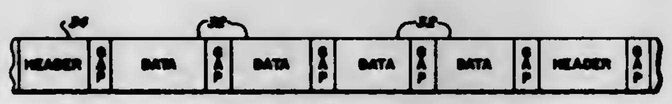
4,001,883
HIGH DENSITY DATA STORAGE ON MAGNETIC DISK

Frederick D. Strout, Phoenix; Jaime Calle, Glendale, and Edwin W. Herron, Phoenix, all of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Mar. 7, 1974, Ser. No. 448,863

Int. Cl.² G11B *5/09*

U.S. Cl. 360—48 **3 Claims**



1. The method of high density storage of data in individually retrievable data sectors on a magnetic recording medium comprising the steps of magnetically recording a header for identifying a plurality of data sectors, magnetically recording after said header and in association therewith a plurality of uniform length data sectors each identifiable from said header and individually retrievable for read and record operations, and providing a gap before and after each data sector to facilitate said read and record operations of a data sector without affecting adjacent data sectors.

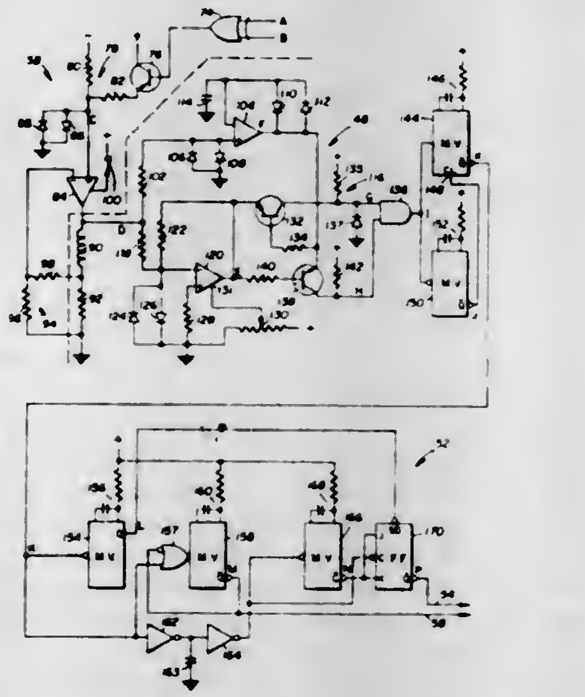
4,001,884
APPARATUS AND METHOD FOR RECORDING AND REPRODUCING DIGITAL-DATA

Wayne R. Herbst, Northbrook, and Paul L. Mika, Des Plaines, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 525,435, Nov. 20, 1974. This application July 10, 1975, Ser. No. 594,835

Int. Cl.² G11B *5/00*

U.S. Cl. 360—40 **4 Claims**



1. An apparatus for detecting digital signals played back from a magnetic tape whereon said signal information is recorded in the form of magnetic flux reversals, said flux reversals, during playback, producing a varying signal having a peak amplitude, the improvement comprising:

- means for amplifying said varying signal, said amplifying means having a first input receiving said varying signal and a second input, said second input providing an amplified output inverted with respect to the amplified output created by said first input; and
- means, responsive to a predetermined level of the output signal, for coupling said output signal to said second input and storage means coupled to said second input whereby said output signal follows said varying signal at said first input until said coupling means conducts thereby maintaining said output signal constant and in response to a slope reversal of said varying signal, the input signals to said amplifier become additive producing an abrupt reversal in the polarity of said output voltage from said amplifier.

4,001,885
VIDEO RECORDING AND REPRODUCING SYSTEM

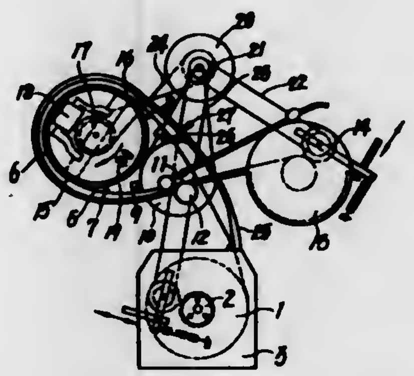
Yoshiyuki Ikushima, Hirakata, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1975, Ser. No. 554,603

Claims priority, application Japan, Mar. 1, 1974, 49-24354; July 12, 1974, 49-81023

Int. Cl.² H04N *5/785;* **G11B** *15/44, 15/46*

U.S. Cl. 360—70 **3 Claims**



1. A system for recording on tracks on a movable recording medium a video signal consisting of multiple fields and for reproducing said video signals comprising:

a. means for moving said transducing head means at a first relative speed with respect to said recording medium during a first operational mode to record one of said fields of said video signal on each of said tracks;
b. means for moving the same transducing head means and said recording medium at said first relative speed to reproduce said fields recorded during said first operational mode;
c. means for reducing said first relative speed between said transducing head means and said recording medium to $(1/n)$ of said first relative speed, where n is an integer equal to or greater than 2, to enable said transducing head means to record n fields of said video signal on each of said tracks in a second operational mode;
d. means for moving the same transducing head means and said recording medium at $(1/n)$ of said first relative speed to reproduce said fields recorded during said second operational mode; and
e. means for correcting for angular error loss during the reproducing of said video signals in second operational mode to thereby facilitate the use of said same transducing head means for reproducing said video signals.

4,001,886
APPARATUS WITH HEADWHEEL SERVO FOR RECORDING AND PLAYING BACK VIDEO INFORMATION

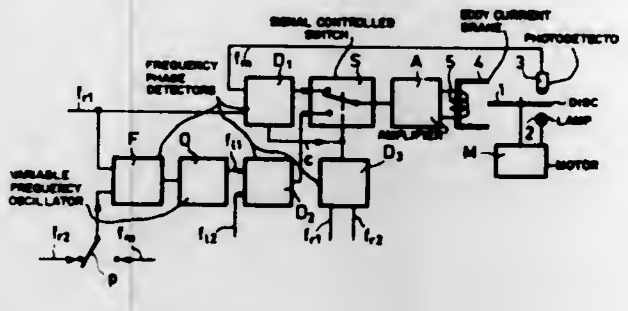
Antonius Isidorus Hofste op Bruinink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 327,492, Jan. 29, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,061

Claims priority, application Netherlands, Feb. 8, 1972, 7201609

Int. Cl.² G11B *21/04*

U.S. Cl. 360—75 **6 Claims**



1. Apparatus for recording and for playing back video signals from a tape-shaped record carrier, comprising a head wheel for recording and playing back the video signals, means for measuring the rotational velocity of the head wheel, means for receiving a first vertical synchronization signal, first detector means connected to said velocity measuring means and to said vertical synchronization signal for providing a first control signal, means for receiving a second vertical synchronization signal read from said tape during play back, phase measuring means for providing an output signal corresponding to the phase difference between two input signals, means for connecting the first vertical synchronization signal to one of the two inputs of said phase measuring means, means connecting the second input of the phase measuring means to the rotational velocity measuring means during recording and to said means for receiving said second vertical synchronization signals during playback, a signal controlled oscillator connected to said phase measuring means for providing horizontal reference signals having a frequency controlled by the output of said phase measuring means, terminal means for providing horizontal synchronization signals read from said tape during playback and for providing horizontal synchronization signals derived from said velocity measuring means during recording, a second detector means connected to said terminal means and to said signal controlled oscillator for providing a second control signal, means for controlling the velocity of said head wheel, and switch means responsive during recording to a second control signal of said first detector means for selectively connecting said first control signal or said second control signal to said velocity controlling means.

4,001,887
MANUAL TAPE APPARATUS WITH GENERATOR FOR PROVIDING ELECTRICAL POWER

Stephen A. Platt, and Gerhard W. Wolff, both of Grand Haven, Mich., assignors to Stephen A. Platt; Vernet B. Platt; Gerhard Walter Wolff and Jeanine V. Wolff, all of Grand Haven, Mich.

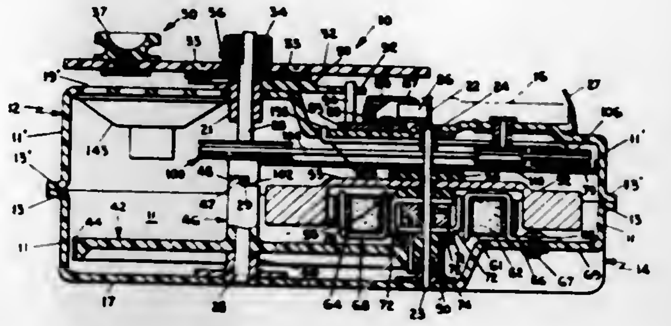
Filed June 6, 1975, Ser. No. 584,465

Int. Cl.² G11B *15/42*

U.S. Cl. 360—90 **19 Claims**

1. A sound reproduction apparatus for manual operation comprising:

- pickup means for detecting prerecorded information on a recording medium;
- manually driven drive means including a driven member for providing relative motion between a recording medium and said pickup means;
- generator means coupled to said drive means for generating electrical power when said drive means is manually operated whereby said apparatus provides electrical power when in use which can be employed operating power for an electrical amplifier; and



- resilient coupling means extending between said driven member and said drive means to isolate from said driven member drive speed variations caused by said generating means when generating electrical power.

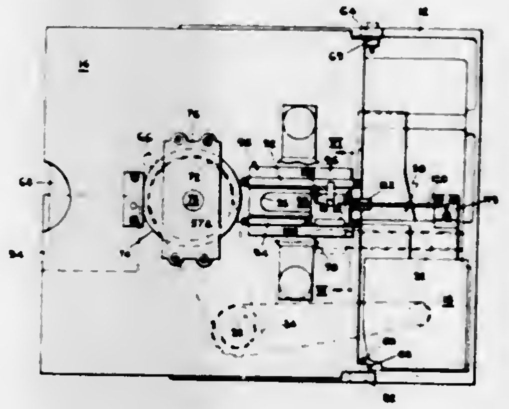
4,001,888
FLEXIBLE DISC RECORDER CONSTRUCTION

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Division of Ser. No. 418,299, Nov. 23, 1973, Pat. No. 3,913,137. This application Feb. 11, 1975, Ser. No. 548,976

Int. Cl.² G11B *5/016, 5/56, 25/04*

U.S. Cl. 360—99 **24 Claims**

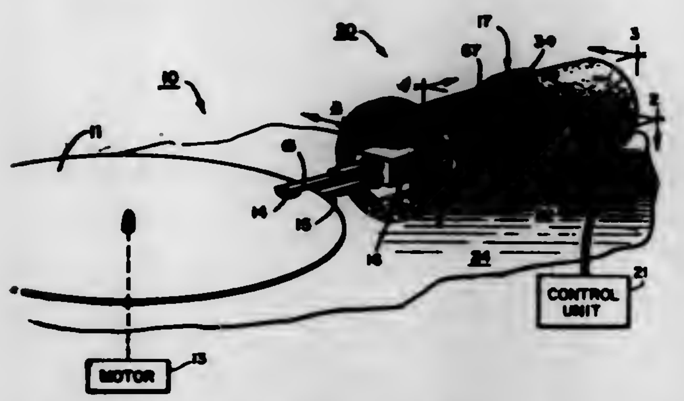


1. A data recorder/reproducer device for use with disc-type recording media, comprising in combination: a rigid support frame; a disc-receiver means defining a narrow receptacle for separately receiving an individual recording disc and removably retaining the latter generally in predetermined position therein, and having means for access to a disc therein; drive hub means supported on said frame, for engaging and rotating a disc received in said receiver means; a transducer head for proximately engaging and transducing signals recorded on said disc; rotary drive means coupled to said drive hub means to drive the same; and translational drive means coupled to said head to move it across a disc in said receiver means; means movably mounting at least a portion of said disc-receiver means upon said support frame for movement toward and away from said drive hub means, generally axially thereof and also angularly relative to such axis in at least two degrees of freedom; and indexing means cooperative between said frame and said disc receiver means to guide and accurately locate at least said movable portion of the latter when the same is moved toward said drive hub means and into close proximity therewith; said indexing means comprising at least two sets of engageable structures, each set spaced from the other by a distance of at least the diameter of said drive hub means and comprising an indexing surface and an element movable against such surface and connected to said receiver portion to move the latter angularly into indexed position as such element moves against said surface.

4,001,889

MOVING CARRIAGE FOR DISK HEAD POSITIONER

Guenter E. Schneider, Concord, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 295,370, Oct. 5, 1972, abandoned. This application June 26, 1974, Ser. No. 483,247
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976
Int. Cl.² G11B *25/04, 5/54, 17/00;* **H02K** *41/02*
U.S. Cl. 360—104 **10 Claims**



1. In a rotating disk memory including a disk, means for rotating the disk and support means for the rotating means, the improvement of means for writing data onto and reading data from the disk, said means comprising:

A. a carriage adapted for linear motion along an axis, said carriage including a central frame unit and, connected to opposite ends thereof, a reading and writing head unit and a coil unit, all said units being formed integrally along the axis with said head unit being operatively associated with the disk,

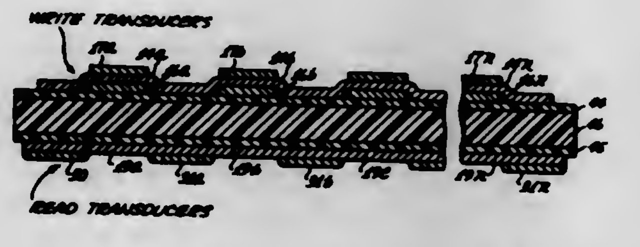
B. an integral housing mounted to the support means adjacent the disk, said housing having guides parallel to the axis for confining carriage motion, and

C. said carriage additionally including coplanar engaging means for coacting with said guides and supporting said carriage for linear motion along the axis, said reading and writing head unit and said coil unit each having portions extending above and below the plane of said coplanar engaging means, the carriage center of gravity thereby being midway between said guides and coplanar with said engaging means.

4,001,890

DOUBLE CHIP FLYING HEAD

Wolfgang W. O. G. Kayser, Paradise Valley, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Aug. 5, 1974, Ser. No. 495,028
Int. Cl.² G11B *5/28, 5/12, 5/30, 5/20*
U.S. Cl. 360—121 **4 Claims**



1. A multitrack magnetic read/write head for use with a movable magnetic recording medium having a plurality of tracks, said head having a plurality of transducers for each of said tracks, said head comprising:

a substrate having first and second mutually spaced surfaces normal to the plane of said medium, the distance between said first and second surfaces being relatively small compared to the length dimension of each of said surfaces in a direction parallel to the plane of said medium;

a plurality of first magnetic write poles mounted in spaced relationship in a row on said first surface;

a plurality of second magnetic write poles each overlying a corresponding first write pole in paired alignment therewith;

a continuous write conductor, successive spaced portions of said write conductor being mounted between said write pole pairs to form successive spaced write transducers;

a plurality of write terminals mounted on said continuous conductor between said spaced write transducers;

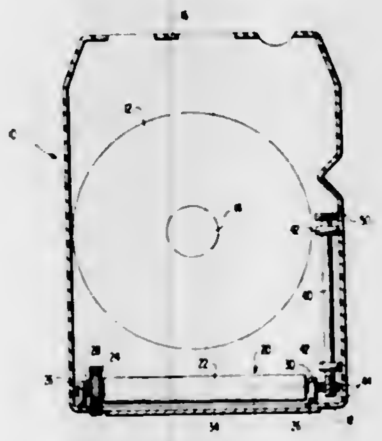
a magnetoresistive film deposited on said second surface of said substrate and extending along the full length dimension thereof opposite said write transducers; and

a plurality of read terminals respectively mounted on said magnetoresistive film opposite corresponding spaces between said write transducers to form read transducers.

4,001,891

DIRECT INDIVIDUAL PROGRAM READOUT OF EIGHT-TRACK TAPE CARTRIDGE

Leon D. Held, 6861 SW. 51st St., Miami, Fla. 33155
Filed Apr. 30, 1975, Ser. No. 573,221
Int. Cl.² G11B *23/04;* **G09F** *9/00*
U.S. Cl. 360—132 **4 Claims**



1. A device for directly indicating the programs located on a particular track of a magnetic tape located within a cartridge while the programs on the particular track are being reproduced, comprising:

a tape cartridge including an elongated opening in the front of the cartridge,

an elongated program identifying member mounted for rotation in said cartridge directly behind said elongated opening, said program identifying member having a plurality of elongated faces, different ones of which are exposed behind said opening as said member is rotated, each face having the titles of programs located on a different track of said tape disposed thereon,

a drive shaft along one side of said cartridge extending substantially perpendicular to said program identifying member,

means interconnecting one end of said drive shaft and said program identifying member for causing said member to rotate when said drive shaft rotates, and

an aperture in said tape cartridge adjacent the other end of said drive shaft to allow engagement therewith by a drive means located exteriorly of said cartridge.

4,001,892

CONTAMINANT TRAPPING IN ROTATING DISK DEVICES

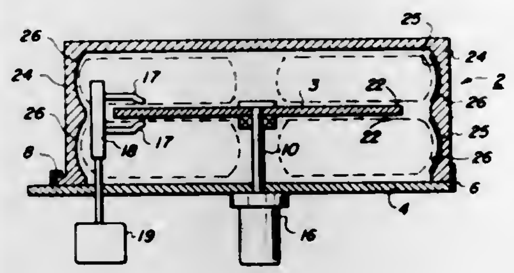
Vittorio Castelli, Scottsdale, N.Y., and Stephen T. Chai, Carson, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 17, 1975, Ser. No. 558,994
Int. Cl.² G11B *23/02*
U.S. Cl. 360—133 **2 Claims**

1. A data storage system providing an ambient fluid free of contaminant particles comprising:

a magnetic disk supported for rotation about a spindle and having at least one surface capable of storing information,

a housing for enclosing said magnetic disk, the interior side surface of said housing being proximate the periphery of said magnetic disk, at least a portion of said interior side surface of said housing being curved relative to the axial direction of said spindle, said housing being fluid tight when the said data storage system is in operation such that the ambient fluid within said housing remains the same when said data storage system is in operation,

means for rotating said magnetic disk, rotation of said magnetic disk producing a centrifugal force within said housing which force causes the ambient fluid and any contaminant particles carried thereby to flow past the outer periphery of said at least one surface of said magnetic disk and past said portion of said interior side surface of said housing, said centrifugal force being greatest adjacent said portion of said interior side surface of said housing due to said portion of said side surface of said housing being curved relative to the axial direction of said spindle, and



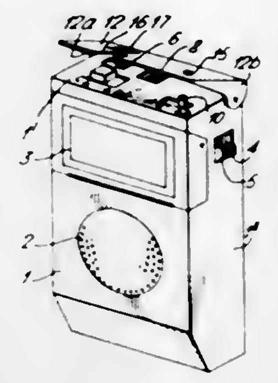
a tacky substance deposited on at least a portion of said portion of said interior side surface of said housing,

the action of the centrifugal force produced by rotation of said magnetic disk causing contaminant particles carried by the ambient fluid within said housing to be flung against said tacky substance as said ambient fluid within said housing moves past said tacky substance whereby said contaminant particles are permanently captured by said tacky substance.

4,001,893

PORTABLE TAPE-RECORDER

Kozo Yamamoto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Oct. 4, 1974, Ser. No. 512,299
Claims priority, application Japan, Oct. 12, 1973, 48-119306; Oct. 12, 1973, 48-119307; Oct. 12, 1973, 48-119308; Oct. 12, 1973, 48-119309
Int. Cl.² G11B *1/04*
U.S. Cl. 360—137 **2 Claims**



1. A chest-pocket type tape-recorder having a microphone on a narrow top face thereof, characterized in that a movable sound reflector for reflecting sounds from the front direction to the microphone is attached over the microphone, the narrow top face of the tape-recorder having a pause knob having an inoperative position separate from a pause position and a rewind-and-fast-forward knob having an inoperative position separate from a rewind-and-fast-forward position, said movable sound reflector being hinged to the top face in a manner that the sound reflector can be held in tilted position for sound reflection, and the sound reflector having dents or holes which, in the closed position, interlocks both the pause knob and the rewind-and-fast-forward knob in their inoperative positions.

DESIGN PATENTS

GRANTED JANUARY 4, 1977

ERRATA

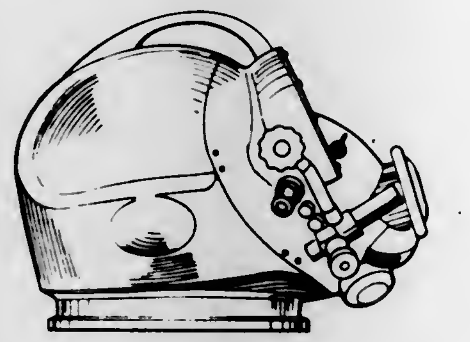
For CLASS	See PATENT NO.
011-131	242,933
015-015	242,940
015-042	242,946
015-104	242,947
015-123	242,948
015-082	242,950

DESIGNS

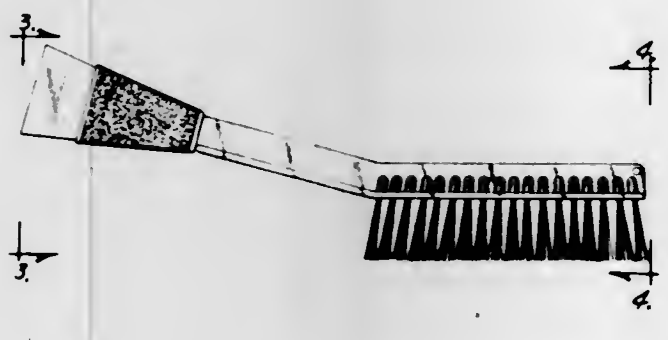
JANUARY 4, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number

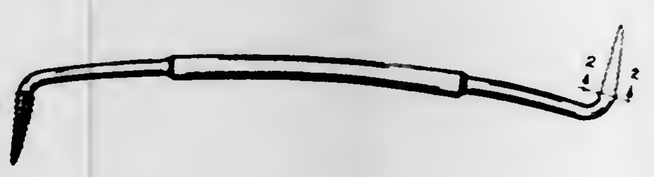
242,881
DIVER'S HELMET
Richard F. Jones, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.
Filed Sept. 8, 1975, Ser. No. 611,301
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



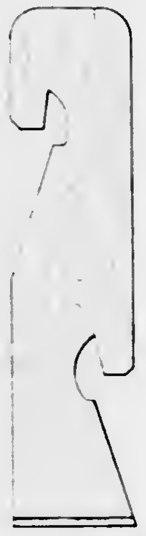
242,882
COMBINED BRUSH AND ICE SCRAPER
Otto W. Schneider, Sioux City, Iowa, assignor to Erwin Weller Company, Sioux City, Iowa
Filed Apr. 21, 1976, Ser. No. 678,727
Term of patent 14 years
Int. Cl. D4—*01*; D7—*05*
U.S. Cl. D4—06



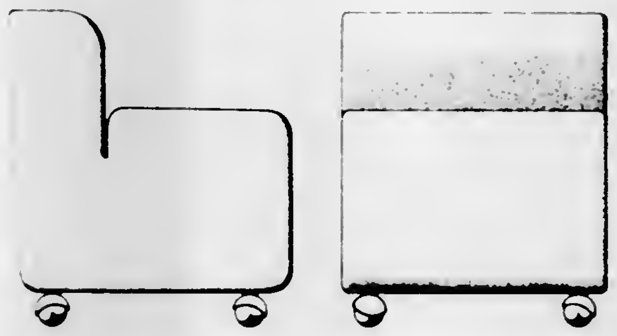
242,883
TOOTHBRUSH
Thomas J. De Marco, 12800 Westchester Trail, Chesterland, Ohio 44026
Filed Sept. 17, 1975, Ser. No. 614,006
Term of patent 14 years
Int. Cl. D4—*02*; D24—*02*
U.S. Cl. D4—28



242,884
STAND FOR POTTED PLANTS
Peter Diaz, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Jan. 7, 1976, Ser. No. 647,174
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20



242,885
CHAIR
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459
Filed Aug. 18, 1975, Ser. No. 605,661
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



242,886

SEAT OR SIMILAR ARTICLE

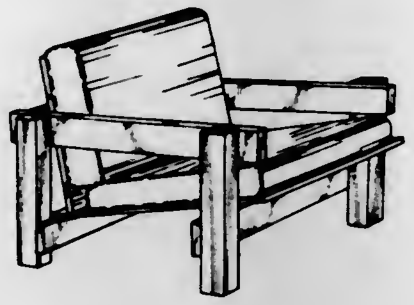
Taylor M. Potter, 550 SW. Palatine Hill Road, Portland, Oreg. 97219

Filed June 2, 1975, Ser. No. 582,783

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—73



242,887

STORAGE RACK FOR ATTACHMENT TO WALL LOCKERS OR THE LIKE

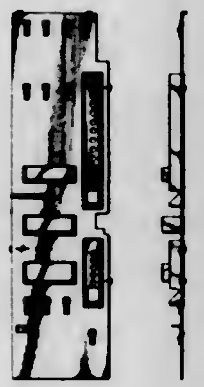
Charles W. Wise, 3208 Westelle, Memphis, Tenn. 38128

Filed Aug. 6, 1975, Ser. No. 602,267

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—131



242,888

SHELF TO BE ATTACHED TO PEGBOARDS OR THE LIKE

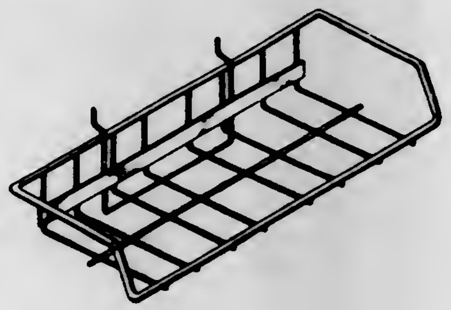
Lowell I. Mazie, 2126 Packard Road, Huntingdon Valley, Pa. 19006; Miles Massey, 1133 Glenn St., Philadelphia, Pa. 19115, and Joseph Stopyra, 1033 E. Hunting Park Ave., Philadelphia, Pa. 19124

Filed Dec. 11, 1975, Ser. No. 639,653

Term of patent 14 years

Int. Cl. D6—*04*; D20—*02*

U.S. Cl. D6—136



242,889

FOOTWEAR DISPLAY STAND

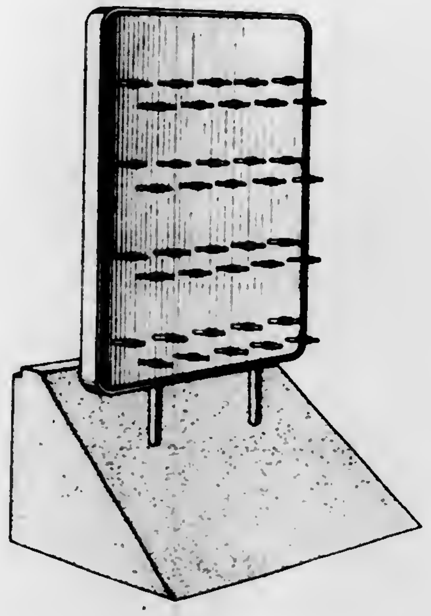
Douglas C. Hillman, Orange, Conn., and Herbert J. Solomon, Beechhurst, N.Y., assignors to Uniroyal, Inc.

Filed Mar. 22, 1976, Ser. No. 669,124

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—157



242,890

FOOTWEAR DISPLAY STAND

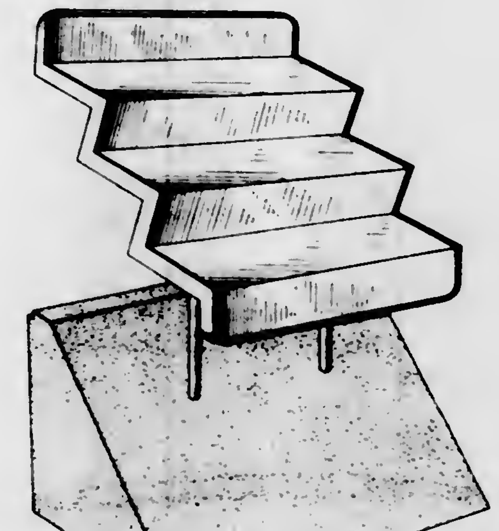
Douglas C. Hillman, Orange, Conn., and Herbert J. Solomon, Beechhurst, N.Y., assignors to Uniroyal, Inc.

Filed Mar. 22, 1976, Ser. No. 669,125

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—186



242,891

ELECTRIC COFFEEMAKER OR SIMILAR ARTICLE

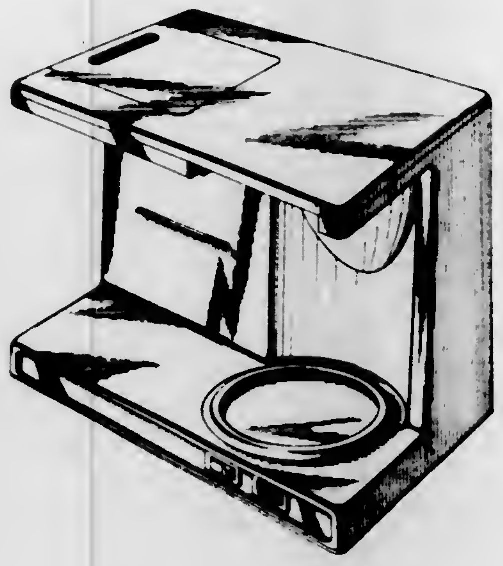
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company

Filed July 28, 1975, Ser. No. 599,414

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—59



242,892

FOOD GRINDER

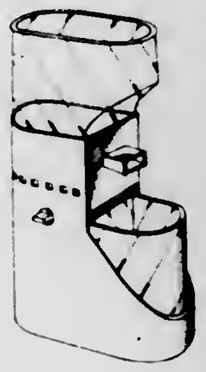
Lester Brown, Flushing; Paul M. Moskowitz, Brooklyn; Michael Lax, New York, all of N.Y., and Robert Dziekonski, Fort Lee, N.J., assignors to Salton, Inc., Bronx, N.Y.

Filed June 5, 1975, Ser. No. 583,997

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—155



242,893

HOLDER FOR A SCOURING IMPLEMENT

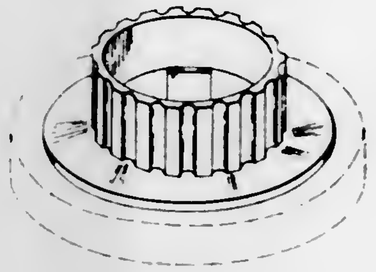
Louis J. Silver, 3434 Baker St., San Francisco, Calif. 94123

Filed Dec. 8, 1975, Ser. No. 638,345

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D7—178



242,894

SPRINKLER HEAD GRASS TRIMMER

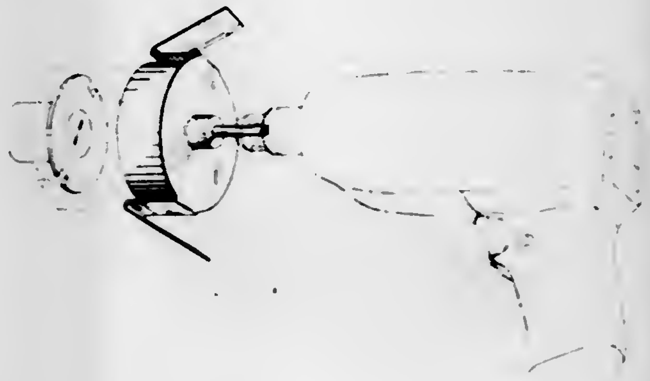
Kenneth W. Harris, San Antonio, Tex., assignor to Allan E. Harris, Austin; Roger T. Harris, Plano and Philip W. Eckman, San Antonio, all of, Tex.

Filed Apr. 25, 1975, Ser. No. 571,608

Term of patent 14 years

Int. Cl. D8—*3*

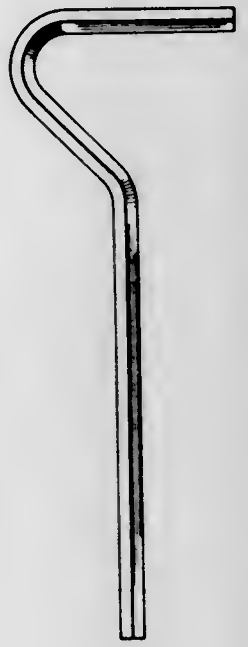
U.S. Cl. D8—8



242,895
WRENCH

Phillip E. Saurenman, Pasadena, Calif., assignor to Clamp Mfg. Co., Inc. (Calif. Corporation), South El Monte, Calif.
Filed Oct. 3, 1975, Ser. No. 619,220
Term of patent 14 years
Int. Cl. D8—*05*

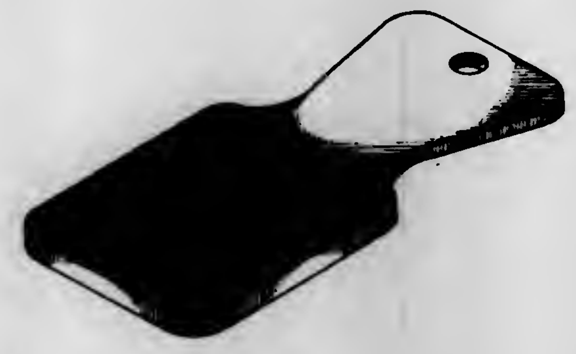
U.S. Cl. D8—29



242,896
POOL CUE TIP FILE

Richard D. Poliquin, 18951 Newton St., Santa Ana, Calif. 92703
Filed Oct. 20, 1975, Ser. No. 623,710
Term of patent 14 years
Int. Cl. D8—*05*

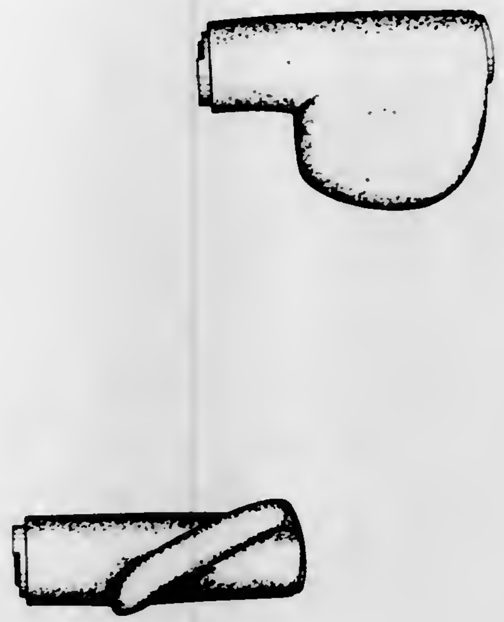
U.S. Cl. D8—90



242,897
HANDLE FOR A PERCUSSIVE TOOL OR THE LIKE

Anders Gunnar Rudolf Lundmark, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Aug. 13, 1975, Ser. No. 604,219
Claims priority, application Sweden, Feb. 18, 1975, 7500038
Term of patent 14 years
Int. Cl. D8—*99*

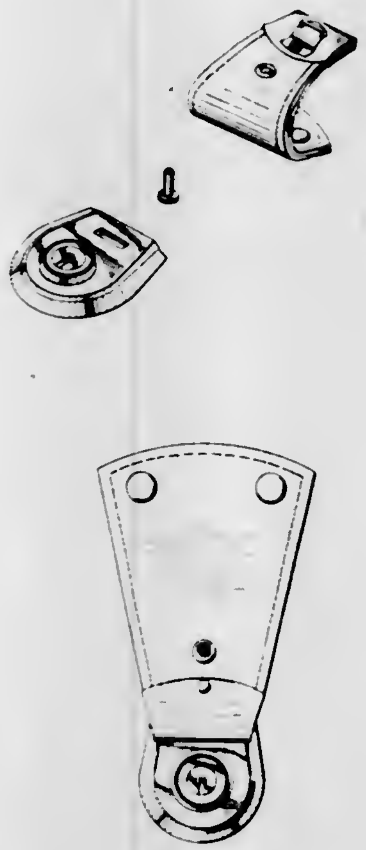
U.S. Cl. D8—107



242,898
COMBINED CLOSURE FLAP AND LOCK FOR LUGGAGE OR THE LIKE

Michael Davis, New Castle, Pa., assignor to Airway Industries Incorporated, West Pittsburgh, Pa.
Filed Nov. 20, 1974, Ser. No. 525,288
Term of patent 14 years
Int. Cl. D8—*07*

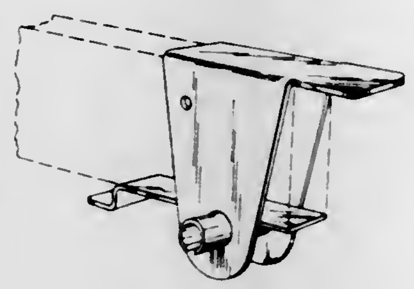
U.S. Cl. D8—122



242,899
SPANNER BEAM HANGER

Stanley Barber, 3310 S. 27th St., Fort Smith, Ark. 72901
Continuation of Ser. No. D. 444,270, Feb. 21, 1974. This application July 11, 1975, Ser. No. 595,068
Term of patent 14 years
Int. Cl. D8—*08*

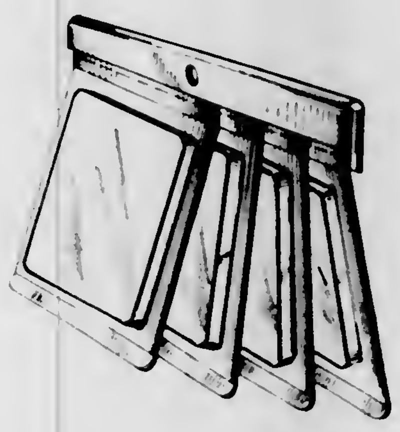
U.S. Cl. D8—235



242,900
MULTI-UNIT, INDIVIDUALLY REMOVABLE, FOOD DISPENSING PACKAGE

Oscar E. Seiferth; Paul E. Grindrod; Robert L. Goller, all of Madison, and Harry L. Radloff, Sun Prairie, all of Wis., assignors to Oscar Mayer & Co. Inc.
Filed June 9, 1975, Ser. No. 585,236
Term of patent 14 years
Int. Cl. D9—*03*

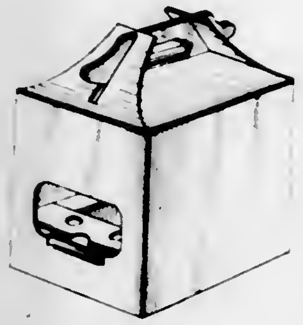
U.S. Cl. D9—191



242,901
CARRYING CARTON

Mervin Lohrbach, Anaheim, Calif., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.
Filed Sept. 10, 1975, Ser. No. 611,868
Term of patent 14 years
Int. Cl. D9—*03*

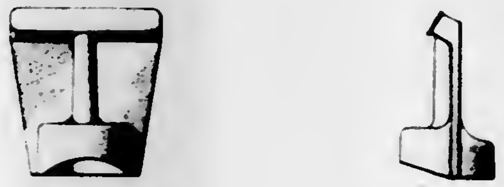
U.S. Cl. D9—224



242,902
COMBINED RAZOR BLADE CARTRIDGE HOLDER AND LATHER DISPENSING CAP

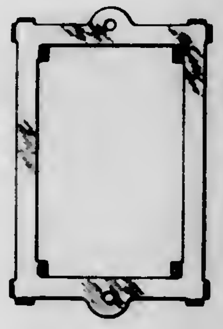
Saul A. Hackmyer, 2335 NE. 172nd St., North Miami Beach, Fla. 33160
Filed July 2, 1975, Ser. No. 592,621
Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D9—261



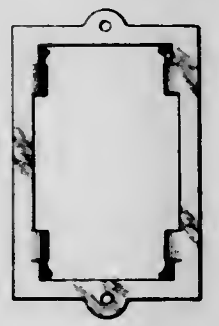
242,903
TEMPLATE FOR FORMING PANEL OPENINGS

Lucien E. Benoit, R.F.D. 2, Woonsocket, R.I. 02895
Filed May 30, 1975, Ser. No. 582,236
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



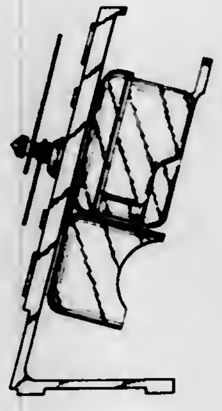
242,904
TEMPLATE FOR FORMING PANEL OPENINGS

Lucien E. Benoit, R.F.D. 2, Woonsocket, R.I. 02895
Filed May 30, 1975, Ser. No. 582,237
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



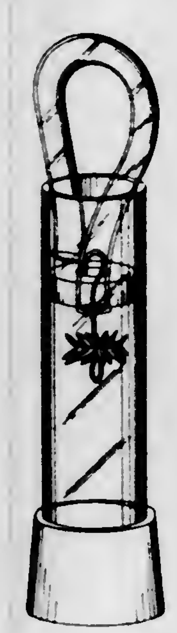
242,905
CLOCK

Richard Louis Eschenfeldt, 578 Laurel Heights Drive, Delavan, Wis. 53115
Filed July 17, 1975, Ser. No. 596,888
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26



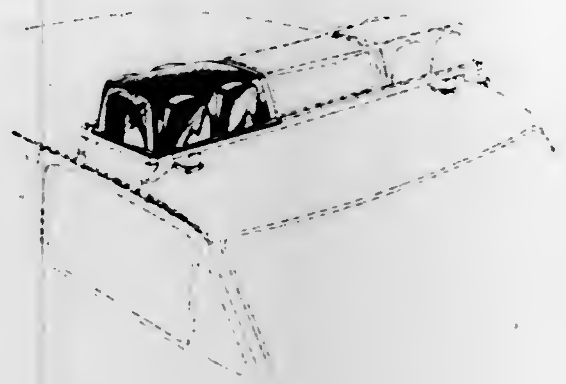
242,906
CARBURETOR AIR FILTER TESTER

Bernard Larson, 1717 Darlington Drive, Tampa, Fla. 33619
Filed Oct. 6, 1975, Ser. No. 620,205
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



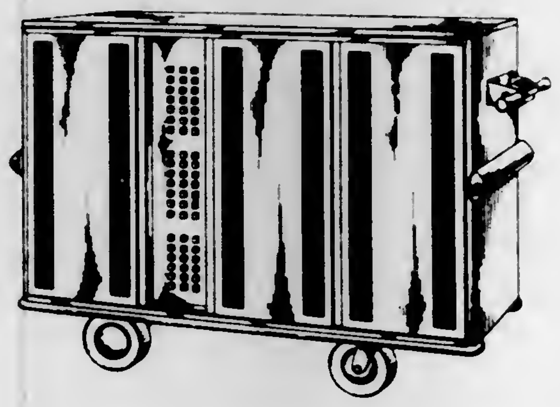
242,907
LENS COVER FOR EMERGENCY WARNING LIGHT

Arnold O. Blaylock; Robert P. Falconer, and Charles M. Campbell, all of Fort Worth, Tex., assignors to Lectric Lites Company, Fort Worth, Tex.
Filed Oct. 2, 1975, Ser. No. 618,906
Term of patent 14 years
Int. Cl. D26—*06*; D10—*06*
U.S. Cl. D10—121



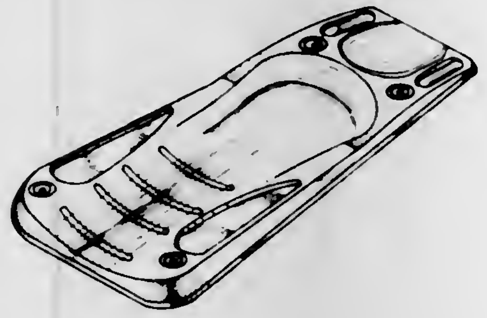
242,908
MOBILE SERVICE VEHICLE

Gene J. Seider, Bloomington, and James R. Duffy, West St. Paul, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.
Filed May 9, 1975, Ser. No. 570,191
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22



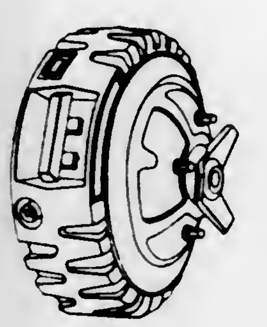
242,909
AUTO MECHANIC'S CREEPER

Jack V. Miller, Sierra Madre, Calif., assignor to Acroform, Inc., Los Angeles, Calif.
Filed Apr. 17, 1975, Ser. No. 569,064
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31



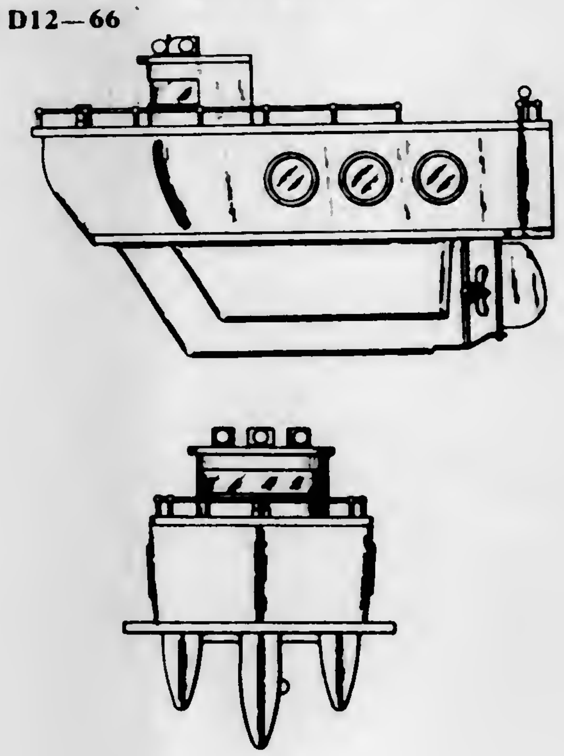
242,910
LIFTING JACK

Velu K. K. Dasan, Madras, India, assignor to Ashok Kumar Shetty
Filed Mar. 12, 1975, Ser. No. 557,626
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



242,911
BOAT

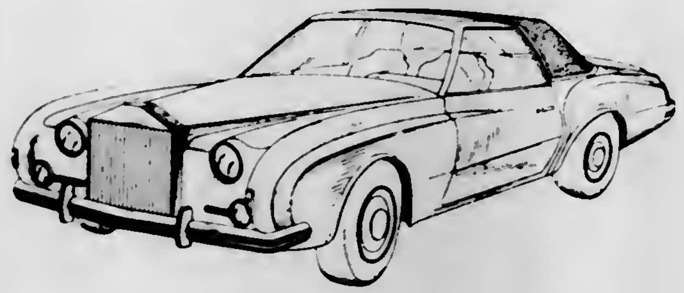
Keamon Kurose, 7002 N. Mercer Way, Mercer Island, Wash. 98040
Filed Oct. 20, 1975, Ser. No. 624,050
Term of patent 3½ years
Int. Cl. D12—*06*
U.S. Cl. D12—66



242,912
AUTOMOBILE

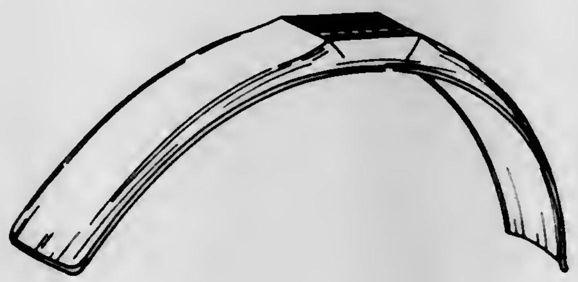
John D. Tedesco, North Miami Beach, Fla., assignor to Car Concepts, Inc.

Filed Sept. 25, 1975, Ser. No. 616,661
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92



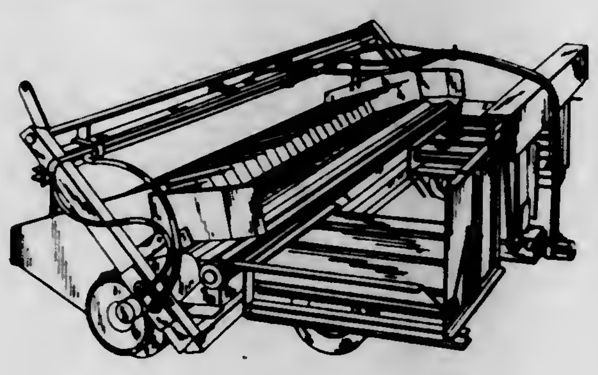
242,913
MOTORCYCLE FENDER

Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed Mar. 7, 1974, Ser. No. 448,810
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—186



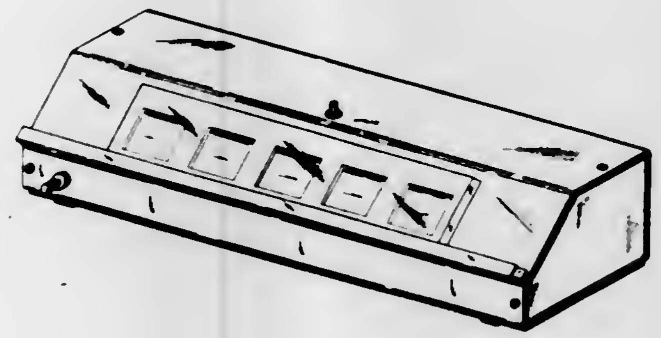
242,914
BEAN HARVESTER

Ronald L. Kilburn, and James E. Fellion, both of Ft. Collins, Colo., assignors to H.F.E., Inc.
Filed Sept. 15, 1975, Ser. No. 613,551
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



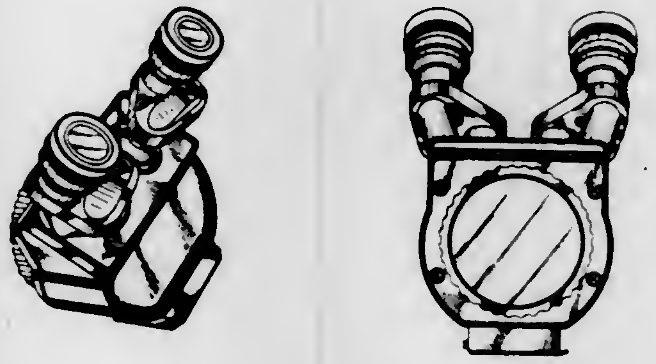
242,915
TRANSPARENCY VIEWER

Robert O. Wang, 2744 S. 61st St., Milwaukee, Wis. 53219
Filed July 17, 1975, Ser. No. 596,626
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



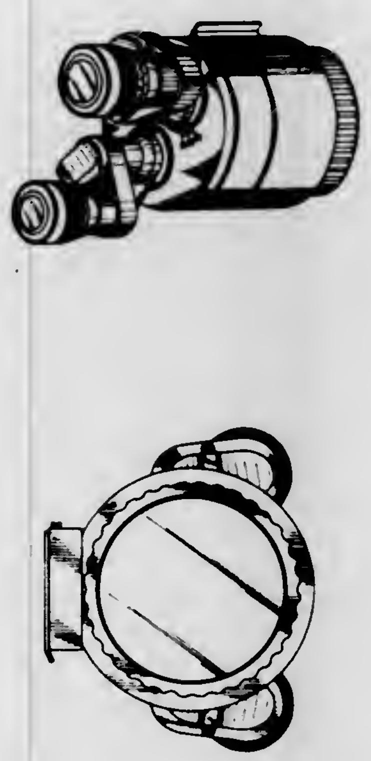
242,916
MICROSCOPE OPTICAL ASSEMBLY

Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan
Filed Jan. 21, 1976, Ser. No. 651,065
Term of patent 7 years
Int. Cl. D16—*06*
U.S. Cl. D16—58



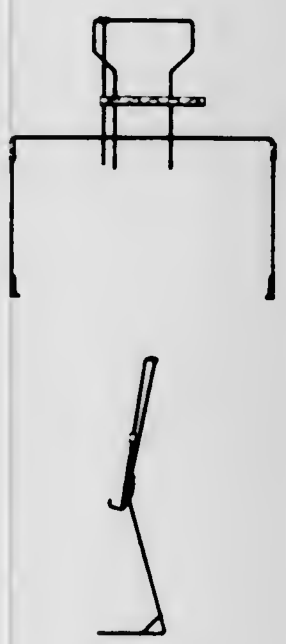
242,917
MICROSCOPE OPTICAL ASSEMBLY

Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan
Filed Jan. 21, 1976, Ser. No. 651,140
Term of patent 7 years
Int. Cl. D16—*06*
U.S. Cl. D16—58



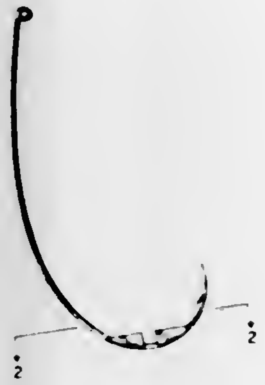
242,918
COPY HOLDER FOR A TYPIST OR THE LIKE

Barry J. Lar Rieu, P.O. Box 752, Menlo Park, Calif. 94025
Filed June 25, 1975, Ser. No. 589,998
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



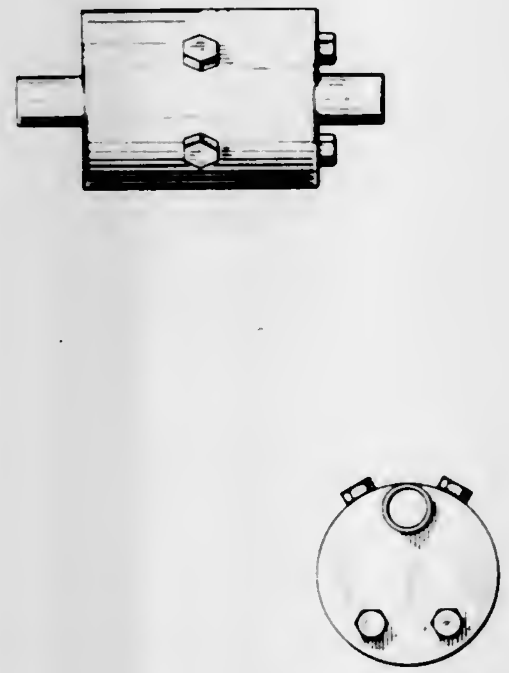
242,919
RETRIEVABLE FISH HOOK

Harry Petersen, Jr., 1860 Lark Lane, Waterloo, Iowa 50701
Filed June 23, 1975, Ser. No. 589,616
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30



242,920
SWIMMING POOL CHLORINATOR

Gregory Csurgay, 3320 NE. 18th Terrace, Fort Lauderdale, Fla. 33306
Filed July 28, 1975, Ser. No. 599,376
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

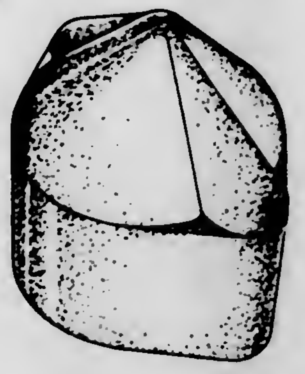


242,921
VALVE HANDLE

Earl A. Bake, and Leonard J. Stephens, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1975, Ser. No. 637,084
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—28

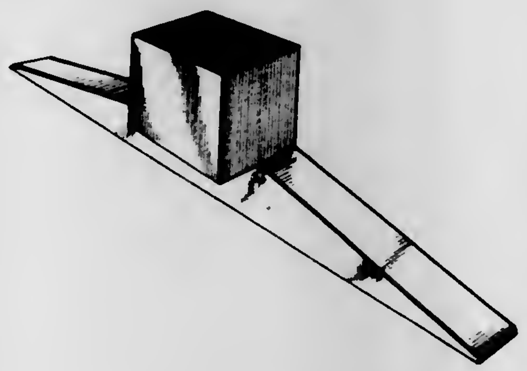


242,922
COMBINED HEAT COLLECTOR AND DIFFUSER

Robert C. Monninger, 110 N. Coolidge St., Normal, Ill. 61761

Filed Apr. 21, 1975, Ser. No. 570,251
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—127

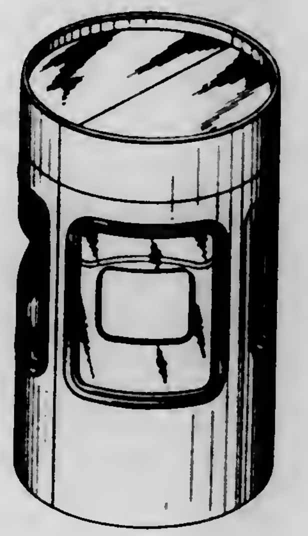


242,923
SHELTER

Richard Dattner, 180 Cabrini Blvd., New York, N.Y. 10033

Filed June 23, 1975, Ser. No. 589,211
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—16

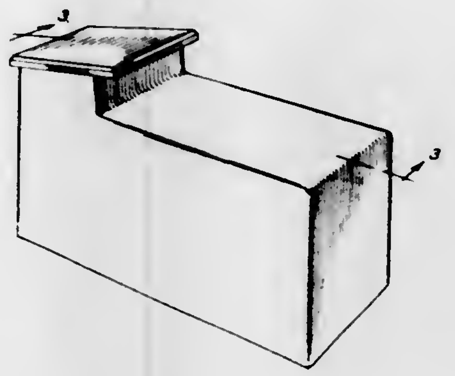


242,924
UNDERGROUND TORNADO SHELTER

Charles E. McKnight, 103 Lockwood Ave., Salem, Ind. 47167

Filed Mar. 24, 1975, Ser. No. 561,557
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—36



242,925
FOLDING LADDER

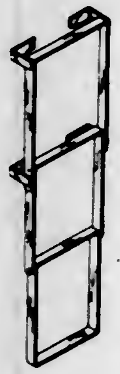
Athol John William Salter, 6 Elphinstone Road, P.O. Box 75, North Hobart, Tasmania, Australia (7001)

Filed Oct. 2, 1975, Ser. No. 618,818

Claims priority, application Australia, Aug. 25, 1975, 67628/75

Term of patent 14 years
Int. Cl. D6—*99*

U.S. Cl. D25—64

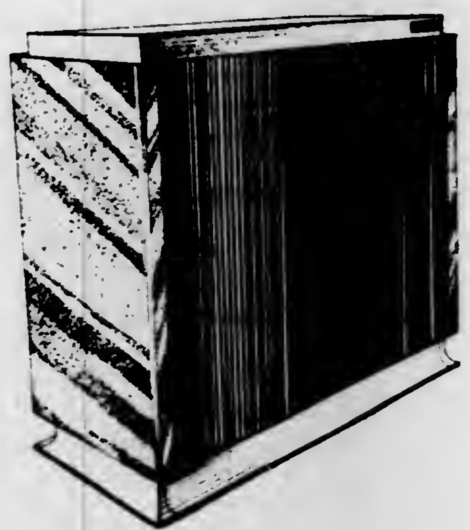


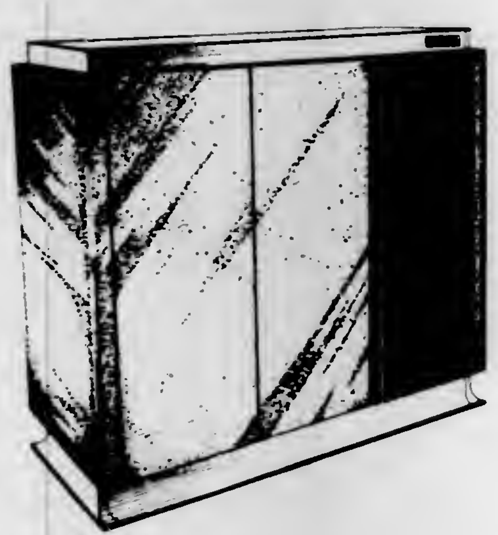
242,926
COMPUTER MODULE CABINET

Thomas C. Abrahamsen, Birmingham, Mich.; Jack K. Beduhn, Westlake Village, and Norman P. Guetschoff, Jr., Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,481
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D26—5 C



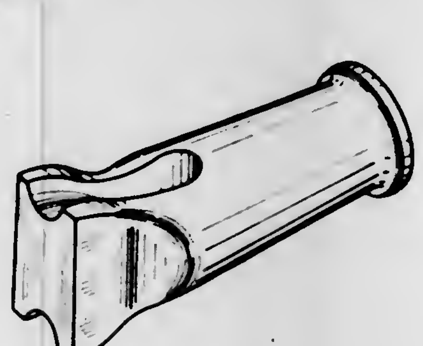


242,927
THIMBLE END STRAIN INSULATOR FITTING

Albert Medler, Jackson, Mich., assignor to Plastigage Corporation

Filed July 2, 1975, Ser. No. 592,391
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D26—10



242,928
TELEPHONE HANDSET

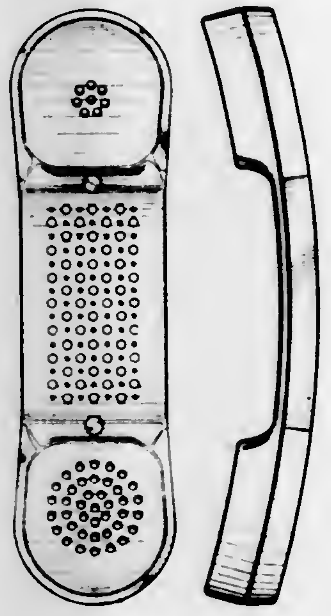
Karl Büchin; Werner Grosse; Wolfgang Klein, and Alfred Wloch, all of Berlin, Germany, assignors to Deutsche Telephonwerke und Kabelindustrie Aktiengesellschaft, Berlin, Germany

Filed Feb. 7, 1975, Ser. No. 548,153

Claims priority, application Germany, Nov. 6, 1974, 4089

Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D26—14 A

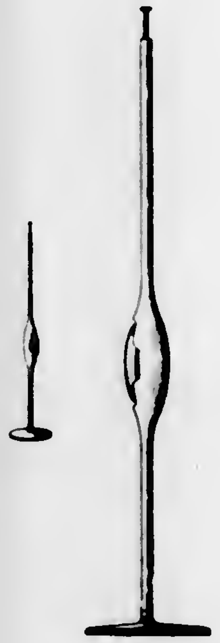


242,929
POLE TELEPHONE

Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 618,841
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D26—14 A

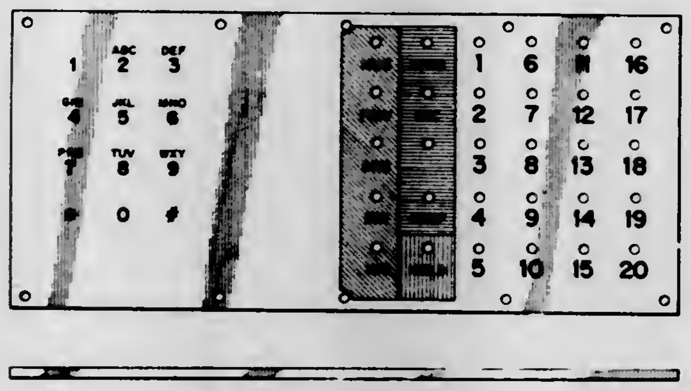


242,930
MEMBRANE SWITCH ASSEMBLY FONT

Joseph Monroe Jackson, and Shai Ronen, both of Menlo Park, Calif., assignors to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.

Filed Nov. 12, 1975, Ser. No. 631,372
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D26—14 A

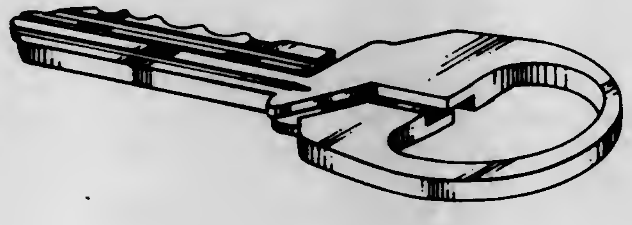


242,931
CIGARETTE HOLDER

Richard B. Kaiser, 4717 Morella Ave., North Hollywood, Calif. 91607, and Denis C. Higgins, 2390 Lorain Road, San Marino, Calif. 91108

Filed Dec. 30, 1974, Ser. No. 537,269
Term of patent 14 years
Int. Cl. D27—*02*

U.S. Cl. D27—2

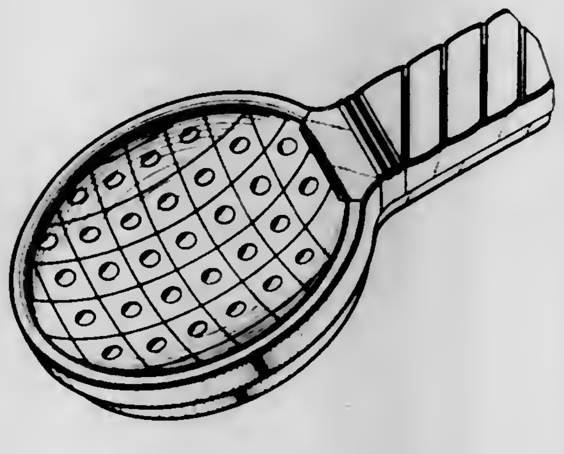


242,932
ASHTRAY

Joan B. Sickul, 10 Hobson St., Stamford, Conn. 06902

Filed Apr. 28, 1975, Ser. No. 572,228
Term of patent 14 years
Int. Cl. D27—*03*

U.S. Cl. D27—22

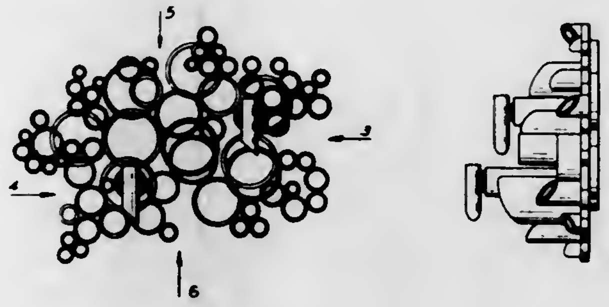


242,933
PIPE SCULPTURE

Mervin A. Brubaker, and Myrtle E. Brubaker, both of 1024 Gettysburg Pike, Mechanicsburg, Pa. 17055

Filed Feb. 11, 1975, Ser. No. 548,952
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—131

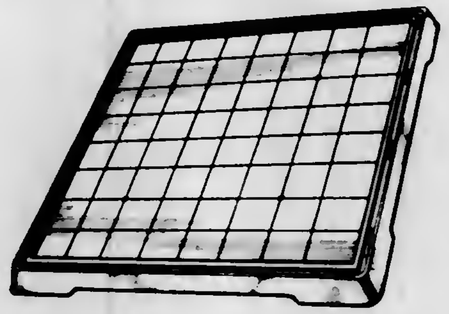


242,934
GAME BOARD

Mitsuo Tsukuda, 3-1-3 Moto-Asakusa, Taito, Tokyo, Japan

Filed May 23, 1974, Ser. No. 472,527
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—5 SS

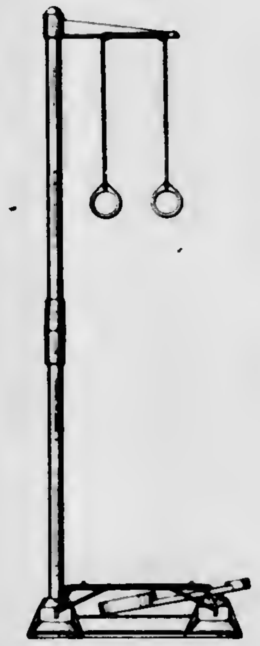


242,935
TOY TRAMPOLINE

Osamu Takahashi, No. 9-10, Tateishi 7-chome,, Katsushika, Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,238
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—5 K

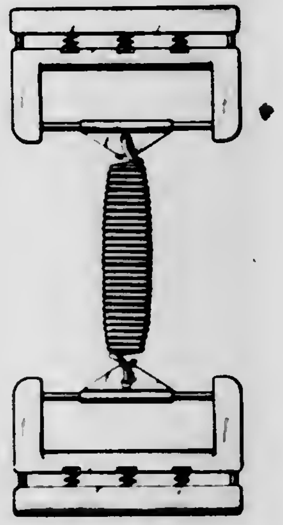


242,936
EXERCISER

Dusan Docic, 61 Clark St., Patterson, N.J. 07505

Filed Sept. 2, 1975, Ser. No. 609,365
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 K

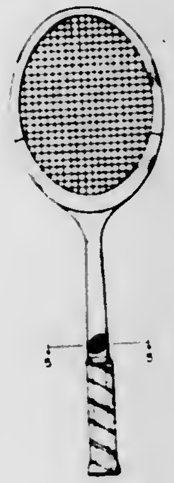


242,937
TRAINING TENNIS RACQUET

Roy G. Williams, P.O. Box 11, Kernersville, N.C. 27284

Filed Sept. 22, 1975, Ser. No. 615,591
Term of patent 14 years
Int. Cl. D21—*04*

U.S. Cl. D34—5 ST

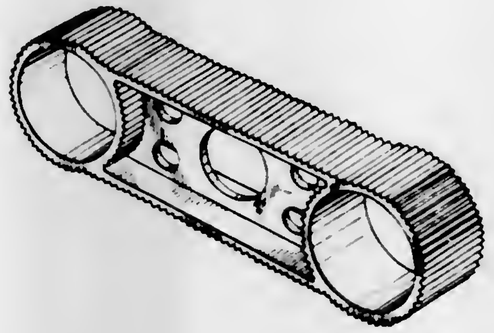


242,938
WEAR SOLE FOR MOUNTING UPON AND LOCKING ROLLER SKATE WHEELS

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,884
Term of patent 14 years
Int. Cl. 1—*D21*

U.S. Cl. D34—14 R

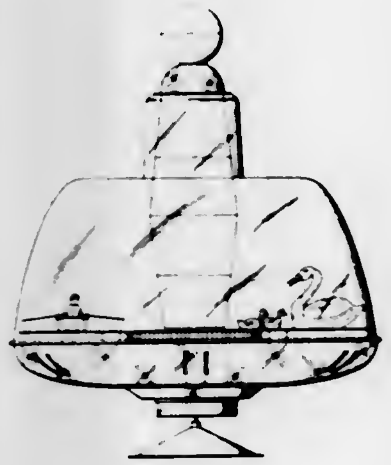


242,939
TOY SPINNING TOP

Peter Balleis, Hermann-Loens-Strasse 55, D-8502, Zirndorf near Nuremberg, Germany

Filed Feb. 14, 1975, Ser. No. 549,968
Claims priority, application Germany, Oct. 2, 1974, 7023
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 W



242,940
COMBINED SELF-PROPELLED ARTICULATED TRACTOR WITH LAWN MOWER APPARATUS

Hans Tage Alfred Ehrlin, and Christian Gunnar Häggstam, both of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden

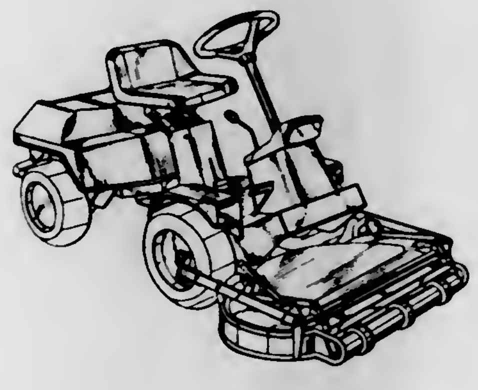
Filed Dec. 18, 1974, Ser. No. 533,783

Claims priority, application Sweden, June 26, 1974, 741063

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—15



242,941
COMBINED LAMP AND PLANTER OR SIMILAR ARTICLE

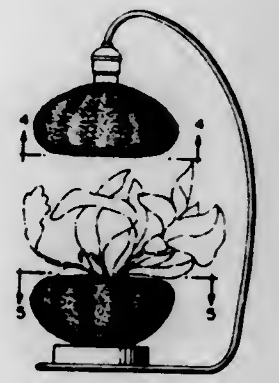
Yuho Nagata, 1036 S. Normandie Ave., Los Angeles, Calif. 90006

Filed June 21, 1974, Ser. No. 481,936

Term of patent 14 years

Int. Cl. D26—*05*

U.S. Cl. D48—20 D



242,942
HOUSING FOR A REVOLVING LAMP

Peter E. Brudy, 111 Angus Drive, Willowdale, Ontario, Canada, and John Smith, 381 Shirley Road, Southampton, England (S091HB)

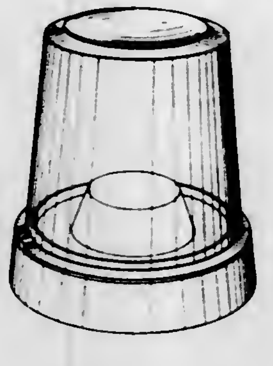
Filed July 23, 1974, Ser. No. 491,001

Claims priority, application Canada, Jan. 23, 1974, D. 45635

Term of patent 14 years

Int. Cl. D26—*02*; D10—*06*

U.S. Cl. D48—24 R



242,943
LIGHT FIXTURE, OR SIMILAR ARTICLE

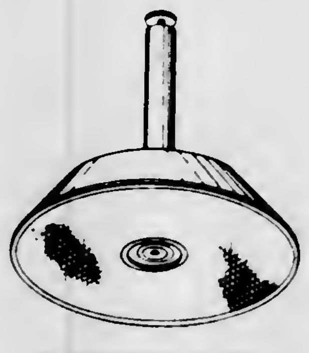
Bernard Lazerson, Chicago, Ill., assignor to Solar Lighting Corporation, Chicago, Ill.

Filed May 27, 1975, Ser. No. 577,421

Term of patent 14 years

Int. Cl. D26—*05*

U.S. Cl. D48—23 R



242,944
DUAL LAMP

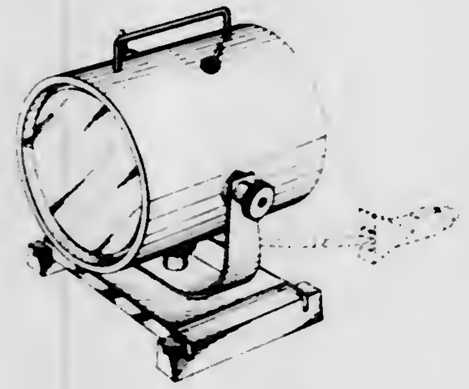
Charles R. Moore, 1615 Merrifield, Mishawaka, Ind. 46544

Filed Dec. 22, 1975, Ser. No. 643,072

Term of patent 14 years

Int. Cl. D26—*03*

U.S. Cl. D48—20 K



242,945
LAMP

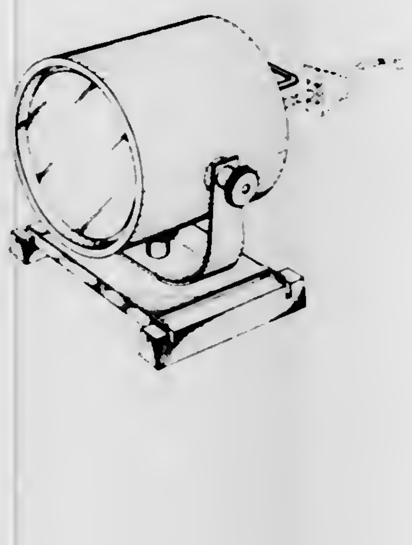
Charles R. Moore, 1615 Merrifield, Mishawaka, Ind. 46544

Filed Dec. 22, 1975, Ser. No. 643,245

Term of patent 14 years

Int. Cl. D26—*03*, *02*

U.S. Cl. D48—20 K



242,946
FOLDING AND SMOOTHING MACHINE FOR SKIRTS AND THE LIKE

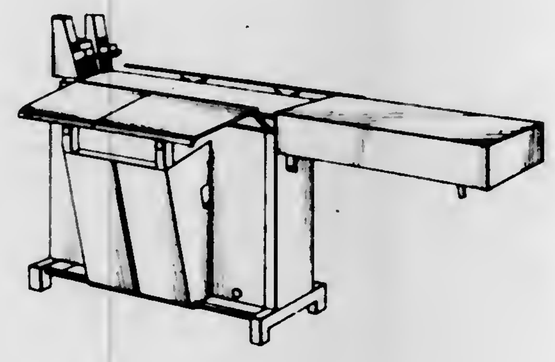
Osmo Viljam Harjapaa, Boras, Sweden, assignor to AB Calator, a joint stock company, Boras, Sweden

Filed Mar. 19, 1975, Ser. No. 559,976

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—42



242,947
DEEP FAT FRYER

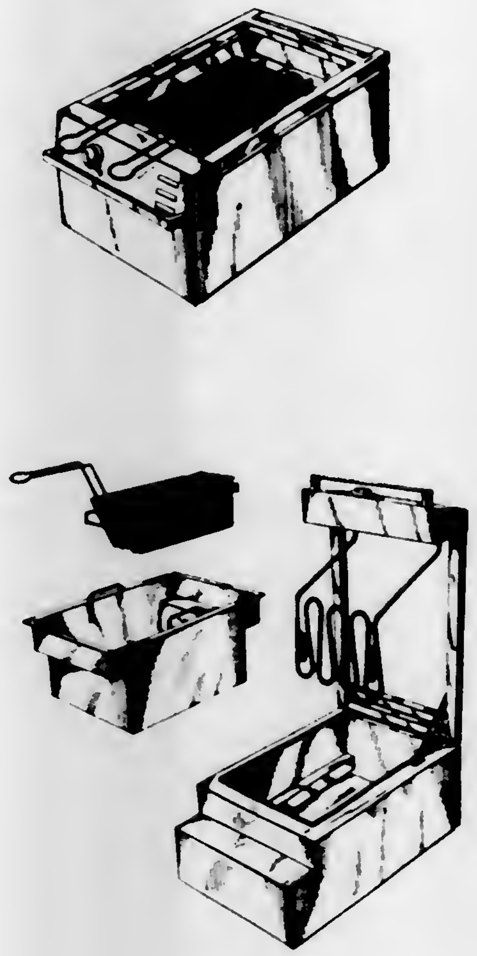
Glenn N. Graham, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.

Filed Aug. 14, 1975, Ser. No. 604,845

Term of patent 14 years

Int. Cl. D15—*08*

U.S. Cl. D15—104



242,948
TUBE BENDER

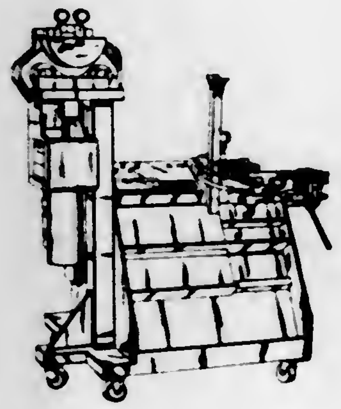
Samuel Grimaldo, 776 San Doval, Thousand Oaks, Calif. 91360, and Leighton Harvey Watling, 1778 Ciprian Ave., Camarillo, Calif. 93010

Filed Jan. 19, 1976, Ser. No. 650,544

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—123



242,949

FONT OF TYPE

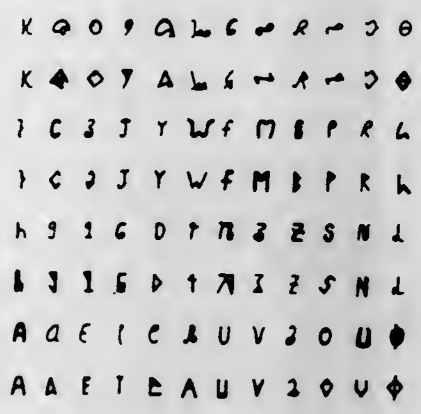
Stephen Earl Diamond, 1720 Pacific Ave., No. 6, San Francisco, Calif. 94109

Filed June 9, 1975, Ser. No. 585,248

Term of patent 7 years

Int. Cl. D18—*03*

U.S. Cl. D64—12 B



242,950

ICE CREAM MACHINE

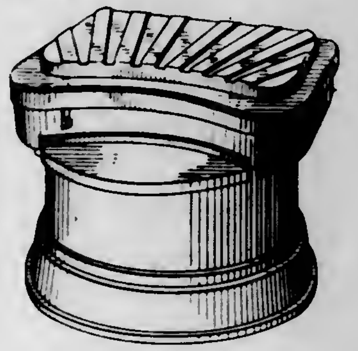
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Mar. 12, 1975, Ser. No. 557,789

Term of patent 14 years

Int. Cl. D15—*07*

U.S. Cl. D15—82



242,951

RECIPROCATING ELECTRIC HAIR COMB

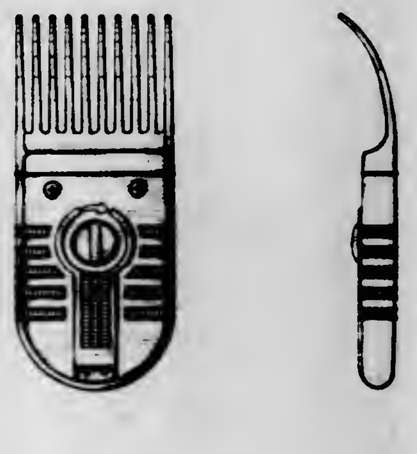
Isaiah W. Bradford, 416 W. 53rd St., Los Angeles, Calif. 90037

Filed May 8, 1975, Ser. No. 575,809

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D86—8



242,952

FLEXIBLE URINARY DRAINAGE CONTAINER

Robert Dyall Flinn, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

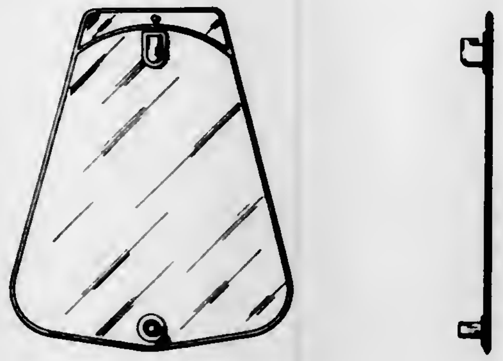
Filed Feb. 25, 1975, Ser. No. 552,821

The portion of the term of this patent subsequent to Jan. 4, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D24—*05*

U.S. Cl. D83—1 U



242,953

STAND FOR CURLER/STYLER

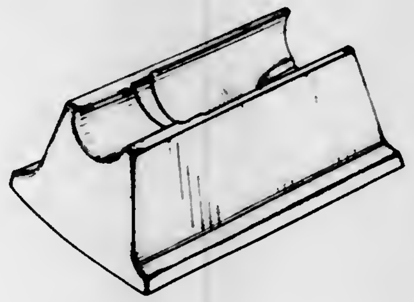
Bernard B. Bluestein, Des Plaines, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,369

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D86—10 A



242,954

SURGICAL PLEDGETS

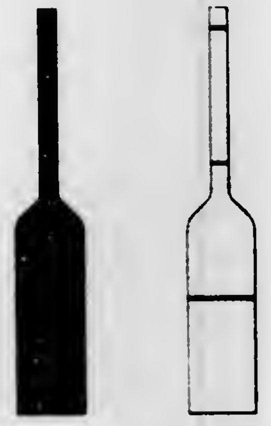
Robert W. Rand, 521 N. Bristol Ave., Los Angeles, Calif. 90049

Filed May 29, 1975, Ser. No. 581,867

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D83—1 A



242,955

ORTHOPEDIC BRACE

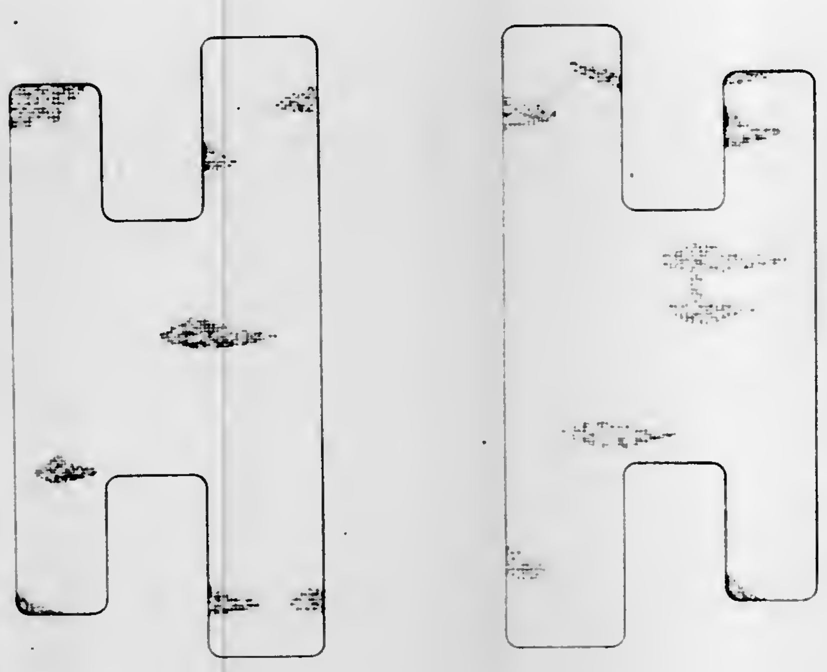
Elmer M. Arluck, New York, N.Y., assignor to Thermo-Mold Medical Products, Inc., New York, N.Y.

Filed July 29, 1975, Ser. No. 600,006

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D83—1 J



242,956

LUNG EXERCISE DEVICE

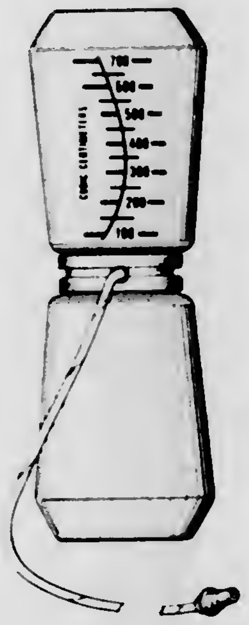
James G. Miller, Northwood; Wayne J. Zitkus, Toledo, and Robert J. Aul, Perrysburg, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 11, 1975, Ser. No. 586,788

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D83—1



242,957

TOTAL ANKLE PROSTHESIS

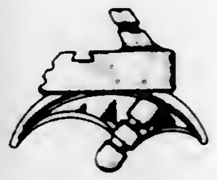
James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed May 28, 1975, Ser. No. 581,650

Term of patent 14 years

Int. Cl. D24—*03*

U.S. Cl. D83—1 E



242,958

FLEXIBLE URINARY DRAINAGE CONTAINER

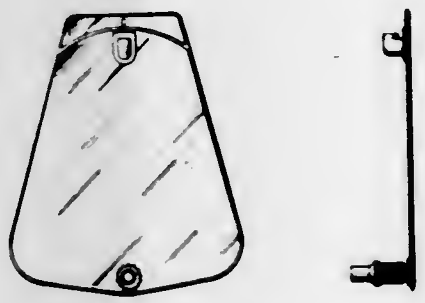
James Gordon Manschot, Mukwonago Township, Waukesha County, Wis.; Kenneth Howard Knox, and Robert Dyall Flinn, both of Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 25, 1975, Ser. No. 552,814

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D83—1 U



242,959

NAIL CLIPPER

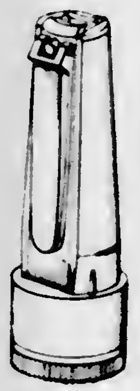
Tatsuya Saito, Seki, Japan, assignor to Sanwa Cutlery Co., Ltd.

Filed Oct. 25, 1974, Ser. No. 518,177

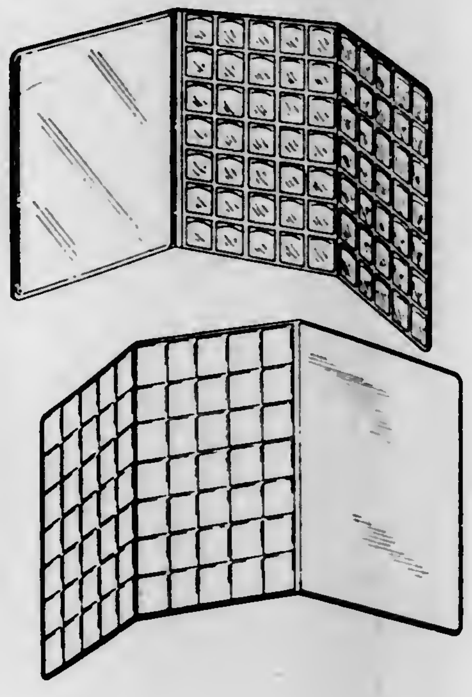
Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D86—10 B



242,960
COIN WALLET
William J. Stanley, 33 Davern Road, Brantford, Ontario, Canada
Filed May 7, 1975, Ser. No. 575,190
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 B



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TO WHOM

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- Amrine, Herman Eugene; and Baker, Richard Eugene, to International Business Machines Corporation. Intruder detecting security system. 4,001,771, Cl. 340-16.00R.
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- Barrett, Gerald George, Hornung, Louis Michael; and Jones, Calvin Coolidge, Jr., to International Business Machines Corporation Method of testing and repairing magnetic bubble domain chip. 4,001,673, Cl 324-34.00R.
- Barrett, M. James. Covalently bound biological substances to plastic materials and use in radioassay. 4,001,583, Cl. 250-303.000.
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  - Fenwick, Robert B.; and Gilliland, Clinton R., 4,001,692.
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  - Shubin, Vladimir Nikolaevich; Silantiev, Viktor Sergeevich, Khlyntsev, Alexandr Sergeevich, Barsova, Antonina Petrovna, and Rodionova, Galina Alexeevna, 4,000,636.
- Bart, Theodor Ernst: *See—*
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- Barton, George Clifford, deceased (by Barton, Margaret Ellen, executrix), to USM Corporation. Shoe machine shoe size and side sensing arrangements. 4,000,535, Cl. 12-126.000.
- Barton, Margaret Ellen, executrix: *See—*
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- Barzynski, Helmut; and Richter, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method for the production of printing plates using photosensitive compositions 4,001,015, Cl. 96-33.000
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  - Diem, Hans; Lihowitzky, Herbert, Matthias, Guenther, Dudeck, Christian; and Lehmann, Gunter, 4,001,337.
  - Fahrbach, Gerhard; Seiler, Erhard, and Gerberding, Karl, 4,001,350.
  - Fischer, Adolf; Hansen, Hanspeter, and Rohr, Wolfgang, 4,001,217.
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  - Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard, and Horn, Hans Christoph, 4,001,273.
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  - Kempter, Firtz Erdmann; Sabelus, Guenther; and Spoor, Herbert, 4,001,155.
  - Pommer, Ernst-Heinrich; Zeeh, Bernd; Goetz, Norbert; and Giergensohn, Bjoern, 4,001,416.
  - Sander, Bruno; Bonitz, Eckhard; Berbner, Heinz; and Hoffmann, Manfred, 4,001,157.
  - Schaefer, Dieter; and Motz, Herbert, 4,001,463.
  - Schaffner, Ernst; Eilingsfeld, Heinz; Schefczik, Ernst; and Patsch, Manfred, 4,001,335.
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- Bassett, Terry J.: *See—*
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- Bassett, Walter D.; and Bassett, Terry J Windshield washer service apparatus. 4,000,835, Cl. 222-183.000.
- Bates, Albert M.: *See—*
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- Batha, Howard D., and Cross, Leslie E., to Carborundum Company, The. Process for generating periodic non-uniform electric field, and for removing polarizable particulate material from fluid, using ferroelectric apparatus. 4,001,102, Cl. 204-186.000.
- Batson-Cook Company: *See—*
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- Bauer, Frederick T.; and Geary, Frederick J., to Robertshaw Controls Company Ignition system. 4,001,638, Cl. 315-209.0SC.
- Bauer, Hannsgeorg; and Otto, Josef. Process for the manufacture of steels with a high chromium content. 4,001,009, Cl. 75-13.000
- Bauer, Karl, to Barmag Barmer Maschinenfabrik Aktiengesellschaft Heating apparatus for the heat treatment of yarns. 4,001,548, Cl 219-388.000
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- Baumann, Niklaus; and Schlunke, Hans-Peter, to Ciba-Geigy AG. Process for the photopolymerization of ethylenically unsaturated compounds 4,001,017, Cl 96-35.100.
- Baumeister, Heard Kilpatrick, Sebrosky, Robert Allen; and Wagner, Walter Rudolph, to International Business Machines Corporation Print wire attachment. 4,000,801, Cl. 197-1.00R.
- Baumel, Anton, to Gebr. Bohler & Co. AG. High silicon-containing austenitic-iron-chromium-nickel alloys 4,000,984, Cl. 29-183.000
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- Beck, Fritz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft Lead batteries. 4,001,037, Cl. 429-188.000.
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Behrenz, Wolfgang: *See—*
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Bell, Reuben H., to Owens-Corning Fiberglas Corporation. Aniline based reaction product. 4,001,329, Cl. 260-570.00D.

Bell, Robert Graham, to National-Standard Company, Limited. Tire building apparatus. 4,001,070, Cl. 156-398.000.

Bell Telephone Laboratories, Incorporated: *See—*
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- Ballamy, William Charles; and Cho, Alfred Yi, 4,001,858.
- Bidlack, Richard Henry; Egan, Wayne Jay; and Miller, Steven Gary, 4,001,517.
- Cook, John Stone; and Personick, Stewart David, 4,001,578.
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- Koontz, Donald Eldridge; and Landau, Uziel, 4,001,093.
- Krupka, Dan Charles, 4,001,719.
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Bendix Corporation, The: *See—*
- Kosakowski, Henry R., 4,001,813.
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- Thomas, Francis J.; Kirchhein, Albert; and Porawski, Donald J., 4,001,605.
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Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-30641 and process for production thereof. 4,001,086, Cl. 195-81.000.

Berg, Robert H. Displacement metering with independent ancillary flow. 4,001,678, Cl. 324-71.0CP.

Berger, Harald: *See—*
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Berkey Photo, Inc.: *See—*
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Berkowitz, Ami E., to General Electric Company. Recording head array with passive pole. 4,001,841, Cl. 346-74.100.

Berlincourt, Don A. Electrically actuated piezoelectric high voltage impact mechanism. 4,001,615, Cl. 310-8.300.

Berman, Alby M.; Walker, Richard C.; and Aller, David J., to Energy Development Associates. System for improving charge efficiency of a zinc-chloride battery. 4,001,036, Cl. 429-67.000.

Bertelsen, Viggo C., Jr.: *See—*
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Bhatti, Nazir A.: *See—*
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Bianchini, Antonio. Congruent modular building segments. 4,000,589, Cl. 52-79.500.

Biber, Conrad H., to Polaroid Corporation. Preferential power distribution system for battery powered camera having electronic flash unit. 4,001,639, Cl. 315-241.00P.

Biber, Conrad H., to Polaroid Corporation. Single trigger photographic strobe unit. 4,001,640, Cl. 315-241.00P.

Bidlack, Richard Henry; Egan, Wayne Jay; and Miller, Steven Gary, to Bell Telephone Laboratories, Incorporated. Direct station selection hold arrangement. 4,001,517, Cl. 179-99.000.

Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, to Thomson-CSF. Communication system for disseminating coded digital data in analogue form utilizing an orthogonal transformation. 4,001,564, Cl. 235-152.000.

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Biehl, Roy A. Seed germinator. 4,000,580, Cl. 47-14.000.

Biela, John A.; and Weirich, H. Paul. Toilet flushing apparatus. 4,000,526, Cl. 4-57.00P.

Bielefeldt, Ernst-August, to Messerschmitt-Bolkow-Blohm GmbH - Division Hamburger Flugzeugbau. Centrifugal treatment of fluids. 4,001,121, Cl. 210-512.00R.

Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,000,741, Cl. 128-218.0NV.

Bindicator Company: *See—*
- Snyder, Ellery P., 4,000,650.

Bingham, Larry A., to NRG Nufuel Company; and Reserve Synthetic Fuels, Inc., part interest to each. Adsorption process. 4,000,990, Cl. 55-30.000.

Biondetti, Mario, to Escher Wyss Limited. Roll for a rolling mill. 4,000,979, Cl. 29-115.000.

Birch Brothers Southern, Inc.: *See—*
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Birch, James D.; Mohr, Max C.; and Waterman, Raymond C., Jr., to Raytheon Company. Ferrite phase shifter having conductive material plated around ferrite assembly. 4,001,733, Cl. 333-24.100.

Birchenough, Arthur G., to United States of America, National Aeronautics and Space Administration. Electronic analog divider 4,001,602, Cl. 307-229.000.

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Birmingham Small Arms Company Limited: *See—*
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Blasingame, Thomas W. Demountable equipment support frame for truck bodies. 4,000,924, Cl. 296-35.00A.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
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Blin, Marie Francoise; Gaussens, Gilbert; and Lemaire, Francis, to Commissariat a l'Energie Atomique. Process for coating surfaces having a base of epoxy resins modified by unsaturated acids and coatings obtained by means of said process. 4,001,462, Cl 427-44.000.

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Blurton, Keith F.; and Sedlak, John M., to Energetics Science, Inc Device for the detection and measurement of NO and NO_2 gases. 4,001,103, Cl. 204-195.00R.

Boah, John K., to General Electric Company. Temperature gradient zone melting utilizing infrared radiation. 4,001,047, Cl. 148-1.500.

Bober, Robert E., to American Optical Corporation. Constant current-pulse led drive circuit. 4,001,667, Cl. 323-1.000.

BOC Limited: *See—*
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Bock Products, Inc.: *See—*
- Weber, Charles A., 4,000,911.

Bockelmann, Wilfried; Grozinger, Hans; and Wobky, Peter Ulrich, to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft. Control installation for the proportioning of a secondary air quantity for improvement of the combustion in internal combustion engines or the afterburning of the exhaust gases of internal combustion engines 4,000,615, Cl. 60-277.000.

Boehm, Arthur F., to Sperry Rand Corporation. Automatic configuration of main storage addressing ranges. 4,001,786, Cl. 340-172.500.

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- Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, 4,001,344.

Bogert, Clayton. Spout forming means for containers. 4,000,838, Cl. 222-529.000.

Boggs, Alben C.; and Shirey, Robert D., to Emerson Electric Co. Electric heating elements. 4,001,547, Cl. 219-322.000.

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Bolgiano, Duane Ridgely, to International Mobile Machines Corporation. Code-controlled ringer attachment for telephones including a-peak-to-peak gain controlled amplifier. 4,001,708, Cl. 330-29 000

Bolker, James H.: *See—*
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Bolliger, Frederic E., to Garrett Corporation, The. Fluid control valve and method. 4,000,607, Cl. 60-39.030.

Bolton, Frederick Arthur; and Eckebrecht, James Louis, to Arcan Eastern Limited. Braking device. 4,000,796, Cl. 193-35.00A.

Bonitz, Eckhard: *See—*
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Bonk, Franz; and Burger, Wolfgang, to Siemens Aktiengesellschaft Method and apparatus for telephone systems for facilitating data traffic between the subscriber stations and a central data processor. 4,001,507, Cl. 179-2.0DP.

Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., to Alza Corporation. Novel polymerized, cross-linked, stromal-free hemoglobin. 4,001,200, Cl. 260-112.50R.

Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., to Alza Corporation. Blood substitute and blood plasma expander comprising polyhemoglobin. 4,001,401, Cl. 424-177.000.

Boosen, Karl-Josef: *See—*
- Moulin, Francois; and Boosen, Karl-Josef, 4,001,255.

Booth, William M.; and Rieth, James E., to Reith, James E. Trolling apparatus. 4,000,653, Cl. 73-343.00R.

Borden, Inc.: *See—*
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Borror, Alan L., to Polaroid Corporation. Indole dehydro phthalides and naphthalides. 4,001,275, Cl. 260-326.12R.

Borror, Alan L., to Polaroid Corporation. Indole phthalides and naphthalides. 4,001,278, Cl. 260-326.12R.

Bossert, Friedrich: *See—*
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- Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,252.
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Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodeposition of epoxy compositions. 4,001,101, Cl. 204-181.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Method of producing epoxy group-containing, quaternary ammonium salt-containing resins. 4,001,156, Cl. 260-29.2EP.

Bosworth, Clive James Arthur, to British Steel Corporation. Monitoring of welding. 4,001,497, Cl. 358-101.000.

Botta, Artur, to Bayer Aktiengesellschaft. Preparation of N-chloroformyl-carbamic acid amides and esters. 4,001,318, Cl. 260-544.00C.

Boudreau, Jerry N.: *See—*
- Reardanz, Eugene H.; and Boudreau, Jerry N., 4,001,449.

Bove, Ottavio; Grossi, Galeazzo; and Kirkley, David William, to Saipem S.p.A.; and BOC Limited. Apparatus for a laser welding of a pipeline, particularly suitable for application on pipe-laying ships. 4,001,543, Cl. 219-121.00L.

Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, to SmithKline Corporation. 2-Alkoxy(and 2-alkoxyalkyl)-2-quinolyl-thioacetamides. 4,001,241, Cl. 260-283.00S.

Boyer, Lionel, to Agence Nationale de Valorisation de la Rechereche (ANVAR). Rotary electrical machines comprising a superconductive winding. 4,001,617, Cl. 310-52.000.

Boyesen, Eyvind, to Performance Industries, Inc. Engine valve means and porting. 4,000,723, Cl. 123-73.0AA.

Bozzelli, John W.; and Shier, George D., to Dow Chemical Company, The. Morpholinones as selective solvents for aromatic hydrocarbons. 4,001,107, Cl. 208-323.000.

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Brandes, Erich: *See—*
- Mau, Gunter; Jacobsen, Gunter; and Brandes, Erich, 4,001,332.

Brandstatter, Horst. Home intercom telephone set. 4,001,506, Cl. 179-1.00H.

Braukmann, Bernhard W.; and Vollmer, Rudolf. Regulating drive, especially for a thermostatically controlled valve shaft. 4,000,848, Cl. 236-68.00R.

Braun, Robert M.: *See—*
- Morris, Derek S.; and Braun, Robert M., 4,001,814.

Braun, Walter Jacob; Altshuler, John Henry; Schlatter, Gerald Lance; and Poland, Robert LeRoy, to Hemotec, Inc. Measuring system for the pharmacological manipulation of the coagulation mechanism in blood and for the elapsed coagulation time. 4,000,972, Cl. 23-230.00B.

Bray, Douglas: *See—*
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Bray, William Edward, to Texas Instruments Incorporated. Switching regulator power supply. 4,001,663, Cl. 321-2.000.

Breindl, Otto: *See—*
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Brennen, Michael B.: *See—*
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Brenner, L. Martin; and Brush, Charles K., to SmithKline Corporation. Substituted benzofurans and benzothiophenes. 4,001,426, Cl. 424-285.000.

Brenner, L. Martin: *See—*
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Breslow, Jeffrey D., to Marvin Glass & Associates. Game device. 4,000,899, Cl. 273-101.000.

Briles, Franklin S. Expanding head riveting method and system. 4,000,680, Cl. 85-37.000.

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- Reske, Eckart; Brinkmann, Ludwig, Fischer, Hartmut; and Rohrscheid, Freimund, 4,001,192.

Bristol-Myers Company: *See—*
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British Steel Corporation: *See—*
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Brodersen, Rolf K., to United States of America, Navy. Drift-compensated free-rotor gyro. 4,000,660, Cl. 74-5.430

Brown, Arthur William: *See—*
- Watson, David; and Brown, Arthur William, 4,001,030

Brown, John L., to Sprague Electric Company. MOS-capacitor for integrated circuits. 4,001,869, Cl. 357-51.000.

Brown, Lloyd H.; Eftax, Daniel S. P., and Kopp, Joseph N., to Quaker Oats Company, The. Apparatus and method for manufacturing cores and molds. 4,000,770, Cl. 164-21.000

Brown, Michael J. Pneumatic automated milking parlor. 4,000,718, Cl. 119-14.030.

Brown, Robert W.: *See—*
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Brown, Victor R.: *See—*
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Brown & Williamson Tobacco Corporation: *See—*
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Bruff, William; and Kongsgaarden, Ole Andreas, to Elkem-Spigerverket. Apparatus for feeding charge to an electric smelting furnace. 4,001,488, Cl. 13-33.000.

Brumley, Ralph E., Riordan, Mathew B., and Bentley, Richard H., to Eastman-Whipstock, Inc Stabilizer. 4,000,549, Cl. 24-263.0KS

Brumlik, George C., to Ingrip Fasteners Inc. Method for making self-gripping devices having integral trains of gripping elements. 4,001,366, Cl. 264-147.000

Bruniaux, Pierre. Process for producing straw-bottomed chairs 4,000,555, Cl. 29-417.000.

Brunnett, Carl J.: *See—*
- Mehrbrodt, Alfonso W.; Mog, Walter F., and Brunnett, Carl J., 4,001,580.

Bruscemi, Frank, to Lawrence Peska Associates, Inc., a part interest. Posture device 4,000,736, Cl. 128-80.00R.

Brush, Charles K.: *See—*
- Brenner, L. Martin, and Brush, Charles K., 4,001,426.

Bruton, William J.: *See—*
- Friant, James E., Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., 4,000,696.

Bryan, Harold; and Johnson, James W., to ACF Industries, Incorporated. Weld joint having a weld droppings receiving pocket. 4,000,952, Cl. 403-271.000.

BSG Designs Inc.: *See—*
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Buchele, Wesley Fisher: *See—*
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Buchholtzer, Claude; Deman, Pierre, Drobecq, Michel; and Oger, Pierre, to Thomson-CSF. Channel board for telephony transmission equipment using single side band multiplexing. 4,001,511, Cl. 179-15.0FS.

Buckley, Keith: *See—*
- Horrocks, Derek; Buckley, Keith; and Vernon, Alan John, 4,001,445.

Buehler, Arthur; Fasciati, Alfred; and Hoelzle, Gerd, to Ciba-Geigy AG. Water-soluble, fiber-reactive phenylazodihydroxy, methyl, cyanopyridine dyestuffs. 4,001,205, Cl. 260-156.000.

Buhler, Fritz: *See—*
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Bulens, Michel: *See—*
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Bundy, Gordon L., to Upjohn Company, The. Phenyl-substituted prostaglandin-β-type anologs. 4,001,286, Cl. 260-410.90R.

Bur, Philip W.: *See—*
- Saul, Glenn; and Bur, Philip W., 4,001,703

Burge, Joseph C.: *See—*
- Nash, Dudley O.; Beavers, Robert G., Burge, Joseph C., Castells, Onofre T. M.; and Parker, Alan I., 4,000,610.

Burge, Merle M. Gravitational irrigation system and method of installing. 4,000,620, Cl. 61-12.000.

Burgener, Frank Robert, Jr: *See—*
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Burger, Wolfgang: *See—*
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Burgers, Bernhardus Walter Antonius, to U.S. Philips Corporation. Pulse radar apparatus. 4,001,825, Cl. 343-7.500.

Burgess, John Alwyn; and Schofield, Zeb Douglas, III. Belt-on tree step (BOTS). 4,000,788, Cl. 182-92.000.

Burke, Robert Virgil; and Hester, Thomas Eugene, to Litton Systems, Inc Power controller for microwave magnetron. 4,001,537, Cl 219-10.55B

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Burlington Industries, Inc.: *See—*
- Griffin, Charles E., Jr., 4,000,704
- Imboden, Walter H., 4,000,630.

Burns, Carmen D., to National Semiconductor Corporation. Copper-to-gold thermal compression gang bonding of interconnect leads to semiconductive devices. 4,000,842, Cl. 228-180.00A.

Burns, Richard W., to Hughes Aircraft Company. π-Loop phase bit apparatus. 4,001,734, Cl. 333-31.00R.

Burrell, George R.: *See—*
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Burroughs Corporation: *See—*
- Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,001,699
- Wisner, Daniel A., Mathamel, Flavius A.; and Schmalzriedt, Truman T., 4,001,665.

Burroughs Wellcome Co.: *See—*
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Burrus, Billy Steve: *See—*
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Burton, Richard, to Burton Aluminum Classics, Inc. Decorative trim for buildings. 4,000,597, Cl. 52-716.000.
Busco, Francis J., to Float. Isolation module. 4,000,749, Cl. 135-1.00R.
Busco, Joseph James: *See—*
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Buskirk, George T.: *See—*
  Conery, William James; and Smith, Donald D., 4,001,533.
Buss, Gerald H.; Clarridge, Chester H.; and Hollands, Daniel H., to Rochester Instrument Systems, Inc. Annunciator system with direct field wiring. 4,001,797, Cl. 340-181.000.
Butler, James G., to Massey-Ferguson Industries Limited. Combine header with bottom support beam. 4,000,600, Cl. 56-220.000.
Butzen, Kenneth B., to Pepsico, Inc. Game ball. 4,000,894, Cl. 273-65.0EG.
Bykhovsky, David Grigorievich. Method of producing electrode units for plasmatrons. 4,001,461, Cl. 427-37.000.
Bylund, Per Gunnar; and Lyberg, Bertil, to Telefonaktiebolaget L M Ericsson. Device for measuring small frequency differencies. 4,001,680, Cl. 324-78.00Z.
Byrne, Leroy H.: *See—*
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C. A. Holweg S.A.: *See—*
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Cahn, Robert P.: *See—*
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  Li, Norman N.; Hucal, Taras; and Cahn, Robert P., 4,001,109.
Calderazzo, Franklin J.; and Fassman, Arnold, to Pitney-Bowes, Inc. Paper thickness adjustment device for a collator. 4,000,890, Cl. 270-58.000.
California Metal Enameling Company: *See—*
  Penton, Hugh V., 4,000,882.
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., to Upjohn Company, The. Pyridylalkyl phenyl ureas and their N-oxides. 4,001,256, Cl. 260-295.00E.
Calle, Jaime: *See—*
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  Strout, Frederick D.; Calle, Jaime; and Herron, Edwin W., 4,001,883.
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  Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, 4,000,940.
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Carbonetta, Reno Raymond, Jr., to RCA Corporation. Gas laser. 4,001,720, Cl. 331-94.50G.
Carborundum Company, The: *See—*
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Cardenas, Carlos G., to SCM Corporation. Preparation of haloesters from dienes. 4,001,307, Cl. 260-491.000.
Cardinal, Daniel E., Jr. Vacuum conduit pick-up device with improved control. 4,000,602, Cl. 56-328.00R.
Cargile, William P.; and Morrison, W. Andrew. Wedge action electrical test probe. 4,001,679, Cl. 324-72.500.
Carl Becher OHG Planen- und Zelte-Fabrik: *See—*
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Carmen, Norman. Identification card holder. 4,000,570, Cl. 40-1.500.
Carnes, James E., to United States of America, Navy. Double-layer, polysilicon, two-phase, charge coupled device. 4,001,861, Cl. 357-24.000.
Carniglia, Stephen C.: *See—*
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Carol, John A., Jr.; and Peterson, Raymond J., to General Motors Corporation. Multiple indication display. 4,001,776, Cl. 340-52.00F.
Carroll, Robert L. Roving can piston. 4,000,934, Cl. 312-71.000.
Carside, David Walker, to Birmingham Small Arms Company Limited. Rotary internal combustion engines. 4,000,721, Cl. 123-8.010.
Carson, Monte A. Ironing table. 4,000,569, Cl. 38-135.000.
Carter, Philip S., Jr., to Watkins-Johnson Company. Interconnecting circuit for EBS diodes and method. 4,001,600, Cl. 307-149.000.
Cartes, Juan Bosch: *See—*
  Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.
Cash, Derek J., to Minnesota Mining and Manufacturing Company. Process of sensitizing silver halide emulsions with heterocyclic sulfur compounds. 4,001,025, Cl. 96-107.000.
Cassens, Nicholas, Jr., to Kaiser Aluminum & Chemical Corporation. Gunnable refractory composition. 4,001,029, Cl. 106-67.000.
Castaing, Raimond; Blaise, Guy; and Quettier, Roger, to Agence Nationale de Valorisation de la Recherche (ANVAR). Local surface analysis. 4,001,582, Cl. 250-288.000.
Castelli, Vittorio; and Chai, Stephen T., to Xerox Corporation. Contaminant trapping in rotating disk devices. 4,001,892, Cl. 360-133.000.
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Castonguay, Roger N.: *See—*
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Cauge, Thomas P.; and Kocsis, Joseph, to Signetics Corporation. Double diffused metal oxide semiconductor structure with isolated source and drain and method. 4,001,860, Cl. 357-23.000.
Cauge, Thomas P.: *See—*
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Cedrone, Nicholas J. Inertial arresting device for feeder. 4,000,798, Cl. 193-40.000.
Celmer, Walter D.; Moppett, Charles E.; Cullen, Walter P.; Routien, John B.; Jefferson, Mark T.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Antibiotic Compound 41,012. 4,001,397, Cl. 424-116.000.
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Cerniway, Leon A.; and Entrikin, Donald W., to U. S. Divers Company. Buoyancy compensator. 4,000,534, Cl. 9-342.000.
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Chamberlin, Thomas A.; and Madison, Norman L., to Dow Chemical Company, The. Oxazoline and/or oxazine-modified polymers. 4,001,147, Cl. 260-2.50B.
Chambers, George S.; and Lane, L. Jubin, to General Electric Company. Active filter with inverse option. 4,001,712, Cl. 330-85.000.
Chambers, Joseph W.; and McTaggart, Lester E., to United States of America, Air Force. Ablative surface insulator. 4,001,475, Cl. 428-175.000.
Channell, Ronald E.; O'Pray, John E.; and Roberto, Francisco Q., to United States of America, Air Force. Fluorine generating formulation for use in chemical lasers. 4,001,136, Cl. 252-187.00R.
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Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich. Semiconductor light-emitting diode and method for producing same. 4,001,055, Cl. 148-172.000.
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Chow, Philip Y., to Lin Offshore Engineering, Inc. Multi-component offshore platform. 4,000,624, Cl. 61-88.000.
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Christensen, John D., to Duff-Norton Company, Inc. Mechanical actuator. 4,000,664, Cl. 74-424.80R.
Christiansen, Frank, to Norapp A/S. Liquid level indicator 4,000,651, Cl. 73-314.000.
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Chuchin, Alexandr Evgenievich; Proskurin, Leonid Leonidovich; Kalnova, Irina Jurievna; and Rozhkov, Vladimir Viktorovich Process for producing vinyl polymers. 4,001,173, Cl. 260-45 70R.
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Chung, Jackson, to Reliance Electric Company. Dry fluid drive 4,000,793, Cl. 192-105.00A.
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Clark, Jack, Jr. Ignition system bypass unit. 4,000,729, Cl. 123-148 0DS
Clark, John, to Banks Barbados Breweries Limited. Beverages. 4,001,436, Cl. 426-29 000.
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Connor, David T; Ringel, Samuel M, Roemer, Sidney; and von Strandtmann, Maximilian, to Warner-Lambert Company. Octahydro and decahydro derivatives of acid S, an antibiotic produced by *Polyangium cellulosum* var. fulvum. 4,001,398, Cl. 424-122.000.
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Continental Oil Company: *See—*
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Cook, Albert M, Engleman, Frank A, Jr.; and Simes, James G., to Sutter Hospitals Medical Research Foundation. Digital waveform generator for automatic respiratory ventilators. 4,001,700, Cl. 328-129 000.
Cook, Billy G., to Rohr Industries, Inc. Sound attenuating structural honeycomb sandwich material. 4,001,473, Cl. 428-116.000.
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  - Rittler, Hermann L., 4,000,998.
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- Crockett, James R., Sr. Water alarm switch. 4,001,531, Cl. 200-61.040.
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  - Nelson, Alden W., 4,000,554.
- Cross, Leslie E.: *See*—
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  - Stavropoulos, William S.; and Crouch, Robert D., 4,001,089.
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- Cypher, James H., to PPG Industries, Inc. Insulating spandrel glazing unit. 4,000,593, Cl. 52-172.000.
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- Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
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- Day, Kenneth Edwin. Carburetor. 4,001,355, Cl. 261-44.00R.
- Deane, Kenneth E.; Ring, Thomas F.; and Malott, Bernard, to P. R. Mallory & Co., Inc. Timing mechanism. 4,001,528, Cl. 200-38.00R.
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- Delikat, Robert P. Audio to video translator. 4,001,880, Cl. 358-81.000.
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- Diamond, Julius, to William H Rorer, Inc. Process for making a methenamine salt of an optically active acid. 4,001,231, Cl 260-248.500
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  - Bluestone, Henry; Scozzie, James A.; and Ignatoski, Joseph A., 4,001,325.
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  - Wilson, Michael A.; Gee, Gordon E.; and Momparler, Fred J., 4,001,718.
- Electro Switch Corporation: *See—*
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- Electroglas, Inc.: *See—*
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- Eli Lilly and Company: *See—*
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  - Dreikorn, Barry A., 4,001,227.
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- Ellin, Seymour, to Polaroid Corporation. Photographic control system with evaluation control. 4,001,843, Cl. 354-23.00D.
- Ellis, Daniel A., to Mueller Co. Means for locking replaceable nozzles to fire hydrants. 4,000,753, Cl. 137-296.000.
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  - Cubitt, John A.; and Ellwood, Henry, 4,000,563.
- Elmore, Dan E.: *See—*
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- Elmore, Glenn V.; and Tanner, Howard A., to Leesona Corporation. Electrochemical cell with alkali and alkaline earth metal containing electrolyte. 4,001,039, Cl. 429-46.000.
- Elscint Ltd.: *See—*
  - Inbar, Dan, 4,001,591.
- Elsner, Norbert Bernard, to General Atomic Company. Radioactive heat source and method of making same. 4,001,588, Cl. 250-493.000.
- Emerson Electric Co.: *See—*
  - Boggs, Alben C.; and Shirey, Robert D., 4,001,547.
  - Plasko, Emil Robert, 4,001,754.
- Emery, Anthony. Produce container. 4,000,827, Cl. 220-4.00F.
- Endevoets, Willy Joseph Catharina: *See—*
  - Drop, Peter Cornelis; Endevoets, Willy Joseph Catharina; van Eijl, Antonie Peter Lambertus; and Jack, Alexander Gray, 4,001,626.
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  - Blurton, Keith F.; and Sedlak, John M., 4,001,103.
- Energy Development Associates: *See—*
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- Engelskirchen, Konrad; and Galinke, Joachim, to Henkel & Cie G.m.b.H. Process for manufacturing cellulose containing 2,3-dihydroxypropyl ether groups. 4,001,210, Cl. 536-84.000.
- Engen, Glenn F.: *See—*
  - Hoer, Cletus A.; and Engen, Glenn F., 4,001,681.
- England, David C.; and Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of carbacyl halosulfates. 4,001,319, Cl. 260-545.00R.
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  - Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., 4,001,700.
- Enoguchi, Yuji: *See—*
  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.
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- Enzmann, Siegmund J. Apparatus for separating foreign solid particles from a liquid. 4,001,118, Cl. 210-187.000.
- Epstein, Arnold S.: *See—*
  - Groves, Warren O.; and Epstein, Arnold S., 4,001,056.
- Equipements de Machines-Outils Spemo: *See—*
  - Pascor, Michel, 4,000,907.
- Erikson, Ernst G.; and Lindstrom, K. Hakan. Boat hull construction. 4,000,712, Cl. 114-77.00R.
- Ermili, Aldo: *See—*
  - Passerini, Norina; Ermili, Aldo; Roma, Giorgio; Balbi, Alessandro; and Mazzei, Mauro, 4,001,424.
- Ernst, Adrian J.: *See—*
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- Ershova, Zinaida Fedorovna: *See—*
  - Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich, Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.
- Escher Wyss Limited: *See—*
  - Biondetti, Mario, 4,000,979.
- Esper, Michael J., Green, Wells L.; Merchant, Stanley R.; and Wells, Charles M., to Ford Motor Company. Stoichiometric air/fuel ratio exhaust gas sensor. 4,001,758, Cl. 338-34.000.
- Evans, Anthony G.: *See—*
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- Exxon Production Research Company *See—*
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- Exxon Research and Engineering Company: *See—*
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  - Geissler, Paul R.; and Cahn, Robert P., 4,001,111.
  - Johnson, Burnett H.; and Huff, Terrence, 4,000,967.
  - Li, Norman N.; Hucal, Taras; and Cahn, Robert P., 4,001,109.
  - Longo, John M., 4,001,375.
  - Steinkamp, Robert A.; and Grail, Thomas J., 4,001,172.
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- Faiveley S.A.: *See—*
  - Monot, Bernard, 4,000,582.
- Falckenberg, Richard, to Siemens Aktiengesellschaft. Apparatus for producing monocrystals by the Verneuil technique. 4,000,977, Cl 23-273.00V.
- Fales, Douglas I., to General Motors Corporation. Solid state thermistor switch. 4,001,802, Cl. 340-244.00A.
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  - Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,001,305.
- Famolare, Inc.: *See—*
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- Famolare, Joseph P., Jr., to Famolare, Inc. Shock absorbing athletic shoe with air cooled insole. 4,000,566, Cl. 36-28.000.
- Farber, Hugh A., to Dow Chemical Company, The. Polyethers having oxidized thioether side chains. 4,001,310, Cl 260-501.150.
- Faris, Edwin E.: *See—*
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  - Mol, Hans C.; Byrne, Leroy H.; and Fassman, Arnold, 4,000,889.
- Faubl, Hermann, to Pfizer Inc. Preparation of α-6-deoxytetracyclines. 4,001,321, Cl. 260-559.0AT.
- Fawkes, David Melville: *See—*
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- Federal Pioneer Electric Limited: *See—*
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- Feinstone, Wolffe Harry; and Bandelin, Fred J., to Plough, Inc. Means for depositing aerosol sprays in buttery form. 4,001,391, Cl 424-45.000.
- Felder, Ernst; and Pitre, David E., to Savac AG. Water-soluble, non-ionizing hydroxy-containing amide derivatives of 2,4,6-triiodo-isophthalic acid. 4,001,323, Cl. 260-559.00A.
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- Fenwick, Robert B.; and Gilliland, Clinton R., to Barry Research Corporation. Time diversity data transmission apparatus. 4,001,692, Cl. 325-38.00R.
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- Ferranti, Limited: *See—*
  - Grundy, David Latham; and Thompson, John, 4,001,694.
  - Levis, Peter Stanley, and Shepherd, Geoffrey, 4,001,555.
- Ferrozzi, Claudio, to AMF Incorporated. Folder. 4,000,599, Cl. 53-378.000.
- Feuer, Laszlo, to Chinoin Pharmaceutical and Chemical Works Ltd. Hormonal product extracted from parathyroid gland and process for the preparation thereof. 4,001,396, Cl. 424-112.000.
- Fierst, Jeannette I. Panty girdle construction. 4,000,746, Cl 128-526.000
- Fildan, Gerhard. Clasp. 4,000,544, Cl. 24-201.0CF
- Fildes, Francis James Thomas, to Imperial Chemical Industries Limited. Slow release biologically active materials for feeding to ruminant animals. 4,001,389, Cl 424-19.000
- Fink, Richard: *See—*
  - Jemison, William; Orlando, Salvatore; and Fink, Richard, 4,000,875
- Finkelston, Robert J., to Standard Pressed Steel Co. Tightening system with quality control apparatus. 4,000,782, Cl. 173-12.000.
- Finley, Richard James; and Nauman, Warren David, to AMP Incorporated. Wiring device with removable finger portion. 4,000,874, Cl. 248-27.100
- Finucane, Thomas P.; Kovacic, Theodore J.; and Wisler, John R., to General Foods Corporation. Beverage mix and method of manufacturing same. 4,001,448, Cl. 426-285.000.
- Fiori, Anthony M., Fiori, Robert T., and Nicholas, Thomas C., III, to Spectra-Vision Corporation. Magnetic tape editing, previewing and animating method and system. 4,001,882, Cl. 360-14.000.
- Fiori, Robert T.: *See—*
  - Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, 4,001,882
- Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Azetidinyl carbothiolates. 4,001,217, Cl. 260-239.00A.
- Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Sulfites of aromatic glycolic amides. 4,001,292, Cl 260-456.0NS.
- Fischer, Hartmut. *See—*
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- Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg AG. Rotary printing press with improved inking system. 4,000,691, Cl. 101-136.000.
- Fischman, Martin; and L'Hommedieu, Jesse H., to GTE Sylvania Incorporated. Horizontal deflection system. 4,001,641, Cl. 315-408.000.
- Fisher, William Bernard; Helmer, Howard Lyle, and Pendlebury, David, to Allied Chemical Corporation. Testing and correcting metering accuracy of multihole spinnerets. 4,001,359, Cl. 264-40.100.
- Fisons Limited: *See—*
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- Fleetwood Systems, Inc.: *See—*
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- Fleetwood, William, to Leesona Plastics Machinery Ltd. Method and apparatus for noise suppression. 4,000,670, Cl 83-42.000.
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  - Busco, Francis J., 4,000,749.
- Flores, Raul, to Lawrence Peska Associates, Inc., a part interest. Ring puzzle. 4,000,901, Cl. 273-158.000.
- Floyd, F. Louis, to SCM Corporation. Process for polymerizing metallocenes. 4,001,194, Cl. 526-240.000.
- Fogel, Arnold W.; and Mercurio, Anthony F., to American Cyanamid Company. Shampoo creme rinse containing a quaternary ammonium saccharinate, cyclamate or phthalimidate. 4,001,394, Cl. 424-70.000.
- Folchi, George A., Wang, Sherman S.; Will, Peter M.; and Zloof, Moshe M., to International Business Machines Corporation. Computer controlled pneumatic retractable search sensor. 4,001,556, Cl 235-151.000.
- Folsom, David A., to QSI Systems, Inc. Switched video recording system. 4,001,881, Cl 360-5.000.
- Fontana, Serge Robert: *See—*
  - Charransol, Pierre, Hauri, Jacques; and Fontana, Serge Robert, 4,001,781.
- Ford, Andrew George; and Hudson, Ronald Augustus, to Imperial Chemical Industries Limited. Method of packaging carbonated beverages in flexible containers. 4,001,450, Cl. 426-410.000.
- Ford, John R., to Vernay Laboratories, Inc. Marine muffler. 4,000,786, Cl 181-52.000
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  - Esper, Michael J.; Green, Wells L.; Merchant, Stanley R.; and Wells, Charles M., 4,001,758
- Foreman, Robert W.: *See—*
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- Foris, Peter L., Brown, Robert W., and Phillips, Paul S., Jr., to NCR Corporation. Capsule manufacture. 4,001,140, Cl. 252-316.000.
- Formica International Limited: *See—*
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- Formoy, Alec James, to Vickers Limited. Plate processing machines 4,001,854, Cl. 354-318.000.
- Forsberg, Nils Gunnar Krister: *See—*
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- Fortescue, Peter, to General Atomic Company. Insulation structure for pressure vessel cavity. 4,000,595, Cl. 52-302.000.
- Fortescue, Peter, to General Atomic Company. Closed cycle gas turbine system. 4,000,617, Cl. 60-644.000.
- Foster Grant Co., Inc.: *See—*
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- Foster-Miller Associates, Inc.: *See—*
  - Hug, Hans Albert, 4,000,783.
- Fowler, Albert Lewis, to Hughes Microelectronics Limited. Ignition arrangements for internal combustion engines. 4,000,724, Cl. 123-117.00R.
- Fraioli, Anthony V., to Plessey Incorporated. Thick film sensor and infrared detector. 4,001,586, Cl. 250-345.000.
- Franchi, Adriano; and Brandani, Paolo, to Axis S.p.A. Control systems for welding machines. 4,001,539, Cl. 219-110.000.
- Franklin, Charles H.: *See—*
  - Geen, Henry C.; Vinton, Clarence S.; and Franklin, Charles H., 4,001,110.
- Franks, Jeffrey L., to Gentex Company. Smoke detecting device. 4,001,800, Cl. 340-237.00S.
- Fraser, Lawrence J., to Xerox Corporation. Photoreceptor for electrostatic reproduction machines with built-in electrode. 4,000,944, Cl. 355-14.000.
- Fratelli Pagnoni S.p.A.: *See—*
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- Frechette, Francis J.: *See—*
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- Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane imines. 4,001,326, Cl. 260-566.00R.
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- Freeman, Peter A., to United States of America, Navy. High gain fluid amplifier. 4,000,757, Cl. 137-834.000.
- Freitag, Dieter; Haberland, Ulrich; and Krimm, Heinrich, to Bayer Aktiengesellschaft. Tetraphenol containing polycarbonates. 4,001,183, Cl. 260-47.0XA.
- French, Grace Allson. Lid for a cooking utensil. 4,000,830, Cl. 220-369.000.
- Frenk, Helmuth, to Ernst Leitz G.m.b.H. Oscillator for non-sinusoidal movements. 4,001,658, Cl. 318-37.000.
- Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., to Excoa, Inc. Cartridge for two component field mixed explosive. 4,000,696, Cl. 102-24.00R.
- Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 6-Substituted 2-naphthyl acetic acid derivatives. 4,001,301, Cl. 260-473.00F.
- Fried, John H.: *See—*
  - Muchowki, Joseph M.; and Fried, John H., 4,001,295.
- Friedman, Henry, to Eli Lilly and Company. 3-(5-Nitroimidazol-2-yl)pyrazolo[3,4-d]pyrimidine compounds. 4,001,230, Cl. 260-247.5DP.
- Friedrich Kocks, Firma: *See—*
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- Fritts, David H. Current measuring shunt. 4,001,684, Cl. 324-126.000.
- Froehling, Dieter K.: *See—*
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- Frost, Rodney I.; Lachman, Irwin M.; and Rieth, Paul H., to Corning Glass Works. Method of preparing crack-free monolithic polycrystalline cordierite substrates. 4,001,028, Cl. 106-62.000.
- Fry, Richard Eugene: *See—*
  - Doutrich, Ray Charles; and Fry, Richard Eugene, 4,001,464.
- Fuhrer, Jack Selig: *See—*
  - Clemens, Jon Kaufmann; Fuhrer, Jack Selig; and Ross, Michael David, 4,001,496.
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  - Akimoto, Taizo; Terasita, Takaaki; and Watanabe, Shigeru, 4,001,594.
  - Fujita, Susumu, 4,001,850.
  - Hayashi, Jun; Sato, Akira; and Shishido, Tadao, 4,001,020.
  - Ikechi, Masai; and Kusano, Kuniyuki, 4,001,857.
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- Fuji Xerox Co., Ltd.: *See—*
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- Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, to Takeda Chemical Industries, Ltd. Novel polypeptides useful for treating diabetes and hypercholesteremia. 4,001,199, Cl. 260-112.50R.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Harada, Hirokichi, 4,001,225.
  - Umio, Suminori; Ueda, Ikuo; Matsuo, Masaaki; Kobayashi, Masakazu; Nakaguti, Osamu; and Sato, Yoshinari, 4,001,280.
- Fujita, Masatoshi: *See—*
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- Fujita, Susumu, to Fuji Photo Film Co., Ltd. Data recording camera. 4,001,850, Cl. 354-219.000.
- Fujiwara, Akinori: *See—*
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- Fujiwara, Minoru: *See—*
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- Fujiwara, Takao: *See—*
  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.
- Fujiwara, Yoshio: *See—*
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- Fukata, Yasuo; and Hatsumi, Ryoichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Signal identification system. 4,001,521, Cl. 179-84.0VF.
- Fukatsu, Shunzo: *See—*
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- Fukaya, Hirokazu, to Nippon Electric Company, Ltd. Vertical deflection circuit for television receiver set. 4,001,715, Cl. 331-20.000.
- Fukuda, Masataro; Iwaki, Tsutomu; and Kobayashi, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Fuel cell. 4,001,040, Cl. 429-15.000.
- Fukuda, Minoru, to Hitachi, Ltd. Field effect transistor Miller integrator oscillator with temperature compensating impedance. 4,001,721, Cl. 331-111.000.
- Fukui, Kiyotake; and Ninomiya, Shuichi, to Matsushita Electric Industrial Co., Ltd. Display device including circuits for driving loads such as electrophoretic displays. 4,001,809, Cl. 340-336.000.
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- Fukumoto, Ryoichi; and Fujita, Masatoshi, to Aisin Seiki Kabushiki Kaisha. Vehicle window regulator mechanism. 4,000,581, Cl. 49-103.000.
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- Funatani, Kiyoshi; Ozaki, Ryosuke; and Mizuno, Kazuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for fixing a bearing cup in a Hooke's type universal joint. 4,000,628, Cl. 64-17.00A.
- Furuhashi, Michio: *See—*
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- Furuhata, Yoshio: *See—*
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- Futamase, Tsuyoshi; and Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,000,675, Cl. 84-1.010.
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  - Masaki, Mitsuo; Matsunami, Satoshi; Fuzimura, Susumu; and Okimoto, Kiyomi, 4,001,240.
- G. D. Searle & Co.: *See—*
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  - Nysted, Leonard N., 4,001,220.
  - Yonan, Peter K., 4,001,244.
- Gable, Howard S.; and Kerr, Glenn W., to Gable, Howard S. Magnetic organo-iron compounds. 4,001,288, Cl. 260-439.00R.
- Gaillard, Jean; and Lassau, Christian, to Institut Francais du Petrole. Process for manufacturing dicyclohexanol propane by hydrogenating diphenol propane. 4,001,343, Cl. 260-631.00H.
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  - Engelskirchen, Konrad; and Galinke, Joachim, 4,001,210.
- Gall, Kurt. Rotating auger arrangement for pumping processing fluid through a film developing container. 4,001,852, Cl. 354-313.000.
- Gall, Martin, to Upjohn Company, The. Process for the production of 1-[(dimethylamino)methyl]-6-phenyl-4H-imidazo[1,2-a][1,4]-benzodiazepine. 4,001,261, Cl. 260-296.00T.
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  - Commeyras, Auguste; Arnaud, Alain; Galzy, Pierre; and Jallageas, Jean-Claude, 4,001,081.
- Gamble, John G., to Veeder Industries, Inc. Rotary electromagnetic indicator. 4,001,815, Cl. 340-373.000.
- Gannon, Peter F., to Vinyl-Fab Industries, Inc. Swimming pool cover floating support. 4,000,527, Cl. 4-172.120.
- Gardner, Frank H.; and Dimmitt, David L. Web severing device. 4,000,888, Cl. 270-21.000.
- Garmaise, David Lyon: *See—*
  - Tim-Wo Chu, Daniel; and Garmaise, David Lyon, 4,001,265.
- Garrett Corporation, The: *See—*
  - Bolliger, Frederic E., 4,000,607.

- Garrett, Sheyrl Wayne: *See—*
  - Rosso, John B.; and Garrett, Sheyrl Wayne, 4,001,701.
- Gartman, William Wesley: *See—*
  - Anderson, Philip Leroy; and Gartman, William Wesley, 4,000,717.
- Gaskins, Jack C., to Batson-Cook Company. Controlled tension let-off for unwinding rolls of material. 4,000,865, Cl. 242-75.430.
- Gaskins, Thomas. Liquid applying means. 4,000,971, Cl. 21-63.000.
- Gates, Paul E.: *See—*
  - Cosco, Robert J., Hebert, Roger T.; and Gates, Paul E., 4,001,624.
- Gates, Peter Stuart, to Fisons Limited. Plant physiologically active compositions containing 2-halo-2,3-dihydrobenzofuran-5-olesters of sulfonic acids and methods of use. 4,001,003, Cl. 71-88.000.
- Gates Rubber Company, The: *See—*
  - Higbee, Charles D., 4,000,759.
- Gaussens, Gilbert: *See—*
  - Blin, Marie Francoise, Gaussens, Gilbert; and Lemaire, Francis, 4,001,462.
- Gay, Michel: *See—*
  - Bakassian, Georges; and Gay, Michel, 4,001,178.
- Geary, Frederick J.: *See—*
  - Bauer, Frederick T.; and Geary, Frederick J., 4,001,638.
- Gehr. Bohler & Co. AG: *See—*
  - Baumel, Anton, 4,000,984.
- Gee, Gordon E.: *See—*
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- Geen, Henry C.; Vinton, Clarence S.; and Franklin, Charles H., to Chemotronics International, Inc. Method for the thermal treatment of tubular dialysis units and improved units resulting therefrom. 4,001,110, Cl. 210-22.00A.
- Gehlhaus, Paul H.: *See—*
  - Baldwin, Mart G.; and Gehlhaus, Paul H., 4,001,057.
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- Gelman, Charles; and Vadnay, Attila, to Gelman Instrument Company. Water filter device. 4,001,120, Cl. 210-420.000.
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  - Gelman, Charles; and Vadnay, Attila, 4,001,120.
- General Atomic Company: *See—*
  - Corte, Ernesto; and Maitra, Pradeep, 4,001,590.
  - Doll, David W., 4,001,078.
  - Elsner, Norbert Bernard, 4,001,588.
  - Fortescue, Peter, 4,000,595.
  - Fortescue, Peter, 4,000,617.
- General Battery Corporation: *See—*
  - Channing, Harry M.; and Eberle, William J., 4,001,066.
- General Dynamics Corporation Pomona Division: *See—*
  - Corney, Martin, 4,000,698.
- General Electric Company: *See—*
  - Berkowitz, Ami E., 4,001,841.
  - Boah, John K., 4,001,047.
  - Carlson, Robert G.; and Harrison, Robert W., 4,000,956.
  - Chambers, George S., and Lane, L. Jubin, 4,001,712.
  - Corbley, Eugene K.; and Collister, Richard L., Jr., 4,001,634.
  - Davis, Mark A.; Eggenberger, Markus A.; and Kure-Jensen, Jens, 4,001,654.
  - Grenfell, K. Pascoe, 4,001,666.
  - Howell, Edward Keith, 4,001,646.
  - Irwin, John W., 4,000,779.
  - Jencks, Charles L.; and Castonguay, Roger N., 4,001,742.
  - Kelling, Leroy U. C., 4,001,558.
  - Klein, Keith W., and Palmieri, Joseph M., 4,001,647.
  - Klein, Keith W., and Palmieri, Joseph M., 4,001,652.
  - Konarski, Mieczyslaw; and Nash, Dudley O., 4,000,854.
  - Lipo, Thomas A., 4,001,660.
  - Lucek, John R., and Palen, Vernon B., 4,000,999.
  - Mark, Victor, 4,001,175.
  - McCardle, Arthur, Jr.; Wright, John J., and Baugh, Jarod L., 4,000,611.
  - Miller, Elwood M., 4,001,282.
  - Nash, Dudley O.; Beavers, Robert G., Burge, Joseph C.; Castells, Onofre T. M., and Parker, Alan I., 4,000,610.
  - Olashaw, William F.; and Kaufhold, Frederick D., 4,001,653.
  - Powell, David B.; and Acampora, Vincent P., 4,001,739.
  - Schneider, Harold N., 4,001,674.
  - Scott, Steven William, 4,001,184.
  - Stackhouse, Bill L.; and Taylor, Theodore E., 4,001,693.
  - Wakeman, Thomas G.; and Nash, Dudley O., 4,000,612.
  - Welch, John F.; and Civardi, Frank P., 4,001,341.
  - Whitley, Edmond R., 4,000,834.
- General Foods Corporation: *See—*
  - Finucane, Thomas P.; Kovacic, Theodore J., and Wisler, John R., 4,001,448.
  - Glicksman, Martin; and Wankier, Bartley N., 4,001,456.
  - Hegadorn, Joseph L., 4,001,457.
  - Jindra, Henri, and Clinton, William Patrick, 4,001,454.
  - Kim, Myung Ki; and Lugay, Joaquin Castro, 4,001,459.
  - Reardanz, Eugene H.; and Boudreau, Jerry N., 4,001,449.
- General Motors Corporation: *See—*
  - Carol, John A., Jr.; and Peterson, Raymond J., 4,001,776.
  - Fales, Douglas I., 4,001,802.
  - Hile, John W., and Rabe, Paul R., 4,001,676.
  - McIntosh, Duane E., 4,001,811.
- General Signal Corporation: *See—*
  - Reker, Frederick A., 4,000,918.
- Geng, Jerome F. Leverage screwdriver. 4,000,767, Cl. 145-61.00L.
- Gensheimer, Valentin: *See—*
  - Wirz, Burkhardt; Decker, Peter; Gensheimer, Valentin, and Dorn, Alfred, 4,000,692.
- Gentex Company: *See—*
  - Franks, Jeffrey L., 4,001,800.
- Geophysical Systems Corporation: *See—*
  - Fort, J. Robert; Westphal, James A., and Dix, C. Hewitt, 4,001,768.
  - Fort, J. Robert; Westphal, James A., and Juilfs, Donald R., 4,001,769.
- Georg Fischer Aktiengesellschaft: *See—*
  - Kettler, Erich, 4,000,772.
- Gerberding, Karl: *See—*
  - Fahrbach, Gerhard; Seiler, Erhard; and Gerberding, Karl, 4,001,350.
- Gerhards, Hans-Dieter; and Moltner, Hermann, to Friedrich Kocks, Firma. Rolling mills. 4,000,637, Cl. 72-226.000.
- Germond, Jean-Claude; Le Mouee, Theodore, Marchal, Paul, Petit, Michel; and Vertut, Jean, to Commissariat a l'Energie Atomique. Control arm for a power manipulator. 4,000,819, Cl. 214-1.0CM.
- Gerster, John F., to Riker Laboratories, Inc. Substituted benzo(ij)-quinolizine-2-carboxylic acids and derivatives thereof. 4,001,243, Cl. 260-287.00P.
- Gertsch AG: *See—*
  - Weigl, Erwin, 4,000,908.
- Geurtsen, Friedrich Henri Herman, and Pichel, Maurice Desire, to Dennison Manufacturing Company. Printing coder. 4,000,690, Cl. 101-36.000.
- Geyer, Robert P., to Standard Car Truck Co. Railway car center plate and auxiliary resilient bearings. 4,000,931, Cl. 308-138.000.
- Gibbons, James F. Semiconductor p-n junction solar cell and method of manufacture. 4,001,864, Cl. 357-30.000.
- Gibson, Gordon L., to TWM Manufacturing Company, Inc. Lightweight high strength auxiliary lift axle suspension system for high framed vehicles. 4,000,913, Cl. 280-704.000.
- Giergensohn, Bjoern: *See—*
  - Pommer, Ernst-Heinrich, Zeeh, Bernd, Goetz, Norbert, and Giergensohn, Bjoern, 4,001,416.
- Gifford, Phillip H., II. Hydrocracking process for the production of synthetic fuels. 4,001,105, Cl. 208-11.00R.
- Gilbert, Seymour, to Dunkin' Donuts Incorporated. Pressure relief valve and bag incorporating same. 4,000,846, Cl. 229-62.500.
- Gillette Company, The: *See—*
  - Pentney, Harry, 4,000,832.
- Gilligan, William H.: *See—*
  - Hall, Thomas N., and Gilligan, William H., 4,001,373.
- Gilliland, Clinton R.: *See—*
  - Fenwick, Robert B., and Gilliland, Clinton R., 4,001,692.
- Givaudan Corporation: *See—*
  - Huber, Ulrich; Kosslakoff, Nicolas; and Vaterlaus, Bruno, 4,001,453.
  - Jaeggi, Kurt; Krasnobajew, Victor; Weber, Peter; and Wild, Jost, 4,001,437.
- Glenn, Eldridge Myles: *See—*
  - Callahan, William A., Glenn, Eldridge Myles; and Rector, Douglas L., 4,001,256.
- Glicksman, Martin; and Wankier, Bartley N., to General Foods Corporation. Low calorie sweetening composition and method for making same. 4,001,456, Cl. 426-548.000.
- Globe Tool and Engineering Company, The: *See—*
  - Reiger, Arthur C., Jr., 4,000,764.
- Gloge, Detlef Christoph, to Bell Telephone Laboratories, Incorporated. Optical fiber jacket designs for minimum distortion loss. 4,000,936, Cl. 350-96.0WG.
- Glory Kogyo Kabushiki Kaisha: *See—*
  - Iizuka, Nobuhiro, and Shigemori, Hideto, 4,001,568.
- Goddard, Stephen A. A. Lamp shade. 4,001,576, Cl. 240-108.00B.
- Goddard, Steven Jerome, to Du Pont de Nemours, E. I., and Company. Herbicidal 2-fluoro-4-halo-phenyl-4,5,6,7-tetrahydro-2H-isoindole-1,3-diones. 4,001,272, Cl. 260-326.0HL.
- Goetz, Norbert: *See—*
  - Pommer, Ernst-Heinrich; Zeeh, Bernd, Goetz, Norbert, and Giergensohn, Bjoern, 4,001,416.
- Golbe, Alvin V. Sound activated alarm system. 4,001,805, Cl. 340-280.000.
- Goldberg, Edward M. Electrical leads for cardiac stimulators and related methods and means. 4,000,745, Cl. 128-418.000.
- Goldie, Harry, to United States of America, Air Force. High average power millimeter duplexer. 4,001,829, Cl. 343-180.000.
- Gooding, David N., and Shimp, Everett M., to International Business Machines Corporation. Arithmetic unit for a digital data processor. 4,001,570, Cl. 235-174.000.
- Goodman, Roger John, to Honeywell Inc. Intrusion detection transducer. 4,001,745, Cl. 336-20.000.
- Goodyear Aerospace Corporation: *See—*
  - Kovac, James J., 4,000,791.
- Goodyear Tire & Rubber Company, The: *See—*
  - Burkholder, Ward J., 4,001,338.
- Gordon, Joseph; and Sukornick, Bernard, to Allied Chemical Corporation. Manufacture of nitrogen trifluoride. 4,001,380, Cl. 423-406.000.
- Gordon, Vladimir Grigorievich: *See—*
  - Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.
- Gornall, Victor Joseph. Animated clacker. 4,000,579, Cl. 46-154.000.

Gorton, Earl M.; and Kline, Robert W., to PPG Industries, Inc. Distillation of methylchloroform. 4,001,345, Cl. 260-652.00P.

Gotham, Stanley T., to Leesona Corporation. Size reduction apparatus. 4,000,860, Cl. 241-242.000.

Goto, Motoo; Fujiwara, Minoru; and Ishikawa, Makoto, to Onahama Seiren Kabushiki Kaisha. Method of operating copper ore smelting reverberatory furnace. 4,001,013, Cl. 75-72.000.

Goust, Jean Michel; and Moulias, Robert Louis, to Piktor Limited. Production of immunological materials. 4,001,080, Cl. 195-1.800.

Graafsma, Richard S., to Auto Specialties Manufacturing Company. Screw jack. 4,000,880, Cl. 254-103.000.

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Graefje, Heinz: *See*—
Hoffmann, Herwig; Boettger, Guenther; Baer, Karl; Wache, Harro; Graefje, Heinz; and Koernig, Wolfgang, 4,001,344.

Graff, Albert L. Electric power generating system. 4,001,597, Cl. 290-53.000.

Grafo Colloids Corporation: *See*—
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Graham, Sandra I.: *See*—
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Graham, Wilson E. Load-bearing wall panel whose elements are mortar-binded, and apparatus and method for fabricating same. 4,001,365, Cl. 264-69.000.

Grail, Thomas J.: *See*—
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Granatek, Alphonse Peter; and Kaplan, Murray Arthur, to Bristol-Myers Company. Injectable formulations of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 4,001,409, Cl. 424-246.000.

Grant, David C., Jr., to United Technologies Corporation. Optical readout for differential laser gyros. 4,000,947, Cl. 356-106.0LR.

Grant, Richard F., to Poly-Choke Company, Incorporated, The. Rib for handgun. 4,000,574, Cl. 42-1.00S.

Granzer, Ernold: *See*—
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,001,431.

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins using catalysts containing various promoter elements. 4,001,317, Cl. 260-533.00N.

Graul, Juergen; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Process for producing semiconductor devices. 4,001,465, Cl. 148-187.000.

Gray, George W., to Lutron Electronics Co., Inc. Lamp ballast. 4,001,637, Cl. 315-205.000.

Gray, Laverne E.: *See*—
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Gray, Roy A.: *See*—
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Graybill, Clinton. Variable venturi downdraft carburetor. 4,001,356, Cl. 261-144.000.

Great Lakes Carbon Corporation: *See*—
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Grebe, Ludwig; and Grebe, Reiner, to Kraemer & Grebe GmbH & Co KG Maschinen- und Modellfabrik. Vacuum food mill. 4,000,861, Cl. 241-282.100.

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Grebe, Ludwig; and Grebe, Reiner, 4,000,861.

Green, Booker. Invalid handling device. 4,000,530, Cl. 5-87.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Method of inhibiting the growth of bacteria by the application thereto of capped polymers. 4,001,432, Cl. 424-329.000.

Green, Wells L.: *See*—
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Grenfell, K. Pascoe, to General Electric Company. Load peak shaver power regulating system. 4,001,666, Cl. 322-4.000.

Gries, Heinz; and Pfeiffer, Heinrich, to Schering Aktiengesellschaft. Triiodized N-methyldicarboxylic acid anilides. 4,001,298, Cl. 260-471.00R.

Grieve, Donald F.: *See*—
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Griffin, Charles E., Jr., to Burlington Industries, Inc. Shipping pallet. 4,000,704, Cl. 108-53.100.

Griffin, Floyd S., to Ordnance Research, Inc. Time delay circuit. 4,001,610, Cl. 307-293.000.

Griffin, Richard J., to Telan Corporation. Method and device for separating blood components. 4,001,122, Cl. 210-516.000.

Grinev, Mikhail Petrovich: *See*—
Panchenkov, Georgy Mitrofanovich; Kozlov, Leonid Leonidovich; Molin, Alexandr Alexandrovich; Ershova, Zinaida Fedorovna; Mikhailov, Lev Mikhailovich; Juzvyak, Albert Genrikhovich; Valitov, Rail Bakirovich; Churov, Vyacheslaw Petrovich; and Grinev, Mikhail Petrovich, 4,001,587.

Groegler, Gerhard; Dankert, Gerhard; Recker, Klaus; and Backes, Josef, to Bayer Aktiengesellschaft. Process for preparing 1-substituted 2-methyl-tetrahydropyrimidines. 4,001,232, Cl. 260-251.00R.

Groenendaal, Willem: *See*—
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Groenig, Robert E. Vehicle for picking fruit. 4,000,787, Cl. 182-2.000.

Grosick, Herbert A., to Koppers Company, Inc. Method for the removal of naphthalene from coke oven gas. 4,001,347, Cl. 260-674.00N.

Gross, Franz, to Siemens Aktiengesellschaft. Selectively damped travelling wave tube. 4,001,630, Cl. 315-3.500.

Grossi, Galeazzo: *See*—
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Grovenstein, Lewis F., Jr.: *See*—
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Groves, Warren O.; and Epstein, Arnold S., to Monsanto Company. Epitaxial deposition of III-V compounds containing isoelectronic impurities. 4,001,056, Cl. 148-175.000.

Grozinger, Hans: *See*—
Bockelmann, Wilfried; Grozinger, Hans; and Wobky, Peter Ulrich, 4,000,615.

Gruenberg, Elliot L. Communications relay system. 4,001,691, Cl. 325-14.000.

Grundy, David Latham; and Thompson, John, to Ferranti, Limited. Automatic gain control circuit arrangements having a plurality of stages of amplification. 4,001,694, Cl. 325-319.000.

Grundy, Reed H., to Westinghouse Air Brake Company. Advance train line register for a train speed regulation system. 4,000,872, Cl. 246-182.00R.

GTE Laboratories Incorporated: *See*—
Haugsjaa, Paul Osborne; and Regan, Robert James, 4,001,632.
McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, 4,001,631.
Robinson, Lawrence B.; and Powazinik, William, 4,001,076.

GTE Sylvania Incorporated: *See*—
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Egan, William F., 4,001,713.
Fischman, Martin; and L'Hommedieu, Jesse H., 4,001,641.

Guldin, David R., to Westinghouse Air Brake Company. Brake shoe and head assembly. 4,000,792, Cl. 188-242.000.

Gundisch, Gusztav: *See*—
Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Gundry, Kenneth James, to Dolby Laboratories, Inc. Calibration oscillators for noise reduction systems. 4,001,732, Cl. 333-14.000.

Gunther, Dieter; Nestler, Hans Jurgen; Rosch, Gunter; and Schinzel, Erich, to Hoechst Aktiengesellschaft. 4-Stilbenyl-5-cyano-1,2,3-triazoles. 4,001,221, Cl. 260-240.00C.

Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., to M & T Chemicals Inc. Method for permanently and uniformly incorporating an additive into an undrawn fiber. 4,001,367, Cl. 264-154.000.

Gutjahr, Gert. Electric shaver. 4,000,560, Cl. 30-41.600.

Gutzwiller, Ernst: *See*—
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Gyugyi, Laszlo; Rosa, John; and Stacey, Eric J., to Westinghouse Electric Corporation. Static reactive power generating apparatus. 4,001,670, Cl. 323-108.000.

Gyugyi, Laszlo; Brennen, Michael B.; and Stacey, Eric J., to Westinghouse Electric Corporation. Apparatus for providing feedback to eliminate a DC component in the output of a static VAR generator. 4,001,671, Cl. 323-119.000.

H. Koch & Sons, Inc.: *See*—
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Haas, Edgar; and Kottsieper, Edward, to Herman Schwabe, Inc. Die press control apparatus. 4,001,645, Cl. 318-17.000.

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Haberland, Ulrich: *See*—
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Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy Corporation. Polyglycidyl compounds containing n-heterocyclic structure. 4,001,236, Cl. 260-256.40F.

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Hadler, Howard, to Chromalloy American Corporation. Safety stop for portable augers and like elevating machinery. 4,000,805, Cl. 198-320.000.

Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Process for removing ammonia from gases. 4,001,374, Cl. 423-237.000.

Haffer, Gregor: *See*—
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard, and Wiechert, Rudolf, 4,001,302.

Haffner, Mark P.; and Pizer, Robert S., to United States of America, Transportation. Programmable anthropomorphic articulation. 4,000,564, Cl. 35-17.000.

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Hager, Bror Olof, to Hager Aktiebolag. Preservative for wood. 4,001,400, Cl. 424-134.000.

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Hahn, Heinrich; Heumann, Hans; and Schweppe, Manfred, to Veba-Chemie AG. Method for producing stabilized ammonium nitrate. 4,001,377, Cl. 423-267.000.

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Hall, Kilmer L.; Davis, Allen E.; and Peck, Robert L., to United States of America, Army. Mode control computer interface. 4,001,554, Cl. 235-150.000.

Hall, Thomas N.; and Gilligan, William H., to United States of America, Navy. Removal of tetranitromethane from TNT plant waste. 4,001,373, Cl. 423-236.000.

Halliar, William R., to Pullman Incorporated. Trough hatch locking device. 4,000,703, Cl. 105-377.000.

Halpern, Alfred: *See*—
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Ham, Allan L.: *See*—
Danilewicz, John C.; Evans, Anthony G.; Ham, Allan L.; and Thomson, Colin, 4,001,422.

Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, to Teijin Limited. Novel naphthalate polyester fibers, and their end uses. 4,001,479, Cl. 428-272.000.

Hamill, Robert L.: *See*—
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Hammann, Ingeborg: *See*—
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Hammond Corporation: *See*—
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Han, Hak Rhim, to Minnesota Mining and Manufacturing Company. Tape closures. 4,000,824, Cl. 215-232.000.

Hanifl, Paul, to International Paper Company. Urine metering and collection system. 4,000,649, Cl. 73-219.000.

Hannover, Hans-Otto, and Spoler, Johannes Gerhard, to Demag Aktiengesellschaft. Railway vehicle and switching mechanism therefor. 4,000,700, Cl. 104-130.000.

Hansen, Hanspeter: *See*—
Fischer, Adolf; Hansen, Hanspeter; and Rohr, Wolfgang, 4,001,217.
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Harada, Hirokichi, to Fujisawa Pharmaceutical Co., Ltd. Pyridyl substituted 7-αesters of 3 heterothio 7-acetamido cephalosporanic acids. 4,001,225, Cl. 260-243.00C.

Harada, Koji: *See*—
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Harada, Seiki: *See*—
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Harashima, Kiyoshi: *See*—
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Harbert, Charles A.: *See*—
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Hardison, Jerry C.; and Gray, Laverne E., to Lone Star Container Sales Corporation. Shipping-display container. 4,000,811, Cl. 206-44.00R.

Hardman, Harley F.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,001,317.

Hardt, Jean, to Aluminium Suisse S.A. Apparatus for capping receptacles. 4,000,708, Cl. 113-18.00R.

Hardy, Michel: *See*—
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Harnisch, Horst; and Brack, Alfred, to Bayer Aktiengesellschaft. Naphtholactam dyestuffs. 4,001,253, Cl. 260-294.80B.

Harper & Tunstall Limited: *See*—
Ashburner, Adi Kaikhushiroo, 4,000,671.

Harrell, John W.: *See*—
Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., 4,001,775.

Harris, Dallas R., to Cummins Engine Company, Inc. Aftercooler coolant flow control for internal combustion engine. 4,000,725, Cl. 123-119.0CD.

Harris, Leonard F.: *See*—
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Harris, Lewis Karl; Burrus, Billy Steve; and Allison, Donald Wayne, to Combustion Engineering, Inc. Turbine meter rotor bearing. 4,000,932, Cl. 308-237.00R.

Harris, Rano J., Jr. Automatic fluid injector. 4,000,654, Cl. 73-422.0GC.

Harrison, Ian T.: *See*—
Fried, John H., and Harrison, Ian T., 4,001,301.

Harrison, Jack M. Scheduling board and method of use thereof. 4,000,571, Cl. 40-19.500.

Harrison, John M.: *See*—
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Harrison, Robert W.: *See*—
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Harvey, Edwin Dennis, Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, to Imperial Chemical Industries Limited. Dyeing process. 4,000,970, Cl. 8-178.00R.

Harvey, Harold F., to Roberts, Millard F., a part interest. Portable antenna mount for trucks. 4,001,831, Cl. 343-715.000.

Harvey, Jay A., to Great Lakes Carbon Corporation. Method of sealing porous material defining a recess. 4,001,469, Cl. 427-238.000.

Hase, Alfred Max. Pulse-firing power oscillator. 4,001,717, Cl. 331-55.000.

Hasegawa, Akira: *See*—
Kobayashi, Yoshinori; Shibata, Yoshitaka, Hasegawa, Akira, and Iwatsuki, Yoshiharu, 4,001,863.

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Hatch, Gilbert J.; Johnson, Richard C., and Kulbida, Ihor, to Xerox Corporation. Flash fusing system with energy control. 4,001,541, Cl. 219-216.000.

Hatsumi, Ryoichi: *See*—
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Hattori, Masayuki: *See*—
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Hatzakis, Michael: *See*—
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Haugsjaa, Paul: *See*—
McNeill, William, Lech, Joseph, Haugsjaa, Paul, and Regan, Robert, 4,001,631.

Haugsjaa, Paul Osborne; and Regan, Robert James, to GTE Laboratories Incorporated. High frequency excited electrodeless light source. 4,001,632, Cl. 315-39.000.

Hauri, Jacques: *See*—
Charransol, Pierre; Hauri, Jacques, and Fontana, Serge Robert, 4,001,781.

Havinga, Reginoldus: *See*—
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Hawkes, James Anthony: *See*—
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Hawthorne, Marion F., to Rohm and Haas Company. Process for the preparation of dekenyl acrylates and methacrylates and products thereof. 4,001,058, Cl. 149-22.000.

Hayakawa, Yoshihiro: *See*—
Noyori, Ryoji, Hayakawa, Yoshihiro, Baba, Yutaka, and Makino, Shinji, 4,001,249.

Hayashi, Eisaku: *See*—
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Hayashi, Jun, Sato, Akira, and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Developing a silver halide emulsion in contact with a heterocyclic thione and a polyalkylene oxide. 4,001,020, Cl. 96-66.300.

Hayashi, Katsuyoshi: *See*—
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Hayashi, Seiichi: *See*—
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Hayashi, Takao, and Matsuo, Masashi, to Asahi Glass Co., Ltd. Method of preparing polyfluoroalkyl group containing compounds. 4,001,309, Cl. 260-493.000.

Hayashi, Yoshiki: *See*—
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Hayashibara Company: *See*—
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Haydock, James Livesey. Treatment of suspensions and slurries by electrophoresis and electro-osmosis. 4,001,100, Cl. 204-180.00R.

Hazleton, Herbert T., to Federal Pioneer Electric Limited. Calibrating adjustment of thermostat. 4,001,752, Cl. 337-368.000.

Hazleton, Herbert T., to Federal Pioneer Electric Limited. Thermostat having stable mounting support. 4,001,753, Cl. 337-380.000.

Headway Research, Inc.: *See*—
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Heath, Harley D.; Hofreiter, Bernard T., and Ernst, Adrian J., to United States of America, Agriculture. Method of making nongelling aqueous cationic dialdehyde starch compositions. 4,001,032, Cl. 106-213.000.

Hebert, Roger T.: *See*—
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Hegadorn, Joseph L., to General Foods Corporation. Method of making a gasified confection. 4,001,457, Cl. 426-572.000.

Heien, Sigurd. Combined mooring and transfer means for oil and other liquid. 4,000,713, Cl. 114-294.000.
Heijne, Leopold, to U.S. Philips Corporation. Measuring cell for determining oxygen concentrations in a gas mixture. 4,001,756, Cl. 338-34.000.
Heilemann, Volkmar. Solar-heated dwelling. 4,000,851, Cl. 237-1.00A.
Heinrich Kopp, Inhaber Theodor Simoneit, Firma: *See*—
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Heinzer, Paul; and Wulz, Helmut, to Wifo Wissenschaftliches Forschungs-Institut A.G. Apparatus for fixing electrophotographic images. 4,001,544, Cl. 219-216.000.
Held, Leon D. Direct individual program readout of eight-track tape cartridge. 4,001,891, Cl. 360-132.000.
Heller, William C., Jr.; and Leatherman, Alfred F., to Heller, William C., Jr. Plastic hose having embedded reinforcing braid. 4,000,760, Cl. 138-141.000.
Hellqvist, Ake O. W. Method for natural biochemical decomposition of latrine. 4,001,108, Cl. 210-12.000.
Helmer, Howard Lyle: *See*—
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Hemingway, Maurice; and Ward, Trevor, to Hotwork International Limited. Method of heating up glass melting furnaces or the like. 4,000,962, Cl. 432-4.000.
Hemmi, Christian O.: *See*—
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Hemotec, Inc.: *See*—
Braun, Walter Jacob; Altshuler, John Henry; Schlatter, Gerald Lance; and Poland, Robert LeRoy, 4,000,972.
Hendrickson, Thomas Allen, to International Business Machines Corporation. Automatic terminal data rate selection. 4,001,504, Cl. 178-68.000.
Henkel & Cie G.m.b.H.: *See*—
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Henninghaus, Franz, to International Harvester Company. Hydraulic power system with automatic priority-demand flow control means. 4,000,751, Cl. 137-101.000.
Henrickson, Gary C.: *See*—
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Henrie, James O., to Rockwell International Corporation. Thermal recombiner. 4,000,978, Cl. 23-277.00R.
Henry, Rodney D.; and Besser, Paul J., to Rockwell International Corporation. Magnetic bubble domain composite with hard bubble suppression. 4,001,793, Cl. 340-174.0TF.
Herbst, Wayne R.; and Mika, Paul L., to Teletype Corporation. Apparatus and method for recording and reproducing digital-data. 4,001,884, Cl. 360-40.000.
Hereth, Ralph F., to Wilkins & Associates, Inc. Honeycomb panel cellular structure having triangular cells. 4,001,474, Cl. 428-116.000.
Herman Schwabe, Inc.: *See*—
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Hoffman, Werner, to BASF Aktiengesellschaft. 2,6,10-Trimethyldodecan-1-al and 2,6,10-trimethyl-dodeca-4,8-dien-1-al. 4,001,336, Cl. 260-601.00R.
Hoffmann, Hellmut; Behrenz, Wolfgang; Hammann, Ingeborg, and Homeyer, Bernhard, to Bayer Aktiengesellschaft. N-Dithiophosphoryl-carbamic acid esters. 4,001,404, Cl. 424-212.000.
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Horwath, Robert Otto, Cole, Gary William; and Lally, John Anthony, to Standard Brands Incorporated. Process for producing isoamylase 4,001,084, Cl. 195-65.000.
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Howie, David Malcolm, McKenzie, Roy Victor W., and Snape, James Ronald, to Pyrotenax of Canada Limited. Heating cables and manufacture thereof. 4,001,760, Cl. 338-238.000.
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Husbands, George E. M., to American Home Products Corporation. 15-Ethynyl-PGE_2. 4,001,314, Cl. 260-514.00D
Hussey, Eugene H., to Polymer Corporation, The. Long-wearing plastic bearings. 4,001,124, Cl. 252-12.000.
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- Igisu, Taro, to EIM Electric Co., Ltd. Method of removing residual stress of a work formed of metal or ceramic and a sealing apparatus. 4,001,053, Cl. 148-12.900.
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- Ikechi, Masai; and Kusano, Kuniyuki, to Fuji Photo Film Co., Ltd. Developing device. 4,001,857, Cl. 354-337.000.
- Ikushima, Yoshiyuki, to Sharp Kabushiki Kaisha. Video recording and reproducing system. 4,001,885, Cl. 360-70.000.
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- Ishimi, Kazuo, to Nippon Kayaku Kabushiki Kaisha. Method for manufacture of methacrylic acid. 4,001,316, Cl. 260-530.00N.
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- Johnson, Burnett H., and Huff, Terrence, to Exxon Research and Engineering Company. Wettable non-woven structures and components thereof. 4,000,967, Cl. 8-115.500
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- Jones, Claude Elmer. Clamping apparatus. 4,000,576, Cl. 43-5.000.
- Jones, Herman L.; and Haugen, John H. Apparatus for producing individual photographic prints with strip adhesive backing. 4,001,073, Cl 156-516.000.
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- Jordan, George, to Hospital Marketing Services Co., Inc. Refrigerating package. 4,000,996, Cl 62-4.000
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- Kanbara, Kenjiro, Hattori, Masayuki, Miyasita, Satoru; Iguchi, Masaaki; and Yoda, Jihei, to Nippon Steel Corporation. Method for processing reduced iron. 4,001,010, Cl 75-35.000.
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Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. 3,3-Disubstituted phthalides and naphthalides. 4,001,277, Cl. 260-326.13R.

Karino, Takafumi: *See—*

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Karklys, Joseph, to Whirlpool Corporation. Appliance programmer with integrated circuit. 4,001,599, Cl. 307-141.000.

Karpluk, Richard William, to Albany International Corporation. Apparatus for cutting knots and slubs out of continuous yarn lengths. 4,000,550, Cl. 28-64.000.

Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon type loudspeaker. 4,001,522, Cl. 179-115.00V.

Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon loudspeaker. 4,001,523, Cl. 179-115.00V.

Kaseman, Paul Warren, to RCA Corporation. Electron discharge image tube with electrostatic field shaping electrode. 4,001,618, Cl. 313-94.000.

Kashiwada, Yasutoshi: *See—*

Megumi, Kouiti; Nagatsuma, Kazuyuki; Kashiwada, Yasutoshi; and Furuhata, Yoshio, 4,001,127.

Kaspari, William J.: *See—*

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Kasumi, Takafumi: *See—*

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Kato, Hiroyuki: *See—*

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Kato, Kimpei: *See—*

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Kato, Nobuo: *See—*

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Katsumoto, Kiyoshi, to Chevron Research Company. Recovery of 2-pyrrolidone from aqueous solutions. 4,001,274, Cl. 260-326.5FN.

Katsurada, Yasuo: *See—*

Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.

Katz, Bruce J. Belt-supported camera carrying case. 4,000,769, Cl. 150-52.00J.

Katz, Seymour; and Brown, Victor R., to IPCO Hospital Supply Corporation. Film identification apparatus. 4,001,592, Cl. 250-476.000.

Kaufhold, Frederick D.: *See—*

Olashaw, William F.; and Kaufhold, Frederick D., 4,001,653.

Kaufman, Barry M., to R F L Industries, Inc. High speed FM and AM demodulator. 4,001,702, Cl. 329-135.000.

Kauneckas, John J. Recording system for photographic cameras. 4,001,846, Cl. 354-105.000.

Kawabata, Hidetoshi: *See—*

Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.

Kawabe, Ushio: *See—*

Tarutani, Yoshimobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, 4,001,481.

Kawai, Hisasi, to Nippon Soken, Inc. Digital interpolator. 4,001,565, Cl. 235-152.000.

Kawakami, Touhei: *See—*

Tajima, Kunio; Kawakami, Touhei; and Hayashi, Seiichi, 4,000,945.

Kawasaki, Mitsuru: *See—*

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Kawasaki Steel Corporation: *See—*

Nakazato, Yoshio; Nakazawa, Masatoshi; Ohashi, Nobuo; and Ito, Yo, 4,001,052.

Kayser, Wolfgang W. O. G., to Honeywell Information Systems, Inc. Double chip flying head. 4,001,890, Cl. 360-121.000.

Keasler, Ben C. Blind bolt fastener installation tool with an apparatus for retrieving severed blind bolt fastener stems. 4,000,668, Cl. 81-55.000.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics. 4,001,151, Cl. 260-17.4ST.

Keener, Robert M.: *See—*

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Keigher, John R.: *See—*

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Keller, Anthony F., to Motorola, Inc. Variable high frequency crystal oscillator. 4,001,724, Cl. 331-116.00R.

Kelley, O. W., to Oxbow Products, Inc. Fish bait box. 4,000,577, Cl. 43-55.000.

Kelling, Leroy U. C., to General Electric Company. Average phase position circuit. 4,001,558, Cl. 235-151.110.

Kelly, John, personal representative: *See—*

Kelly, William, deceased; Kelly, Monica, personal representative; Kelly, John, personal representative; and Halpern, Alfred, 4,001,311.

Kelly, Monica, personal representative: *See—*

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Kelly, Thomas M. Wall supporting structure. 4,000,592, Cl. 52-149.000.

Kelly, William, deceased; by Kelly, Monica, personal representative; by Kelly, John, personal representative; and Halpern, Alfred, to Synergistics, Inc. Stabilized choline salicylate compounds. 4,001,311, Cl. 260-501.150.

Kelsey-Hayes Company: *See—*

Drake, Charles J.; and Farrow, John F., 4,001,540.

Kemper, Orville. Evaporation accelerator. 4,001,077, Cl. 159-4.00S.

Kempter, Firtz Erdmann; Sabelus, Guenther; and Spoor, Herbert, to BASF Aktiengesellschaft. Paint binders of Mannich bases and epoxy resins. 4,001,155, Cl. 260-29.2EP.

Kendall Company, The: *See—*

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Kennett, Barrington George; and Miller, Adrian Ernest, to International Standard Electric Corporation. Power control circuit for a power oscillator. 4,001,727, Cl. 331-182.000.

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Kershaw, Stanley Scott, Jr., to McGraw-Edison Company. Station lightning arrester with dual rupture diaphragms for gas pressure release. 4,001,651, Cl. 317-61.000.

Kettler, Erich, to Georg Fischer Aktiengesellschaft. Apparatus for producing casting molds. 4,000,772, Cl. 164-194.000.

Keyes, Melvin H., to Owens-Illinois, Inc. Immobilization of enzymes on an inorganic matrix. 4,001,085, Cl. 195-68.000.

Khajezadeh, Heshmat, to RCA Corporation. High-reliability plastic-packaged semiconductor device. 4,001,872, Cl. 357-54.000.

Khanna, Ram-Tirth, to Du Pont de Nemours, E. I., and Company. Polymeric fibers containing color concentrates. 4,001,171, Cl. 260-40.00R.

Khlyntsev, Alexandr Sergeevich: *See—*

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Kiehl, Paul G., to Visual Data Corporation. Mailing viewer for slides and the like. 4,000,572, Cl. 40-63.00A.

Kiemle, Horst, to Siemens Aktiengesellschaft. Holographic storage device, 4,001,791, Cl. 340-173.0LM.

Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 2-Oxo-cyclopenta[b]furan-5α-carboxylic acid esters. 4,001,281, Cl. 260-343.30R.

Kikukawa, Tsuyoshi; and Hashimoto, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Data reading apparatus. 4,001,780, Cl. 340-146.30D.

Kilbride, Robert S.: *See—*

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Kim, Jonathan J.: *See—*

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Kim, Myung Ki; and Lugay, Joaquin Castro, to General Foods Corporation. Fibrous protein materials. 4,001,459, Cl. 426-656.000.

Kimberly-Clark Corporation: *See—*

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Kimmel, Milton Jay, to International Business Machines Corporation. Data processor for pattern recognition and the like. 4,001,787, Cl. 340-172.500.

Kimura, Toshimitsu: *See—*

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King, Robert W., to Avco Corporation. Three-dimensional fabric material. 4,001,478, Cl. 428-257.000.

Kinney, Thomas D.; and Pickett, John E. P. Light microscopy processing method. 4,001,460, Cl. 427-2.000.

Kino, Yoshio: *See—*

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Kirchhein, Albert: *See—*

Thomas, Francis J.; Kirchhein, Albert; and Porawski, Donald J., 4,001,605.

Kirk, James D., Jr. Building construction member. 4,000,594, Cl. 52-241.000.

Kirk, Norbert A. Rotary safety reflector. 4,000,938, Cl. 350-99.000.

Kirkley, David William: *See—*

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Kits van Heyningen, Arent H., to Raytheon Company. Electronically stabilized beam former system. 4,001,763, Cl. 340-3.0PS.

Kizawa, Hidenori: *See—*

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Klafka, Frank L., to Clevepak Corporation. Back-up brake assembly for a partition strip feeding mechanism in a partition fabricating machine 4,000,891, Cl 271-8.00R

Klawitter, Jerome J.; and Bhatti, Nazir A., to United States of America, Navy. Ceramic prosthetic implant suitable for a knee joint plateau 4,000,525, Cl. 3-1.911.

Klaxon: *See—*

Warnod, Bertrand A., 4,000,715.

Klein, Johannes P.; Setlur, Swethadrivas R.; and Groenendaal, Willem, to Shell Oil Company. Process for H_2S removal employing a regenerable polyalkanolamine adsorbent. 4,001,386, Cl 423-574.00L.

Klein, Keith W.; and Palmieri, Joseph M., to General Electric Company. Ground fault receptacle with unitary support of GFCI module and switching mechanism 4,001,647, Cl. 317-18.00D.

Klein, Keith W ; and Palmieri, Joseph M., to General Electric Company. Ground fault receptacle with improved stationary contact mounting and backing. 4,001,652, Cl. 317-112.000.

Kleiner, Hans-Jerg; and Rupp, Walter, to Hoechst Aktiengesellschaft Process for the preparation of ethane-1,2-diphosphinic acid diesters 4,001,352, Cl. 260-970.000

Kleiner, Walter, to Staeubli Ltd. Device for controlling the sequence of movement of individual heddle frames of a weaving machine 4,000,761, Cl 139-66.00R.

Kleinschmidt, Peter, to Siemens Aktiengesellschaft. Device for the electrical determination of two-dimensional co-ordinates of a point 4,001,677, Cl. 324-65.00R

Klimchak, Edward G.: *See—*

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Kline, Robert W.: *See—*

Gorton, Earl M.; and Kline, Robert W., 4,001,345.

Klutchko, Sylvester; and von Strandtmann, Max, to Warner-Lambert Company. 4-Substituted-2, 3-dihydro-1-benzoxepin-3, 5-diones and tautomers. 4,001,224, Cl. 260-240.00R.

Knapp, Randolph H., to Shell Oil Company Well treating process for consolidating particles with aqueous emulsions of epoxy resin components. 4,000,781, Cl. 166-276.000.

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Knavish, Leonard A.; and Cerutti, Richard L., to PPG Industries, Inc Horizontal glassmaking furnace 4,001,001, Cl 65-337.000.

Knickerbocker, Karl. Coin totalizer mechanism. 4,000,799, Cl. 194-1.00L.

Knoll A.G. Chemische Fabriken: *See—*

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Knutson, William J., and Smith, Daniel M., to Motorola, Inc. Radio frequency power amplifier constructed as hybrid microelectronic unit. 4,001,711, Cl. 330-66.000.

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Kobayashi, Yoshinori; Shibata, Yoshitaka; Hasegawa, Akira; and Iwatsuki, Yoshiharu, to Minolta Camera Kabushiki Kaisha. Resin-sealed type semiconductor device 4,001,863, Cl. 357-30.000

Kocmicli, Donald Orrie, to Opti Products Incorporated. Tonometer tester 4,000,640, Cl. 73-1.00B.

Kocsis, Joseph: *See—*

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Koernig, Wolfgang: *See—*

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Kolbow, Peter: *See—*

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Kolosko, Leon F., and Topolski, Alvin S., to Wurlitzer Company, The Two-speed automatic phonograph. 4,000,906, Cl. 274-9.00A.

Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu, and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Camera allowing simultaneous sound recording. 4,000,940, Cl. 352-72.000.

Konarski, Mieczyslaw; and Nash, Dudley O., to General Electric Company. Thrust vectorable eshaust nozzle. 4,000,854, Cl. 239-265.350.

Kondo, Fumio: *See—*

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Kondo, Shinichi. *See—*

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Konishiroku Photo Industry Co., Ltd.: *See—*

Nakajima, Tomio; Habu, Teiji; Sakamoto, Eiichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, 4,001,021.

Koo, Tuh-Kai, to NCR Corporation Method of fabricating an isolated p-n junction. 4,001,050, Cl. 148-1.500.

Koontz, Donald Eldridge; and Landau, Uziel, to Bell Telephone Laboratories, Incorporated. Method of electroplating precious metals in localized areas 4,001,093, Cl. 204-15.000.

Kopp, Joseph N.: *See—*

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Kosakowski, Henry R., to Bendix Corporation, The Precision capacitance to digital conversion system. 4,001,813, Cl. 340-347.00R

Kosower, Edward M., and Kosower, Nechama S., to Polymer Sciences Corporation. Cyclopropane derivatives and use thereof as cell membrane mobility agents. 4,001,428, Cl. 424-307.000.

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Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Substituted phenyl-benzimidazo compounds. 4,001,268, Cl. 260-309.200.

Kozacka, Frederick J., to Chase-Shawmut Company, The. Electric fuse for elevated circuit voltages. 4,001,749, Cl. 337-244.000.

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Kramer, Charles E., and Tiger, Menachem, to G. D. Searle & Co. Apparatus and method for preparing, diluting and replicating laboratory samples. 4,000,976, Cl 23-259.000

Krasnobajew, Victor: *See—*

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Kraus, Helmut, to Siemens Aktiengesellschaft. Liquid jet recorder 4,001,839, Cl. 346-75.000.

Kravitz, Bernard L.; and Seaton, George R., to Dionics, Inc. Monolithic, junction isolated photrac 4,001,866, Cl. 357-39.000.

Kravitz, Bernard L.; and Seaton, George R., to Dionics, Inc. Semiconductive devices with integrated circuit switches. 4,001,867, Cl. 357-39.000.

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Kreeger, Elsmer W.: *See—*

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Kreighbaum, William E., to Mead Johnson & Company. Alkanesulfonamido triphenylethylenes. 4,001,229, Cl. 260-247.10R.

Kreissl, Ernst; Vahle, Erwin; and Uhlig, Hans, to Singer Company, The Skip stitch mechanism for sewing machines. 4,000,706, Cl 112-221.000

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Krupka, Dan Charles, to Bell Telephone Laboratories, Incorporated. Fabrication of a self-aligned mirror on a solid-state laser for controlling filamentation. 4,001,719, Cl. 331-94.50H.
Krupp, Ernest E. Center device. 4,000,669, Cl. 82-33.00R.
Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., to Eastman Kodak Company. Magenta image-providing phenylazonaphthyl dues containing a morpholinyl of piperidine radical. 4,001,204, Cl. 260-152.000.
Kubota, Tatsushi; and Fujiwara, Akinori, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seat belt buckle switch having slidable actuator and bridging contact wire. 4,001,532, Cl. 200-61.58B.
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Kurk, Kenneth G.; and Kilbride, Robert S., to Moorman Manufacturing Company. Method and apparatus for assembling layers of packages on a pallet. 4,000,820, Cl. 214-6.0DK.
Kurokawa, Fuminori, to Diesel Kiki Co., Ltd. Fuel injection governor. 4,000,728, Cl. 123-140.00R.
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, to Teijin Limited. Process for the preparation of 1,4-diacetoxycyclopent-2-ene. 4,001,308, Cl. 260-491.000.
Kurtz, Bernard; and Spizzo, Ermes, to Les Ateliers de Constructions Mecaniques; and C. A. Holweg S.A. Method and means for winding pre-cut bags to form rolls. 4,000,864, Cl. 242-59.000.
Kurtzbein, Earl D. Wave and current operated power generating device. 4,001,596, Cl. 290-53.000.
Kusano, Kuniyuki: *See—*
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Kyburz, Rolf, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids using vinyl substituted, SO_2 containing, amine salt. 4,001,201, Cl. 260-117.000.
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  Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,001,414.
Lachman, Irwin M.: *See—*
  Frost, Rodney I.; Lachman, Irwin M.; and Rieth, Paul H., 4,001,028.
Lacotte, Jean Pierre, to Thomson-Brandt. Method apparatus and record for distributing information in the form of color images. 4,001,874, Cl. 358-2.000.
La Force, Phil D.: *See—*
  Fukumoto, Akiharu; and La Force, Phil D., 4,000,613.
Laing, Nikolaus. Rotary heat exchanger. 4,000,777, Cl. 165-86.000.
Laing, Nikolaus. Temperature-control system with rotary heat exchangers. 4,000,778, Cl. 165-86.000.
Lally, John Anthony: *See—*
  Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, 4,001,084.
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Acoustic telemetry system for oil wells utilizing self generated noise. 4,001,773, Cl. 340-18.0LD.
Lammert, Steven R.: *See—*
  Kukolja, Stjepan P.; and Lammert, Steven R., 4,001,239.
Landau, Uziel: *See—*
  Koontz, Donald Eldridge; and Landau, Uziel, 4,001,093.
Landholm, Richard A.: *See—*
  Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., 4,001,204.
Lane, L. Jubin: *See—*
  Chambers, George S.; and Lane, L. Jubin, 4,001,712.
Langbein-Pfanhauser Werke AG: *See—*
  Schulze-Berge, Klaus, 4,001,470.
Langeliers, Roger W.: *See—*
  Langeliers, Walter J.; and Langeliers, Roger W., 4,000,953.
Langeliers, Walter J.; and Langeliers, Roger W., to Concrete Curb Inlets Co. Concrete catch basin with spring retained manhole cover. 4,000,953, Cl. 404-5.000.
Lankes, Richard George, Jr., to Borden, Inc. Ink containing methylenedisalicylic acid and method for offset printing. 4,001,027, Cl. 106-23.000.
Lantos, Elemer: *See—*
  Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.
Lantzsch, Reinhard; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for preparing 4-amino-2,2,6,6-tetramethyl piperidine. 4,001,250, Cl. 260-293.520.
Larsen, Carl Ib Peder, to Haldex Aktiebolag. Apparatus for operation selector circuits, especially tariff selector circuits in electronically operated taximeters. 4,001,560, Cl. 235-151.320.
Larson, Lawrence L.: *See—*
  Ruger, William B.; and Larson, Lawrence L., 4,000,575.
Lassau, Christian: *See—*
  Gaillard, Jean; and Lassau, Christian, 4,001,343.
Lattmanig, Viktor: *See—*
  Schmid, Peter-Jens; and Lattmanig, Viktor, 4,000,818.
Lauraitis, Kristina N., to Babcock & Wilcox Company, The. Composite golf club shaft. 4,000,896, Cl. 273-80.00R.
Lausman, Thomas Clifford: *See—*
  Wang, Chih Chun; Lausman, Thomas Clifford; and Bates, Ronald Frank, 4,001,099.
Lavedrine, Marcel: *See—*
  Pace, Henri; Lavedrine, Marcel; and Berdou, Jean, 4,001,621.
Laver, Myron B.: *See—*
  Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,200.
  Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,001,401.
Lavery, Lawrence P.; and Shuey, David R., to Xerox Corporation. Amplifier for use in a document scanning system. 4,001,500, Cl. 358-282.000.
La Via, Anthony Laurence; and Hill, John Anthony, to E. R. Squibb & Sons, Inc. Sweetening compositions. 4,001,455, Cl. 426-548.000.
Lawrence Brothers Inc.: *See—*
  Newlon, Robert L., 4,000,540.
Lawrence Peska Associates, Inc.: *See—*
  Bruscemi, Frank, 4,000,736.
  Flores, Raul, 4,000,901.
  Woods, Walter, 4,000,523.
L'ear Siegler, Inc.: *See—*
  Inman, Harold W., 4,000,531.
Leatherman, Alfred F.: *See—*
  Heller, William C., Jr.; and Leatherman, Alfred F., 4,000,760.
Lebet, Jean-Pierre; and Ducommun, Joel, to Baumgartner Papiers S.A. Device for controlling composite cigarette filter rods. 4,001,579, Cl. 250-223.00R.
Leblanc, Conrad L., to Foster Grant Co., Inc. Case for clip-on sunglasses. 4,000,810, Cl. 206-5.000.
Le Carvennec, Francois: *See—*
  Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,564.
  Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.
  d'Auria, Luigi; Huignard, Jean-Pierre; Reboul, Jean Philippe; and Le Carvennec, Francois, 4,001,635.
Lech, Joseph: *See—*
  McNeill, William; Lech, Joseph; Haugsjaa, Paul; and Regan, Robert, 4,001,631.
Lee, Charles D., Jr., to Parks-Cramer Company. Textile yarn spinning machine with supply strand interruption. 4,000,603, Cl. 57-87.000.
Lee, Henry L., Jr.; and Orlowski, Jan A. Dental sealant for amalgam restorations. 4,001,483, Cl. 526-270.000.
Lee, Sung In. Texturized acetate yarn and method of manufacture. 4,000,604, Cl. 57-153.000.
Leesona Corporation: *See—*
  Elmore, Glenn V.; and Tanner, Howard A., 4,001,039.
  Gotham, Stanley T., 4,000,860.
Leesona Plastics Machinery Ltd.: *See—*
  Fleetwood, William, 4,000,670.
Le Gallais, Jacques J., to Societe Controle Bailey. Variable control current generator arrangement. 4,001,662, Cl. 318-564.000.
Legate, Alvin C.: *See—*
  Ramberg, Harold C.; and Legate, Alvin C., 4,001,643.
Lehmann, Cyrill George. Cue-game and sliding disk for same. 4,000,900, Cl. 273-126.00R.
Lehmann, Gunter: *See—*
  Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.

Leigh Products, Inc.: *See—*
  Malott, Richard C., 4,000,688.
Leland Stanford Junior University, The Board of Trustees of: *See—*
  Alhanese, Andres; and Quate, Calvin F., 4,001,577.
Lemaire, Francis: *See—*
  Blin, Marie Francoise; Gaussens, Gilbert; and Lemaire, Francis, 4,001,462.
LeMaitre, Jacques: *See—*
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Lemin, Denis Ronald: *See—*
  Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, 4,000,970.
Le Mouee, Theodore: *See—*
  Germond, Jean-Claude; Le Mouee, Theodore; Marchal, Paul; Petit, Michel; and Vertut, Jean, 4,000,819.
Lenntoft, Bo Nils Konrad, to Sintab Swedinventor AB. Tubular belt conveyor. 4,000,809, Cl. 198-819.000.
Leonhardt, Horst M. Flammable thermoplastic cement. 4,001,152, Cl. 260-18.00N.
Le Parquier, Guy, to Thomson-CSF. Recording apparatus coding circuit for an image signal and corresponding decoding circuit. 4,001,875, Cl. 358-4.000.
Lepel High Frequency Laboratories, Inc.: *See—*
  Rossnick, Melvin, 4,001,725.
Les Ateliers de Constructions Mecaniques: *See—*
  Kurtz, Bernard; and Spizzo, Ermes, 4,000,864.
Les Fils d'Auguste Scheuchzer S.A.: *See—*
  Scheuchzer, Fredy; Buhler, Fritz; and Chiesa, Alfred, 4,000,699.
Letchworth, Peter E.; and Weil, Edward D., to Stauffer Chemical Company. Phosphonate synergists. 4,001,405, Cl. 424-210.000.
Leung, Steve Ka-Lai: *See—*
  Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,001,699.
Lever Brothers Company: *See—*
  Curry, Kenneth Vasey; and Sahir, Ahamado Ismail, 4,001,392.
Levine, Seymour, to United States of America, Air Force. Mechanical retention system for use with caseless ammunition. 4,000,697, Cl. 102-38.000.
Levis, Peter Stanley; and Shepherd, Geoffrey, to Ferranti, Limited. Signal processing apparatus. 4,001,555, Cl. 235-150.530.
Lewis, Donald J.: *See—*
  Thibodaux, Joseph G., Jr.; and Lewis, Donald J., 4,000,682.
Lewis, Robert E., to Schick Incorporated. Electric shaver operable from a wide range of supply voltages. 4,001,668, Cl. 323-19.000.
Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Friction measuring apparatus. 4,000,641, Cl. 73-9.000.
Ley, Kurt; Seng, Florin; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. 3-Amino-1,2,4-benzotriazine-1,4-di-N-oxide compositions and method of using same. 4,001,410, Cl. 424-249.000.
Ley, Kurt: *See—*
  Seng, Florin; and Ley, Kurt, 4,001,324.
L'Hommedieu, Jesse H.: *See—*
  Fischman, Martin; and L'Hommedieu, Jesse H., 4,001,641.
Li, Norman N.; Hucal, Taras; and Cahn, Robert P., to Exxon Research and Engineering Company. Demulsification process. 4,001,109, Cl. 210-22.00R.
Li, Yao Tzu. Zero stiffness taut ribbon rotary suspension systems. 4,000,659, Cl. 73-514.000.
Liang, Robert Chao-Chuin, to International Business Machines Corporation. Latching driver circuit and structure for a gas panel display. 4,001,868, Cl. 357-46.000.
Libowitzky, Herbert: *See—*
  Diem, Hans; Libowitzky, Herbert; Matthias, Guenther; Dudeck, Christian; and Lehmann, Gunter, 4,001,337.
Lieb, Carl; and Piaskowski, Edward J., to Babcock & Wilcox Company, The. Vapor generator. 4,000,720, Cl. 122-510.000.
Liebler, Marvin E.; and Lum, Eugene J., to Westinghouse Electric Corporation. Helical resistor and method for assembling. 4,001,761, Cl. 338-304.000.
Liepa, Alexander L., to Procter & Gamble Company, The. Meat analog. 4,001,441, Cl. 426-104.000.
Lim, Jin-Twan: *See—*
  Cheng, Rudolph Hon-Ching; and Lim, Jin-Twan, 4,001,735.
Limeres, Ricardo; and Osborn, Alfred, to Ideal Corporation. Flasher switch vane structure. 4,001,747, Cl. 337-136.000.
Lin Offshore Engineering, Inc.: *See—*
  Chow, Philip Y., 4,000,624.
Lindemann, Martin K., to Chas. S. Tanner Co. Crushed foam-backed fabrics and emulsions for producing the same. 4,001,158, Cl. 260-29.6TA.
Lindemann, Martin K., to Chas. S. Tanner Co. Aqueous emulsion adhesives based on C_2-C_4 ethers of N-methylol amides copolymerized with vinyl esters in the presence of hydroxy functional protective colloids. 4,001,160, Cl. 260-29.6WA.
Linden, Sven-Erik; and Forsberg, Nils Gunnar Krister, to Elektriska Svetsningsaktiebolaget. Chain making apparatus. 4,000,606, Cl. 59-16.000.
Lindig, Otto; and Sack, Werner, to Jenaer Glaswerk Schott & Gen. Low working temperature reed glasses. 4,001,741, Cl. 335-153.000.
Lindlof, James A.: *See—*
  Tungseth, Barry F.; and Lindlof, James A., 4,001,167.
Lindquist, Gunnar: *See—*
  Wallin, Erik W.; and Lindquist, Gunnar, 4,001,827.
Lindstrom, K. Hakan: *See—*
  Erikson, Ernst G.; and Lindstrom, K. Hakan, 4,000,712.
Lingenfelter, Robert C.; Moore, Curtis L.; and Kunes, James J., to Westinghouse Electric Corporation. Sudden pressure relay having seismic protection. 4,001,644, Cl. 317-14.00G.
Lipo, Thomas A., to General Electric Company. Regulating the torque of an induction motor. 4,001,660, Cl. 318-227.000.
Littman, Stanley: *See—*
  Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.
Litton Systems, Inc.: *See—*
  Burke, Robert Virgil; and Hester, Thomas Eugene, 4,001,537.
Ljung, Sten Rune. Insert for the furnaces of boilers. 4,000,735, Cl. 126-361.000.
Lo, David S.; and Paul, Maynard C., to Sperry Rand Corporation. Magneto-inductive readout of cross-tie wall memory system using hard axis drive field and noise cancelling sense line. 4,001,795, Cl. 340-174.0TF.
Lockheed Missiles & Space Company, Inc.: *See—*
  Momyer, William R., 4,001,043.
Loev, Bernard: *See—*
  Bowman Van Hoeven, Helene E.; Brenner, L. Martin; and Loev, Bernard, 4,001,241.
Loh, Jack C.: *See—*
  Marwell, Edward M.; and Loh, Jack C., 4,001,688.
Lohmann, Frank, to Ciba-Geigy Corporation. Stable solutions of fluorescent brighteners. 4,001,138, Cl. 252-301.270.
Lombardo, Dominick A. Lighting devices. 4,001,803, Cl. 340-248.00B.
Lone Star Container Sales Corporation: *See—*
  Hardison, Jerry C.; and Gray, Laverne E., 4,000,811.
Long, Edward C., to Beckman Instruments, Inc. Liquid scintillation solution. 4,001,139, Cl. 252-301.170.
Longo, John M., to Exxon Research and Engineering Company. Process for the desulfurization of flue gas. 4,001,375, Cl. 423-244.000.
Lonseth, Palmer; Selkirk, Neil Robertson; and Panter, Hubert Gerald, to Canadian General Electric Company Limited. Grounding of outer winding insulation to cores in dynamoelectric machines. 4,001,616, Cl. 310-45.000.
Lonza Ltd.: *See—*
  Moulin, Francois; and Boosen, Karl-Josef, 4,001,255.
L'Orange, Raul, to Blendax-Werke R. Schneider GmbH & Co. Means for caries prophylaxis. 4,001,393, Cl. 424-52.000.
Loucks, Wesley T., Sr., to William F. Shepherd, Inc. Electromechanical interlock device for a vending machine. 4,000,800, Cl. 194-9.00R.
Loughley, William A.: *See—*
  Tecco, Charles; and Loughley, William A., 4,000,839.
Love, David A. Electronic vibrato system. 4,000,676, Cl. 84-1.250.
Lucas Industries Limited: *See—*
  Orloff, George, 4,000,755.
Lucas, Roland T., to St. Luke's Hospital Research Foundation, Inc. Manifold report form and methods for using the same. 4,000,916, Cl. 282-11.50A.
Lucchesi, Benedict R., to University of Michigan, The Regents of the. Novel quaternary salts and method. 4,001,327, Cl. 260-567.60M.
Lucek, John R.; and Palen, Vernon B., to General Electric Company. Centrifugally casting hollow glass body around vapor shield. 4,000,999, Cl. 65-49.000.
Lucking, Hans Joachim: *See—*
  Maass, Gunther; Lucking, Hans Joachim; Sattlegger, Hans; and Rudolph, Karl-Heinz, 4,001,168.
Lugay, Joaquin Castro: *See—*
  Kim, Myung Ki; and Lugay, Joaquin Castro, 4,001,459.
Lum, Eugene J.: *See—*
  Liebler, Marvin E.; and Lum, Eugene J., 4,001,761.
Lutron Electronics Co., Inc.: *See—*
  Gray, George W., 4,001,637.
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  Ramey, Chester E.; and Luzzi, John J., 4,001,181.
Lyberg, Bertil: *See—*
  Bylund, Per Gunnar; and Lyberg, Bertil, 4,001,680.
Lydiksen, George C., to Simplex Filler Co. Bottom-up container-filling machine. 4,000,765, Cl. 141-181.000.
Lynch, James Edward, to AMP Incorporated. Strip bus bar for terminal posts. 4,001,490, Cl. 174-88.00R.
Lyon, John W., to Nineteen Sixties Corporation. Punching machine. 4,000,673, Cl. 83-526.000.
M & J Valve Company: *See—*
  Dunegan, Ronald G., 4,000,989.
M & T Chemicals Inc.: *See—*
  Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.
Maass, Gunther; Lucking, Hans Joachim; Sattlegger, Hans; and Rudolph, Karl-Heinz, to Bayer Aktiengesellschaft. Transparent storage-stable polysiloxanes which cross-link under atmospheric conditions. 4,001,168, Cl. 260-37.0SB.
MacGregor, Paul T.: *See—*
  Karger, Eva R.; and MacGregor, Paul T., 4,001,277.
Mack, Alfred; and Schweitzer, Cameron Charles, to RCA Corporation. Method and apparatus for compensation of doppler effects in satellite communication systems. 4,001,690, Cl. 325-4.000.
Mackintosh, Charles. Transportation system. 4,000,702, Cl. 104-244.000.
MacLean, Alexander, to Electro Switch Corporation. Control switch relay and control circuit means. 4,001,740, Cl. 335-73.000.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Tertiary-aliphatic amidazo compounds. 4,001,207, Cl. 260-192.000.

- Maddox, Ronnie Joseph, to Electroprint, Inc. Methods and apparatus for cleaning paper in a high speed electrostatic printing apparatus. 4,001,838, Cl. 346-153.000.
- Madison, Norman L.: *See*—
  - Chamberlin, Thomas A.; and Madison, Norman L., 4,001,147.
- Maeda, Hiroshi: *See*—
  - Ishimaru, Satoshi; Maeda, Hiroshi; and Mizukami, Tatsuto, 4,001,830.
- Maeda, Kenji: *See*—
  - Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,001,208.
- Magill, Hugh; and Herwynen, John Alfred. Wall partition system and components thereof. 4,000,596, Cl. 52-481.000.
- Maguire, Edward John, Jr., to Procter & Gamble Company, The. Automatic dishwashing detergent composition. 4,001,132, Cl. 252-105.000.
- Mahon, Joseph J., to Singer Company, The. Percentage timer. 4,001,529, Cl. 200-39.00R.
- Maitani, Yoshihisa; and Hashimoto, Akihiko, to Olympus Optical Co., Ltd. Electrical shutter circuit for camera. 4,001,845, Cl. 354-51.000.
- Maitra, Pradeep: *See*—
  - Corte, Ernesto; and Maitra, Pradeep, 4,001,590.
- Makepeace, Charles E. Process for making metal pipe. 4,001,054, Cl. 148-16.500.
- Makino, Shinji: *See*—
  - Noyori, Ryoji; Hayakawa, Yoshihiro; Baba, Yutaka; and Makino, Shinji, 4,001,249.
- Malchow, Max Edward: *See*—
  - Sheng, Abel Ching Nam; and Malchow, Max Edward, 4,001,723.
- Malcolm, Bruce G.; and Dawson, William P. Direct contact rotary attenuator. 4,001,736, Cl. 333-81.00A.
- Malen, Charles; and Desnoyers, Pierre, to Science Union et Cie, Societe Francaise de Recherche Medical. Thiazolyl benzoic acid compounds. 4,001,420, Cl. 424-270.000.
- Malott, Bernard: *See*—
  - Deane, Kenneth E.; Ring, Thomas F.; and Malott, Bernard, 4,001,528.
- Malott, Richard C., to Leigh Products, Inc. Ventilator for roof ridge. 4,000,688, Cl. 98-42.00A.
- Maltman, William Ramsey; and Howard, Colin Robert, to Pilkington Brothers Limited. Manufacture of float glass. 4,001,476, Cl. 428-209.000.
- Manabe, Osamu; and Nara, Kenichi, to Osaka City. Manufacture of aromatic amino compounds. 4,001,313, Cl. 260-508.000.
- Mandock, Richard F., to Eclipse, Inc. Primary flame safeguard system. 4,000,961, Cl. 431-2.000.
- Manitowoc Company, Inc., The: *See*—
  - Morrow, James G., Sr.; Pech, David J.; and Kutz, Norman J., 4,000,784.
- Marathon Cheese Corporation: *See*—
  - Menzner, Donald F.; and Knauf, Robert L., 4,001,075.
- Marchal, Paul: *See*—
  - Germond, Jean-Claude; Le Mouee, Theodore; Marchal, Paul; Petit, Michel; and Vertut, Jean, 4,000,819.
- Mardix, Shmuel; McIlvaine, Paul M.; and Nudelman, Sol, to State of Rhode Island, Board of Regents for Education of the. Method of preparing conductron-type photoconductors and their use as target materials for camera tubes. 4,001,627, Cl. 313-385.000.
- Marine Resources, Inc.: *See*—
  - Sims, Claude C., 4,001,765.
- Marion, Frank A.; and McSpadden, Hugh J., to Universal Propulsion Co. Heat protective material and method of making the material. 4,001,126, Cl. 252-62.000.
- Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,001,175, Cl. 260-45.70S.
- Market Research Corporation of America: *See*—
  - Strom, Leslie S., 4,000,915.
- Markofsky, Sheldon Boris; and Block, Jacob, to W. R. Grace & Co. Scale inhibiting process. 4,001,134, Cl. 252-180.000.
- Marks, Robert G., to Itek Corporation. Toner dispensing apparatus. 4,000,833, Cl. 222-105.000.
- Marmo, Don; and Rocco, Frank Louis, to International Flavors & Fragrances Inc. Flavor composition for use in orally utilizable compositions. 4,001,438, Cl. 426-96.000.
- Marquez, Joseph A.: *See*—
  - Weinstein, Marvin J.; Wagman, Gerald H.; and Marquez, Joseph A., 4,001,209.
- Marshall, Winston S., to Eli Lilly and Company. 3-Substituted phenylalkyl amines. 4,001,322, Cl. 260-559.00D.
- Marshall, Winston S.: *See*—
  - Zimmerman, Dennis M.; and Marshall, Winston S., 4,001,247.
  - Zimmerman, Dennis M.; and Marshall, Winston S., 4,001,248.
- Martin, Barrie James, to Plessey Handel und Investments A.G. Fuel atomizers. 4,000,852, Cl. 239-102.000.
- Martin, James Scott; and Cook, Robert E., to Charles Machine Works, Inc., The. Pushing or pulling apparatus for pipe, rod or the like. 4,000,879, Cl. 254-29.00R.
- Martin, Jean-Marc: *See*—
  - Chesneau, Rene; and Martin, Jean-Marc, 4,001,832.
  - Chesneau, Rene; and Martin, Jean-Marc, 4,001,833.
- Martin, Myron D., to National Service Industries, Inc. Lighting system. 4,001,571, Cl. 240-9.00R.
- Maruyama, Isamu: *See*—
  - Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Katayama, Shigenari; and Yamamoto, Hisao, 4,001,312.
- Maruyama, Tatsuo; and Sasaki, Hiroshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Asynchronous delay circuit. 4,001,611, Cl. 307-293.000.
- Marvin Glass & Associates: *See*—
  - Breslow, Jeffrey D., 4,000,899.
- Marwell, Edward M.; and Loh, Jack C., to Curtis Instruments, Inc. Coulometer with end of integration color change indicator. 4,001,688, Cl. 324-182.000.
- Marwil, Stanley J.: *See*—
  - Drake, Charles A.; and Marwil, Stanley J., 4,001,294.
- Marzoli, Angelo, to F. Lli Marzoli & C. S.p.A. Installation for metering textile fibers. 4,000,541, Cl. 19-81.000.
- Masaki, Mitsuo; Matsunami, Satoshi; Fuzimura, Susumu; and Okimoto, Kiyomi, to UBE Industries, Ltd. Hexakis(2-pyridylthio)-tetrazine monooxide. 4,001,240, Cl. 260-270.00K.
- Maschinenfabrik Augsburg-Nurnberg AG: *See*—
  - Fischer, Hermann, 4,000,691.
  - Ottl, Adolf; Dost, Fredy; and Breindl, Otto, 4,000,730.
- Maser, Kenneth R., to United States of America, Interior. Remote sealing of mine passages containing flowing water. 4,000,621, Cl. 61-35.000.
- Massey-Ferguson Industries Limited: *See*—
  - Butler, James G., 4,000,600.
- Masuda, Keiji; Kizawa, Hidenori; and Otaki, Yasuhiko, to Nippon Soda Company Limited. Process for producing nicotinic acid. 4,001,257, Cl. 260-295.50R.
- Mathamel, Flavius A.: *See*—
  - Wisner, Daniel A.; Mathamel, Flavius A.; and Schmalzriedt, Truman T., 4,001,665.
- Matlock, William C.; and Somlo, Patricia K. Solar energy converter. 4,000,734, Cl. 126-271.000.
- Matner, Martin; Perrey, Hermann; and Schwinum, Ernst, to Bayer Aktiengesellschaft. Stable heat-sensitive latex mixtures. 4,001,162, Cl. 260-29.6SQ.
- Matner, Martin; Schwinum, Ernst; and Mott, Ludwig, to Bayer Aktiengesellschaft. Styrene-butadiene copolymer latices containing carboxyl groups. 4,001,163, Cl. 260-29.70T.
- Matsui, Takeshi; Hinachi, Matatoyo; and Kotera, Masao, to Nippon Soken, Inc. Pulse radar method and system. 4,001,823, Cl. 343-7.00A.
- Matsumoto Kiko Co., Ltd.: *See*—
  - Matsumoto, Kouichi, 4,000,881.
- Matsumoto, Kouichi, to Matsumoto Kiko Co., Ltd. Slowdown escaping apparatus. 4,000,881, Cl. 254-157.000.
- Matsumura, Yasuo; Kishimoto, Soichiro; and Okazaki, Saburo, to Japan Exlan Company Limited. Process for producing carbon fibers having excellent physical properties. 4,001,382, Cl. 423-447.100.
- Matsunami, Satoshi: *See*—
  - Masaki, Mitsuo; Matsunami, Satoshi; Fuzimura, Susumu; and Okimoto, Kiyomi, 4,001,240.
- Matsuo, Masaaki: *See*—
  - Umio, Suminori; Ueda, Ikuo; Matsuo, Masaaki; Kobayashi, Masakazu; Nakaguti, Osamu; and Sato, Yoshinari, 4,001,280.
- Matsuo, Masashi: *See*—
  - Hayashi, Takao; and Matsuo, Masashi, 4,001,309.
- Matsushita Electric Industrial Co., Ltd.: *See*—
  - Ando, Eiji; and Hayashi, Yoshiki, 4,001,014.
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- Moulet, Camille, to Crinospital S.p.A. Automatic low throughput metering apparatus for selecting and controlling the flow rate of liquids. 4,001,801, Cl. 340-239.00R.
- Moulias, Robert Louis: *See—*
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- Moulin, Francois, and Boosen, Karl-Josef, to Lonza Ltd. Process for the production of cyanopyridines. 4,001,255, Cl. 260-294.900.
- Moulton, James A., to Rockwell International Corporation. Range-gated moving target signal processor. 4,001,826, Cl. 343-7.700
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- MSE Corporation: *See—*
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- Muchowki, Joseph M., and Fried, John H., to Syntex (U.S.A.) Inc. 11,12-Difluoromethylene substituted prostanoic and prost-5-cis-enoic acid derivatives. 4,001,295, Cl. 260-468.00D
- Mueller, Anthony A., Bao, Frank W., Parker, Stephen D., and Hummeldorf, James L., to Actus, Inc. Automatic sample changer. 4,001,584, Cl. 250-328.000.
- Mueller Co.: *See—*
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- Muller, Friedhelm: *See—*
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- Murakami, Keisuke: *See—*
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- Muraviev, Ernest Nikolaevich: *See—*
  - Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich, Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983
- Murdock, Robert H., to NEF Systems. Railing construction. 4,000,883, Cl. 256-65.000.
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- Murrmann, Helmuth: *See—*
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- Murtha, Timothy P.; and Gray, Roy A., to Phillips Petroleum Company. Flame retardants for polymers. 4,001,182, Cl. 260-45.85R
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- Najer, Henry; and Pascal, Yves Robert Alain, to Synthelabo. Apovincaldehyde. 4,001,251, Cl. 260-293.530.
- Nakabayashi, Shigetoshi: *See—*
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- Nakakubo, Koichi: *See—*
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- Nash, Dudley O., Beavers, Robert G., Burge, Joseph C., Castells, Onofre T. M., and Parker, Alan I., to General Electric Company. Flight maneuverable nozzle for gas turbine engines. 4,000,610, Cl. 60-230.000
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- Nelson, James P., to Standard Oil Company (Indiana). Dimethyl 2,5-dibromoterephthalate esterification. 4,001,188, Cl. 260-75.00H

Nelson, Norman A., to Upjohn Company, The. 5-Oxa prostaglandin E_1 analogs. 4,001,296, Cl. 260-468.00D.
Nelson, Theodore M., to United States of America, Air Force. High power microwave radar pulse shaping system. 4,001,821, Cl. 343-5.00R.
Nesson, Israel; Faris, Edwin E.; and Palmer, Robert G., to Berkey Photo, Inc. Camera construction. 4,001,848, Cl. 354-196.000.
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Nomoto, Yoshihisa; Takegami, Shigeru; Nakakubo, Koichi; and Yoneyama, Takao, to Hitachi, Ltd. Temperature-rise preventive apparatus for television receiver parts. 4,001,503, Cl. 358-243.000.
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Noyori, Ryoji; Hayakawa, Yoshihiro; Baba, Yutaka; and Makino, Shinji, to Sanwa Kagaku Kenkyusho Co. Ltd. Process for the preparation of tropane alkaloids. 4,001,249, Cl. 260-292.000.
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- Petersen, Arne J., to Beckman Instruments, Inc. Sample residue cleaning system for biological analyzers. 4,000,973, Cl. 23-230.00R.
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- Poortman, Karel Arnold Tee off device. 4,000,904, Cl. 273-183.00A
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- Schexnayder, Lawrence F., to Caterpillar Tractor Co. Hydraulic load lifting system. 4,000,683, Cl. 91-411.00R.
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- Societe Controle Bailey: *See—*
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- Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
  - Kalina, Vladimir, 4,001,090.
- Socolescu, Grigore O.: *See—*
  - Dascalescu, Aurelian M.; and Socolescu, Grigore O., 4,001,381.
- Solartron Electronic Group Limited, The: *See—*
  - Withers, Paul Owen; and Metcalf, Eric, 4,001,697.
- Somlo, Patricia K.: *See—*
  - Matlock, William C.; and Somlo, Patricia K., 4,000,734.
- Sommerfield, Edmund H.: *See—*
  - Smith, William E.; and Sommerfield, Edmund H., 4,001,340.
- Sondy, Dominic P. Kiln alarm. 4,001,799, Cl. 340-213.00Q.
- Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, to American Cyanamid Company. Low molecular weight hydrolyzed polyacrylamide and use thereof as scale inhibitor in water systems. 4,001,161, Cl. 260-29.60H.
- Song, Il H., to Richardson Company, The. Transparent solvent and heat resistant terpolymer compositions. 4,001,484, Cl. 526-329.000.
- Sony Corporation: *See—*
  - Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.
- Sorensen, Wayne H.; and Sorenson, John F., to Hoerner Waldorf Corporation. Die cut corner pad. 4,000,843, Cl. 229-14.00C.
- Sorenson, John F.: *See—*
  - Sorensen, Wayne H.; and Sorenson, John F., 4,000,843.
- Sorgenfrei, Malachi E.; and Aepli, Otto T., to BASF Wyandotte Corporation. Method of washing glassware and inhibited cleaning solution and additive composition useful therein. 4,001,133, Cl. 252-156.000.
- Sorkin, Morris; and Oicles, Jeffrey A., to TRW Inc. Angular velocity indicating apparatus. 4,001,687, Cl. 324-173.000.
- Souza, Anthony J., to Woodstream Corporation. Trigger-assembly for rotating-frame type animal traps. 4,000,578, Cl. 43-92.000.
- Spannlang, Ronald; and Kagerhuber, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Roller or roll assembly. 4,000,553, Cl. 29-115.000.
- Specht, Edward H.; and O'Mara, James H., to Rohm and Haas Company. Additives to improve the flow of heavy fuels and crude oils. 4,000,986, Cl. 44-62.000.
- Spectra-Vision Corporation: *See—*
  - Fiori, Anthony M.; Fiori, Robert T.; and Nicholas, Thomas C., III, 4,001,882.
- Sperry Rand Corporation: *See—*
  - Boehm, Arthur F., 4,001,786.
  - Datwyler, George L., 4,000,862.
  - Lo, David S.; and Paul, Maynard C., 4,001,795.
- Spinner, Georg. Variable directional coupler having movable coupling lines. 4,001,730, Cl. 333-10.000.
- Spirer, Peter R., to Horizon Industries, Inc. Tufted pile fabric and method of making same. 4,000,707, Cl. 112-410.000.
- Spiridonov, Eduard Georgievich: *See—*
  - Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.

- Spitz, Erich: *See—*
  - Bied-Charreton, Philippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,564.
  - Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.
- Spiwak, John J.: *See—*
  - Skubon, Michael J.; Spiwak, John J.; and Naro, Rodney L., 4,001,468.
- Spizzo, Ermes: *See—*
  - Kurtz, Bernard; and Spizzo, Ermes, 4,000,864.
- Spoler, Johannes Gerhard: *See—*
  - Hannover, Hans-Otto; and Spoler, Johannes Gerhard, 4,000,700
- Spoor, Herbert: *See—*
  - Kempter, Firtz Erdmann; Sabelus, Guenther; and Spoor, Herbert, 4,001,155.
- Sprague Electric Company: *See—*
  - Brown, John L., 4,001,869.
- Spruyt, Harry, to Scott Paper Company. Moisture impervious packaging systems. 4,000,816, Cl. 206-498.000.
- Spry, Douglas O., to Eli Lilly and Company. 3-(Substituted)carbonylamino cephem derivatives. 4,001,226, Cl. 260-243.00C.
- Squire, William D.: *See—*
  - Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 4,001,773.
- Squires, Robert L., to American Electronics Corporation. Ultrasonic rodent control device and method. 4,001,817, Cl. 340-384.00E.
- Staba, Edward A., to Olin Corporation. Method for preparing an extrudable priming mixture containing modified karaya gum. 4,001,060, Cl. 149-109.600.
- Stacey, Eric J.: *See—*
  - Gyugyi, Laszlo; Rosa, John; and Stacey, Eric J., 4,001,670.
  - Gyugyi, Laszlo; Brennen, Michael B.; and Stacey, Eric J, 4,001,671.
- Stackhouse, Bill L.; and Taylor, Theodore E., to General Electric Company. Apparatus for establishing communication between a first radio transmitter and receiver and a second radio transmitter and receiver. 4,001,693, Cl. 325-58.000.
- Staeubli Ltd.: *See—*
  - Kleiner, Walter, 4,000,761.
- Stahlberger, Bruno; and von Dach, Werner, to Elastin-Werk Aktiengesellschaft. Collagen-containing preparations. 4,001,442, Cl. 426-105.000.
- Stamicarbon B.V.: *See—*
  - Kaasenbrood, Petrus J. C., 4,001,320.
- Standard Brands Incorporated: *See—*
  - Horwath, Robert Otto; and Rotheim, Philip, 4,001,083.
  - Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, 4,001,084.
- Standard Car Truck Co.: *See—*
  - Geyer, Robert P., 4,000,931.
- Standard Oil Company: *See—*
  - Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,001,317.
- Standard Oil Company (Indiana): *See—*
  - Nelson, James P., 4,001,188.
- Standard Pressed Steel Co.: *See—*
  - Finkelston, Robert J., 4,000,782.
- Stanley, Andrew D.: *See—*
  - Nayfa, James E.; and Stanley, Andrew D., 4,000,536.
- Stant Manufacturing Company, Inc.: *See—*
  - Crute, Billy G.; and Evans, John H., 4,000,828.
  - Evans, John H., 4,000,633.
  - Summan, Dennis J., 4,000,632.
- State of Rhode Island, Board of Regents for Education of the: *See—*
  - Mardix, Shmuel; McIlvaine, Paul M.; and Nudelman, Sol, 4,001,627.
- Stauffer Chemical Company: *See—*
  - Baker, Don R.; and Walker, Francis H., 4,001,427.
  - Baker, Don R.; and Walker, Francis H., 4,001,430.
  - Letchworth, Peter E.; and Weil, Edward D., 4,001,405.
  - Petersen, Alfred W., 4,001,383.
- Stavropoulos, William S.; and Crouch, Robert D., to Dow Chemical Company, The. Method for determination of triglycerides and glycerol. 4,001,089, Cl. 195-103.50R.
- Steel Engineering Company Limited, The: *See—*
  - Wallace, Trevor Evelyn, 4,000,873.
- Steele, Everett T., Jr.: *See—*
  - Wagner, Joseph P.; and Steele, Everett T., Jr., 4,000,849.
- Stein, Marcel. Dustproof and airtight luminaires. 4,001,572, Cl 240-25.000.
- Steinberg, David Herbert: *See—*
  - Dexter, Martin; and Steinberg, David Herbert, 4,001,299.
- Steinkamp, Robert A.; and Grail, Thomas J., to Exxon Research and Engineering Company. Polymers with improved properties and process therefor. 4,001,172, Cl. 260-42.180.
- Steinstrasser, Ralf, to Merck Patent Gesellschaft mit beschrankter Haftung. Nematic compounds and mixtures. 4,001,137, Cl 252-299.000.
- Stephan, Raymond C.: *See—*
  - Rote, Franklin E.; and Stephan, Raymond C., 4,001,012.
- Stephenson, Dwight L., to United States of America, Energy Research and Development Administration. Stored program digital process controller. 4,001,557, Cl. 235-151.100.
- Stephenson, Robert L.; and Schotthoefer, Jerome W., to Allied Chemical Corporation. Separable fastener with pin latch. 4,000,548, Cl 24-230.0AL.
- Sterling Drug Inc.: *See—*
  - Alexander, Ernest John, and Mooradian, Aram, 4,001,270
- Sterzer, Fred, to RCA Corporation. Electronic license plate for motor vehicles. 4,001,822, Cl. 343-6.5SS.
- Stevens, Arthur Royden, to Centrax Limited. Belt-type abrader with means to compensate for tool wear. 4,000,583, Cl. 51-135.00R.
- Stevens, Robert C., to Cordis Corporation. Hemostasis cannula 4,000,739, Cl. 128-214.400.
- Stevenson, George Earley, to Pico Electronics Limited. Floating point calculator with RAM shift register. 4,001,566, Cl. 235-159.000
- Stift, Kurt, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method and apparatus for the reduction of ores, especially iron ores. 4,001,008, Cl. 75-11.000.
- Stimson, Paul B. Photographic processing apparatus. 4,001,856, Cl 354-331.000.
- Stoepel, Kurt: *See—*
  - Meyer, Horst; Bossert, Friedrich, Vater, Wulf; and Stoepel, Kurt, 4,001,235.
  - Meyer, Horst, Bossert, Friedrich, Vater, Wulf; and Stoepel, Kurt, 4,001,252.
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,258.
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,001,259.
- Stokes, Phillip John: *See—*
  - Williams, John Llewellyn; and Stokes, Phillip John, 4,001,689
- Storage Technology Corporation. *See—*
  - Radichel, Frank; and Wirkkanen, Richard, 4,001,818.
  - Radichel, Frank A., 4,001,686.
- Stosak, Ronald J.: *See—*
  - Trocciola, John C.; Elmore, Dan E.; and Stosak, Ronald J., 4,001,042.
- Stout, James T., to Mead Corporation, The. Article carrier. 4,000,813, Cl. 206-187.000.
- Stout, James T., to Mead Corporation, The. Article carrier. 4,000,814, Cl. 206-187.000.
- Stovall, Leland F., to Exxon Production Research Company. Skimmer fence. 4,000,618, Cl. 61-1.00F.
- Strathman, Lyle R.: *See—*
  - Swanson, Ronald L.; and Strathman, Lyle R., 4,001,716.
- Straujups, John E., to Birch Brothers Southern, Inc. Winding apparatus with wrapping arrangement. 4,000,863, Cl. 242-56.00R.
- Strike, Donald P., to American Home Products Corporation. Prostaglandin derivatives. 4,001,315, Cl. 260-514.00D.
- Strom, Leslie S., to Market Research Corporation of America. Consumer diary. 4,000,915, Cl. 281-31.000.
- Strout, Frederick D.; Calle, Jaime; and Herron, Edwin W., to Honeywell Information Systems, Inc. High density data storage on magnetic disk. 4,001,883, Cl. 360-48.000.
- Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Magnetic bearing system. 4,000,929, Cl 308-10.000.
- Sturm, Karl, to Hoechst Aktiengesellschaft. Process for the manufacture of 5-sulfamoyl-anthranilic acids. 4,001,284, Cl. 260-397.70R
- Sturm, Ruger & Co. Inc.: *See—*
  - Ruger, William B., and Larson, Lawrence L., 4,000,575.
- Suchanek, Peter: *See—*
  - Mennicke, Winfried; Suchanek, Peter, and Vogt, Peter F., 4,000,965.
- Suchy, Milos: *See—*
  - Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,001,339.
- Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, to Oiles Industry Co., Ltd. Sintered self-lubricating article. 4,000,981, Cl. 29-182.500
- Sugahara, Hirozo: *See—*
  - Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku, Kurisaki, Konomu, Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, 4,001,223.
- Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu, Sugahara, Hirozo, Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, to Idemitsu Kosan Co., Ltd.; and Nippon Chemiphar Co., Ltd. Adamantane-piperazine derivatives. 4,001,223, Cl. 260-240.00J
- Sugimoto, Yukio, to Matsushita Electric Industrial Co., Ltd. Discrete four-channel disc reproducing system. 4,001,518, Cl. 179-100.4ST.
- Sukman, Edwin L.: *See—*
  - Guthrie, Roger T., Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,001,367.
- Sukornick, Bernard: *See—*
  - Gordon, Joseph; and Sukornick, Bernard, 4,001,380.
- Sullivan, Charles I., to Polaroid Corporation. Method for producing zinc anode. 4,001,467, Cl. 427-123.000.
- Sullivan, Daryl Dean; and Odle, Herbert Arnold, to Johns-Manville Corporation. Luminaire and luminaire arrangement for lighting the ceiling within a room. 4,001,575, Cl. 240-81.0LD.
- Sullivan, Francis R.: *See—*
  - Clovis, James S.; and Sullivan, Francis R., 4,001,176.
- Sumitomo Chemical Company, Limited: *See—*
  - Hirohashi, Toshiyuki; Sato, Hiromi; Inaba, Shigeho, and Yamamoto, Hisao, 4,001,412.
  - Hirooka, Masaaki, Fujii, Yoshikazu; and Hata, Kazuhiko, 4,000,958.
  - Imai, Shozaburo; and Hirooka, Masaaki, 4,001,159.
  - Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Katayama, Shigenari; and Yamamoto, Hisao, 4,001,312.
  - Umemura, Takeaki, 4,001,334.

Summan, Dennis J., to Stant Manufacturing Company, Inc. Locking gas cap. 4,000,632, Cl. 70-165.000.

Summers, Thomas Wade, to Brown & Williamson Tobacco Corporation. Apparatus and process for shredding and crimping smoking materials. 4,000,748, Cl. 131-140.00C.

Superior Concrete Accessories, Inc.: *See—*

Courtois, Peter D., 4,000,591.

Superior Outdoor Display, Inc.: *See—*

Olsen, Roy, 4,001,810.

Suresh, Dev D.: *See—*

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,001,317.

Sutcliffe, Brian L. Lathe duplicator. 4,000,766, Cl. 144-144.00R.

Sutter Hospitals Medical Research Foundation: *See—*

Cook, Albert M.; Engleman, Frank A., Jr.; and Simes, James G., 4,001,700.

Sutton, Joel F.: *See—*

Anders, Larry E.; and Sutton, Joel F., 4,000,855.

Sutton, Robert D.: *See—*

Wong, Wilford F.; Hall, Gordon R.; Tsukahira, Tatsuo W.; and Sutton, Robert D., 4,000,869.

Suzuki, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for improving the physical properties of ceramics. 4,001,364, Cl. 264-63.000.

Suzuki, Matsumi; and Itoh, Toshi, to Fuji Xerox Co., Ltd. Half tone reproducing process in facsimile. 4,001,492, Cl. 358-283.000.

Suzuki, Shigeo: *See—*

Iisaka, Yoshiharu; Katsurada, Yasuo; Suzuki, Shigeo; and Saijo, Takatoshi, 4,001,062.

Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Apparatus for making electro-luminescent screens for color cathode-ray tubes of continuous phosphor stripes. 4,001,842, Cl. 354-1.000.

Svendsen, Noel A.; and Sylvester, Willard G., to Arthur D. Little, Inc. Headgear support system. 4,000,520, Cl. 2-418.000.

Swanson, Arthur P. Shirt collar strap. 4,000,522, Cl. 2-141.00R.

Swanson, Arthur P. Golf glove. 4,000,903, Cl. 273-166.000.

Swanson, Ronald L.; and Strathman, Lyle R., to Rockwell International Corporation. Variable frequency digital oscillator. 4,001,716, Cl. 331-48.000.

Swanson, Roy T.: *See—*

Scherer, Henry W.; and Swanson, Roy T., 4,001,750.

Swaters, Pieter Dirk; Havinga, Reginoldus; and van der Hauw, Tjerk, to Akzona Incorporated. Compositions curable by exposure to ultra violet light in the presence of chloro-substituted acetophenones. 4,001,098, Cl. 204-159.230.

Sweet, Anthony William, to ITT Industries, Inc. Microprocessor Boolean processor. 4,001,789, Cl. 340-172.500.

Sweeting, Charles William, to United Technologies Corporation. Deflection signal pre-start circuit for a constant speed, stroke-write vector display system. 4,001,806, Cl. 340-324.00A.

Swenck, George F.: *See—*

Scott, Irvin C., Jr.; and Swenck, George F., 4,000,895.

Swift & Company: *See—*

Shank, Joseph L., 4,001,480.

Swodenk, Wolfgang: *See—*

Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,001,303.

Sycor, Inc.: *See—*

Morgan, Samuel A., 4,001,888.

Sylvester, Willard G.: *See—*

Svendsen, Noel A.; and Sylvester, Willard G., 4,000,520.

Symmank, William D., to J. I. Case Company. Multi-engine multi-pump hydraulic summating system. 4,000,616, Cl. 60-420.000.

Synergistics, Inc.: *See—*

Kelly, William, deceased; Kelly, Monica, personal representative; Kelly, John, personal representative; and Halpern, Alfred, 4,001,311.

Syntex Corporation: *See—*

Fried, John H.; and Harrison, Ian T., 4,001,301.

Syntex (U.S.A.) Inc.: *See—*

Edwards, John A., 4,001,421.

Muchowki, Joseph M.; and Fried, John H., 4,001,295.

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Wing, James C.; and White, Jack V., 4,001,593.

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Najer, Henry; and Pascal, Yves Robert Alain, 4,001,251.

Systron Donner Corporation: *See—*

Hrbacek, Benny A.; and Grovenstein, Lewis F., Jr., 4,001,695.

Taguchi, Sadanori: *See—*

Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, 4,001,481.

Taiho Kogyo Co., Ltd.: *See—*

Ueda, Hiroshi, 4,000,982.

Tajima, Kunio; Kawakami, Touhei; and Hayashi, Seiichi, to Hitachi, Ltd. Information recording apparatus. 4,000,945, Cl. 355-45.000.

Takada, Mamoru: *See—*

Arima, Sumitaro; Oda, Minoru; Miyashita, Kyoichi; and Takada, Mamoru, 4,001,589.

Takahashi, Kazutoshi: *See—*

Miyazaki, Ken; Takahashi, Kazutoshi; and Omino, Mamoru, 4,001,785.

Takahashi, Kiyoshi: *See—*

Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, 4,000,940.

Takahashi, Tamotsu, to Copal Company Limited. Photographic camera for use with film cartridge. 4,001,849, Cl. 354-207.000.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener with emergency opening means. 4,000,545, Cl. 24-205.00R.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Slider for concealed slide fasteners. 4,000,546, Cl. 24-205.10R.

Takasawa, Yoshio: *See—*

Toyama, Teruhiko; and Takasawa, Yoshio, 4,001,004.

Takase, Tadaaki: *See—*

Sugafuji, Akira; Kurimoto, Hiroshi; and Takase, Tadaaki, 4,000,981.

Takeda Chemical Industries, Ltd.: *See—*

Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,001,199.

Ogino, Akira; Nakai, Yoshikazu; Nakayama, Takeo; and Miyamura, Koji, 4,001,153.

Takegami, Shigeru: *See—*

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Takenaka, Shigeo: *See—*

Tsuneta, Asahide; and Takenaka, Shigeo, 4,001,018.

Taketa, Katsumi; Nitta, Hirotoshi; and Sato, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Ground fault detector. 4,001,648, Cl. 317-18.00D.

Taketomi, Shigehisa: *See—*

Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,001,199.

Takeuchi, Yasuhisa; and Iizuka, Haruhiko, to Nissan Motor Co., Ltd. Vehicle skid control system including vehicle speed sensor. 4,000,928, Cl. 303-103.000.

Takigawa, Tomoshi: *See—*

Okajima, Hidekazu; Takigawa, Tomoshi; Hirata, Noritsugu; Toyama, Masamichi; and Ichiyanagi, Toshikazu, 4,000,941.

Takman, Bertil H.: *See—*

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Tanaka, Hiroshi: *See—*

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Tanaka, Shogo: *See—*

Oguchi, Noboru; Hiramatsu, Takashi; Igami, Ikuo; Aoki, Akira; Tanaka, Shogo; Seki, Toshiro; and Inoue, Takao, 4,000,960.

Tanaka, Susumu: *See—*

Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,001,545.

Tanaka, Toshio: *See—*

Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,001,308.

Tanikella, Murty S.; and von Susani, Odorich, to Du Pont de Nemours, E. I., and Company. Fibers of acid-dyeable polyester having tetramethylpiperidine groups attached through oxyalkalene linkages to ends of polymer chains. 4,001,189, Cl. 260-75.00N.

Tanikella, Murty S.; and von Susani, Odorich, to Du Pont de Nemours, E. I., and Company. Acid-dyeable fibers of polyester modified with tetramethylpiperidine polyether glycols. 4,001,190, Cl. 260-75.00N.

Tanner, Howard A.: *See—*

Elmore, Glenn V.; and Tanner, Howard A., 4,001,039.

Tartarintsev, Vladimir Mikhailovich: *See—*

Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tartarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,000,983.

Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, to Hitachi, Ltd. Superconductive elements and method for producing the same. 4,001,481, Cl. 428-469.000.

Tatemichi, Hidemaro: *See—*

Ogasawara, Takahisa; Senzaki, Yoshimichi; Kato, Hiroyuki; and Tatemichi, Hidemaro, 4,001,097.

Tauchmann, Reinhard, to Dornier GmbH. Heating device for flow sondes. 4,000,647, Cl. 73-181.000.

Taurus Gumiipari Vallalat: *See—*

Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.

Tauszig, Julio G., to A. B. Dick Company. Devices for the copying of images by sequential sweeping. 4,001,495, Cl. 358-294.000.

Tavazzani, Carlo: *See—*

Severini, Febo; Tavazzani, Carlo; and Delle Ville, Piero, 4,001,349.

Taylor, Alan K.: *See—*

McDonald, John C.; Henrickson, Gary C.; Taylor, Alan K.; and Settle, William A., 4,001,509.

Taylor, Theodore E.: *See—*

Stackhouse, Bill L.; and Taylor, Theodore E., 4,001,693.

Tecco, Charles; and Loughley, William A. Safety closure with removable lid for containers. 4,000,839, Cl. 222-540.000.

Teijin Limited: *See—*

Hamana, Isao; Fujiwara, Yoshio; and Kumakawa, Shiro, 4,001,479.

Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; and Ishimoto, Sachio, 4,001,308.

Telan Corporation: *See—*

Griffin, Richard J., 4,001,122.

Teledyne, Inc.: *See—*

Conrad, Richard A., 4,001,744.

Telefonaktiebolaget L M Ericsson: *See—*

Bylund, Per Gunnar; and Lyberg, Bertil, 4,001,680.

Teletype Corporation: *See—*

Herbst, Wayne R.; and Mika, Paul L., 4,001,884.

Temple, James E. Switch assemblies. 4,001,534, Cl. 200-160.000.

Tench, Michael Dennis Roy, to Plessey Handel und Investments A.G. Drive field for circular magnetic domain devices. 4,001,792, Cl. 340-174.0TF.

Terabayashi, Gosaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. One-touch action type power window. 4,001,661, Cl. 318-264.000.

Terasita, Takaaki: *See—*

Akimoto, Taizo; Terasita, Takaaki; and Watanabe, Shigeru, 4,001,594.

Terracol, Claude; and Schueller, Pierre, to Merlin Gerin. Circuit interrupter having an electromagnetic repulsion device. 4,001,738, Cl. 335-16.000.

Testa, Giorgio; and Pozzi, Mario, to Societa Italiana Telecomunicazioni Siemens S.p.A. Method of and means for quantizing analog-voltage samples. 4,001,812, Cl. 340-347.0NT.

Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, to Hoechst Aktiengesellschaft. Derivatives of the 1,2-diarylethylene- and pharmaceutical compositions thereof. 4,001,431, Cl. 424-327.000.

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Texas Instruments Incorporated: *See—*

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Culpepper, Jerry W., 4,001,828.

Dover, R. Thomas; and Hemmi, Christian O., 4,001,835.

Hofer, Helmut H., 4,001,770.

Thayer, Stephen C., to Panel Technology, Inc. Segmented gas discharge display panel. 4,001,629, Cl. 313-517.000.

Theissen, Robert J., to Mobil Oil Corporation. Herbicidal compositions comprising halophenoxy benzoic acid esters. 4,001,005, Cl. 71-108.000.

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Thettu, Raghulinga R., to Xerox Corporation. Cleaning apparatus for a heat and pressure fuser. 4,000,963, Cl. 432-60.000.

Thibodaux, Joseph G., Jr.; and Lewis, Donald J., to United States of America, National Aeronautics and Space Administration. Solid propellant rocket motor and method of making same. 4,000,682, Cl. 86-1.00R.

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Thomas, Francis J.; Kirchhein, Albert; and Porawski, Donald J., to Bendix Corporation, The. Voter circuit including averaging means. 4,001,605, Cl. 307-235.00F.

Thomas, Frank A. Method of recovering nutrients from cheese whey and purifying the effluent. 4,001,198, Cl. 260-112.00R.

Thomas, Gordon D.; and Schwoerer, Jerome L., to Kimberly-Clark Corporation. Nonwoven reinforced cellulosic material and method of preparation. 4,001,472, Cl. 428-109.000.

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Bied-Charreton, Phillippe; Le Carvennec, Francois; and Spitz, Erich, 4,001,563.

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Tissier, Jacques. Cleaning device. 4,000,538, Cl. 15-320.000.

Tjernstrom, Ove; and Zetterlund, Uno, to Allmanna Svenska Elektriska Aktiebolaget. Direct-cooled tape layer winding. 4,001,746, Cl. 336-62.000.

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- Tuckey, Charles H., to Walbro Corporation. Cover plate for a carburetor body. 4,001,354, Cl. 261-35.000.
- Tungseth, Barry F.; and Lindlof, James A., to Minnesota Mining and Manufacturing Company. Adhesive compositions comprising aromatic process oil and block copolymer. 4,001,167, Cl. 260-33.6AQ.
- Turk, Gunter; and Welsch, Joseph, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process of making superfine amorphous high structural silicic acid. 4,001,379, Cl. 423-339.000.
- Turner, James E., to Warner-Lambert Company. Blood gas control. 4,001,142, Cl. 252-408.000.
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- Tyler, Hugh J., to Robertshaw Controls Company. Damper actuator. 4,000,663, Cl. 74-424.8VA.
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- Van Sluys, Robert Nestor Joseph, to U.S. Philips Corporation. Device for optionally realizing two mutually complementary functions. 4,001,731, Cl. 333-14.000.
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- Wade, John A. Collapsible carrier for kegs. 4,000,922, Cl. 294-16.000
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Yale, Harry Louis; and Petigara, Ramesh B., to E. R. Squibb & Sons, Inc. 2-Amino-1-(2'-bromo-3'-substituted phenyl) pyridinium compounds. 4,001,233, Cl. 260-256.40N.
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Nakajima, Tomio; Habu, Teiji; Sakamoto, Eiichi; Yamada, Hiroshi; Mitsui, Katsuhide; and Hayashi, Eisaku, 4,001,021.
Yamada, Katuhiko: *See—*
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Yamada, Kiyoshi; Morisue, Kazushige; Shimomura, Hiroshi; and Imamura, Yoshio, to Matsushita Electric Works, Ltd.; and Matsushita Electric Industrial Co., Ltd. Electronic chime. 4,001,816, Cl. 340-384.00E.
Yamada, Takaaki: *See—*
Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.
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Yamagishi, Shokichi: *See—*
  Ohno, Shigeru; Sekigawa, Fujio; and Yamagishi, Shokichi, 4,001,390.
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  Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,000,821.
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  Sugimoto, Michio; Yamamoto, Fumitada; Honna, Kosaku; Kurisaki, Konomu; Sugahara, Hirozo; Watanabe, Kiyoshi; Fujimoto, Yasuo; and Ryu, Syoji, 4,001,223.
Yamamoto, Hisao: *See—*
  Hirohashi, Toshiyuki; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, 4,001,412.
  Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Katayama, Shigenari; and Yamamoto, Hisao, 4,001,312.
Yamamoto, Kozo, to Matsushita Electric Industrial Co., Ltd. Portable tape-recorder. 4,001,893, Cl. 360-137.000.
Yamamoto, Miyoshi: *See—*
  Yagi, Kiyoshi; and Yamamoto, Miyoshi, 4,001,174.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
  Osono, Takashi; Moriyama, Kiruko; Murakami, Keisuke; and Umezawa, Hamao, 4,001,399.
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  Aoki, Teruaki; Yamoto, Hisayoshi; Okayama, Masanori; Hirata, Yoshimi; Sato, Shuichi; and Yamada, Takaaki, 4,001,762.
Yates, Patrick A.: *See—*
  Friant, James E.; Bruton, William J.; Bertelsen, Viggo C., Jr.; and Yates, Patrick A., 4,000,696.
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  Yagi, Kiyoshi; and Yamamoto, Miyoshi, 4,001,174.
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  Kanbara, Kenjiro; Hattori, Masayuki; Miyasita, Satoru; Iguchi, Masaaki; and Yoda, Jihei, 4,001,010.
Yokoyama, Akio: *See—*
  Iwakura, Junji; Sato, Kimihiko; Fujii, Hisashi; Hashimoto, Yoshihiro; Ono, Shigeo; Watanabe, Shozaburo; and Yokoyama, Akio, 4,001,384.
Yonan, Peter K., to G. D. Searle & Co. 1-Aryl-3,4-dihydro-2(1H)-isoquinoline carbonyl chlorides. 4,001,244, Cl. 260-287.00D.
Yoneyama, Takao: *See—*
  Nomoto, Yoshihisa; Takegami, Shigeru; Nakakubo, Koichi; and Yoneyama, Takao, 4,001,503.
York, David S. Game apparatus. 4,000,897, Cl. 273-93.00C.
Yoshida Kogyo Kabushiki Kaisha: *See—*
  Takamatsu, Ikuo, 4,000,545.
  Takamatsu, Ikuo, 4,000,546.
Youhouse, Joseph. Electrostatic precipitation apparatus for vehicle engine exhaust. 4,000,994, Cl. 55-112.000.
Young, Edwin Harry Paterson: *See—*
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Young, John A. I., to Canadian General Electric Company Limited. Temperature monitoring of semiconductors. 4,001,649, Cl. 317-41.000.
Young, William G. Separating machine and method of separating. 4,000,686, Cl. 93-36.00A.
Youngelson, Harold: *See—*
  Sinclair, Brett Jason; and Youngelson, Harold, 4,001,705.
Yount, Emory N.: *See—*
  Troutman, Bruce L.; and Yount, Emory N., 4,001,553.
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  Horvath, Laszlo; Gundisch, Gusztav; Antal, Sandor; Arvai, Mihaly; Zador, Gyorgy; and Lantos, Elemer, 4,000,920.
Zahner, Louis J., to Engel, Edward, a part interest. Portable scaffold. 4,000,789, Cl. 182-152.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyo Kai: *See—*
  Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,001,208.
Zaltieri, Adriano, to Ing. C. Olivetti & C., S.p.A. Arrangement for transferring a ribbon from a feed spool to a take-up spool. 4,000,804, Cl. 197-151.000.
Zeeh, Bernd: *See—*
  Pommer, Ernst-Heinrich; Zeeh, Bernd; Goetz, Norbert; and Giergensohn, Bjoern, 4,001,416.
Zeller, Allen D., to Clevepak Corporation. Partition assembly and partition strips therefor. 4,000,845, Cl. 229-15.000.
Zenith Radio Corporation: *See—*
  Adler, Robert; and Rennick, John L., 4,001,494.
  Rogers, Melvin F., 4,000,997.
Zetterlund, Uno: *See—*
  Tjernstrom, Ove; and Zetterlund, Uno, 4,001,746.
Ziegler, Charles T. Means and method for controlling beach and sandbar erosion. 4,000,619, Cl. 61-3.000.
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Zimmerman, Dennis M.; and Marshall, Winston S., to Eli Lilly and Company. N-cycloalkylmethyl decahydroisoquinolines. 4,001,248, Cl. 260-289.00D.
Zloof, Moshe M.: *See—*
  Folchi, George A.; Wang, Sherman S.; Will, Peter M.; and Zloof, Moshe M., 4,001,556.
Zoephel, Richard L.; and Bolker, James H., to Kendall Company, The. Disposable garment and method. 4,000,521, Cl. 2-114.000.
Zonni, Marco: *See—*
  Zonni, Nick; and Zonni, Marco, 4,001,439.
Zonni, Nick; and Zonni, Marco. Method of producing ice cream in individual sliced form. 4,001,439, Cl. 426-101.000.
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  Simic, Dragomir; Zupancic, Heinz-Ulrich; and Cherubim, Martin, 4,001,148.

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 288,018	3,925,239	Dec 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,627	3,916,179	Oct 28, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,638	3,925,132	Dec 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 112,422	3,913,484	Oct 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 150,560	3,913,654	Oct 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 290,328	3,924,838	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 211,786	3,914,300	Oct 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 293,437	3,913,414	Oct 21, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 223,621	3,925,526	Dec 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 224,323	3,925,476	Dec 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,481	3,921,593	Nov 25, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,674	3,916,107	Oct 28, 1975
B 235,011	3,925,086	Dec 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,925	3,924,949	Dec 9, 1975	B 299,267	3,917,106	Nov 4, 1975
B 236,609	3,925,187	Dec 9, 1975	B 300,353	3,921,734	Nov 25, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 239,289	3,922,711	Nov 25, 1975	B 302,692	3,924,598	Dec 9, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 248,916	3,920,862	Nov 18, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 251,109	3,914,148	Oct 21, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 252,947	3,923,803	Dec 2, 1975	B 304,687	3,924,783	Dec 9, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,417	3,915,882	Oct 28, 1975
B 254,708	3,923,878	Dec 2, 1975	B 305,868	3,921,463	Nov 25, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,829	3,925,411	Dec 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 258,687	3,914,221	Oct 21, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,661	3,924,349	Dec 9, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 308,892	3,919,624	Nov 11, 1975
B 260,455	3,925,634	Dec 9, 1975	B 309,207	3,914,743	Oct 21, 1975
B 260,945	3,925,250	Dec 9, 1975	B 309,499	3,922,002	Nov 25, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,681	3,927,374	Dec 16, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,755	3,919,468	Nov 11, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,860	3,922,485	Nov 25, 1975
B 262,378	3,914,410	Oct 21, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,257	3,928,665	Dec 23, 1975	B 310,271	3,923,689	Dec 2, 1975
B 264,833	3,923,566	Dec 2, 1975	B 310,740	3,985,686	Oct 12, 1976
B 265,369	3,925,245	Dec. 9, 1975	B 311,313	3,925,142	Dec 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,317	3,918,975	Nov 11, 1975
B 265,862	3,915,915	Oct 28, 1975	B 311,413	3,925,515	Dec 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,910	3,924,357	Dec 9, 1975
B 269,673	3,914,377	Oct 21, 1975	B 311,911	3,925,233	Dec 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 312,139	3,925,530	Dec 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,098	3,925,045	Dec 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,594	3,924,626	Dec 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,993	3,948,823	Apr 6, 1976	B 314,049	3,920,588	Nov 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,255	3,923,764	Dec 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 278,991	3,914,469	Oct 21, 1975	B 314,489	3,925,016	Dec 9, 1975
B 279,583	3,923,749	Dec 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 280,395	3,919,604	Nov 11, 1975	B 315,363	3,920,673	Nov 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,397	3,923,963	Dec 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,731	3,914,108	Oct 21, 1975
B 282,081	3,913,483	Oct 21, 1975	B 316,014	3,920,861	Nov 18, 1975
B 282,252	3,924,997	Dec 9, 1975	B 316,239	3,913,546	Oct 21, 1975
B 282,819	3,982,932	Sep 28, 1976	B 316,917	3,925,494	Dec 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,080	3,925,324	Dec 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,347	3,923,552	Dec 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,624	3,925,167	Dec 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,195	3,915,699	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,618	3,915,365	Oct 28, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,640	3,925,186	Dec 9, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,226	3,925,082	Dec 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,402	3,919,568	Nov 11, 1975
B 287,270	3,924,825	Dec 9, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,373	3,918,568	Nov 11, 1975	B 320,452	3,925,083	Dec. 9, 1975

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B 320,603	3,915,571	Oct. 28, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,018	3,921,623	Nov. 25, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,682	3,924,973	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,506	3,916,021	Oct. 28, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,719	3,915,715	Oct. 28, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,443	3,927,405	Dec. 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,569	3,914,554	Oct. 21, 1975	B 384,658	3,913,452	Oct 21, 1975
B 361,604	3,922,702	Nov. 25, 1975	B 384,773	3,915,416	Oct 28, 1975
B 361,734	3,915,764	Oct. 28, 1975	B 385,210	3,913,406	Oct 21, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 386,403	3,924,895	Dec 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 386,592	3,925,305	Dec 9, 1975
B 363,337	3,928,639	Dec 23, 1975	B 387,039	3,924,510	Dec 9, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,331	3,913,701	Oct 21, 1975
B 363,674	3,929,716	Dec 30, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,892	3,913,395	Oct 21, 1975	B 387,687	3,918,151	Nov 11, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,761	3,914,245	Oct 21, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,285	3,914,631	Oct 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,639	3,914,626	Oct 21, 1975
B 365,371	3,988,181	Oct. 26, 1976	B 389,726	3,921,010	Nov. 18, 1975
B 365,490	3,918,527	Nov 11, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,834	3,914,702	Oct 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,933	3,913,267	Oct 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,732	3,913,878	Oct 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,589	3,914,719	Oct 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,021	3,914,752	Oct 21, 1975	B 391,437	3,915,416	Oct 28, 1975
B 367,040	3,924,775	Dec 9, 1975	B 391,509	3,925,175	Dec 9, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,675	3,916,017	Oct 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,732	3,914,903	Oct 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,753	3,916,341	Oct 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,563	3,924,449	Dec 9, 1975	B 393,347	3,985,800	Oct 12, 1976
B 369,607	3,923,786	Dec 2, 1975	B 393,970	3,914,638	Oct 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976	B 394,188	3,924,591	Dec. 9, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,496	3,919,435	Nov 11, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,671	3,920,418	Nov 18, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 395,889	3,913,190	Oct 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,027	3,923,736	Dec 2, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,527	3,913,488	Oct 21, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 397,990	3,914,848	Oct 28, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,262	3,913,481	Oct 21, 1975
B 376,504	3,914,570	Oct 21, 1975	B 398,551	3,924,924	Dec 9, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,597	3,913,743	Oct 21, 1975
B 376,742	3,924,392	Dec 9, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 377,172	3,918,255	Nov 11, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,282	3,913,462	Oct 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,955	3,913,157	Oct 21, 1975	B 402,065	3,925,413	Dec 9, 1975
B 380,014	3,921,915	Nov 25, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,141	3,925,161	Dec 9, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,310	3,921,048	Nov 18, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,990	3,914,684	Oct 21, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 381,074	3,919,583	Nov 11, 1975	B 405,137	3,915,566	Oct 28, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,847	3,921,152	Nov 18, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,495	3,924,577	Dec 9, 1975
B 382,290	3,924,717	Dec 9, 1975	B 405,938	3,920,109	Nov 18, 1975
B 382,783	3,919,527	Nov 11, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,357	3,924,529	Dec 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 406,800	3,952,708	Apr. 27, 1976
B 383,465	3,927,412	Dec. 16, 1975	B 407,736	3,924,463	Dec 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,581	3,925,318	Dec 9, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,380	3,984,172	Oct. 5, 1976

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 408,487	3,924,046	Dec. 2, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 408,749	3,914,116	Oct. 21, 1975	B 425,035	3,914,025	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975	B 425,345	3,922,015	Nov. 25, 1975
B 409,220	3,915,648	Oct. 28, 1975	B 425,470	3,923,796	Dec. 2, 1975
B 409,251	3,922,620	Nov. 25, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 409,657	3,927,362	Dec. 16, 1975	B 425,541	3,914,051	Oct. 21, 1975
B 409,816	3,921,317	Nov. 25, 1975	B 425,572	3,923,822	Dec. 2, 1975
B 410,062	3,923,855	Dec. 2, 1975	B 425,770	3,989,817	Nov. 2, 1976
B 410,168	3,914,717	Oct. 21, 1975	B 427,631	3,921,433	Nov. 25, 1975
B 411,145	3,914,168	Oct. 21, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975	B 428,795	3,921,056	Nov. 18, 1975
B 411,483	3,925,196	Dec. 9, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 411,633	3,914,741	Oct. 21, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 412,516	3,927,417	Dec. 16, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 412,619	3,925,292	Dec. 9, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 412,867	3,924,587	Dec. 9, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 413,006	3,914,850	Oct. 28, 1975	B'432,373	3,919,670	Nov. 11, 1975
B 413,546	3,924,314	Dec. 9, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 414,288	3,925,537	Dec. 9, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 415,124	3,915,944	Oct. 28, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 415,845	3,925,076	Dec. 9, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 415,957	3,925,635	Dec. 9, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 415,977	3,927,359	Dec. 16, 1975	B 438,385	4,001,104	Jan. 4, 1977
B 416,598	3,923,473	Dec. 2, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 418,302	3,913,252	Oct. 21, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 419,327	3,921,197	Nov. 18, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 422,467	3,924,804	Dec. 9, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 422,949	3,921,873	Nov. 25, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 424,415	3,919,458	Nov. 11, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 424,572	3,924,979	Dec. 9, 1975	B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 391,844	3,999,165	Mar 16, 1976	Dec. 21, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 392,798	3,996,249	Mar 30, 1976	Dec. 7, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan 4, 1977	B 394,248	3,989,764	Jan 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb 10, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan 13, 1976	Sep 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 395,554	3,998,156	Mar 9, 1976	Dec 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 396,164	3,989,590	Feb 3, 1976	Nov 2, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 160,045	3,983,446	Jan 13, 1976	Sep. 28, 1976	B 398,084	3,996,239	Feb 3, 1976	Dec 7, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 398,488	3,987,991	Feb 24, 1976	Oct. 26, 1976
B 167,470	4,001,101	Mar 2, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 181,208	4,001,391	Mar 9, 1976	Jan. 4, 1977	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 400,871	3,988,893	Feb 17, 1976	Nov. 2, 1976
B 214,925	3,997,648	Mar 9, 1976	Dec. 14, 1976	B 401,042	D 242,197	Mar 16, 1976	Nov. 9, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 402,162	3,994,902	Mar 2, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 402,328	3,995,545	Apr 6, 1976	Dec. 7, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 403,243	3,996,232	Mar 30, 1976	Dec. 7, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 279,415	4,000,697	Mar 16, 1976	Jan. 4, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan 13, 1976	Oct. 12, 1976	B 405,726	3,981,241	Jan 13, 1976	Sep. 21, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 407,205	4,000,966	Mar 16, 1976	Jan. 4, 1977
B 288,757	4,001,072	Mar 30, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb 3, 1976	Nov. 16, 1976
B 301,143	3,991,107	Jan 27, 1976	Nov. 9, 1976	B 409,848	3,983,270	Jan 27, 1976	Sep 28, 1976
B 302,160	3,985,774	Feb 3, 1976	Oct. 12, 1976	B 410,074	4,001,303	Feb 24, 1976	Jan. 4, 1977
B 306,668	3,985,713	Feb 3, 1976	Oct 12, 1976	B 410,694	3,995,530	Mar 23, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb 3, 1976	Nov. 23, 1976	B 411,471	3,982,933	Feb 17, 1976	Sep. 28, 1976
B 308,659	3,981,947	Jan 27, 1976	Sep. 21, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 311,450	3,988,976	Mar 9, 1976	Nov. 2, 1976	B 411,765	3,993,428	Feb 24, 1976	Nov 23, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 412,068	3,981,244	Jan 13, 1976	Sep. 21, 1976
B 328,116	4,000,774	Mar 9, 1976	Jan. 4, 1977	B 413,379	4,001,325	Mar 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar 16, 1976	Jan. 4, 1977	B 414,028	3,993,738	Feb 17, 1976	Nov 23, 1976
B 330,736	3,996,299	Feb 3, 1976	Dec. 7, 1976	B 414,266	3,993,614	Feb 10, 1976	Nov 23, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 414,481	3,982,979	Jan 20, 1976	Sep. 28, 1976
B 333,110	3,989,867	Mar 16, 1976	Nov. 2, 1976	B 414,971	D 242,208	Feb 10, 1976	Nov. 9, 1976
B 333,247	4,001,201	Mar 16, 1976	Jan. 4, 1977	B 415,021	3,994,173	Mar 2, 1976	Nov. 30, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 415,122	3,997,503	Feb 10, 1976	Dec. 14, 1976
B 339,194	3,982,215	Feb 3, 1976	Sep. 21, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan 4, 1977
B 339,446	4,001,067	Feb 24, 1976	Jan. 4, 1977	B 416,589	3,990,363	Jan 27, 1976	Nov 9, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 417,014	3,981,851	Jan 13, 1976	Sep. 21, 1976
B 347,661	3,999,218	Mar 16, 1976	Dec. 21, 1976	B 417,164	4,001,360	Mar 2, 1976	Jan. 4, 1977
B 348,433	3,984,405	Feb 3, 1976	Oct. 5, 1976	B 417,349	3,985,076	Mar 9, 1976	Oct 12, 1976
B 349,370	3,989,684	Jan 27, 1976	Nov. 2, 1976	B 418,489	3,989,592	Jan 13, 1976	Nov 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 419,173	3,999,728	Mar 9, 1976	Dec. 28, 1976
B 354,959	3,995,996	Feb 17, 1976	Dec. 7, 1976	B 419,582	3,989,681	Mar 2, 1976	Nov. 2, 1976
B 356,187	3,981,222	Jan 20, 1976	Sep. 21, 1976	B 420,176	4,001,017	Mar 16, 1976	Jan. 4, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 420,321	3,990,645	Mar 30, 1976	Nov 9, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov 2, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 358,427	3,989,896	Feb 3, 1976	Nov. 2, 1976	B 421,373	4,001,326	Mar 23, 1976	Jan 4, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 421,975	3,994,693	Mar 2, 1976	Nov 30, 1976
B 364,797	3,996,131	Feb 17, 1976	Dec. 7, 1976	B 422,063	3,994,835	Feb 3, 1976	Nov. 30, 1976
B 367,305	3,998,640	Mar 2, 1976	Dec 21, 1976	B 423,365	3,996,186	Feb 17, 1976	Dec 7, 1976
B 367,621	3,989,589	Feb 3, 1976	Nov 2, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov 2, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 423,883	3,986,871	Jan 27, 1976	Oct. 19, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 424,989	3,990,569	Feb 3, 1976	Nov. 9, 1976
B 372,722	3,998,925	Mar 9, 1976	Dec. 21, 1976	B 425,462	3,998,396	Mar 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 425,588	3,985,111	Jan 13, 1976	Oct. 12, 1976
B 374,588	3,985,899	Jan 27, 1976	Oct. 12, 1976	B 426,227	3,999,028	Mar 2, 1976	Dec. 21, 1976
B 378,513	3,981,750	Jan 27, 1976	Sep 21, 1976	B 426,266	3,998,839	Mar 2, 1976	Dec. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 426,424	3,993,742	Feb 3, 1976	Nov. 23, 1976
B 379,177	3,981,976	Jan 27, 1976	Sep 21, 1976	B 426,639	3,992,539	Feb 3, 1976	Nov. 16, 1976
B 381,709	3,984,587	Jan 13, 1976	Oct. 5, 1976	B 426,819	3,995,868	Feb 17, 1976	Dec. 7, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov 9, 1976	B 427,883	3,982,277	Jan 20, 1976	Sep. 21, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 428,103	4,000,211	Feb 10, 1976	Dec. 28, 1976
B 384,330	3,985,613	Jan 27, 1976	Oct. 12, 1976	B 428,271	3,987,415	Mar 23, 1976	Oct. 19, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 428,408	3,995,252	Mar 2, 1976	Nov. 30, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov 30, 1976	B 428,877	3,984,649	Jan 27, 1976	Oct. 5, 1976
B 385,483	3,993,684	Feb 17, 1976	Nov. 23, 1976	B 429,018	3,990,061	Feb 10, 1976	Nov. 2, 1976
B 385,631	3,982,924	Jan 27, 1976	Sep. 28, 1976	B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 386,257	3,981,915	Feb 3, 1976	Sep. 21, 1976	B 429,157	3,990,628	Jan 27, 1976	Nov. 9, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov 23, 1976	B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976	B 430,157	3,992,465	Feb 17, 1976	Nov. 16, 1976
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977	B 430,172	3,982,563	Jan 13, 1976	Sep. 28, 1976
B 389,304	3,986,829	Jan 27, 1976	Oct. 19, 1976	B 430,276	3,982,171	Jan 20, 1976	Sep. 21, 1976
B 390,031	3,985,799	Jan 13, 1976	Oct. 12, 1976	B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 390,408	3,992,426	Feb 3, 1976	Nov 16, 1976	B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 391,473	3,988,370	Mar 2, 1976	Oct. 26, 1976	B 431,072	3,985,610	Jan 20, 1976	Oct. 12, 1976
B 391,797	3,988,046	Mar 9, 1976	Oct 26, 1976	B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct 26, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30. 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10,-1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan 20, 1976	Nov. 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb 3, 1976	Nov. 30, 1976
B 529,974	3,987,098	Feb 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,901	3,984,318	Jan 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan 27, 1976	Oct 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct 19, 1976
B 534,016	3,983,381	Feb 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb 10, 1976	Sep 21, 1976
B 534,333	3,981,480	Feb 17, 1976	Sep 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec 14, 1976
B 534,443	3,989,970	Jan 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb 24, 1976	Dec 7, 1976
B 534,591	3,991,141	Feb 17, 1976	Nov 9, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep 21, 1976
B 534,991	3,983,517	Jan 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar 30, 1976	Dec 21, 1976
B 535,386	3,981,150	Jan 13, 1976	Sep 21, 1976
B 535,391	3,981,386	Jan 27, 1976	Sep 21, 1976
B 535,411	3,990,543	Feb 24, 1976	Nov 9, 1976
B 535,437	3,997,555	Feb 24, 1976	Dec 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec 14, 1976
B 535,466	3,981,309	Jan 27, 1976	Sep 21, 1976
B 535,813	3,981,819	Jan 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan 13, 1976	Sep 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep 21, 1976
B 536,082	3,997,783	Mar 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct 12, 1976
B 536,935	3,985,729	Jan 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan 13, 1976	Sep 21, 1976
B 537,711	3,985,748	Jan 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb 17, 1976	Dec 7, 1976
B 541,496	3,982,232	Jan 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb 24, 1976	Nov 23, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb 17, 1976	Dec 14, 1976
B 544,476	3,993,585	Feb 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb 17, 1976	Nov 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep 28, 1976
B 545,050	3,982,073	Jan 20, 1976	Sep 21, 1976
B 545,299	4,001,259	Feb 24, 1976	Jan 4, 1977
B 545,464	3,992,387	Feb 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan 27, 1976	Sep 21, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov 9, 1976
B 545,945	3,995,260	Jan 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec 28, 1976
B 546,295	3,987,070	Jan 20, 1976	Oct 19, 1976
B 546,426	3,982,063	Jan 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct 5, 1976
B 546,665	3,990,062	Jan 20, 1976	Nov 2, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep 21, 1976
B 546,922	3,987,742	Mar 16, 1976	Oct 26, 1976
B 547,016	3,999,741	Mar 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan 4, 1977
B 547,547	3,997,670	Feb 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan 20, 1976	Nov 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 548,462	D 242,283	Feb 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb 17, 1976	Nov 9, 1976
B 548,978	3,998,139	Mar 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan 20, 1976	Oct 12, 1976
B 549,964	3,995,899	Feb 24, 1976	Dec 7, 1976
B 550,693	3,982,194	Jan 20, 1976	Sep 21, 1976
B 550,744	3,993,550	Feb 17, 1976	Nov 23, 1976
B 550,810	4,000,910	Mar 23, 1976	Jan 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec 7, 1976
B 551,527	3,982,599	Jan 13, 1976	Sep 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec 14, 1976
B 551,952	Re 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb 3, 1976	Nov 16, 1976
B 552,489	3,994,864	Feb 10, 1976	Nov 30, 1976
B 552,498	3,983,139	Jan 13, 1976	Sep 28, 1976
B 552,508	4,001,250	Mar 16, 1976	Jan 4, 1977
B 552,629	3,994,773	Mar 23, 1976	Nov 30, 1976
B 552,709	4,001,467	Mar 23, 1976	Jan 4, 1977
B 552,932	3,989,292	Feb 3, 1976	Nov 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977				

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF JANUARY, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec 16, 1969, 869 O. G 687

Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O.; and Kroell, Karl E., to International Business Machines Corporation. Narrow channel field effect transistor. T954,008, 1-4-77, Cl. 357-23 000.

Basdekas, Demetrios L.; and Bell, George I., to United States of America, Atomic Energy Commission. Reactivity control system for nuclear reactors by magnetic means. T954,003, 1-4-77, Cl. 176-86.00R.

Bell, George I.: *See—*
Basdekas, Demetrios L.; and Bell, George I., T954,003.

Brunner, Friedrich C.; Frasch, Peter U., Schwerdt, Friedrich W; and Vogtmann, Theodor P., to International Business Machines Corporation. Method of coating oxidized inorganic substrates with polyimide. T954,010, 1-4-77, Cl 427-335.000.

Castrucci, Paul P.; Collins, Robert H; and Deverse, Frank T., to International Business Machines Corporation Process for increasing mask life T954,002, 1-4-77, Cl. 96-38 300.

Collins, Robert H.: *See—*
Castrucci, Paul P., Collins, Robert H, and Deverse, Frank T., T954,002.

Davis, Burns; Overton, James R; and Schulken, Roger M., Jr. Process for preparing containers using branched polyesters. T954,005, 1-4-77, Cl. 264-98.000.

Deverse, Frank T.: *See—*
Castrucci, Paul P.; Collins, Robert H., and Deverse, Frank T., T954,002

Dickason, William C.; Jackson, Winston J., Jr.; and Wooten, Willis C., Jr Process for preparing containers using polyesters. T954,004, 1-4-77, Cl 264-98.000.

Firestone Tire and Rubber Company, The: *See—*
Smith, Robert C., T954,012

Folberth, Otto G.: *See—*
Baitinger, Utz G.; Folberth, Otto G, Haug, Werner O., and Kroell, Karl E., T954,008

Frasch, Peter U.: *See—*
Brunner, Friedrich C, Frasch, Peter U.; Schwerdt, Friedrich W, and Vogtmann, Theodor P., T954,010.

General Electric Company: *See—*
Nevin, Robert Y.; and Scheer, James Allen, T954,007.

Hassitt, Anthony, to International Business Machines Corporation Method and apparatus for operating computer apparatus in response to program statements T954,011, 1-4-77, Cl. 444-1 000.

Haug, Werner O.: *See—*
Baitinger, Utz G., Folberth, Otto G., Haug, Werner O.; and Kroell, Karl E., T954,008

International Business Machines: *See—*
Lee, James M.; and Sonoda, George, T954,006.

International Business Machines Corporation: *See—*
Baitinger, Utz G., Folberth, Otto G.; Haug, Werner O., and Kroell, Karl E., T954,008.
Brunner, Friedrich C.; Frasch, Peter U., Schwerdt, Friedrich W., and Vogtmann, Theodor P., T954,010.
Castrucci, Paul P., Collins, Robert H., and Deverse, Frank T., T954,002
Hassitt, Anthony, T954,011.
Malin, Konrad, and Seybold, Dietrich, T954,009.

Jackson, Winston J., Jr.: *See—*
Dickason, William C.; Jackson, Winston J., Jr.; and Wooten, Willis C, Jr., T954,004

Kroell, Karl E.: *See—*
Baitinger, Utz G.; Folberth, Otto G.; Haug, Werner O., and Kroell, Karl E, T954,008

Lee, James M; and Sonoda, George, to International Business Machines. On-chip substrate voltage generator. T954,006, 1-4-77, Cl. 307-304 000

Malin, Konrad, and Seybold, Dietrich, to International Business Machines Corporation. Method for the thermal oxidation of silicon with added chlorine. T954,009, 1-4-77, Cl 427-93.000

Mangus, James D, to Westinghouse Electric Corporation. Fluid circulation system for heat exchangers. T954,001, 1-4-77, Cl. 60-682.000

Nevin, Robert Y., and Scheer, James Allen, to General Electric Company Signal enhancement system for radar display. T954,007, 1-4-77, Cl. 343-17 000

Overton, James R: *See—*
Davis, Burns; Overton, James R.; and Schulken, Roger M., Jr., T954,005

Scheer, James Allen *See—*
Nevin, Robert Y.; and Scheer, James Allen, T954,007.

Schulken, Roger M., Jr *See—*
Davis, Burns, Overton, James R.; and Schulken, Roger M., Jr., T954,005

Schwerdt, Friedrich W.. *See—*
Brunner, Friedrich C.; Frasch, Peter U., Schwerdt, Friedrich W., and Vogtmann, Theodor P, T954,010

Seybold, Dietrich. *See—*
Malin, Konrad; and Seybold, Dietrich, T954,009

Smith, Robert C., to Firestone Tire and Rubber Company, The Transparent impact polystyrene plastics T954,012, 1-4-77, Cl 526-340.000

Sonoda, George. *See—*
Lee, James M.; and Sonoda, George, T954,006
Atomic Energy Commission *See—*
Basdekas, Demetrios L, and Bell, George I, T954,003

Vogtmann, Theodor P.: *See—*
Brunner, Friedrich C, Frasch, Peter U, Schwerdt, Friedrich W, and Vogtmann, Theodor P, T954,010.

Westinghouse Electric Corporation *See—*
Mangus, James D, T954,001

Wooten, Willis C., Jr.. *See—*
Dickason, William C., Jackson, Winston J, Jr, and Wooten, Willis C., Jr., T954,004.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JANUARY, 1977

Note —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abex Corporation: *See—*
Jones, Roger D., Re. 29,096.

Amagi, Yasuo; Nishimura, Yasushi, and Uehara, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Method for the preparation of carbon moldings and activated carbon moulding therefrom. Re. 29,101, Cl. 423-449.000.

Avco Corporation: *See—*
Wilson, Jack; and Kantrowitz, Arthur R., Re. 29,103

Bando Kiko Co., Ltd.. *See—*
Bando, Shigeru, Re. 29,097

Bando, Shigeru, to Bando Kiko Co., Ltd. Glass plate edge grinding machine. Re. 29,097, Cl 51-110.000

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin, and Enlow, William Palmer, Re. 29,098

Cognitronics Corporation. *See—*
Shepard, David H., Re. 29,104

Enlow, William Palmer: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Palmer, Re. 29,098.

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378 4,000,599

CLASS 55
18 4,000,989
30 4,000,990
48 4,000,991
87 4,000,992
94 4,000,993
112 4,000,994
282 4,000,995

CLASS 56
220 4,000,600
328 R 4,000,601
4,000,602

CLASS 57
87 4,000,603
153 4,000,604
157 TS 4,000,605

CLASS 59
16 4,000,606

CLASS 60
39 03 4,000,607
39 36 4,000,608
4,000,609
230 4,000,610
4,000,611
4,000,612
251 4,000,613
276 4,000,614
277 4,000,615
420 4,000,616
644 4,000,617

CLASS 61
1 F 4,000,618
3 4,000,619
12 4,000,620
35 4,000,621
39 4,000,622
4,000,623
88 4,000,624

CLASS 62
4 4,000,996
63 4,000,625
175 4,000,626

CLASS 63
2 4,000,627

CLASS 64
17 A 4,000,628
21 4,000,629

CLASS 65
23 4,000,997
33 4,000,998
49 4,000,999
59 A 4,001,000
337 4,001,001

CLASS 66
177 4,000,630

CLASS 68
23.7 4,000,631

CLASS 70
165 4,000,632
4,000,633

CLASS 71
65 4,001,002
88 4,001,003
100 4,001,004
108 4,001,005
117 4,001,006

CLASS 72
69 4,000,634
148 4,000,635
173 4,000,636
226 4,000,637
238 4,000,638
316 4,000,639

CLASS 73
1 B 4,000,640
9 4,000,641
15 R 4,000,642
88 5 R 4,000,643
95 4,000,644
155 4,000,645
170 A 4,000,646
181 4,000,647
189 4,000,648
219 4,000,649
290 V 4,000,650
314 4,000,651
336 4,000,652
343 R 4,000,653
422 GC 4,000,654
432 R 4,000,655
4,000,656
448 4,000,657
490 4,000,658
514 4,000,659

CLASS 74
5 43 4,000,660
89 15 4,000,661
331 4,000,662
424 8 R 4,000,664
424.8 VA 4,000,663
572 4,000,665
604 4,000,666

CLASS 75
5 4,001,007
11 4,001,008
13 4,001,009
35 4,001,010
40 4,001,011
51 4,001,012
72 4,001,013

CLASS 76
101 R 4,000,667

CLASS 81
55 4,000,668

CLASS 82
33 R 4,000,669

CLASS 83
42 4,000,670
4,000,671
203 4,000,672
526 4,000,673

CLASS 84
1 01 4,000,674
4,000,675
1 25 4,000,676
375 4,000,677
453 4,000,678
464 4,000,679

CLASS 85
37 4,000,680
62 4,000,681

CLASS 86
1 R 4,000,682

CLASS 91
411 R 4,000,683
447 4,000,684
469 4,000,685

CLASS 93
36 A 4,000,686
53 M 4,000,687

CLASS 96
1 5 4,001,014
33 4,001,015
35 1 4,001,016
4,001,017
36.1 4,001,018
66 R 4,001,021
66.3 4,001,020
76 R 4,001,022
87 A 4,001,023
87 R 4,001,024
107 4,001,025
114 1 4,001,026

CLASS 98
42 A 4,000,688

CLASS 100
229 A 4,000,689

CLASS 101
36 4,000,690
136 4,000,691
144 4,000,692
183 4,000,693
365 4,000,694
4,000,695

CLASS 102
24 R 4,000,696
38 4,000,697
93 4,000,698

CLASS 104
2 4,000,699
130 4,000,700
138 R 4,000,701
244 4,000,702

CLASS 105
377 4,000,703

CLASS 106
23 4,001,027
54 4,001,019
62 4,001,028
67 4,001,029
100 4,001,030
4,001,031
213 4,001,032
287 SS 4,001,033
292 4,001,034
307 4,001,035

CLASS 108
53 1 4,000,704

CLASS 110
3 4,000,705

CLASS 112
221 4,000,706
410 4,000,707

CLASS 113
18 R 4,000,708
114 BG 4,000,709

CLASS 114
67 A 4,000,710
74 A 4,000,711
77 R 4,000,712
248 4,000,714
294 4,000,713

CLASS 116
137 R 4,000,715

CLASS 118
5 4,000,716
49 4,000,717

CLASS 119
14 03 4,000,718
51 13 4,000,719

CLASS 122
510 4,000,720

CLASS 123
8 01 4,000,721
30 D 4,000,722
73 AA 4,000,723
117 R 4,000,724
119 CD 4,000,725
134 4,000,726
136 4,000,727
140 R 4,000,728
148 DS 4,000,729
189 4,000,730
191 S 4,000,731

CLASS 126
92 R 4,000,732
270 4,000,733
271 4,000,734
361 4,000,735

CLASS 128
80 R 4,000,736
154 4,000,737
214 D 4,000,738
214 R 4,000,740
214 4 4,000,739
218 NV 4,000,741
229 4,000,742
303 R 4,000,743
330 4,000,744
418 4,000,745
526 4,000,746

CLASS 130
30 C 4,000,747

CLASS 131
140 C 4,000,748

CLASS 134
38 4,001,038

CLASS 135
1 R 4,000,749
16 4,000,750

CLASS 136
205 4,001,046
230 4,001,045

CLASS 137
101 4,000,751
118 4,000,752
296 4,000,753
487 4,000,754
595 4,000,755
596.17 4,000,756
834 4,000,757

CLASS 138
31 4,000,758
130 4,000,759
141 4,000,760

CLASS 139
66 R 4,000,761
452 4,000,762

CLASS 140
82 4,000,763
113 4,000,764

CLASS 141
181 4,000,765

CLASS 144
144 R 4,000,766

CLASS 145
61 L 4,000,767

CLASS 148
1 5 4,001,047
4,001,048
4,001,049
4,001,050
9 R 4,001,051
12 C 4,001,052
12 9 4,001,053
16 5 4,001,054
172 4,001,055
175 4,001,056
187 4,001,465

CLASS 149
19 3 4,001,057
22 4,001,058
109 4 4,001,059
109 6 4,001,060

CLASS 150
3 4,000,768
52 J 4,000,769

CLASS 156
3 4,001,061
59 4,001,062
73.1 4,001,063
73.6 4,001,064
86 4,001,065
152 4,001,066
159 4,001,067
315 4,001,068
353 4,001,069
398 4,001,070
435 4,001,071
461 4,001,072
516 4,001,073
580 4,001,074
581 4,001,075
624 4,001,076

CLASS 159
4 S 4,001,077

CLASS 164
21 4,000,770
64 4,000,771
194 4,000,772
281 R 4,000,773

CLASS 165
4 4,000,774
8 4,000,775
32 4,000,776
86 4,000,777
4,000,778
111 4,000,779

CLASS 166

72	4,000,780
276	4,000,781

CLASS 173

12	4,000,782

CLASS 174

10	4,001,489
88 R	4,001,490
209	4,001,491

CLASS 175

346	4,000,783

CLASS 176

35	4,001,078
87	4,001,079

CLASS 178

68	4,001,504

CLASS 179

1 H	4,001,506
1 SC	4,001,505
2 DP	4,001,507
6 D	4,001,508
7.1 R	4,001,509
15 FD	4,001,510
15 FS	4,001,511
17 A	4,001,512
18 DA	4,001,513
18 FC	4,001,514
18 HB	4,001,515
81 R	4,001,520
84 R	4,001,516
84 VF	4,001,521
99	4,001,517
100.4 ST	4,001,518
100.41 G	4,001,519
115 V	4,001,522
	4,001,523
170 T	4,001,524
175.31 R	4,001,525

CLASS 180

9.48	4,000,784
143	4,000,785

CLASS 181

52	4,000,786

CLASS 182

2	4,000,787
92	4,000,788
152	4,000,789

CLASS 184

27 R	4,000,790

CLASS 188

71.5	4,000,791
242	4,000,792

CLASS 192

105 A	4,000,793
106.2	4,000,794
109 F	4,000,795

CLASS 193

35 A	4,000,796
38	4,000,797
40	4,000,798

CLASS 194

1 L	4,000,799
9 R	4,000,800

CLASS 195

1.8	4,001,080
29	4,001,081
31 F	4,001,082
65	4,001,083
	4,001,084
68	4,001,085
81	4,001,086
103.5 R	4,001,087
	4,001,088
	4,001,089
109	4,001,090

CLASS 196

46	4,001,091

CLASS 197

1 R	4,000,801
27	4,000,802
133 R	4,000,803
151	4,000,804

CLASS 198

320	4,000,805
443	4,000,806
	4,000,807
572	4,000,808
819	4,000,809

CLASS 200

16 D	4,001,526
38 FB	4,001,527
38 R	4,001,528
39 R	4,001,529
48 A	4,001,530
61.04	4,001,531
61.45 R	4,001,185
61.58 B	4,001,532
84 C	4,001,533
160	4,001,534
340	4,001,535

CLASS 202

262	4,001,092

CLASS 204

15	4,001,093
129.6	4,001,094
157.1 R	4,001,095
158 R	Re.29,098
	4,001,096
159.16	4,001,097
159.23	4,001,098
164	4,001,099
180 R	4,001,100
181	4,001,101
186	4,001,102
195 R	4,001,103
243 R	4,001,104

CLASS 206

5	4,000,810
44 R	4,000,811
87	4,000,812
187	4,000,813
	4,000,814
205	4,000,815
498	4,000,816
505	4,000,817

CLASS 208

11 R	4,001,105
75	4,001,106
323	4,001,107

CLASS 210

12	4,001,108
22 A	4,001,110
22 R	4,001,109
24	4,001,111
31 C	4,001,112
33	4,001,113
44	4,001,114
67	4,001,115
83	4,001,116
180	4,001,117
187	4,001,118
402	4,001,119
420	4,001,120
512 R	4,001,121
516	4,001,122

CLASS 214

1 CM	4,000,819
1 P	4,000,818
6 DK	4,000,820
8.5 F	4,000,821
10	4,000,822
86 A	4,000,823

CLASS 215

232	4,000,824
318	4,000,825

CLASS 219

10.55 B	4,001,536
	4,001,537
69 M	4,001,538
110	4,001,539
	4,001,540
117 R	4,001,542
121 L	4,001,543
216	4,001,541
	4,001,544
	4,001,545
	4,001,546
322	4,001,547
388	4,001,548

CLASS 220

3	4,000,826
4 F	4,000,827
203	4,000,828
265	4,000,829
369	4,000,830

CLASS 221

196	4,000,831
232	4,000,832

CLASS 222

105	4,000,833
180	4,000,834
183	4,000,835
399	4,000,836
512	4,000,837
529	4,000,838
540	4,000,839
607	4,000,840

CLASS 224

48 R	4,000,841

CLASS 228

180 A	4,000,842

CLASS 229

14 C	4,000,843
15	4,000,844
	4,000,845
62.5	4,000,846

CLASS 232

35	4,000,847

CLASS 235

61.12 R	4,001,549
61.7 B	4,001,550
70 A	4,001,551
92 DN	4,001,552
92 MS	4,001,553
150	4,001,554
150.53	4,001,555
151	4,001,556
151.1	4,001,557
151.11	4,001,558
151.31	4,001,559
151.32	4,001,560
	4,001,561
	4,001,562
152	4,001,563
	4,001,564
	4,001,565
156	4,001,568
	4,001,569
159	4,001,566
170	4,001,567
174	4,001,570

CLASS 236

68 R	4,000,848
100	4,000,849

CLASS 237

1 A	4,000,850
	4,000,851

CLASS 239

102	4,000,852
230	4,000,853
265.35	4,000,854
265.39	4,000,855
332	4,000,856
428.5	4,000,857

CLASS 240

9 R	4,001,571
25	4,001,572
64	4,001,573
78 E	4,001,574
81 LD	4,001,575
108 B	4,001,576

CLASS 241

27	4,000,858
194	4,000,859
242	4,000,860
282.1	4,000,861

CLASS 242

7.06	4,000,862
56 R	4,000,863
59	4,000,864
75.43	4,000,865
107.7	Re.29,095
203	4,000,866

CLASS 244

1 TD	4,000,867
12.5	4,000,868
53 B	4,000,869
118 R	4,000,870
119	4,000,871

CLASS 246

182 R	4,000,872

CLASS 248

2	4,000,873
27.1	4,000,874
56	4,000,875
205 R	4,000,876

CLASS 249

82	4,000,877

CLASS 250

199	4,001,577
	4,001,578
223 R	4,001,579
239	4,001,581
288	4,001,582
303	4,001,583
328	4,001,584
	4,001,585
336	4,001,589
	4,001,590
345	4,001,586
363 S	4,001,580
	4,001,591
474	4,001,587
476	4,001,592
493	4,001,588
522	4,001,593
559	4,001,594
575	4,001,595

CLASS 251

127	4,000,878

CLASS 252

8.8	4,001,123
12	4,001,124
29	4,001,125
62	4,001,126
62.9	4,001,127
63.2	4,001,128
78.5	4,001,129
89 B	4,001,130
99	4,001,131
105	4,001,132
156	4,001,133
180	4,001,134
187 R	4,001,135
	4,001,136
299	4,001,137
301.17	4,001,139
301.27	4,001,138
316	4,001,140
351	4,001,141
408	4,001,142
462	4,001,143
463	4,001,144
513	4,001,145
514	4,001,146

CLASS 254

29 R	4,000,879
103	4,000,880
157	4,000,881

CLASS 256

13.1	4,000,882
65	4,000,883

CLASS 259

191	4,000,884

CLASS 260

2.5 B	4,001,147
2.5 F	4,001,148
2.5 FP	4,001,149
17 R	4,001,150
17.4 ST	4,001,151
18 N	4,001,152
22 CB	4,001,153
29.2 EP	4,001,155
	4,001,156
29.4 UA	4,001,154
	4,001,157
29.6 H	4,001,161
29.6 SQ	4,001,162
29.6 TA	4,001,158
	4,001,159
29.6 WA	4,001,160
29.7 T	4,001,163
31.8 N	4,001,164
33.6 AQ	4,001,167
33.6 UB	4,001,165
	4,001,166
37 SB	4,001,168
40 P	4,001,169
	4,001,170
40 R	4,001,171
42.18	4,001,172
42.45	Re.29,099
45.7 R	4,001,173
	4,001,174
45.7 S	4,001,175
45.75 B	4,001,179
45.75 N	4,001,181
45.75 S	4,001,178
45.8 NT	4,001,177
45.8 R	4,001,176
45.85 R	4,001,182
47 XA	4,001,183
	4,001,184
63 N	4,001,186
75 H	4,001,188
75 M	4,001,187
75 N	4,001,189
	4,001,190
75 NH	4,001,180
77.5 BB	4,001,191
78 R	4,001,192
112 R	4,001,197
	4,001,198
112.5 R	4,001,199
	4,001,200
117	4,001,201
124 R	4,001,202
146 R	4,001,203
152	4,001,204
156	4,001,205
158	4,001,206
192	4,001,207
239 A	4,001,217
239 B	4,001,213
	4,001,214
	4,001,216
239 BC	4,001,212
	4,001,215
239.1	4,001,218
239.5	4,001,219
239.55 R	4,001,220
240 C	4,001,221
240 G	4,001,222
240 J	4,001,223
240 R	4,001,224
243 C	4,001,225
	4,001,226
	4,001,239
243 R	4,001,227
247.1 M	4,001,228
247.1 R	4,001,229
247.5 DP	4,001,230
248.5	4,001,231
251 R	4,001,232
256.4 B	4,001,237
	4,001,238
256.4 C	4,001,234
256.4 F	4,001,236
256.4 N	4,001,233
256.4 O	4,001,235
270 K	4,001,240
283 S	4,001,241
285.5	4,001,242
287 CF	4,001,245
287 D	4,001,244
287 P	4,001,243
288 CF	4,001,246
289 D	4,001,247
	4,001,248
292	4,001,249
293.52	4,001,250
293.53	4,001,251
294.8 B	4,001,253
294.8 E	4,001,254
294.8 G	4,001,252
294.9	4,001,255
295 E	4,001,256
295.5 A	4,001,258
	4,001,259
295.5 R	4,001,257
296 A	4,001,263
296 R	4,001,260
296 T	4,001,261
	4,001,262
306.7 C	4,001,264
307 H	4,001,265
308 B	4,001,266
309	4,001,267
309.2	4,001,268
310 C	4,001,269
315	4,001,270
325 PH	4,001,271
326 HL	4,001,272
326 R	4,001,273
326.12 R	4,001,275
	4,001,276
	4,001,278
326.13 R	4,001,277
326.5 FN	4,001,274
340.3	4,001,279
340.5	4,001,280
343.3 R	4,001,281
343.6	4,001,282
347.9	4,001,283
397.7 R	4,001,284
401	4,001,285
410.9 R	4,001,286
435 R	4,001,287
439 R	4,001,288
450	4,001,289
453 A	4,001,290
455 R	4,001,291
456 NS	4,001,292
465.7	4,001,293
465.8 R	4,001,294
468 D	4,001,295
	4,001,296
470	4,001,297
471 R	4,001,298
473 A	4,001,300
473 F	4,001,301
473 S	4,001,299
479 R	4,001,302
483	4,001,303
486 H	4,001,305
486 R	4,001,304
488 R	4,001,306
491	4,001,307
	4,001,308
493	4,001,309
501.15	4,001,310
	4,001,311
501.18	4,001,312
508	4,001,313
514 D	4,001,314
	4,001,315
530 N	4,001,316
533 N	4,001,317
544 C	4,001,318
545 R	4,001,319
555 A	4,001,320
559 A	4,001,323
559 AT	4,001,321
559 D	4,001,322
561 R	4,001,324
562 B	4,001,325
566 R	4,001,326
567.6 M	4,001,327
	4,001,328
570 D	4,001,329
570.6	4,001,330
571	4,001,331
585.5	4,001,332
586 P	4,001,333
586 R	4,001,334
591	4,001,335
601 R	4,001,336
606	4,001,337
610 A	4,001,338
612 D	4,001,339
620	4,001,340
621 B	4,001,341
624 R	4,001,342
631 H	4,001,343
635 M	4,001,344
652 P	4,001,345
671 M	4,001,346
674 N	4,001,347
864	4,001,348
878 R	4,001,349
880 B	4,001,350
900	4,001,351
970	4,001,352
984	4,001,353

CLASS 261

35	4,001,354
44 R	4,001,355
144	4,001,356

CLASS 264

12	4,001,357
33	4,001,358
40.1	4,001,359
49	4,001,360
51	4,001,361
56	4,001,362
61	4,001,363
63	4,001,364
69	4,001,365
147	4,001,366
154	4,001,367
176 R	4,001,368
177 F	4,001,369
256	4,001,370

CLASS 266

83	4,000,885
147	4,000,886
274	4,000,887

CLASS 270

21	4,000,888
58	4,000,889
	4,000,890

CLASS 271

8 R	4,000,891
180	4,000,892

CLASS 273

29 A	4,000,893
65 EG	4,000,894
72 A	4,000,895
80 R	4,000,896
93 C	4,000,897
101	4,000,898
	4,000,899
126 R	4,000,900
158	4,000,901
164	4,000,902
166	4,000,903
183 A	4,000,904
187 A	4,000,905

CLASS 274

9 A	4,000,906

CLASS 279

121	4,000,907

CLASS 280

11.37 E	4,000,909
468	4,000,911
623	4,000,908
701	4,000,912
704	4,000,913
710	4,000,910
716	4,000,914

CLASS 281

31	4,000,915

CLASS 282

11.5 A	4,000,916

CLASS 285

18	4,000,917
93	4,000,918
111	4,000,919
149	4,000,920
336	4,000,921

CLASS 290

53	4,001,596
	4,001,597

CLASS 294

16	4,000,922
67 AB	4,000,923

CLASS 296

35 A	4,000,924

CLASS 297

304	4,000,925

CLASS 301

63 DD	4,000,926

CLASS 302

2 R	4,000,927

CLASS 303

100	Re 29,096
103	4,000,928

CLASS 307

106	4,001,598
141	4,001,599
149	4,001,600
205	4,001,601
229	4,001,602
232	4,001,603
235 A	4,001,604
235 F	4,001,605
251	4,001,606
252 C	4,001,607
268	4,001,608
	4,001,609
293	4,001,610
	4,001,611
304	4,001,612
308	4,001,613
311	4,001,614

CLASS 308

10	4,000,929
35	4,000,559
36.3	4,000,930
138	4,000,931
237 R	4,000,932
	4,000,933

CLASS 310

8.3	4,001,615
9.5	4,001,767
45	4,001,616
52	4,001,617

CLASS 312

71	4,000,934

CLASS 313

94	4,001,618
105 R	4,001,619
	4,001,620
113	4,001,621
	4,001,622
184	4,001,623
185	4,001,624
220	4,001,625
229	4,001,626
385	4,001,627
487	4,001,628
517	4,001,629

CLASS 315

3.5	4,001,630
39	4,001,631
	4,001,632
47	4,001,633
73	4,001,634
169 R	4,001,635
169 TV	4,001,636
205	4,001,637
209 SC	4,001,638
241 P	4,001,639
	4,001,640
408	4,001,641

CLASS 317

5	4,001,642
11 E	4,001,643
14 G	4,001,644
18 D	4,001,646
	4,001,647
	4,001,648
41	4,001,649
	4,001,650
61	4,001,651
112	4,001,652
119	4,001,653
135 R	4,001,654
230	4,001,655
	4,001,656
256	4,001,657

CLASS 318

17	4,001,645
37	4,001,658
119	4,001,659
227	4,001,660
264	4,001,661
564	4,001,662

CLASS 321

2	4,001,663
15	4,001,664
18	4,001,665

CLASS 322

4	4,001,666

CLASS 323

1	4,001,667
19	4,001,668
75 C	4,001,669
108	4,001,670
119	4,001,671
124	4,001,672

CLASS 324

34 D	4,001,689
34 R	4,001,673
54	4,001,674
56	4,001,675
60 CD	4,001,676
65 R	4,001,677
71 CP	4,001,678
72.5	4,001,679
78 Z	4,001,680
83 D	4,001,682
83 R	4,001,681
115	4,001,683
126	4,001,684
158 P	4,001,685
158 R	4,001,686
173	4,001,687
182	4,001,688

CLASS 325

4	4,001,690
14	4,001,691
38 R	4,001,692
58	4,001,693
319	4,001,694
363	4,001,695
373	4,001,696

CLASS 328

26	4,001,697
55	4,001,698
71	4,001,699
129	4,001,700
158	4,001,701

CLASS 329

135	4,001,702

CLASS 330

1 A	4,001,703
4.3	4,001,704
	4,001,705
14	4,001,706
18	4,001,707
29	4,001,708
30 R	4,001,709
31	4,001,710
66	4,001,711
85	4,001,712

CLASS 331

1 A	4,001,713
4	4,001,714
20	4,001,715
48	4,001,716
55	4,001,717
65	4,001,718
94.5 G	4,001,720
94.5 H	4,001,719
94.5 PE	Re 29,103
111	4,001,721
	4,001,722
	4,001,723
116 R	4,001,724
117 R	4,001,725
178	4,001,726
182	4,001,727

CLASS 332

1	4,001,728
	4,001,729

CLASS 333

10	4,001,730
14	4,001,731
	4,001,732
24.1	4,001,733
31 R	4,001,734
80 R	4,001,735
81 A	4,001,736
83 R	4,001,737

CLASS 335

16	4,001,738
34	4,001,739
73	4,001,740
153	4,001,741
173	4,001,742
201	4,001,743
205	4,001,744

CLASS 336

20	4,001,745
62	4,001,746

CLASS 337

136	4,001,747
159	4,001,748
244	4,001,749
280	4,001,750
343	4,001,751
368	4,001,752
380	4,001,753
407	4,001,754

CLASS 338

32 H	4,001,755
34	4,001,756
	4,001,757
	4,001,758
68	4,001,759
238	4,001,760
304	4,001,761
309	4,001,762

CLASS 340

3 PS	4,001,763
3 R	4,001,764
8 L	4,001,766
8 PC	4,001,765
15.5 FC	4,001,768
15.5 MC	4,001,770
15.5 TS	4,001,769
16 R	4,001,771
18 LD	4,001,773
	4,001,774
	4,001,775
52 F	4,001,776
68	4,001,777
114 B	4,001,778
146.1 AV	4,001,779
146.3 B	Re 29,104
146.3 D	4,001,780
147 C	4,001,781
171 PF	4,001,772
171 R	4,001,782
172.5	4,001,783
	4,001,784
	4,001,785
	4,001,786
	4,001,787
	4,001,788
	4,001,789
	4,001,790
173 LM	4,001,791
174 TF	4,001,792
	4,001,793
	4,001,794
	4,001,795
	4,001,796
181	4,001,797
191	4,001,798
213 Q	4,001,799
237 S	4,001,800
239 R	4,001,801
244 A	4,001,802
248 B	4,001,803
255	4,001,804
280	4,001,805
324 A	4,001,806
	4,001,807
336	4,001,808
	4,001,809
338	4,001,810
347 DD	4,001,811
347 NT	4,001,812
347 R	4,001,813
365 R	4,001,814
373	4,001,815
384 E	4,001,816
	4,001,817
415	4,001,818
420	4,001,819

CLASS 343

5 R	4,001,821
5 SA	4,001,820
6.5 SS	4,001,822
7 A	4,001,823
7.3	4,001,824
7.5	4,001,825
7.7	4,001,826
18 A	4,001,827
113 R	4,001,828
180	4,001,829
702	4,001,830
715	4,001,831
747	4,001,832
	4,001,833
754	4,001,834
	4,001,835
756	4,001,836
815	4,001,837

CLASS 346

74.1	4,001,841
75	4,001,839
76 L	4,001,840
153	4,001,838

CLASS 350

41	4,000,935
96 WG	4,000,936
	4,000,937
99	4,000,938
160 R	4,000,939

CLASS 352

72	4,000,940
141	4,000,941

CLASS 354

1	4,001,842
23 D	4,001,843
51	4,001,844
	4,001,845
105	4,001,846
174	4,001,847
196	4,001,848
207	4,001,849
219	4,001,850
266	4,001,851
313	4,001,852
315	4,001,853
318	4,001,854
324	4,001,855
331	4,001,856
337	4,001,857

CLASS 355

3 R	4,000,942
8	4,000,943
14	4,000,944
45	4,000,945

CLASS 356

89	4,000,946
106 LR	4,000,947
165	4,000,949
172	4,000,948

CLASS 357

14	4,001,858
19	4,001,859
23	4,001,860
24	4,001,861
	4,001,862
30	4,001,863
	4,001,864
38	4,001,865
39	4,001,866
	4,001,867
46	4,001,868
51	4,001,869
54	4,001,870
	4,001,871
	4,001,872
59	4,001,873

CLASS 358

2	4,001,874
4	4,001,875
8	4,001,876
10	4,001,877
28	4,001,879
41	4,001,878
81	4,001,880
93	4,001,499
101	4,001,497
127	4,001,493
	4,001,494
	4,001,496
160	4,001,498
	4,001,501
165	4,001,502
243	4,001,503
282	4,001,500
283	4,001,492
294	4,001,495

CLASS 360

5	4,001,881
14	4,001,882
40	4,001,884
48	4,001,883
70	4,001,885
75	4,001,886
90	4,001,887
99	4,001,888
104	4,001,889
121	4,001,890
132	4,001,891
133	4,001,892
137	4,001,893

CLASS 401

32	4,000,950

CLASS 402

22	4,000,951

CLASS 403

271	4,000,952

CLASS 404

5	4,000,953

CLASS 408

3	4,000,954

CLASS 415

183	4,000,955

CLASS 416

230	4,000,956

CLASS 418

35	4,000,959

CLASS 423

213.2	4,001,371
235	4,001,372
236	4,001,373
237	4,001,374
244	4,001,375
	4,001,376
267	4,001,377
268	4,001,378
339	4,001,379
406	4,001,380
426	4,001,381
447.1	4,001,382
449	Re 29,101
531	4,001,383
551	4,001,384
573 G	4,001,385
574 L	4,001,386

CLASS 424

1	4,001,387
14	4,001,388
19	4,001,389
35	4,001,390
44	Re 29,102
45	4,001,391
47	4,001,392
52	4,001,393
70	4,001,394
92	4,001,395
112	4,001,396
116	4,001,397
122	4,001,398
123	4,001,399
134	4,001,400
177	4,001,401
182	4,001,402
184	4,001,403
210	4,001,405
212	4,001,404
228	4,001,406
238	4,001,407
244	4,001,408
246	4,001,409
249	4,001,410
250	4,001,411
251	4,001,412
	4,001,422
253	4,001,413
263	4,001,414
	4,001,415
266	4,001,416
267	4,001,417
	4,001,418
	4,001,419
270	4,001,420
	4,001,421
	4,001,447
273	4,001,423
283	4,001,424
285	4,001,425
	4,001,426
304	4,001,427
307	4,001,428
311	4,001,429
324	4,001,430
327	4,001,431
329	4,001,432
	4,001,433
361	4,001,434

CLASS 425

76	4,000,960

CLASS 426

3	4,001,435
29	4,001,436
34	4,001,437
96	4,001,438
101	4,001,439
104	4,001,440
	4,001,441
105	4,001,442
106	4,001,443
110	4,001,444
250	4,001,445
	4,001,446
285	4,001,448
332	4,001,449
410	4,001,450
438	4,001,451
454	4,001,452
533	4,001,453
534	4,001,454
548	4,001,455
	4,001,456
572	4,001,457
592	4,001,458
656	4,001,459

CLASS 427

2	4,001,460
22	4,000,957
37	4,001,461
44	4,001,462
48	4,001,463
58	4,001,464
96	4,001,466
115	4,001,042
123	4,001,467
134	4,001,468
238	4,001,469
304	4,001,470
389	4,000,958

CLASS 428

60	4,001,471
109	4,001,472
116	4,001,473
	4,001,474
175	4,001,475
209	4,001,476
224	4,001,477
257	4,001,478
272	4,001,479
411	4,001,480
469	4,001,481

CLASS 429

15	4,001,040
17	4,001,041
46	4,001,039
67	4,001,036
166	4,001,044
188	4,001,037
206	4,001,043

CLASS 431

2	4,000,961

CLASS 432

4	4,000,962
60	4,000,963

CLASS 526

22	Re 29,100
26	4,001,193
73	4,001,482
240	4,001,194
270	4,001,483
329	4,001,484
341	4,001,485
348	4,001,195
	4,001,196

CLASS 528

492	4,001,486

CLASS 536

17	4,001,208
	4,001,209
84	4,001,210
	4,001,211

CLASSIFICATION OF DESIGNS

D2—	232	242,881
D4—	06	242,882
	28	242,883
D6—	20	242,884
	47	242,885
	73	242,886
	131	242,887
	136	242,888
	157	242,889
	186	242,890
D7—	59	242,891
	155	242,892
	178	242,893
D8—	8	242,894
	29	242,895
	90	242,896
	107	242,897
	122	242,898
	235	242,899
D9—	191	242,900
	224	242,901
	261	242,902
D10—	26	242,905
	64	242,903
		242,904
	96	242,906
	121	242,907
D11—	131	242,933
D12—	22	242,908
	31	242,909
	55	242,910
	66	242,911
	92	242,912
	186	242,913
D15—	15	242,940
	27	242,914
	42	242,946
	82	242,950
	104	242,947
	123	242,948
D16—	14	242,915
	58	242,916
		242,917
D19—	91	242,918
D22—	30	242,919
D23—	3	242,920
	28	242,921
	127	242,922
D25—	16	242,923
	36	242,924
	64	242,925
D26—	5 C	242,926
	10	242,927
	14 A	242,928
		242,929
		242,930
D27—	2	242,931
	22	242,932
D34—	5 K	242,935
		242,936
	5 SS	242,934
	5 ST	242,937
	14 R	242,938
	15 W	242,939
D48—	20 D	242,941
	20 K	242,944
		242,945
	23 R	242,943
	24 R	242,942
D64—	12 B	242,949
D83—	1	242,956
	1 A	242,954
	1 E	242,957
	1 J	242,955
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D86—	8	242,951
	10 A	242,953
	10 B	242,959
D87—	3 B	242,960

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P.—	11	4,006
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		4,008
	19	4,003
	68	4,002
	75	4,004
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96—	38.3	T954,002
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		T954,005
307—	304	T954,006
343—	17	T954,007
357—	23	T954,008
427—	93	T954,009
	335	T954,010
444—	1	T954,011
526—	340	T954,012

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

6 : T954,011
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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Order

John W. Kraft of Boise, Idaho, whose registration number is 24,701, is hereby excluded from further practice before the Patent and Trademark Office until March 31, 1981, when he will become eligible for reinstatement as an attorney in Idaho. On or after that date, he may be reinstated here upon submission of a satisfactory showing (1) that he is entitled to reinstatement as an attorney in Idaho, pursuant to the terms set forth in an order of the Supreme Court of the State of Idaho dated September 27, 1976 (Supreme Court No. 12182), and (2) that he is then qualified for registration under 37 C.F.R. 1.341.

This action is taken under the provisions of 35 U.S.C. 32.

Dec. 16, 1976.

LUTRELLE F. PARKER,
Deputy of Commissioner of Patents and Trademarks.

Practice Re: Applications Involving Computer Programs

On November 18, 1976, the Court of Customs and Patent Appeals decided the cases of *In re Noll* and *In re Chatfield*. In both cases the Board of Appeals had taken the position that the claims were drawn to non-statutory subject matter under the Supreme Court's decision in *Gottschalk* v. *Benson*, 409 U.S. 63, 175 USPQ 673 (1972). The Noll application claims were drawn to an apparatus and the Chatfield application claims were drawn to a method.

The CCPA reversed the Board of Appeals in both cases. Until these decisions become final and since further review or clarification may be forthcoming, the patent examining corps will continue to examine computer programming applications in accordance with its current interpretation of the Supreme Court decision in the Benson case.

Prosecution will be resumed on all applications previously suspended under 37 CFR 1.103(b). No further programming applications will be suspended at the instance of the Office.

C. MARSHALL DANN,
Dec. 14, 1976. *Commissioner of Patents and Trademarks.*

Patent and Trademark Office Advisory Committee

Notice of Meeting

The Patent and Trademark Office Advisory Committee will meet from 10:00 a.m. to 5 p.m. on February 4, 1977, in Room 3–11C28 (Commissioner's Conference Room), Patent and Trademark Office, Crystal Plaza Building 3, Arlington, Virginia. This committee was established on December 15, 1975 to advise the Patent and Trademark Office on matters concerning the patent system and the administration of the Office. The agenda for the February 4 meeting is:

(1) Status report on Patent and Trademark Office studies and activities concerning topics previously considered by the Committee.
(2) Further consideration of a system of reexamination of issued patents, including a draft recommendation on this subject.
(3) Problems of the independent inventor and small business patentee.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first-come first-served basis. A period will be set aside for oral comments or questions by public observers of 3 minutes per individual on each of the agenda items. More extensive comments or questions should be submitted in writing before February 2. Other public statements may be submitted at any time before or after the meeting.

Copies of the minutes will be available on request 45 days after the meeting.

Inquiries may be addressed to the Committee Control Officer, Herbert C. Wamsley, Office of the Commissioner of Patents and Trademarks, Washington, D.C. 20231, telephone: 703–557–3071; or to the Executive Secretary, David B. Allen, Office of Legislation and International Affairs, Patent and Trademark Office, Washington, D.C. 20231, telephone: 703–557–3065.

Dec. 20, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH. D.
Assistant Secretary for Science and Technology.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 11, 1977

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Availability of Booklet on Significant Patents and Inventors

A commemorative booklet celebrating the Bicentennial, "Revolutionary Ideas—Patents and Progress in America," is now available. The booklet contains a list of numerous significant patents, with pertinent information on each, and coupons for ordering copies of these patents. Highlights of the listing include important inventions such as the Cotton Gin, the Telephone, and the Phonograph; well-known inventors such as Thomas A. Edison, Nikola Tesla, and Samuel F. B. Morse; famous individuals who were granted patents such as Abraham Lincoln and Samuel L. Clemens; and the official Bicentennial Patent. A brief narrative discusses the significance of the Patent System in the American and world economies. In the front of the booklet is a copy of the first patent grant in the United States, on parchment, suitable for framing. Copies of the booklet are available from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402—stock number: 003–004–00537–8; price: $1.00 per copy.

SARA E. BJORGE,
Date: Dec. 14, 1976. *Director, Office of Management and Organization.*

Dedications

3,463,651.—*Rubin Warsager,* Newark, N.J. MULTICOLOR SURFACE DECORATION AND PROCESS FOR PRODUCING SAME. Patent dated Aug. 26, 1969. Dedication filed Nov. 11, 1976, by the inventor.

Hereby dedicates to the Public Claims 3, 6 and 7 of said patent.

3,738,952.—*Paul D. Kostenbader,* Bethlehem, Pa. METHOD FOR TREATING ACID WATER CONTAINING METALLIC VALUES. Patent dated June 12, 1973. Dedication filed June 1, 1976, by the assignee, *Bethlehem Steel Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimer and Dedication

3,499,107.—*Edward Emanuel Sheldon,* New York, N.Y. LIGHT TRANSFER DEVICES USING LIGHT CONDUCTING MEMBERS OF MULTILAYERED CONSTRUCTION AND PHOTOELECTRIC MEANS. Patent dated Mar. 3, 1970. Disclaimer and dedication filed Nov. 1, 1976, by the assignee, *American Optical Corporation.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Errata

All reference to Patent No. 4,000,255 to Bernhard Guggenheim et al. of Switzerland for Mutanase appearing in the OFFICIAL GAZETTE of December 28, 1976 should be deleted since no patent was granted.

All reference to Patent No. 4,000,337 to Sieghard Neufeldt of Germany for Process and Agent for the Processing of Yarns appearing in the OFFICIAL GAZETTE of December 28, 1976 should be deleted since no patent was granted.

Disclaimers

3,463,651.—*Rubin Warsager,* Newark, N.J. MULTICOLOR SURFACE DECORATION AND PROCESS FOR PRODUCING SAME. Patent dated Aug. 26, 1969. Disclaimer filed Oct. 28, 1976, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 4, 5, 8 and 9 of said patent.

3,586,463.—*Jean Charles Marchadour,* Quimper, France. FILLING AND METERING DEVICE FOR USE IN CANNING. Patent dated June 22, 1971. Disclaimer filed Oct. 12, 1976, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,608,593.—*Samuel L. McCormick, Jr.* and *John J. Burke,* Indianapolis, and *Arthur R. Morstadt,* Speedway, Ind. METHOD OF FILLING POWDERS INTO CONTAINERS. Patent dated Sept. 28, 1971. Disclaimer filed Oct. 6, 1976, by the assignee, *Eli Lilly and Company.*

Hereby enters this disclaimer to all claims of said patent.

3,635,933.—*Robert J. Schoffhauser,* Brookside, and *Charles D. Mason,* Florham Park, N.J. 1,2-POLYBUTADIENE MOLDING COMPOSITION. Patent dated Jan. 18, 1972. Disclaimer filed July 29, 1976, by the assignee, *Allied Chemical Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,660,360.—*Dilip K. Ray-Chaudhuri* and *Carmine P. Iovine,* Somerset, N.J. WATER- AND OIL-REPELLENCY AGENTS. Patent dated May 2, 1972. Disclaimer filed Sept. 28, 1976, by the assignee, *National Starch and Chemical Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 12 of said patent.

3,660,900.—*Lawrence F. Andrews,* La Jolla, Calif. METHOD AND APPARATUS FOR IMPROVED ORTHODONTIC BRACKET AND ARCH WIRE TECHNIQUE. Patent dated May 9, 1972. Disclaimer filed Oct. 27, 1976, by the assignee, *"A"-Company, Inc.*

The term of this patent subsequent to Nov. 11, 1986, has been disclaimed.

3,675,156.—*Hans Guenter Danielmeyer,* Matawan, N.J. LASER PUMP CAVITY WITH CONICAL GEOMETRY. Patent dated July 4, 1972. Disclaimer filed Oct. 12, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to all claims of said patent.

3,697,346.—*Horace B. Van Dorn,* Kensington, *Richard J. Matt,* Simsbury, and *Thomas P. Rolland,* Bristol, Conn. METHOD OF MAKING A COMPOSITE PLASTIC BEARING. Patent dated Oct. 10, 1972. Disclaimer filed Oct. 18, 1976, by the assignee, *Textron Inc.*

Hereby enters this disclaimer to claims 1, 3, 4, 5, 11, 12, 14, and 17 of said patent.

3,717,549.—*Foy F. Roberts,* Stonington, Conn. FERMENTATION PROCESS FOR THE PRODUCTION OF CITRIC ACID. Patent dated Feb. 20, 1973. Disclaimer filed Oct. 22, 1976, by the assignee, *Pfizer Inc.*

Hereby enters this disclaimer to claims 1 through 7 of said patent.

3,776,961.—*Robert J. Theissen,* Westfield, N.J. 3-SUBSTITUTED 4-NITROPHENYL HALOPHENYL ETHERS. Patent dated Dec. 4, 1973. Disclaimer filed July 26, 1976, by the assignee, *Mobil Oil Corporation.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,843,933.—*Adel Abdel Azia Ahmed,* Annandale, N.J. CURRENT AMPLIFIER. Patent dated Oct. 22, 1974. Disclaimer filed Sept. 27, 1976, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 4, 5, 7, 8, 9, 10, 11, 12, 13 and 16 of said patent.

3,874,540.—*Walter E. Hidding,* Barrington Hills, Ill. TAMPERPROOF CAP. Patent dated Apr. 1, 1975. Disclaimer filed Nov. 18, 1976, by the inventor.

Hereby enters this dicslaimer to claims 2, 3 and 4 of said patent.

3,887,293.—*Bradshaw Bowman,* Carmel, Calif. METHOD FOR IMPRINTING NON-REPEATING STONE PATTERNS IN FRESH CONCRETE. Patent dated June 3, 1975. Disclaimer filed Nov. 19, 1976, by the assignee, *Bomanite Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

3,975,249.—*Philip Anthony Staniland,* Welwyn, and *Graham Jarrett,* Hitchin, England. AROMATIC POLYMERS OF INCREASED RESISTANCE TO FLOW AND MOLECULAR WEIGHT OBTAINED BY IRRADIATION. Patent dated Aug. 17, 1976. Disclaimer filed Nov. 1, 1976, by the assignee, *Imperial Chemical Industries Limited.*

The term of this patent subsequent to May 25, 1993, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 4, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-30-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-4-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-14-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-22-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-22-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-2-76

Expiration of patents: The patents within the range of numbers indicated below expire during December 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents........ Numbers 2,914,768 to 2,919,442 inclusive
Plant Patents........ Numbers 1,882 to 1,892, inclusive

REISSUES

JANUARY 11, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue These entries will be in numerical order by document publication number

Re. 29,105

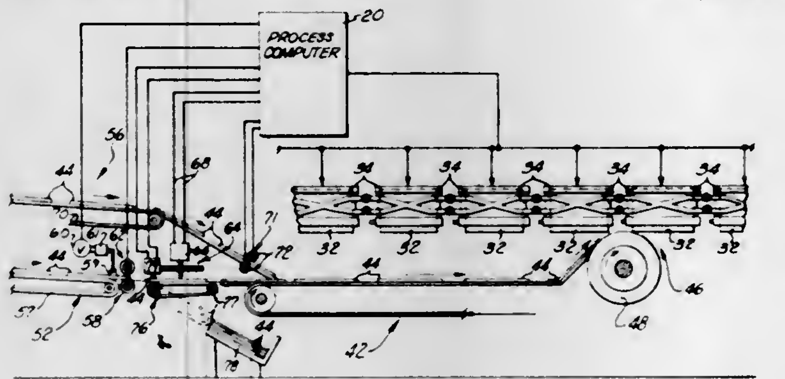
APPARATUS FOR MAKING BOOKS

Leonard Miaskoff, and David A. Reed, both of Easton, Pa., assignors to Harris Corporation, Cleveland, Ohio

Original No. 3,816,866, dated June 18, 1974, Ser. No. 357,608, May 7, 1973. Application for reissue Dec. 18, 1975, Ser. No. 642,178

Int. Cl.² B42C *11/00*

U.S. Cl. 11—3 **8 Claims**



6. An apparatus as set forth in claim **[**4**]** *5* further including third cover feed means for feeding covers which are different than the covers fed by said first and second cover feed means, said control means including means for effecting operation of said first cover feed means to feed covers to combinations of signatures for one group of subscribers and for effecting operation of said third cover feed means to feed covers to combinations of signatures for another group of subscribers.

Re. 29,106

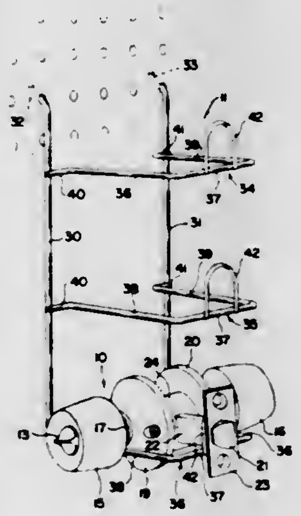
DISPLAY RACK FOR LOCKSETS

William M. Folberth, 3535 W. 140th St., Cleveland, Ohio 44111

Original No. 3,774,320, dated Nov. 27, 1973, Ser. No. 299,304, Oct. 20, 1972. Application for reissue Nov. 28, 1975, Ser. No. 635,841

Int. Cl.² G09B *25/00*

U.S. Cl. 35—49 **7 Claims**



1. In combination, a **[**cylindrical**]** lockset comprising a latch bolt assembly including a housing with an integral plate, and a knob and spindle assembly interconnectable with said latch bolt assembly; and a display and demonstrator rack comprising an upright frame, a plurality of vertically spaced supporting brackets extending outwardly from said frame and adapted to support in operable condition, said knob and spindle assembly, and a plurality of lockset retaining means, one being anchored to the outer portion of each of said brackets, each retaining means defining with its respective bracket an opening adapted to receive therethrough, said latch bolt housing and to retain said latch bolt plate on the outer side thereof, whereby said lockset is supported in operable condition for the purpose of demonstration, and secured against casual removal, on said rack.

Re. 29,107

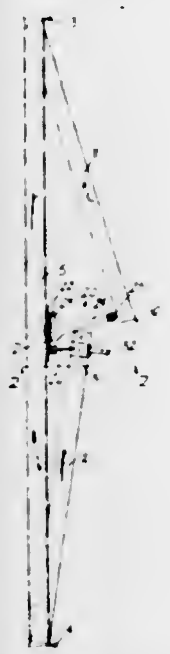
DOOR COORDINATOR

William B. Imhoff, Springdale, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.

Original No. 3,894,356, dated July 15, 1975, Ser. No. 455,609, Mar. 28, 1974. Application for reissue Mar. 8, 1976, Ser. No. 664,882

Int. Cl.² E05C *7/05*

U.S. Cl. 49—366 **12 Claims**



1. A door coordinator adapted to control the closing of a pair of swinging doors constituted by an active door and an inactive door hung to swing into and out of closed position beneath a head frame, the coordinator comprising a hub, means mounting the hub on the head frame for rotation about a horizontal axis higher than the top edges of the doors, a pair of arms of unequal length fixed to and projecting from the hub and having their axes in a plane containing the axis of the hub, means limiting the downward swinging movement of said arms, the longer arm being angled with respect to the hub to cause its free end to lie, when below horizontal, in the swinging path of the active door, the shorter arm having a downwardly facing substantially straight elongated cam surface, the cam surface terminating at a bottom edge lying substantially parallel to said plane, and a roller mounted on said shorter arm with its periphery projecting beyond said bottom edge adjacent to the point of termination of the cam surface, said cam surface, in the lower position of the arms, lying in the swinging path of the upper edge of the inactive door.

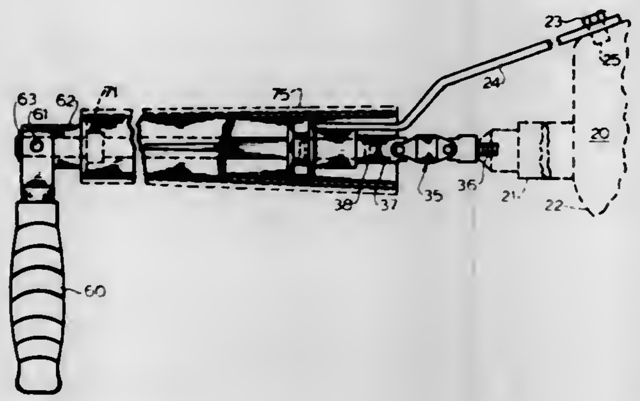
Re. 29,108
DRILL-OPERATED ABRADING TOOL

William M. Atwater, Pittsboro, N.C., assignor to Harriss-Conners Chevrolet, Inc., Chapel Hill, N.C.

Original No. 3,869,832, dated Mar. 11, 1970, Ser. No. 474,131, May 28, 1974. Application for reissue Dec. 9, 1975, Ser. No. 639,207

Int. Cl.² B24B *23/02*

U.S. Cl. 51—170 PT **2 Claims**



2. A portable abrading tool adapted to be removably secured to a hand electric drill of the type having a front housing, a chuck supported on the face of said housing, said tool comprising, in combination:

- *a. a hollow elongated cylinder member having at least one slit in the wall thereof and extending for a major portion of the length thereof, having bearing surfaces within said cylinder member intermediate the length thereof and at oppositely disposed positions substantially radially removed from said slit, said bearing surfaces being adapted to receive a camming pressure for expanding said cylinder member, said cylinder member being open at one driven end and being closed at the opposite end by a wall having a central aperture;*
- *b. a drive shaft centrally positioned within said cylinder member and extending from a driven end proximate said cylinder member open end to and through said cylinder member closed end and providing externally of said cylinder member closed end a handle mounting extension portion, said driven end being secured to a said drill chuck;*
- *c. a bearing mounted on said drive shaft handle portion and having connected thereto an auxiliary handle and locking means secured to said drive shaft for retaining said handle bearing on said shaft;*
- *d. camming means secured to said drive shaft and disposed between said bearing surfaces, said camming means when rotated with respect to said bearing surfaces being operable in a first rotative position to contact said bearing surfaces and expand said cylinder member to tighten any abrading sleeve positioned thereon and in a second rotative position being movable out of contact with said bearing surfaces to allow said cylinder member to contract and said abrading sleeve to be removed;*
- *e. a support bearing mounted internally of said cylinder member outwardly from said camming means and proximate said shaft driven end; and*
- *f. an abrading sleeve having an appropriate length and internal diameter fitted on said cylinder member and adapted to be tightened thereon by rotation of said caming means against said bearing surfaces to said first rotative position and to be loosened for relacement by rotation of said camming means to said second rotative position.*

Re. 29,109
APPARATUS FOR THE DETERMINATION OF INTERNAL COMBUSTION ENGINE COMPRESSION PRESSURE

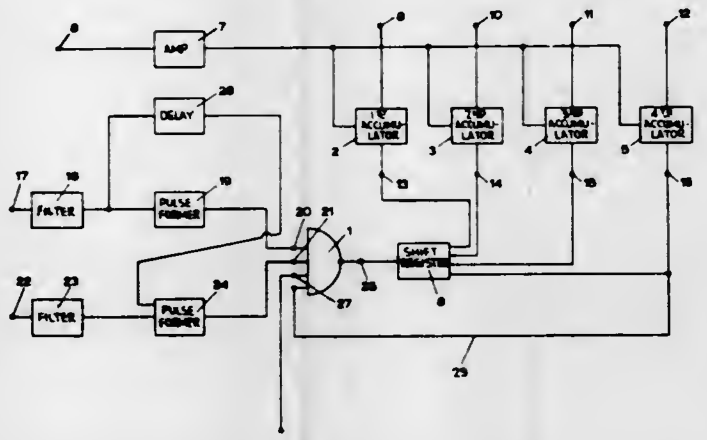
Hans-Gunther Petersen, Parkridge, N.J., and Heiko Requardt, Gifhorn, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Original No. 3,713,331, dated Jan. 30, 1973, Ser. No. 116,957, Feb. 19, 1971. Application for reissue June 7, 1974, Ser. No. 477,346

Claims priority, application Germany, Feb. 20, 1970, 2007806

Int. Cl.² G01M *15/00*

U.S. Cl. 73—117.2 **10 Claims**



11. Apparatus for the determination of cylinder compression pressure of an internal combustion engine having a starter, by storage of signals representative of starter current and generating coordination signals from the ignition impulses of the engine, the apparatus comprising, a gating circuit having a first input for receiving signals corresponding to the ignition impulses of all cylinders of the engine, and a second input for receiving signals initiated by the ignition impulses from a selected engine cylinder;

means for storing said signals representative of starter current; and

said gating circuit passing to said means for storing said signals received by said first input only during presence of said signals received by said second input for actuating said means for storing.

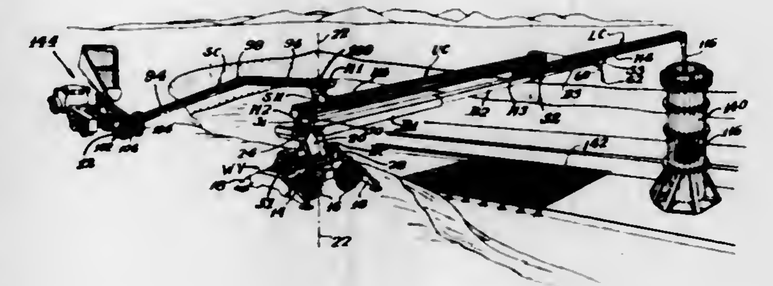
Re. 29,110
BOOM MOUNTED CONVEYING MEANS

Robert F. Oury, Elmhurst, Ill., assignor to Rotec Industries, Inc., Elmhurst, Ill.

Original No. 3,598,224, dated Aug. 10, 1971, Ser. No. 778,242, Nov. 22, 1968. Application for reissue July 13, 1973, Ser. No. 380,089

Int. Cl.² B65G *15/26*

U.S. Cl. 198—314 **20 Claims**



15. A self-propelled crane having an extendable boom and an extendable conveyor system, comprising in combination:

- *a. a self-propelled crane having a main boom and at least one extendable boom extendable and retractable parallel to said main boom;*

- *b. a main conveyor connected in spaced relationship above said main boom, said main conveyor having a flexible endless belt driven by at least one motor;*
- *c. a feed conveyor movably attached to said main conveyor at one end thereof and adapted to convey materials from a loading point onto said main conveyor, said feed conveyor having an endless conveyor belt;*
- *d. an extension conveyor connected at one end to an extendable and retractable boom, and said extension conveyor having a flexible endless belt driven by at least one motor;*
- *e. said main conveyor being spaced above said main boom sufficiently to allow said extension conveyor to move between said main boom and said main conveyor during extension and retraction of said extension conveyor by said extendable and retractable boom extending and retracting; whereby materials are adapted to be placed over an area defined by the extension and retraction of said extension conveyor;*
- *f. said feed conveyor being adapted to discharge materials onto said main conveyor and said main conveyor being adapted to discharge materials onto said extension conveyor and said extension conveyor being adapted to discharge said materials from said conveyor apparatus; and*
- *g. said crane boom being rotatable for rotating said main conveyor on said vehicle for extending the area of placement of materials by said apparatus.*

Re. 29,111
PHOTOGRAPHIC DEVELOPER COMPOSITION CONTAINING FORMALDEHYDE BISULFITE ALKANOLAMINE CONDENSATION PRODUCT AND FREE ALKANOLAMINE

Thomas J. Masseth, Sweden, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,573,914, dated Apr. 6, 1971, Ser. No. 661,532, Aug. 18, 1967. Continuation-in-part of Ser. No. 583,935, Oct. 3, 1966, abandoned. Application for reissue Jan. 7, 1976, Ser. No. 647,299

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.4 **17 Claims**

1. A liquid photographic developer composition comprising:

- a. a *dihydroxybenzene* silver halide developing agent,
- b. a [carbonyl] *formaldehyde* bisulfite-alkanolamine condensation product, and
- c. at least about 0.075 mole of free alkanolamine per liter of developer composition.

Re. 29,112
METHODS OF FORMING A FIBER REINFORCED PIPE ON AN INFLATABLE MANDREL

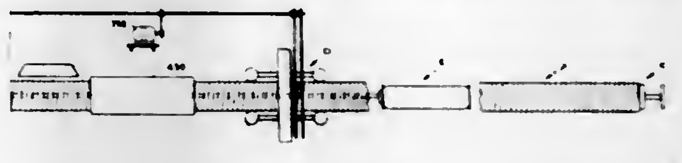
J. Warne Carter, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Original No. 3,700,519, dated Oct. 24, 1972, Ser. No. 824,153, May 13, 1969. Continuation-in-part of Ser. No. 577,035, Sept. 2, 1966, Pat. No. 3,507,412, which is a continuation-in-part of Ser. No. 387,372, Aug. 4, 1964, abandoned, and a continuation of Ser. No. 705,564, Feb. 14, 1968. Application for reissue Dec. 5, 1975, Ser. No. 638,204

Int. Cl.² B65H *81/06*; **B65C** *3/26*

U.S. Cl. 156—156 **33 Claims**

1. A method for continuously making substantially rigid, fiber reinforced plastic pipe comprising providing an air impervious conveyor tube on an axially fixed, hollow mandrel, the mandrel being provided with means to furnish an air seal with the interior of the conveyor tube as the conveyor tube is continuously advanced over the mandrel, winding a plurality of bands of thermosetting resin composition impregnated continuous fiber elements onto the conveyor tube to provide a pipe assembly, rotating the pipe assembly with respect to the mandrel, curing the thermosetting resin composition, providing an air seal at the forward end of the pipe assembly being generated, linearly advancing the pipe assembly by directing air under pressure through the mandrel and out from the



forward end thereof into the interior of the pipe assembly, [and] controlling the rate of linear advancement of the pipe assembly [.] *and providing a temporary seal to prevent the loss of pressure within the advancing pipe assembly when a section thereof is cut and to allow providing an air seal at the forward end of the pipe assembling being generated.*

Re. 29,113
TRIANGULAR PIEZOELECTRIC TRANSDUCER FOR RECORDING VIDEO INFORMATION

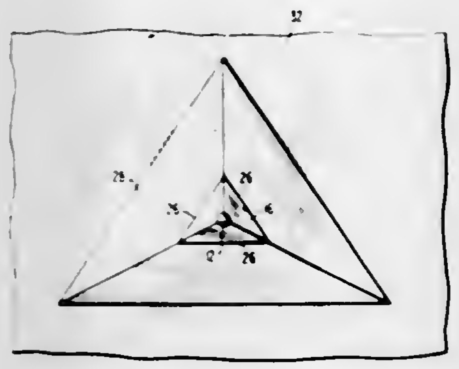
Jerome Barth Halter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Original No. 3,865,997, dated Feb. 11, 1975, Ser. No. 351,599, Apr. 16, 1973. Application for reissue Sept. 12, 1975, Ser. No. 612,737

Claims priority, application United Kingdom, Apr. 19, 1972, 18039/72

Int. Cl.² G11B *3/00*; **H04R** *17/04*; **H01V** *7/00*

U.S. Cl. 358—128 **14 Claims**



1. Apparatus for providing displacement of a cutting stylus in response to electrical signals and adapted for mounting to a bracket comprising:

(*1*) a pedestal having first and second opposing sides of different surface area;

(*2*) a cutting stylus; [a stylus mount having a base region and adapted for receiving said cutting stylus;]

(*3*) a piezoelectric element having first and second opposing sides, said first side of said *piezoelectric* element adjacent to and rigidly coupled to a first side of said pedestal [and said second side of said element adjacent to and rigidly coupled to said base region of said stylus mount,];

(*4*) *means for rigidly coupling said cutting stylus to said second side of said piezoelectric element;*

said pedestal, *said* piezoelectric element, and [stylus mount] *said coupling means* forming a structure having all external surfaces disposed anti-parallel to each other;

(*5*) means for providing electrical signals to said piezoelectric element; and

(*6*) means for mounting said second side of said pedestal on said bracket.

PLANT PATENTS

GRANTED JANUARY 11, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,009

LADY UARDA

Carl A. Larsen, 2561 Elm Ave., Salt Lake City, Utah 84109

Filed July 11, 1975, Ser. No. 595,070

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plants—66 **1 Claim**

1. A new and distinct variety of *Syringa vulgaris* hybrid French Lilac plant, characterized in that the mature plant is about 9 feet high and about 6 feet wide; and in that its flowers are magenta to burgundy, and very large when compared with other French Lilac hybrid plants, with large florets and tight flowers spikes that are well formed.

PATENTS

GRANTED JANUARY 11, 1977

ERRATA

For CLASS	See PATENT NO.
024–016 PB	4,001,898
062–028	4,002,042
172–581	4,002,334
096–001 R	4,002,409
429–194	4,002,492
429–026	4,002,493
429–089	4,002,494
426–087	4,002,495
429–052	4,002,496
536–017	4,002,608
536–119	4,002,609
424–037	4,002,718
427–078	4,002,735
260–346.2 R	4,002,793
358–106	4,002,823
358–180	4,002,824
325–032	4,002,825
358–128	4,002,826
343–005 SC	4,002,827
358–240	4,002,828
358–286	4,002,829
358–293	4,002,830
358–254	4,002,831
200–159 A	4,002,879
318–117	4,002,954

PATENTS

GRANTED JANUARY 11, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,001,894

PROTECTIVE HELMET

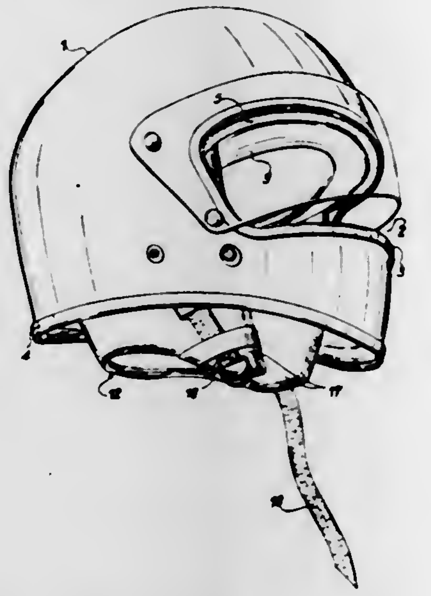
Gérard Roques-Rogery, Vineuil Saint Firmin, France, assignor to S.I.D.A.C. S.A., Paris, France

Filed Apr. 19, 1974, Ser. No. 462,578

Claims priority, application France, Apr. 20, 1973, 73.14537

Int. Cl.² A42B *3/02*

U.S. Cl. 2—415 **1 Claim**



1. A protective helmet, comprising, in combination, an open shell covering the wearer's head a transverse opening in said shell in register with the wearer's eyes, two layers of appropriate thickness of an elastic and resilient material secured with said shell to dampen shocks, an internal hood within said shell, a hood with ears directly fixed to the inside of the shell and tightly covering the wearer's skull, nape and temples, said hood with ears forming an extension of said shell, side straps for said hood with ears for securing the helmet under the wearer's chin, said shell and said hoods being interconnected along a substantially circular contact zone inside of said shell to said shell between said two layers, said hood comprising two thicknesses of synthetic fabric containing a layer of resilient material.

4,001,895

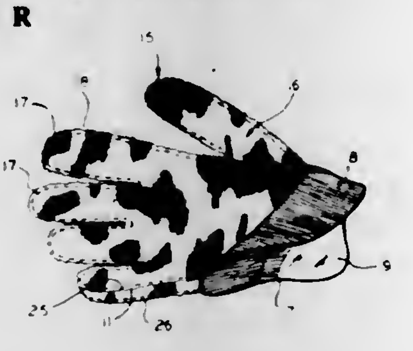
PANELED DIP-COATED WORK GLOVE

Neal Ian Cohen, Glenview, Ill., assignor to Magid Glove Manufacturing Company, Inc., Chicago, Ill.

Filed Sept. 4, 1975, Ser. No. 610,171

Int. Cl.² A41D *19/00*

U.S. Cl. 2—161 R **11 Claims**



1. A dip-coated work glove comprising:

an exterior surface layer of plastic material enveloping a substantial portion of said work glove,

an interior lining layer which directly contacts and surrounds a hand upon insertion of said hand into said glove,

said interior lining layer having a front portion, a back portion, and extension panel means,

said front portion, back portion and extension panel means integrated into one piece by lining portion attachment means, and

said interior lining layer and said exterior surface layer integrally joined to one another in a juxtaposed position by layer attachment means.

4,001,896

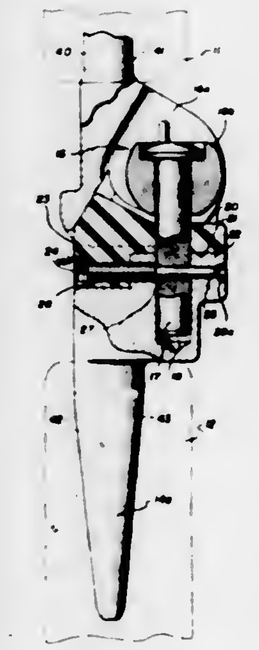
PROSTHETIC JOINT FOR TOTAL KNEE REPLACEMENT

Robert Arkangel, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc., Warsaw, Ind.

Substitute for Ser. No. 584,796, June 9, 1975, abandoned. This application Jan. 26, 1976, Ser. No. 652,587

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **3 Claims**



1. A joint prosthesis comprising a first prosthetic member for fixation to a first skeleton element and including a convexly shaped articulation surface for location at the distal end of said first skeleton element, a second prosthetic member for fixation to a second skeleton element adjacent said first skeleton element, and having a boss extending upward therefrom said boss having an aperture extending therethrough link means interconnecting first and second prosthetic members for pivotal movement relative to one another, a removable plateau secured to said second prosthetic member having a recess to receive said boss and prevent rotational movement of said plateau relative to said second prosthetic member and including a front wall portion immediately in front of said boss to define an end wall surface of said recess, aligned apertures extending through said front wall portion and said boss and said member providing an engagement surface for said first prosthetic member, said link means pivotally connecting said first and second prosthetic members to provide a sliding engagement between said convexly shaped articulation surface and said engagement surface of said plateau, and removable fastener means including a threaded shaft having one end thereof split, a chamfer formed at one end of said boss to receive the split end of the threaded shaft, whereby the split end can be spread to retain the threaded shaft in position, said shaft extending through said aligned apertures of said plateau and said boss to retain said plateau to said second prosthetic member, whereby said plateau can be selectively removed and replaced when worn.

4,001,897
PROSTHESIS FOR A JOINT

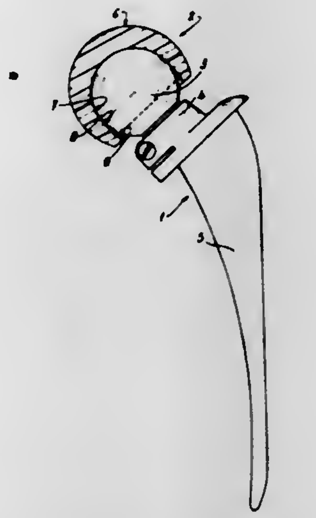
Andre Rambert, Residence Florentine Avenue Lacassagne, Lyon 3eme, Rhone, France, and Gilles Bousquet, 19 Avenue Berranger, Ecully, Rhone, France

Filed Jan. 27, 1976, Ser. No. 652,810

Claims priority, application France, Jan. 31, 1975, 75.03645

Int. Cl.^{2} A61F *1/24*

U.S. Cl. 3—1.913 **5 Claims**



1. A prosthesis for a joint comprising, in combination:

a spherical head integral with a part which is to substitute for at least a portion of a bone, and

a spherical cap which is to be accommodated and supported in a patient, said spherical cap having (1) an inside spherical bearing surface with a given diameter so as to ensure that said spherical head may be accommodated and have freedom of movement therein, (2) an internal cylindrical shoulder at its base, said shoulder being narrow in width and having a diameter slightly smaller than said given diameter, and (3) a portion defining an inner cylindrical surface co-axial with said bearing surface and adjacent said shoulder, said cylindrical surface being disposed between said shoulder and said spherical surface when in its utilization position.

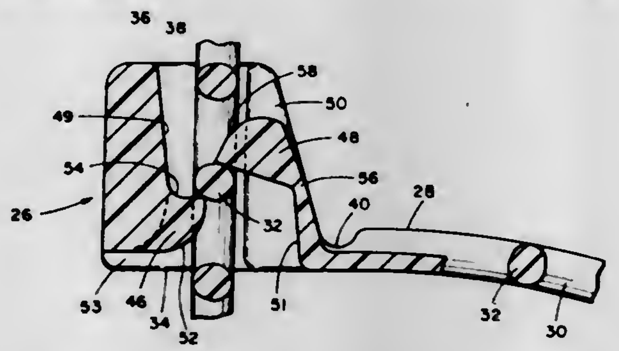
4,001,898
FIXED DOG LADDER STRAP

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corporation, Tinley Park, Ill.

Filed Oct. 6, 1975, Ser. No. 619,884

Int. Cl.^{2} B65D *63/00*

U.S. Cl. 24—16 PB **14 Claims**



1. A self-locking cable tie for forming a plurality of elongate objects such as wires into a bundle and comprising:

an elongate flexible strap positionable about the objects to be bundled and including a plurality of spaced transversely extending abutments, said strap being of the ladder type having a pair of spaced, generally longitudinally extending side rails, said abutments constitute rungs joining said rails;

a head extending from adjacent one end of said strap, having a strap entrance face and a strap exit face, and having a transverse aperture extending between said faces for receiving the distal end of said strap;

non-pivotal locking means carried by said head and extending into said aperture for securely engaging a preselected one of said abutments; and

pusher means carried by said head and extending into said aperture and responsive to retrograde movement of the strap to push the abutment to be held into engagement with said locking means, said pusher means having a position wherein its spacing from said locking means is sufficient to permit strap passage therebetween whereby said strap can be threaded with relatively low force as said pusher means is not required to resist strap withdrawal forces.

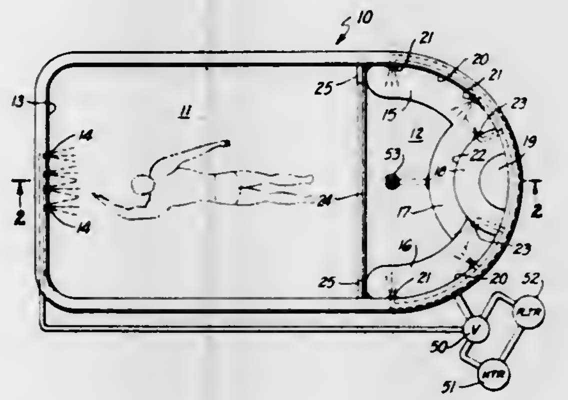
4,001,899
COMBINED SWIMMING AND THERAPY POOL

Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Filed Sept. 22, 1975, Ser. No. 615,208

Int. Cl.^{2} E04H *3/16, 3/18;* **F16L** *22/02*

U.S. Cl. 4—172 **5 Claims**



1. A swimming pool having a length only slightly greater than the length of the human body, said pool having a substantially vertical wall at one end thereof, jet water outlet means directed horizontally inwardly from said vertical wall, said jet water outlet means being constructed and arranged to move water into said swimming pool in a horizontal direction with sufficient force so that a user can swim for an extended period of time in a substantially stationary horizontal position within said swimming pool in the opposite direction against the force of the water entering said pool from said jet water outlet means, and a therapy pool disposed directly adjacent to said swimming pool, said swimming pool and therapy pool comprising adjacent areas of a single pool, said therapy pool being of shallower depth than said swimming pool, said therapy pool having horizontally directed seat means and second jet water outlet means directed substantially horizontally toward said seat means.

4,001,900
SWIMMING POOL COVER HAVING A RAISED LEADING EDGE

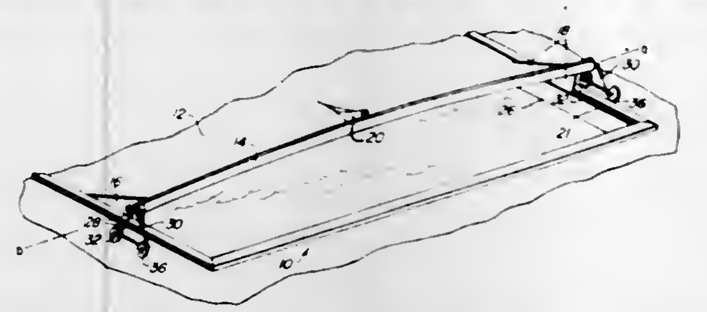
Joe H. Lamb, 3500 Hillside Lane, Salt Lake City, Utah 84109

Filed Nov. 10, 1975, Ser. No. 630,316

Int. Cl.^{2} E04H *3/16, 3/18;* **F16L** *22/02*

U.S. Cl. 4—172.14 **9 Claims**

1. A swimming pool cover comprising a rasised bowed tubular member, a flexible impervious sheet having a beaded longitudinal side edge and a beaded forward leading edge for engagement into a longitudinal and forward track or channel means respectively, said longitudinal track or channel being mounted to the side margins of a swimming pool and said forward track or channel means being fixed to said bowed tubular member, said bowed tubular member adapted to hold said beaded forward or leading edge, wheeled support members fixed to the ends of said bowed tubular member for maintaining said leading edge of said pool cover in a raised position, and a stop member fixed to the ends of said bowed tubular member for limiting the rolling action of said wheeled support members of said bowed tubular member.



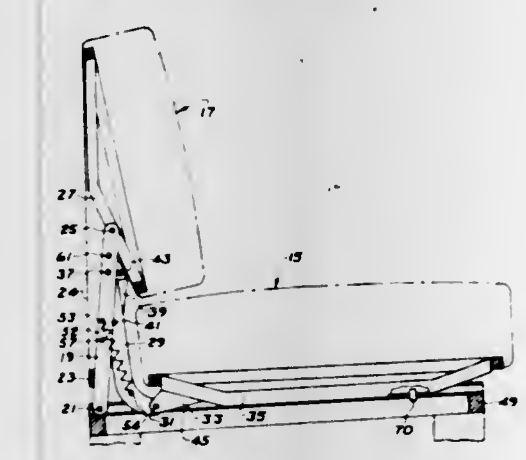
4,001,901
CONVERTIBLE SEAT-BED

Howard M. Quakenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa

Continuation-in-part of Ser. No. 402,860, Oct. 2, 1973, Pat. No. 3,913,152. This application Aug. 6, 1975, Ser. No. 602,203

Int. Cl.^{2} A47C *17/17*

U.S. Cl. 5—37 R **12 Claims**



1. In a convertible seat-bed assembly, a unit including a generally rectangular back having generally parallel opposite top and bottom edge portions, back support means supporting said back for movement between an inclined seating position in which said top edge portion thereof is in a first position spaced upwardly and rearwardly with respect to said bottom edge portion thereof and a bed position in which said top edge portion thereof is in a second position spaced rearwardly from and in horizontal alignment with said bottom edge portion thereof, a generally rectangular seat having generally parallel forward and rearward edge portions, seat support means supporting said seat for movement between a rearward seat position in which said rearward edge portion thereof is disposed below and behind said bottom edge portion of said back when said back is in said first position and a forward bed position in which said rearward edge portion thereof is contiguous to said bottom edge portion of said back with the upper surface of said back and seat then being in a common horizontal plane, said back support means comprising arm means pivotal about a first horizontal axis below said back and pivotally connected to said back on a second horizontal axis, first link means pivotally connected to said seat on a third horizontal axis and pivotally connected to said arm means on a fourth horizontal axis, and second link means pivotally connected to said first link means on the fifth horizontal axis and pivotally connected to said back on a sixth horizontal axis, said second horizontal axis being spaced a first predetermined distance from said first horizontal axis and being on the rearward side of said back and spaced a second predetermined distance from said bottom edge portion of said back, said fourth horizontal axis being spaced a third predetermined distance from said second horizontal axis and said sixth horizontal axis being spaced a fourth predetermined distance from said fifth horizontal axis, the relationship between said first, second, third and fourth predetermined distances being such that said top edge portion of said back is moved in a substantially vertical path between said first and second positions thereof when said seat is moved forwardly and rearwardly between said rearward seat and forward bed positions thereof.

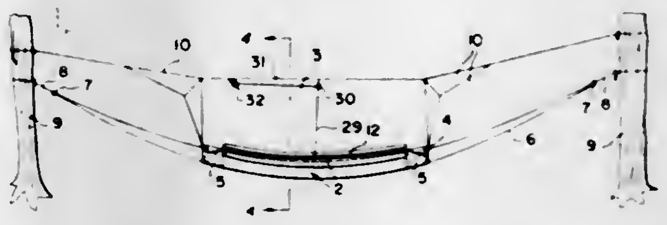
4,001,902
SUSPENDED BED AND SHELTER

John O. Hall, and Anna Cobb Hall, both of 1419 N. Negley, Pittsburgh, Pa. 15206

Filed Jan. 16, 1975, Ser. No. 541,598

Int. Cl.^{2} A45F *3/22*

U.S. Cl. 5—121 **16 Claims**



1. A combination comprising a hammock, an insulated sleeping bag and a tent;

said hammock being a generally rectangular shaped sheet of material, providing a relatively level support surface for at least one occupant, with the longest edges thereof each defining a catenary curve, including a spreader bar attached to each of the shortest edges thereof and means for adjustably suspending said hammock attached to each said spreader bar;

said insulated sleeping bag formed of an upper insulated portion and a lower insulated portion, wherein said upper portion is attached to one of said longest edges of said hammock material and said lower portion is attached to substantially cover and insulate the underside of said hammock material; and

said tent includes means for attaching said tent to said longest edges of said hammock material and means for supporting said tent above said hammock and said sleeping bag.

4,001,903
WORKPIECE MANIPULATING DEVICES

Robert B. Hay, 100 Appleton St., North Andover, Mass. 01845

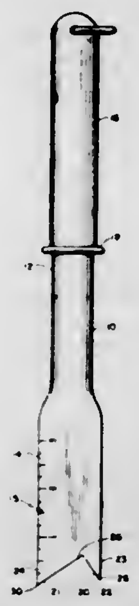
Filed Jan. 22, 1975, Ser. No. 543,057

Int. Cl.^{2} B25F *1/00*

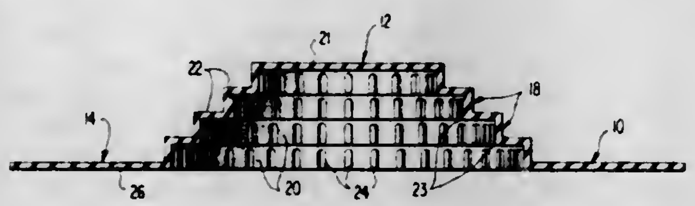
U.S. Cl. 7—1 M **10 Claims**

1. A workpiece manipulating device comprising an elongate handle, the upper end of which defines a hand grip and the lower end of which comprises a laterally flattened working end portion composed of a rigid and relatively soft material, the terminus of said working end portion having a triangular notch extending upwardly and inwardly from the respective

lateral margins thereof, the angle defined between the adjacent sides of said triangular notch being essentially a right angle and the apex thereof being located substantially to one side of the lateral centerline of said working end portion.



4,001,904
KITCHEN UTENSIL
Walter L. Gill, 225 S. Buena Vista, Redlands, Calif. 92373
Filed Feb. 13, 1976, Ser. No. 658,020
Int. Cl.^{2} B67B *7/18*; B25F *1/00*
U.S. Cl. 7—14.6 3 Claims



1. A kitchen utensil comprising

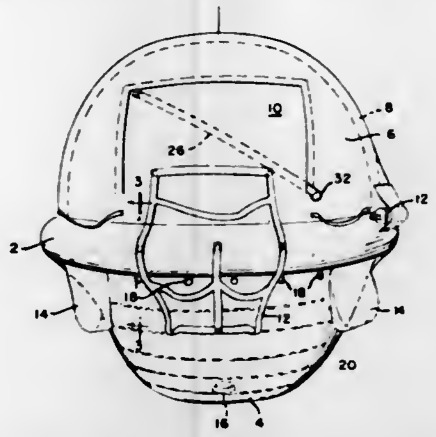
a body molded of flexible rubber or synthetic plastic and including a central stepped frustro-conical hollow portion surrounded by a flange extending radially from the edge of the largest diameter of the hollow portion,

the stepped portions of the hollow portion including a plurality of axially disposed cylindrical walls having on their inner surfaces axially extending ribs spaced therearound, said walls being connected by radially disposed annular walls between one end of a larger cylindrical wall and the corresponding opposite end of the next smaller cylindrical wall, the steps being arranged in successively smaller diameters and closed by a wall spanning the area of the smallest of the cylindrical walls,

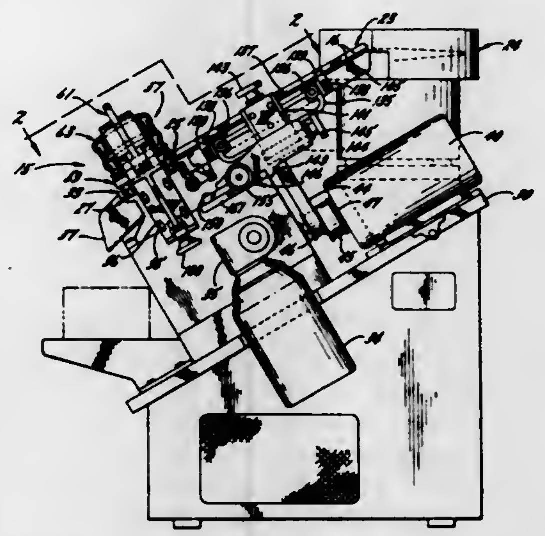
the surface of the flange corresponding to the hollow side of the stepped portion defining a pattern of textural roughness thereon to facilitate scrubbing of pots and pans.

4,001,905
IMPROVED STABILIZED SURVIVAL RAFT
James A. Givens, 18105-33rd NE., Seattle, Wash. 98155
Continuation-in-part of Ser. No. 314,389, Dec. 12, 1972, Pat. No. 3,883,913, which is a continuation-in-part of Ser. No. 216,990, Jan. 11, 1972, abandoned. This application May 2, 1975, Ser. No. 573,914
Int. Cl.^{2} B63C *9/04*
U.S. Cl. 9—11 A 9 Claims

2. A stabilized life raft having a peripheral, inflatable member supporting a floor spanning the interior distance of the raft and a stabilizing chamber defined by the floor of the raft and a wall structure spaced from said floor, a peripheral trough surrounding said chamber, said trough filling with the supporting fluid and providing temporary stabilization during the filling of the main chamber, said chamber being filled with the supporting fluid when in use and means separating the stabilizing chamber into communicating sections permitting controlled fluid flow between the chambers to assure stability even though the weight in the raft shifts.

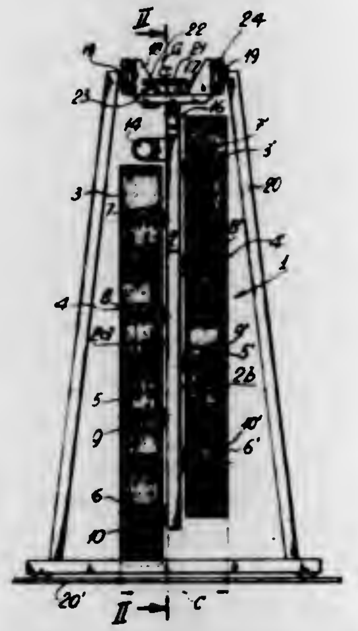


4,001,906
MACHINE FOR CUTTING SLOTS IN SCREW SHANKS
John N. Betz, 4624 Redbluff Drive, Rockford, Ill. 61107
Filed Aug. 14, 1975, Ser. No. 604,618
Int. Cl.^{2} B23G *9/00, 11/*^
U.S. Cl. 10—2 20 Claims



1. A machine for forming slots in the shanks of fasteners comprising a frame, a fastener-carrying disk mounted on said frame, indexing means connecting with said disk to move the latter intermittently along a predetermined path through spaced fastener-receiving, slotting and exit stations, cutting means at said slotting station for forming slots in the fasteners during a dwell period, feed means at said fastener-receiving station for directing the fasteners onto said disk, and clamping mechanism supported by said frame for holding the fasteners on said disk as the latter is rotated along said path from said receiving station, through said slotting station and to said exit station, said mechanism including a support mounted on said frame for movement between an in-service position and an out-of-the-way position, an actuator attached to said support and being movable bodily therewith, said actuator being spaced a predetermined distance from said disk when said support is in its in-service position, an adapter connected with said disk for bodily rotation therewith and being located between said actuator and said disk, clamping members carried on said adapter and being movable relative to said adapter toward and away from said disk for clamping said fasteners on said disk as the fasteners are carried along said path and through said slotting station, said actuator engaging said members as they are moved between said receiving and exit stations to urge said members toward said disk to clamp the fasteners on said disk as the latter is being moved and while the fasteners are being slotted, said actuator comprising a turret journaled on said free portion of said arm, said turret including a plurality of plungers slidably supported thereon and projecting in a generally axial direction relative to said turret urging said plungers resiliently toward said adapter, said adapter including a plurality of clamping rods slidably mounted thereon and projecting therefrom in a generally axial direction relative to said adapter and toward said disk, said rods being engaged by said plungers between said fastener-receiving and exit stations to connect said turret for bodily rotation with said adapter and to urge said rods toward said disk thereby clamping the fasteners to said disk.

4,001,907
VEHICLE-WASHING STATION WITH SCRUBBING UNIT COMPOSED OF VERTICALLY SUPERPOSED ROTARY BRUSHES
Uberto Capra, Alte Ceccato (Venice), Italy, assignor to Ceccato & C. S.p.A., Alte Ceccato (Venice), Italy
Filed July 11, 1975, Ser. No. 595,084
Claims priority, application Italy, July 11, 1974, 25003/74
Int. Cl.^{2} B60S *3/06*
U.S. Cl. 15—53 A 9 Claims



1. In a vehicle-washing station, in combination:

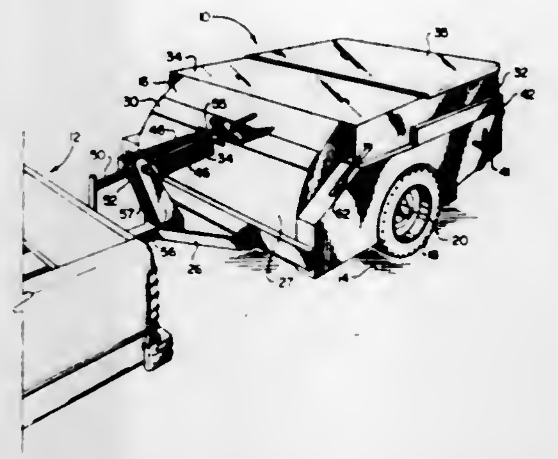
support means positionable adjacent a vehicle to be washed, said support means including an overhead mounting and a depending arm pivotally secured to said mounting for swinging in a vertical plane;

at least one scrubbing unit on said support means including an array of vertically superposed cylindrical brushes journaled on said arm and centered on generally horizontal axes lying in a common plane transverse to said vertical plane;

drive means for jointly rotating said brushes about their axes; and

guide means enabling relative horizontal displacement of said support means and said vehicle along an upright vehicular surface parallel to said axes in contact with said brushes.

4,001,908
SWEEPING APPARATUS FOR COUPLING TO A MOTORIZED VEHICLE
David W. Franklin, 3416 Stanford St., Dallas, Tex. 75225
Filed Mar. 3, 1975, Ser. No. 554,967
Int. Cl.^{2} E01H *1/04*
U.S. Cl. 15—83 7 Claims



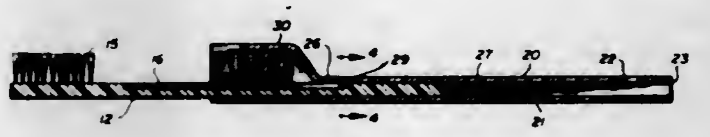
1. For coupling to a motorized vehicle, a brushing apparatus of the type having a housing supporting a transversely extending brush rotatably mounted therein for sweeping and moving dirt, debris and the like from a surface over which the vehicle may pass, and which brush rotation is derived from an interconnection between a surface engaging wheel and a drive capstan coaxially affixed to said brush, comprising:

a tow frame forwardly extending from said housing and adapted for coupling to the motorized vehicle for towing;

hinge means on a rearward end of said frame hingedly attaching said frame to the housing; and

expansion linkage means interconnecting a portion of said tow frame and a portion of the housing for determining the resulting angularity between said tow frame and the housing and the degree of engagement of the brush with the surface over which the vehicle may pass.

4,001,909
CHILD'S TOOTHBRUSH HAVING A WHISTLE
Wallace A. Erickson, Chicago, and David K. Erickson, Skokie, both of Ill., assignors to Wallace A. Erickson & Company, Chicago, Ill.
Filed Feb. 2, 1976, Ser. No. 654,217
Int. Cl.^{2} A46B *17/04*; G10K *5/00*
U.S. Cl. 15—105 3 Claims



1. A combined toothbrush and whistle device, said device comprising:

a brush having a bristle portion and a shaft;

a hollow cover adapted to fit over and slide relative to said shaft;

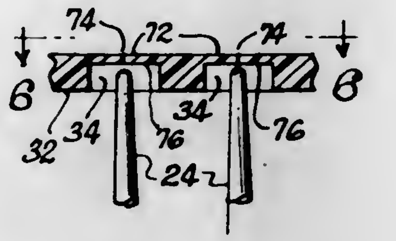
said cover having two ends, one which is an open, outboard end and a top, bottom and side walls;

said cover having a tapered opening in said top wall located near said outboard end, said taper running downward and toward the free end of the cover;

and means connecting said shaft portion and said cover whereby said cover is positioned to embrace said shaft and is adapted to move relative to said shaft portion to provide a whistle in which one can play a range of musical notes when air is blown into said open outboard end of said cover and the cover adjusted.

4,001,910
RETRACTABLE BRUSHES

Lester R. Peilet, 6144 N. Talman Ave., Chicago, Ill.
Filed May 21, 1975, Ser. No. 579,441
Int. Cl.² A46D *7/00, 15/00, 17/06*
U.S. Cl. 15—184 **9 Claims**



1. A retractable brush,

comprising a body made of resilient resinous plastic material and having a front wall with a multiplicity of guide openings therein,

a bristle carrying member movable forwardly and rearwardly in said body and having a multiplicity of bristle elements thereon movable forwardly and retractable rearwardly in the respective openings between extended and retracted positions,

said bristle elements extending through said openings and projecting forwardly from said front wall when said bristle elements are in said extended position,

said bristle elements being retracted rearwardly into said openings and having tip portions guided in said openings when said bristle elements are in said retracted position,

and a multiplicity of flexible flaps formed integrally with said front wall and extending across substantially the entire front of each of said guide openings for substantially closing said openings when said bristle elements are moved to said retracted position, said flaps being substantially thinner in cross-section than the cross-section of said front wall,

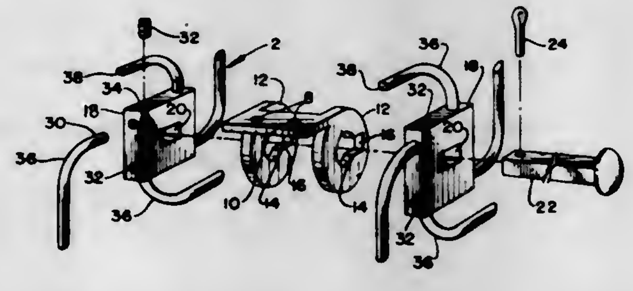
said tip portions of said bristle elements being disposed and guided in said guide openings and to the rear of said flexible flaps when said bristle elements are in said retracted position,

said bristle elements being movable through said guide openings and past said flexible flaps when said bristle elements are moved to said extended positions,

said flexible flaps being in wiping engagement with said bristle elements to clean said bristle elements as they are retracted from said extended position to said retracted position.

4,001,911
MANUALLY OPERATED ROTARY SEWER CLEANOUT DEVICE

Clyde W. Watson, 1916 SE. 6th Ave., Mineral Wells, Tex. 76067
Filed July 9, 1975, Ser. No. 594,607
Int. Cl.² B08B *9/02*
U.S. Cl. 15—104.3 SN **7 Claims**



2. A manually operated pipe cleanout device, which device comprises;

a. a non-rotatable, mounting member for attachment to a plumber's fish tape for longitudinal movement in a pipe,

b. a rotatable member having outstanding tines thereon, which member is mounted on said mounting member for rotation in the pipe, when said mounting member is moved in one direction,

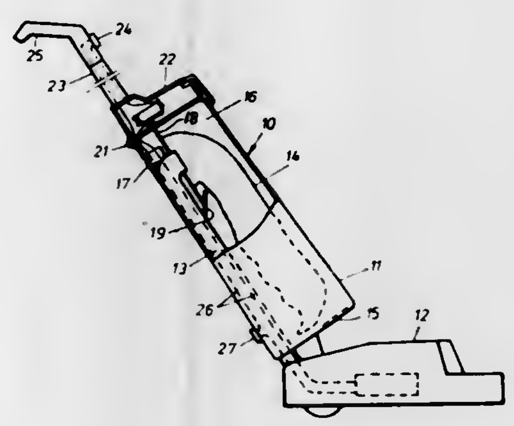
1. locking means to restrain said rotatable member against rotation when said mounting member is moved in the opposite direction,

c. the axis of said rotatable member is transverse to the longitudinal axis of the pipe,

d. each said tine on said rotatable member has a portion thereof curved, which curved portions of said tines extend in the direction to rotate counter to the direction of rotation of said rotatable member.

4,001,912
VACUUM CLEANER DEVICE

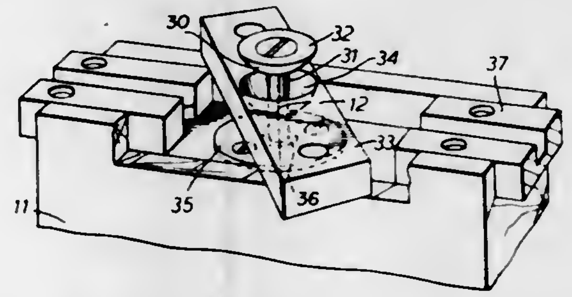
Bolik Anders Gottfrid Eriksson, Johanneshov, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Jan. 16, 1976, Ser. No. 649,692
Claims priority, application Sweden, Jan. 31, 1975, 7501051
Int. Cl.² A47L *5/28*
U.S. Cl. 15—339 **7 Claims**



1. In a motor-driven vacuum cleaner having a dust container with an air pervious portion connected to a relatively rigid attachment plate, said plate having an inlet for dust-laden air, a current supply circuit for said motor that is normally open when no dust container is present in said vacuum cleaner, the improvement comprising: a surface of said attachment plate being positioned to close the current supply circuit and render said motor operative when said dust container is inserted in the proper place in said vacuum cleaner, and said vacuum cleaner is in its operating configuration.

4,001,913
DOOR MOUNTING

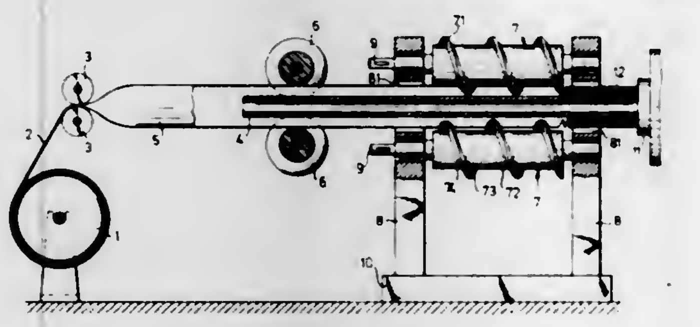
William John Bernard Ollis, 6A Church End, Haddenham, Bucks, and Clive Beech Ansley Long, Newtons Farms Widemer End, High Wycombe, Buckinghamshire, both of England
Filed Dec. 17, 1974, Ser. No. 533,628
Int. Cl.² E05D *15/06*
U.S. Cl. 16—88 **6 Claims**



1. A two-way opening door mounting comprising top door support means and a bottom door guide means each having a component respectively for attachment to a door and a component for attachment to a door frame, wherein said support means include a pin and a seat having cooperating part spherical sliding bearing surfaces which define a range of substantially vertical hinge axes, said bearing surface of said seat facing away from said guide means and being located in said top support component, and said door guide means define two alternative laterally-spaced substantially vertical axes, whereby substantially the whole weight of a door is supported from the head of its frame by said door support means, and whereby said guide means serves to guide the opening of said door in each of opposite directions.

4,001,914
PROCESS AND APPARATUS FOR SHIRRING TUBULAR CASINGS

Ernst Riegler, Walluf; Heinrich Kron, Mainz-Mombach, and Klaus-Jürgen Bittner, Wiesbaden-Biebrich,, Germany, assignors to Hoechst Aktiengesellschaft, Germany
Filed Feb. 26, 1974, Ser. No. 446,630
Claims priority, application Germany, Feb. 27, 1973, 2309720
Int. Cl.² A22C *13/02*
U.S. Cl. 17—42 **12 Claims**



1. In the process for shirring cylindrical tubular casings, especially artificial sausage casing of synthetic material, in which an inflated casing is conveyed in the direction of its longitudinal axis and shirred, with pleating, against a counterforce by shirring forces acting upon the circumference of the casing,

the improvement which comprises that the forces acting upon the surface of the casing do so continuously and simultaneously, at equal intervals, at a plurality of points on at least two straight lines extending parallel to and symmetrically about the longitudinal axis of the casing, the action of said forces being at right angles to the longitudinal axis of the casing, and, simultaneously, in the direction of the longitudinal axis of the casing, against said counter-force.

4,001,915
ELECTRIC EXTENSION OF HIND LEG

Ralph P. Prince, Storrs, Conn., and Rudy G. Westervelt, Newfield, N.Y., assignors to Council of Livestock Protection, Inc., New York, N.Y.
Filed Oct. 1, 1975, Ser. No. 618,462
Int. Cl.² A22B *3/06*
U.S. Cl. 17—45 **2 Claims**

1. In a double rail conveyor system for slaughtering animals positioned in an upright position and employing apparatus for mechanical shackling of a slain animal, the method of extending the hind legs of said slain animal so as to enable said shackling apparatus to grab one of the hind legs of said slain animal and convey said slain animal in a position with the head directed downward, said method comprising

positioning said slain animal already in an upright position on said double rail conveyor to expose a bare skin spot near the anus;

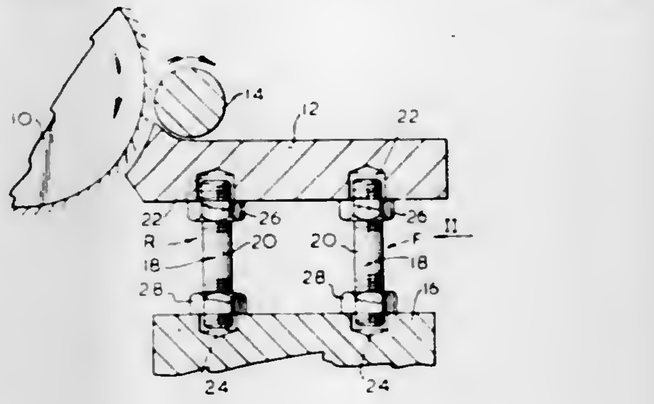
placing an electrode on said bare skin spot near said anus;

placing a ground electrode on a bare skin spot between said hind legs; and

applying a voltage to said electrodes whereby said hind legs become extended and involuntary motion is suppressed thereby enabling said mechanical shackling means to grab one of said hind legs and convey said slain animal.

4,001,916
FEED MECHANISMS FOR FIBER PROCESSING MACHINES

Keith Grimshaw, Todmorden, and Roy Taylor, Oldham, both of England, assignors to The English Card Clothing Company Limited, Yorkshire, England
Filed Oct. 21, 1974, Ser. No. 516,581
Claims priority, application United Kingdom, Nov. 10, 1973, 52292/73
Int. Cl.² D01H *15/40*
U.S. Cl. 19—96 **5 Claims**



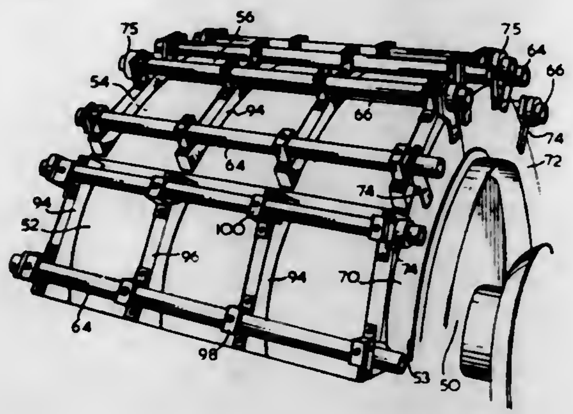
1. In a fibre processing machine: a rotary feed roller; a fibre feed plate positioned with at least part of its operative surface adjacent to the surface of said feed roller; said feed plate being capable of a predetermined degree of deflection towards and away from said feed roller; and means for adjusting the relative displacement between the feed plate and the rotary feed roller comprising a series of individual supports arranged in at least two rows, each row including at least three supports for said feed plate spaced apart in a direction longitudinal of said feed plate, at least an intermediate one of said supports in each row comprising a jack which applies deflecting loads to said feed plate to deflect said feed plate to a predetermined degree for the purpose of controlling the spacing of the roller and plate, thereby exercising control over the feed of fibrous material between said feed plate and said feed rollers.

4,001,917
CARDING APPARATUS

Roy Taylor, 5, Tunstall Road, Oldham, Lancashire, England
Continuation-in-part of Ser. No. 516,581, Oct. 21, 1974, abandoned. This application May 8, 1975, Ser. No. 575,810
Claims priority, application United Kingdom, May 10, 1974, 20672/74; Oct. 25, 1974, 46376/74
Int. Cl.² D01G *15/24, 15/28*
U.S. Cl. 19—104 **10 Claims**

1. For use in a carding machine assembly having a rotating cylinder, a stationary carding plate assembly comprising a relatively rigid support structure adapted to be mounted in association with said carding machine whereby said support structure can bridge the part of the machine occupied by the rotating cylinder, an arcuate plate having card clothing on its concave front face, and means mounting said plate on said support structure comprising at least two mounting members secured on the back face of the plate in spaced relation laterally with respect to the axis of the cylinder and at least two

devices connecting each said member to the support structure, each said device being spaced circumferentially of the

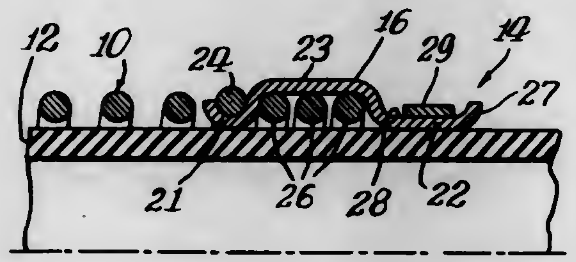


cylinder and having means for adjustably displacing said plate relative to said support structure.

4,001,918
GUARD RETAINER

Jimmy E. Moore, Fort Worth, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Filed Dec. 9, 1974, Ser. No. 530,952
Int. Cl.² F16L *11/00;* **A44B** *21/00*
U.S. Cl. 24—16 R **13 Claims**

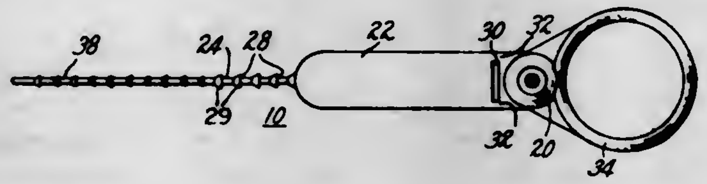


1. Apparatus comprising a coiled spring guard for use with a tubular member, said spring guard being adapted to be coiled around said tubular member, a clip comprising a portion at one end thereof fastened to a selected coil of said guard, said selected coil being displaced from an end of said guard, a portion at the other end of said clip positioned beyond the endmost coil of said guard and adapted to be fastened to said tubular member, and a portion between said ends of said clip overlying and extending closely adjacent the endmost coil of said guard.

4,001,919
SEAL

Sigurd M. Moberg, Orange, and George A. Lundberg, Pompton Lakes, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Filed May 22, 1974, Ser. No. 471,828
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **5 Claims**

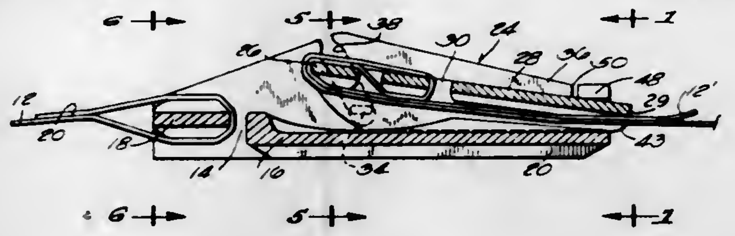


1. A shackle seal formed of resilient plastic, said seal comprising a housing forming a socket, a shackle extending from the housing, said socket and the remote end of the shackle having means for locking engagement forming a shackle loop when said end is inserted into said socket, and for extending through a device to be sealed, and other means attached to the housing and extending from the housing for grasping for breaking the shackle after the seal is assembled, said other means having an aperture dimensioned to receive a finger.

4,001,920
QUICK-DISCONNECT BUCKLE

Edwin L. Johnson, N. 166 W. 20832 Parkway Drive, Jackson, Wis. 53037

Filed July 31, 1975, Ser. No. 600,263
Int. Cl.² A44B *21/00*
U.S. Cl. 24—75 **7 Claims**



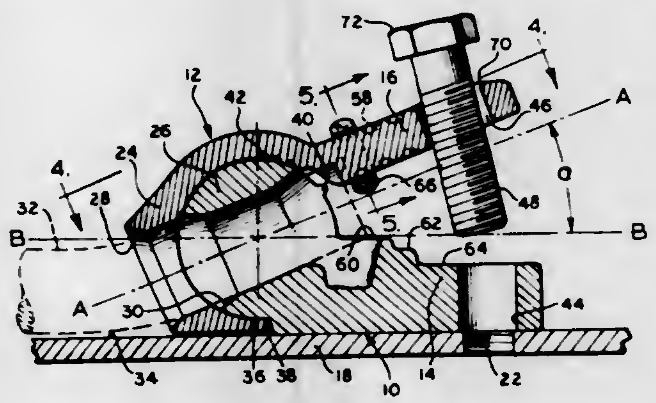
1. A quick-disconnect buckle for engaging and tightening the ends of a strap, said buckle comprising:

a. a frame member secured to one end of the strap, having upwardly extending flanges with transverse retaining slots with narrow apertures extending downwardly and away from the fixed end of the strap,
b. a handle member adjustably secured to the other end of the strap, said handle member having a front edge and an end portion, and having downwardly extended flanges, and
c. transversely extending pins having non-circular cross-sections secured to said handle member flanges, and laterally positioned between said front edge and said end portion, said pins being detachably, pivotally engaged within said retaining slots when said handle member is in an open position, and said pins being fixedly pivotally engaged within said retaining slots when said handle member pivots from an open to closed position, said end portion pivoting downwardly and said front edge pivoting forwardly and upwardly, thereby tightening the strap as said handle member pivots from an open to closed position.

4,001,921
CABLE CLAMP WITH SIZE ADJUSTMENT

Robert E. Lawlor, Huntington Beach, Calif., and Paul A. Cornell, Headborough House, Ireland, assignors to Paul A. Cornell, Headborough House, Ireland

Filed Sept. 4, 1975, Ser. No. 610,418
Int. Cl.² A44B *21/00;* **H01R** *9/10*
U.S. Cl. 24—132 LS **12 Claims**



1. A clamp type cable connector comprising:

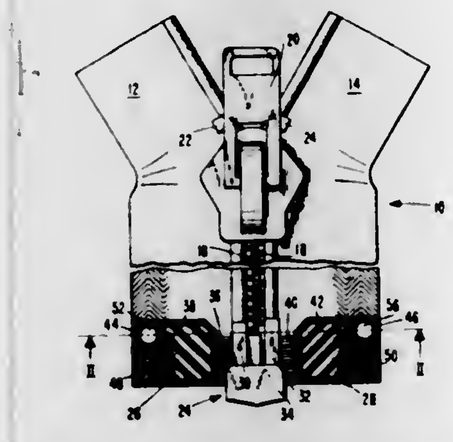
a male member including a tail having a planar bottom surface for mounting said connector on a planar body; and a generally cylindrical head at one end of said tail, said head having a bore for receiving a cable;
a female member including a tail; and a generally C-shaped sleeve at one end of said tail, said sleeve having a bore for receiving said cable;

said sleeve being adapted to receive said head for rotatable movement between open and closed positions of said connector as said tails are moved apart or together, said bores being in generally axial registry when said tails are spaced apart in the fully open position of said connector, with the internal surfaces of said bores serving to clamp said cable upon relative rotation of said sleeve and head as said tails are moved together to close said connector; and
wherein the angle of the axis of the bore in said sleeve with the plane of said bottom surface when said connector is fully open is sufficiently small to permit insertion of a cable nearly as large in diameter as the diameter of said bore, and means for rotating said sleeve relative to said head between fully open and closed positions of said connector sufficiently to provide adequate clamping force on a cable of substantially smaller diameter than the diameter of said bore.

4,001,922
TAPE REINFORCEMENTS FOR SLIDE FASTENERS

H. Blair Ward, Jr., Guys Mills, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 3, 1975, Ser. No. 628,310
Int. Cl.² A44B *19/36*
U.S. Cl. 24—205.11 F **1 Claim**



1. A slide fastener installation comprising

first and second mounting tapes, each of the tapes having inner and outer edges and a hole adjacent the outer edge of the tape,
a plurality of coupling elements secured to the inner edge of each of the tapes,
a slider entrained on said coupling elements and being movable therealong to engage and disengage the coupling elements,
a bottom stop including first and second bottom stop elements, each having a leg portion to receive the slider thereon,
each of the bottom stop elements including tape reinforcing members on opposite sides of each mounting tape extending away from the leg portions, and
a connecting plug extending through and filling the hole in each mounting tape,
each connecting plug being integrally formed with and joining together the tape reinforcing members on the opposite sides of each tape to insure that the tape reinforcing members cannot peel away from the outer edge of its mounting tape.

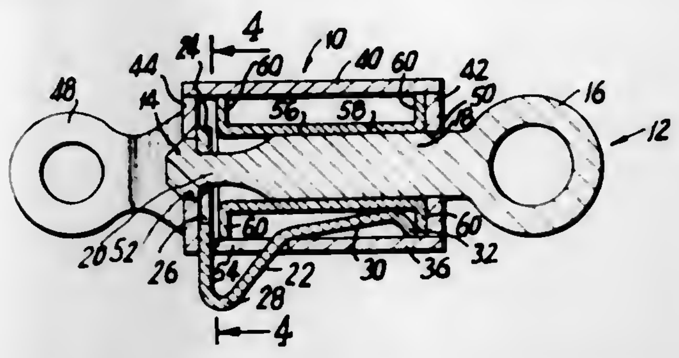
4,001,923
JEWELRY CLASP

Charles Frankel, Brooklyn, N.Y., and Max Skobel, Edison, N.J., assignors to MSL Laboratories Inc., Iselin, N.J.

Filed May 22, 1975, Ser. No. 579,838
Int. Cl.² A44B *17/00*
U.S. Cl. 24—230 SL **9 Claims**

1. A jewelry clasp comprising

a female member having an opening therein;
a male member adapted to be inserted into said female member through said opening;
releasable locking means for engaging said male member to hold said male member to said female member;
said locking means including an integral one-piece locking member having a locking portion for engaging said male member, a resilient portion for biasing said locking portion against said male member, and an actuating portion for moving said locking portion relative to pressure of said resilient portion for releasing said male member to permit retraction of said male member from said female member;



holding means disposed within said female member for positioning said resilient portion relative to said female member;
said holding means including a hollow body element in alignment with said opening in said female member to receive and guide said male member through said female member;
said body element being provided with means to space said body element from internal sidewalls of said female member; and
said resilient portion of said locking member being disposed within the space provided between said body element and said internal sidewalls.

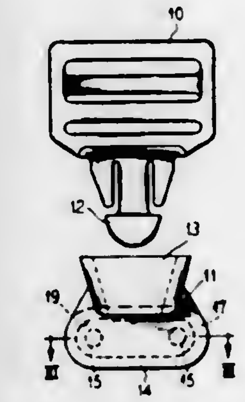
4,001,924
FITTING FOR ATTACHMENT TO A PIECE OF FABRIC

Sigurd Walter Bengtsson, Bruksgatan 17, 41451 Goteborg, Sweden

Filed June 10, 1975, Ser. No. 585,497

Claims priority, application Sweden, June 12, 1974, 7407732

Int. Cl.² A44B *19/00*
U.S. Cl. 24—230 F **8 Claims**



1. A buckle having a portion for being attached to fabric, comprising:

a. a first part having a side face for being disposed against one side of the fabric;
b. a second part having a side face for being disposed against the other side of the fabric;
c. at least one post extending from one of said parts for passing through the fabric into a bore in the other of said parts; and

d. a recess in one of said side faces and a raised portion of complemental shape on the other of said side faces extending about said at least one post and receivable in said recess, there being a peripheral clearance between said recess and said raised portion corresponding to the thickness of the fabric.

4,001,925
CUTTING TOOL

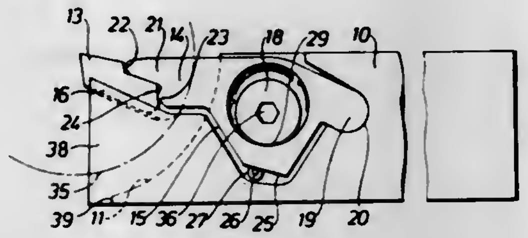
Stig-Lennart Eriksson, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Oct. 7, 1975, Ser. No. 620,404

Claims priority, application Sweden, Oct. 16, 1974, 7413006

Int. Cl.^{2} B26D *1/12*

U.S. Cl. 29—96 **7 Claims**



1. In a cutting tool such as a parting-off and recessing tool comprising a cutting insert and a tool holder therefor, said tool holder having a top face, a bottom, two opposed longitudinally extending side faces generally parallel to each other, a front and a back, said tool holder being provided at one of its side faces with a longitudinal recess, said longitudinal recess having a wall perpendicular to the top face of, and extending in the longitudinal direction of the tool holder and constituting an inner wall of said longitudinal recess, said longitudinal recess having a front part shaped as a support for the cutting insert and a main or back part containing a clamp, there being a bore extending transversely through said clamp and into the associated body of the tool holder, said bore being threaded in the holder for the reception of a screw, said bore terminating at the outer face of said clamp in a conical recess, said clamp being arranged as a lever forcing said cutting insert against said support, the clamp being held and operated by means of a screw in engagement with the tool holder, the improvement wherein screw (18) has a conical head (30), cooperating with the aforesaid conical recess (31) in the clamp (14), and a cylindrical shaft, said screw extending into the aforesaid bore from said outer face of said clamp and having an operating-key-receiving groove in the conical head so as to be operatively rotatable from the side face of said tool holder, wherein the clamp is supported by the aforesaid inner wall when the cutting insert is clamped in the tool holder, the cutting insert thus being fixed in its lateral position.

4,001,926
DOUBLE CLIPPER, SINGLE PISTON OPERATED DEVICE

Clyde R. Velarde, Raleigh, N.C., assignor to Rheem Manufacturing Company, New York, N.Y.

Continuation-in-part of Ser. No. 565,581, April 7, 1975. This application Mar. 18, 1976, Ser. No. 668,148

Int. Cl.^{2} B23P *11/00*

U.S. Cl. 29—243.56 **12 Claims**

1. An improved clip attachment device comprising, in combination:

a mounting frame;

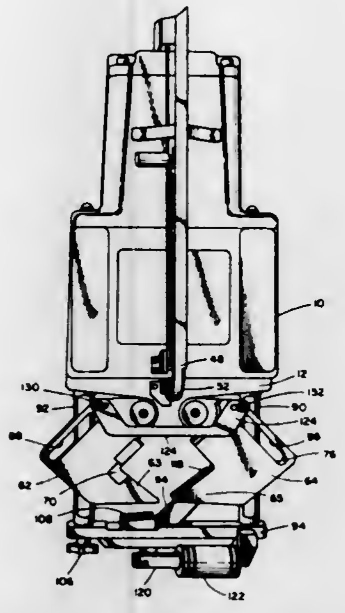
drive means mounted on the mounting frame, said drive means having a unitary drive shaft translatable between a projected position and a retracted position;

a punch for driving a clip, said punch attached to said drive shaft and translatable thereby between a retracted position and a projected clip fastening position;

clip ejection means for positioning a clip in the path of the punch means intermediate the retracted position and clip fastening position;

first and second gates pivotally attached to the mounting frame in opposed relation on opposite sides of the path of travel of the punch, one of said gates including a die for cooperation with said punch, said gates being pivotal between a closed position for clip attachment and an open position for release of clip material; and

first and second parallel linkage arms, each arm being attached to said drive shaft for movement parallel with the punch on opposite sides thereof, said first arm including cam drive means cooperative with the first gate to pivotably drive said gate from the open position to the closed position, the second arm including cam drive means cooperative with the second gate to pivotally drive said second gate from the open position to the closed position, said die being cooperative with the punch when the gates are both in the closed position to form a clip about material positioned and gathered by action of closing said gates.



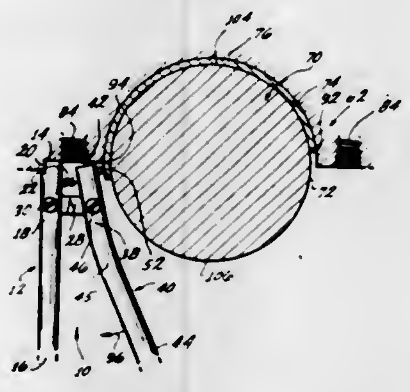
4,001,927
HAND TOOL FOR REMOVING A MOVABLE MEMBER FROM A CONFINED SPACE ADJACENT A FIXED MEMBER

Norman Edward Enderle, 4400 Glenn Cannon St., Bakersfield, Calif. 93308

Filed Sept. 2, 1975, Ser. No. 609,586

Int. Cl.^{2} B25B *27/02*

U.S. Cl. 29—267 **2 Claims**



1. A main bearing removal device for use with an engine having a block with at least one arcuate bearing seat, a crankshaft having a journal surface adjacent said arcuate bearing seat, an arcuate bearing shell in said arcuate bearing seat between said bearing seat and said crankshaft journal surface and at least one shoulder on said block adjacent said bearing seat for receiving one end of a bearing cap, said device comprising:

a first lever having a work-engaging end, an intermediate portion and a second end, said second end defining a grip portion, said first end being provided with a flat land and a shoulder for engaging said shoulder on said block, said intermediate portion being provided with an elongated bore;

a second lever having a work-engaging end, an intermediate portion and a second end, said second end defining a grip portion, said work-engaging end being provided with a blade having a major axis which is normal to the major axis of said second lever and which is adapted to engage said arcuate bearing shell, said intermediate portion of said second lever being provided with an elongated, transverse bore;

a link having a first end disposed in said bore in said first lever and a second end disposed in said bore in said second lever;

a first pin pivotably connecting said first end of said link to said first lever; and

a second pin pivotably connecting said second end of said link to said second lever.

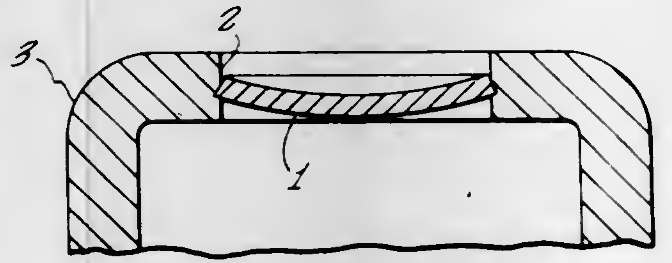
4,001,928
METHOD FOR PLUGGING AN APERTURE WITH A HEAT RECOVERABLE PLUG

Robert J. Schweiso, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 320,930, Jan. 4, 1973. This application June 3, 1975, Ser. No. 583,277

Int. Cl.^{2} B23P *11/02*

U.S. Cl. 29—447 **4 Claims**



1. A method of sealing an aperture comprising inserting into said aperture a heat-recoverable plug, said plug having been deformed from a heat-stable configuration it possesses in its austenitic state to a heat-recoverable configuration which it maintains while in its martensitic state, said plug having a transverse dimension smaller in its heat-recoverable condition than in its heat-stable condition and warming said plug to a temperature above a transition temperature at which it reverts from its martensitic state to its austenitic state whereby the transverse dimension of said plug increases and the circumference of said plug is brought into sealing contact with the walls of said aperture.

4,001,929
METHOD OF CONSTRUCTING A MEDICAL NEEDLE HOLDER ASSEMBLY

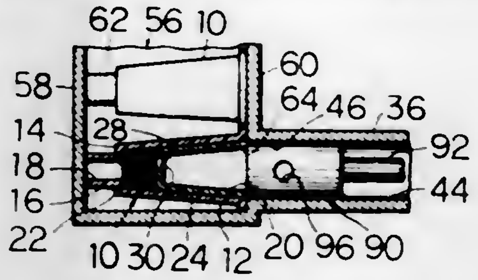
Soji Ishikawa, No. 8-5, 1-chome, Kamata, Setagaya, Tokyo, Japan

Filed Aug. 7, 1975, Ser. No. 602,740

Int. Cl.^{2} B23P *11/02*

U.S. Cl. 29—451 **6 Claims**

1. A method of assembling together a generally tubular needle holder, a filter element composed of a wad of a predetermined length of filament yarn of synthetic resin and a generally tubular filter retainer adapted to be received in said needle holder with said filter element fitted in the needle holder, comprising (1) feeding said needle holder and said filter retainer into respective predetermined positions longitudinally spaced apart from and aligned with each other and feeding said filament yarn into a predetermined position intermediate between said predetermined positions of said needle holder and said filter retainer, (2) producing a unidirectional stream of air flowing from said predetermined position of said filament yarn toward said predetermined position of said filter retainer for moving the filament yarn from said predetermined position thereof toward the filter retainer in said predetermined position thereof until the filament yarn is forced in the form of a tangle against the foremost end of said filter retainer, (3) moving said filter retainer from said predetermined position thereof toward said needle holder in said predetermined position thereof with said tangle of said filament yarn carried on the foremost end of said filter retainer, and (4) forcing the filter retainer into said needle holder in said predetermined position thereof so that the tangle of the filament yarn is compacted into wad form within said needle holder.



4,001,930
METHOD FOR REDUCING HARMFUL STRESSES IN LAYERS APPLIED BY THERMAL SPRAYING

Eggert Tank, Fellbach, and Franz Pigisch, Beutelsbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 18, 1972, Ser. No. 316,060

Claims priority, application Germany, Dec. 17, 1971, 2162700

Int. Cl.^{2} B23P *3/20*

U.S. Cl. 29—460 **36 Claims**

1. A method for reducing harmful stresses in at least one layer applied on a metallic structural part by thermal spraying, which at least one layer has a thickness which causes the harmful stresses, comprising the step of providing partition members on said metallic structual part to subdivide the at least one layer applied in planes extending perpendicularly to the surface of the metallic structural part so as to reduce the harmful effects of such stresses.

4,001,931
WIRE TERMINATION METHOD

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

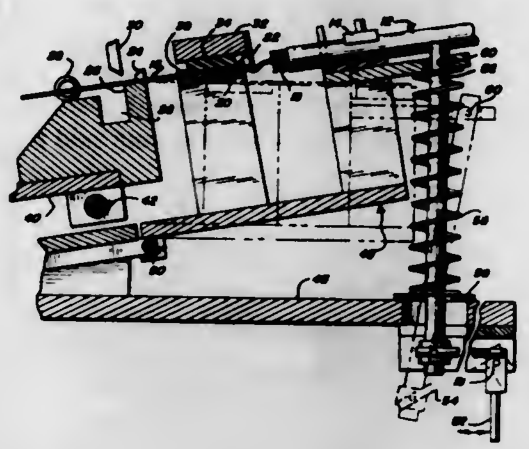
Division of Ser. No. 502,085, Aug. 30, 1974, abandoned. This application June 9, 1975, Ser. No. 585,308

Int. Cl.^{2} H01R *43/04*

U.S. Cl. 29—628 **4 Claims**

1. In a method for simultaneously effecting solderless terminations of a plurality of wires in a multi-wire connector having a wire gripping terminal disposed within each of a plurality of wire-securing channels, the steps comprising spreading said wires to the relative interval to be assumed when terminated in such multi-wire connector, cutting said wires to be terminated to length, maintaining the cut wires in fixed position with the intervals therebetween substantially equal to the intervals between the connector wire-receiving channels, locating a multi-wire connector adjacent said wires with the wire-receiving channels therein in substantial alignment with such positioned wires, effecting relative movement between said connector channels and said wires in a direction transverse to the

longitudinal axes of said wires so as to have said wires enter said channels with which aligned and have wires confined within the channels of said connector, and engaging and driving said wires after said wires are confined within said channels by means of wire-driving means so as to drive said wires into said terminals in said connector channels to effect termination of said wires in said connector terminals.



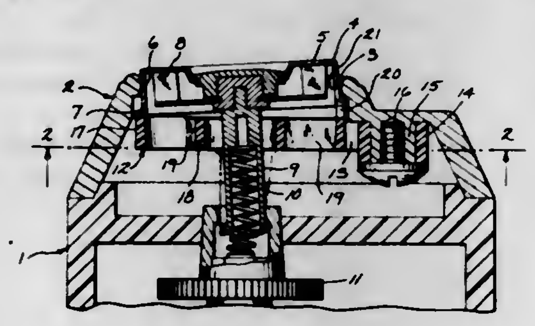
4,001,932
ROTARY SHAVER WITH SHEAR PLATE ROTATION PREVENTING MEANS

Wallace D. Herrick, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 271,798, July 14, 1972. This application Nov. 17, 1972, Ser. No. 307,517

Int. Cl.² B26B *19/16*

U.S. Cl. 30—43.5 **3 Claims**



1. A dry shaver comprising:
- **a. a shaver housing including a shaving head having at least one opening therein,**
- **b. a shear plate disposed within said opening and adapted for tilting relative thereto and with the edge of said opening forming a fixed outer stop therefor, said shear plate including a cylindrical wall,**
- **c. a floating rotary cutting element disposed within said shear plate and tiltably supporting the latter,**
- **d. a rigid fixed inner shear plate stop member removably secured in said head,**
- **e. and cooperative interlocking means on said shear plate and on said fixed stop member to prevent shear plate rotation at any tilted position thereof during rotation of said cutting member, said interlocking means comprising:**
  - **1. recess means comprising at least one notch formed in said cylindrical wall,**
  - **2. and a fixed projection formed in said rigid stop member and disposed within said notch, said fixed projection comprising a post of fixed length disposed within said notch throughout the full range of floating shear plate positions,**
- **f. said stop member including an inner transverse planular portion from which said post extends,**
- **g. the length of said post being such that said shear plate will, upon inward floating movement, engage said inner transverse planular portion before said post can bottom within said notch.**

3. A dry shaver comprising:
- a. a shaver housing including a shaving head having at least one opening therein,
- b. a shear plate disposed within said opening and adapted for tilting relative thereto and with the edge of said opening forming a fixed outer stop therefor, said shear plate including a cylindrical wall,
- c. a floating rotary cutting element disposed within said shear plate and tiltably supporting the latter,
- d. a rigid fixed inner shear plate stop member removably secured in said head,
- e. and cooperative interlocking means on said shear plate and on said fixed stop member to prevent shear plate rotation at any tilted position thereof during rotation of said cutting member, said interlocking means comprising:
  - 1. recess means comprising at least one notch formed in said cylindrical wall,
  - 2. and a fixed projection formed in said rigid stop member and disposed within said notch, said fixed projection comprising a post of fixed length disposed within said notch throughout the full range of floating shear plate positions,
- f. said stop member including an inner transverse planular portion comprising inner and outer concentric. rings which are joined together,
- g. said post extending from said outer ring.

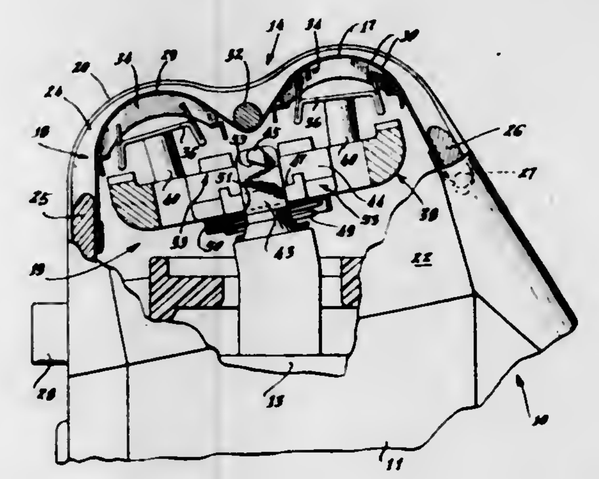
4,001,933
CUTTER DRIVE ARRANGEMENT FOR AN ELECTRIC DRY SHAVER

Peter A. Czerner, Trumbull, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 4, 1975, Ser. No. 583,612

Int. Cl.² B26B *19/02*

U.S. Cl. 30—43.92 **12 Claims**



1. An inner cutter drive assembly for an electric dry shaver having cutter drive means for operating an inner cutter relative to an outer cutter, said assembly comprising,
- a. a motor driving arm carrying projections thereon;
- b. a driven plate member for carrying the inner cutter and adapted for engagement with said driving arm to be driven thereby;
- c. spring means disposed on said driving arm and operable to urge the plate member in a direction to resiliently maintain the inner cutter in engagement with the outer cutter;
- d. a slot formed in the plate member for slidably receiving the driving arm, the walls of the slot being shaped and dimensioned to prevent rotation of the arm therein; and
- e. ledges formed in the walls of the slot for engaging said driving arm to effect driven movement of the plate member, said ledges further being formed to seat the projections of the driving arm thereon to interlock the plate member thereto.

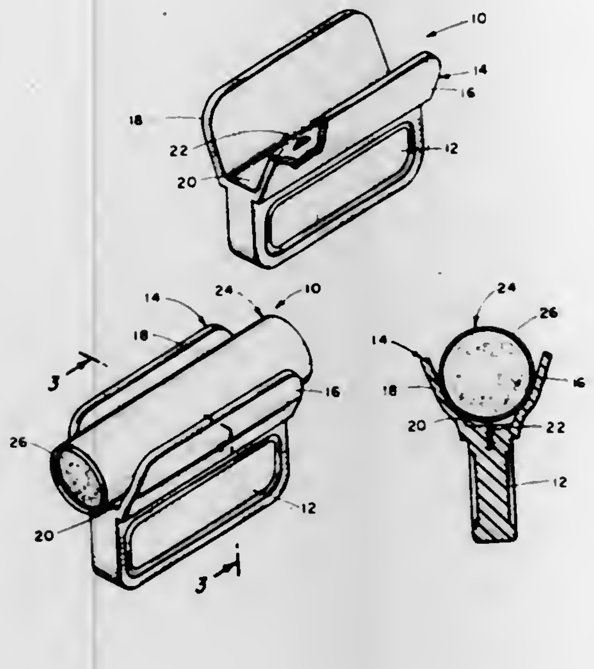
4,001,934
COIN ROLL CUTTER

Robert G. Bell, 300 Rolling Oaks Drive, Apt. 167, Thousand Oaks, Calif. 91360

Filed July 10, 1975, Ser. No. 594,866

Int. Cl.² B25F *3/00*; B26B *3/00*

U.S. Cl. 30—124 **4 Claims**



1. A cutter for coin rolls comprising:
- a base, said base being adapted to be grasped by a person's hand;
- a bifurcated section divided into a first leg and a second leg, a receiving chamber located between said legs;
- a knife blade connected to said base and extending within said receiving chamber, said blade adapted to contact the paper roll of a coin roll that is placed within said receiving chamber and as said cutter is moved longitudinally along the coin roll the paper roll is severed, said first leg and said second leg being formed of a material of construction so as to permit automatic deflection of said legs in respect to said base to accomodate different sizes of coin rolls by said legs spreading apart when a larger diametered coin roll is inserted within said receiving chamber and upon removal of the coin roll the legs automatically return to the undeflected state.

4,001,935
ROVING CUTTER

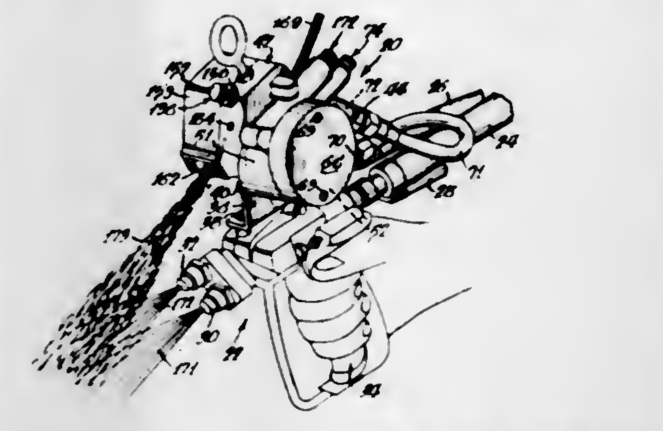
Duane D. Krohn, Westminster, and Samuel W. Culbertson, Arvada, both of Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed June 12, 1975, Ser. No. 586,206

Int. Cl.² B26B *17/00*; B25F *3/00*

U.S. Cl. 30—128 **11 Claims**

1. A roving cutter comprising an integrated air motor and cutting means driven thereby, characterized by:
- a unitary mounting plate located between the air motor and the cutting means, said mounting plate defining part of an air motor rotor cavity on one side thereof and mounting means for the cutting means on the other side thereof.
- said air motor including a hollow body having an opening therein mounted on said one side of said plate and defining therewith an air motor rotor cavity, a rotor rotatably mounted in said cavity and having a shaft rotatably supported in and extending through said plate to said other side thereof, air passages in said body and said plate for



  conducting compressed air to said cavity for driving said rotor.
- said cutting means including a cutter roller mounted on said shaft at said other side of said mounting plate and driven thereby, a back-up roller rotatably mounted on said mounting plate at said other side thereof in parallel relation to said cutter roller, and means on said other side of said mounting plate for feeding roving between said cutter roller and said back-up roller, said cutter roller cooperating with said back-up roller to cut the roving into short segments.

4,001,936
CARPET CUTTER

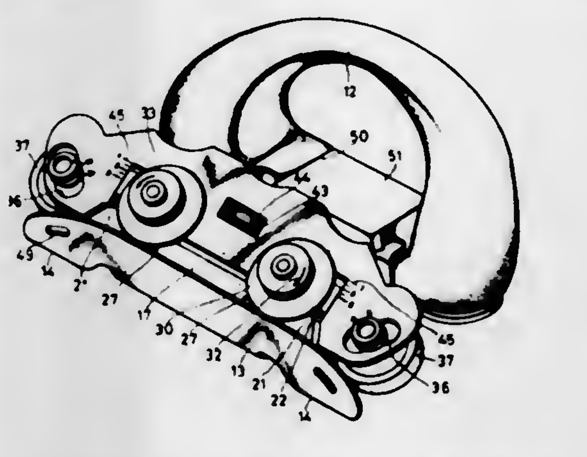
Katsumi Matsushita, Sakai, Japan, assignor to Kabushiki Kaisha Toa Interia (Toa Interior Co., Ltd.), Osaka, Japan

Filed Nov. 14, 1975, Ser. No. 631,958

Claims priority, application Japan, Nov. 21, 1974, 49-134566

Int. Cl.² B26B *29/00*

U.S. Cl. 30—287 **4 Claims**



1. A carpet cutter for cutting a carpet to the size or configuration of a room comprising:
- a bed plate adapted to be slid on the carpet,
- a grip fixedly mounted on said bed plate along the rear edge thereof,
- a guide plate extending upward from the front edge of said bed plate and having its ends projecting beyond the ends of said bed plate,
- a slanting plate secured on the bed plate in the rear of said guide plate with its lower front edge adjacent to said guide plate,

- a blade mounting plate fixedly mounted on said slanting plate at the lower front portion thereof,
- an opposed pair of cutting blades mounted on said blade mounting plate at the ends thereof, said blades each being secured in position by tightening a clamping nut on a stud bolt projecting from said blade mounting plate,
- a roller mounting plate mounted on said slanting plate at the upper rear portion thereof above said blade mounting plate to be slidable along the surface of the slanting plate, said roller mounting plate forming with said guide plate a space into which the carpet is inserted for cutting,
- an opposed pair of presser rollers rotatably mounted on the underside of said roller mounting plate at the ends thereof so as to roll on the carpet during cutting, and
- roller position adjusting means providing in the center of said slanting plate for sliding said roller mounting plate up and down the slanting plate to adjust the position of said presser rollers according to the thickness of the carpet to be cut.

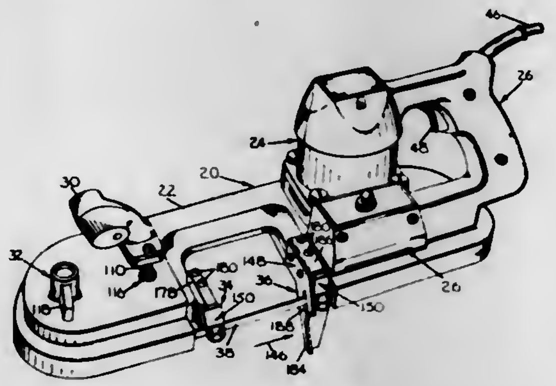
4,001,937
PORTABLE POWER DRIVEN BAND SAW

Charles R. Stelljes, Fayetteville, and Lars Frostad, Syracuse, both of N.Y., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1975, Ser. No. 571,969

Int. Cl.² B27B *13/08*

U.S. Cl. 30—380 **7 Claims**



1. A portable, hand-manipulated band saw comprising, a driving pulley and an idler pulley, a continuous band-type saw blade mounted on said pulleys, motor drive means connected to said driving pulley, tension control means connected to said idler pulley, handle means and motor control elements, blade guide means providing a blade cutting plane rotated relative to a plane tangent to the peripheries of the pulleys, and a frame means supporting said pulleys, said motor drive means, said tension control means, said handle means and said blade guide means, said frame means providing cutting capacities wherein blade depth penetration at full width of cut and rip cut width capacity are each at least 50% of the diameter of said pulleys, a pair of blade guide roller assemblies for twisting the blade in order to give greater cutting capacities of said band saw, each said guide roller assembly comprising a pair of roller assemblies at an end of the cutting run of the blade mounted on a roller holder, each said roller assembly comprising a guide and a low friction bearing mounted on a bolt, said guide having stepped outside dimensions, the larger of which is approximately equal to the outer dimension of said bearing, and said roller holder being adjustably fixed to said band saw.

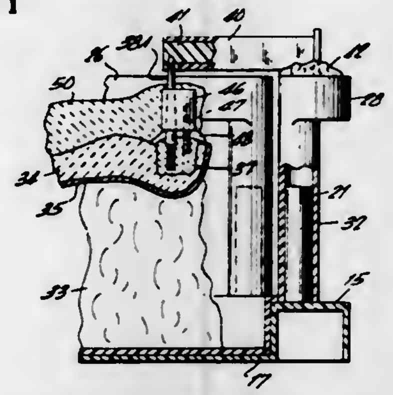
4,001,938
DENTAL RESTORATION JIG

Abraham J. Cooper, 348 Country Club Lane, Pomona, N.Y. 10970

Division of Ser. No. 379,856, July 16, 1973, Pat. No. 3,871,804. This application Dec. 11, 1974, Ser. No. 531,473

Int. Cl.² A61C *13/00*

U.S. Cl. 32—11 **2 Claims**



1. A dowel assembly for casting models of individual tooth impression into dental impression tooth recesses comprising an alignment sleeve having spaced first and second bores therein, a rigid dowel pin received within a first bore and extending therethrough, and adapted to extend into an individual tooth recess, and a rigid alignment pin received within the second bore and extending therefrom and adapted to extend into the said individual tooth recess.

4,001,939
TOOTH-FILLING MATERIAL BASED ON SYNTHETIC PLASTICS MATERIAL

Albert Gross, Frankfurt, Germany, assignor to Kulzer & Co. GmbH, Bad Homburg, Germany

Continuation of Ser. No. 140,279, May 4, 1971, abandoned, which is a continuation of Ser. No. 751,357, Aug. 9, 1968, abandoned. This application Nov. 20, 1972, Ser. No. 308,084

Claims priority, application Germany, Aug. 19, 1967, K 63146

Int. Cl.² A61K *5/06*

U.S. Cl. 32—15 **38 Claims**

1. In a tooth-filling and dental fixing material based on a polymerisable acrylate liquid, an acrylate polymer in powder form, a polymerisation catalyst and an accelerator on the basis of a redox system, the improvement which comprises as a component for said material for increasing adhesion thereof, at least one hydroperoxide of the general formula ROOH or a compound from which such a hydroperoxide is formed in situ, in which R is an optionally substituted alkyl radical, the bonding with the OOH-group being effected by way of a primary, secondary or tertiary carbon atom.

4,001,940
ELASTIC POSITIONER APPARATUS FOR ORTHODONTISTS

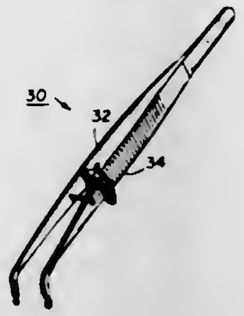
Anthony J. Cusato, Closter, N.J., assignor to Henry Mann, Inc., Huntingdon Valley, Pa.

Filed Feb. 19, 1975, Ser. No. 550,983

Int. Cl.² A61C *3/00*

U.S. Cl. 32—40 R **2 Claims**

1. An elastic band positioner having a tweezer configuration with two leg members attached at one end and with the other ends of the legs in a free condition, the positioner particularly for use by orthodontists for receiving, mounting and retaining small elastic bands during expansion, positioning and placing of these bands on arch wire retaining brackets, between teeth and for like uses, said band positioner including: (a) a reduced end portion formed on each of the free ends of the legs and of a reduced size, this pair of legs and these ends movable toward and away from each other in a common plane; (b) a contoured configuration formed on each of the ends of the legs and formed so as to be mirror images of each other and when in a closed side-by-side relationship each leg end provides essentially one-half of an ovoid-shaped configuration whose maximum diameter is easily forced through the passageway of a small elastic band to be mounted and positioned on the closed ovoid-shaped ends of the legs, this ovoid configuration when the legs are in closed condition extending away from the attached ends of the legs and with the curved surface providing a cam and guide for the entrance of the contoured ends to and through the aperture in the elastic bands; (c) a reduced diameter groove formed in the leg ends, this groove immediately adjacent the ovoid configured ends and transverse of a plane bisecting the space between the legs, said groove sized to receive and retain said small elastic band when mounted therein; (d) a shoulder formed on each leg end adjacent this groove, this shoulder providing a stop for inhibiting the unwanted upward travel of the band when placed in said groove, and (e) means for manually moving the legs to an apart condition whereat the mounted band is brought to an expanded condition after which the legs are brought to a closed condition for removal of the band to and on the tooth of the patient, said means including a cam block pivotally carried by one leg of the tweezer and swingable in an arc whose axis is normal to the axis of the leg and in which the other end of the cam block has a cam portion adapted to engage the underside of the opposite leg, this cam block being manipulated from a closed to an open position by means of a manually engaged bar member, one end of said cam block being carried by a spring bar member secured at one end to the leg of the tweezer and with the other end of the spring bar member pivotally retaining and carrying the cam block.



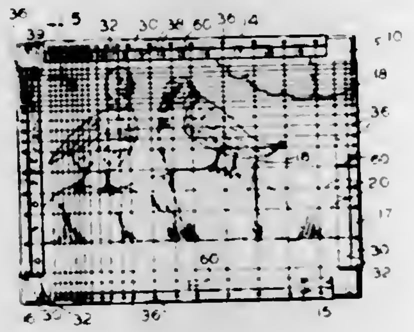
4,001,941
GRAPHIC REPRODUCTION APPARATUS

Gustavo Joel Cruz, 2224 NW. Johnson St., Portland, Oreg. 97210

Filed Apr. 21, 1975, Ser. No. 569,830

Int. Cl.² B43L *13/00*

U.S. Cl. 33—1 K **3 Claims**



1. In a graphic reproduction apparatus,

- canvas means including a rectangular frame and a canvas on the frame,
- a plurality of fastening means,
- two pairs of elongated, generally C-shaped mounting clips extending over a substantial portion of the frame, said clips having strip-like jaw portions and loop-like spring portions connecting the jaw portions and adapted to temporarily clip to the front and back of the two pairs of opposite edge portions of the frame and rigidly secured to and each clip carrying a plurality of spaced apart fastening means,
- and a plurality of highly stretchable elastic strings each secured under tension to a pair of the fastening means, on the opposite clips the strings extending at right angles to each other to form a grid over the canvas, whereby the strings can be temporarily deflected to clear an area on the canvas for working thereon.

4,001,942
ROD EXTENSOMETER

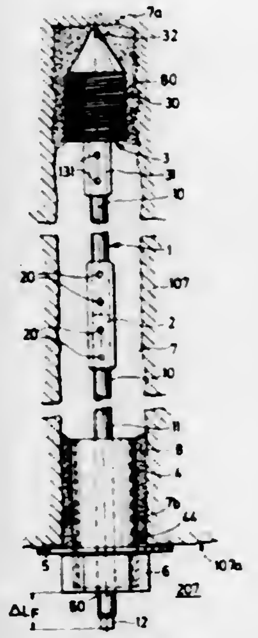
Fritz Schuermann, Hattingen; Herbert Müller, and Horst Böddicker, both of Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed May 29, 1975, Ser. No. 582,417

Claims priority, application Germany, May 30, 1974, 2426088

Int. Cl.² G01B *5/00*

U.S. Cl. 33—125 B **6 Claims**



1. An extensometer for mounting in a bore having an outer end portion at the face of a mass of rock, ore, or similar material and an inner end portion remote from said outer end portion, said extensometer serving to measure the shifting of said material and comprising: an elongated rigid rod extending between said end portions and comprised of a plurality of aligned rod sections and at least one sleeve rotationally rigidly coupling said sections together, said rod having an inner end at said inner end portion and an outer end at said outer end portion; a head fixed on said inner end and integrally formed with a threaded external surface and with a generally conical tip turned away from said outer end, said head being adapted to be fixed at said inner end portion and said tip being adapted to break an adhesive cartridge; a sleeve spacedly surrounding said outer end and adapted to be fixed in said outer end portion remote from said head; a washer surrounding said sleeve and lying against said face; means including a nut threaded on said sleeve and bearing on said washer for pressing same against said face, said outer end projecting through said washer, said sleeve, and said means; and a polygonal formation on said outer end engageable by a tool for rotation of said head.

4,001,943
VARIABLE INVOLUTE DISC GAUGE

Henry J. Flair, Franklin Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

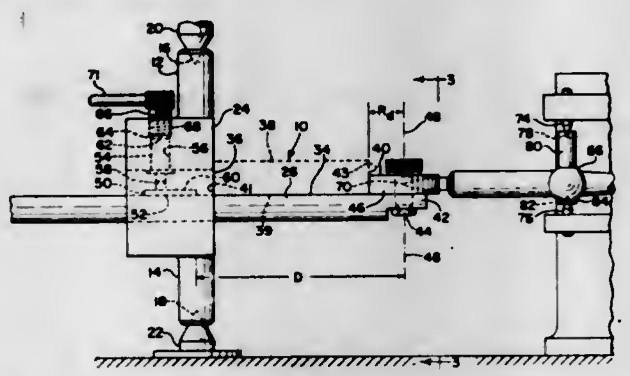
Filed Jan. 30, 1976, Ser. No. 653,914

Int. Cl.² G01B *05/00*

U.S. Cl. 33—174 R **8 Claims**

1. An involute checking gauge for verifying that a gear checking instrument is operational for use with a multitude of gear base diameters over a predetermined range of base diam-

eters wherein said instrument includes a rotation means which provides rotation of an object in engagement therewith abcut an axis of rotation, and a sensing means; and said gauge comprises engagement means for engaging said rotation means so that said gauge is rotated by said rotation means, said engagement means including a section having a passageway therethrough and a first substantially flat surface, substantially parallel to the axis of rotation of said rotation means, an elongated arm slideably extending through said passageway and having a substantially flat second surface that makes substantially a right angle with said first surface, and a substantially cylindrically shaped disc secured to an outer end of said arm so that the longitudinal axis of said disc is substantially normal to said second surface and so that the periphery of said disc extends beyond said outer end of said arm and into contact with said sensing means and locking means for selectively locking said arm so that it does not move relative to said section when a predetermined distance between said first surface and the longitudinal axis of said disc has been established.



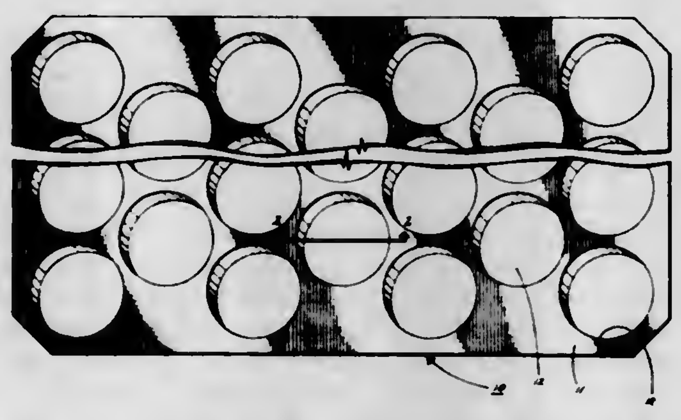
4,001,944
FREEZE-DRYING PROCESS

David C. Williams, Royal Oak, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Aug. 25, 1975, Ser. No. 607,306

Int. Cl.² F26B *5/06*

U.S. Cl. 34—5 **6 Claims**



1. The process of freeze-drying parenteral aqueous liquid by means of a tray-shaped unitary block of heat-conducting metal having a plurality of spaced cavities therein each adapted to receive a container supported in a close fit so that the spacing between the containers is occupied substantially only by the heat-conducting metal, comprising the steps of

distributing said liquid within containers in cavities of the block to a depth such that for heat transfer the body of liquid in each container is substantially confined within the block,

subjecting the block to nitrogen bath cooling to freeze the liquid in a short period less than about one hour, thereby freezing the liquid in each container at substantially the same rate,

and drying the frozen product under vacuum while confined within the block so that the frozen product in each container is dried in less than about 4½ days at substantially the same rate.

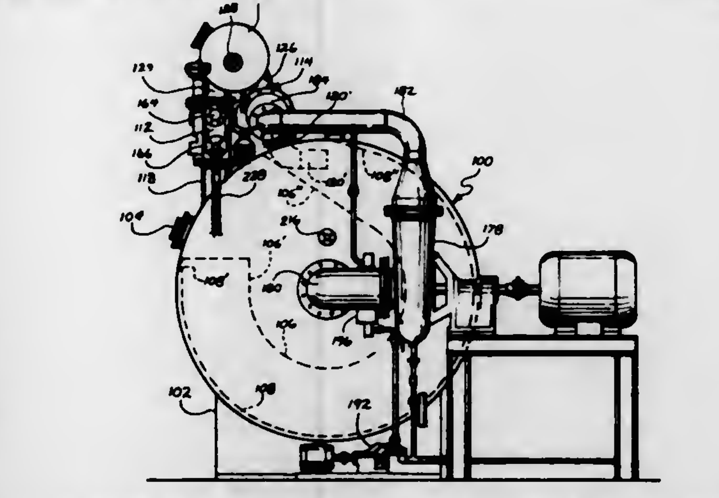
4,001,945
WET PROCESSING MEANS

Christoph W. Aurich, Clemson, S.C., and James Keith Turner, Lincolnton, N.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Division of Ser. No. 381,268, July 20, 1973, Pat. No. 3,921,420, which is a continuation-in-part of Ser. No. 318,087, Dec. 26, 1972, abandoned. This application Sept. 24, 1975, Ser. No. 616,152

Int. Cl.² F26B *13/00*

U.S. Cl. 34—155 **3 Claims**



1. In apparatus adapted for wet processing textile strand material in which means is included for causing the strand material to circulate in traveling strand form to and from a pleated accumulation within an enclosure for such processing, the improvement which comprises an extraction jet disposed between the point of strand circulation from said pleated accumulation and said circulating means for subjecting the circulating strand material to an aspirating influence directed oppositely to the direction of strand material circulation, means for selectively supplying an inert gas to said jet to generate an aspirating influence thereat for extracting said strand material following wet processing and means for application of a suction influence ahead of said extraction jet.

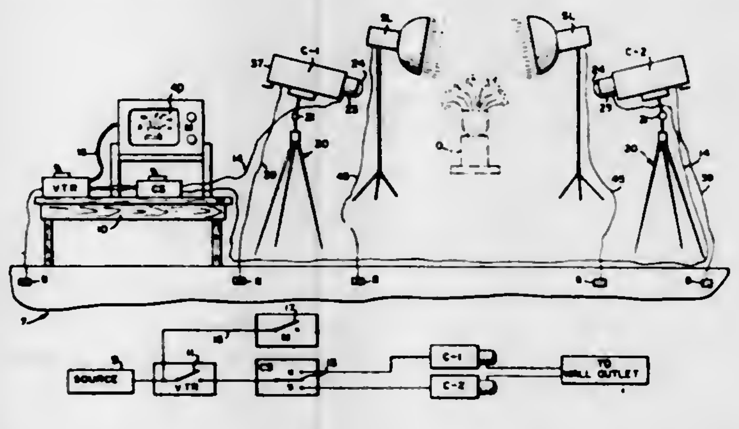
4,001,946
TELEVISION EDUCATIONAL GAME

Luke Procopio, 239 Windsor Way, Hillside, N.J. 07205

Filed Feb. 18, 1975, Ser. No. 550,873

Int. Cl.² G09B *5/00*

U.S. Cl. 35—8 R **11 Claims**



1. A training device and game for simulating the televised production of a television show which comprises: a source of energy

miniature components in the form of and simulating components employed in a television production, said simulated miniature components including

a video tape recorder,

means for connecting said video tape recorder to a source of energy,

a monitor cooperatively associated with said video tape recorder,

a camera switch cooperatively associated with said connecting means,

at least one camera responsive to the activation of said camera switch, and

an object to be televised by said camera.

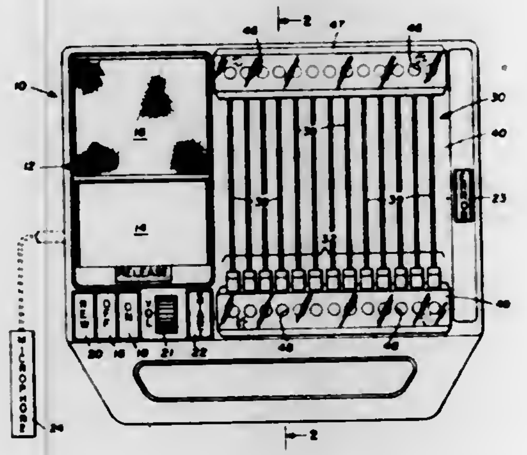
4,001,947
TEACHING SYSTEM

Jack S. Kilby, 7723 Midbury, Dallas, Tex. 75230

Continuation of Ser. No. 154,493, June 18, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,884

Int. Cl.² G09B *7/02*

U.S. Cl. 35—9 B **3 Claims**



1. The teaching system comprising:

first record means for storing signals including audio signals and data signals,

second means for recording a question on the record means,

third means under the control of a teacher for recording a data signal on the record means representative of the correct multiple character alphanumeric answer including

a predetermined number of reusable alphanumeric character display means each controlled by an independently movable character selector and each being capable of displaying any one of the entire set of selectable characters to the teacher, each being capable of displaying the selected character to the teacher until changed by movement of the respective selector, and

means for producing an encoded data signal representative of a character represented by the position of the respective selector,

fourth means for reproducing the signals stored on the record means as electrical signals,

fifth means for converting the electrical signals to audio signals to pose the question to a student,

sixth means under the control of a student for composing a multiple character alphanumeric answer including

a corresponding number of reusable alphanumeric character display means each controlled by an independently movable character selector and each being capable of displaying any one of the entire set of selectable characters to the student until changed by movement of the selector, and

encoding means for producing a signal representative of the position of each of the selectors, and

seventh means for comparing the encoded answer and the answer represented by the data signal.

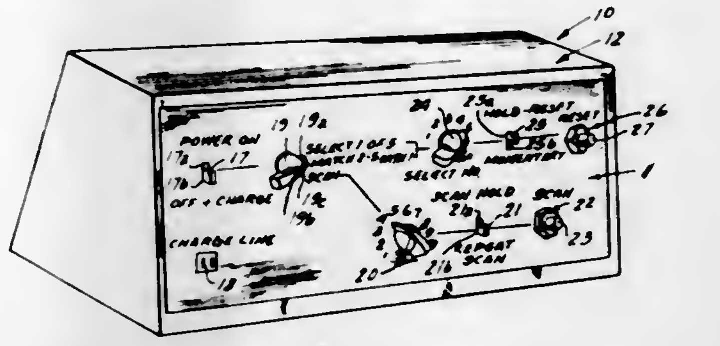
4,001,948
LIGHT RESPONSE TEACHING SYSTEM

Stanley Wolfe, P.O. Box 205, Booneville, Ark. 72927

Filed Sept. 29, 1975, Ser. No. 617,836

Int. Cl.² G09B *7/06*

U.S. Cl. 35—9 R **8 Claims**



1. A light response teaching device adapted for training pupils by selectively illuminating a plurality of learning indicia cards, comprising:

a. a display circuit means having illumination means adjacent a plurality of panels for illuminating a single learning indicia card received by each panel;

b. scanning circuit means for causing said illumination means to sequentially illuminate said learning indicia cards according to a pre-arranged pattern;

c. match and select circuit means having a panel select switch and also including a card selection switch adjacent each of said panels,

i. said match and select circuit means causing said display circuit means to illuminate the panel preselected by said panel select switch when one of said card selection switches is activated by the pupil, and

ii. said match and select circuit means also causing one of said panels to remain illuminated and causing said display means to illuminate one of the other panels preselected by said panel select switch when one of said card selection switches is activated by the pupil;

d. a mode selection circuit means connected to said display circuit means, scanning circuit means, and match and select circuit means and being effective to alternately preselect a matching, selecting, and scanning mode of operation; and

e. power supply means connected to at least one of said display, scanning, match and select, and mode selection circuit means for supplying power to all of said circuit means.

4,001,949
DYNAMIC FIRE SIMULATOR AND TRAINER

David N. Francis, Marinette, Wis., assignor to The Ansul Company, Marinette, Wis.

Filed May 9, 1975, Ser. No. 576,218

Int. Cl.² G09B *9/00*

U.S. Cl. 35—10 **12 Claims**

1. A method of providing realistic on-line fire responses in accordance with the accuracy of an on-line fire fighting sequence employed by a fire fighter, comprising the steps of:

dynamically simulating the image of an actual fire;

projecting said simulated fire image on a screen;

establishing a predetermined fire fighting sequence to be followed by the fire fighter for properly extinguishing the simulated fire;

loading said predetermined fire fighting sequence in the memory of a computer;

applying an input to said image projected on said screen in accordance with the on-line fire fighting sequence employed by the fire fighter in fighting said simulated fire;

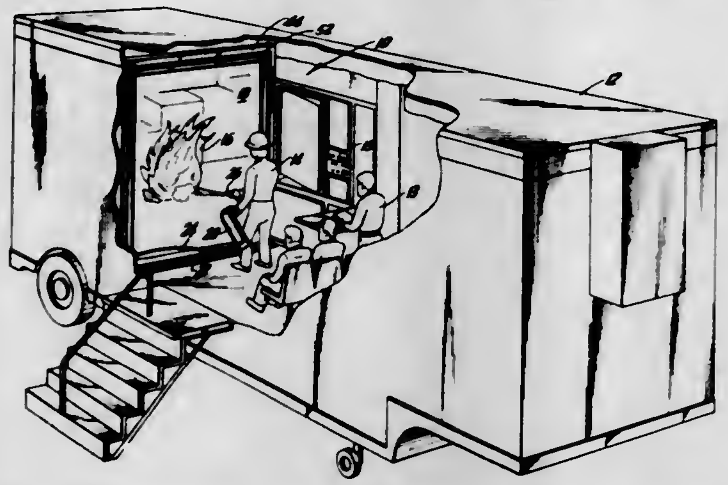
monitoring said on-line fire fighting sequence employed by the fire fighter in fighting said simulated fire;

determining the points of application of said on-line input by said fire fighter;

supplying data to said computer in accordance with said on-line fire fighting sequence employed by said fire fighter;

comparing said actual fire fighting sequence and said points of application of the on-line input by the fire fighter with the predetermined fire fighting sequence stored in the computer; and

changing the projected image of the simulated fire in accordance with the on-line input of the fire fighter and the predetermined fire fighting sequence stored in the computer.



4,001,950
RESUSCITATION TRAINING APPARATUS

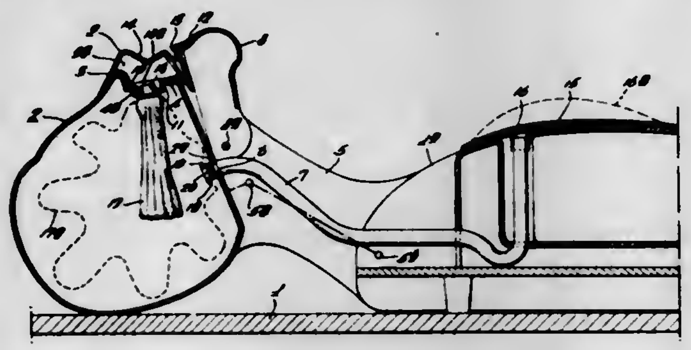
Hans Christian Blumensaadt, Virum, Denmark, assignor to Testa-Laboratorium A/S, Copenhagen, Denmark

Continuation-in-part of Ser. No. 178,362, Sept. 7, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,383

Claims priority, application Sweden, Feb. 26, 1971, 12211/71; Apr. 10, 1972, 4603/72

Int. Cl.² G09B *23/28*

U.S. Cl. 35—17 **38 Claims**



1. Apparatus for practicing resuscitation, comprising: a simulated head portion including a shell enclosing a cavity and having an air opening and an outlet opening, a mask detachably covering said shell adjacent said air opening and having an opening communicating with said air opening, said shell and said mask providing members of said simulated head portion, an air-impervious collapsible bladder extending into said cavity and having a portion with a bladder opening, said bladder being held by at least one of said members with the bladder opening in communication with the opening in said mask, and lung simulating means offering resistance to insufflation corresponding to the resistance of the human lungs to insufflation and responsive to air displaced from said cavity through said outlet opening by insufflation of said bladder for indicating proper insufflation, said apparatus having a primary air system including said bladder and a secondary air system including said lung simulating means responsive to air displaced from said cavity, said bladder separating the primary air system from the secondary air system and being formed to be filled with air to a volume without offering appreciable resistance at least as large as required to cause said lung simulating means to indicate proper insufflation, whereby a rise in air pressure in the primary air system is transferred without appreciable loss to said secondary air system to provide uniformity of operation for indicating proper insufflation by any user of said apparatus.

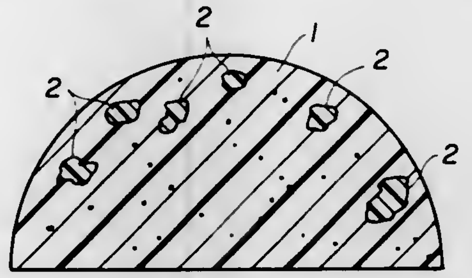
4,001,951
BREAST CANCER DETECTION TRAINING DEVICE

Wolfgang G. Fasse, 2556 Legion St., Box K, Bellmore, N.Y. 11710

Filed Mar. 25, 1975, Ser. No. 561,791

Int. Cl.² G09B *23/30*

U.S. Cl. 35—17 **10 Claims**



1. A training device for facilitating the detection of human breast cancer, comprising a body of an elastically yielding material having a given firmness and a plurality of lumps of varying hardness, sizes and configurations permanently embedded in said elastically yielding material at locations where cancer nodules are naturally located, said lumps having a firmness larger than said given firmness, said lumps further resembling, due to said varying hardness, sizes, and configurations, nodules of breast cancer cells said device further comprising an air-tight elastically yielding envelope surrounding said elastically yielding body, and air supply means connected to said body for adjusting the firmness of said body, whereby the location of said lumps may be emphasized by adjusting the air pressure in said body.

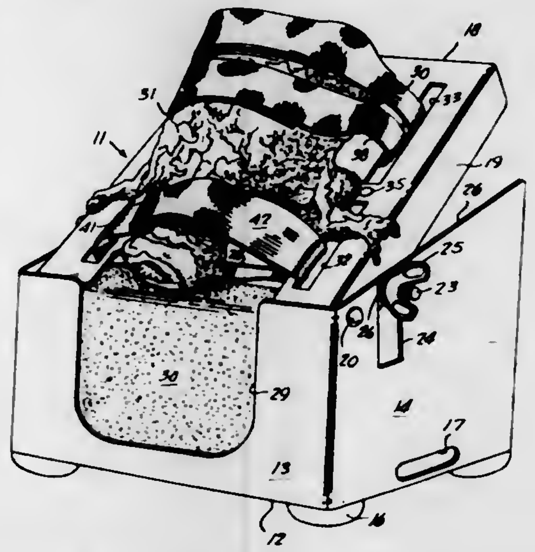
4,001,952
HYSTEROSCOPY TEACHING AID

Trygve M. Kleppinger, 1300 Lancaster Pike, Reading, Pa. 19607

Filed Oct. 24, 1975, Ser. No. 625,384

Int. Cl.² G09B *23/30;* **A61G** *13/00*

U.S. Cl. 35—17 **14 Claims**



1. An anatomical display device comprising a box-like base having upstanding front and side walls, a stage member pivoted to the upper front corner portions of the side walls, means to clamp the stage member in pivotally adjusted position, and flexible strap means connected to opposite side marginal portions of the stage member for holding an anatomical specimen on the stage member.

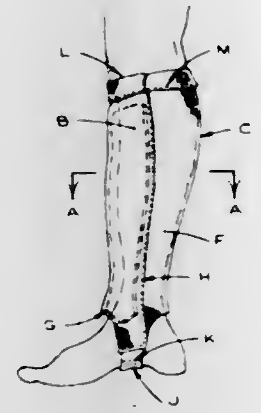
4,001,953
PROTECTIVE GAITER

Albert Lee Fugere, 4901 - 17th Ave. S., Seattle, Wash. 98108, and Michael Joseph Kelly, 808 NE. 82nd, Seattle, Wash. 98115

Continuation-in-part of Ser. No. 461,156, April 15, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,551

Int. Cl.² A41D *17/00, 13/00*

U.S. Cl. 36—2 R **11 Claims**



1. A protective gaiter, comprising:

an elongated first fabric section having an outline which includes an upper edge, a lower edge and two longitudinal edges extending therebetween, said lower edge comprising two straight edge portions and an intermediate edge portion, said intermediate edge portion being concavely shaped, said lower edge being adapted to extend over a portion of a wearer's foot when the gaiter is in place on the wearer's leg;

a second fabric section substantially identical in outline to said first fabric section;

means securing said first fabric section to said second fabric section substantially around the respective outlines thereof, thereby defining a completely enclosed pocket between said first and second fabric sections;

a third fabric section having upper and lower edges and two longitudinal edges extending therebetween;

means securing one longitudinal edge of said third fabric section along the length thereof to one longitudinal edge of said first and second fabric sections, and means securing the other longitudinal edge of said third fabric section along the length thereof to the other longitudinal edges of said first and second fabric sections, said third fabric section, when so secured to said first and second fabric sections, extending from the upper edge of said first and second fabric sections to a point just above said intermediate edge portion of the lower edge of said first and second fabric sections;

an elastic strap secured to and extending between opposing ones of said straight edge portions of the lower edge of said first and second fabric sections; and

an energy-absorbing pad, having an outline similar to the outlines of said first and second fabric sections, said pad having a lower edge which includes two straight edge portions and an intermediate edge portion, said intermediate edge portion being concavely shaped, said intermediate edge portion being configured to mate with said intermediate edge portions of said first and second fabric sections such that with said protective gaiter operatively positioned about the wearer's leg, the shinbones of the wearer are covered by said pad.

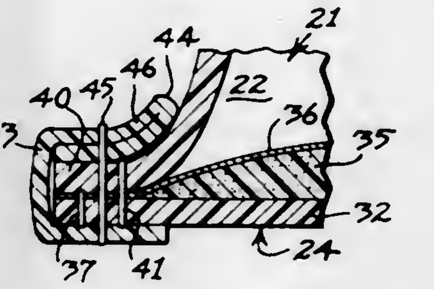
4,001,954
SHOE CONSTRUCTION

Kennedy G. Taylor, Jr., Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.

Filed May 19, 1975, Ser. No. 578,483

Int. Cl.² A43B *9/10, 13/28*

U.S. Cl. 36—16 **6 Claims**



1. In a shoe construction,

a. an insole having a top face, a bottom face, an outer edge, a forepart, a forepart marginal portion, and a backpart,

b. a first padded member substantially coextensive with and covering the top face of the forepart of said insole,

c. a cover sheet over said first padded member and coextensive with the forepart of said insole,

d. a first line of cover stitching securing the margin of said cover sheet to the forepart marginal portion of said insole and being spaced inward approximately 1/16th of an inch from the outer edge of said insole,

e. an upper having a forepart marginal flange fitting flush against said forepart marginal portion,

f. an elongated binding tape extending the length of said forepart marginal flange,

g. said tape being folded about its longitudinal axis over the free edges of said forepart marginal portion and flange, said folded tape having a lower portion covering said forepart marginal portion and an upper portion covering said forepart marginal flange,

h. a second line of stitching securing together the upper portion of said tape, said forepart marginal flange, said cover sheet, said forepart marginal portion of said insole, and the lower portion of said tape, said second line of stitching being spaced inward from said first line of stitching,

i. an outsole fitting against said insole and having a marginal portion fitting against said lower portion of said folded tape, and

j. means securing said outsole to said insole.

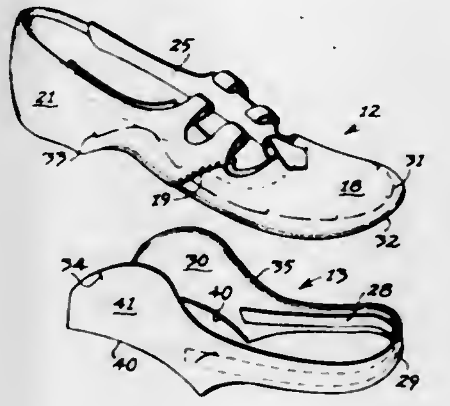
4,001,955
MUDGUARD STYLE SHOE CONSTRUCTION

Newton C. Turner, Jr., Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.

Filed Oct. 28, 1975, Ser. No. 620,873

Int. Cl.² A43B *7/14, 23/00*

U.S. Cl. 36—96 **5 Claims**



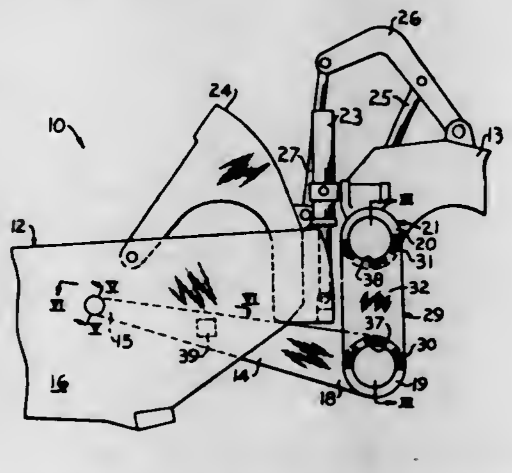
1. In a shoe construction,

a. an upper member comprising an upper and a discrete

mudguard piece, said upper member having a forepart, an intermediate portion, and opposite sides,
b. said upper having a forepart lower marginal portion, intermediate lower marginal portions on opposite sides, and a backpart portion,
c. said mudguard piece having a top marginal portion extending throughout its forepart and intermediate sides,
d. means securing the top marginal portion of said mudguard piece to the lower marginal portions of said upper, so that the secured forepart portions of said upper and said mudguard piece form a forepart pocket,
e. at least one insole member having a bottom face within said upper member,
f. said mudguard piece having spaced forepart bottom marginal portions secured to the bottom face to one of said insole members,
g. the intermediate sides of said mudguard piece comprising side flaps having abutting bottom edges,
h. means securing said abutting bottom edges together,
i. a forepart outsole,
j. means securing said forepart outsole to the forepart bottom marginal portions of said mudguard piece, and
k. heel means fixed to the backpart portion of said upper.

4,001,956
TRACTOR SCRAPER TRANSPORTATION AND ASSEMBLY THEREFOR

Eugene M. Wilson, and William T. Girard, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 17, 1975, Ser. No. 614,052
Int. Cl.² E02F *3/62*
U.S. Cl. 37—129 **13 Claims**



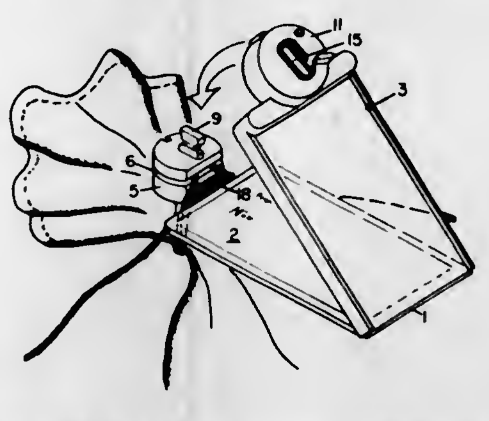
1. A transported tractor scraper of the type having a scraper bowl connected to a tractor, comprising:

1. A laterally extending draft tube disposed longitudinally between said tractor and said scraper bowl;
2. Spacer means mounted interiorly on respective sidewalls of said scraper bowl;
3. A pair of draft arms each having a first end thereof detachable mounted interiorly on said spacer means a spaced distance away from a respective sidewall; and
4. A generally flat transport bracket detachably interconnected between a second end of each of said draft arms and said draft tube.

4,001,957
LABEL HOLDER FOR MAIL BAGS AND THE LIKE

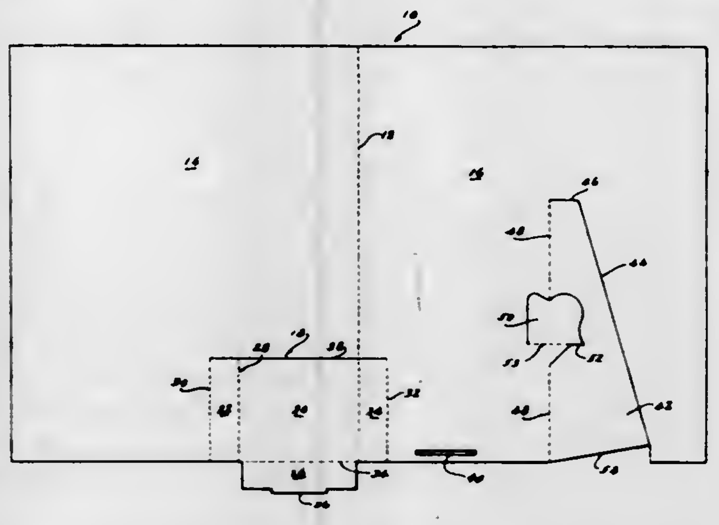
Eduardo Neto de Lima Castro, Rua do Lavradio 162, Rio de Janeiro, Brazil
Filed Oct. 23, 1974, Ser. No. 517,350
Claims priority, application Brazil, Oct. 24, 1973, 8295
Int. Cl.² G09F *3/18*
U.S. Cl. 40—10 R **17 Claims**

1. A label holder attachable by a string or the like to mailbags, luggage or the like comprising a first part cooperable with a second part for holding a label therebetween, said first part having integrally formed at one end thereof a fixed spool having a recess within which a portion of said string or the like may be wound, said second part including integrally therewith a cap part having an inner surface corresponding in shape substantially to the outer surface of said spool for closure over the latter to confine a string positioned within said recess, said first and second parts including means permitting them to be sealed together with said spool received within said cap part when said first part and said second part are closed for holding said label therebetween, means being provided for permitting the string or the like to be fixed to said first part in the region of said spool, said cap part having an inner side wall surface provided with a rib extending generally parallel to the axis of said cap, and said spool has an outer side surface formed with a slot adapted to receive said rib.



4,001,958
"TAKE-ONE" DISPLAY CARD

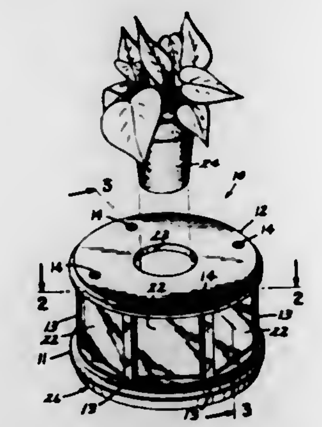
Francis D. Fecko, Aurora, Ohio, assignor to The A. L. Garber Company, Ashland, Ohio
Filed Mar. 29, 1976, Ser. No. 671,499
Int. Cl.² G09F *1/06*
U.S. Cl. 40—124.1 **2 Claims**



1. A display card having all elements thereof embraced in a single sheet of material and folded to form a front panel and a rear panel, said panels being positioned in contiguous back-to-back relationship, a pocket positioned forwardly and normal to said front panel and formed from said sheet and defined by folds in said rear panel and said front panel, said pocket having a bottom panel formed substantially normal to said front panel, and means on said bottom panel to secure said bottom panel to said rear panel; a foot formed from said back panel, hinged thereto and having a free edge, and being positioned substantially normal to said back panel, said front and back panels secured back-to-back by a suitable means.

4,001,959
ROTARY PICTURE FRAME

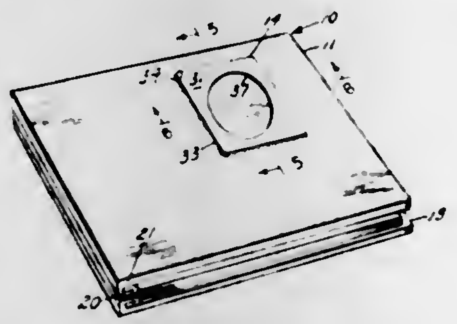
Russell S. Grendahl, P.O. Box 115, Pennock, Minn. 56279
Filed July 23, 1975, Ser. No. 598,531
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152.1 **8 Claims**



1. A decorative picture frame comprising, in combination:
a generally flat base having a predetermined outline;
a plurality of elongated spacers having first ends secured to said base at intervals around the outline thereof;
a generally flat top having an outline similar to that of said base and a generally central aperture;
fastening means removably securing said top to second ends of said spacers to define with said spacers and said base a three-dimensional hollow body having a top opening, for receiving an ornamental object, and a plurality of peripheral openings, for receiving pictures to be displayed, each said peripheral opening being defined by a portion of said base, a portion of said top, and apposed edges of a pair of said spacers;
sets of inner and outer parallel, spaced grooves extending along apposed portions of pairs of said spacers between said base and said top, and oriented to lie in a set of predetermined geometrical surfaces;
picture supporting means in said inner grooves;
and picture protecting means in said outer grooves, so that a picture to be displayed may be inserted between said supporting means and said protecting means.

4,001,960
PHOTO ALBUM COVER WITH FRAMED INSERT

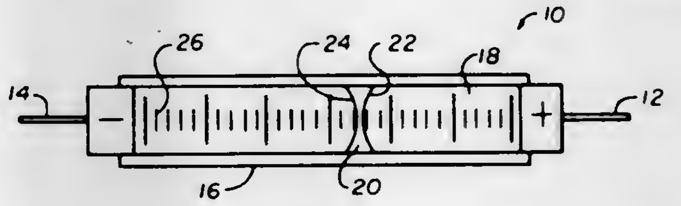
Sheldon Holson, Norwalk, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Mar. 16, 1976, Ser. No. 667,399
Int. Cl.² B42D *3/00*
U.S. Cl. 40—159 **3 Claims**



1. In combination, a photo album cover and a frame element engaged therewith; said cover having a principal plane and comprising a plurality of laminated layers, said cover having a through opening extending perpendicular to the plane thereof of given size and configuration, and having outer and inner planar surfaces; said frame element including a generally planar outer wall having an opening therein, said wall being bordered by a beaded edge; side walls communicating with said beaded edge, and flange members carried by said side walls and lying in a plane substantially parallel to said outer wall, said side walls of said frame element corresponding in size and configuration to that of said opening in said cover; said frame element defining a recess between said side walls thereof, and a member maintained in said recess to underlie said opening in said outer wall thereof; said frame element being engaged within said opening such that said beaded edge overlies said outer surface of said cover in the area bordering said opening, and said flange members engage said inner surface of said cover, whereby said frame element is positively retained in said through opening.

4,001,961
ROUND COUNTER

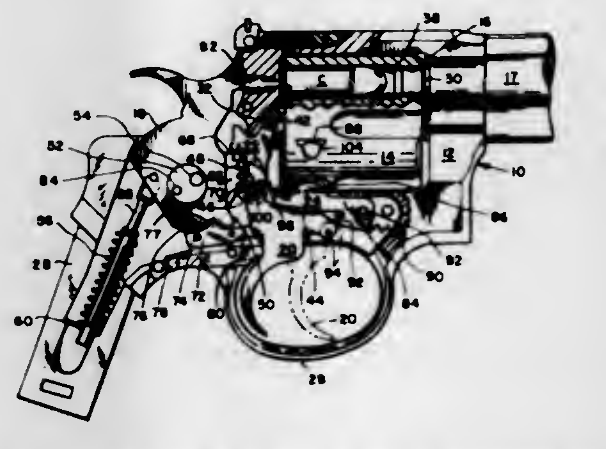
Curtis D. Johnson, and Hal E. Weidner, both of Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sept. 3, 1975, Ser. No. 610,028
Int. Cl.² F41C *27/00*
U.S. Cl. 42—1 E **5 Claims**



1. A weapon having parts capable of mechanical movement in the firing of said weapon,
a weapon buffer, a transducer on said weapon buffer, and an electrochemical elapsed time meter indicator with counter circuitry for indicating the number of cycles a mechanical movement and hence the firing of said weapon to which said indicator and said circuitry are attached, and transducer means on said weapon buffer for actuating said indicator.

4,001,962
CYLINDER-INDEXING MEANS FOR REVOLVERS

Richard L. Baker, Wallingford, Conn., assignor to The Leisure Group, Inc., Los Angeles, Calif.
Filed Nov. 25, 1974, Ser. No. 526,719
Int. Cl.² F41C *19/00*
U.S. Cl. 42—67 **6 Claims**



1. In a revolver having a frame, a barrel mounted on said frame, a cylinder with a plurality of cartridge chambers disposed at equal angles about its central axis, said cylinder being mounted on said frame for rotation about said axis, means for indexing said cylinder in order to move each chamber in sequence into alignment with said barrel, said cylinder having a plurality of equally spaced notches corresponding in number to said chambers disposed circumferentially about its periphery, a cylinder lock mounted on said frame for reciprocal movement into and out of locking engagement with said notches and means for urging said cylinder lock into engage-

ment with said notches, said notches being disposed relative to said chambers such that when said lock is fully engaged within one of said notches a corresponding one of said chambers is aligned with said barrel, the improvement in said cylinder-indexing means comprising

- ratchet means for rotating said cylinder in sequence through a predetermined arc,
- said indexing means further including a cam-surface on said cylinder lock disposed for engagement with the leading edge of each of said notches,
- said cylinder being rotated by said ratchet means through said predetermined arc to a position at which said cam-surface engages the leading edge of each of said notches in sequence,
- said cam-surface facing in the general direction of rotation of said cylinder and being inclined at an angle to the radius of said cylinder at said leading edge such that upon engagement of said cam-surface by the leading edge of any one of said notches, said cylinder is rotated by said means urging said cylinder lock into engagement with said notches until said lock is fully registered with said one notch.

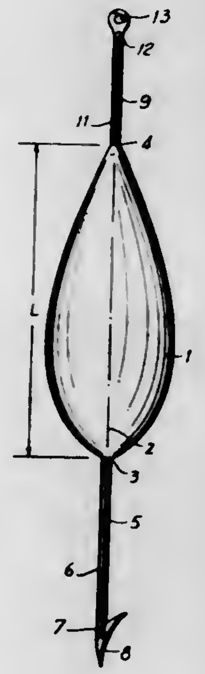
4,001,963
FISH DART

Minton W. Hamsley, 127 Centre Ave., East Rockaway, N.Y. 11518

Filed Nov. 6, 1975, Ser. No. 629,383

Int. Cl.² A01K *81/04*

U.S. Cl. 43—6 **4 Claims**



1. A fish dart, comprising

- a substantially oval shaped weighted body having an axis, a length extending along the axis and spaced opposite first and second ends on its axis defining its length;
- a barbed member extending from the first end of the body coaxially with said body; and
- an eye member extending from the second end of the body coaxially with said body for affixing a fishing line to said fish dart, said barbed member and said eye member being integrally formed with said body and each of said barbed member, said eye member and said body being stationary relative to the others.

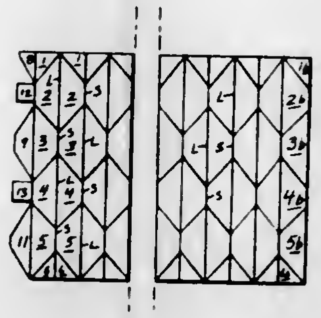
4,001,964
POLYHEDRAL ANNULAR STRUCTURES, AND BLANKS THEREFOR

Rea Ferdinand Hooker, 170 W. 74th St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 355,037, April 27, 1973, Pat. No. 3,894,352. This application July 7, 1975, Ser. No. 593,552

Int. Cl.² A63H *33/16*

U.S. Cl. 46—1 L **12 Claims**



1. A polyhedral structure which is radially substantially symmetrical about a central axis, said structure comprising a number of planar trapezoids hinged together at their sides so as to form a continuous multiplanar toroidal web having two edges, which structure can be rotated, about its core, into a plurality of different stable configurations each of which is radially substantially symmetrical about said central axis, said structure comprising congruent plane trapezoids arranged in an least three rows of adjacent trapezoids, each of said rows being a ring of single trapezoids arranged in alternation so that each trapezoid has a hinged longer side in common with one of its two neighbors of its row and has a hinged shorter side in common with the other of its neighbors of its row, said rows interfitting so that each trapezoid of each row has a side in common with a trapezoid of the adjacent row, the longer and shorter common sides within a row being respectively, infold and outfold hinges arranged within planes which radiate from and include said axis and the sides which adjacent rows have in common being outfold hinges.

7. A flat blank of sheet material, said blank having means, including score lines at which said blank can be folded and edges adapted to be secured together to form a continuous web after said blank is folded at said score lines, for converting said blank to a polyhedral structure which is radially substantially symmetrical about a central axis, said structure comprising a number of planar trapezoids hinged together at their sides so as to form a continuous multiplanar toroidal web having two edges, which structure can be rotated, about its core, into a plurality of different stable configurations each of which is radially substantially symmetrical about said central axis, said structure comprising congruent plane trapezoids arranged in at least three rows of adjacent trapezoids, each of said rows being a ring of single trapezoids arranged in alternation so that each trapezoid has a hinged longer side in common with one of its two neighbors of its row and has a hinged shorter side in common with the other of its nieghbors of its row, said rows interfitting so that each trapezoid of each row has a side in common with a trapezoid of the adjacent row, the longer and shorter common sides within a row being, respectively, infold and outfold hinges arranged within planes which radiate from and include said axis and the sides which adjacent rows have in common being outfold hinges, said score lines being situated so that, on folding, they form the boundaries of said trapezoids.

4,001,965
CONNECTOR FOR USE WITH STRUCTURAL-FOAM ELEMENTS

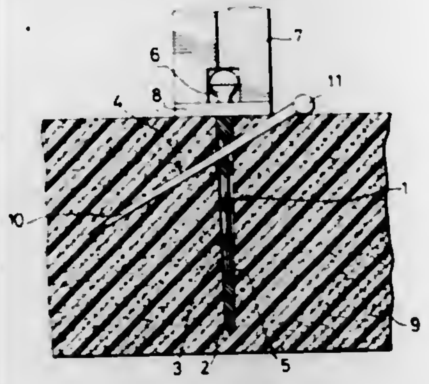
Artur Fischer, Altheimer Str. 219, D-7241 Tumlingen, Germany

Continuation-in-part of Ser. No. 487,806, July 11, 1974, Pat. No. 3,960,460. This application Aug. 8, 1974, Ser. No. 495,842

Claims priority, application Germany, Sept. 5, 1973, 2344713

Int. Cl.² A63H *33/08*

U.S. Cl. 46—23 **9 Claims**



1. A connector for connecting elements of a toy construction kit to structural-foam elements, conprising a first elongated member having a first portion provided with a substantially flat blade-shaped leading end adapted to cut a slit-like incision in a structural-foam element when said first portion is pushed therein and with a trailing portion, said first portion being provided with a plurality of holes spaced in the direction of said elongation from each other and respectively extending transversely to said direction in substantially parallel planes, said first member further having at said trailing end a second portion of a shape adapting it to serve as a stop when said first portion is pushed into said structural-foam element; a connecting element provided on said second portion and, when said first portion is pushed into a structural-foam element, being accessible at the exterior thereof for connection to a cooperating connecting portion of an element of a toy construction kit; a second member having a second substantially flat blade-shaped portion adapted to cut a slit-like incision in said structural-foam element when said second member is pushed therein transversely of said first member and to pass through any of said holes, so as to anchor said first member in said structural-foam element without causing crumbling of the material of the latter.

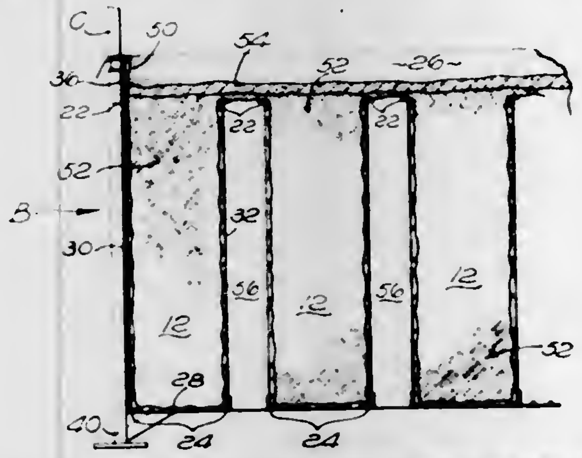
4,001,966
GROWING TRAY STRUCTURE, AS FOR MUSHROOMS

Rudolf Paul Metzner, 6234 N. Irwindale Ave., Azusa, Calif. 91702

Filed Oct. 3, 1973, Ser. No. 403,237

Int. Cl.² A01G *1/04;* B65D *21/02*

U.S. Cl. 47—1.1 **9 Claims**



1. A bed structure to receive growing medium, as for use in the production of mushrooms or the like, comprising:

- a plurality of walled container sections for holding said growing medium, each having one side defining a substantial opening for receiving said medium for containment, said sections extending away from said opening to a distance of at least 20 inches;
- means for affixing said walled container sections together in vertically spaced-apart relationship with said openings horizontally disposed whereby to permit air flow around individual of said container sections; and
- means defining a common space above the openings of said walled container sections for containing a quantity of said casing media whereby mushrooms may be grown in a continuous horizontal bed, supported by spaced-apart quantities of said growing medium in said container sections.

4,001,967
SELF-WATERING PLANTER AND PROCESS OF MAKING

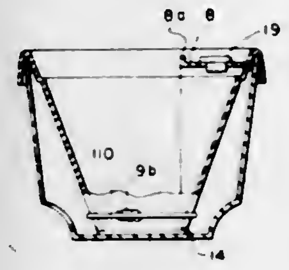
June H. Swift, and John A. Swift, both of 2740 Mayhew Drive, Dallas, Tex. 75228

Continuation-in-part of Ser. No. 362,535, May 21, 1973, Pat. No. 3,903,644. This application Mar. 7, 1975, Ser. No. 556,409

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² A01G *27/00*

U.S. Cl. 47—80 **11 Claims**

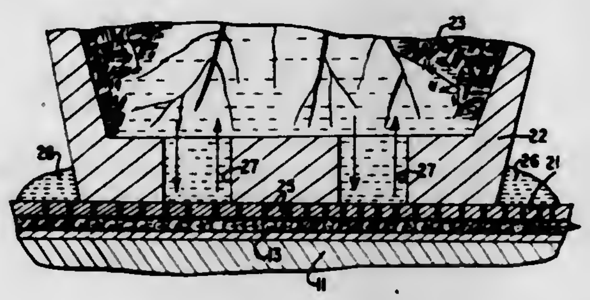


1. An all plastic, vacuum operated, automatically controlled, self-watering planter structure, comprising:

- a. an inner shell containing soil medium, gravel or the like and having a square bottom plate and upwardly tapering side walls terminating in an inverted channel of square plan configuration,
- b. an outer shell having a square bottom plate larger than said inner shell bottom plate and upwardly tapering side walls terminating in an ipen end of compatible dimension to said square plan configuration, said side walls being smaller in cross-section than the channel they engage,
- c. a bonding means consisting of lacquer thinner joining said outer and inner shells in the vertex of said channel in such a manner as to define a vacuum-tight water reservoir therebetween,
- d. a plurality of opening means communicating between said water reservoir and the soil medium compartment of said inner shell and located intermediate the corners of the side walls adjacent to the bottom plate of the inner shell and being so restricted in size, quantity and location as to meter water along a gradient created by the capillary action of the soil medium in response to evapotranspiration, through one or more of said opening means from said reservoir into said inner shell when air enters to partially satisfy a partial vacuum in the reservoir through at least one of the other similar restricted opening means into said vacuum-tight water reservoir,
- e. the product of said opening means in thousandths of an inch in diameter times the number of said opening means being within the arbitrary numbers range of 60 to 140 inclusive.

4,001,968
SOIL IRRIGATION SYSTEM AND METHOD

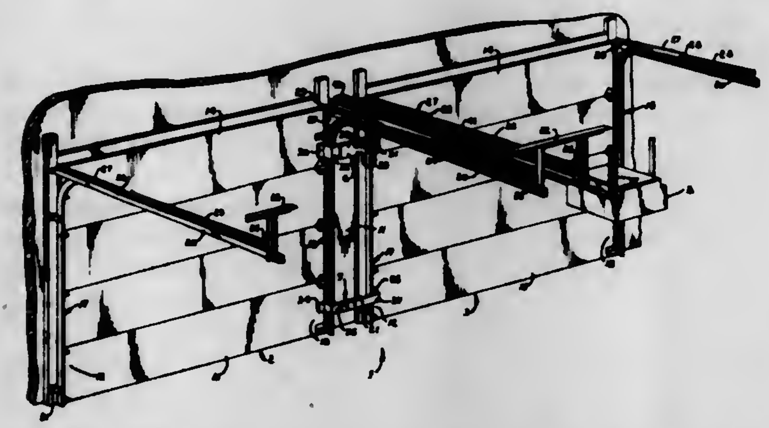
Evert S. Green, 14 Kenneth Ave., N. Bellmore, N.Y. 11710
Filed July 30, 1975, Ser. No. 600,351
Int. Cl.² A01G *27/00*
U.S. Cl. 47—80 **22 Claims**



9. A soil irrigating system which comprises a substantially horizontal support, a silica sand sheet overlying said support which comprises a plastic sheet having adherent on a surface thereof a substantially continuous coating approximately one grain in thickness of silica sand particles essentially in the size range from about 0.002 mm to about 0.25 mm that are interspersed with a network of capillary spaces conducive to lateral spreading of water therealong, said silica sand sheet being disposed with said coating facing upwardly, a substantially opaque plastic sheet that is substantially impervious to moisture except for a multiplicity of substantially evenly spaced capillary openings therethrough about 0.045 to about 0.145 inch in diameter adapted for capillary travel of water therethrough and that directly overlies the silica sand coating on the silica sand sheet and means for supplying water to the interface between said silica sand sheet and said capillary sheet.

4,001,969
GARAGE DOOR STRUCTURE

Joseph J. Hoobery, 8908 W. 104th St. Drive, Overland Park, Kans. 66212
Filed July 6, 1976, Ser. No. 702,735
Int. Cl.² E05F *17/00*
U.S. Cl. 49—95 **7 Claims**



1. In a garage door structure having a pair of side-by-side door openings and a pair of doors movable between a closed position and an open position, each of said doors having a pair of guide tracks each positioned adjacent respective opposite sides of the respective door opening, each of said doors being counterbalanced and having means thereon guided in said respective guide tracks for movement of said doors between a closed position and an open position, the garage door structure having means for moving said pair of doors together as a unit between the closed position and the open position and comprising:

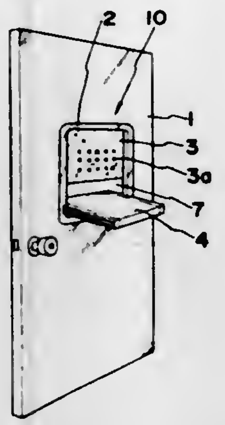
a. an upper tie member extending between and having opposite end portions thereof connected to a pair of doors adjacent an upper portion of said doors;

b. a lower tie member extending between and having opposite end portions thereof connected to said pair of doors adjacent a lower portion of said doors; and

c. a remote controlled power means operatively connected to said upper tie member for selectively and simultaneously moving said pair of doors together as a unit between the closed position and the open position.

4,001,970
CLOSABLE COUNTER DEVICE FOR VERTICAL WALL

Akio Miyamoto, 19-24, 2-chome, Nakaikegami, Octu, Tokyo, Japan
Filed Feb. 11, 1975, Ser. No. 549,037
Int. Cl.² E06B *7/28*
U.S. Cl. 49—171 **7 Claims**



1. A closable counter apparatus for fitting in an opening through a vertical surface, said apparatus comprising:

a frame fitted into said opening and attached to said vertical surface;

a transparent plate mounted in said frame and spaced from one edge thereof, whereby a window opening between the edge of said plate spaced from said frame is defined;

at least two horizontal pins spaced from each other on each of the lower inside vertical side surfaces of said frame; and

a counter plate within said frame having longitudinal grooves in said opposite sides thereof engaging said horizontal pins, said counter plate being pivotable vertically within said frame about said horizontal pins, whereby said window opening and said transparent plate are covered, and said counter plate being slidable horizontally along said pins within said longitudinal grooves when said counter plate is pivoted toward the horizontal about said pins, whereby said transparent plate is uncovered, said window opening is opened, and said counter plate provides a counter surface.

4,001,971
UNIT WINDOW REGULATOR ASSEMBLY

Michael Gobush, Northville, and Richard Freedland, Southfield, both of Mich., assignors to Freedland Industries Corporation, Dearborn, Mich.
Filed Sept. 2, 1975, Ser. No. 609,621
Int. Cl.² E05F *11/48*
U.S. Cl. 49—352 **4 Claims**

1. For use in conjunction with a vehicle door or body having a framework and an upright opening defined by inner and outer walls;

a unit window regulator assembly nested within said opening comprising a pair of longitudinally spaced transverse support brackets secured to said framework;

an upright upwardly opening C frame in said opening spanning and supported upon and adjustably secured to said brackets for longitudinal and transverse adjustments thereon;

a pair of horizontally disposed longitudinally spaced elevator channels;

an upright window spanning, supported upon and secured to said channels;

a pair of parallel spaced arcuate guide rods at their lower ends secured to said brackets and at their upper ends secured to said outer wall;

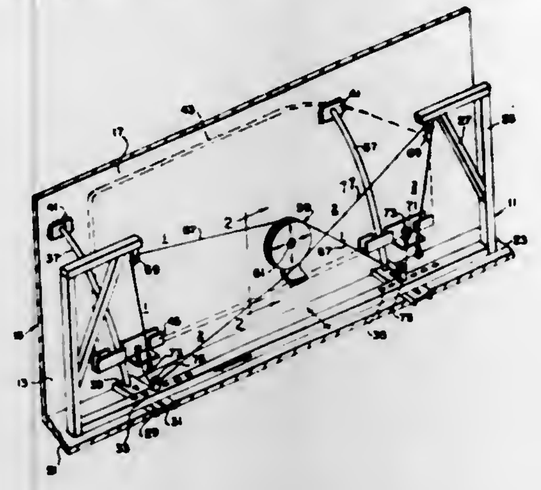
first lateral apertured flanges on one side of said channels receiving and guidably mounted on said rods for predetermined vertical and longitudinal translation movements;

second lateral flanges upon the other side of said channels;

a rotatable capstan journalled on said inner wall within said opening;

longitudinally spaced coplaner upper and lower pulleys on upper and lower portions of said C frame;

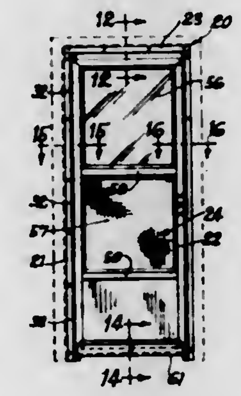
a first cable at one end connected to the second lateral flange of one channel, extending through an upper pulley and a longitudinally spaced lower pulley, wound in one direction around said capstan, and at its other end secured to the second lateral flange of the other channel;



and a second cable at one end connected to the second lateral flange of said other channel, extending through an upper pulley and a longitudinally spaced lower pulley, wound in the opposite direction around said capstan, and at its other end secured to the second lateral flange of said one channel, whereby rotation of the capstan in one direction elevates and longitudinally translates the window for movement along said guide rods, and in the other direction, lowers said window.

4,001,972
PREFABRICATED PRE-HUNG COMBINATION STORM AND SCREEN DOOR AND METHOD FOR INSTALLING THE SAME

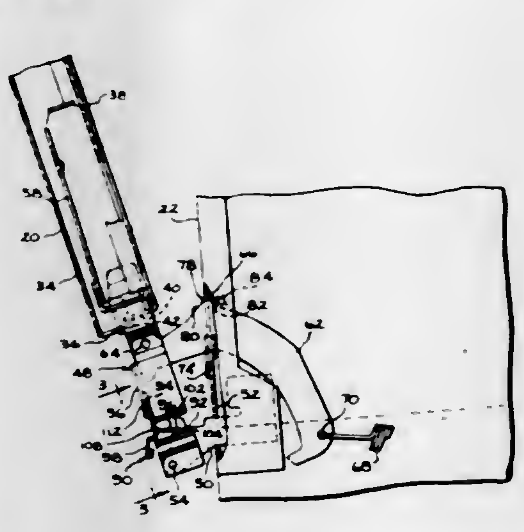
Mathew Hurwitz, 63 Oakland Ave., Auburndale, Mass. 02166
Filed June 9, 1975, Ser. No. 584,779
Int. Cl.² E06B *3/32*
U.S. Cl. 49—380 **3 Claims**



1. In a pre-hung combination storm and screen door and jamb assembly, a combination comprising a pair of vertical jambs of extruded metal arranged to be mounted in a framed door opening in a building wall, a pre-hung assembly consisting of a door unsymmetrical with respect to its horizontal axis and including a hinge stile and a lock stile with horizontal rail members bridging said stiles adjacent to the upper and lower ends thereof, hinge means permanently connecting said hinge stile to one of said jambs so as to allow the door to open in one direction in relation to one side of said framed opening, said jambs having attachment provisions for the selective attachment of each of said jambs to either side of said framed opening, whereby inversion of said jambs and said door in the plane of the door will locate said hinge means on the opposite side of said framed opening to allow the door to open in an opposite direction, a readily mountable and detachable header member for connection to one end of said jambs and adapted for selective connection to the opposite end of said jambs upon the intended inversion of said jambs and door within the framed door opening, a plurality of movable panels within the door frame adapted to be affixed to said stiles between said horizontal rail members, said panels comprising a kickplate adjacent to said lower rail member, and at least one transverse mullion and panel thereabove extending between said stiles and said upper rail member, means for mounting said kickplate adjacent to said lower rail member or alternatively adjacent to said upper rail member preparatory to the transference of said header member to the opposite end of said jambs, means for fastening said transverse mullion and panel in the door opening beyond said kickplate, and an upwardly facing channel extender mounted between said stiles on said rail member adjacent to said kickplate at the lower portion of the door in both alternate positions thereof.

4,001,973
REMOVABLE DOOR HINGE SYSTEM

Frank L. Rice, Jeffersontown, and Arthur C. Wilson, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.
Filed Oct. 6, 1975, Ser. No. 619,669
Int. Cl.² E05F *1/10*
U.S. Cl. 49—386 **4 Claims**

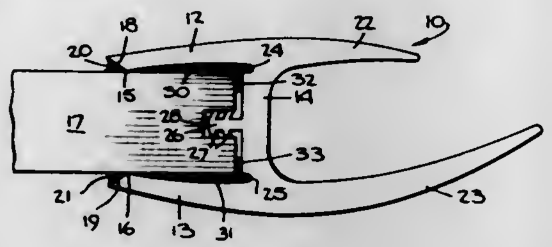


1. An appliance comprising an outer cabinet with a front-opening access door, the cabinet having a front frame forming a door opening, a pair of hinge mechanisms mounted on the door frame, the door being removably mounted upon the hinge mechanisms and capable of movement between a vertical closed position and a generally horizontal open position, each hinge mechanism comprising a fixed support bracket, a door guide pivotally supported from the support bracket, a hinge lever connected to the door guide, and slot means in the door frame through which the support bracket and hinge lever extend, a mating member mounted in the door for receiving the said door guide, and slot means in the door for reception of the door guide and hinge lever, and counterbalance spring means fixed at one end to the cabinet and attached at the other end to the hinge lever; the invention comprising a slip-on, self-supporting spring means encircling the door guide, said spring means having a fixed portion at one end, an intermediate locking portion of loop configuration, and a trigger portion at its opposite end that normally extends outwardly of the door guide for engagement by the mating member, the

support bracket including a keeper for receiving the locking portion of the spring means when the oven door is in a partially open position and the door is partially removed from the hinge mechanisms so as to disengage the mating member from the trigger, while the return of the door to the hinge mechanisms actuates the trigger to disconnect the locking portion from the keeper.

4,001,974
DOOR EDGE GASKET AND ASSEMBLY

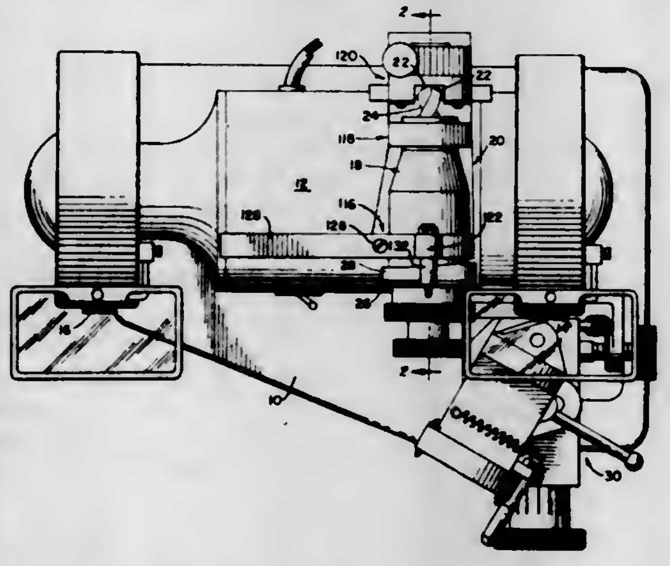
John T. Wright, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.
Filed Nov. 10, 1975, Ser. No. 630,297
Int. Cl.² E06B *7/22*
U.S. Cl. 49—488 **7 Claims**



1. A resilient gasket for application to the edge of a door, said gasket being formed of elastomeric material and having a channel for receiving the edge of the door, said channel being defined by opposite spaced apart lip portions extending from opposite side edges of an integrally interconnecting web portion, said lip portions, prior to assembly of said gasket to said door edge, converging outwardly from said web portion, each said lip portion engaging said door along an intermediate point thereof, the distal end of each said lip portion defining a fillet extending outwardly from said intermediate point thereof so as to be spaced from said door, thereby enabling adhesive to be trapped between the fillets of said lip portions and said door to provide means for verifying adequate application of adhesive and proper distribution thereof; and a seal establishing portion extending from said web portion outside of said channel.

4,001,975
TWIST DRILL SHARPENER AND ALIGNING FIXTURE

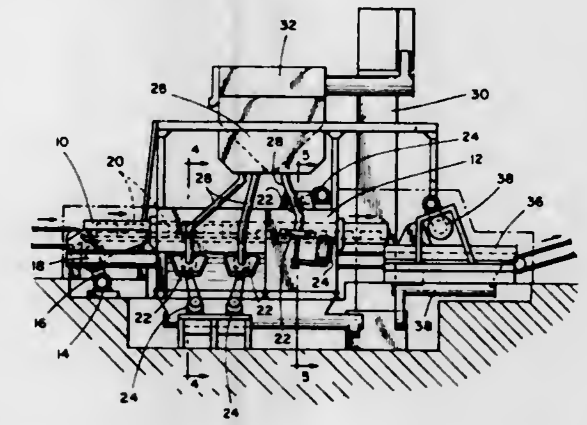
Arthur Alexander Bernard, Beecher, and Richard Allen Bernard, Flossmoor, both of Ill., assignors to Darex Corporation, Beecher, Ill.
Filed July 9, 1975, Ser. No. 594,349
Int. Cl.² B24B *3/30*
U.S. Cl. 51—5 R **17 Claims**



12. A twist drill sharpener including a rotary grinding wheel, a twist drill chuck, and grinding control cams: characterized in that the cams are rotatably mounted on the chuck and the chuck includes means for locking the cams against rotation relative to said chuck, and means for aligning the lips of a twist drill to be sharpened with the chuck carried cams, said aligning means including a fixture adapted to receive the chuck and said fixture including means engaging the grinding control cams and further including a pair of opposed blocks, means mounting each of said opposed blocks for sliding movement toward and away from each other and into engagement with the lips of the chuck supported twist drill and in a plane transverse to the longitudinal axis of the twist drill to be sharpened.

4,001,976
APPARATUS FOR CLEANING CASTING

William Robertson MacMillan, Sale, England, assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.
Filed June 23, 1975, Ser. No. 589,600
Int. Cl.² B24C *3/14, 3/18*
U.S. Cl. 51—9 R **5 Claims**



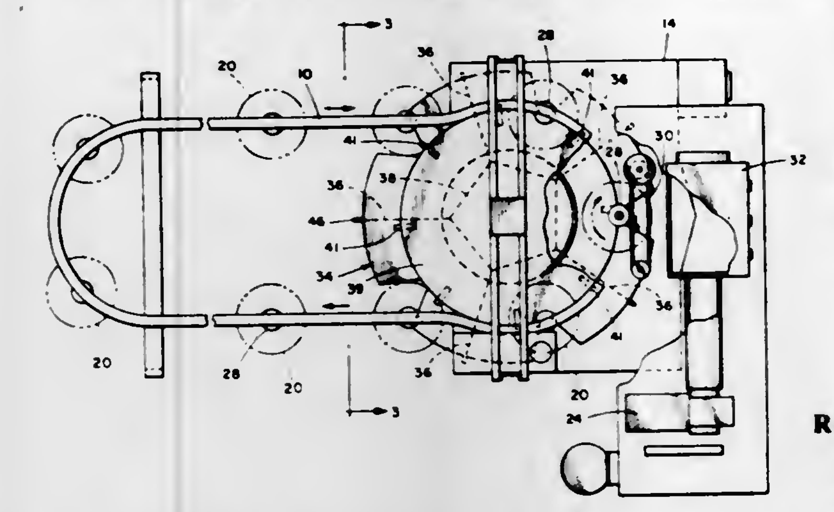
1. A device for removing mold sand from castings comprising:
a. an open framework vibratory conveyor receiving said castings and subjecting them to a jolting action to loosen and break up said sand;
b. a blast enclosure disposed about at least a portion of said conveyor; and
c. blasting means mounted to said enclosure for throwing particulate at said castings through said open framework to enhance and accelerate the breakup and removal of sand by said vibratory conveyor,
said open framework conveyor including a plurality of spaced bars which support and guide said casting, and wherein the configuration of said bars changes to alter the spatial orientation of the castings thereby to subject a greater portion of the castings to the blast means.

4,001,977
ROTARY VESTIBULE BLASTING DEVICE

Donald E. Schrader, South Bend, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.
Filed Aug. 25, 1975, Ser. No. 607,261
Int. Cl.² B24C *3/14*; **B08B** *5/00*
U.S. Cl. 51—15 R **11 Claims**

1. A device for particulate treatment of parts comprising:
a. a particulate treatment chamber having blast means therein and at least one opening thereto;
b. conveyor means for moving parts to be treated into and out of said chamber through said opening; and
c. a rotating vestibule for dynamically sealing each opening to said chamber to prevent particulate escape while permitting passage of parts into and out of said chamber on a continuous basis,

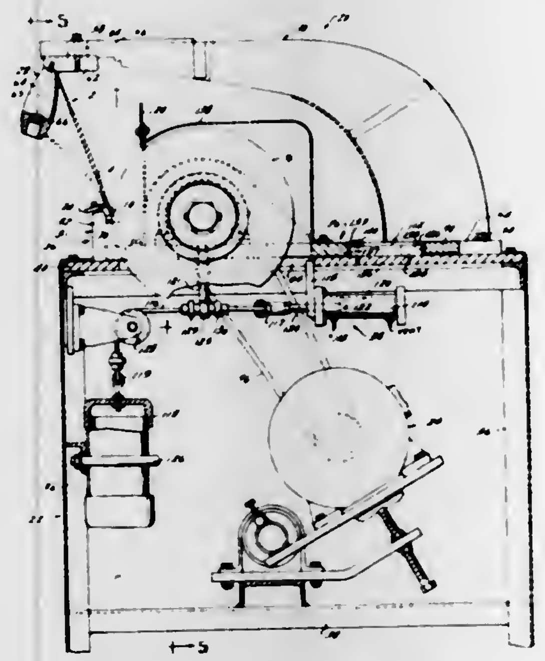
d. said conveyor having a drive mechanism and said vestibule including means for engaging said drive mechanism



for movement of said conveyor to rotate said vestibule and vice versa.

4,001,978
APPARATUS FOR SHAPING THE EDGE OF A BLADE ELEMENT

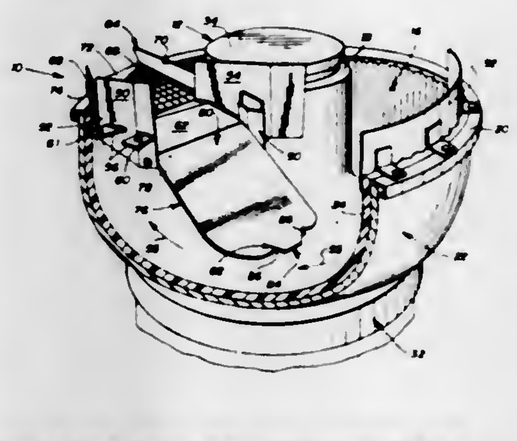
Louis S. Hales; Don R. Hamilton; Harry F. Weller, and Donald E. Burgbacher, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Apr. 1, 1975, Ser. No. 564,066
Int. Cl.² B24B *17/02, 19/14*
U.S. Cl. 51—100 R **8 Claims**



1. An apparatus for shaping to a predetermined profile an edge of a blade, translatable in said apparatus, said blade having a leading edge and a trailing edge, comprising:
motive means;
first means driven by said motive means for removing material from said blade, said first means having a first position wherein said first means engages a portion of one of said edges;
second means engaging said blade for supporting said blade during translation of said blade relative to said first means while successive portions of said one of said edges engage said first means in said first position;
third means engaging said blade for guiding said blade during said translation and for presenting said edge portion for engagement with said first means at a predetermined angle said third means including a cam surface having a predetermined configuration selected to represent the loci of a portion of said blade when successive portions of said one of said edges are presented for engagement with said first means at said predetermined angle, said cam surface being further configured to represent at least one of said loci which does not occupy the same point in space as other of said loci as successive portions of said blade are presented for engagement with said first means at said predetermined angle; and
fourth means for holding said first means, said second means and said third means against translational movement with respect to each other during shaping of said edge.

4,001,979
UNLOADING RAMP ASSEMBLY

Raymon Kelsick Elkins, Arlington, and Richard Neil Hutson, Dallas, both of Tex., assignors to The Hutson Corporation, Arlington, Tex.
Filed Sept. 8, 1975, Ser. No. 611,129
Int. Cl.² B24B *31/06*
U.S. Cl. 51—163.2 **30 Claims**



20. An unloading ramp assembly comprising:
an elongate rod having a length substantially equal to the width of the hopper of a vibratory finishing machine;
means supporting the rod above the hopper of the vibratory finishing machine and extending substantially radially with respect thereto so that the rod defines a substantially horizontally disposed axis of pivotal movement;
ramp means including a substantially planar surface at least as long as the distance from the rod to the bottom of the hopper of the vibratory finishing machine;
means at the upper end of the ramp means for pivotally engaging the ramp means with the rod across the entire width of the ramp means and thereby initiating an insertion sequence in which the bottom end of the ramp means is engaged with moving media and piece parts in the hopper and the ramp means is thereby pivoted downwardly into engagement with the bottom of the hopper; and
handle means secured to one side of the ramp means for disengaging said one side of the ramp means from the rod.

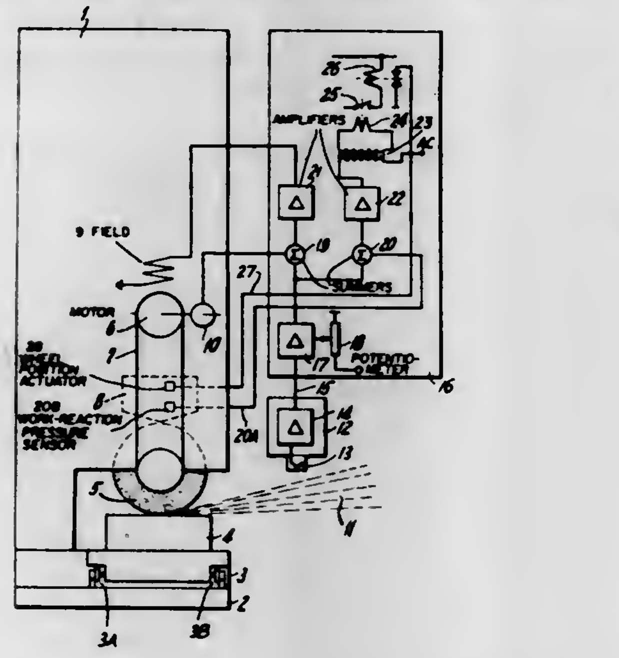
4,001,980
GRINDING MACHINE

Sven-Herman Wallin, Djursholm, Sweden, assignor to Ambar Investment Inc., Herrliberg, Switzerland
Continuation-in-part of Ser. No. 307,370, Nov. 17, 1972, abandoned. This application Aug. 14, 1974, Ser. No. 497,384
Int. Cl.² B24B *49/12*
U.S. Cl. 51—165.72 **1 Claim**

1. A grinding machine for skin-grinding the surface of a metal workpiece, comprising:
a machine frame and work-supporting means carried thereby,
a grinding wheel and frame-referenced feed means for movably positioning said wheel with respect to an exposed surface of a metal workpiece supported by said work-supporting means,
driving means for continuously rotating said grinding wheel,

traversing means for traversing said wheel and work-supporting means with respect to each other, whereby a flow of grinding matter will emanate in essentially a single direction of discharge away from the instantaneous zone of grinding contact with the workpiece in the course of a cutting traverse, said flow near the grinding region being characterized by radiant energy of magnitude indicative of the instantaneous depth of local grinding cut into the exposed surface of the workpiece,

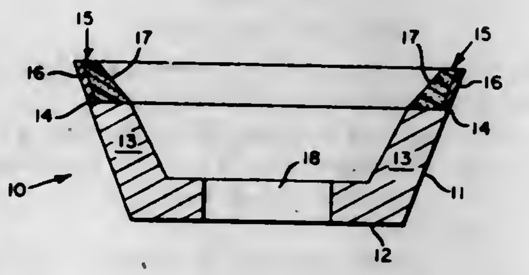
radiant-energy responsive means positioned in offset adjacent to said flow and producing an electrical signal output proportional to the instantaneously detected radiant-energy level in said flow near the grinding region, and



control means responsively connected to said radiant-energy responsive means and operatively connected to said feed means for continuously positioning said grinding wheel with respect to the instantaneously ground workpiece region such that the radiant energy in said flow is maintained at a substantially constant level as evidenced by a substantially constant output signal produced by said radiant-energy responsive means in the course of a cutting traverse, whereby the exposed surface of the workpiece is skinned to an essentially constant predetermined depth of cut.

4,001,981
ABRASIVE ARTICLE

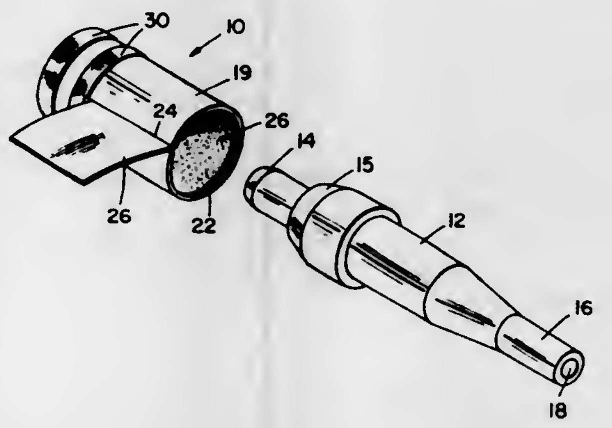
Everitt Franklin Wood, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 443,205, Feb. 19, 1974, abandoned. This application June 26, 1975, Ser. No. 590,495
Int. Cl.² B24D *7/02*
U.S. Cl. 51—209 R **3 Claims**



1. An abrasive article comprising a nonabrasive support member having an annular support surface and an annular abrasive member adhesively secured directly to the annular support surface of said support member, wherein said annular abrasive member includes annular resin - bonded abrasive means so constructed and arranged as to provide the outer peripheral surface of said annular abrasive member and having an annular abrading surface, and an annular back-up member of a frangible and abradable porous polyimide resin secured to the inside surface of said annular abrasive means and to the annular support surface of said support member, said annular back-up member having an annular surface terminating in a plane coextensive with the annular abrading surface of said annular resin-bonded abrasive means, whereby said annular surface of said annular back-up member is adapted to abrade and wear away when said annular abrading surface of said annular resin-bonded abrasive means is consumed in use.

4,001,982
CUTTING TIP RESEATER

Robert K. Griffin, and Birch A. Ober, both of Sparks, Nev., assignors to Sierra Tool Company, Sparks, Nev.
Filed July 23, 1975, Ser. No. 598,464
Int. Cl.² B24D *15/00*
U.S. Cl. 51—211 R **5 Claims**



1. Apparatus for reseating the two or more sealing surfaces of a cutting tool tip which are conformed to a common conical shape, said apparatus comprising a support member having an interior cavity, the interior surface of said cavity at least partially having a conical shape conformed to the common conical shape of the sealing surfaces, said support member further having a slit communicating with the cavity so that the slit intersects the conical shape of the interior surface, and a sheet of emery paper inserted through the slit to circumscribe and conform to the interior surface to the cavity whereby the cutting tool tip can be inserted in the cavity with the sealing surfaces thereof flush with the emery paper and the support member rotated relative to the cutting tool tip to reseat the sealing surfaces in said common conical shape.

4,001,983
LOADER ASSEMBLY

Paul Favrot, Lyon, France, assignor to Landis-Gendron S.A., Villeurbanne, France
Filed Apr. 14, 1975, Ser. No. 560,757
Int. Cl.² B24B *47/22*
U.S. Cl. 51—215 R **5 Claims**

1. A loader assembly comprising

a channel member for gravitationally delivering unground workpieces to and removing finished workpieces from the grinding station of a machine tool such as a cylindrical grinder, said channel member including a magazine portion for holding a plurality of unground workpieces,

means for releasing workpieces from said magazine portion one at a time,

Pin means,

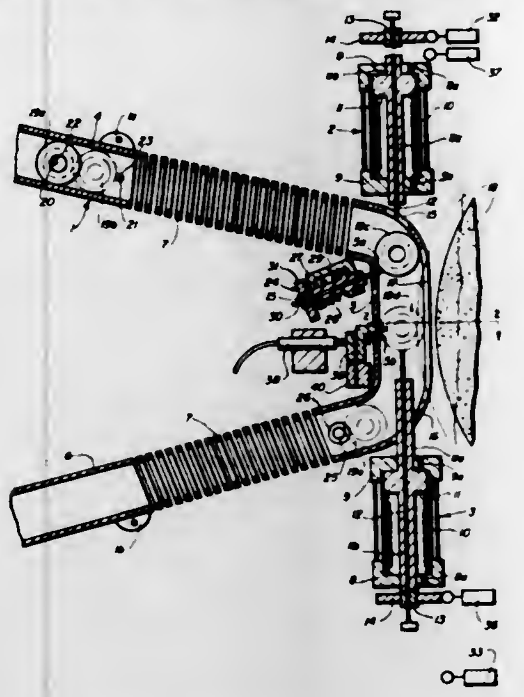
means for biasing said pin means to project into said channel for stopping the gravitational displacement of a workpiece after it has been released by said releasing means at a predetermined ready position,

locator means,

means for advancing said locator means from a retracted position beyond said channel to an advanced position within said channel,

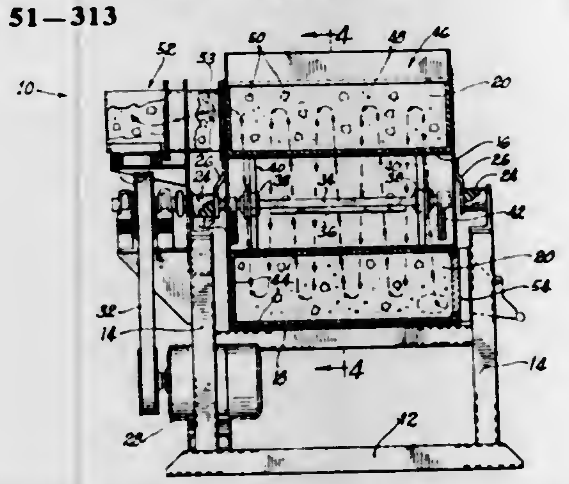
means for selectively pushing the stopped workpiece past said biased pin means after said locator means has been displaced to said advanced position so that the workpiece will be gravitationally displaced to locate against said advanced locating means, and

means for selectively retracting said locator means from said advanced position to said retracted position.



4,001,984
METHOD FOR FINISHING PARTS

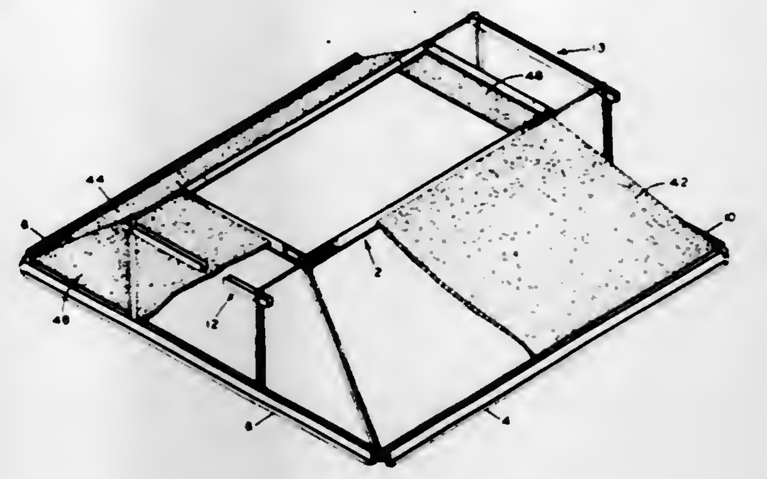
Harvey Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.
Division of Ser. No. 418,556, Nov. 23, 1973, Pat. No. 3,918,212. This application June 6, 1975, Ser. No. 584,485
Int. Cl.² B24B *31/06*
U.S. Cl. 51—313 **3 Claims**



1. A method of surface finishing parts comprising the steps of: introducing parts and finishing media into an upper portion of a closed annular chamber defined by a pair of horizontally oriented concentric circular members of different radii; vibrating said chamber to produce orbital motion therein for causing said parts and media to move circumferentially within said chamber; discharging said parts and media from said chamber at said upper portion; and separating said parts from said media including the sub-steps of classifying the media according to a physical characteristic thereof, and returning selected portions of the media to said chamber at a bottom portion thereof by vibrational and gravitational force.

4,001,985
CEILING SUPPORT FRAME WITH PIVOTALLY ATTACHED OUTRIGGERS

Harold W. Nikolaus, Columbia, and Kenneth L. Wasson, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Filed Dec. 5, 1975, Ser. No. 637,899
Int. Cl.² E04B *5/62*
U.S. Cl. 52—28 **7 Claims**



1. A suspended ceiling for use with a room having a main structural ceiling from which said suspended ceiling is to be suspended comprising:

a. a main grid assembly consisting of a plurality of grid members arranged in a polygonal configuration forming plural modules and defining the lower plane of the suspended ceiling,

b. independent support means connected to and carried by the grid members in the lower ceiling plane and being capable of carrying the weight of an upper ceiling element and the load placed thereon,

c. a plurality of quadrilateral ceiling boards being carried by the grid members and the upper ceiling element,

d. the improvement comprises said upper ceiling element being at least one polygonal configured support frame formed of small frame members and positioned above the lower ceiling plane, said smaller frame defining the upper ceiling plane,

e. outrigger arm means being pivotally attached to said upper support frame and extending horizontally beyond the ends thereof to suspend said support frame from said independent support means and to position said upper support frame relative to a module formed by the grid members of the lower ceiling plane, and

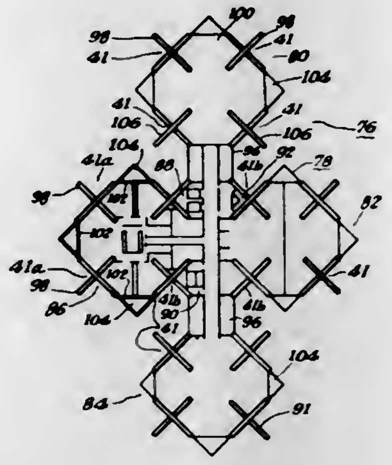
f. a polygonal ceiling board being mounted within said upper support frame constituting the upper plane of the ceiling system.

4,001,986
ARCHITECTURAL CONSTRUCTIONAL SYSTEM

John Kozak, 323 Leax Lane, Turtle Creek, Pa. 15145
Filed June 10, 1974, Ser. No. 477,983
Int. Cl.² E04C *1/10*; E04B *1/34*
U.S. Cl. 52—73 **27 Claims**

1. A preformed structural member comprising a generally rectangular precast slab having sufficient thickness for load-carrying capability, joining means extending across said slab and spaced from opposed sides thereof, about one-half of said joining means being a narrowly tapered solid region and the remainder of said joining means being a complementarily tapered void region, said solid joining region being capable of interfitting tightly within a void region of a similar structural member, said void joining region being capable of receiving a solid joining region of said other member in tightly interfitting relationship whereby said structural member when thus interfitted is positively prevented from angular displacement rela-

tive to said similar member, a second such slab, said second slab being inverted relative to said first-mentioned slab, and the tapered joining means of said second slab and of said first-mentioned slab being interfitted as aforesaid and extend-



ing generally vertically, the width of said second slab urging said joining means into a tapered interfitting relationship and maintaining said second slab and said first-mentioned slab rigidly in a predetermined attitude relative to one another to form a synergistic structural unit.

4,001,987
SCREEN CONSTRUCTIONS

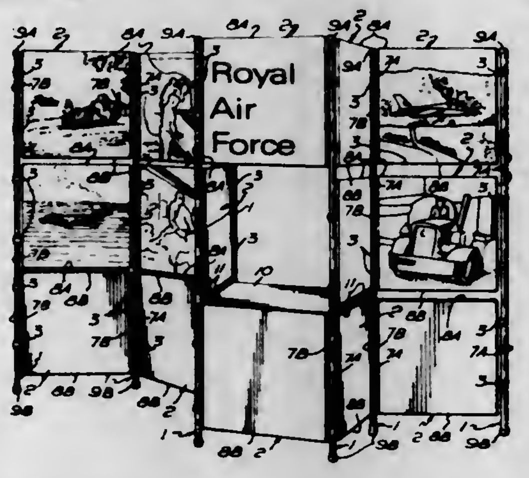
James Albert Coulthard, Sheffield, England, assignor to Kepac, Limited, Sheffield, England

Filed Feb. 3, 1975, Ser. No. 546,452

Claims priority, application United Kingdom, Feb. 8, 1974, 5980/74

Int. Cl.^{2} E04H *1/12*

U.S. Cl. 52—79.9 **20 Claims**



1. A screen construction comprising a plurality of support members of elongate form and uniform circular cross-section in contact with the floor, a plurality of rectangular panels, and a plurality of clips secured at least two on each of two opposite edges of each panel, said clips snapping around the support members, each of said clips being open-ended and extending around greater than 180° of the circumference of said circular cross-section support member, adjacent ones of said panels thereby being orientatable at any angle relative to each other, and said support members being free-standing without any overhead support.

4,001,988
CONCRETE BLOCK PANEL

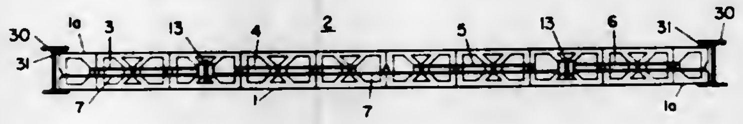
Monte Riefler, P.O. Box 210, Hamburg, N.Y. 14075

Filed Jan. 9, 1975, Ser. No. 539,774

Int. Cl.^{2} E04G *21/00*

U.S. Cl. 52—125 **13 Claims**

5. A prefabricated concrete wall panel which may be prefabricated and delivered to a constructon site in modular sizes, siad panel having planar top and bottom load bearing surfaces and laterally spaced top and bottom holes for lifting rods, a plate at the lower end of each rod in thrust relation to and extending below said bottom surface adjacent each rod and laterally spaced from the plate on another rod and connected to each rod by a releasable load carrying connection, the



thickness of the plate being the thickness of a mortar joint so that when the panel is lowered onto a bed of mortar on a supporting surface with said bottom surface in load bearing relation to the mortar the excess mortar is squeezed out leaving only a mortar joint of thickness equal to the thickness of the plate.

4,001,989
APPARATUS FOR FIXING AN OBJECT TO A LOW-STRENGTH SUPPORT STRUCTURE

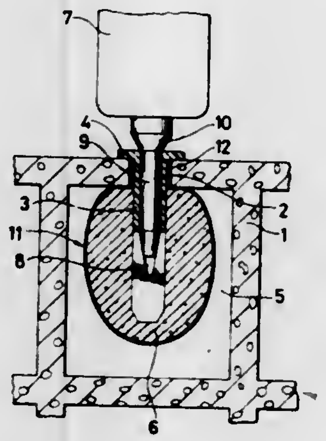
Artur Fischer, D-7241 Tumlingen Gde., Weinhalde 34, Waldachtal, Germany

Continuation-in-part of Ser. No. 617,832, Oct. 1, 1975, which is a continuation-in-part of Ser. No. 616,072, Sept. 23, 1975. This application Oct. 15, 1975, Ser. No. 622,681

Claims priority, application Germany, Oct. 30, 1974, 2451496

Int. Cl.^{2} E04B *1/41*; **E04C** *5/12*

U.S. Cl. 52—127 **6 Claims**



1. An apparatus for mounting an object to a low-strength support structure having an anchoring hole; comprising an elongated anchor member insertable in said anchoring hole and having an open leading end and an open trailing end provided with an integral abutment flange, said anchor member having a slot extending from said leading end towards said trailing end, said anchor member also having a body portion bounding a single integral passage which extends through said flange from said open leading end towards said open trailing end and which communicates via said slot with the exterior of said anchor member; an expandable element positioned about said anchor member so as to at least in part surround the same, said expandable element having a closed end bounding an interior space which encloses said open leading end of said anchor member and communicates via said slot with said internal passage; a plug surrounding said anchor member and filling said interior space, said plug being constituted of a hardenable substance injected by an injection device through said open trailing end into said internal passage and from there via said slot into said interior space, whereby a predetermined amount of said hardenable substance is admitted into said interior space and prevents withdrawal of said anchor member from said hole upon the hardening of said substance.

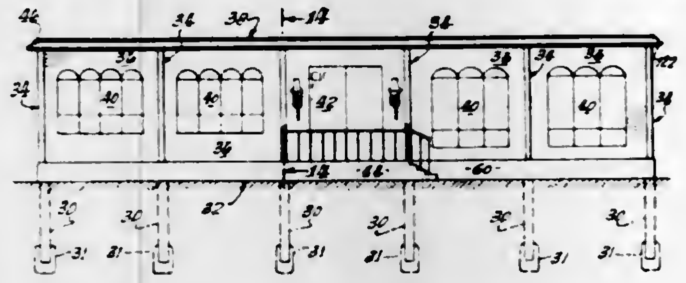
4,001,990
PREFABRICATED BUILDING STRUCTURE

William P. Chase, 8404 Willis Ave., Panorama City, Calif. 91402, and Leon Holloschutz, 8456 Blackburn Ave., Los Angeles, Calif. 90048

Filed July 23, 1975, Ser. No. 598,396

Int. Cl.^{2} E04B *7/00, 1/98*; **E04H** *9/00*

U.S. Cl. 52—167 **31 Claims**



1. A prefabricated building structure comprising a floor slab assembly, a plurality of vertical columns, means for attaching the lower ends of said columns to said floor slab assembly, and a roof truss assembly attached to and supported by said columns and adapted to support and tie down a roof slab assembly, and means permitting movement of said floor slab assembly, said roof truss assembly and said vertical columns relative to one another in response to slight building movements due to shock, settling or the like.

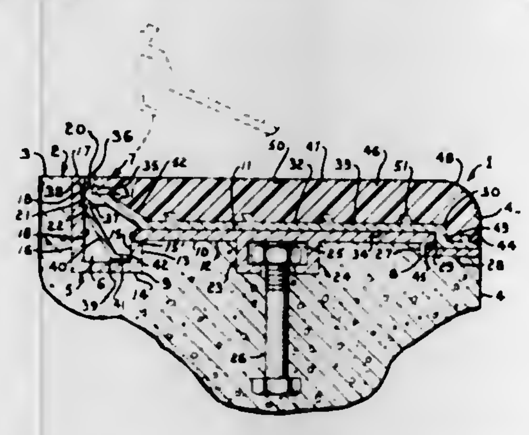
4,001,991
STAIR NOSING STRUCTURE

Claude P. Balzer; Abner A. Reiff, and Edward M. Corman, all of Wichita, Kans., assignors to Balco, Inc., Wichita, Kans.

Filed Jan. 2, 1976, Ser. No. 646,359

Int. Cl.^{2} E04F *11/16*

U.S. Cl. 52—179 **10 Claims**



1. A stair nosing structure for a stair step having a tread surface, said stair nosing structure comprising:

a. an elongated relatively rigid base member adapted to be mounted on a stair step, said base member having forward and rear edge portions and upwardly facing portions and a lower face, said base member having an anchor portion adapted to be secured to the stair step, said base member having portions defining a channel extending along the length thereof and presenting opposed faces;
b. an elongated tread member having forward and rear edge portions and overlying said base member, said tread member having portions engaging upwardly facing portions of said base member;
c. elongated means on said tread member and extending therefrom and engaging said base member with an interference engagement with spaced portions of said base member including one of said opposed faces to secure said tread member to said base member;
d. said base member channel defining portions include wall members extending from said base member adjacent the rear edge portion thereof; and
e. said means to secure said tread member to said base member includes:
    1. cooperating portions on the rear edge portion of said tread member and on one of said wall members of said base member for retaining the rear edge portion of said tread member in engagement with said one wall member of said base member; and
    2. a resilient wall member extending from said tread member and in engagement with the other of said wall members on said base member for urging said tread member into clamping engagement with said upwardly facing portions of said base member.

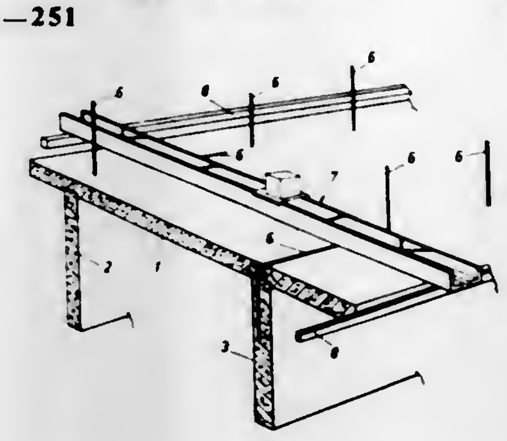
4,001,992
REINFORCEMENT MEANS

Eric Röhss, Askim, Sweden, assignor to Ola Bergqvist AB, Vastra Frolunda, Sweden

Filed Mar. 20, 1975, Ser. No. 560,296

Int. Cl.^{2} E04B *1/00*

U.S. Cl. 52—251 **4 Claims**



1. An improved means for reinforcing concrete and to prevent collapse of concrete walls during the forming thereof comprising a complete cast wall having reinforcement means cast therein, and a joisting slab cast above and supported at least in part by said complete cast wall, said reinforcement means extending through said joisting slab and extending a sufficient distance thereabove to be cast into another wall supported at least in part upon said joisting slab, said reinforcement means comprising a steel wire, said wire having resilience on the portion thereof extending above said joisting slab, said resilience being of an order so that the portion of the wire may be readily deformed to a substantially level condition with the upper surface of said joisting slab during finishing operations thereupon and capable of springing back by its own resilience to its upstanding position for casting into the other wall.

4,001,993
STEEL WALL STUD AND THE WALL FRAME EMPLOYING THE SAME

Lawrence H. Daniels, Piedmont, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

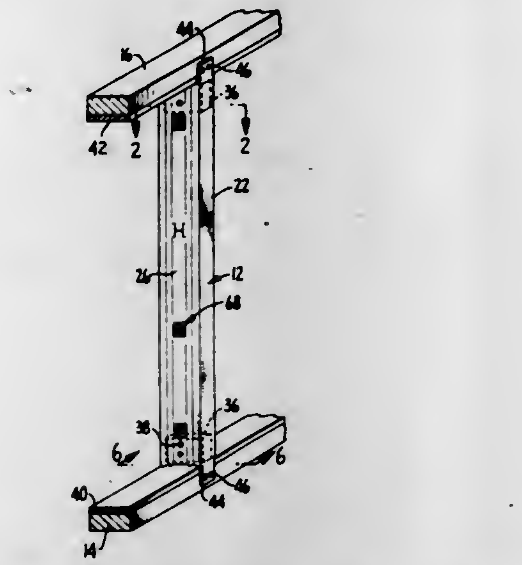
Filed June 20, 1973, Ser. No. 371,764

Int. Cl.^{2} E04C *2/24, 2/42*

U.S. Cl. 52—376 **9 Claims**

1. A wall frame comprising a bottom wooden plate coextensive with the lower boundary of the frame, said bottom plate having opposite vertical faces and an upper horizontal surface extending between said vertical faces, a first strip of particle board coextensive with and overlying said upper horizontal surface, said first strip having an upper surface with a shear strength higher than that of the upper horizontal surface of the bottom plate, a plurality of studs extending upward from said bottom plate and first strip, each of said studs having a lower end bearing on said first strip and four sheet metal walls formed in a closed, generally rectangular, hollow cross-sectional shape with the lower edge of at least one of said walls disposed in bearing engagement with the upper horizontal surface of the first strip, said studs having a depth corresponding to the width of the bottom plate so that two opposing walls

of each of the studs lie in general coplanar relation to the respective opposite vertical faces of said bottom plate, each of said studs having an upper end opposite said lower end, a second strip of particle board supported on the upper ends of said studs, a top wooden plate overlying said second strip of particle board, said second strip having a lower surface with shear strength higher than that of lower surface of the upper plate, said lower surface of the second strip being disposed in bearing engagement with the upper edge of at least one wall of each of the studs on which the strip is supported, and stud retaining means for retaining said upper and lower ends of said studs to said top and bottom plates.



4,001,994

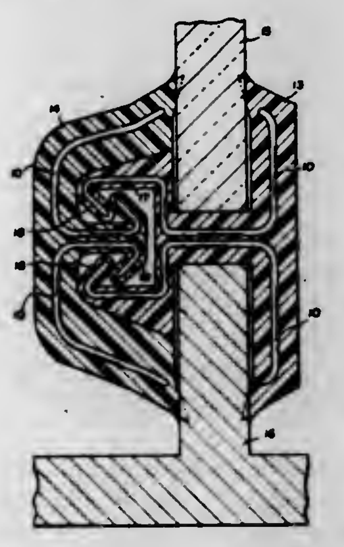
GLAZING DEVICE

Fred Williams, Pittsford, and Charles Yackiw, Fairport, both of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

Continuation of Ser. No. 502,073, Aug. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 401,663, Sept. 28, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,217

Int. Cl.² E06B *3/62*

U.S. Cl. 52—400 **4 Claims**



1. A glazing device for supporting a glass panel in place relative to an anchorage region around said glass panel, said glazing device including longitudinally extending inner and outer strips interlocked together and supported in place in said anchorage region to have a cantilevered free end portion of each of said strips extending farthest from said anchorage region and respectively engaging inner and outer peripheral surfaces of said glass panel, each of said strips comprising a length of spring material and an elastomeric material extruded over and encasing said spring material, and said glazing device comprising:

a. said spring material being in a fixed position in said anchorage region and extending to said cantilevered free end portion of each of said strips to a relatively movable position in the region of said engagement of each of said strips with said glass panel;

b. said spring material extending closely around the region of said interlock between said strips to provide gripping force for said interlock for firmly holding said strips in interlocked relation so said spring material in said cantilevered free end portion of each of said strips is flexibly displaced from a relatively relaxed position to a position forcing said engagement region of each of said strips against said glass panel with a predetermined pressure sealing and holding said glass panel in place;

c. said spring material being formed of a resilient wire element formed in a transverse pattern of zig-zag loops, said pattern extending along the length of each of said strips;

d. longitudinally extending rows of knitted strands linking said loops together in said zig-zag pattern; and

e. said predetermined pressure being a function of the tensile strength of said wire element, the diameter of said wire element, the material of said wire element, and the number of said loops per unit of length of said strip.

4,001,995

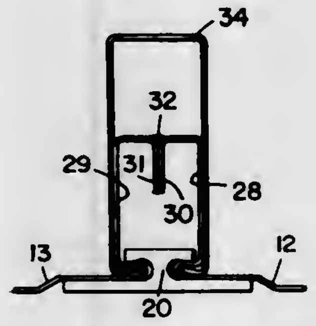
METAL ROOFING/SIDING SYSTEM

Donald Cotter, Pacifica, Calif., assignor to Field Form, Inc., Pacifica, Calif.

Filed Sept. 8, 1975, Ser. No. 611,298

Int. Cl.² E04C *1/34*

U.S. Cl. 52—460 **9 Claims**



1. A roofing and siding system comprising:

a plurality of elongate, generally planar sheets each having upwardly projecting flanges disposed along the lateral edges of said sheet, said flanges each having an outwardly directed C-shaped cross section, said sheets placed side-by-side so that the lateral edges thereof are contiguous to corresponding lateral edges of adjacent sheets to provide a generally weather-proof surface comprising the exposed surface of a building;

means for attaching the planar sheets to said building comprising a plurality of discrete clips disposed along each pair of contiguous lateral edges of said planar sheets, said clips being attached to the building and in engagement with the adjacent planar sheets to fix said sheets to the building; and

a plurality of elongate battens constructed of resilient material, each said batten having a generally rectangular cross section including two longer, substantially parallel sides and two relatively shorter sides, one said shorter side being slit so that the batten can be snapped over adjacent flanges on contiguous lateral edges of two said planar sheets and provide weatherproofing at said edges.

4,001,996

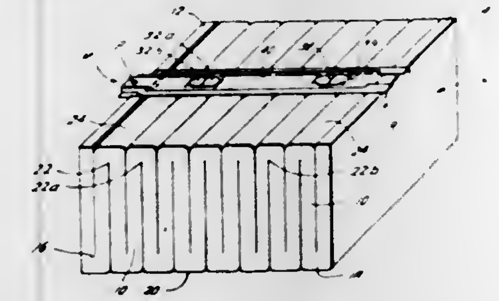
PREFABRICATED INSULATING BLOCKS FOR FURNACE LINING

Carlisle O. Byrd, Jr., Houston, Tex., assignor to J. T. Thorpe Company

Continuation-in-part of Ser. No. 475,439, June 3, 1974, Pat. No. 3,952,470. This application Aug. 11, 1975, Ser. No. 603,391

Int. Cl.² E04B *1/80;* **C04B** *43/02*

U.S. Cl. 52—509 **26 Claims**



1. An insulating block for lining a wall of a furnace and like equipment, comprising:

a. an insulating blanket folded into a plurality of folds of adjacent layers of fiber insulating material;

b. a portion of said fibers in said layers of said blanket adjacent said folds being transversely disposed to the remainder of said fibers and extending into other adjacent layers to bind the layers together into an insulating block; and

c. means for attaching said insulating blanket to the wall of the furnace, said means for attaching including a support member mounted in a fold of said insulating blanket.

4,001,997

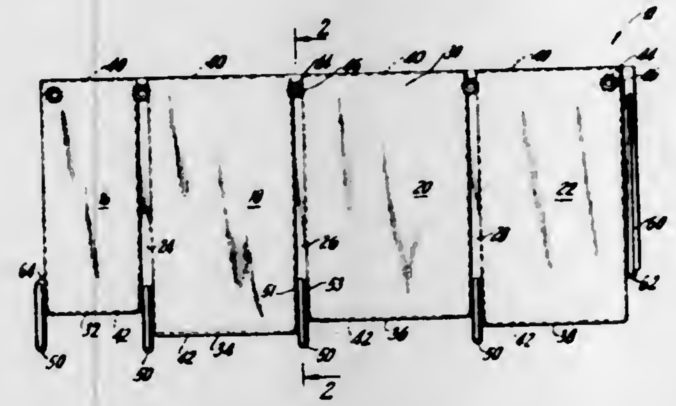
MOLDED SIDING MEMBER

Jerry E. Saltzman, 3022 Shore Road, Bellmore, N.Y. 11710

Filed Jan. 3, 1975, Ser. No. 538,391

Int. Cl.² E04D *3/362, 3/32*

U.S. Cl. 52—521 **7 Claims**



1. A molded siding member for use on buildings composed of

a plurality of vertically extending panels connected side by side by intervening webs to simulate a horizontal course of shingles and having exterior and interior surfaces, the said webs being countersunk below the exterior surfaces to simulate spaces between adjacent shingles, each course being positionable with its lower margin overlapping the upper margin of the next lower course,

the member being formed along its upper margin with a plurality of nail receiving recesses molded into the exterior surface to form widely separated bosses protruding inwardly a predetermined distance from the interior surface of the siding member and its upper margin to engage the side of the building and thereby provide a predetermined spacing of the said upper margin outwardly from the side of the building when the member is nailed in place,

the member being formed with protruding portions extending downwardly below its lower margin and inwardly of the web surface to form locking tongues adapted to be inserted in the opening afforded by said predetermined spacing between the building and the upper margin of the next lower member to lock the lower margin of the upper member in place, the said tongues originating above the said lower margin and being separated therefrom to accommodate the said overlap.

4,001,998

PRE-FABRICATED STRUCTURAL ELEMENTS AND METHOD OF ASSEMBLING THE SAME

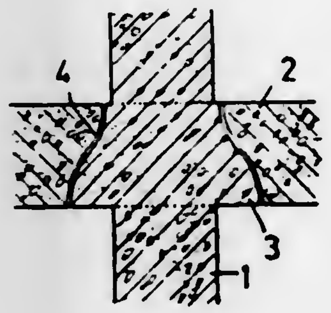
Wolfgang Naumann, Cologne, Germany, assignor to Horst W. Pollehn, Freidburg-Zaehringen, Germany

Filed Dec. 1, 1975, Ser. No. 636,365

Claims priority, application Germany, Dec. 12, 1974, 2458750

Int. Cl.² E04B *5/00;* **E04C** *1/00*

U.S. Cl. 52—608 **11 Claims**



1. A set of structural elements for assembling load-bearing structures, comprising

a first structural element;

at least one second structural element; and

respective cooperating abutment faces on said elements, said structural elements being adapted to be assembled relative to one another to form a load-bearing structure wherein said abutment faces extend substantially horizontally and bound with one another a gap which is horizontally elongated and which in vertical direction has a spatially curved cross-section the curvative of which extends at least in part orthogonally to the main stress lines acting upon the assembled structure in the region of said gap, so as to counter-act forces tending to move said elements apart in horizontal direction.

4,001,999

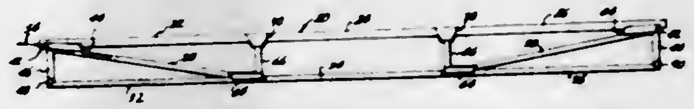
WOOD TRUSS STRUCTURE WITH ECCENTRIC END SUPPORT

Benson Chandler, P.O. Box 224, Medina, Wash. 98039

Continuation-in-part of Ser. No. 319,320, Dec. 29, 1972, abandoned, which is a division of Ser. No. 68,715, Sept. 1, 1970, Pat. No. 3,709,762. This application Oct. 10, 1975, Ser. No. 621,341

Int. Cl.² E04C *3/17, 3/42*

U.S. Cl. 52—693 **4 Claims**



1. A structural component such as a truss or joist comprising multiple whole wood members, each with their grain arranged in the direction of its major dimension and as a group forming the outer periphery of said structural component

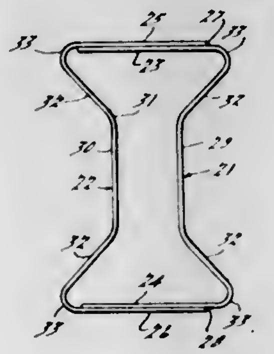
having a top chord and spaced diagonal and vertical inner members, gusset members positioned over selected joints of some of the multiple whole wood members being joined together and said gussets being joined to the whole wood members solely by an adhesive, said diagonal members being secured to said top chord adjacent to the outer ends of said top chord the ends of the top chord having downwardly facing support surface areas for engagement by vertical support structure, said structural component having eccentric moments induced therein by having said support surfaces off-set entirely inwardly from the intersection of the center lines of said top chord and diagonal members in a precise, predetermined manner at least to significantly reduce bending stress in said diagonal members and further to distribute and minimize bending moments throughout the structural component.

4,002,000
BEAM CONSTRUCTION AND METHOD OF MANUFACTURE

Robert W. Howard, Stouffville, and Desmond K. Rose, Mississauga, both of Canada, assignors to Palmer-Shile Company, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,868
Int. Cl.² E04C *3/30, 3/10*

U.S. Cl. 52—729 **2 Claims**



1. In a beam for use in industrial storage racks or the like, first and second beam sections, each section comprising a pair of spaced parallel flanges, said flanges being flat throughout their widths, a central web portion between and at right angles to said flanges and spaced therefrom a distance substantially greater than their thickness, and first and second inclined web portions connecting the edges of the central web portion to the edges of the flanges on the same side thereof, the outer surfaces of said second beam section flanges being spaced apart a distance substantially equal to the inner surfaces of said first beam section flanges, the outer surfaces of the flanges of said second beam section fitting snugly within the inner surfaces of the flanges on the first beam section, the flanges of said two beam sections overlapping substantially completely, whereby the sections together form a closed beam, and means securing said beam sections together comprising welds between the outer edges of the first beam section flanges and said second beam section.

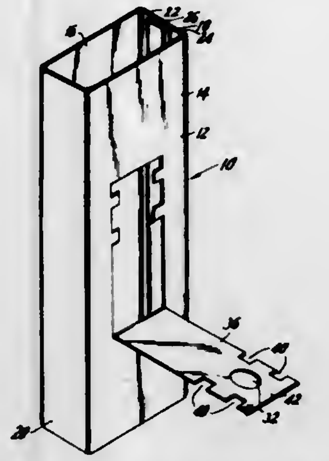
4,002,001
WALL STUD FOR SECURING PLASTERBOARD

Samuel B. Uydess, 10 McKenna Place, Mamaroneck, N.Y. 10453

Filed Feb. 24, 1975, Ser. No. 552,549
Int. Cl.² E04C *3/30;* **E04B** *5/52*

U.S. Cl. 52—731 **2 Claims**

1. A wall stud for securing plasterboard to masonry, bricks, blocks and the like, said wall stud comprising box-like means for receiving fasteners which secure the plasterboard to said box-like means, said box-like means including first, second, third and fourth walls connected in sequence to define a box-like member, said first wall being adapted to be secured against the plasterboard in a parallel arrangement therewith, said box-like member being provided with anchoring means adapted to be disposed in mortar joints connecting the masonry, bricks, blocks and the like to secure said third wall against the masonry, bricks, blocks and the like, said anchoring means being movable to a position perpendicular to said third wall to extend away from said third wall, said anchoring means including a bent-out tab member having an attached portion connected to said third wall and an end portion which is remote from said third wall in the perpendicular position, open means for permitting insertion therethrough for forcing said remote end portion of said tab member out and away from said third wall to said perpendicular position, said open means being disposed in said tab member between said attached portion and said remote end portion to receive mortar therethrough when in said perpendicular position to anchor said remote end portion when the mortar is hardened, said open means including a circular hole extending through said tab member and recesses provided in edge portions of said tab member, said recesses being disposed on opposite sides of said circular hole.



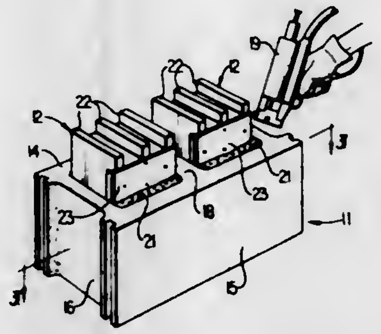
2. A wall stud according to claim 1, wherein said box-like member is fabricated from sheet metal and has a longitudinal overlap seam in one of said first, second and fourth walls.

4,002,002
INSULATING BUILDING BLOCK

Jacob C. Barnhardt, Jr., Springs Road, Mount Airy, N.C. 27030

Filed Apr. 19, 1976, Ser. No. 678,054
Int. Cl.² E04G *21/00;* **B29H** *3/00*

U.S. Cl. 52—743 **8 Claims**



1. A method for forming a composite insulating building block which comprises:

a. disposing a shield insert within at least one original cavity of a hollow building block to form a relatively smaller cavity between the shield insert and a longitudinally extending side face of said original cavity, said shield insert extending from top to bottom of said original cavity when disposed in said original cavity;

b. dispensing a foam material into the smaller cavity between said shield insert and the side face of said original cavity;

c. allowing said foam material to solidify as it adheres to the side face of said original cavity, thus forming a layer thereon; and

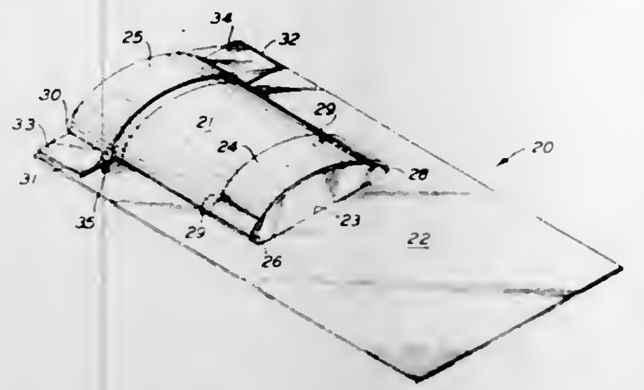
d. removing said shield insert from said original cavity.

4,002,003
METHOD FOR SECURING ARTICLES TO A DISPLAY BOARD

Osmund V. Place, Hudson; Philip C. Hungerford, Jr., Cleveland Heights, and John L. Gereby, Wickliffe, all of Ohio, assignors to Cardpak Incorporated, Cleveland, Ohio

Division of Ser. No. 412,907, Nov. 5, 1973, Pat. No. 3,885,373. This application May 27, 1975, Ser. No. 581,023
Int. Cl.² B65B *1/04*

U.S. Cl. 53—14 **6 Claims**



1. A method for packaging articles with a display card generally larger than the article and having a cutout portion therein and at least one tab contiguous therewith, comprising the steps of:

placing the article and display card upon a movable belt;

urging at least one tab away from the plane of the display card by movement of the article relative to the display card whereby the article extends partially through the cutout portion and contacts the tab;

advancing the card and article to a position for the application of a means for joining the article to the card;

moving at least one of said joining means into juxtaposition with the article and card; and,

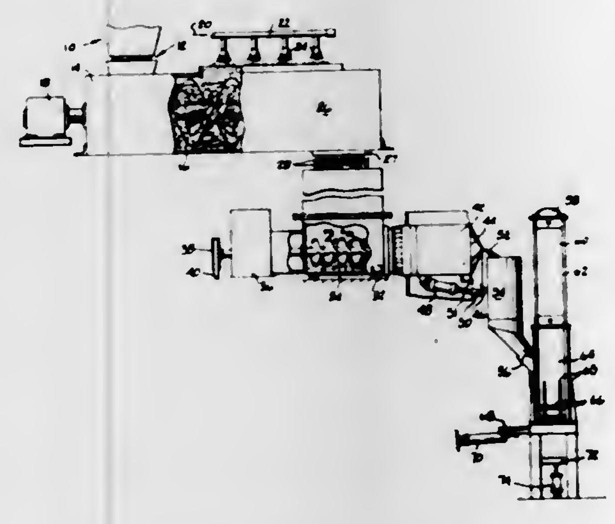
affixing the article to the card by applying said joining means to the article and at least one tab.

4,002,004
PACKAGING ASBESTOS FIBERS

Gerard Lucien Lambert, Asbestos, Canada, assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 438,969, Feb. 4, 1974. This application Feb. 26, 1976, Ser. No. 661,690
Int. Cl.² B65B *1/24*

U.S. Cl. 53—24 **10 Claims**



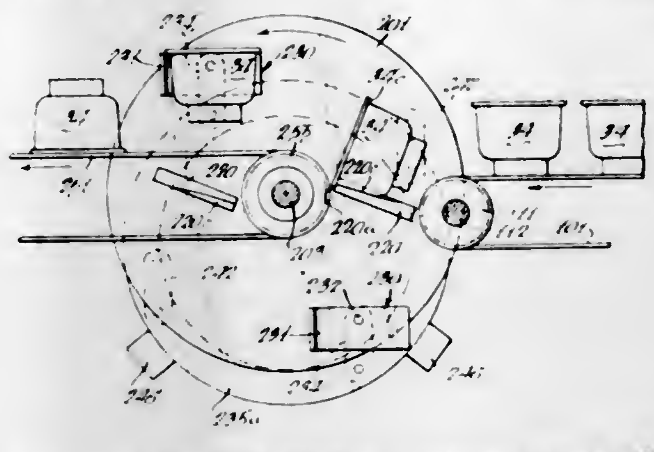
1. A method of packaging a mass of fluffy asbestos fibers comprising; (a) adding a small amount of liquid to said fluffy fibrous mass; (b) distributing said liquid throughout said fibrous mass; (c) partially compacting the resultant damp fibrous mass to increase the density thereof; (d) removing the excess air from the partially compacted fibrous mass; and (e) finally compacting said fibrous mass into a shape having a density of at least about 90 PCF.

4,002,005
PACKAGE OF NESTED CONTAINERS AND METHOD AND APPARATUS FOR PRODUCING SAME

Martin Mueller, Wonder Lake, and David L. St. Clair, Wilmette, both of Ill., assignors to Owens-Illinois, Inc., Ohio

Continuation-in-part of Ser. No. 371,521, June 19, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,647
Int. Cl.² B65B *35/58, 35/44, 53/02*

U.S. Cl. 53—26 **15 Claims**



1. A method of packaging nestable containers having different dimensions at opposite ends comprising the steps of: continuously feeding said containers in side by side relationship along transversely spaced adjacent process paths; engaging each container in each path and inverting alternate containers in each of said process paths while alternating said container inversion between said process paths such that inverted containers are in side by side relationship with noninverted containers; collating said containers into multiple row groups of predetermined number; moving a support member beneath each of said collated groups; transferring said groups in timed relationship with the moving of said support members to a second process path such that each group is positioned on a support member to form an assembly; enveloping each assembly in a film of thermoplastic heat-shrinkable material; and transferring said enveloped assemblies to a heating means whereby said film will be shrunk to the contour of said assembly to provide a finished package.

4,002,006
METHOD AND APPARATUS FOR PACKAGING GOODS

Edward C. Bruno, 4105 Holly St., Denver, Colo. 80216

Filed June 30, 1975, Ser. No. 591,420
Int. Cl.² B65B *9/14, 67/02*

U.S. Cl. 53—29 **27 Claims**

1. A method of packaging goods in separate individual containers formed from a length of a continuous unexpanded tube of expandable resilient net-like material having an open end and a length several times longer than the length of the individual containers to be formed therefrom, and comprising the steps of:

forming an open elongated cavity in only an intermediate portion of the continuous unexpanded tube of net-like material by resilient expansion of the intermediate portion, with the open end and portions of the continuous unexpanded tube of net-like material on opposite sides of the expanded intermediate portion being unexpanded, and providing an unexpanded end length portion between the expanded intermediate portion and the open end sufficient in length to form a container for the goods;

then closing the unexpanded open end of the continuous tube of net-like material to form a closed first end portion for the unexpanded end length portion;

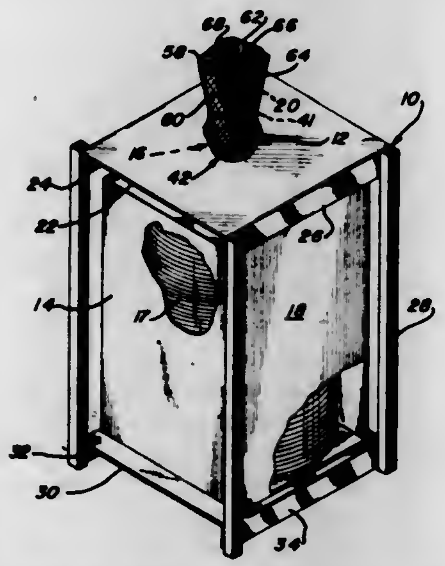
then placing the unexpanded end length portion and the closed first end portion thereof within the open elongated cavity and expanding a portion of the end length portion next adjacent the intermediate portion to provide an access opening to place the goods into the end length portion;

then placing the goods within the end length portion through the access opening and thereby resiliently expanding the end length portion between the access opening and the closed first end portion to form a container conforming to the goods with the goods and the end length portion being located within the expanded intermediate portion of the tube of net-like material during the forming of the container; and

then severing the end length portion from the intermediate portion of the tube of net-like material to provide a separate individual container for the goods having a second end portion opposite said closed first end portion.

5. Apparatus for packaging of goods in separate individual containers formed from a length of an unexpanded continuous tube of resiliently expandable material having a terminal end portion and a length many times greater than the length of the separate individual containers to be formed therefrom, and comprising:

material expansion means for supporting and resiliently expanding an intermediate portion of the length of the net-like material adjacent the terminal end portion with the terminal end portion and portions of the continuous tube of net-like material on opposite sides of the expanded intermediate portion being unexpanded, and providing an unexpanded end length portion between the expanded intermediate portion and the terminal end portion sufficient in length to form a separate individual container for the goods;



elongated packaging chamber means defined by and located within said material expansion means for receiving the unexpanded end length portion of the net-like material, the terminal end portion being closed to prevent passage of goods therethrough; and

access opening means at one end of said packaging chamber means for permitting placement therethrough of the unexpanded end length portion of the net-like material into said packaging chamber means, and for enabling placement therethrough of goods into the unexpanded end length portion of the net-like material within said packaging chamber means to form an individual container for the goods by resilient expansion of the unexpanded end length portion to accomodate the goods, and for enabling removal of the goods and the individual containers formed for the goods upon severance of the end length portion from the intermediate portion of the net-like material.

4,002,007

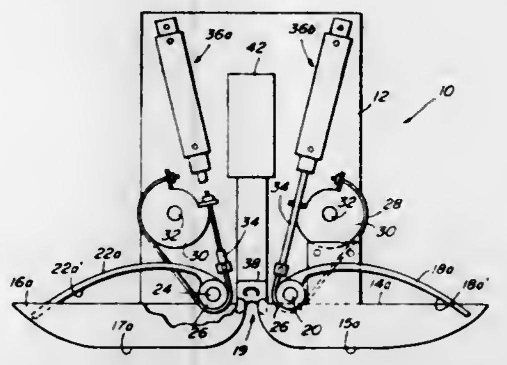
APPARATUS FOR CLOSING FLEXIBLE CONTAINERS

Robert C. Bertelsen, 42044 Balmoral Drive, Columbiana, Ohio 44408

Filed Apr. 16, 1976, Ser. No. 677,768

Int. Cl.^{2} B65B *51/08, 51/04, 13/02*

U.S. Cl. 53—138 A **7 Claims**



1. Apparatus for closing an open-sided container formed from a flexible material comprising

fixed guide defining an open-sided channel for receiving flexible material of a container and including first and second planar portions, each having a guide edge,

first and second gathering arms supported for motion in planes parallel to, respectively, said first and second planar portions of said guide means, each gathering arm including a material contacting edge and being movable between a first open position in which said first and second arms are retracted from the associated guide edges and a second position in which said first and second arms overlap the associated guide edges and each other to enclose the open side of said channel defined by said guide means, thereby to gather portions of said flexible material intermediate said arms, each said material contacting edge shaped, such that it makes at least a right angle with its associated guide edge and also with the other material contacting edge throughout the movement of the arm between said first and second positions,

drive means for driving said arms between said portions, and

fastening means applying a closure device to said gathered material portions when said first and second arms are in their second positions.

4,002,008

COMPRESSION PACKAGING METHOD AND APPARATUS

John Louis Grasson, North Ridgeville, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 15, 1975, Ser. No. 640,560

Int. Cl.^{2} B65B *63/02, 1/24*

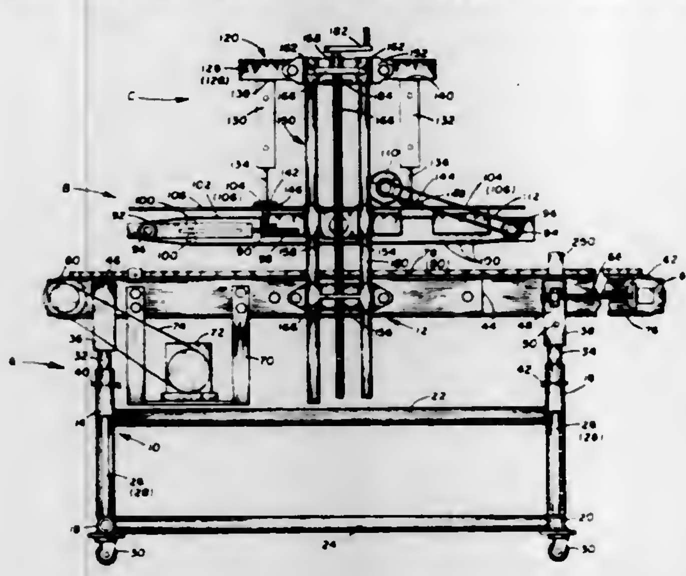
U.S. Cl. 53—167 **9 Claims**

1. Apparatus for nesting a plurality of individual pieces in a base member which is comprised of a permanently deformable material having a predetermined thickness wherein said pieces are initially placed on the top face of said base member and forced thereinto from said top face toward the bottom face, said apparatus comprising:

a first conveyor having a first generally flat conveyor surface defining a lower work path extending between an initial position and a final position adapted to support said base member with said pieces thereon, said first conveyor including means for continuously moving said first conveyor surface with said base member and pieces thereon from said initial to said final position at least during a nesting operation;

a second conveyor having second generally flat conveyor surface defining an upper work path spaced generally vertically from and extending generally parallel to said lower work path between an initial and a final position, said second conveyor including means for continuously moving said second conveyor surface from said initial to said final position at least during a nesting operation;

means for altering the transverse distance between said upper and lower work paths between a first normal position with said upper work path spaced from said lower work path a distance greater than the initial combined height of said base member with said pieces placed on the top face thereof and a second working position with the spacing between said paths being less than said initial combined height but greater than the height of said pieces such that said pieces will be engaged by said second conveyor surface and forced into said base member from said top face toward said bottom face to create substantially permanent nesting areas for said pieces; and



means for selectively controlling operation of said altering means such that as said base member and pieces pass beneath said upper work path initial position said altering means moves said work paths from said first to said second position and as said base members and pieces are moved to said upper work path final position said work paths are moved from said second back to said first position, said base member and pieces being continuously moved between said work paths at least between said upper work path initial and final positions.

4,002,009

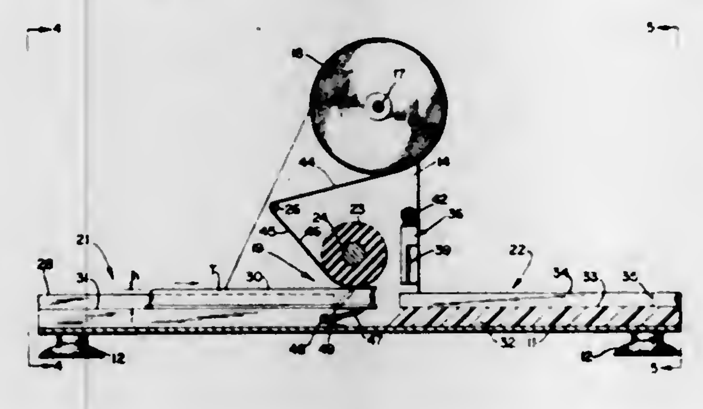
COMBINATION TAPE DISPENSER AND TRAY SEALER DEVICE

Felix P. Tolosa, and Lawrence Boxer, both of Alexandria, Va., assignors to Dynatech Laboratories, Incorporated, Alexandria, Va.

Filed Aug. 21, 1975, Ser. No. 606,454

Int. Cl.^{2} B65B *7/16, 61/06*

U.S. Cl. 53—296 **7 Claims**



1. A device for applying a cover over the surface of a test tray having a multiplicity of upwardly open wells, comprising a base having a sealing zone intermediate a tray loading zone and a tray removal zone, means rotatably mounting a roll of tape in the upper part of said sealing zone, slide guide means on said loading zone leading to said sealing zone, feed means in said sealing zone for applying the leading end of said tape upon and along the top surface of said tray while moving said tray along said slide guide means to said removal zone comprising a rotatable feed roller disposed for pressing the leading end of said tape onto the top surface of said moving tray, and a tape guide pin or roller mounted on a fixed axis below said tape roll at the loading zone side of said sealing zone for tensioning the tape from said roll and directing the leading end of said tape at a predetermined angle to the underside of said feed roller while affixing the tape thereto, rotation of said roller serving to draw tape from said roll over said guide pin or roller and to slidably displace said tray through said sealing zone, and means movably mounted at said base for holding the leading end of the tape against said roller, said holding means being positioned so as to be engaged by the tray and moved to inoperative position when the tray passes through said sealing zone.

4,002,010

HARVESTER FOR RICE, WHEAT AND SIMILAR CEREALS

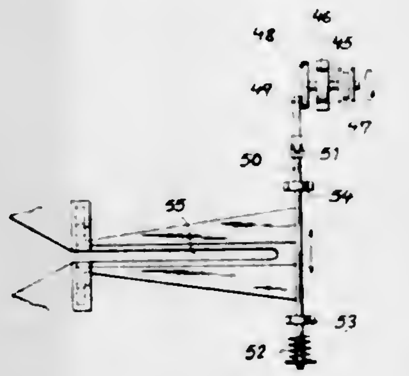
Domicano Da Silva Passos, 440 Durval Clemente St., Sao Paulo, Brazil

Filed Apr. 23, 1975, Ser. No. 570,586

Claims priority, application Brazil, Apr. 23, 1974, 03363

Int. Cl.^{2} A01D *41/08*

U.S. Cl. 56—126 **10 Claims**



1. A harvesting machine for a grain-carrying standing crop, said machine comprising:

a frame adapted to be displaced along the ground in a horizontal transport direction and formed with an upwardly and rearwardly inclined platform with a forwardly opening slot;

a pair of flailing elements on said frame to either side of said slot;

drive means on said frame for displacing said elements horizontally back and forth relative to said slot for threshing grain from crop projecting upwardly through said slot;

an upwardly and rearwardly extending collector conveyor on said frame including at least one belt on said frame below said slot for catching grain threshed from said crop; and

a cropper for said grain below said platform at the rear thereof for receiving grain from said conveyor.

4,002,011

HIGH SPEED BINDING DEVICE

Shigenobu Tanaka, Higashi-Ooizumi; Seiichi Nishikawa, Chiba, and Seiji Ishikawa, Fujinomiya, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

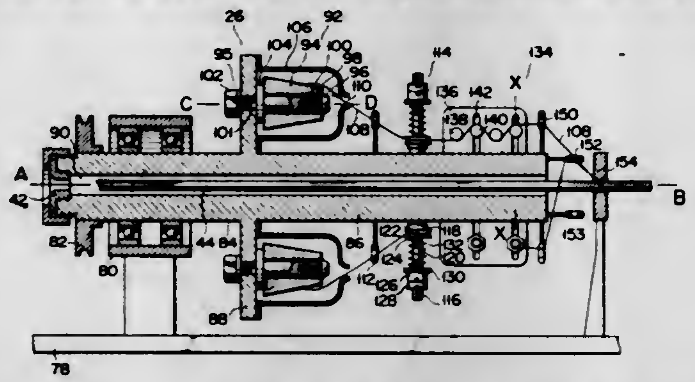
Filed Nov. 28, 1975, Ser. No. 636,202

Int. Cl.^{2} D07B *3/04*

U.S. Cl. 57—15 **10 Claims**

1. A high speed binding device comprising a flyer rotated about its rotation axis and having a through hole bored coaxially with said rotation axis for passing an element assembly therethrough, a cylinder of said flyer extending in the direc-

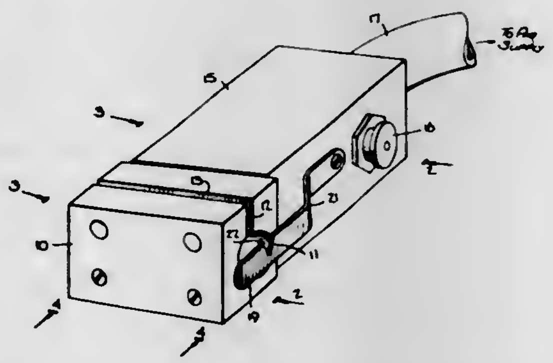
tion of said rotation axis, and a flange of said flyer formed at right angles to said cylinder, a plurality of package holders mounted on said flyer and each having a package having a wound binding thread and each having a package-attaching mechanism fixed to said flyer with a binding thread-winding axis of said package in parallel to said rotation axis of said flyer and suited for drawing out said binding thread in the direction of said winding axis, means provided on said cylinder for each said package holder, for imparting a substantially uniform back tension to each binding thread bound about said element assembly moving through said through hole bored through said cylinder, irrespective of the variation of the rotation speed of said flyer and including a first tensioner for imparting to each said binding thread a back tension which is decreased as the rotation speed of said flyer rises and a second tensioner for imparting to each said binding thread a back tension which is increased as the rotation speed of said flyer rises so as to cancel said decreased amount of back tension, and a binding die for applying the binding threads to said element assembly in cooperation with the rotation of said flyer.



4,002,012
METHOD AND APPARATUS FOR SPLICING THERMOPLASTIC TEXTILE YARN

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed May 21, 1975, Ser. No. 579,442
Int. Cl.^{2} D01H *15/00*
U.S. Cl. 57—22 **8 Claims**



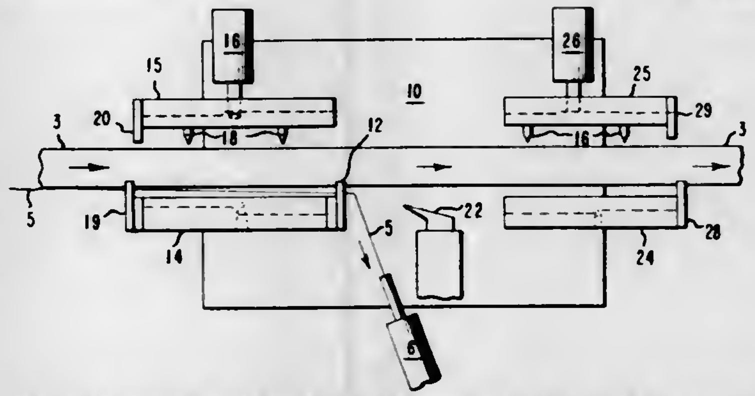
1. The method of splicing thermoplastic yarn comprising the steps of placing in side-by-side overlapping relationship the yarn ends which are to be spliced, disposing the overlapping yarn ends within a cylindrical cavity of a splicing device with the yarn secured at opposite ends of said cavity substantially at the longitudinal axis thereof and with sufficient slack within said cavity to insure initially engagement of said yarn therein with the wall of said cavity when said yarn is spun circumferentially around said axis, and circumferentially spinning said yarn within said cavity for a time sufficient to cause, and thereby causing, thermal bonding of adjacent yarn fibers.

6. Apparatus for splicing thermoplastic yarn comprising a body with a cylindrical cavity therethrough, means for gripping overlapping yarn ends in side-by-side relation at opposite ends of said cavity substantially at the longitudinal axis thereof, said gripping means being arranged to introduce a predetermined amount of slack in the yarn therebetween and comprising at least at one end of said cavity a gripping element mounted for movement along the longitudinal axis of said cavity for a predetermined distance whereby the yarn ends can be stretched taut initially between said gripping means and said slack introduced by moving said movable gripping element, and means for circumferentially spinning said yarn in the span between said gripping means.

4,002,013
PROCESS AND APPARATUS

Melvin Harry Johnson, Wilmington, Del., and Calvin Brooks Walker, Wilmington, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1976, Ser. No. 648,762
Int. Cl.^{2} B65H *69/06*
U.S. Cl. 57—22 **8 Claims**

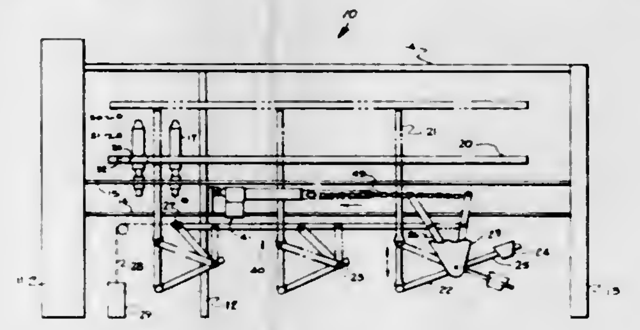


4. In an apparatus for slicing a running yarn with a running tow, the combination of a first fluid-jet means for entangling filaments of the tow with and about filaments of the yarn, cutting means for severing the yarn to leave a small protruding tail ahead of the entangled filaments, and a second fluid-jet means for entangling the tail within the tow.

4,002,014
BEAR DOWN SYSTEM FOR YARN HANDLING MACHINE

Charles A. Grant, Spartanburg, and Charles C. Saylors, Greenville, both of S.C., assignors to Grant's Textiles, Incorporated, Spartanburg, S.C.

Filed Dec. 23, 1974, Ser. No. 535,220
Int. Cl.^{2} D01H *9/14*
U.S. Cl. 57—54 **18 Claims**



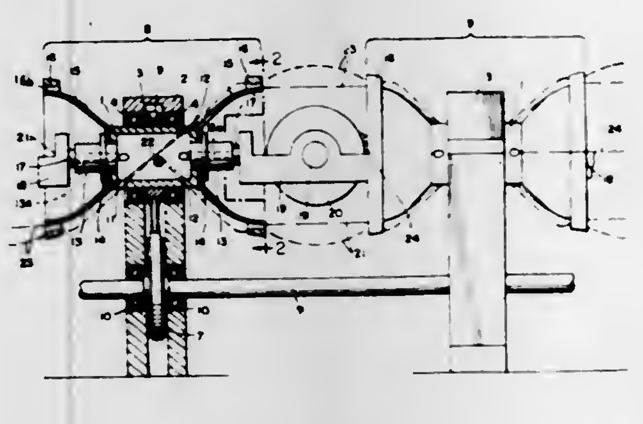
18. A bear down system for a yarn handling frame having a traverse element with associated means to move said element up and down comprising:

a. a mounting bracket secured to said frame;
b. a power unit loosely secured to said mounting bracket to permit self alignment of said power unit thereabout, said power unit comprising a ball bearing screw actuator and an electric motor operatively connected thereto, said ball bearing screw actuator and said motor being enclosed by a housing, said ball bearing screw actuator having a sleeve secured to a portion thereof and being extendible out of said housing;
c. a flexible, nonextensible connector secured to said sleeve at one end and to said traverse element movement means at an other end, whereby actuation of said power unit causes movement of said sleeve and said connector to effect movement of said traverse element; and
d. control means for said power unit, said control means actuating said power unit at a predetermined time and deactuating said power unit after said power unit has been actuated and has borne down the traverse element.

4,002,015
TWISTING MACHINE

Dietrich Berges, Marienheide; Bodo Damzog, Remscheid, and Ulrich Saam, Gummersbach, all of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Jan. 20, 1975, Ser. No. 542,198
Claims priority, application Germany, Jan. 29, 1974, 2404030
Int. Cl.^{2} D01H *7/90*
U.S. Cl. 57—58.38 **3 Claims**



1. In a twisting machine for stranding wires or the like including a plurality of rotatably mounted bearing members which are arranged in axial alignment on said machine and spaced at an interval one behind the other, a spool carrier for a take-off spool pivotally mounted for free oscillation and interposed between each of at least two successive bearing members, means to rotatably drive said bearing members at the same rotational speed and guide means to guide the wires in a transported path through each bearing member and outwardly around each individual spool carrier with its take-off spool, the improvement which comprises:

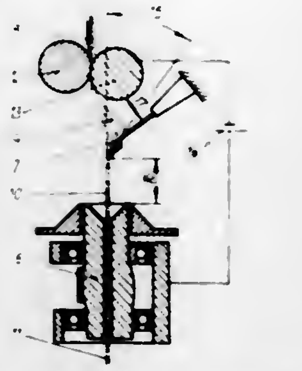
- rotatable bearing members having guide bores for the transport of wires extending obliquely to the machine axis through each bearing member to emerge at openings adjacent the ends thereof facing the interposed spool carrier;
- concave guide pots having oppositely disposed open projecting ends and being fixed at their bases to said facing ends of the bearing members for rotation therewith, each pot providing an outer curved guide surface which is approximately defined by said wire path when flying freely as the generatrix rotated symmetrically around the machine axis between two successive bearing members, the emerging openings of the guide bores in each bearing member being situated outside the curved guide surface of its associated guide pot; and
- a retaining ring arranged around the open projecting end of each guide pot to limit outward movement of the wire.

4,002,016
OPEN END SPINNING APPARATUS

Peter Fischer; Bruno Schmidt; Rolf Langer, and Günter Trommer, all of Karl-Marx-Stadt, Germany, assignors to VEB Spinnereimaschinenbau, Karl-Marx-Stadt, Germany

Filed Aug. 13, 1975, Ser. No. 604,398
Claims priority, application Germany, Aug. 16, 1974, 180546
Int. Cl.^{2} D01H *1/12*
U.S. Cl. 57—58.95 **10 Claims**

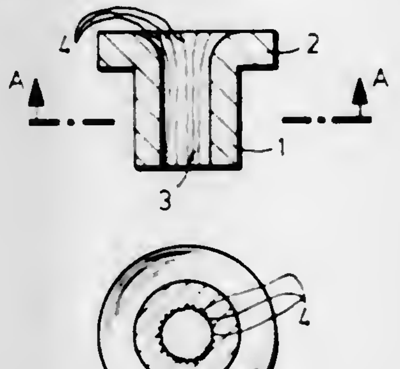
1. In an open end spinning apparatus for converting staple fibers into yarn, the apparatus comprising a rotor having a rotatable surface to which a substantially parallel array of the fibers is fed substantially along the axis of the rotor and by engagement with which the fibers are twisted together, the improvement comprising a needle non-rotatably mounted adjacent the rotor and having a free end impinging on the path of travel of the array of fibers to the rotor and being directed in the direction of the rotor, whereby the needle engages the array of fibers and thereby holds back the fibers at that point from co-rotating with the fibers engaged by the rotor.



4,002,017
FRICTION MEMBER FOR A MISTWISTING APPARATUS

Ernst A. Weinz, Auf der Bilz 2, 6580 Idar-Oberstein 2, Germany

Filed June 23, 1975, Ser. No. 589,435
Claims priority, application Germany, June 28, 1974, 2431101
Int. Cl.^{2} D02G *1/08*
U.S. Cl. 57—77.4 **7 Claims**



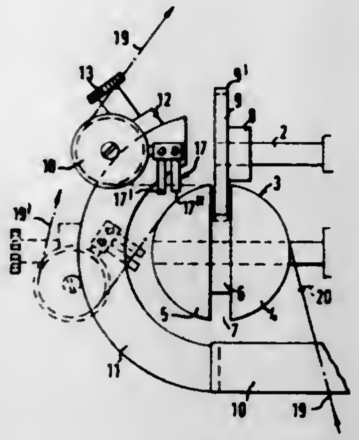
1. A friction element for use in a false twisting apparatus for the texturing of yarn, comprising a rotatable friction element in the form of an annulus having a curvilinear yarn-engaging surface, the surface having longitudinal grooves therein extending generally parallel to the axis of rotation of the friction member.

4,002,018
DEVICE FOR MODIFYING THE YARN WRAP ANGLE IN A FRICTION FALSE-TWIST DEVICE

Arnold Steck, Wattwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Feb. 27, 1976, Ser. No. 662,288
Claims priority, application Switzerland, Apr. 18, 1975, 4976/75; Dec. 3, 1975, 15711/75
Int. Cl.^{2} D02G *1/08*
U.S. Cl. 57—77.4 **10 Claims**

1. A friction false-twist device for texturing textile yarns of thermoplastic synthetic material comprising a main friction element mounted to rotate about a first fixed axis and formed with an external surface constituted essentially by a convex surface of revolution about said first axis tapering inwardly towards said first axis from a central location of maximum diameter in each direction to terminal locations, said main friction element being formed with at least one circular groove having its centre on said axis and being substantially displaced from said terminal locations, a secondary friction element mounted to rotate about a second fixed axis parallel to said first fixed axis and comprising as many circular discs as there are grooves in said main friction element, each such disc being centred on the second axis and arranged with a rim portion thereof projecting into an individual one of said grooves, a yarn-guide unit mounted externally of said main friction element, a support for said yarn-guide unit, and means for adjustably positioning said yarn-guide unit on said support, said support and said positioning means constantly locating said yarn-guide unit substantially in a notional plane containing said first axis and arranged for said yarn-guide unit to be fixed in any position about substantially one half of said main friction element at the same distance from said surface of revolution for each such position.



4,002,019

METHOD OF MAKING YARNS FROM ANGORA RABBIT'S-WOOL AND YARNS SO MADE

Gerhard Egbers, Eningen, and Peter Artzt, Reutlingen, both of Germany, assignors to Patentverwertungs-AG der Spinnerei am Uznaberg, Ballen, Switzerland

Filed July 21, 1975, Ser. No. 597,454

Claims priority, application Switzerland, July 22, 1974, 10092/74

Int. Cl.^{2} D02G *3/02, 3/04*

U.S. Cl. 57—140 BY **10 Claims**

10. Yarn of a fineness between Nm 60 and Nm 250 comprising fibres from the fur of angora rabbits, which fibres have been pretreated with a two-component composition of an antistatic agent and an agent for increasing the adhesability of the angora fibres, said fibres being spun together with an uninterrupted carrier thread of a cross-sectional area up to one third of the spun yarn.

4,002,020

FOUR-SIDED WATER-RESISTANT WATCH-CASE

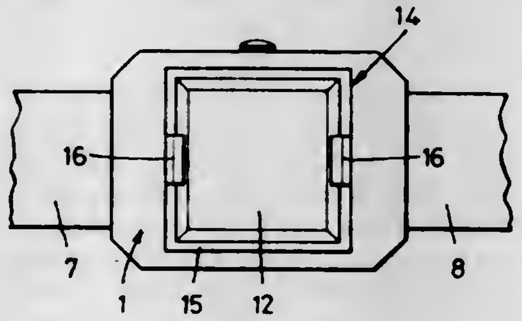
Hans Ulrich Klingenberg, St. Niklaus near Merzligen, Switzerland, assignor to Century Time Ltd., Switzerland

Filed Oct. 30, 1974, Ser. No. 519,293

Claims priority, application Switzerland, Nov. 9, 1973, 15758/73

Int. Cl.^{2} G04B *37/08*

U.S. Cl. 58—90 R **3 Claims**



1. A four-sided water-resistant watch-case comprising:

a caseband having a plane upper surface and an opening therein for receiving a watch movement;
an annular gasket disposed on said plane upper surface adjacent said opening;
a crystal made of inorganic material covering said opening and resting on a top surface of said gasket, said crystal having outwardly beveled side portions extending from a top planar surface of the crystal part-way to a bottom coplanar surface of the crystal;
a bezel mounted to said caseband on said plane upper surface, said bezel comprising a frame having a main body portion surrounding said annular gasket and having an inner face, the plane of which is substantially perpendicular to said plane upper surface, contacting a complementary outer face of said gasket, said inner face extending upwardly from said plane upper surface toward but not higher than the bottom beveled edge of said crystal side portions, and at least one pair of oppositely disposed claw members extending upwardly from said main body portion and contacting corresponding ones of said beveled side portions, said claw members each having an inner face extending from said main body portion inner face and forming an angle of greater than 90° with respect to said inner face, said inner faces of said claw members engaging the beveled side portions of said crystal, each of said claw members having a length substantially less than the length of the side of said frame from which said claw member extends such that the beveled portions of the crystal engaged with said claw members remain largely uncovered; and
means securing said bezel to said caseband whereby said claw members press against said beveled side portions of said crystal to press said crystal against said gasket.

4,002,021

ROTARY ESCAPEMENT FOR TIMEPIECE

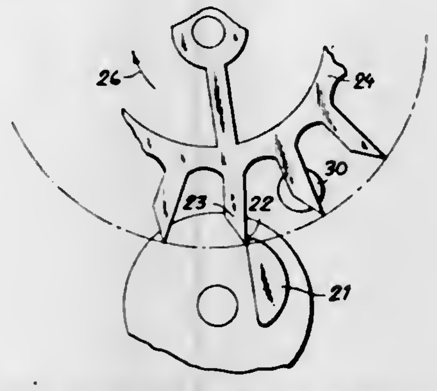
Roland Dubois, and Alexandre Antoine Bernasconi, both of Le Locle, Switzerland, assignors to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Filed Oct. 31, 1975, Ser. No. 627,909

Claims priority, application Switzerland, Nov. 2, 1974, 14651/74

Int. Cl.^{2} G04B *15/14*

U.S. Cl. 58—117 **6 Claims**



1. In a timepiece escapement wherein a balance carrying an eccentric pallet pin periodically and regularly oscillates forward and backward about a balance axis with the pin engaging on each forward oscillation between the teeth of an adjacent escape wheel rotatable about a parallel wheel axis to displace said wheel only during said forward oscillation about said balance axis through a predetermined lift angle centered on said balance axis, said pallet pin being engaged within the orbit defined by said teeth and substantially preventing rotation of said wheel independent of said balance during forward and backward oscillation of said balance through a predetermined engagement angle at least partially overlapping said lift angle, the improvement wherein said engagement angle is at least twice as great as said lift angle.

4,002,022

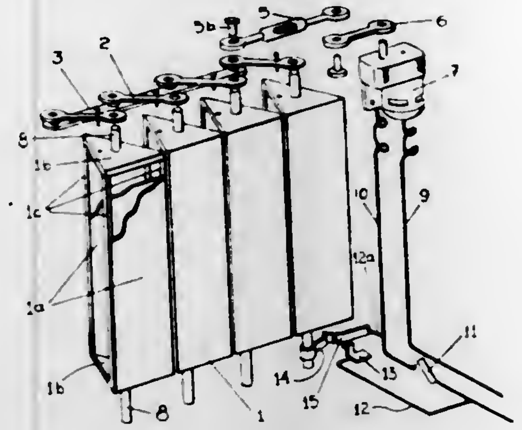
ELECTRO-MECHANICAL SIGN STRUCTURE WITH ALTERNATING FACES FORMED BY SEVERAL ADJACENT DIHEDRAL ANGLES

Guillermo Lopez C., 102 W. Crockett St., P.O. Box 2663, San Antonio, Tex. 78299

Filed Oct. 1, 1974, Ser. No. 511,055

Int. Cl.^{2} G04B *19/00;* **G09F** *11/02;* **G04B** *19/02*

U.S. Cl. 58—126 R **8 Claims**



1. An electromechanical sign structure comprising a frame, several adjacent dihedral angles contained inside said frame, means connected to said dihedral angles for rotating said angles back and forth in an angular motion to alternately exhibit each of the two faces of all the dihedral angles synchronously at the front of the frame, thus forming a continuous surface on which a sign or message has been placed, means in the frame supporting said rotating adjacent dihedral angles, said rotating means including a series of angle gears and pinion gears, a pinion gear being mounted on each of the dihedral angles, a rotary transmission shaft supporting the angle gears to transmit a rotational motion to said angle gears to thereby transmit a synchronized back and forth rotational movement to said dihedral angles to allow the sign formed by the adjacent faces to remain stationary for several seconds in the frame, means to stop the back and forth angular motion only when dihedral angles have completed their predetermined entire angular stroke, means to optionally illuminate the faces of said dihedral angles, said electromechanical sign structure further including a clock mechanism, means to support said clock mechanism, rearwardly of said dihedral angles, said mechanism having a clock hands shaft protruding through and between two dihedral angles disposed forwardly thereof to the front face of the frame, clock hands attached to the shaft forwardly of the front face means to exhibit the numerals of the clock face on the front of the sign.

4,002,023

STATIONARY POWER-GENERATING PLANT

Max Hartmann, Baden, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

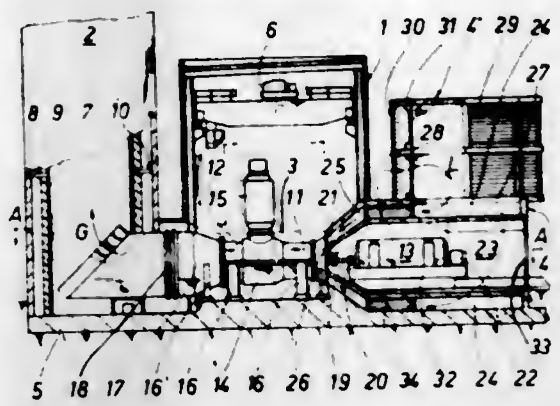
Filed Mar. 25, 1975, Ser. No. 561,694

Claims priority, application Switzerland, Apr. 9, 1974, 4980/74

Int. Cl.^{2} F02C *7/20*

U.S. Cl. 60—39.31 **2 Claims**

1. A stationary power-generating plant comprising a foundation, a building structure on said foundation and which houses a casing supported on said foundation, said casing enclosing an axial flow compressor shaft-connected to an axial flow gas turbine, a combustion chamber upstanding on said casing intermediate said compressor and turbine, an axial flow exhaust gas diffusor supported on said foundation and connected to said casing at the discharge side of said turbine, an upright exhaust gas stack connected to the discharge side of said diffusor, an electrical generator mounted on said foundation and shaft-connected to said compressor at the air inlet side thereof and which receives the principal useful power output from said turbine, said building structure including a pair of spaced walls extending longitudinally of and surrounding said generator and which establish therebetween an annular air intake duct for flow of air to said compressor, the lower part of said annular duct beneath the generator being incorporated within the foundation, said air intake duct being located co-axially with the axis of said compressor and being connected to the inlet end of the latter by means of a convergent conical annular duct, and an air filter structure mounted above said building structure, the filtered air flowing downwardly from the filter outlet through an opening into said annular air intake duct and being turned into a horizontal flow through said duct into the compressor inlet.



4,002,024

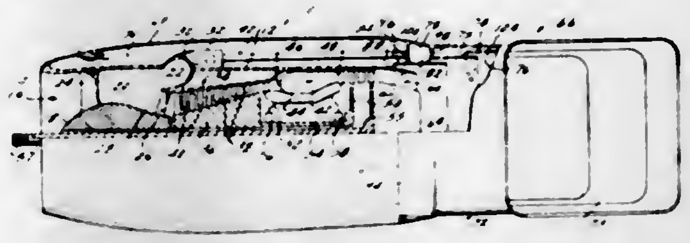
INFRARED SUPPRESSION SYSTEM FOR A GAS TURBINE ENGINE

James Leroy Nye, Marblehead; Samuel Rothrock Barr, Swampscott; Thomas Chew, W. Peabody, and William Steyer, Ipswich, all of Mass., assignors to General Electric Company, Lynn, Mass.

Division of Ser. No. 528,797, Dec. 2, 1974, Pat. No. 3,921,906. This application May 21, 1975, Ser. No. 579,549

Int. Cl.^{2} F02K *1/02, 3/02*

U.S. Cl. 60—262 **9 Claims**



1. An infrared suppression system for an aircraft gas turbine engine of the type having an integral inlet particle separator including a particle collection chamber and blower for evacuating said chamber, comprises:

means for directing the airflow from the integral inlet particle separator blower to the hot engine exhaust stream for mixing therewith,
means for capturing a portion of the ambient ram airflow around the engine and directing it to the hot engine exhaust stream for mixing therewith, and
wherein the engine is housed within an aircraft engine nacelle so as to define an annular bay area therebetween and cooling airflow is admitted to the bay area to cool the aircraft engine nacelle after which said bay cooling airflow is directed to the hot engine exhaust stream for mixing therewith.

4,002,025

SYSTEM FOR HEATING INTAKE PIPE OF INTERNAL COMBUSTION ENGINE

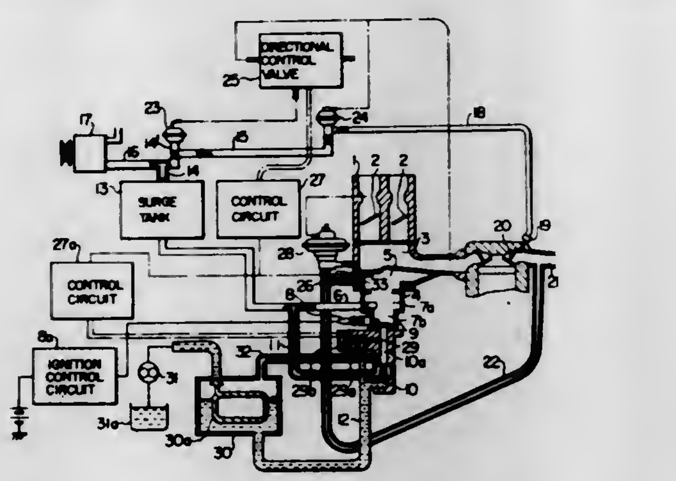
Shunzo Yamaguchi, Nishio; Tadashi Ozaki, Gamagori; Masashi Kida, Nishio, and Toshiaki Konomi, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed Oct. 29, 1975, Ser. No. 627,008

Claims priority, application Japan, Oct. 31, 1974, 49-126423

Int. Cl.² F02M *31/00*; **F02B** *75/10*

U.S. Cl. 60—274 **7 Claims**



1. In an internal combustion engine including an intake pipe and an exhaust manifold,

a system for heating the intake pipe comprising

- a. a combustion equipment disposed adjacent to said intake pipe for heating the same and including
  - a mixing chamber where the air and fuel are mixed, a combustion chamber which is communicated with said mixing chamber and in which the air-fuel mixture is burned, and
  - an ignition means for igniting the air-fuel mixture;
- b. a fuel supply system adapted to supply the fuel into said combustion equipment and including a main fuel injection nozzle and an auxiliary fuel injection nozzle so arranged as to inject the fuel into said mixing chamber of said combustion equipment;
- c. an air supply system adapted to supply the air into said combustion equipment and including an air pump connected through air supply lines with said mixing chamber and said combustion chamber of said combustion equipment; and
- d. control means adapted to control said auxiliary fuel injection nozzle so as to start or stop the fuel injection into said mixing chamber depending upon an operating condition of the engine.

4,002,026

DEVICE FOR THE AFTER-BURNING OF EXHAUST GASES

Dietmar Löffelhardt, Fellbach, Germany, assignor to J. Eberspacher, Germany

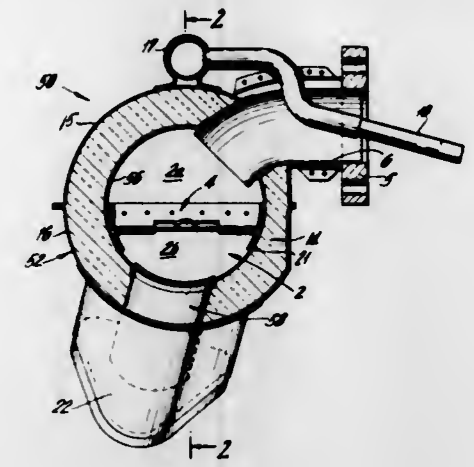
Filed Oct. 15, 1974, Ser. No. 514,466

Claims priority, application Germany, Oct. 17, 1973, 2351979

Int. Cl.² F01N *1/15*

U.S. Cl. 60—282 **10 Claims**

1. A device for the after-burning of combustible components of engine exhaust gases particularly for mounting on an engine block of an Otto cycle engine, comprising a cylindrical reactor housing closed at each end and having an interior elongated reaction chamber, a flat perforated bottom plate extending completely across said reaction chamber and dividing it into first and second reaction chamber portions, said plate being composed of at least two plate parts closing off said first reaction chamber portion from said second reaction chamber and with a marginal edge of one of said plate parts overlapping and slideably engaged on the other, a longitudinally extending support plate connected to each side of the interior of said housing and to each plate, a relatively short exhaust gas conduit having engine block mounting means at one end and connected at its opposite end into said first reaction chamber portion, a treated gas discharge conduit connected into said second reaction chamber portion, and secondary combustion air supply means connected through a portion of said exhaust gas conduit and communication with said first reaction chamber portion to supply air for reacting with the exhaust gases for flow through the perforations of said bottom plate to said reaction chamber portion and out said treated gas discharge conduit.



4,002,027

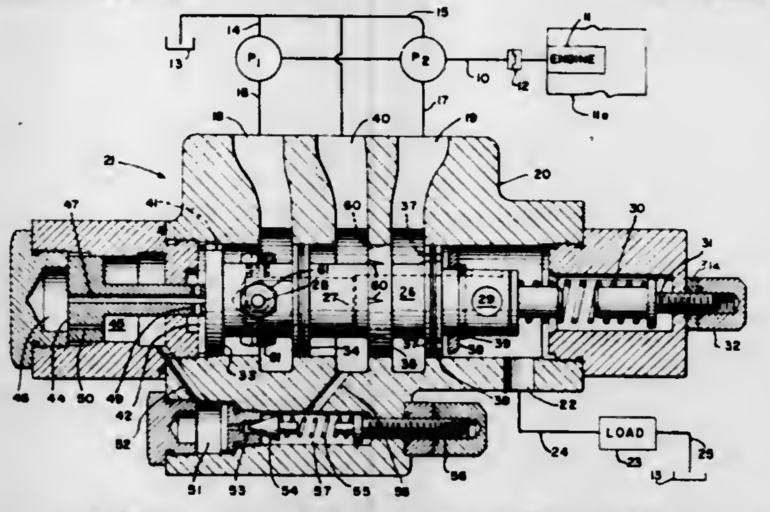
MULTIPLE PUMP CONTROL SYSTEM

James M. Eley, Corinth, Miss., and Fred T. Smith, Dearborn Heights, Mich., assignors to Tyrone Hydraulics, Inc., Corinth, Miss. and Sargent Industries, Inc., Los Angeles, Calif., part interest to each

Continuation of Ser. No. 402,292, Oct. 1, 1973, abandoned. This application Jan. 28, 1976, Ser. No. 652,532

Int. Cl.² F15B *13/09*

U.S. Cl. 60—430 **20 Claims**



1. In a fluid control system, a pair of fixed displacement pumps each having supply and discharge passages for supplying operating fluid from a reservoir to a load, control valve means including a movable valve member and valve passages for delivering the fluid discharged from the pumps to the load, said valve member being movable to a first position to combine the flow of fluid from said pumps for delivery to the load and to a second position in which the flow of fluid from a first one of said pumps is delivered to the load and in which flow from the other one of the pumps is by-passed from delivery to the load and valve actuating means operative in response to a predetermined upper limit of flow and to a predetermined upper limit of pressure downstream from one of the said pumps for moving the valve member to the second position when either the predetermined upper limit of flow or the predetermined upper limit of pressure is reached.

4,002,028

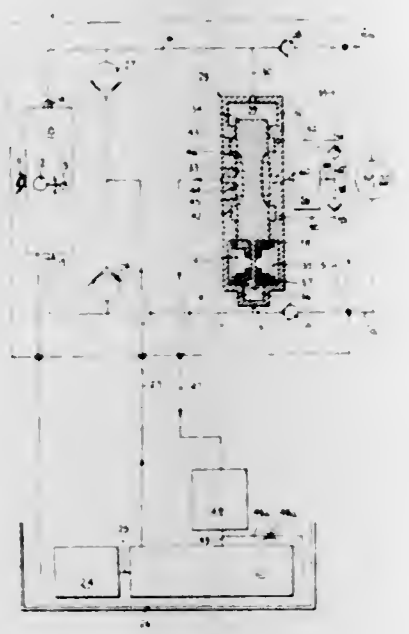
HYDROSTATIC TRANSMISSION MIXED LOOP SYSTEM

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 554,619, March 3, 1975, Pat. No. 3,962,872. This application Apr. 5, 1976, Ser. No. 674,036

Int. Cl.² F15B *15/18, 21/04*

U.S. Cl. 60—453 **10 Claims**



1. A fluid power transmission and control system having a variable delivery fluid pump and a fluid motor, fluid conducting means between said variable delivery fluid pump and said fluid motor, the improvement which comprises a fluid distributing and control system interposed between said variable delivery fluid pump and said fluid motor said distributing and control system having motor exhaust fluid bypass means to selectively bypass full flow of motor exhaust fluid past said fluid conducting means, said motor exhaust fluid bypass means including motor exhaust fluid diverting means, fluid reservoir means and motor exhaust flow boosting means and means for phasing full suction flow requirement of said variable delivery fluid pump from said motor exhaust flow boosting means to said variable delivery fluid pump.

4,002,029

PUMP MOTOR COMBINATION FOR HYDRAULIC TREATMENT

Francis L. Jones, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Sept. 22, 1975, Ser. No. 615,442

Int. Cl.² F15B *15/18*

U.S. Cl. 60—458 **3 Claims**

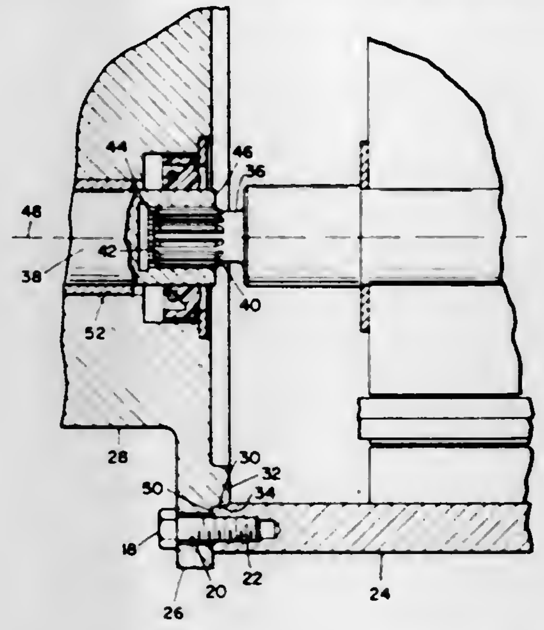
1. In a hydraulic implement controlling assembly comprising a hydraulic implement, a hydraulic pump for controlling flow of hydraulic fluid to said hydraulic implement and an electric motor for driving said pump, the improvement comprising:

means for coaxially aligning a driving shaft of said motor to the driven shaft of said pump, said aligning means comprising a first pilot on said motor and a second pilot on said pump mating with said pilot, said first pilot comprising a rounded undercut in a motor surrounding cylindrical casing proceeding from said motor towards said pump and said second pilot comprising an extension from said pump towards said motor, said extension fitting matingly within said undercut, said extension comprising a generally annular ridge having a rounded edge and extending towards said motor, said ridge being upraised from a flange which extends radially outwardly from said pump to abut an end of said cylindrical casing;

means for affixing said pump to said motor with said flange abutting an end of said cylindrical casing and serving along with said pump as an end cover for said motor, said affixing means comprising a plurality of holes through said flange with axes perpendicular thereto, a plurality of threaded bores extending longitudinally into said cylindrical casing, each of said bores being alignable with a respective hole in said flange and a plurality of bolt means affixed through said holes and threaded into said bores;

means for directly drivingly engaging said driving shaft with said driven shaft, said engaging means comprising a driving spline on said first end of said driving shaft and a mating driven spline on a first end of said driven shaft; and

only one single bearing supporting said driven shaft, said single bearing also serving to support the first end of said driving shaft via said engaging means.



4,002,030

PRESSURE FORCE GENERATOR FOR MACHINE TOOLS

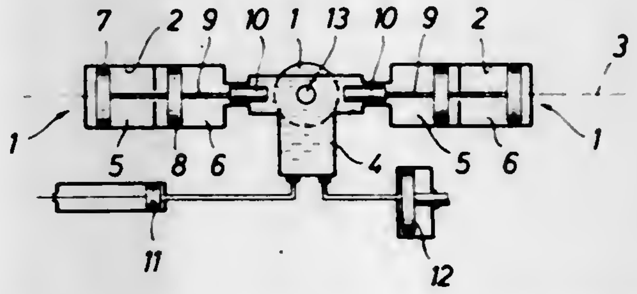
Siegfried Harcüba, Petersbergstrasse 51, 6600 Saarbrucken, Germany

Filed Aug. 20, 1975, Ser. No. 606,098

Claims priority, application Germany, Aug. 21, 1974, 2440163

Int. Cl.² F15B *7/00*

U.S. Cl. 60—581 **5 Claims**



1. A pressure force generator for machine tools comprising:

at least two, separate and independent, pneumatic-hydraulic pressure multipliers;

a single, high-pressure container directly connected to each of said multipliers and containing hydraulic fluid to be pressurized by said multipliers in order to actuate at least one of said machine tools;

each of said multipliers including two pneumatically-operated pistons mounted upon a single piston rod at one end thereof, and a plunger mounted upon said piston rod at the other end thereof and disposed within said hydraulic container for pressurizing said hydraulic fluid within said container; and

control means for selectively actuating said multipliers, either simultaneously, sequentially, or singly,

whereby the pressurization of said hydraulic fluid may be selectively controlled as desired or required so as to in turn selectively control the operation of said at least one of said machine tools.

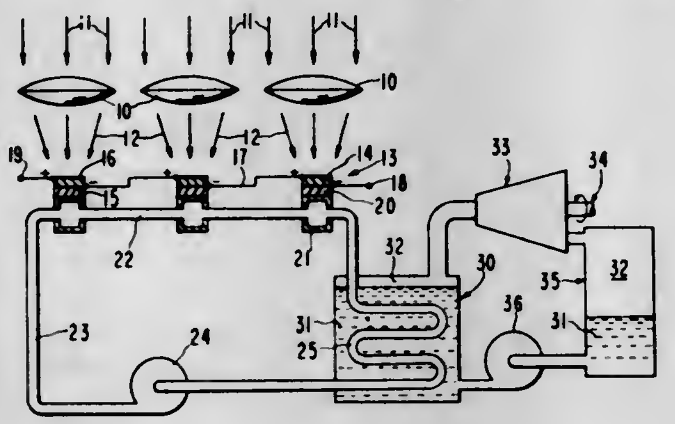
4,002,031
SOLAR ENERGY CONVERTER WITH WASTE HEAT ENGINE

Ronald L. Bell, Woodside, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed July 7, 1975, Ser. No. 593,913

Int. Cl.² F03G *7/02*; H01L *31/06*

U.S. Cl. 60—641 **5 Claims**



1. A solar energy converter comprising:

collector means for concentrating solar electromagnetic radiation,

a gallium arsenide junction cell for receiving said concentrated radiation and converting a portion thereof to electrical energy,

means for transferring heat from said cell to a circulating fluid, and

heat engine means for converting a portion of said heat to mechanical energy.

4,002,032
SOLAR HEATED DEVICE

D'Arle G. Bash, 10345 SW. 117th St., Miami, Fla. 33176

Filed Nov. 28, 1975, Ser. No. 636,158

Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **14 Claims**

1. In a solar heated device for expansion of gaseous material including:

conduit means for containing gaseous material and for permitting expansion and flow of said gaseous material therein;

and solar light collecting means in heat transfer relation with said conduit means for collecting light from the sun and causing the light to heat the gaseous material in said conduit means for expansion and flow of said gaseous material in said conduit means;

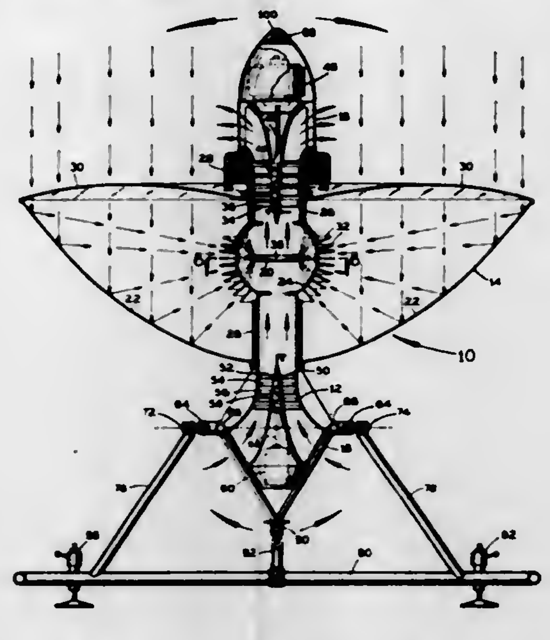
the improvement comprising

turbine means including at least one stator and one rotor driven by said expanded flowing gaseous material for converting solar energy into mechanical energy;

said solar light collecting means comprising a parabolic reflector means associated with said conduit means for directing light from the sun on to said conduit means to heat the same;

said conduit means being in heat transfer relation with gaseous material therein;

said parabolic reflector means having a focal point within said conduit means and encircling said conduit means; and



said turbine means being located within said conduit means adjacent said focal point of said parabolic reflector means.

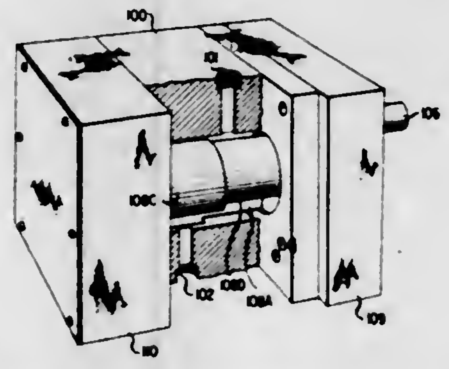
4,002,033
ROTARY DISPLACER FOR ROTARY ENGINES OR COMPRESSORS

Robert Maurice Welch, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 4, 1975, Ser. No. 546,935

Int. Cl.² F01K *25/02*

U.S. Cl. 60—682 **15 Claims**



1. In a rotary engine of the rotary-abutment type having a housing with a plurality of cylindrical intercommunicating parallel bores therein and a piston centrally located in one of said bores, said piston having at least one rotatable lobe, the improvement comprising:

a cylindrical rotary abutment centrally located in another of said bores substantially engaging said piston and having at least one recess therein to engage said lobe during rotation, said rotary abutment having a first and a second section located along the axis thereof, said first section maintaining close clearance with the wall of said other bore and said second section having a diameter substantially smaller than said first section; and

means for defining discharge and intake ports in said housing for said rotary engine, said ports communicating with said other bore at different points along the axis thereof, one of said ports being located over said first section of said rotary abutment and the other of said ports being located over said second section of said rotary abutment so that said one of said ports located over said first section is sequentially opened and closed during the rotation of said abutment by said first section while said port located over said second section remains in constant communication with said other bore.

4,002,034
MATTING FOR THE PREVENTION OF HYDRAULIC EROSION

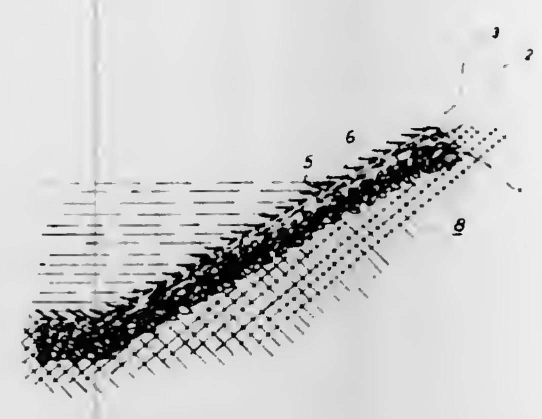
Walter Mühring, 20, Meppener Strasse, 45 Osnabruck, and Ernst-Gunther Gossling, 18, Bachstrasse, 495 Dankersen, both of Germany

Filed June 25, 1975, Ser. No. 590,169

Claims priority, application Germany, June 27, 1974, 2431038

Int. Cl.² C02B *3/12*

U.S. Cl. 61—3 **5 Claims**



1. A protective matting laid on a ground surface adjacent a body of water for inhibiting hydraulic erosion of said ground surface, said matting comprising at least two superposed fibrous layers, the fibers employed in the one of said layers closest to said ground surface being thicker than those in the other of said two layers more remote from said ground surface, and the spacing between the thicker fibers in the one of said layers closest to said ground surface being greater than the spacing between the thinner fibers in the other of said layers more remote from said ground surface, and said matting including a third layer disposed outwardly of said two fibrous layers relative to the ground surface and constructed to provide a preferential direction of water flow through said matting with the resistance to water flow through said matting in a direction from the ground surface side of said matting toward the water surface side of said matting being less than the resistance to water flow through said matting in a direction from the water surface side of said matting toward said ground surface side of said matting wherein said third layer is positioned adjacent the uppermost surface of said matting facing said body of water and comprises a flexible layer having a plurality of perforations therein, said third layer further comprising means providing a plurality of flexible closure elements extending outwardly from said uppermost surface toward said body of water and adapted to selectively cover underlying associated ones of said perforations respectively in response to flow of water through said matting from said body of water toward said ground surface, and adapted to uncover said associated perforations respectively in response to flow of water through said matting from said ground surface toward said body of water.

4,002,035
MOBILE SHORING RIG FOR EXCAVATION OF TRENCHES

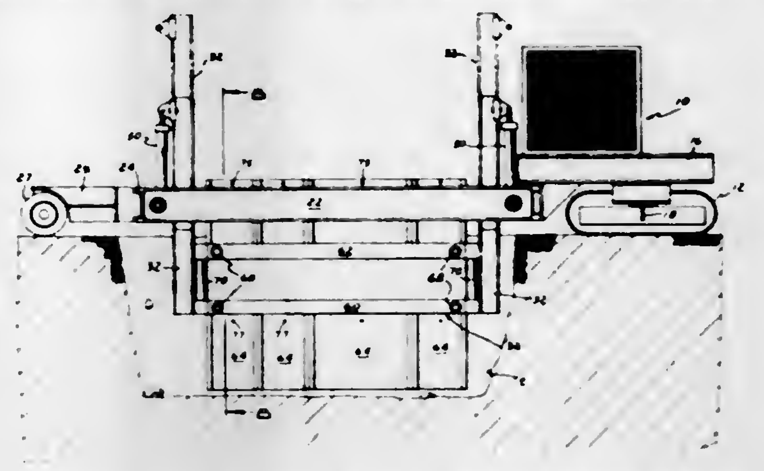
Charles V. Wright, 54 Oak Hollow Road, Springfield, Mass. 01128

Filed July 11, 1975, Ser. No. 595,366

Int. Cl.² E02D *19/00*

U.S. Cl. 61—41 A **5 Claims**

1. Mobile shoring for use in trench excavation comprising a carrier including a pair of laterally spaced longitudinally extending beams, beam support members, the opposite ends of each longitudinally extending beam being pivotably supported by one of said beam support members, conveyancing means including track vehicles, each beam support member being pivotably supported by one of said conveyancing means so that said conveyancing means may be swung outwardly and parallel to said longitudinally extending beams, a shoring frame supported by said carrier, said frame including longitudinally and transversely extending beam support members, means for raising and lowering said shoring frame relative to said carrier, a plurality of longitudinally and vertically spaced guide sections on the outer surface of the longitudinally extending beam support members of said shoring frame and a plurality of shoring plates vertically slidably retained by said guide sections, each of said plates spanning at least one of said vertically and longitudinally spaced pairs of guide sections and being vertically movable together with said frame and individually relative thereto.



4,002,036
MINE ROOF SUPPORTS

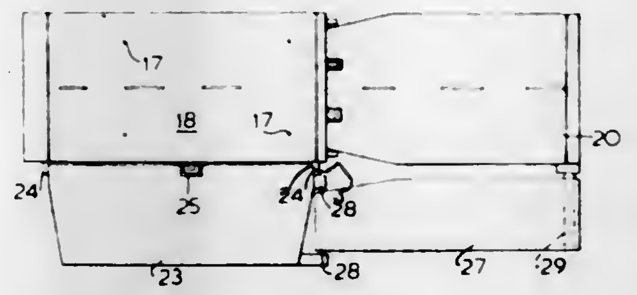
Ian Campbell Jeffrey, Parbold, and James Gray Stevenson, Wigan, both of England, assignors to Gullick Dobson Limited, Wigan, England

Filed May 9, 1975, Ser. No. 575,960

Claims priority, application United Kingdom, June 4, 1974, 24633/74

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **9 Claims**



1. A self-advancing mine roof support comprising a base structure and a roof-engaging structure extending over said base structure and supported therefrom by hydraulically extensible props, said roof-engaging structure including selectively positionable lateral extension structure means for laterally extending the effective roof-supporting width of the roof-engaging structure in a direction transverse to its direction of advance, and ram means connected to said lateral extension structure means from the remainder of the support for applying force to said lateral extension structure means upwardly towards a mine roof to be supported thereby.

4,002,037

SELF-ADVANCING SUPPORT FOR USE IN THE PIT OF COAL OR METAL MINE

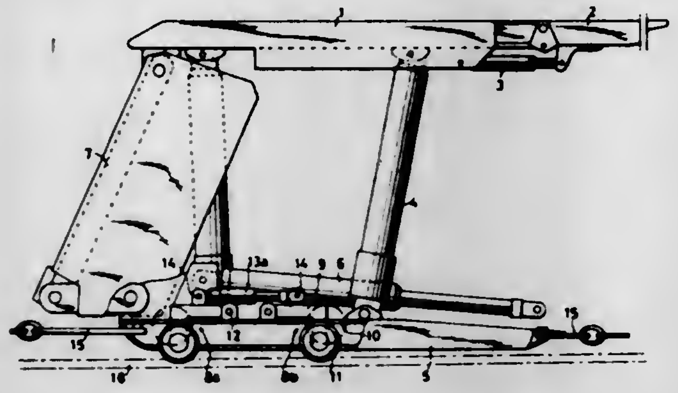
Masao Hujimori; Shigeo Nakajima; Ken Takahashi, all of Tokyo; Tsunetoshi Ito; Toshio Shimada, both of Yokohama; Hajime Endo, Kushiro, and Nobuo Kiyama, Yokohama, all of Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,190

Claims priority, application Japan, Aug. 8, 1975, 50-97057

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D 4 Claims



1. A self-advancing support for use in the pit of a coal or metal mine comprising a table, at least one beam mounted on the table for supporting the pit roof, poles supporting the beam on the table, a shifter for enabling the support to be moved in the pit, a plurality of wheel assemblies, each of said wheel assemblies comprising an arm, means pivotally connecting one end of each of said arms to the table, a respective wheel rotatably mounted on the other end of each of said arms, hydraulic cylinder-piston rod assemblies connected to said arms for pivoting said arms thereby alternatively to pivot said arms sufficiently downwardly for the wheels to support the table whereby the support may be transported with the aid of the wheels and to pivot said arms sufficiently upwardly for the table to rest directly on the floor of the pit whereby the wheels are not caused to bear a load when the support is in operation at a pit face, and openings in the table for receiving said wheels when the table is resting directly on the floor of the pit.

4,002,038

METHOD AND APPARATUS FOR RAPID ERECTION OF OFFSHORE TOWERS

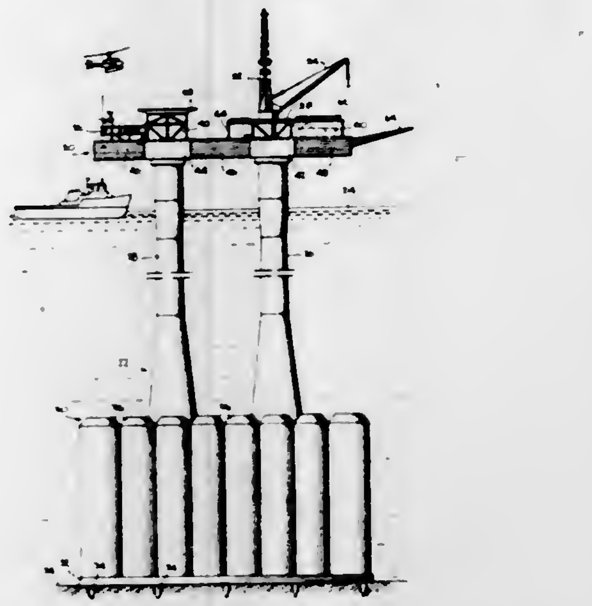
Lindsey J. Phares, Sugar Land, and George J. Gendron, Houston, both of Tex., assignors to Raymond International Inc., Houston, Tex.

Filed Oct. 6, 1975, Ser. No. 620,203

Int. Cl.² E02B *17/00*

U.S. Cl. 61—91 4 Claims

1. A method of erecting an offshore tower, said method comprising the steps of positioning a template, having at least one vertical template leg, on a sea floor so that said vertical leg extends up above the sea level, said template being provided with jacking mechanism mounting means connected to the upper end of said template leg, moving a platform into position adjacent the template leg; connecting at least one jacking leg to extend down from an associated jacking mechanism on said mounting means and to be connected to said platform and then operating said jacking mechanism to pull said jacking leg upwardly to raise said platform clear of the water.



4,002,039

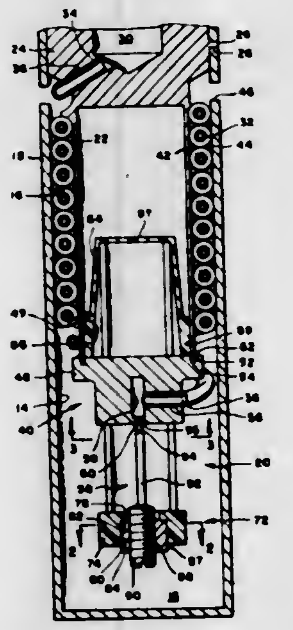
SELF-REGULATING CRYOSTAT

Robert L. Cramer, and James A. Mientus, both of Davenport, Iowa, assignors to The Bendix Corporation, South Bend, Ind.

Filed Aug. 28, 1975, Ser. No. 608,421

Int. Cl.² F25B *19/00*

U.S. Cl. 62—224 10 Claims



1. A cryogenic cooling apparatus comprising:

a housing having a blind bore therein;

tubular means centrally located in said blind bore for establishing a temperature regulation chamber defined by the end thereof and the bottom of said blind bore;

nozzle means fixed to said tubular means in said temperature regulation chamber, said nozzle means having an orifice located therein;

finned tube means spirally wound around said tubular means, said tube means having an entrance port connected to a source of fluid under pressure and an exit port connected to said orifice;

support means located in said tubular means;

expander means having a first leg and a second leg fixed to said support means and extending into said temperature regulation chamber;

mounting means connecting said first leg with said second leg, said mounting means having an opening therein;

needle valve means connected to said mounting means and adapted to cooperate with said orifice in said nozzle means for controlling the flow of said fluid under pressure into said temperature regulation chamber in a manner to lower the temperature in the temperature regulation chamber, said first and second legs of the expander means expanding and contracting as a function of the temperature of the fluid in said temperature regulation chamber to proportionally regulate the flow of the fluid through said orifice; and

bushing means located in said opening having an eccentric surface for aligning said needle valve in an axial position with said orifice in the nozzle means.

4,002,040

METHOD OF COOLING AIR AND APPARATUS INTENDED THEREFOR

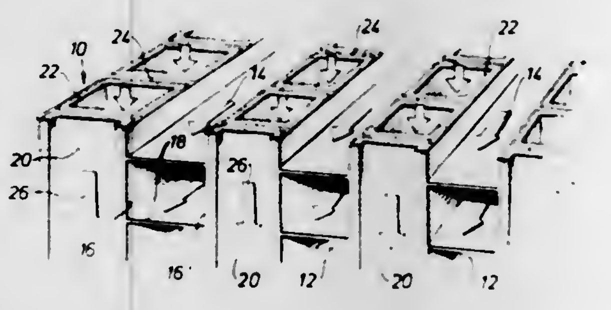
Carl Munters, Minusio, and Per Norback, Lidingo, Sweden, assignors to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed July 17, 1974, Ser. No. 489,236

Claims priority, application Sweden, July 8, 1973, 7310061

Int. Cl.² F28C *1/00*; F28D *5/00*

U.S. Cl. 62—121 8 Claims



1. In a method of conditioning a first air stream by cooling by means of a second auxiliary air stream in a heat exchanger having two groups of channels separated from each other by walls through which heat exchange between the air streams occurs and having wettable material lining the channels through which the auxiliary air stream flows maintained wet by means of water which is caused to evaporate by the auxiliary air stream passing thereover to obtain cooling of the first stream with substantially unchanged moisture content thereof, the improvement providing increased conditioning efficiency comprising the step of applying water to the wettable material intermittently only for a period of time shorter than the period of time in which the evaporation takes place and in an amount in excess of that amount required for replacing the amount evaporated.

4,002,041

THERMOSTAT CONTROL SYSTEM FOR AN AUTOMATIC ICE MAKER

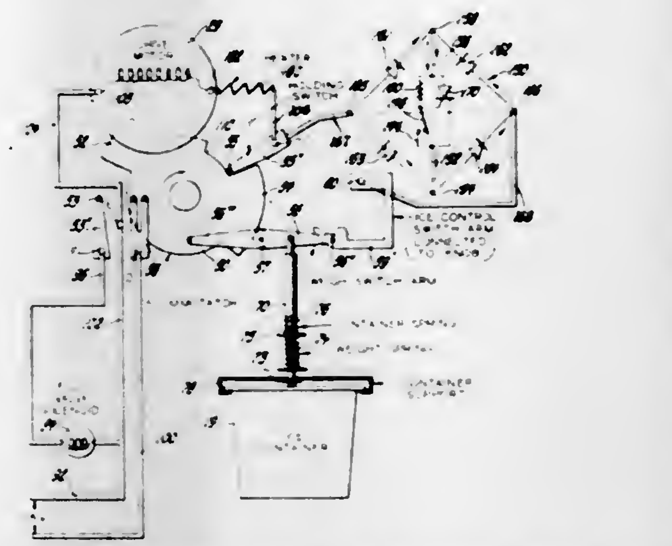
James Allen Canter, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 18, 1975, Ser. No. 588,062

Int. Cl.² F25C *1/10*

U.S. Cl. 62—137 3 Claims

1. In an automatic ice maker for use within a freezer compartment including an ice tray, an electric drive motor including field windings, tray drive gear means operated by said motor for rotating said tray about its longitudinal axis so as to harvest ice pieces therefrom, a thermal ice harvesting control mechanism comprising: a mercury thermostat including a temperature sensing metal tube positioned within a longitudinal chamber in said tray with said tube principal axis coinciding with said tray rotational axis, said tube having an axial bore with a pool of liquid mercury at its closed inner end responsive to the temperature of the water change in the tray ice piece forming cavities, a pair of conducting wires extending into said bore at differing axial distances, means for hermetically sealing the front open end of said tube bore, such that upon the mercury pool sensing a below freezing temperature of the water charge in said tray cavities said mercury contracts axially toward the closed end of said bore causing disengagement of said mercury from the shorter of said pair of wire conductors and opening the mercury thermostat, circuit means connecting said motor field windings across the alternating-current output terminals of a full-wave diode bridge circuit, said wire conductors being connected between the direct-current terminals of said diode bridge, said diode bridge having an SCR switch connected in parallel with said wire conductors between said bridge direct-current terminals, whereby upon said mercury thermostat opening said SCR conducts to trigger each half cycle of said diode bridge circuit energizing said drive motor field winding causing rotation of said tray to harvest the ice pieces from said ice maker tray.



4,002,042

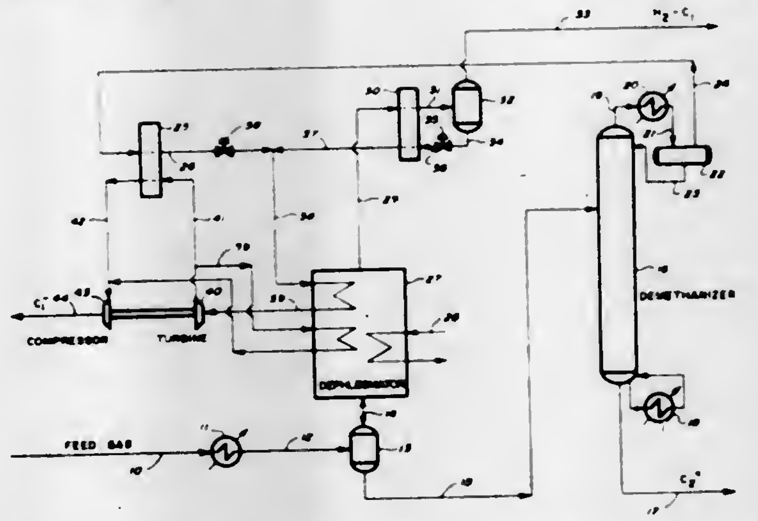
RECOVERY OF C_2+ HYDROCARBONS BY PLURAL STAGE RECTIFICATION AND FIRST STAGE DEPHLEGMATION

John A. Pryor, Emmaus, and Howard C. Rowles, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 27, 1974, Ser. No. 527,516

Int. Cl.² F25J *3/02*

U.S. Cl. 62—28 19 Claims



1. A method of separating and recovering a major portion of the C_2+ hydrocarbon content of a feed gas comprising hydrogen, methane, ethylene and ethane, which comprises:

a. introducing said feed gas into a dephlegmation zone comprising a plurality of indirect heat exchange passages through which at least a portion of the feed gas passes in an upward direction and is cooled by refrigerant means provided in indirect heat exchange with said passages, as said gas flows upward it partially condenses on the walls of said passages forming a reflux liquid such that interaction takes place between the upward flowing gas stream and the stream of cooler liquid flowing downward and said liquid gradually becomes enriched with the C_2+ hydrocarbons of the feed gas;

b. cooling at least a portion of said feed gas in the dephlegmation zone by indirect heat exchange to form a condensate stream containing the major portion of the C_2+ hydrocarbons in the feed gas and a vapor stream containing the balance of the uncondensed material from the feed gas;

c. withdrawing the vapor stream from the dephlegmation zone;

d. passing the condensate stream from the dephlegmation zone to a rectification zone; and

e. withdrawing from the rectification zone a substantially C_1 and lighter stream and a C_2+ hydrocarbon stream,

whereby the energy requirements for the refrigeration utilized in separating the C_2+ hydrocarbons from the C_1 and lighter components are low.

4,002,043
APPARATUS FOR ABSORBING TORQUE FLUCTUATIONS PRODUCED BY AN INTERNAL COMBUSTION ENGINE

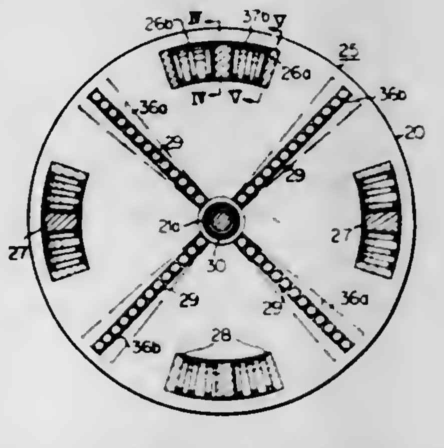
Akio Yoshida, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 416,370, Nov. 16, 1973, abandoned. This application May 7, 1975, Ser. No. 575,233

Claims priority, application Japan, July 10, 1973, 48-77035

Int. Cl.² F16D *3/14*

U.S. Cl. 64—27 C **14 Claims**



1. An apparatus capable of being disposed between an internal combustion engine and a drive train mechanism, and adapted for use as a damped vibration system in absorption of a fluctuating torque present in an output torque produced by the engine, comprising:

- a plurality of rotationally inert bodies arranged on a common axis of rotation facing each other with a small gap therebetween, an outermost one of said inert bodies being connectable to a crank-shaft of said engine and the other outermost one of said inert bodies being connectable to said drive train mechanism,
- spring elements provided between the facing inert bodies and displaceable circumferentially with respect to the axis of rotation, each of the elements having one end thereof connected to one of said facing inert bodies and the other end thereof connected to another of said facing inert bodies, and
- damping elements provided between said facing inert bodies, each of the damping elements having engagement with two adjacent bodies of said facing inert bodies, the values of the moment of inertia, spring constant, and damping coefficient of the system being preselected for averaging the torque output of the engine.

4,002,044
YARN STOP MOTION

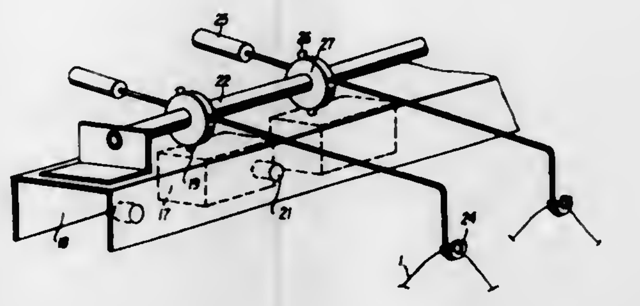
Michel Paul Dollat, Le Cheylard, France, assignor to Establissements A. Chromarat & Cie, Paris, France

Filed Dec. 2, 1974, Ser. No. 528,859

Claims priority, application France, Dec. 18, 1973, 73.45399; Oct. 4, 1974, 74.33607

Int. Cl.² D04B *35/12*

U.S. Cl. 66—161 **5 Claims**



1. A knitting machine which is continuously fed with a yarn under constant tension, comprising:

- a yarn supply (2,3);
- a knitting head (11);
- a rotatable reserve negative feed device (8) mounted on the frame of the knitting machine and across which the yarn feeding the knitting head passes under substantially constant tension;
- means for winding (13) up the knitted goods produced;
- a first drive means including an electrical panel (15) for the stopping and operating movement of the knitting head and the winding means, said first drive means being connected to the winding means;
- a yarn guide (7), located between the yarn supply and the feed device, over which the unwinding yarn passes;
- a second drive means including an electrical panel (16) for the automatic starting and operating functions of the different movable elements of the knitting machine, said second drive means being connected to the means for rotating the feed device and to the first drive means;
- means including a micro-contact (17) located in the vicinity of the guide, for transmitting to the second drive means the excess tensions of the yarn passing over the guide;
- wherein said second drive means comprises:
  - a contactor (32) connected to the micro-contact and to the means for rotating the feed devices, for controlling the stopping and the operation of the movement of rotation of the feed device;
  - a first timing element (33) connected to the contactor and to the first drive means for, when the contactor is actuated, stopping the movement of rotation of the knitting head after a period of time at least equal to a predetermined short limit;
  - a second timing element (34) connected to the first timing element, for preventing the automatic restarting of the machine after a period of time at least equal to a predetermined upper limit,
  - a third timing element (36) connected to the first and second timing elements and to the first drive means for actuating rotation of the machine when the contactor returns to its initial position.

4,002,045
WARP-KNIT SUPPORT TAPE FOR SLIDE-FASTENER STRINGER

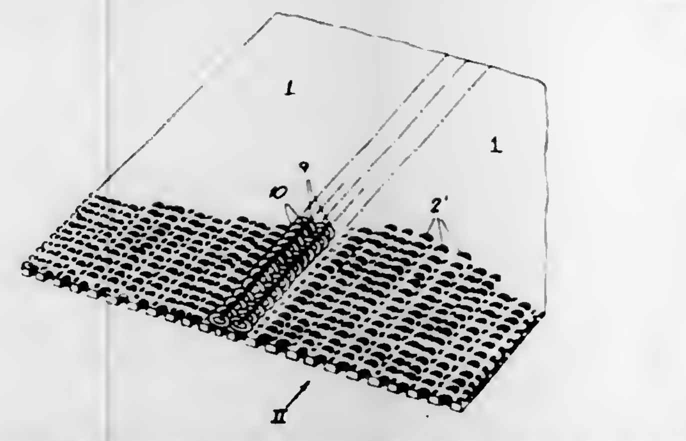
Alfons Fröhlich, and Marie-Luise Cappel, both of Essen, Germany, assignors to Opti-Holding AG, Glarus, Switzerland

Division of Ser. No. 511,676, Oct. 3, 1974, Pat. No. 3,965,833. This application May 23, 1975, Ser. No. 580,306

Claims priority, application Germany, Oct. 6, 1973, 2350318

Int. Cl.² D04B *7/16, 11/12, 21/14, 21/16*

U.S. Cl. 66—202 **1 Claim**



1. A slide-fastener stringer support tape comprising a plurality of warp-knitted warp filaments and weft filaments, a portion of said weft filaments being textured synthetic yarns forming loose bulges on at least one face of said tape and another portion of said weft filaments being shrunk synthetic yarns, said yarns forming a series of loop-free spaces along an edge of said tape adapted to receive stitching securing a coupling element to said edge.

4,002,046
TEXTILE PRINTING APPARATUS

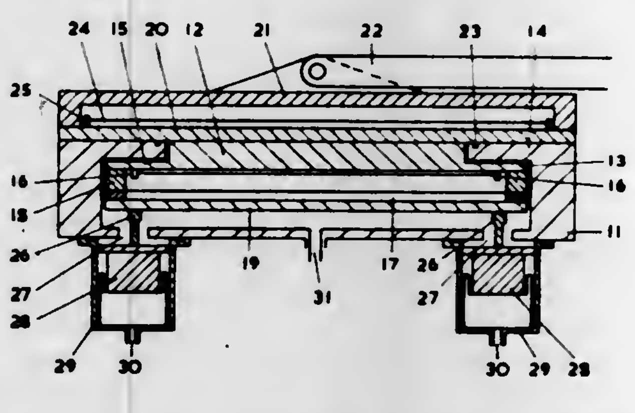
Guillaume Ward Jamin, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 14, 1975, Ser. No. 622,157

Claims priority, application United Kingdom, Oct. 23, 1974, 45841/74; Oct. 23, 1974, 45842/74

Int. Cl.² B41C *1/06;* **B25B** *11/00;* **B30B** *15/34;* **D06P** *5/20*

U.S. Cl. 68—5 C **4 Claims**



1. Apparatus for effecting the colouration of snythetic textile materials, at a reduced pressure, by a transfer process, which comprises a pair of opposed rigid platens mounted for relative movement towards and away from each other, means for heating at least one of said platens to a temperatre above 100° C, means for enclosing at least a portion of the space between the opposed surfaces of said platens when the platens have been moved towards each other into a closed position and means for reducing the pressure, within said portion, when the platens are in said closed position, to below 100 mm of mercury, at least one rolling diaphragm air cylinder assembly having a cylinder, a piston within the cylinder and a flexible rolling diaphragm sealed at its periphery to the inside of said cylinder, said diaphragm being connected to said piston and forming an annular fold or roll which resides between a portion of the piston and the sidewall of the cylinder, one of said platens being supported from the piston of said rolling diaphragm air cylinder assembly, the space on the side of said rolling diaphragm from which the platens is supported being connected to the gas tight region between the platens whereby relative motion between the platens is effected by the differential pressure that is established across said rolling diaphragm when the pressure in the gas tight region is reduced.

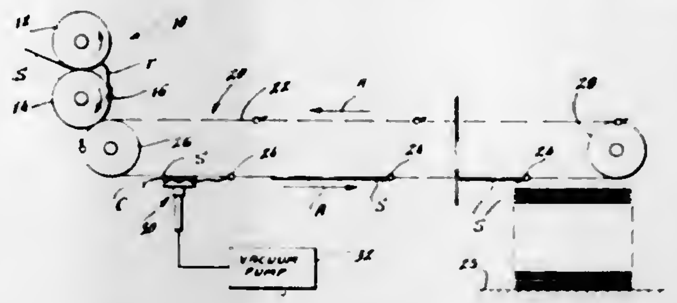
4,002,047
SHEET MATERIAL DECURLING APPARATUS

John M. MacPhee, Rowayton, Conn., and Charles Robert Gasparrini, Rye, N.Y., assignors to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed July 7, 1975, Ser. No. 593,568

Int. Cl.² B21D *1/00*

U.S. Cl. 72—160 **11 Claims**



1. A sheet material decurling apparatus for use with a machine having sheet material conveyor means, the sheet material having thickness *t*; said apparatus comprising:

- A. a trough member including
  - 1. two elongate sheet supporting members, each having an arcuate upper surface with a radius greater than 100*t*,
  - 2. an elongate fillet joining said sheet supporting members having an arcuate upper surface, curved in the direction opposite to that of the sheet supporting member surfaces, with a radius of less than 15*t*, the angle formed between the planes tangent to said sheet supporting member surfaces at the lines of transition therefrom into the fillet surface being in the range of 60° to 120°, and
  - 3. a plurality of vacuum conduits adjacent the bottom of said fillet, said conduits having a cross-sectional area of from 0.05 square inch to 0.15 square inch per linear foot of trough member, and
- B. a vacuum pump in fluid communication with said vacuum conduits for generating gas flow downward therethrough, whereby sheet material drawn across said trough member, with a curl directed theretoward by the conveypr means, is pulled down onto said sheet supporting member surfaces and into said fillet by gas flow generated by said vacuum pump to impart a reverse bend to the sheet material and whereby said decurling apparatus can decurl sheet material having widths less than that which the trough member can accommodate without covering exposed vacuum conduits.

4,002,048
METHOD OF STRETCH REDUCING OF TUBULAR STOCK

Dezsoe Albert Pozsgay, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Elwood City, Pa.

Filed Dec. 19, 1975, Ser. No. 642,663

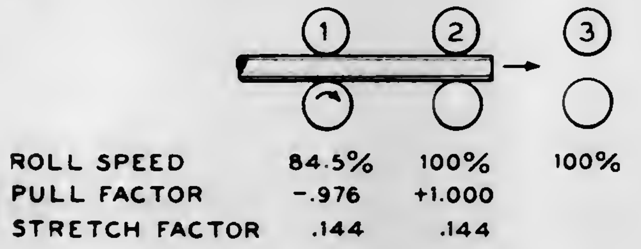
Int. Cl.² B21B *17/00*

U.S. Cl. 72—205 **12 Claims**

11. A process for the stretch reducing of the tail end of tubular stock of finite length, in a multiple stand rolling mill, in which at least a plurality of mill stands at the upstream end of the mill are of variable speed, which comprises

a. initially driving said variable speed mill stands at steady-state speed,

b. upon entry of the tail end section into the upstream mill stands, initially controlling the mill stand engaging the end section farthest upstream to provide maximum retarding force effectiveness, and



c. controlling one or more variable speed mill stands downstream of the last mentioned mill stand to provide one of (i) maximum pulling force effectiveness, (ii) a lesser force effectiveness to avoid exceeding a predetermined stretch factor, (iii) a still lesser force effectiveness to avoid reducing the wall thickness below scheduled minimum for the mill stand location.

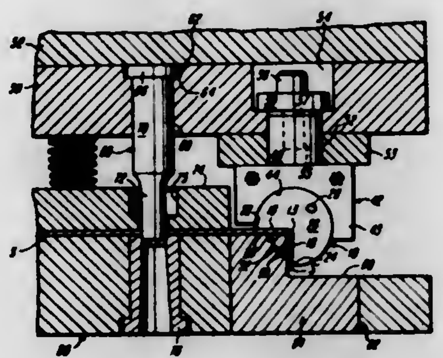
4,002,049
FORMING TOOL FOR USE IN A DIE ASSEMBLY

Allan Emerson Randolph, Sr., Kettering, Ohio, assignor to Ready Stamping System, Inc., Dayton, Ohio

Filed June 9, 1975, Ser. No. 585,066

Int. Cl.^{2} B21D *5/04*

U.S. Cl. 72—388 **9 Claims**



1. A forming tool comprising a holder an exterior surface portion of which includes a groove the base of which is arcuately configured and provides a bearing surface for an operating head in the form of a roller device, said roller device including a longitudinally extended radially directed V-shaped notch the side walls of which are outwardly divergent, define an angle which is less than that to be formed in the work material to which it is applied and provide circularly spaced edge portions at their outer extremities for contact with the work material, said roller device being mounted for free rotation with respect to said holder in response to a bearing of one of said spaced edge portions against a supported portion of the work material and a bearing movement of the other of said spaced edge portions on an unsupported portion of the work material whereby to bend a portion of said material to a predetermined angle, and means providing abutment surfaces which determine the limits of rotation of said roller device in the application thereof to work material.

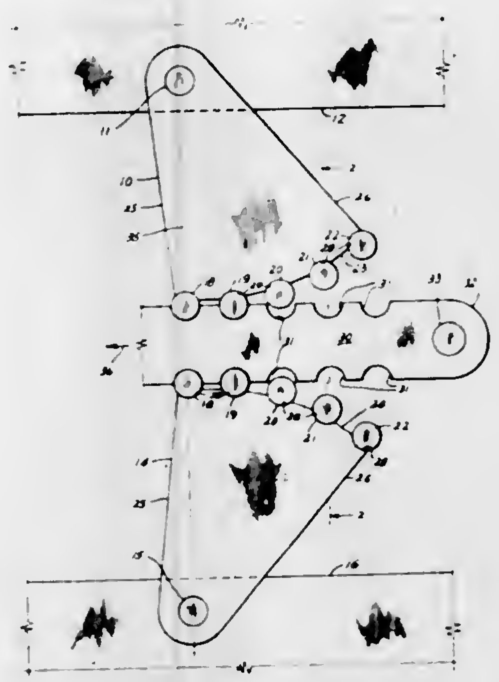
4,002,050
FORCE MAINTAINING TOGGLES SYSTEMS

Edward Albert Clavin, Houston, Tex., assignor to Mid-Continent Pipeline Equipment Co., a division of Harrisburg, Inc., Houston, Tex.

Filed June 11, 1975, Ser. No. 585,976

Int. Cl.^{2} B21D *9/00*; G05G *1/04*

U.S. Cl. 72—466 **28 Claims**



1. Toggle system, comprising plural opposed toggle elements having plural spaced engagement means at their inner ends and adapted for pivotal engagement with one or more objects at their outer ends, operating means disposed between said opposed toggle elements also having plural spaced engagement means for engagement one after another with said engagement means of said toggle elements, individual engagement means of said toggle elements and said operating means being mutually engaged sequentially one after another when said toggle elements are pivotally moved about said pivotal engagements with one or more objects by movement of said operating means to bring the engagement means of opposed toggle elements sequentially one after another into positions of maximum span in line between said pivotal engagements with one or more objects, the next subsequent toggle engagement means engaging in the next subsequent operating means engagement means at the time that one toggle engagement means already engaged in an operating means engagement means reaches a position aligned between said pivotal engagements of opposed toggle elements, the maximum span between said pivotal engagements with one or more objects increasing stepwise from a shorter span when the engagement means at one end of said pluralities thereof are engaged to a longer span when the engagement means at the other end of said pluralities thereof are engaged, whereby as the space between objects pivotally engaged by said toggle elements increases as said span increases in length the force on said objects is maintained at or near maximum as sequential of said engagements occur.

4,002,051
METHOD FOR DETERMINING THE BEHAVIOR OF A SHOCK ABSORBER OF A MOTOR VEHICLE ARRANGED IN THE WHEEL SUSPENSION AND A JIG FOR PERFORMING THE METHOD

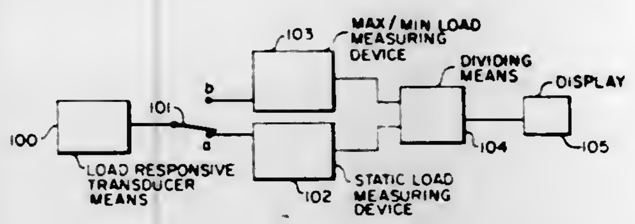
Jan Willem Hilbrands, Hattingen, Netherlands, assignor to Maschinenfabrik Koppern & Co., KG, Germany

Filed Dec. 24, 1974, Ser. No. 536,178

Claims priority, application Germany, May 18, 1974, 2423978

Int. Cl.^{2} G01M *17/04*

U.S. Cl. 73—11 **16 Claims**


103
MAX / MIN LOAD MEASURING DEVICE
DIVIDING MEANS
DISPLAY
b
101
a
100
104
105
LOAD RESPONSIVE TRANSDUCER MEANS
102
STATIC LOAD MEASURING DEVICE

1. A method for determining the behaviour of a shock absorber arranged within a wheel suspension unit within the sprung-mass-system of a vehicle, comprising the steps of measuring the static wheel load, causing the wheel to vibrate by applying forces to the wheel according to a predetermined relationship of amplitude to frequency, measuring at least one of the minimum and maximum value of the vertical contact force applied by the wheel to a support surface while subjecting the wheel to such applied forces as an indication of the minimum and maximum wheel load, respectively, and forming a dimensionless factor serving as an indication of the usability of the shock absorber by dividing one of the minimum and maximum wheel loads by the static wheel load.

4,002,052
METHOD FOR THE RAPID ANALYSIS OF A MIXTURE OF A NUMBER OF SUBSTANCES BY CHROMATOGRAPHY

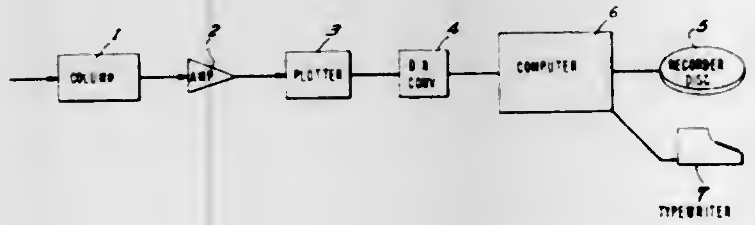
Jacques Bordet, Bouxieres aux Dames, and Jean-Paul Gourlia, Vandoeuvre, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Paris, France

Filed Apr. 18, 1975, Ser. No. 569,411

Claims priority, application France, Apr. 24, 1974, 74.14277

Int. Cl.^{2} G01N *31/08*

U.S. Cl. 73—23.1 **2 Claims**



1. A method of rapid analysis of a mixture of a predetermined number of known substances by chromatography wherein, in a first step, a chromatographic column having a retention time within the range of a few seconds to two minutes in the case of the most strongly retained substance is calibrated by passing separately through the column in the absence of each of the other substances used for the formation of the mixture which is to be subsequently analyzed in said column and by recording at the exit the pulse response of each separate substance aforesaid in respect of said column; in a second step, the mixture to be analyzed is passed through the same said column and the total pulse response corresponding to said mixture is recorded; in a third step, relating the total pulse response corresponding to the mixture and the specific pulse responses of each separate substance to determine the concentration of each separate substance aforesaid in the mixture, wherein in the first step and in the case of a given carrier gas flow velocity, the specific pulse response of each of said substances i aforesaid is sampled as it is being recorded and the values $h_i(t_j)$ of said response which is surface-normed are stored in memory at each sampling instant t_j; in the second step, the total pulse response corresponding to said mixture is sampled as it is being recorded and the values $x(t_j)$ of said response are stored in memory at each sampling instant t_j; in the third step, the concentration of each of the substances in the mixture is calculated by using the method of least squares by minimizing the sum:

$$S = \sum_{j=1}^{m} \left[x(t_j) - \sum_{i=1}^{n} \alpha_i h_i(t_j) \right]^2 .$$

where m is the number of points sampled and α_i represents the mass of molar percentages of each of the n substances i in the mixture and there is then solved the system of n linear equations having n unknown quantities α_i corresponding to the equation $\delta S/\delta\alpha_i = 0$ in the case of each substance i from 1 to n.

4,002,053
METHOD AND APPARATUS FOR MEASURING DENSITY OF SUSPENSION

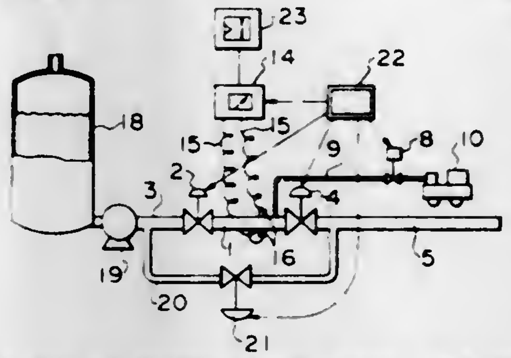
Noboru Hayakawa, Tokyo, Japan, assignor to Nishihara Environmental Sanitation Research Corporation Ltd., Japan

Filed Sept. 17, 1975, Ser. No. 614,434

Claims priority, application Japan, Sept. 20, 1974, 49-108446

Int. Cl.^{2} G01N 9/24

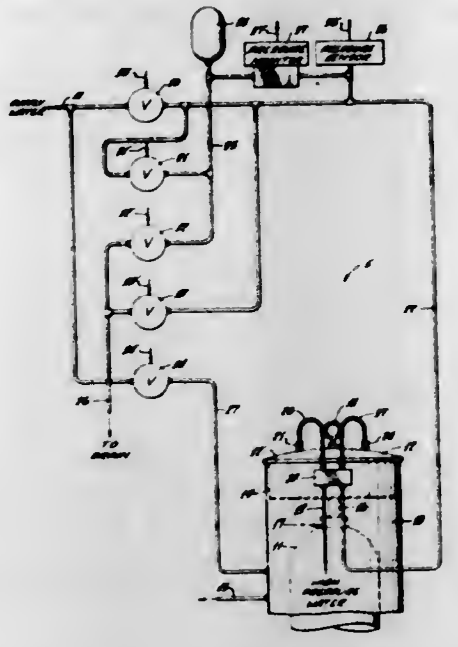
U.S. Cl. 73—32 R **4 Claims**



1. An apparatus for measuring the density of a suspension comprising a storage tank for the suspension; pipe means extending from the storage tank comprising an inlet pipe and an outlet pipe; an inlet valve and an outlet valve disposed on the pipe means in a spaced relation from each other to retain the suspension from the storage tank in a confined space in said pipe means when the inlet and outlet valves are in their closed position; a by-pass pipe by by-passing the inlet valve and the outlet valve, through which the suspension continuously fed from the storage tank flows when the suspension is confined in said pipe means between the inlet and outlet valves; means for changing the pressure of the confined suspension; means for measuring the density of the suspension, said means being mounted on the pipe means between the inlet and outlet valves; and a sequential circuit being adapted to control shut-off of the outlet valve and the inlet valve, and then to control operation of the pressure changing means to change the pressure of the confined suspension, and to control operation of the density measuring means by detecting the completion of the pressure change.

4,002,054
METHOD AND MEANS FOR VOLUMETRIC EXPANSION TESTING

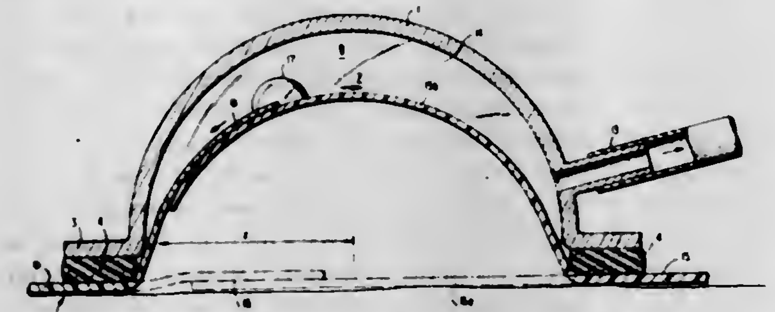
Carl A. Grenci, 4791 Lesa Place, Yorba Linda, Calif. 92686
Filed Aug. 4, 1975, Ser. No. 601,847
Int. Cl.² G01M *3/36*
U.S. Cl. 73—37 **16 Claims**



1. Apparatus for hydrostatically testing the expansion of a vessel immersed in a fluid-filled jacket when subjected to an internal pressure comprising:
- means for sensing weight including a sensing element;
- fluid collection means operatively connected to said sensing element of said sensing means;
- means for conducting the fluid expelled from said jacket when said pressure is applied to said vessel into said fluid collection means, said weight sensing means providing an indication of the volumetric change in said vessel; and
- means permitting the fluid level in said fluid collection means to remain substantially constant as fluid is added to and removed therefrom.

4,002,055
PROCESS AND APPARATUS FOR TESTING THE TIGHTNESS OF SEAM JOINTS OF SYNTHETIC RESIN SHEETS BY MEANS OF VACUUM

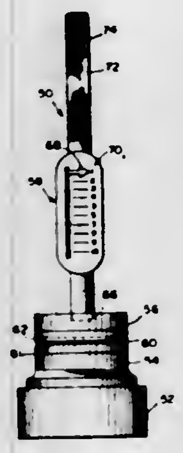
Friedrich Kops, Rondorf, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany
Filed Feb. 20, 1973, Ser. No. 334,074
Claims priority, application Germany, Feb. 18, 1972, 2207648
Int. Cl.² G01M *3/12*
U.S. Cl. 73—40 **9 Claims**



1. An apparatus for testing the leakproofness of seam joints of synthetic resin sheets by a vacuum produced by a pump means in a testing chamber, which comprises a semi-cylindrical shell of a transparent material having rounded corners in the form of quarter spheres, said shell forming an opening at its underside, sealing strip means surrounding said opening, a continuous frame for engaging said strip means and a flexible closure means secured to said frame fro sealing off the opening by contacting the synthetic resin sheets whereby a test chamber is formed with said apparatus over a portion of the seam joint to be tested.

4,002,056
PROCESSES AND DEVICES FOR DETERMINING PROPERTIES OF VISCOUS FLUIDS

Louis Kopito, Brookline; Samuel R. Schuster, Wellesley, and Harold Kosasky, Brookline, all of Mass., assignors to Ovutime, Inc., Brookline, Mass.
Continuation-in-part of Ser. No. 558,247, March 14, 1975, Pat. No. 3,926,037. This application Dec. 4, 1975, Ser. No. 637,830
Int. Cl.² G01N *33/16, 13/02*
U.S. Cl. 73—53 **12 Claims**

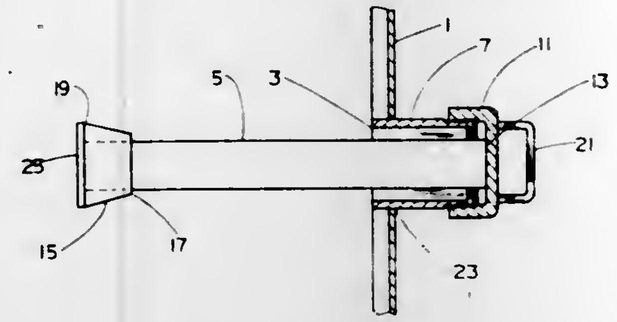


1. A device for determining the properties of bodily mucus comprising:
- a. a pair of separable cooperating members, each said member having a working face defining a bearing surface characterized by non-planar elongated ridge increments characterized by ridge lines, said bearing surfaces in face to face relationship define a plurality of regions adapted to contain a fluid sample, said ridge lines of one of the bearing surfaces being crossed with respect to said ridge lines of the other of the bearing surfaces to intersect in a matrix of points, the surface area of said regions being greater that the surface area of the interface between said bearing surfaces; and
- b. indicating means operatively connected to at least one of said members for providing an indication of the force required to separate said members when said regions contain a fluid sample, the force required to separate said fluid sample at said interface defining the viscoelastic properties of said fluid.

4,002,057
SAMPLING DEVICE

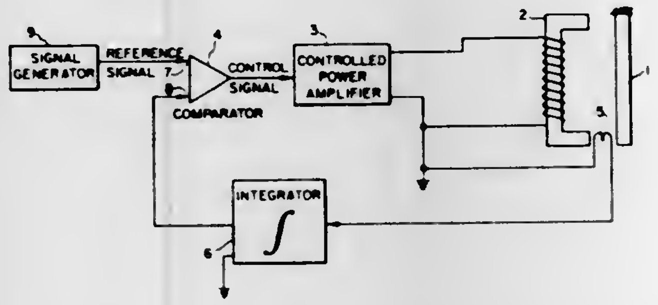
David H. Kannapell, Prospect, Ky., and Mervin L. Smith, Sellersburg, Ind., assignors to American Air Filter Company, Inc., Louisville, Ky.
Filed Dec. 5, 1975, Ser. No. 638,146
Int. Cl.² G01N *17/00*
U.S. Cl. 73—61.2 **7 Claims**

1. A sampling device comprising:
- a vessel having a sampling aperture therein;
- a coupling sleeve means surrounding said aperture and attached to said vessel and extending outwardly therefrom; and,
- an elongated sample member longitudinally extending through said coupling sleeve means with sealing means at each end thereof, the sealing means of the outer end of said sample member including a cap attached to said sample member, said cap including means for mating with said coupling sleeve means.



4,002,058
METHOD AND APPARATUS FOR VIBRATION OF A SPECIMEN BY CONTROLLED ELECTROMAGNETIC FORCE

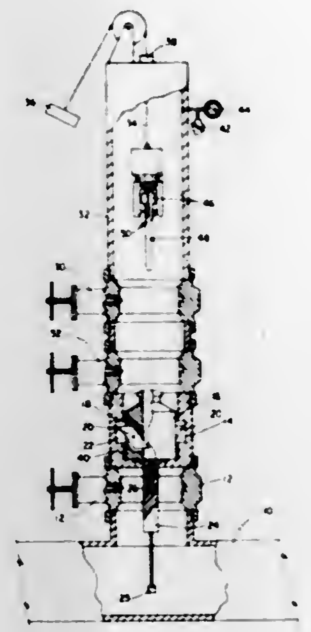
John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,491
Int. Cl.² G01M *7/00;* **G01N** *29/00*
U.S. Cl. 73—71.5 R **7 Claims**



1. An apparatus for applying controlled electromagnetic force to a test specimen over a predetermined range of electromagnet excitation frequencies to effect vibration of the specimen comprising:
- a. an electromagnet for producing an electromagnetic field to apply the force to the test specimen;
- b. a controlled electrical power source connected to the electromagnet for applying a regulated voltage thereto and establishing excitation current therein;
- c. a comparator for developing a control signal and applying this signal to the power source to effect regulation of the magnitude of the voltage applied to the electromagnet, said comparator having first and second inputs;
- d. sensing means for measuring the flux density of the electromagnetic field and developing a first electrical signal having a magnitude and frequency representative of that of the applied force;
- e. a signal generator for producing a reference electrical signal of predetermined magnitude at frequencies varying over a predetermined range;
- f. said first signal and said reference signal being applied to the first and second comparator inputs, respectively, said comparator effecting comparison of the signals for developing the control signal and applying the control signal to the power source to effect regulation of the magnitude of the voltage applied to the electromagnet to maintain the difference between the compared signals at a minimum.

4,002,059
APPARATUS FOR MANIPULATING CORROSION COUPONS AND THE LIKE

Mark A. Jeffers, Kenner, and Jackie D. Dendy, Lafayette, both of La., assignors to Standard Oil Company, Chicago, Ill.
Filed Feb. 18, 1976, Ser. No. 659,183
Int. Cl.² G01N *17/00*
U.S. Cl. 73—86 **3 Claims**



1. A static monitoring device manipulating apparatus for petroleum pipeline, a portion of which apparatus can be removed while the monitoring device is in said pipeline, said apparatus comprising:
- a. a pipeline valve mounted generally on top of said pipeline;
- b. a lock receiving section mounted on top of said pipeline valve;
- c. a wireline lock means adapted to be fastenable in said lock receiving section;
- d. a static monitoring device assembly mounted on the bottom of said lock means in such a manner that when said lock means is fastened in said lock receiving section that said static monitoring device assembly extends down through said pipeline valve and into said pipeline;
- e. at least one wireline lock gripping tool to controllably grip said lock means;
- f. an isolation valve mounted on top of said lock receiving section; and
- g. a wireline lubricator fastened on top of said isolation valve, said wireline lubricator being adapted to being unfastened from said isolation valve while said static monitoring device assembly is extending into said pipeline.

4,002,060
PRESSURE MEASUREMENT SHEET AND METHOD OF USING THE SAME

Yasuhiro Ogata, and Hiroharu Matsukawa, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan
Filed Oct. 29, 1975, Ser. No. 627,151
Claims priority, application Japan, Oct. 29, 1974, 49-125198
Int. Cl.² G01L *1/00*
U.S. Cl. 73—88 R **9 Claims**

1. A pressure measurement sheet comprising a support wherein a layer containing microcapsules containing a color former and a layer containing adsorbent are provided on the same or opposing sides of said support, wherein the ratio of the number average wall thickness (δ) to the volume average

particle diameter (D) of the microcapsules lies in the range: δ/D=about 1.5×10^{-3} to about 3.0×10^{-2}.

4,002,061

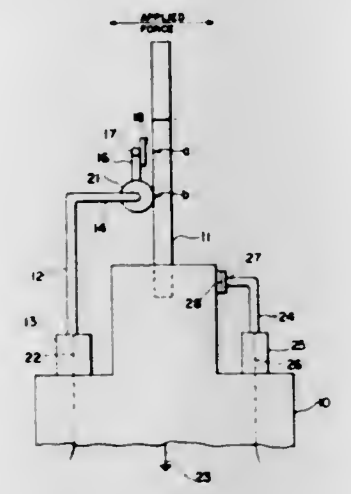
CAPACITANCE TRANSDUCER FOR THE MEASUREMENT OF BENDING STRAINS AT ELEVATED TEMPERATURES

Hugh H. Smith, Oxon Hill, Md.; David J. Michel, and Paul Shahinian, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1976, Ser. No. 681,964

Int. Cl.^{2} G01N *3/20*

U.S. Cl. 73—88.5 R **3 Claims**



1. A capacitance transducer for the measurement of bending strains of a test specimen which comprises:
- means for supporting said test specimen in a vertical plane;
- a high-temperature-alloy, electrical conductor spring wire supported at one end and having a U-shaped portion at the unsupported end with the U in a vertical plane parallel with the plane in which said specimen is supported;
- a high-temperature-type insulator surrounding the inner electrical leg portion of said U-shaped end and adapted to be in contact with said test specimen;
- a metal plate secured to and along the outer leg of said U-shaped portion of said wire conductor with said metal plate extending in a vertical plane parallel with the vertical plane of said U-shaped end and said specimen;
- a second high-temperature-alloy, spring-wire, electrical conductor supported at one end with its unsupported end adjacent said test specimen supporting means and near the supported end of said specimen;
- a flat metal plate secured to and along said unsupported end of said second electrically conductive wire parallel to said test specimen supporting means;
- whereby the deflection of said specimen is determined by changes in capacitance between said metal plate on said U-shaped end of said conductive wire and said specimen and said deflection is calibrated into strain.

4,002,062

AVERAGE FUEL CONSUMPTION RATE MEASURING SYSTEM

Akira Kuno, Nagoya; Yoshio Shinoda, Okazaki, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

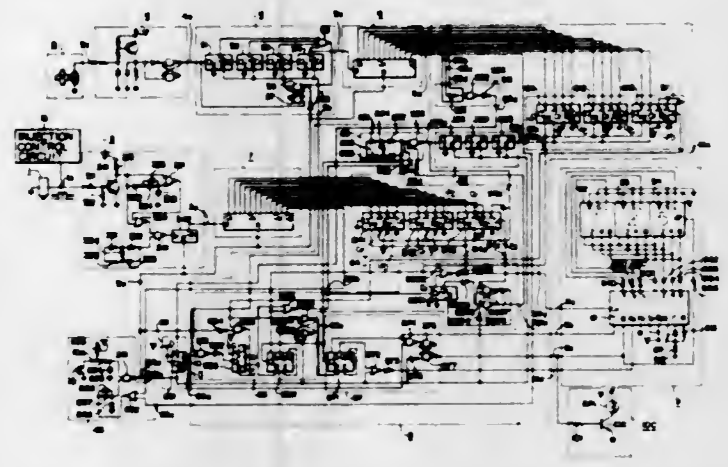
Filed Sept. 25, 1975, Ser. No. 616,819

Claims priority, application Japan, Oct. 5, 1974, 49-114853

Int. Cl.^{2} G01F *9/00*

U.S. Cl. 73—114 **5 Claims**

1. An average fuel consumption rate measuring system comprising:
- a distance measuring circuit for generating a first electric signal each time a predetermined distance is traveled by a running vehicle;
- a distance integrating circuit connected to said distance measuring circuit for counting said first electric signals to form an integrated value indicative of the cumulative distance traveled by said vehicle;
- a fuel measuring circuit for generating a second electric signal each time a predetermined quantity of fuel is consumed by said vehicle;
- a fuel integrating circuit connected to said fuel measuring circuit for counting said second electric signals to form an integrated value indicative of the cumulative amount of fuel consumed by said vehicle;



- a divider circuit connected to said distance integrating circuit and said fuel integrating circuit for repetitively obtaining an average fuel consumption rate by dividing the integrated cumulative value of one of said integrating circuits by that of the other of said integrating circuits each time a selected one of the integrated cumulative values increases by a predetermined value; and
- an indication circuit connected to said divider circuit to indicate the result of said division by said divider circuit.

4,002,063

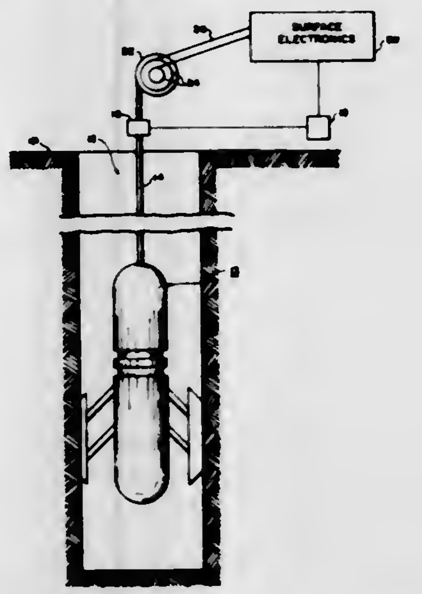
WELL LOGGING PAD DEVICES HAVING DIFFERENTIAL PRESSURE RELIEF

Jorg August Angehrn, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 26, 1975, Ser. No. 616,967

Int. Cl.^{2} E21B *49/00*

U.S. Cl. 73—152 **4 Claims**



1. An apparatus for investigating earth formations traversed by a borehole, comprising:
- an elongated support member adapted for movement through a borehole; and
- an auxiliary pad member connected to said support member and adapted to be urged against the borehole wall, said pad member having first and second surfaces, said first surface including at least one electrode and adapted to engage the borehole wall, and said pad member having at least one fluid channel between said first and second surfaces adapted to be continuously open during the operation of said apparatus for preventing the build-up of excess pressure between said first and second surfaces.

4,002,064

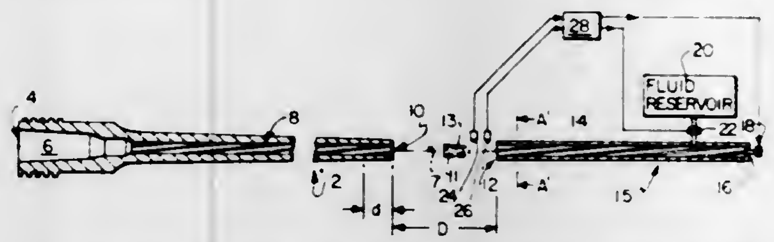
RIFLED SOFT RECOVERY SYSTEM

Herbert D. Curchack, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1976, Ser. No. 659,320

Int. Cl.^{2} G01L *5/14*

U.S. Cl. 73—167 **12 Claims**



1. A system for decelerating a projectile in flight, having rifle engravings thereon, fired by a gun bore rifled with a land pattern having a characteristic number of turns per bore diameter, whose muzzle has a first angular orientation along the projectile's flight axis, the gun having a characteristic recoil distance, comprising:
- a tubular member having an opened end at a first distance from said gun muzzle, with a rifled land pattern having a second angular orientation at said opened end, about said projectile flight axis, displaced from said first angular orientation substantially by the project of said characteristic turns per bore diameter times the sum of said first distance and said characteristic recoil distance;
- means contained within said tubular member for imposing a force on said projectile opposite to the direction of flight;
- whereby said projectile is decelerated in flight.

4,002,065

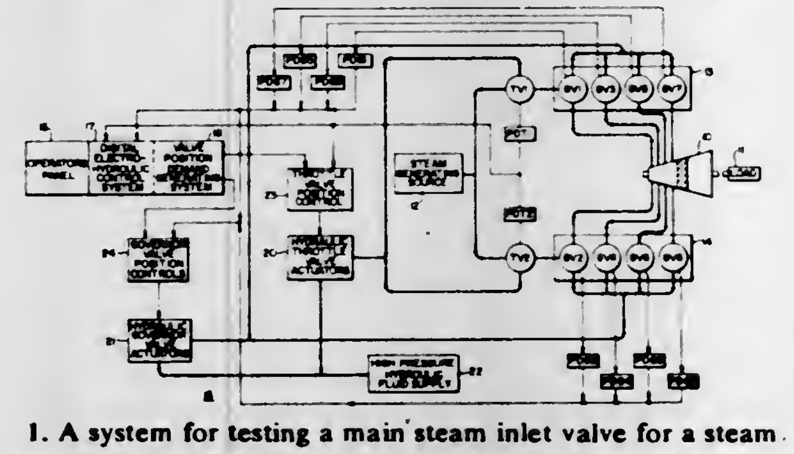
STEAM TURBINE VALVE POSITIONING SYSTEM HAVING THROTTLE VALVE TEST CAPABILITY

Francesco Lardi, Pittsburgh, and Uri G. Ronnen, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1975, Ser. No. 591,245

Int. Cl.^{2} G01L *27/00*

U.S. Cl. 73—168 **13 Claims**



1. A system for testing a main steam inlet valve for a steam turbine by closing and opening the valve during operation of the turbine without disturbing the required flow of steam to the turbine for a predetermined load, comprising:
- a. a main steam inlet valve;
- b. at least one position controllable valve downstream of the main inlet valve;
- c. at least one position controllable valve connected to control the flow of steam to the turbine in a path parallel to the main inlet valve;
- d. means to generate a representation of total steam flow demand to the turbine;
- e. means to select in the alternative a single and sequential mode of operation for the position controllable valves;
- f. means governed by the total steam flow demand representation to generate for each of the position controllable valves a representation of valve lift, said representation being based upon a characterization of valve steam flow versus valve lift in accordance with the selected single or sequential mode of operation;
- g. means governed by the initiation of a valve test for the main steam inlet valve to generate repetitively a predetermined position demand representation of incremental closure of the downstream position controllable valve;
- h. means governed by generated representations including the incremental closure representation to generate a representation of actual flow for the downstream valve based upon the characterization of valve steam flow versus valve lift;
- i. means governed by each representation of actual flow and the total steam flow demand representation to generate a representation of flow demand error created by the generated representation of incremental closure;
- j. means governed by each flow demand error representation to generate a representation of valve position demand for the position controllable valve in the parallel path, said governor valve position demand being based upon the characterization of steam flow versus valve lift;
- k. means to position each of the position controllable valves in accordance with each generated respective downstream position demand and the parallel path position demand representations; and
- l. means to close and open the main inlet valve when the downstream valve is closed.

4,002,066

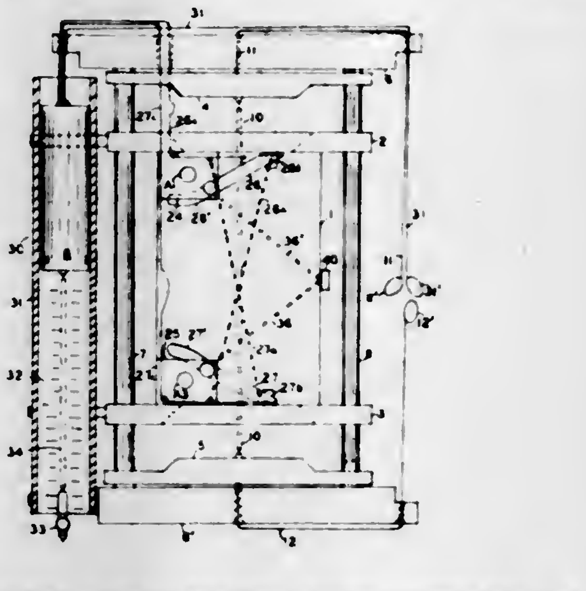
OCEANOGRAPHIC WATER SAMPLER

Edward Ratigan, 170 Birch Hill Road, Locust Valley, N.Y. 11560

Filed Mar. 4, 1976, Ser. No. 663,914

Int. Cl.^{2} G01N *1/12*

U.S. Cl. 73—170 A **6 Claims**



1. Oceanographic water sampling means comprising, a container, cable means connected to the container to locate the container at a predetermined location in an ocean,
- cover means closably mounted on the container,
- means connected to close the cover means to trap a water sample, and
- means to add chemicals to the trapped water in the container at the same location where the sample is taken.

4,002,067
LOW FRICTION ABSOLUTE PRESSURE CONTINUOUS INTEGRATOR

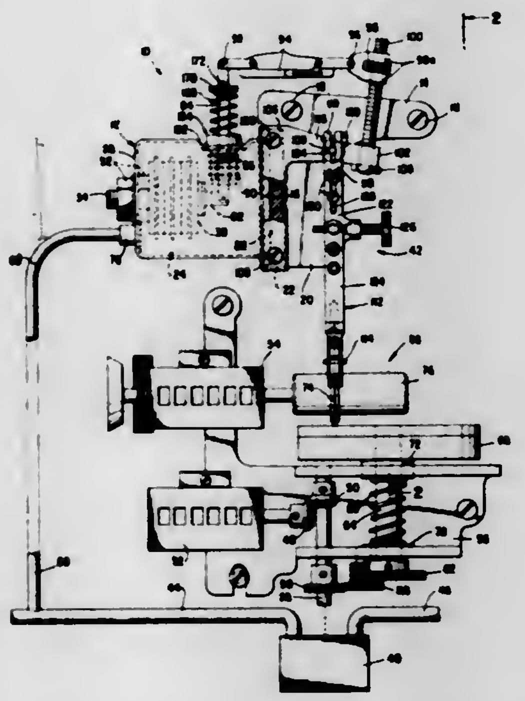
Carl John Kugler, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 472,246, May 22, 1974, Pat. No. 3,946,609. This application Dec. 10, 1975, Ser. No. 639,557

The portion of the term of this patent subsequent to Mar. 20, 1990, has been disclaimed.

Int. Cl.² G01F *1/12*

U.S. Cl. 73—233 **8 Claims**



1. An absolute pressure continuous integrator device for measuring the absolute pressure of the volume of the throughput fluid flow of a line having a meter connected therein, which device comprises:

- a. a housing having a chamber sealed from atmospheric pressure therein,
- b. a pressure sensing means mounted in the housing and having one end extending in the chamber freely to move responsive to changes in the line absolute pressure,
- c. conduit means connected between the line and the housing to communicate line absolute pressure to one or the other of the chamber or the pressure sensing means, with the other being evacuated to substantially zero absolute pressure whereby changes in the line absolute pressure will be sensed by the pressure sensing means,
- d. a link transfer assembly having one end connected within the chamber to the free end of the pressure sensing means,
- e. a flexible seal means connected to the housing in sealed communication with the chamber to permit the link transfer assembly to sealingly exit the chamber,
- f. a continuous integrator assembly associated with the meter and connected to and operated responsive of movements of the other end of the link transfer assembly,
- g. the link transfer assembly includes a transfer link which sealingly exits the chamber at the seal means, and
- h. a support assembly sealingly interconnected between the housing and the transfer link, and to shift in substantially friction-free, non-lineal movement responsive to changes of the position of the pressure sensing means, to cause the transfer link of the link transfer assembly to shift correspondingly.

4,002,068
LEVEL-SENSITIVE SYSTEM

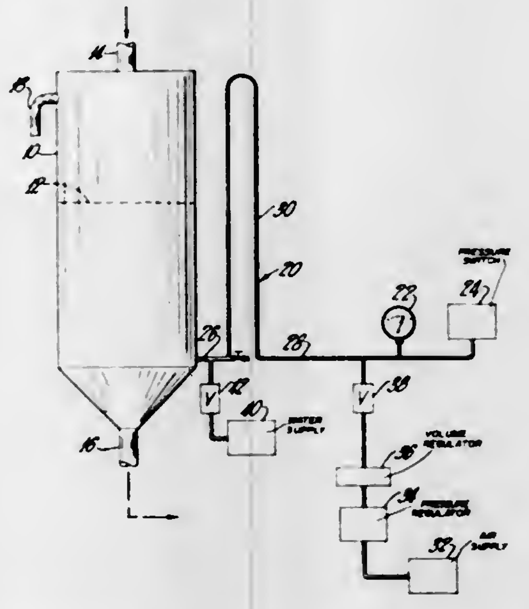
John A. Borst, San Jose, Calif., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 24, 1974, Ser. No. 463,473

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G01F *23/16*

U.S. Cl. 73—302 **1 Claim**



1. In combination, a container for a liquid, the level of which is subject to rising and falling, a device sensitive to the level of the liquid in the container, passage means connecting the device to a lower portion of said container, means for supplying gas under pressure to said passage means to effect a flow of gas into said container through said passage means, and means for supplying liquid under pressure through said passage means to said container, at a rate of 10 cc per minute to 2 gallons per hour, to effect a combined flow of liquid and gas into said container and through said passage means downstream of the liquid introduction site.

4,002,069
MEASURING LANCE FOR MOLTEN METAL SUCH AS STEEL

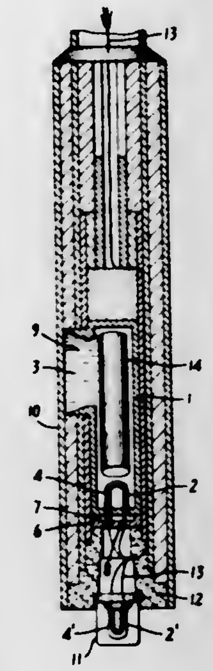
Yozo Takemura, Tohkai; Eisuke Akiyoshi; Hiroshi Matsukubo, both of Aichi, and Toshihiko Shibata, Tohkai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 14, 1975, Ser. No. 577,160

Int. Cl.² G01K *13/12*

U.S. Cl. 73—354 **9 Claims**

1. A measuring lance to be inserted into molten metal which comprises an expendable body, a first thermocouple protected by a first tube mounted on one end of the body, a receptacle chamber for receiving the molten metal provided inside the body, a second thermocouple protected by a second tube mounted at the bottom of said chamber and projected in the upside-down direction relative to the projecting direction of the first thermocouple, and a path for the molten metal leading to said chamber, characterized in that one or both opening ends of said second tube are positioned in a porous brick provided below the receptacle chamber.



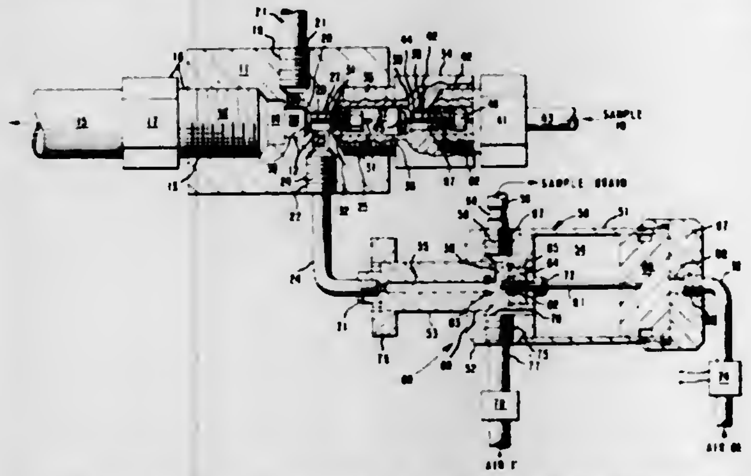
4,002,070
SAMPLE INJECTION SYSTEM

Gary W. Howell, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,427

Int. Cl.² G01N *1/14*

U.S. Cl. 73—422 GC **7 Claims**



1. An apparatus for injecting a quantity of a sample liquid into a continuously flowing carrier liquid, comprising:

- a. a primary housing having a primary channel therein;
- b. a carrier outlet in said primary housing connected to said primary channel;
- c. a carrier inlet in said primary housing connected to said primary channel adjacent to said carrier outlet, said carrier inlet and outlet together forming a carrier conduit through said primary housing;
- d. a sample outlet in said primary housing connected to said primary channel;
- e. a sample inlet in said primary housing connected to said primary channel adjacent to said sample outlet, said sample inlet and outlet together forming a sample conduit through said primary housing;
- f. a primary pressure relief valve disposed within said primary housing in said primary channel between said sample conduit and said carrier conduit, said primary pressure relief valve being biased to the normally closed position to prevent intermixing of liquid flowing in said sample conduit and the liquid flowing in said carrier conduit; and
- g. means to change the pressure differential between the liquid flowing in said carrier conduit and the liquid flowing in said sample conduit to the point where the primary pressure relief valve opens to admit sample liquid into said carrier conduit, said means comprising
  - i. a pumping system comprising a housing, and a motor cylinder, first and second channels, and a sample drain orifice all formed in said housing, said first channel being a cylindrical pump channel with an axis parallel to the axis of said motor cylinder, one end of said pump channel being connected to said motor cylinder and the other end being connected to said sample outlet, one end of said second channel being connected to said pump channel at a point adjacent to the connection of said first channel to said motor cylinder and the other end of said second channel being connected to said sample drain orifice, said first and second channels forming a continuous path from said sample outlet to said sample drain orifice;
  - ii. a piston movably mounted in said motor cylinder;
  - iii. a cylindrical rod carried by said piston and extending into said first channel;
  - iv. means to seal said cylindrical rod to the walls of said first channel in movable, leak-tight association, the end of said rod disposed within said first channel being normally positioned between the point at which said first channel is connected to said motor cylinder and the point at which said first channel is connected to said second channel; and
  - v. means to move said piston in said motor cylinder and thereby move said rod in said first channel.

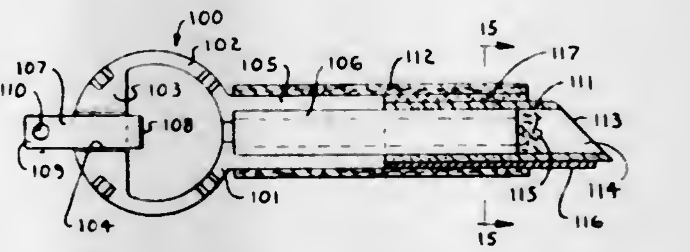
4,002,071
DEVICE AND METHOD FOR OBTAINING ONE OR MORE SAMPLES OF LIQUID

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Filed Jan. 24, 1975, Ser. No. 543,687

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.4 R **15 Claims**



1. A device for obtaining a sample of liquid from a supply thereof, said device comprising wall structure forming a chamber, tubular means communicating with and extending from said chamber and having an outer exposed extremity provided with an entrance through which liquid initially received may be caused to flow into said chamber, and means for supporting at least a portion of said outer extremity adjacent the entrance against possible damage when inserted into a supply of liquid.

4,002,072
DEVICE AND METHOD OF OBTAINING A SAMPLE OF LIQUID

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

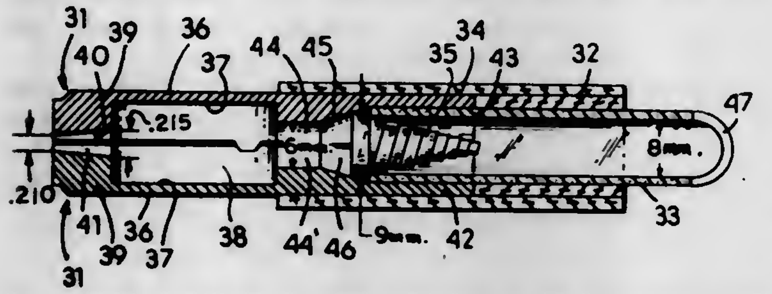
Filed Mar. 31, 1975, Ser. No. 563,590

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.6 **21 Claims**

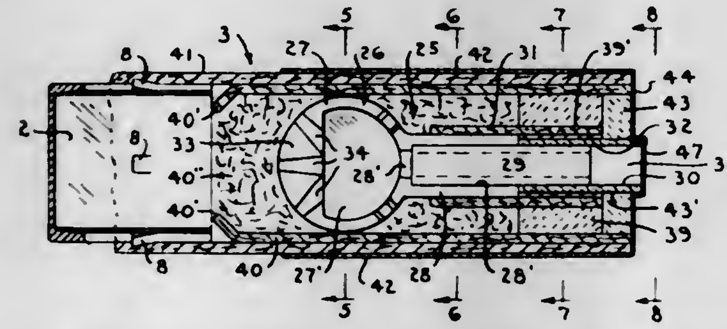
1. A device of the character described for obtaining a sample of molten metal, said device comprising structure provided with an unevacuated chamber and an integral tubular formation extending therefrom, a tube disposed in axial relation to said tubular formation for initially receiving molten metal for

flow into said chamber, buffer means held against a portion of said tubular formation by an inner end of said tube, and tubular means embracing at least a portion of said tubular formation for holding the components assembled.



4,002,073
MOLTEN METAL SAMPLER

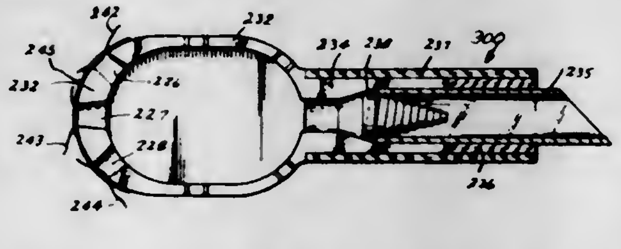
William J. Collins, 7005 Madison St., Merrillville, Ind. 46410
Filed July 11, 1975, Ser. No. 595,155
Int. Cl.^{2} G01N *1/12*
U.S. Cl. 73—425.4 R **18 Claims**



1. A device for obtaining a sample of hot liquid, said device comprising wall structure forming a primary chamber and a secondary chamber for successively receiving such a liquid, tubular structure extending from and communicatively connected to said primary chamber, a tubular casing substantially multisided in cross-section, surrounding and supporting said wall structure, a support fixed in said coating and provided with an opening, and said tubular structure being disposed in said opening and affording initial entry of a liquid for flow into said chambers.

4,002,074
DEVICE AND METHOD FOR OBTAINING ONE OR MORE SAMPLES OF MOLLEN METAL

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410
Continuation-in-part of Ser. No. 543,687, Jan. 24, 1975. This application May 26, 1976, Ser. No. 690,296
Int. Cl.^{2} G01N *1/12*
U.S. Cl. 73—425.4 R **26 Claims**



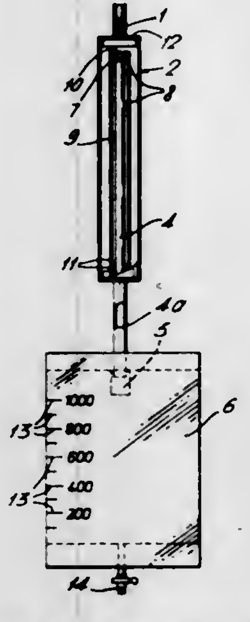
2. Structure constituting a subassembly of a device for obtaining a sample of molten metal, said subassembly comprising a pair of half sections, each of said sections having a head provided with a recess and an extended portion provided with a groove, said head of each section also having a relatively thick chordal portion provided with a longitudinal groove spaced from the groove in the extended portion, the arrangement being such that when said sections are correctly assembled, said recesses and the grooves in the extended portions will respectively form a primary chamber and an opening, and said grooves in said chordal portions will form a secondary chamber for receiving metal from said primary chamber whereby to obtain a sample substantially entirely within the confines of said chambers and head to form a large portion and a smaller portion of a predetermined size extending from said large portion.

18. A device for obtaining a sample of molten material from a supply thereof, said device comprising a casing, wall structure disposed in said casing and forming a primary chamber provided with an entrance for receiving the material and a secondary chamber for receiving the material from said primary chamber, and fibrous means secured in said casing serving to substantially prevent the outflow of the molten material from said secondary chamber.

4,002,075
LIQUID-MEASURING APPARATUS

David E. Cross, Folkestone, England, assignor to Smiths Industries Limited, London, England
Continuation-in-part of Ser. No. 378,100, July 11, 1973, Pat. No. 3,888,126. This application Aug. 15, 1975, Ser. No. 605,106

Claims priority, application United Kingdom, Aug. 16, 1974, 36164/74
Int. Cl.^{2} G01F *19/00*
U.S. Cl. 73—426 **12 Claims**

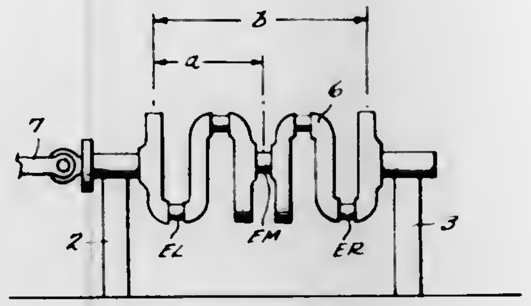


1. In liquid-measuring apparatus which comprises a first chamber having an inlet for supplying the liquid to be measured to a predetermined level in said first chamber, said first chamber communicating with ambient atmospheric pressure above said predetermined level, a second chamber for the liquid being measured, said second chamber having a substantially larger liquid-holding capacity than said first chamber, and a passageway intercoupling the two chambers for automatically conveying selected increments of the liquid being measured from the first chamber to the second chamber, said passageway opening into said first chamber below said predetermined level and including a first portion extending upwardly to said predetermined level and a second portion extending downwardly from the said predetermined level to said second chamber so as thereby to provide an automatic siphon for draining a predetermined unit quantity of the liquid out of the said first chamber and into said second chamber in response to the liquid content of the said first chamber reaching said predetermined level: the improvement wherein the said upwardly-extending first portion of said passageway comprises a compartment within said first chamber, said compartment being open to said first chamber below said predetermined level and being closed to said first chamber above said predetermined level, and wherein the said downwardly-extending second portion of said passageway comprises tubular means which opens at said predetermined level within said compartment of said first chamber.

4,002,076
METHOD AND CIRCUIT FOR USE IN DETERMINING UNBALANCE OF A ROTARY BODY

Hermann Brunnengraber, Heppenheim, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany
Filed Apr. 26, 1976, Ser. No. 680,127

Claims priority, application Germany, Apr. 30, 1975, 2519356
Int. Cl.^{2} G01M *1/22*
U.S. Cl. 73—462 **7 Claims**



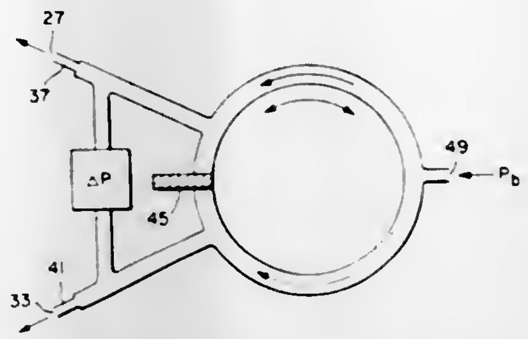
3. For a balancing machine, a circuit for determining unbalance of a rotary body which is of a structural configuration providing structurally predetermined compensation planes and restricted angular regions thereof, for compensation of such unbalance, the circuit comprising:

- input means for receiving electrical signals characterizing unbalance detected on the rotary body and converting said input signals to the structurally predetermined compensation planes; and
- means for determining the polarity of said input signals so that, when the signal polarity indicates that the unbalance cannot be compensated in a said compensation plane, said signals are converted to another compensation plane or planes and/or to a substitution plane or planes in which said unbalance can be compensated, by a circuit means connected to the output of said polarity-determining means and comprising:
  - a. a first inverting amplifier for receiving from the polarity-determining means signals which characterize unbalance that cannot be compensated in a said compensation plane;
  - b. a second inverting amplifier for receiving from the polarity-determining means signals which characterize unbalance that cannot be compensated in a second said compensation plane;
  - c. a third inverting amplifier operatively connected to the output of said first inverting amplifier;
  - d. means for varying the output of said third inverting amplifier as a function of the distance of the substitution plane from a said compensation plane; and
  - e. means connecting the output of said first inverting amplifier to the input of said second inverting amplifier;

whereby, in operation, the output of the first inverting amplifier is added by way of the third inverting amplifier to the output of the second inverting amplifier and the output of the first inverting amplifier is applied to the input to the second inverting amplifier, such that the output of the second inverting amplifier is available for use in unbalance compensation in said substitution plane and the result of the operation of adding the outputs of the first and second amplifiers is available for use in unbalance compensation in said other compensation plane.

4,002,077
INTEGRATING ANGULAR ACCELEROMETER

Lael Brent Taplin, Royal Oak, Mich., assignor to The Bendix Corporation, South Bend, Ind.
Filed Mar. 6, 1975, Ser. No. 555,924
Int. Cl.^{2} G01P *3/26, 15/02*
U.S. Cl. 73—503 **28 Claims**



1. An integrating angular accelerometer for measuring angular rate of a rotating body, comprising a housing, an inertial mass positioned in the housing and arranged for relative rotation with respect to the housing, a viscous fluid in the housing, the inertial mass and housing forming an annular channel therebetween located about the acceleration sensitive axis and dimensioned to cause fluid flow upon relative rotation of the housing and inertial mass in the direction of relative rotation, means for blocking fluid flow in the channel to provide a differential pressure across the block means corresponding to relative angular rotation of the inertial mass and housing, and means for sensing the differential pressure across the blocking means to provide a signal corresponding thereto.

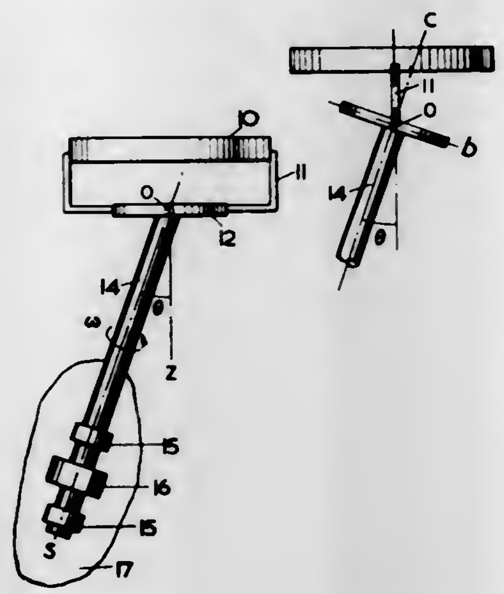
4,002,078
DYNAMICALLY TUNED GYROSCOPES

Ivor Lewis Thomas, Wigan, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Feb. 13, 1975, Ser. No. 549,676

Claims priority, application United Kingdom, Feb, 14, 1974, 6804/74
Int. Cl.^{2} G01C *19/16*
U.S. Cl. 74—5 R **6 Claims**

1. A dynamically tuned gyroscope comprising a rotor to be rotated, a driving member rotatable about an axis fixed therein, a single gimbal member, first torsion flexure means extending along a first axis of symmetry of said gimbal member and connecting said driving member to said gimbal member, a second torsion flexure means extending along a second axis of symmetry of said gimbal member, said first and second axes of symmetry being at right angles to each other, said second torsion flexure means connecting said gimbal to said rotor and having an effective torsional stiffness K_2 equal to $4w^2 r_2^2 m_2$ where w is the tuned rotational speed of said rotor, m_2 is the component mass of said gimbal on an axis through the centre of gravity of the gimbal and normal to said first and

second axes of symmetry and r_3 is the distance of the component mass m_3 from the centre of gravity of the gimbal, and



means for making the effective torsional stiffness K_1 of said first torsion flexure means zero.

4,002,079

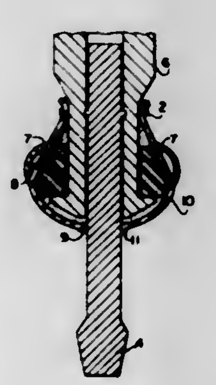
BREATHING PROTECTOR BOOT FOR IMPACTOR TOOLS

William A. Hall, Rte. 1, Box 310-A, Anniston, Ala. 36201

Filed Aug. 27, 1975, Ser. No. 608,369

Int. Cl.² F16J *15/50*

U.S. Cl. 74—18.2 **4 Claims**



1. An air-vented boot adapted for protecting the lower housing of an impactor tool comprising in combination:

A. A thine-walled symmetrical elastomeric body having a vertical axis or revolution, and further including:

B. An upper annular surface defining a first horizontal disposed opening in said body adapted to be clamped around the lower end of an impactor housing, and a lower annular surface defining a second horizontally disposed opening and adapted to be distensibly engaged around, and against relative movement to, the shaft of an impactor bit; and,

C. Aperture means defining at least one air vent through the wall of said body between said first and second openings, said aperture means including a protector lobe formed external to, and in partial encompassing relation over, said air vent opening in said body whereby said air-vented boot is operable to pump an air flow within and without said boot during oscillation of said breaker bit.

4,002,080

DERAILLEUR GEAR FOR A BICYCLE

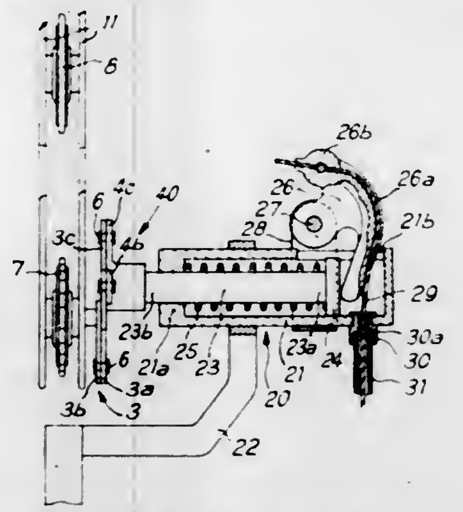
Roger Huret, and Jacques Huret, both of 60, avenue Felix Faure, 92000 Nanterre, France

Filed Feb. 19, 1975, Ser. No. 551,018

The portion of the term of this patent subsequent to July 29, 1993, has been disclaimed.

Int. Cl.² F16H *7/22, 9/24*

U.S. Cl. 74—217 B **12 Claims**



1. A derailleur gear for a bicycle comprising:

a. displacement means (1 or 20) including a first part (*1a* or *21*) rigidly attached to a frame part of a bicycle and a second part (4 or 40) connected to and supported by the first part and displaceable with respect to said first part in a direction generally transversely to the plane of the rear wheel of the bicycle;

b. a support parallelogram linkage (3) including a vertically movable portion (*3a*, *3b*, *3c*) disposed generally in a plane perpendicular to the axis of the rear wheel of the bicycle, said vertically movable portion being pivotally connected to and supported by said second part of said displacement means, said second part comprising a rigid connecting side link of said support parallelogram linkage;

c. a spindle (9) carried by said vertically movable portion of said support parallelogram linkage, said spindle extending in a direction transverse to the plane of the rear wheel of the bicycle;

d. a chain guide sprocket (7) ratatably mounted on said spindle;

e. an elongated arm member (11) pivotally connected to said vertically movable portion of said support parallelogram linkage for movement about an axis transverse to the plane of the rear wheel of the bicycle; and

f. a chain tension pulley (8) rotatably supported by said arm member.

4,002,081

PULLEY CONSTRUCTION

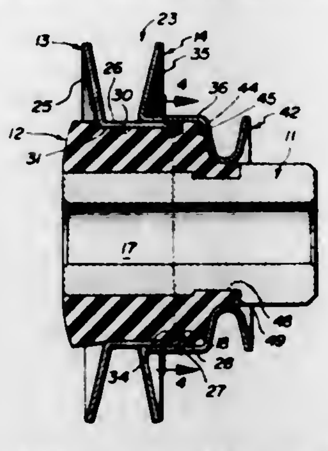
Edward H. Schultz, Jr., Glencoe, Ill., assignor to Nagel-Chase Manufacturing Company, Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,248

Int. Cl.² F16H *55/44, 55/49*

U.S. Cl. 74—230.8 **11 Claims**

1. A pulley, comprising the combination of a hub, a firmly resilient collar affixed to the hub and having an annular surface having a groove formed therein, a first annular sheet metal member having an outwardly flared margin and a bi-ended bushing portion axially extending from the flared margin to an annular, radially inwardly extending free end adapted for engagement with the collar groove, the bushing having an inner surface for engaging the collar outer surface with an axially extending press fit, the pulley further comprising a second annular sheet metal member having an outwardly flared margin adapted to oppose the first sheet metal member margin and form therewith a groove for accommodating a belt, and a bi-ended sleeve portion axially extending from the flared margin and adapted to engage the first sheet metal member bushing with an axially extending, nesting fit.



4,002,082

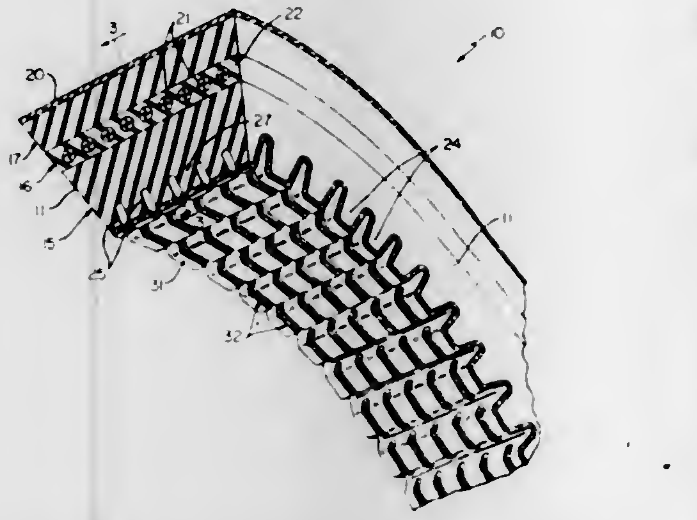
ENDLESS POWER TRANSMISSION BELT

Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Sept. 17, 1975, Ser. No. 614,293

Int. Cl.² F16G *1/28, 5/16, 5/00*

U.S. Cl. 74—231 C **18 Claims**



1. An endless power transmission belt made primarily of elastomeric material and having a compression section comprising a plurality of teeth defining the inside portion of said belt and extending perpendicular to the endless path of said belt, each of said teeth having at least one groove extending therethrough substantially transverse thereto and extending parallel to said endless path.

4,002,083

BALANCED COMPONENT OPERATIVE WITH AN ASSOCIATED SHAFT FOR RELATIVE POSITIONING MOVEMENT THEREBETWEEN

Harry Glicken, 333 Trotting Road, Union, N.J. 07083

Filed Dec. 11, 1975, Ser. No. 639,852

Int. Cl.² F16H *55/22, 27/02, 1/8, 1/20*

U.S. Cl. 74—459 **31 Claims**

1. A component for use on a shaft having transport means thereon comprising,

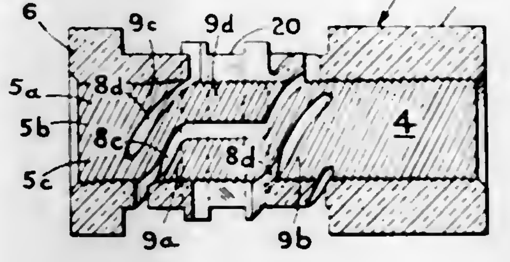
a. a member having a bore therethrough,

b. matching transport means formed in the member substantially along the length of said bore to permit said component to be mounted for movement to and fro relative the transport means of the associated shaft,

c. a plurality of circumferentially spaced slots cut through the wall of said member each generally having a length less than the member,

d. said slots defining a plurality of circumferentially spaced connecting members on the member each of which connecting members is disposed between an adjacent pair of slots, and

e. means about the medial section of said component and transverse to the longitudinal line thereof for exerting compressive forces on the connecting members and to provide a predetermined engagement forces for balanced relative movement between the matching transport means or the component and the transport mean on the associated shaft.



4,002,084

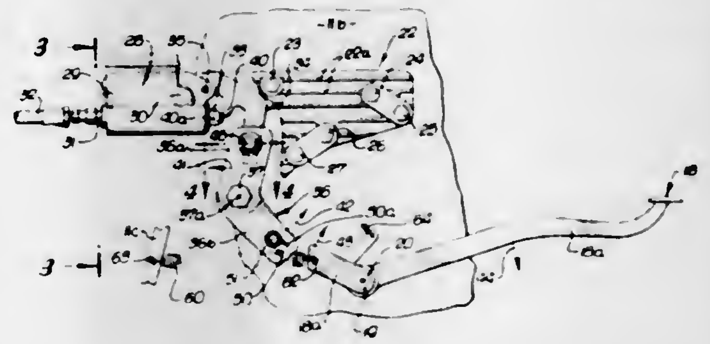
MOTORCYCLE BRAKING LINKAGE

Samuel J. Martins, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed July 30, 1975, Ser. No. 600,389

Int. Cl.² G05G *1/04, 1/14*

U.S. Cl. 74—512 **6 Claims**



1. For combination with a motorcycle having a frame, a wheel braking surface, a braking pad, a fluid pressure responsive actuator operable to urge the pad against said surface, and a pivotally mounted brake pedal, the combination comprising

a. a mount adapted for attachment to the frame,

b. a braking cylinder on the mount and having a pressurized fluid outlet communicable with said actuator and a plunger movable relative to the cylinder to pressurize fluid therein,

c. a plunger actuating lever pivotally connected to the mount to swing between retracted position relative to the cylinder and advanced position in which the plunger is moved to pressurize fluid in the cylinder,

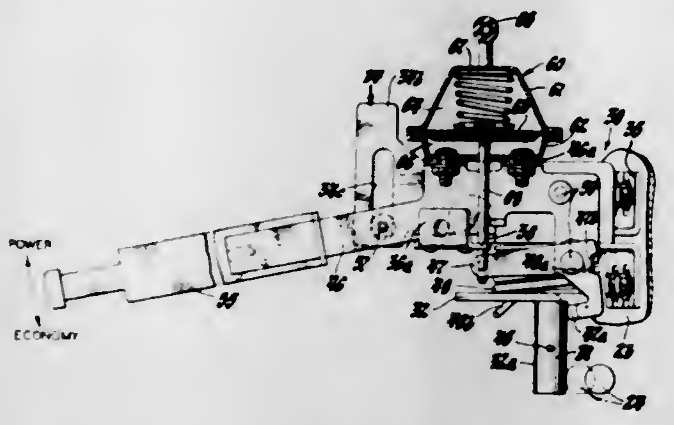
d. and a crank pivotally connected to the mount, the crank having a first arm with lost motion pivotal connection to said actuating lever, and a second arm with operative connection to said brake pedal, said lost motion connection increasing the mechanical advantage of force transmission from the crank to the actuating lever as the crank is rotated counterclockwise by the pedal to swing the actuating lever from retracted to advanced position,

e. said crank defining a pivot axis, said lost motion connection including a guide shoulder and a follower movable lengthwise along said guide shoulder relatively close to said axis as the crank pivots counterclockwise, the guide shoulder and follower respectively located on said crank first arm and on said actuating lever.

4,002,085

ACCELERATOR CONTROL ASSEMBLY

Daniel U. Johnston, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed May 8, 1975, Ser. No. 575,610
Int. Cl.^{2} G05G *11/00*
U.S. Cl. 74—513 5 Claims



1. In an automotive vehicle having an internal combustion engine with an induction system including a movable throttle and a driver operated actuating means operatively connected to the throttle to effect opening movement of the throttle, an accelerator control assembly operative to provide a force signal to the vehicle operator indicating proper throttle settings for economical engine operation, said accelerator control assembly including a support means, a shiftable bumper stop means pivotably supported by said support means and positioned in the path of movement of said actuating means and engageable by said actuating means when said actuating means is moved to effect opening movement of the throttle, a manually adjustable lever pivotably supported on said support means, a lever means pivotably supported on said lever with one end of said lever means positioned to abut against said bumper stop means, a vacuum actuator having an actuator rod operatively connected to said lever means to normally pivot said lever means in a first direction to allow pivotal movement of said bumper stop means in a direction to resist throttle opening movement of said actuating means, said vacuum actuator having a chamber connected to the induction system of the engine downstream of the throttle for applying induction vacuum pressure to the vacuum actuator whereby at a predetermined vacuum pressure said vacuum actuator will effect pivotal movement of said lever means in a second direction to effect pivotal movement of said bumper stop means in a direction to permit increased throttle opening movement of said actuating means and, coiled spring means operatively connected at one end to said bumper stop means and at its other end to said lever and to said lever means to normally bias said bumper stop means in a direction to resist throttle opening movement of said actuating means and to effect pivotal movement of said lever and said lever means in a direction for said one end of said lever means to abut against said bumper stop means.

4,002,086

DEVICE FOR AUTOMATIC CORRECTION OF UNBALANCE IN RAPIDLY ROTATING MACHINE ELEMENTS

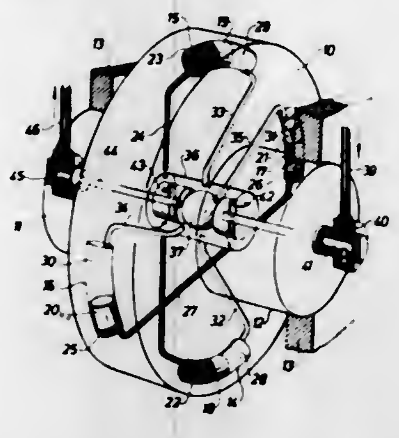
Rolf Bertil Reinhall, Killingevagen 16, 181 64 Lidingo, Sweden
Continuation of Ser. No. 363,016, May 23, 1973. This application June 25, 1975, Ser. No. 590,398
Claims priority, application Sweden, June 6, 1972, 7433/72
Int. Cl.^{2} F16F *15/22*
U.S. Cl. 74—573 F 13 Claims

1. A device for counteracting imbalances in a rotary body and automatically restoring it to be balanced condition, comprising:

a. an axial bore in said rotary body forming a reservoir and containing a fluid medium;

b. a plurality of chambers disposed about said bore at spaced distances therefrom and each having a balancing mass movable therein;

c. means floating freely in said fluid containing reservoir for developing pressure differentials about the axis of rotation proportional to any imbalances arising during rotation of said body;

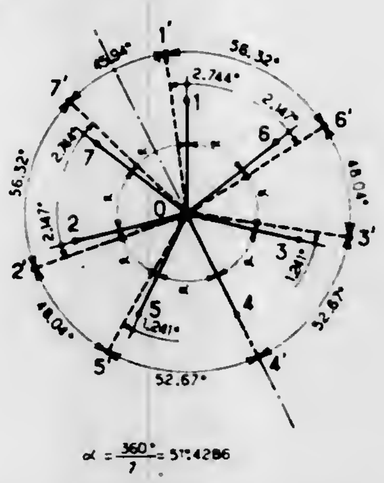


d. means for transmitting said pressure differentials to said balancing masses to displace the latter in said chambers a distance proportional to the pressure differentials and being effective to restore said body to a balanced condition.

4,002,087

MACHINE CRANK-SHAFT WITH IMPROVED DYNAMIC BALANCE RATIO

Michel Ferrand, Ecouen, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France
Filed May 12, 1975, Ser. No. 576,560
Claims priority, application France, May 31, 1974, 74.19053
Int. Cl.^{2} F16F *15/10*
U.S. Cl. 74—595 1 Claim

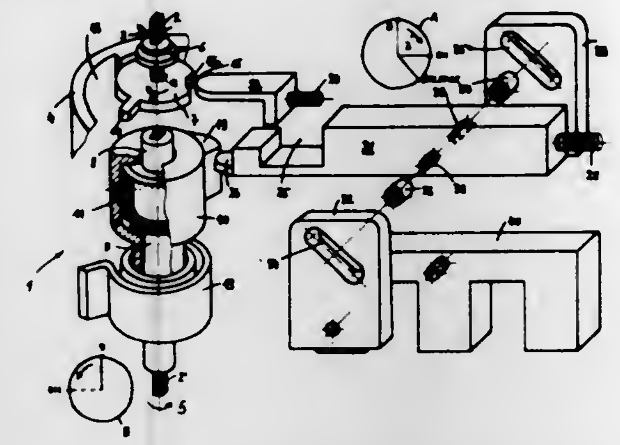


1. A seven-throw crank-shaft provided with substantially identical balancing counterweights for a four-cycle internal combustion engine with at least one bank of seven cylinders arranged in a cylindrical position sequence numbered 1-2-3-4-5-6-7 to be fired according to an ignition sequence 1-6-3-4-5-2-7 comprising crank throws whose crank position sequence along said crank-shaft corresponds to said cylinder position sequence and wrist pins for the crank throws and wherein when viewed endwise of said crank-shaft in orthogonal projection on a radial plane perpendicular to the longitudinal axis of rotation of said crank-shaft, said crank-throws are angularly spaced from each other successively arranged about said axis of rotation in the same order as said ignition sequence when travelling in a single circumferential direction about said axis, each of three pairs of said crank-throws 1-7, 6-2, 3-5 being respectively symmetrical with respect to the longitudinal axial center plane passing through the wrist-pin of a middle crank-throw 4 and through said axis of rotation and wherein the crank-throws of said three pairs respectively make angles of 157.03°; 100.71° and 52.67° with said axial center plane as measured from said center plane of said middle crank-throw 4.

4,002,088

CLUTCH FOR A ROTARY SWITCH DRIVE SHAFT

Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Vienna, Austria
Filed Apr. 10, 1975, Ser. No. 566,993
Claims priority, application Austria, Apr. 25, 1974, 3421/74
Int. Cl.^{2} F16H *57/10*; H01H *3/00*
U.S. Cl. 74—777 10 Claims



1. A clutch means between an actuating element for selectively switching an electric switch on and off, the actuating element including a rotary shaft, and a drive shaft for the switch, the shafts being coaxially mounted, comprising

1. a differential gearing coupled between the rotary shaft of the actuating element and the drive shaft, the gearing including
    - a. a first bevel gear coaxial with the rotary shaft and keyed thereto for rotation therewith about the axis of the shafts,
    - b. a second bevel gear means axially spaced from the first gear, coaxial with the drive shaft and keyed thereto for rotation therewith about the axis,
    - c. idler gear means meshing with the bevel gears and interconnecting the same, and
    - d. a housing carrying the idler gear means and mounted for rotation about the axis,
2. a releasable latch means arranged selectively to permit and stop rotation of the gearing housing,
3. an exterior housing surrounding the gearing housing, and
4. spring means connected between the gearing housing and the exterior housing, the spring means being biased to press the gearing housing against the latch means to prevent rotation of the gearing housing.

4,002,089

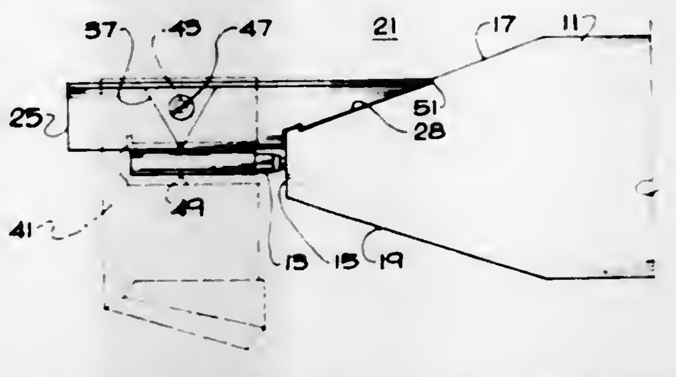
ADJUSTMENT MEANS

Elof Granberg, 530 Canal St. 1A, San Rafael, Calif. 94901
Continuation of Ser. No. 305,447, Nov. 10, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 531,106
Int. Cl.^{2} B23D *63/16*
U.S. Cl. 76—37 5 Claims

1. An adjustment plate for mounting on a saw chain sharpener having a rotary grinding element, said plate comprising

a holding portion releasably secured to the body of said sharpener, said holding portion having means for laterally adjusting said plate with respect to said sharpener body, and

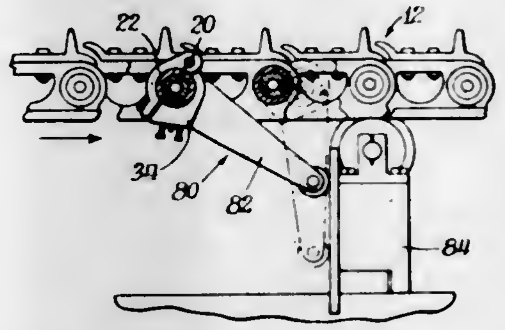
a planar guide portion fixed to said holding portion and extending generally perpendicularly therefrom beyond the end of said sharpener body, said planar guide portion being disposed substantially perpendicular to the direction of said lateral movement of said plate and closely parallel to said grinding element, the bottom edge of said planar guide portion being spaced slightly above the outer diameter of said grinding element such that, by laterally adjusting said holding portion with respect to said body, the flat guiding surface of said planar guide portion can be adjusted relative to the axis of said grinding element to control the contact of said element with the cutting edge of different types and sizes of saw chain teeth supported on said guiding surface, said holding portion including indicia means for alignment with further indicia means on the body of said sharpener to enable said guide portion of said plate to be adjusted with respect to different diameter grinding elements for sharpening different types and sizes of saw chain cutting teeth said guide portion including a depth gauge attachment detachably secured thereto and extending therefrom, and said holding portion includes further indicia means to enable said holding plate portion to be adjusted with respect to said grinder, whereby, when the depth gauge attachment means is secured to said guide portion the cutter gauge portion of the cutter links of a saw chain may be adjustably ground.



4,002,090

TRACK BUSH TURNING TOOL

Harold W. Vanlandingham, Washington; Roger L. Boggs; David A. Bullock, both of East Peoria, all of Ill., and James N. Maytum, Waverly, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 348,886, April 9, 1973, Pat. No. 3,915,036. This application Sept. 29, 1975, Ser. No. 617,347
Int. Cl.^{2} B25B *13/48*
U.S. Cl. 81—3 R 2 Claims



1. For use with a tractor track including a series of interconnected track links and a plurality of bushings associated with the track links, said bushings being arranged for engagement between teeth of a track driving sprocket, each bushing having a sprocket engaging area which is normally substantially unchanging as the tractor track is operated, apparatus for rotating a bushing to define a new sprocket engaging area thereof with the track in its substantially assembled state comprising: arm means; means associated with the bushing and connected to the arm means so that upon application of force to the arm means about the bushing, rotative force is applied to the bushing through the means associated with the bushing; and means for applying said force to the arm means to rotate said bushing, wherein the means associated with the bushings comprise removable means positionable about the bushing in close proximity thereto, and an insert associated with the

means positionable about the bushing and movable inwardly and outwardly from the bushing, said insert being movable inwardly into the worn area of the bushing with the means positionable about the bushing so positioned, and means for fixing the insert in said inward position, wherein the insert is in sliding relation with the means positionable about the bushing and movable substantially radially of the bushing inwardly and outwardly thereof with the means positionable about the bushing so positioned, wherein the insert defines a surface adapted to contact the surface of the bushing in the worn area thereof, the contacting surface of the insert being shaped to conform generally to the contacting of said worn area, wherein said means for applying said force to the arm means comprise a body fixed relative to the tractor, and positioned to be contacted by the arm means as the tractor track is operated.

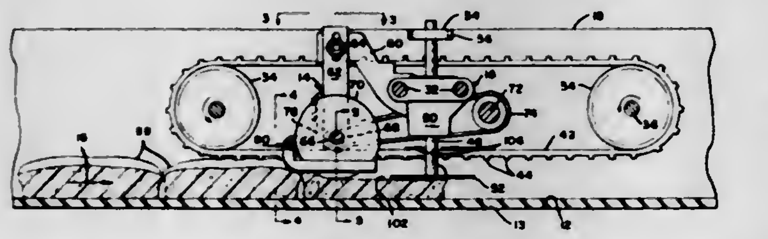
4,002,091
METHOD OF SLICING BAKERY PRODUCTS

David Laverne White, Dallastown, Pa., assignor to Alto Corporation, York, Pa.

Division of Ser. No. 637,891, Nov. 28, 1975. This application Apr. 26, 1976, Ser. No. 679,891

Int. Cl.² B26D *3/08, 3/12*

U.S. Cl. 83—4 **6 Claims**



1. The method of forming a slit extending along a proof line in a cluster of hot dog buns or the like comprising the steps of:

A. Moving a cluster of buns downstream toward and past a cutting blade located on the nominal proof line between two adjacent buns in the cluster;

B. Forcing the side of the bun nearest the nominal proof line to a position further away from the nominal proof line when immediately upstream of the cutting blade to position the proof line between the adjacent buns on the nominal proof line;

C. Holding the proof line on the nominal proof line as the cluster passes the cutting blade; and

D. Forming a slit in the proof line between the adjacent buns as the cluster passes the cutting blade.

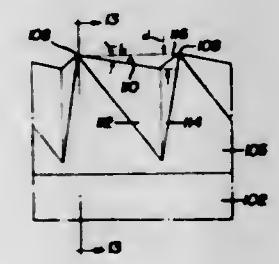
4,002,092
COMPOUND ANGLE CUTTING EDGE AND METHOD OF USING SAME

Billy R. Smith, and Francis Moses Smith, both of Warren, Mich., assignors to B & M Die Co., Inc., Warren, Mich.

Division of Ser. No. 585,802, June 11, 1975, Pat. No. 3,961,858. This application Nov. 7, 1975, Ser. No. 630,067

Int. Cl.² B26F *1/44*

U.S. Cl. 83—55 **3 Claims**



1. In a method of cutting blanks from stock material, the steps of positioning the stock material in alignment with a die rule, relatively moving the die rule and stock material toward one another, initially contacting the stock material by a plurality of generally equally spaced peaks on a cutting portion of the die rule, thereby piercing the stock material at a plurality of generally equally spaced positions, continuing to relatively move the material and the die rule and cutting the stock material between the plurality of pierced positions with a plurality of cutting edges, each of said primary cutting edges (a) extending from one piercing peak substantially the entire distance to the next piercing peak and (b) extending away from the stock material by an angle of from about one to fifteen degrees with a line connecting the piercing peaks said cutting edges thereby progressively cutting the stock material substantially unidirectionally from one pierced position progressively toward a next adjacent pierced position by an amount in comparison with the extent of relative movement between the cutting tool and stock material within the ratios of between about 57.29:1 and 3.73:1.

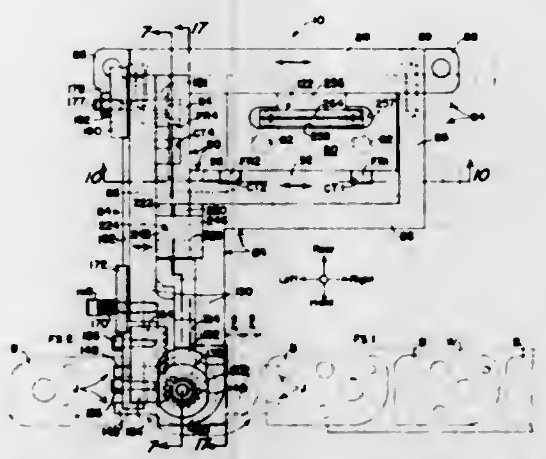
4,002,093
PUNCH PRESS TRANSFER MECHANISM

Harold Heisler, Old Naperville Road, Rte. 3, Plainfield, Ill. 60544

Filed Sept. 19, 1975, Ser. No. 615,056

Int. Cl.² B26D *7/06, 5/22*

U.S. Cl. 83—154 **26 Claims**



1. The combination with a punch press having a fixed die shoe and a vertically reciprocable punch holder, of a cyclicly-operable transfer mechanism for receiving successive work blanks issuing from a web at a first forming station and delivering the same angularly displaced to a second forming station, said transfer mechanism comprising a guide member fixedly secured to the die shoe, a carriage shiftable laterally on said guide member between said stations, a pair of work-engaging jaws mounted on said carriage for rotation about a vertical axis and including cooperating jaw fingers relatively movable toward and away from each other between blank-gripping and blank-releasing positions, means for releasably locking said jaw fingers in their blank-gripping position, a cam member shiftable laterally in unison with said carriage and slidably secured to the punch holder for vertical movements in unison therewith, means effective between said carriage and jaws for rotating the latter, first cam means effective between the cam guide members for shifting the cam member and consequently the carriage laterally, second cam means effective between the cam member and rotating means for actuating the latter, and third cam means effective between the cam member and jaws for actuating said locking means.

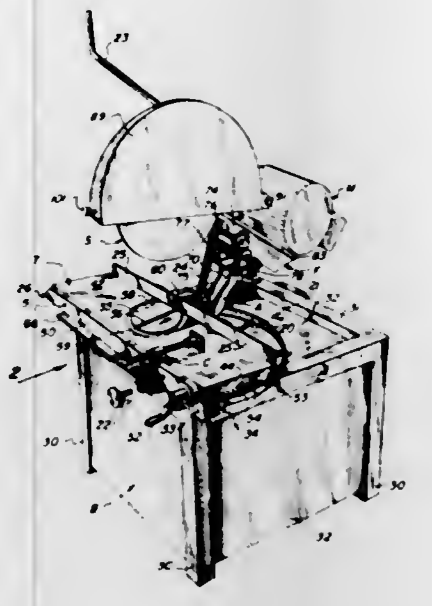
4,002,094
METAL SAW

Harold L. Erickson, Salida, and Wayne S. Weaver, Denver, both of Colo., assignors to Quick Rip Corporation, Littleton, Colo.

Filed Aug. 11, 1975, Ser. No. 603,268

Int. Cl.² B27B *5/20, 5/26*

U.S. Cl. 83—471.3 **5 Claims**



1. A circular saw for cutting elongated, rod-like material square, or at any selected bevel angle, said saw and its mount being carried upon a fixed, bench-like base having a front edge which a workman will normally face when operating the saw and with the saw being disposed above the material to drop downwardly upon the material, and comprising, in combination therewith:

a. an elongated, horizontally-disposed table to receive and hold the rod-like material to be cut by the saw with the longitudinal reach thereof paralleling and being adjacent to the front edge of the base;

b. a swing arm mounted upon a vertical pivot carried on the base beneath the table, the vertical pivot axis thereof projecting through the table at a position where material on the table may be centered with respect to this axis and said arm extending rearwardly and upwardly therefrom to project behind and above the table to carry a horizontally disposed trunion shaft behind and above the table;

c. a tippable frame mounted upon said trunion shaft to extend forwardly therefrom and over and above the table;

d. a horizontal, powered, saw shaft on said frame positioned over the table and substantially at the projection of the vertical axis of the pivot, and with the aforesaid circular saw carried upon the shaft at a point intersecting the said projection of the vertical axis of the pivot whereby the saw is essentially centered at the extension of said vertical pivot axis above the table to permit the saw to drop downwardly and directly upon a piece of material on the table at the said pivot axis with the angle of the cut being selected by swinging the swing arm, and with the saw blade adapted to move a short distance below the table surface as it cuts through the piece of material;

e. a cutout in the table about the vertical axis of the pivot having proportions slightly greater than the span of the portion of the blade moving below the table surface; and

f. a horizontal, circular guide plate upstanding from the swing arm at the pivot axis and extended into the cutout and to the surface of the table with an axial center-slot therein to receive the portion of the blade which moves below the table surface, said saw and guide plate rotating together whenever the swing arm swings.

4,002,095
WAVEFORM CONVERTER FOR USE WITH AN ELECTRONIC MUSICAL INSTRUMENT AND CAPABLE OF CONTROLLING THE DUTY FACTOR OF A RECTANGULAR WAVE TONE SIGNAL

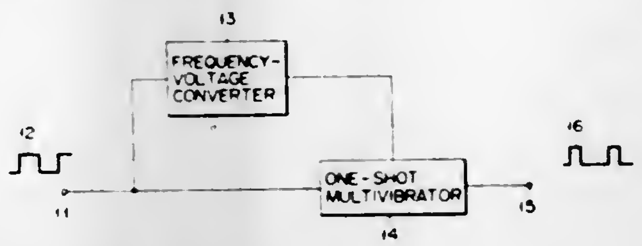
Rokurota Mantani, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 7, 1975, Ser. No. 629,919

Claims priority, application Japan, Nov. 13, 1974, 49-129855

Int. Cl.² G10H *1/06, 1/02*

U.S. Cl. 84—1.01 **2 Claims**



1. A duty factor controlling waveform converter for use with an electronic musical instrument comprising:

an input terminal for receiving an input rectangular wave tone signal; an output terminal; a frequency-voltage converter coupled to said input terminal to receive the input rectangular wave tone signal and produce a control voltage signal whose level corresponds to the frequency of the input rectangular tone signal; a one-shot multivibrator coupled between said input and output terminals to generate at said output terminal an output rectangular wave tone signal having the same frequency as the input rectangular wave tone signal, said one-shot multivibrator including a control terminal coupled to receive the control voltage signal and means responsive to the control voltage signal for determining the duty factor of the output rectangular wave tone signal to be produced by said one-shot multivibrator in accordance with the voltage level of the control voltage signal.

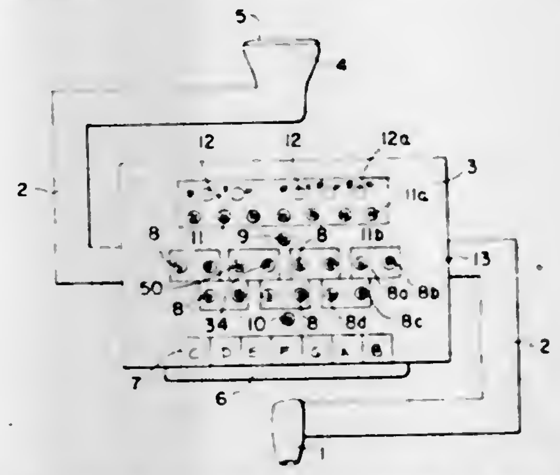
4,002,096
MUSICAL INSTRUMENT

William Mitchell, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 19, 1976, Ser. No. 650,056

Int. Cl.² G10D *7/00*

U.S. Cl. 84—380 R **11 Claims**

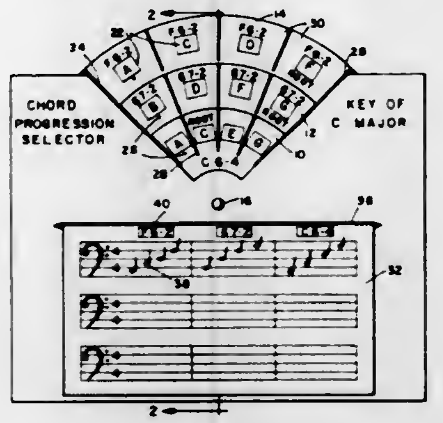


1. A wind musical instrument comprising a hollow tube having a bell shaped termination, a plurality of holes along the length of said tube, first hole covering means manually independently operable by depression of buttons, first number of holes uncoverable upon depression of said buttons, said first hole covering means biased to cover said first number of holes when said buttons are undepressed, said first number of holes capable of producing one octave of musical tones containing seven natural sequential tones and five intermediary half tones, seven second hole covering means each manually inde-

pendently operable by depressing one of seven keys associated therewith, slide hole covers uncoverable by depression of said keys, said second hole covering means biased to cover said slide hole covers when in hole covering position when said keys are undepressed, a second number of holes beneath said slide hole covers, said slide hole covers each selectively manually displaceable into a displaced position uncovering the associated hole in said second number of holes, said slide hole covers individually operated by programming means, said programming means adapted to selectively individually displace into said displaced position said slide hole covers, six of said seven second hole covering means each covering three slide hole covers constituting a tonal group complex, each of said three slide hole covers adapted to cover and uncover into said displaced position a hole in said tonal group complex, independent means to selectively uncover the middle slide hole cover into said displaced position and simultaneously cover the remaining two slide hole covers within each of said six tonal group complexes, said middle slide hole cover associated with each of said six tonal group complexes when uncovered into said displaced position exposes one of said second member of holes adapted to produce one of six successive natural tones within a musical scale, two slide hole covers adjacent said middle slide hole cover within each of said six tonal group complexes uncover two of said second number of holes adapted to produce respectively the half tone below and above said natural tone when two slide hole covers are operated independently of each other in said displaced position, the seventh of said seven second hole covering means covers two slide hole covers constituting the C natural tonal group complex, each of said two slide hole covers in said seventh second hole covering means adapted to cover and uncover into said displaced position a hole in said C tonal group complex, means to cover said two slide hole covers within said C tonal group complex, the length of said tube adapted to produce the C natural tone when all holes in said first number of holes and all holes in said second number of holes are covered, one of said two slide hole covers within said C tonal group complex adapted to produce the half tone below the C natural tone, the other of said two slide hole covers within said C tonal group complex adapted to produce the half tone above said C natural tone, means to selectively cover said middle hole within each of said six tonal group complexes upon uncovering into the displaced position one of said adjacent slide hole covers, means to cover the hole associated wit one of said adjacent slide hole covers a tonal group complex upon locating the other adjacent slide hole cover into said displaced position, means to locate into hole covering position one of the said two slide hole covers within said C tonal group complex upon locating the other of said two slide hole covers within said C tonal group complex into said displaced position, operation of linkage means adapted to simultaneously locate into the hole covering position said two slide hole covers within said C tonal group complex, means to produce the half tone above said middle natural tone within said six natural tone group complexes upon operating an adjacent slide cover into said displaced position, means to produce the half tone below the middle natural tone within said six natural tone group complexes upon operating the other adjacent slide cover into the displaced position, manually operated first ganging means adapted to simultaneously operate three of the said six middle slide hole covers and said linkage means into said displaced position, manually operated second ganging means adapted to simultaneously operate the remaining three of said six middle slide hole covers into said displaced position, said first ganging means adapted to include the C-E-G-B tonal group complexes, said second ganging means adapted to include the D-F-A tonal group complexes, lever means adapted to uncover an octave hole located intermediate the mouthpiece end of said tube and all of said second number of holes, uncovering means for said octave hole producing a tone one octave higher than the tone otherwise produced by uncovering a single hole in said first number of holes or said second number of holes when said octave hole is covered.

4,002,097
CHORD PROGRESSION SELECTOR

Verna M. Leonard, 8701 N. Highway 41, Fresno, Calif. 93727
Filed July 10, 1975, Ser. No. 594,746
Int. Cl.^{2} G09B *15/02*
U.S. Cl. 84—471 SR **2 Claims**



1. An aid for simplifying the selection of chord inversion progressions comprising:

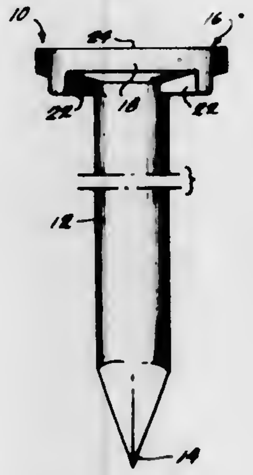
a. a plurality of dials centrally pivoted together and being of incrementally increased diameter from front to rear, such that each dial has a margin which is visible around the next forward dial;

b. the visible margin of each dial being divided into a plurality of sectors representing a particular chord type and its inversions and each of said sectors displaying in order the space scale tone names of the chord or inversion named thereon, said sectors being identical in angular dimension and number for all dials and each of said sectors containing the same number of scale tones; and

c. each of said dials being composed of a flexible material and having a plurality of radial slits provided in pairs adjacent each of said named scale tones to provide a tab for each scale tone, whereby any selected one of said named scale tones can be removed from view by folding the tab displaying same backward.

4,002,098
NOTCHED HEAD NAIL HAVING A PAIR OF DEPENDING ANNULARLY SPACED RADIAL ABUTMENT RIBS AND PACKAGE THEREOF

Edward A. Colechia, East Greenwich, R.I., assignor to Textron, Inc., Providence, R.I.
Filed May 7, 1975, Ser. No. 575,399
Int. Cl.^{2} F16B *15/02*
U.S. Cl. 85—28 **11 Claims**



1. A nail including a shank provided by a length of metal strand material severed at one end from an end portion of a supply of such material and formed thereon with a workpiece entering configuration,

said shank having an integral enlargement on the opposite end portion thereof formed in such a way that there is a tendency for a burr to grow upwardly therefrom in a position hereinafter set forth, said enlargement defining a head configured to facilitate collation of said nail with similar nails in a row formation in which the shanks of adjacent nails are in abutting parallel relation and the heads of adjacent nails are in overlapping abutting relation,

said head extending radially outwardly from said shank substantially throughout the entire periphery thereof and terminating in a partially circular peripheral edge of greater than 180° generally arcuate about the axis of said shank interconnected by a concavely curved open-sided peripheral edge disposed in aligned relation at its central portion with an adjacent peripheral portion of said shank, the position of said aligned relation constituting the position of burr growth,

the lower portion of said head bounded by said partially circular peripheral edge and extending radially outwardly from said shank having a pair of annularly spaced abutment elements depending therefrom,

said head and shank being symmetrical with respect to a median plane which passes through the aforesaid aligned portions of said shank and said open-sided peripheral edge,

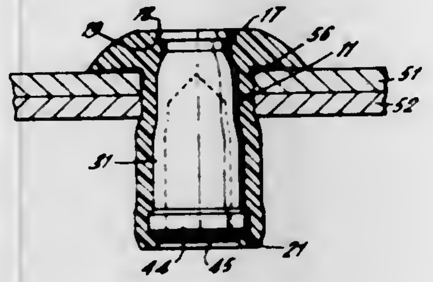
said abutment elements extending outwardly from the adjacent periphery of said shank toward said partially circular peripheral edge in annularly spaced relation to a peripheral portion of said shank opposed to the aforesaid adjacent peripheral portion in aligned relation with said open-sided peripheral edge and symmetrical relation with said median plane,

said abutment elements defining a pair of annularly spaced downwardly facing abutment surfaces disposed in general alignment,

the upper portion of said head having a top surface including a pair of mating upwardly facing abutment surface areas extending inwardly from said open-sided peripheral edge in spaced relation to the aforesaid central portion thereof disposed in aligned relation with said shank adjacent peripheral portion.

4,002,099
RIVET

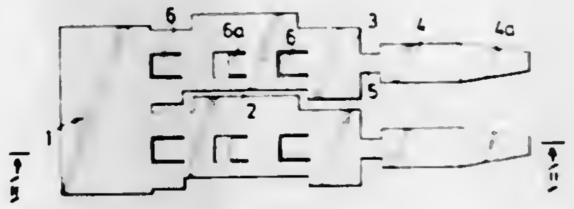
William David Bradley, and Keith Denham, both of Welwyn Garden City, England, assignors to Aerpat A.G., Zug, Switzerland
Filed Aug. 11, 1975, Ser. No. 603,656
Claims priority, application United Kingdom, Aug. 16, 1974, 36253/74
Int. Cl.^{2} F16B *13/10*
U.S. Cl. 85—74 **14 Claims**



1. A blind self-plugging rivet comprising a stem and a tubular shell, said shell having an enlarged head at one end, a tail portion remote from the head and a bore extending completely through the shell, the bore in said tail portion having a step wise reduction in diameter in a direction away from the head; said stem extending through the bore of the tubular shell and having an enlarged head at one end; whereby the stem head can be pulled into the tail end of the bore of the tubular shell in a direction towards the head of the shell to radially expand the shell at least at the tail end thereof to form a blind head, and thereafter the remainder of the stem can be broken off from the stem head to leave the stem head plugging the shell, said shell having first and second engaging means positioned spaced apart along the shell bore, said second engaging means being provided by said step wise reduction in the tail portion; and third and fourth engaging means positioned spaced apart along the stem head; the said second and third engaging means being adapted to be mutually engaged to hold the stem and shell assembled together before pulling of the stem head into the shell as aforesaid, and the said first and third engaging means being adapted to be mutually engaged, and the said second and fourth engaging means being adapted to be mutually engaged, to assist in retaining the stem head plugging the shell after the stem has been pulled into the shell as aforesaid.

4,002,100
EXPANSION ANCHOR SLEEVE AND METHOD OF MAKING THE SAME

Josef Bucheli, Herrliberg, Switzerland, assignor to Tuflex AG, Glattbrugg, Switzerland
Filed May 30, 1975, Ser. No. 582,282
Claims priority, application Switzerland, June 5, 1974, 7708/74
Int. Cl.^{2} F16B *13/06*
U.S. Cl. 85—85 **9 Claims**



1. A metal expansion anchor sleeve, comprising a sheet-metal sleeve body open along a generatrix thereof and having at least two radially outwardly expansible sections separated by a slot extending from one end of the sleeve body, said sleeve body also having a longitudinal passage for insertion of an expander member, and said sleeve body further having tongues integral with one end of the sleeve body and bent back upon the respective sections inwardly of said sleeve and forming a bight-shaped leading end portion which has a radius of curvature equal to at least one-half of the thickness of a respective section, each tongue including a tapered free end portion bounded by two mutually converging surfaces one of which is inclined relative to the other, said one inclined surface facing and engaging the inner surface of said longitudinal passage defining a tapered continuation thereof, the respective tongue being bent back through an arc of more than 180° providing unobstructed entry of the expander member into said passage.

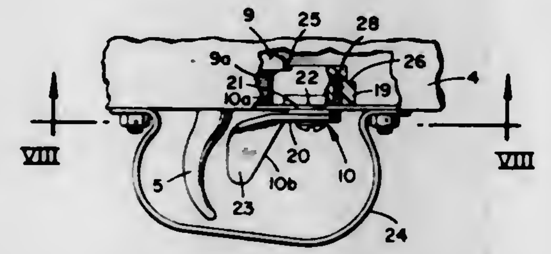
4,002,101
FIREARMS

Paul E. Tellie, 20 rue Bergson, 42000 Saint-Etienne, France
Filed May 17, 1974, Ser. No. 470,853
Claims priority, application France, May 29, 1973, 73.19393
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.^{2} F41C *17/02;* **F41D** *11/02*
U.S. Cl. 89—142 **7 Claims**

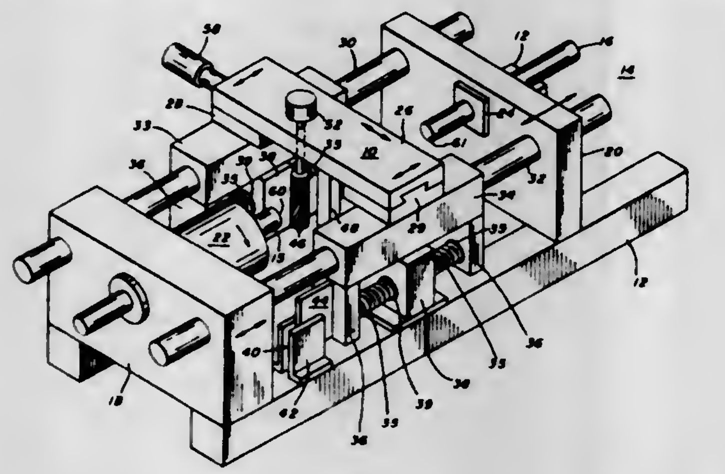
1. An automatic firearm comprising:

a trigger, and

a firing selector positioned adjacent said trigger, said firing selector comprising an inner part cooperating with a mechanism of the firearm and an outer part actuable by a marksman, said outer part being movable, relative to the vertical plane passing through the longitudinal axis of the firearm, into a central position symmetrical relative to said plane, a right-hand off center position to the right of said plane relative to the front end of the firearm, and a left-hand off-center position to the left of said plane relative to the front end of the firearm, and the central position corresponds to a "safety" position of the firing selector and the two off-center positions correspond to a "burst" position and a "shot-by-shot" position of the firing selector, said firing selector being turnable, said inner part comprising a turning part, said outer part comprising a pivoting part connected to said turning part to control its rotation, and said pivoting part being positioned in front of the trigger and mounted pivotally around a pin which is substantially perpendicular to the longitudinal axis of the firearm.



4,002,102
AUTOMATIC SETUP FOR MACHINING DEVICE
Trenton L. Brown, Bethel Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Nov. 20, 1975, Ser. No. 633,682
Int. Cl.² B23C *1/06*
U.S. Cl. 90—15 R **10 Claims**



1. Apparatus for relatively positioning the cutting edge of a machine tool and the surface of a workpiece to be machined by said tool, the apparatus comprising

means for mounting the workpiece,

a structural member supported for transverse movement with respect to the mounting means and the surface of the workpiece to be machined,

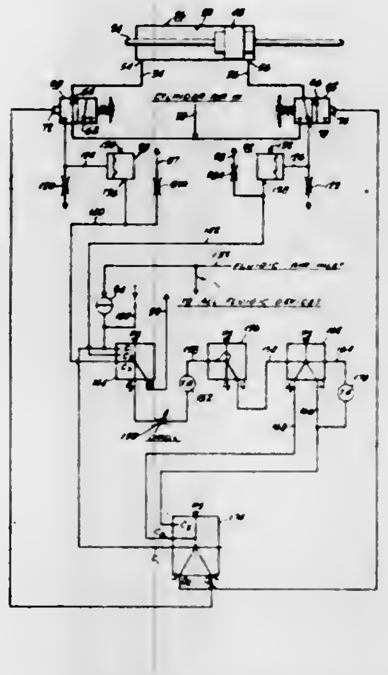
a tool having at least one cutting edge for machining the surface of the workpiece,

means having a surface for locating the surface of the workpiece relative to the cutting edge of said tool in a relationship in which the cutting edge of said tool lies outside of and parallel to the surface of said locating means, said tool and locating means being serially located on said structural member,

means adapted to place the surface of the workpiece to be machined and the surface of said locating means in mutual engagement with each other, and

means for moving the structural member relative to and in a direction transverse of the surface to be machined such that the locating means can be moved from the surface to be machined and the machining tool can be moved into cutting engagement with the surface to be machined.

4,002,103
RECIPROCATING APPARATUS WITH A CONTROLLABLE DWELL TIME AT EACH END OF THE STROKE
Frederick W. Martin, Pottstown, Pa., assignor to The West Company, Phoenixville, Pa.
Filed July 1, 1974, Ser. No. 484,699
Int. Cl.² F01L *31/00*
U.S. Cl. 91—219 **3 Claims**



1. Apparatus for controlling the reciprocation of a piston in a cylinder chamber having a first port near one end thereof and a second port near the other end thereof, each said port being positioned beyond the cylinder wall portion sealed off by said piston when in its most extreme positions, said apparatus comprising:

first and second pilot valve means each having a cylinder connection, an exhaust connection, a cylinder-air supply connection, and a pilot control connection responsive to a change in fluidic pressure to switch said cylinder connection from communication with said cylinder-air connection to communication with said exhaust connection;

means connecting said cylinder connections of said first and second pilot valve means to said first and second ports respectively;

a source of cylinder-air connected to said cylinder-air supply connections of both of said first and second pilot valve means;

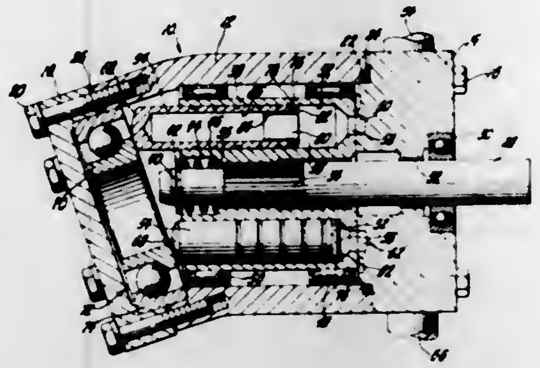
first fluidic means responsive to simultaneous occurrence of substantially zero exhaust flow from said exhaust connections of said first and second pilot valve means to switch its output from a first position to a second position;

second fluidic means having two output connections and two stable output states in one of which states the fluidic pressure at one of said two connections is high compared to that at the other of said two output connections and vice versa in the other of said two states;

means responsive to each occurrence of said second output position of said first fluidic means to reverse the state of said second two-state fluidic means; and

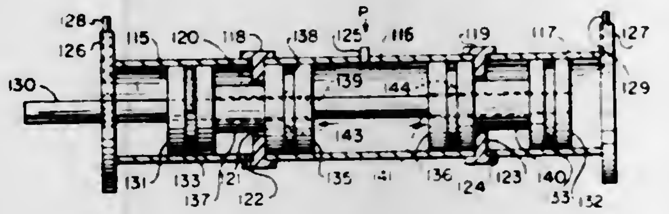
means connecting said output connections of said second two-state fluidic means to respective pilot control connections of said first and second pilot valve means to switch said first and second pilot valve means alternately at times determined by the times of said simultaneous occurrences of substantially zero exhaust flow.

4,002,104
PISTON PUMP OR MOTOR HAVING INTERNAL FLUID FILTER
Morris J. Duer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed May 5, 1975, Ser. No. 574,599
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **2 Claims**



1. A piston pump or motor comprising; a housing, a cylinder block rotatably disposed in said housing including a plurality of axially extending cylinder bores disposed therein; a plurality of pistons each slidably disposed in a respective cylinder bore of said cylinder block and cooperating therewith to form a respective fluid chamber and each piston having an interior opening; a cam disposed in said housing in abutting relation with said pistons to urge said pistons into said cylinder bores to induce fluid flow to and from the fluid chambers upon rotation of said cylinder block; and filter means disposed on each of said pistons for filtering foreign matter from fluid leaking between said pistons and bores into said housing from said fluid chambers including a ring of filter material abutting the piston face adjacent said fluid chamber and being in contact with said cylinder bore, and retaining means disposed in interference fit relation with the interior opening of said piston and having a lip portion securing said ring to said piston.

4,002,105
FLUID ACTUATED GEAR CHANGING SYSTEM
Charles Gilbert Bell, 2220 S. Helen, Sioux City, Iowa 51106, and Michael M. Randolph, 2814 Nebraska St., Sioux City, Iowa 51104
Division of Ser. No. 522,214, Nov. 8, 1974, Pat. No. 3,945,265. This application July 23, 1975, Ser. No. 598,249
Int. Cl.² F01B *7/10*
U.S. Cl. 92—62 **4 Claims**



1. A fluid actuated cylinder and piston positioning assembly having three positive positions comprising the combination of

a cylinder having end walls;

a shaft;

first and second pistons attached to said shaft and movable therewith;

third and fourth pistons slidably mounted on said shaft between said first and second pistons with said third piston adjacent said first piston and said fourth piston adjacent said second piston;

first stop means attached to and extending into said cylinder between said first and third pistons for limiting axial motion of said first and third pistons;

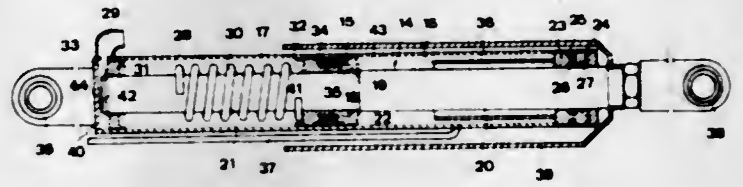
second stop means attached to and extending into said cylinder between said second and fourth pistons for limiting axial motion of said second and fourth pistons;

means interposed between said third piston and said first piston and movable with said third piston for reaching beyond said first stop means and contacting and moving said first piston;

means interposed between said fourth piston and said second piston and movable with said fourth piston for reaching beyond said second stop means and contacting and moving said second piston;

first, second and third means on said cylinder for passing fluid under pressure respectively between said third and fourth pistons and axially beyond the outer limits of motion of said first and second pistons, whereby said assembly assumes three different positively established positions in response to the application of fluid pressure to any one of said first, second and third means with the other two vented.

4,002,106
PISTON-CYLINDER MECHANISM
Torbjorn Edmo, Harnosand, Sweden, assignor to Bispgardens Svets & Smide AB, Bispgarden, Sweden
Filed Mar. 20, 1975, Ser. No. 560,111
Claims priority, application Sweden, Mar. 22, 1974, 7403881
Int. Cl.² F01B *7/10*; F16J *1/10*
U.S. Cl. 92—65 **8 Claims**



1. A piston-cylinder mechanism for the pivoting or tilting of a platform of a vehicle mounted goods elevator between a raised resting position and a lowered working position, including:

a. a cylinder,

b. a piston movably mounted in the cylinder,

c. a piston rod slidably movable through the piston, and movable in the cylinder between a bottom position wherein the platform is lowered and a position of maximum extension out of the cylinder wherein the platform is raised,

d. a driving means connecting the piston and piston rod for moving the piston and piston rod together from the bottom position,

e. a stop in the cylinder limiting travel of the piston and determining an intermediate position of the piston rod, the piston rod being movable relative to the piston between the intermediate position and the position of the maximum extension,

f. spring-engaging means carried by the piston rod, and

g. a spring engaging the spring-engaging means and tending to urge the piston rod from the position of maximum extension in a direction toward the bottom position whereby to initiate at all times a lowering of the platform, the length of the spring being no longer than the difference between the piston rod travel and the piston travel so that the spring is operative solely during the movement of the piston rod relative to the piston and tends to move the platform into a position wherein the proper weight of the platform can cause the piston rod to return to the bottom position in which the platform is lowered.

4,002,107
DISPOSABLE FLUID ACTUATOR

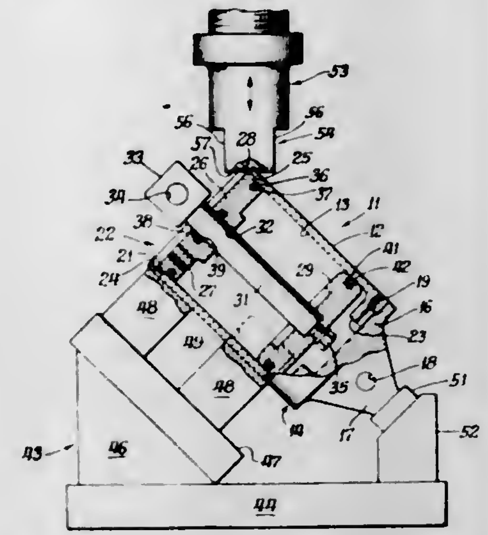
Rodney R. Erickson, Joliet; Melvin H. Peters, Minooka, and Daniel L. McMillan, Morris, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1973, Ser. No. 425,193

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² F16J *11/02;* **F01B** *29/00*

U.S. Cl. 92—163 **1 Claim**



1. A disposable fluid actuator comprising:

a cylinder member having a cylindrical portion and a head end closure which is an integral element therewith and wherein a head end fluid port extends through said head end closure, said cylinder member also having a head end mounting tang extending from said closure, said tang also being an integral element of said cylinder member, said cylinder member having a rod end opposite from said head end closure and having an interior cylindrical chamber extending from said rod end towards said closure and also having a shorter counterbore extending inward from said rod end, said counterbore being of greater diameter than said interior chamber to form an annular shoulder in conjunction therewith which shoulder faces said rod end,

a circular end cap disposed within said rod end of said cylinder member in coaxial relationship therewith, said end cap having a stepped peripheral surface forming an annular shelf which abuts said shoulder of said cylinder member, said end cap being held therein by a plurality of radially inwardly extending deformed portions of said rod end of said cylinder member, said end cap having a central opening therethrough for a piston rod, said end cap further having a rod end fluid port extending therethrough,

a piston rod extending into said cylinder member through said opening of said end cap, and

a piston disposed coaxially in said chamber for axial movement therewith, said piston being secured to said piston rod,

said end cap and said piston rod and said piston being permanently secured to said cylinder member by said radially inwardly extending portions of said rod end of said cylinder member.

4,002,108
VENTILATED BACK-SEAT REST PARTICULARLY FOR AUTOMOTIVE VEHICLES

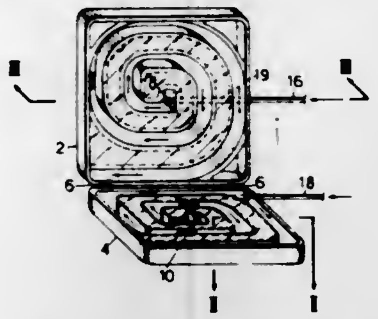
Mordeki Drori, 89 Zahal St., Kiron, Israel

Continuation of Ser. No. 498,634, Aug. 19, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,309

Int. Cl.² A47C *7/74;* **B60H** *1/00*

U.S. Cl. 98—2.03 **3 Claims**

1. A body supporting device for use as a chair back rest or seat rest, comprising: a panel of molded plastic material formed with a spirally-extending corrugation defining a spiral channel open at the upper face of the panel and a spiral channel open at the under face of the panel; and an air conduit extending along the under face of the panel from the outer periphery of its spiral channel to the center thereof; one end of the conduit being connected to a source of air, and the opposite end of the conduit being connected to an opening passing through the panel at the center of the spiral channels to conduct the air to the upper face of the panel; whereby, when the device is occupied by an occupier contacting the center of the upper face of the panel, the center of the open spiral channel at the upper face of the panel is covered by the occupier and the air is directed along the upper face spiral channel in direct contact with the occupier and escapes from the channel at the outer edges of the panel where not contacted by the occupier.



4,002,109
BLOWER

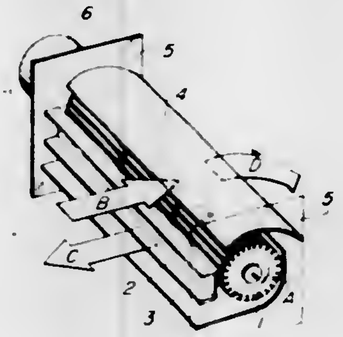
Michimasa Hori, Yao, and Takeshi Aizawa, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 427,733, Dec. 26, 1973, Pat. No. 3,940,215. This application May 30, 1975, Ser. No. 582,293

Claims priority, application Japan, May 14, 1973, 48-53431; Dec. 28, 1973, 49-3330; Oct. 18, 1973, 48-117591

Int. Cl.² B23B *39/00;* **F24F** *13/00*

U.S. Cl. 98—32 **10 Claims**



1. A blower including a blower body installed, in a room to be conditioned, near or on a wall of the room partitioning the inside and the outside of the room, comprising:

a cross flow fan;

a vortex stabilizing plate spaced apart from one side of the outer periphery of said cross flow fan;

a back guider, located in a position opposite the position of said vortex stabilizing plate, with said cross flow fan located between said vortex stabilizing plate and said back guider, said back guider being in the form of a curved surface which parts progressively from the outer periphery of said cross flow fan in the rotating direction of said fan;

a flow dividing guider, disposed on a suction side of said cross flow fan and parting progressively from the outer periphery of said cross flow fan in the rotating direction of said cross flow fan; and air suction space being formed between said flow dividing guider and said vortex stabilizing plate, a first branching air delivery space being formed between said flow dividing guider and said back guider, and a second air delivery space being formed between said vortex stabilizing plate and said back guider, said flow dividing guider including means for enabling air to flow from said air suction space in two substantially opposite directions to said first air delivery space and said second air delivery space, and

an air passageway, communicating with said first branching air delivery space, formed in the wall for establishing a communication between the inside and the outside of the room.

4,002,110
AUTOMATIC OBTURATOR FOR A GASODYNAMIC VENTILATION DEVICE

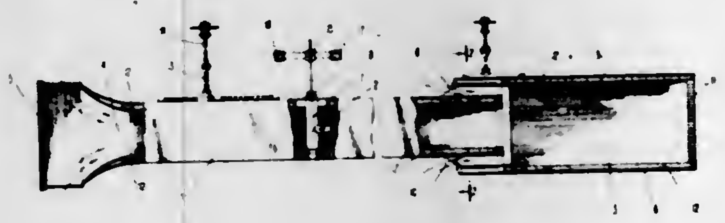
Constantin Teodorescu; Ilie Chiriac, and Ion Stelian Iacob, all of Bucharest, Romania, assignors to Institutal Pentru Creatie Stiintifica si Tehnica, Bucharest, Romania

Division of Ser. No. 455,338, March 27, 1974, abandoned. This application May 6, 1975, Ser. No. 574,927

Claims priority, application Romania, Apr. 2, 1973, 74347

Int. Cl.² F24F *13/10*

U.S. Cl. 98—43 R **3 Claims**



1. A gasodynamic ventilation device consisting of a primary ejection channel, an injection nozzle within the primary ejection channel and facing downstream, a secondary ejection channel mounted coaxially of the primary ejection channel and connected to the downstream end of the primary ejection channel by vanes so that the two channels are separated by the section which constitutes an inlet for the admission of secondary air, the primary ejection channel being provided at its upstream end with an admission inlet for the ambient air, and the downstream end of the secondary ejection channel being provided with an exit port having upper and lower edges, an automatic obturator disposed at the exit port of the secondary channel, the obturator having the shape of a flap and having a bore extending therethrough intermediate its ends, a pivot pin supported at the exit port of the secondary channel in parallel relation to and intermediate the upper and lower edges, the pivot pin extending through the intermediate bore of the flap to support the flap for pivotal movement between an open position and a closed position, and a counterweight affixed to the upper end of the flap.

4,002,111
CONTINUOUS-FLOW WINE-MAKING APPARATUS

Andre Joseph Pujol, 11120 Argeliers, France

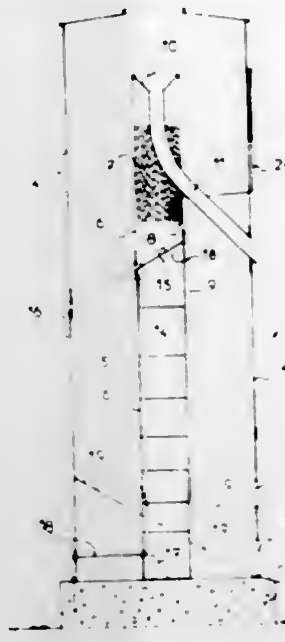
Filed Nov. 24, 1975, Ser. No. 634,737

Claims priority, application France, Dec. 12, 1974, 74.40945

Int. Cl.² C12B *1/10*

U.S. Cl. 99—276 **10 Claims**

1. Continuous-flow wine-making apparatus comprising two coaxial towers, the central of said towers being divided by an intermediary inclined bottom into an upper wine room along which extend annular filtering grids and a lower room which is entirely filled with a thermal regulation fluid, especially cooling water, hot water or heating steam.



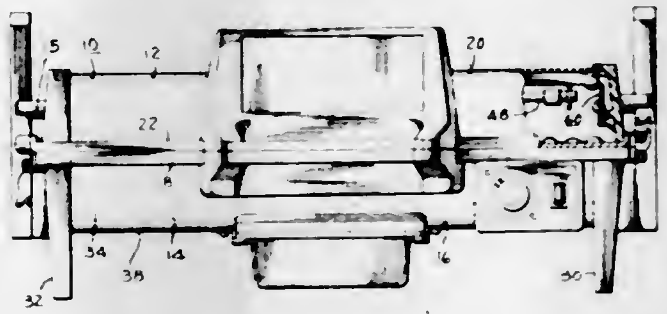
4,002,112
COOKING APPLIANCE WITH REMOVABLE COOKING GRIDS

Paul V. Snyder, Whitehall, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed July 21, 1975, Ser. No. 597,835

Int. Cl.² A47J *37/06*

U.S. Cl. 99—376 **8 Claims**



1. An electric cooking appliance comprising:

a. a housing including side walls and a generally horizontal wall;

b. electric heating means positioned within said housing;

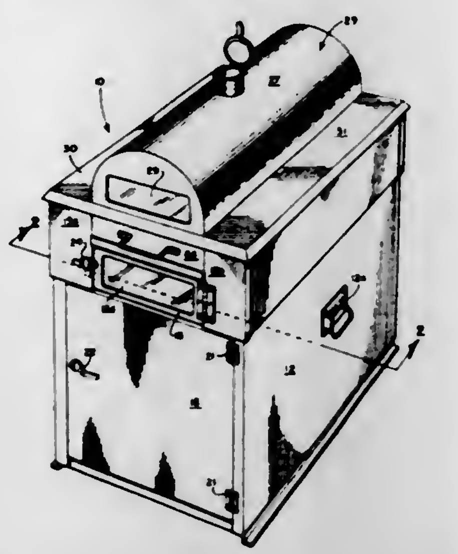
c. a cooking grid being shaped to be removably positioned on said housing;

d. keeper means having a slot provided at the side of said grid, said keeper means including a raised retaining portion and a lower seating portion facing into said slot, and said slot including a generally vertical open portion located adjacent to said raised retaining portion; and

e. a latch having two legs, one of the legs extending generally inwardly within the housing toward the horizontal wall and along the inside of one of the side walls, the end portion of said inwardly extending leg being movably connected to said side wall, the other leg of said latch extending outwardly over said side wall so that said cooking grid may be positioned on said housing with the outwardly extending leg of said latch being located within the open portion of said slot and the cooking grid may be held on the cooking appliance by moving the latch over the raised portion of the keeper and onto the lower seating portion of the keeper wherein the latch and the keeper hold the grid on the cooking appliance.

4,002,113
COOKING APPARATUS

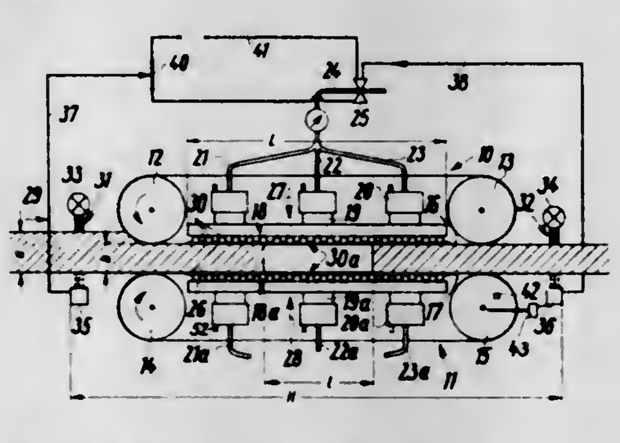
Jack S. McLane, 1853-B Vintage Court, Marietta, Ga. 30060
Continuation-in-part of Ser. No. 187,972, Oct. 12, 1971, abandoned. This application Nov. 13, 1975, Ser. No. 631,716
Int. Cl.² A47J *37/04*
U.S. Cl. 99—447 **5 Claims**



1. A grill type cooking apparatus comprising a housing, a source of heat at a lower portion of said housing, a grill cooking surface located above said source of heat, an open container positioned beneath said grill cooking surface for holding flavoring means or the like, and means in said housing for directing heated air from said source of heat first in upward directions from said source of heat and then in lateral directions over said container and then in upward directions through said grill.

4,002,114
HYDRAULIC DUAL-BELT PRESS AND CONTROL

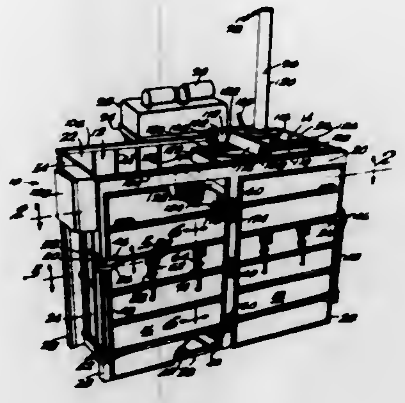
Manfred Guttinger, Leinfelden, Germany, assignor to Sandco Ltd., Ottawa, Canada
Filed Apr. 29, 1975, Ser. No. 572,937
Claims priority, application Germany, May 7, 1974, 2421955
Int. Cl.² B30B *15/16;* **B29C** *3/06, 15/00*
U.S. Cl. 100—49 **10 Claims**



1. In a dual-belt press for exerting controlled pressure upon a continuous strip of material passing through a treatment zone, control means which includes sensing means which senses the flow of the strip of material toward said treatment zone and pressure-control means to control the pressure exerted by the press and which responds to an interruption in said flow of material when sensed by said sensing means to reduce said pressure exerted by the press, said control means including means to restore said pressure exerted by the press to a predetermined value upon the resumption of said flow of material as sensed by said sensing means and including means to prevent said restoring of said pressure until a continuous strip of material has moved toward the press passed said sensing means having a length sufficient to extend from said sensing means through said treatment zone.

4,002,115
DOUBLE BALING PRESS

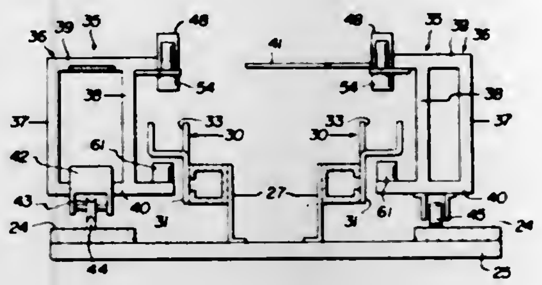
Maurice Nanoia, 1761-NW. 108th Ave., Pembroke Pines, Fla. 33026
Filed Feb. 6, 1975, Ser. No. 547,563
Int. Cl.² B30B *15/16*
U.S. Cl. 100—53 **5 Claims**



1. A baling press comprising a baling box having an open top and including a base defining a bottom box wall, and a main frame comprising a pair of spaced opposed end walls of a first common predetermined height, a front wall and a rear wall, said front wall and rear wall having upper end zones, and door means in said front wall; a vertical septum extending between the front and rear walls separating the box into two like side-by-side baling chambers, said septum extending upwardly above said bottom wall a distance less than said predetermined height of said end walls, said main frame including track means on the upper end zones of the front and rear walls and above said septum and extending across the septum, and a trolley carriage means including roller means in mating engagement with said track means for reciprocable movement along said track means across the top of said septum from a first position above one of the chambers to a second position above the other of said chambers, power actuated platen means operably supported by said trolley carriage for selective bi-directional vertical movement within either of said two side-by-side baling chambers; a first electrical interlock means to render said power actuated platen means inoperable except when said platen is vertically aligned with either of said side-by-side baling chambers, a second vertical interlock means to render said power actuated platen means inoperable if said door means are not closed, said door means comprising a main portion of said front wall, providing access means to the respective baling chambers for removal of compacted bales therefrom; and means normally suspending said power actuated platen means in the top portion of said baling box and means to actuate said platen means including a vertically disposed ram means centrally disposed atop said trolley carriage; and said first electrical interlock means comprises, a switch actuating plate pivotally attached to the outside face of said back wall for vertical alignment with said septum and being spaced thereabove in the path of travel of said carriage, and an inwardly extending horizontal lip portion on said switch actuating plate, extending through said back wall into the path of travel of said platen along said track means and a first electric switch means on the box including a portion operably engaged by said switch actuating plate and including biasing means normally urging said switch means into an "off" position and movable to a second current "on" position when said lip is moved outwardly by said platen.

4,002,116
APPARATUS FOR FORMING TRUSSES

James Knowles, Bloomfield Hills, Mich., assignor to Jack N. Schmitt, Birmingham, Mich.
Filed May 9, 1975, Ser. No. 576,031
Int. Cl.² B30B *1/32*
U.S. Cl. 100—100 **8 Claims**



1. Apparatus for forming truss-like joists made of a pair of parallel, elongated chords with flat, sheet metal webs overlapping and extending between the chords and secured thereto at the overlapped portions by struck-out teeth, comprising:

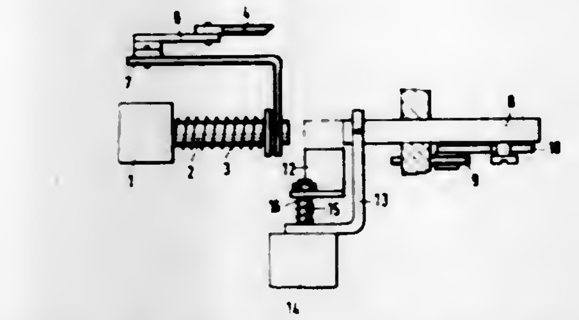
- a support surface and a pair of parallel rails mounted above the support surface;
- a number of upwardly opening U-shaped supports secured to said rails for receiving wooden chords and positioning them above and to the sides of said rails, whereby metal webs may be laid upon said rails so that their ends extend generally transversely of the rails and beneath chords supported within such U-shaped supports;
- a pair of presses supported upon said support surface, each adjacent to one of said rails, with each of said presses comprising a generally C-shaped frame arranged in a vertical plane, with one frame opening towards the other and means interconnecting the two frames for joint movement;
- guide means formed on said support surface and cooperating guide elements formed on one of said frames for guiding said frame in parallelism along the length of the rails;
- a pressure clamp means mounted upon a horizontal leg of each of said frames and an opposing platen mounted upon another leg of said frames in alignment with the clamp means, with said clamp means arranged to overlap its adjacent chord;

wherein webs may be arranged on said rail below said chords and corresponding webs may be arranged upon the upper surfaces of said chords in alignment with the first mentioned webs and said clamp means may be each aligned with a pair of opposed tooth portions formed on said webs so that actuation of said clamp means squeeze the webs towards the chords for embedding their teeth therein.

4,002,117
ROTARY COPYING MACHINE

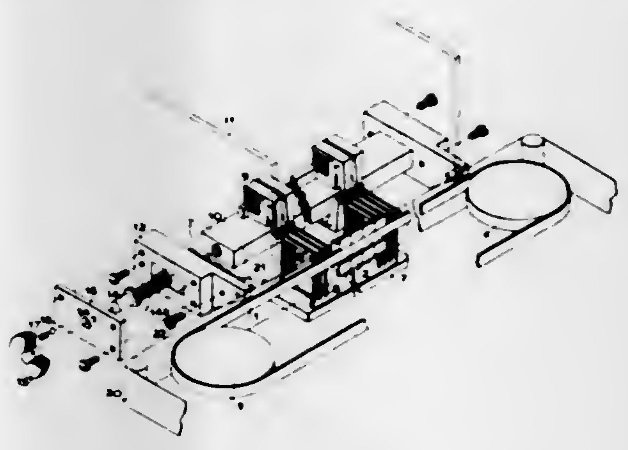
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany
Filed Aug. 1, 1975, Ser. No. 601,165
Claims priority, application Germany, Aug. 2, 1974, 2437817
Int. Cl.² B41L *47/46*
U.S. Cl. 101—91 **7 Claims**

1. A rotary copying machine comprising a rotatable printing drum carrying a printing form; a back pressure roller movable toward and away from the printing drum; means for feeding sheets to be printed between said printing drum and said back pressure roller; adjustable means for cyclically moving said back pressure roller during each revolution of said printing drum for selectively printing either a full page or a section of a full page of the printing form on the sheet; means for feeding a moistening liquid onto the sheets while they are fed between the drum and the roller and comprising a pump with a reciprocating piston; adjustable stop means; and locating means operatively connected to said adjustable means for locating said adjustable stop means in the path of said piston to limit the stroke of the latter during printing of a section of a full page and for locating said adjustable stop means out of the path of said piston during printing of a full page.



4,002,118
PRINTER MECHANISM FOR ADJUSTING THE POSITION OF HAMMERS

Osamu Washimine, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sept. 23, 1975, Ser. No. 616,134
Claims priority, application Japan, Sept. 27, 1974, 49-111089
Int. Cl.² B41J *1/20*
U.S. Cl. 101—93.14 **2 Claims**



1. A hammer type printer mechanism comprising:

- a belt having a multiplicity of embossed type characters thereon;
- a driving pulley and driven pulley around which the belt is looped to carry the characters along a printing line;
- a plurality of printing hammers for impacting with the type characters to print the characters on a recording medium;
- leaf springs for supporting said printing hammers;
- electromagnetic actuating means for striking said printing hammers to cause said printing hammers to impact against said recording medium;
- support means for mounting said leaf springs in said printer;
- means for shifting said support means in a direction parallel with the printing line, wherein said shifting means includes:
- a guide member for supporting slidably said support means;
- a threaded member journaled in said guide member and threaded in said support means so as to shift said support means when rotated, and
- a dial attached to said threaded member and exposed on one side of said guide member for manual manipulation.

4,002,119

METHOD FOR IN SITU ASSEMBLY OF CHARGE FOR CONTROLLED SHOOTING OF WELLS

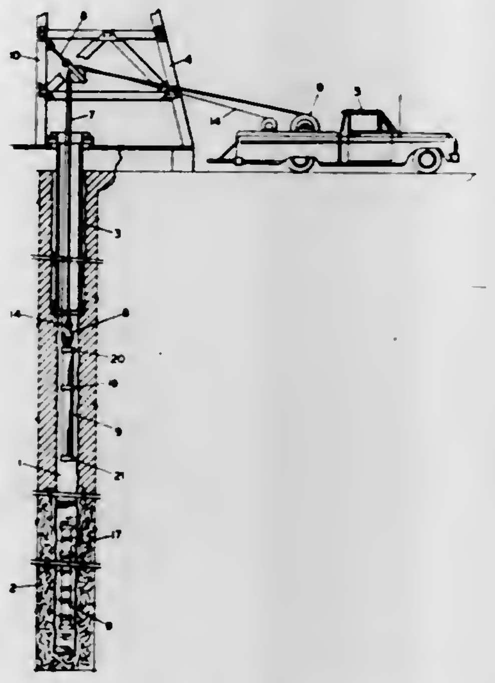
Henry H. Halley, Jr., Alton, Ill., assignor to Drogen Incorporated, Alton, Ill.

Continuation-in-part of Ser. No. 56,438, July 20, 1970, Pat. No. 3,763,781. This application July 16, 1973, Ser. No. 379,642

The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl.^{2} F42D *1/00*

U.S. Cl. 102—21 **5 Claims**



1. In the method for in situ assembly of charge for controlled shooting of wells which are at least partially occupied by water, the process of increasing flow comprising, providing a charge of solid state alkali metal having a surface area formed, shaped and capable of providing a controlled reaction when exposed to the water, hermetically sealing the charge within a container to prevent exposure of the charge to moisture prior to initiating the controlled reaction, weighting the containerized charge to insure its sinking into the water occupied well, depositing the containerized charge into the well, and opening the container to react the charge at a sustained rate with the surrounding water to improve petroleum production from the drilled well formation.

4,002,120

MISSILE STAGE COUPLER

Frank Swales, deceased, late of Saratoga, Calif.; by Doris Swales, heir, Sunnyvale, Calif.; by Sally M. Swales, heir, Mountain View, Calif., and by Pamela J. Lettis, heir, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 31, 1975, Ser. No. 600,662

Int. Cl.^{2} F42B *15/10*

U.S. Cl. 102—49.5 **6 Claims**

1. A separation system comprising:

a. a first missile stage;

b. a second missile stage;

c. means for joining and separating said first and second missile stages;

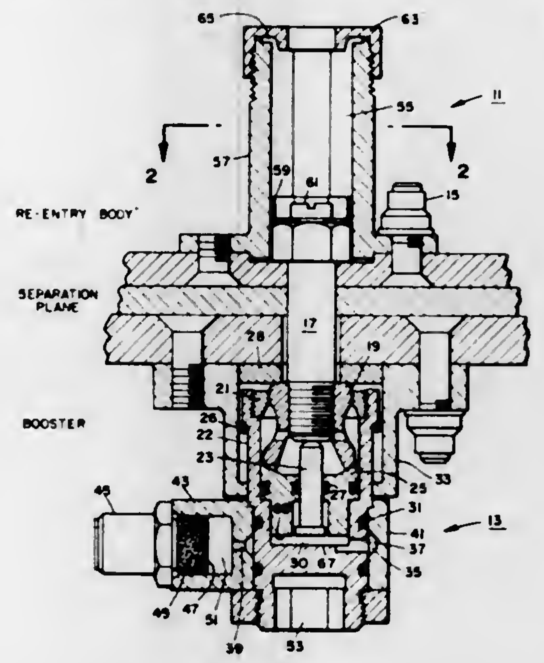
d. said means including a bolt, at least one catcher for securing one portion of said bolt to said first missile stage, at least one securing means for joining another portion of said bolt to said second missile stage, and ejection means for propelling said bolt from said second missile stage into contact with said first missile stage;

e. said bolt having a head portion, a bottom portion and a shaft therebetween, the cross-section of said shaft being of lesser dimension than that of the head portion;

f. each catcher being a bolt catcher having a top portion, a bottom portion and a body therebetween, said bottom portion having a hole therein, said hole being of cross-section at least equal to the cross-section of said shaft and less than at least one cross-section dimension of said bolt head portion;

g. said bolt further having a flat guide located at the top of said bolt head portion having a size and shape identical to the interior cross-section of the body of said bolt catcher and an upturned edge located at its periphery to further stabilize the upward trajectory of said bolt upon ejection from the second stage;

h. said bolt catcher further having a cover located at said top portion said cover having a groove located at the interior junction of said cover and the body of said bolt catcher to accommodate the upturned edge of said guide upon ejection of said bolt from the second stage;



i. the head of said bolt contained within said bolt catcher, the shaft passing through the hole in said bolt catcher and the bottom portion of said bolt joined to said securing means to join said missile stages together;

said ejection means comprising at least one ejector, each of which is simultaneously activated by an electrical signal; whereby

k. upon ejection from said second missile stage the energy of said propelling bolt is transferred to said first missile stage through the body of said bolt catcher, providing a separation thrust to said first missile stage to separate it from said second missile stage.

4,002,121

INCENDIARY PAYLOAD FOR A HEAVY-DUTY BALLISTIC PROJECTILE

Jüergen Prochnow, and Alfred Johannes, both of Duesseldorf, Germany, assignors to Rheinmetall G.m.b.H., Duesseldorf, Germany

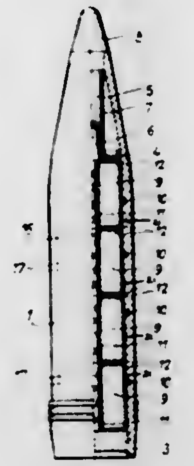
Filed Aug. 1, 1975, Ser. No. 600,965

Claims priority, application Germany, Aug. 3, 1974, 2437535

Int. Cl.^{2} F42B *13/14*

U.S. Cl. 102—66 **6 Claims**

1. In an elongated, heavy-duty ballistic projectile wherein a detonation-charge containing nose portion of the projectile communicates axially with a tail section thereof through a central ignition channel, and wherein an ejectable payload comprising incendiary material is disposed along and arranged coaxially around the central ignition channel and is disposed before detonation within a plurality of hollow annular elongated containers, the containers being successively disposed in abutting relation between the nose portion of the projectile and an end plate situated in the tail of the projectile behind the rear-most container, the inner boundary of each container including at least one aperture extending radially therethrough for providing communication between the interior of the ignition channel and the incendiary material within the associated container to effect ignition of the incendiary material upon detonation of the charge, the improvement wherein the end plate in the tail section is removably supported within the tail section and is adapted to be blown free of the projectile by gas pressure generated during detonation of the charge and conducted to the end plate through the ignition channel; and wherein the containers are each formed from a material capable of withstanding the gas pressure generated during detonation of the charge so that the containers remain intact as a self-supporting column after the incendiary material therein is ignited, whereby the intact containers with the ignited incendiary charge disposed therein are ejected rearwardly in a sequential manner out of the projectile when the end plate is blown clear of the projectile.



4,002,122

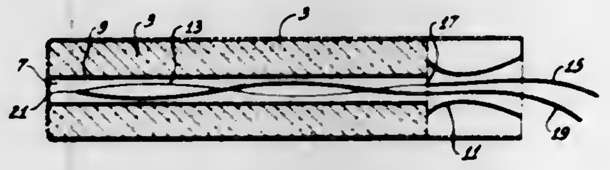
MICROJET FUSE

Bert B. Gould, Berkeley, Calif., assignor to MB Associates, San Ramon, Calif.

Filed Mar. 2, 1961, Ser. No. 92,963

Int. Cl.^{2} F42C *19/12*

U.S. Cl. 102—70.2 A **4 Claims**



1. An igniter for a miniature solid propellant rocket containing a propellant grain and a nozzle comprising in combination

a. a solid propellant grain having a central burning perforation extending substantially the length thereof;

a$_1$. a housing enclosing the grain in which the housing is closed at the front end and open at the rear end

b. a pyrotechnic coating on substantially the entire surface of said propellant grain;

c. an electrical ignition wire extending substantially the length of the perforation of said propellant grain, said ignition wire being comprised of first and second sections, said first section being bare resistance wire and said second section being an insulated return wire connected to the bare resistance wire at its front end located in the forward end portion of the perforation; and

d. means for supplying current through said insulated wire and said resistance wire whereby the forward end portion of the resistance wire heats up at least as rapidly as the remainder to ignite the pyrotechnic material at the forward end portion of the perforation as soon as the remainder whereby the flame upon ignition of the pyrotechnic material is confined for flow rearwardly through the perforation substantially instantaneously to ignite the propellant grain throughout its length.

4,002,123

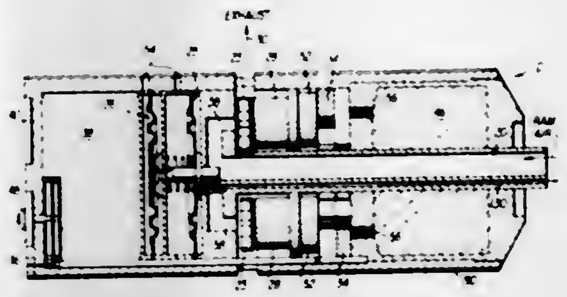
DUAL CHANNEL REDUNDANT FUZE

Evan D. Fisher, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,189

Int. Cl.^{2} F42C *11/04*

U.S. Cl. 102—70.2 G **18 Claims**



1. A dual channel redundant fuze for aircraft-carried bombs, which comprises:

a fuze housing containing a pair of substantially identical actuation channels, each of which comprises:

ram air actuated means for generating electrical energy;

governor means coupled to said ram air actuated means for regulating gear box means;

rotor means coupled to said gear box means for rotating a detonator from a safe position to an armed position; and

booster means explosively responsive to the actuation of said detonator means only when the latter is in said armed position;

said fuze further comprising:

ram air receiving means positioned remotely from said housing; and

barometric sensing switch means positioned within said housing and responsive to ram air and ambient pressure for preventing electrical energy from being coupled out from said ram air actuated means until said fuzed bomb has fallen a predeterminable distance from said aircraft.

4,002,124

TRACKED AIR CUSHION VEHICLE SYSTEMS

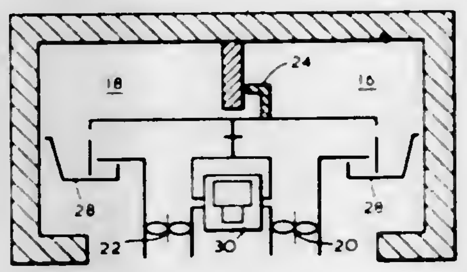
Denys Stanley Bliss, Great Shelford, England, assignor to Bliss Pendair Limited, London, England

Filed Aug. 21, 1975, Ser. No. 606,357

Claims priority, application United Kingdom, Sept. 2, 1974, 38189/74

Int. Cl.^{2} B61B *13/08*

U.S. Cl. 104—23 FS **8 Claims**



1. A tracked air cushion vehicle system comprising an inverted channel section track, a vehicle platform received within the track, a vehicle body connected to the lift platform, the body and the platform being capable of conjoint vertical and rolling movements relative to the track, bogies at each end of the platform for guiding the latter in longitudinal move-

ment relative to the track and cooperating therewith to enclose a chamber between the lift platform and the track, means for maintaining a subatmospheric pressure within said chamber, means dividing said chamber longitudinally into two separate sub-chambers, said chamber dividing means including sealing means cooperating with said track, and means responsive to any lateral force exerted on the body, except for lateral forces due to centrifugal action, to cause a differential pressure between the two sub-chambers for causing a rolling moment to be applied to said lift platform which is substantially equal and opposite to the rolling moment resulting from the lateral force exerted on the body.

4,002,125
MONORAIL SUPPORT

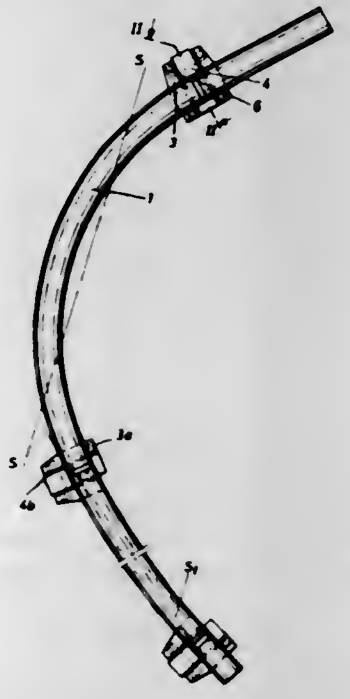
Johannes Gerhard Spoler, Hagen, Germany, assignor to DEMAG, A.G., Duisburg, Germany

Filed Sept. 29, 1975, Ser. No. 617,722

Claims priority, application Germany, Oct. 1, 1974, 2446770

Int. Cl.² E01B *25/24*; **B61B** *12/04*

U.S. Cl. 104—124 **15 Claims**



1. A support for sharply curved load bearing girders forming a portion of a track for an elevated transportation system, characterized by
- a. an elongated sharply curved girder;
- b. a vertical support at each end of said girder;
- c. said vertical supports being positioned adjacent said girder;
- d. a cross-support at each end of said girder, each said cross-support extending through the girder end and having one end thereof supported on its respective vertical support;
- e. the opposite end of said cross-support forming one side of a pivot bearing;
- f. a crossbeam connected to each said vertical support and extending across its respective girder end; and
- g. one end of each said crossbeam forming the other side of said pivot bearing.

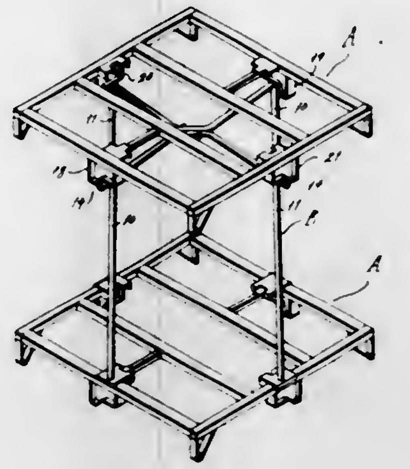
4,002,126
PALLET CONSTRUCTION

Ferris Andrew Bell, St. Louis County, Mo., and Thomas N. DePew, 10 Sunningdale, St. Louis County, Mo. 63124, assignors to said Thomas N. DePew, by said Ferris Andrew Bell, St. Louis, Mo.

Filed Nov. 11, 1974, Ser. No. 522,575

Int. Cl.² B65D *19/40*

U.S. Cl. 108—53.5 **8 Claims**



1. The combination with a pallet for storage and transportation purposes comprising means defining a load supporting deck having four sides, a support member affixed to each side of said deck intermediately thereof and depending therefrom, each support member having a bottom edge comprising upper and lower horizontal linear portions there being an intermediate linear portion interconnecting said upper and lower linear portions, of a tiering frame comprising a plurality of substantially vertical posts corresponding in number to said pallet support members, means detachably engaging the lower ends of said posts upon said pallets immediately above a respective support member, a substantially horizontal top member having legs each of which is fixed proximate its outer end upon a post, each leg having an extension projecting beyond the related post, the upper linear portion of each support member being of greater length than the horizontal cross section of the leg extensions of said top member whereby upon disposition of a pallet upon a tiering frame top member the support members of such overlying pallet will be received upon the upper surfaces of the respective end extensions of the tiering frame top member therebelow permitting limited linear shiftability of such pallet without loss of engagement with said leg end extensions, the intermediate linear portions of support members on two adjacent sides of said deck being directed toward one corner of said deck and the intermediate linear portions of the other two support members being directed toward the corner of said deck diagonally opposite said one corner whereby said intermediate portions of said support members cooperate with the accepted tiering frame and extensions to stabilize the supported pallet against displacement.

4,002,127
CYCLONE STRUCTURE

Derek Angus, 727 Galloway Crescent, London, Ontario, Canada

Filed Mar. 13, 1975, Ser. No. 558,095

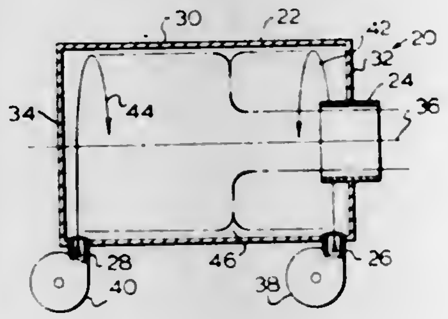
Int. Cl.² F23G *5/12*; **F23D** *1/02*

U.S. Cl. 110—8 C **15 Claims**

1. An incinerator for burning waste products and the like, the incinerator comprising:
- a combustion chamber having a side wall disposed concentrically about a longitudinal axis and having first and second transverse end walls attached to respective ends of the side wall;
- a discharge tube mounted in the first end wall concentrically about said axis;

- first and second inlets adjacent the respective end walls, the inlets being adapted to create two distinct vortical flows in the combustion chambers, the flows moving in the same direction about the axis;
- means coupled to the first inlet and adapted to move said waste products and primary air through the first inlet and into the combustion chamber thereby creating a first generally vortical fluid path which progresses axially towards the second end wall;
- means coupled to the second inlet and adapted to move secondary fuel and secondary air through the second inlet and into the combustion chamber thereby creating a second generally vortical fluid path which progresses axially towards the first end wall of the combustion chamber;
- ignition means adapted to ignite the secondary fuel to cause combustion adjacent the second end wall; and
- said fluid paths meeting intermediate the end walls to create an inward radial flow path where the major portion of the combustion of the waste products takes place, the products of combustion then moving axially within the first fluid path before leaving the combustion chamber through the discharge tube, and the waste products and primary air being heated as they move towards the radial flow path by the products of combustion leaving the radial flow path.

12. A method of burning waste products and the like, comprising the steps of:



- providing a combustion chamber having a side wall which is substantially symmetrical about an axis, end walls attached to respective ends of the side wall, a discharge outlet in one of said end walls substantially concentrically about the axis, and first and second inlets adjacent respective said end walls for creating two distinct converging vortical flows in the chamber;
- directing waste products and primary air through said first inlet and into said combustion chamber in a first generally vortical flow path which progresses axially toward the second end wall;
- directing secondary fuel and secondary air through said second inlet into said second combustion chamber in a second vortical flow path which progresses axially toward the first end wall of the combustion chamber and which flow path moves about the axis in the same direction as said first flow path;
- igniting said secondary fuel to cause combustion adjacent said second end wall;
- permitting the flow paths to meet intermediate the end walls thereby creating an inward radial flow path where the major portion of the combustion of the waste products takes place, the products of combustion then moving axially within the first fluid path before leaving the combustion chamber through said discharge outlet, and the waste products and primary air being heated as they move towards the radial flow path by the products of combustion leaving the radial flow path.

4,002,128
AUTOMATIC SEWING MACHINE

Florian F. Yanikoski, Braintree, Mass., assignor to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 496,749, Aug. 12, 1974, Pat. No. 3,970,016. This application Dec. 16, 1974, Ser. No. 532,986

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.11 **12 Claims**

1. An automatic sewing machine comprising
- a sewing needle,
- a work holder for holding in place a material to be sewn, the work holder being movable with respect to the needle,
- first driving means to move the work holder in a first coordinate direction,
- second driving means to move the work holder in a second coordinate direction,
- a homing assembly for positioning said work holder at a predetermined home position in said first coordinate direction, said homing assembly being driven in positional synchronism with movement of the work holder in the first coordinate direction,
- said homing assembly comprising
- an adjustable position indicating means, said position indicating means being connected to and driven by one of said driving means, and
- a position reading means providing an output signal in response to the position indicating means, adjustment of said indicating means causing a change in said home position.

4,002,129
CLAMPING APPARATUS FOR AUTOMATIC SEWING MACHINE

Gerald A. Kraatz, Highland Park, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed July 3, 1975, Ser. No. 592,833

Int. Cl.² D05C *9/04*

U.S. Cl. 112—121.15 **30 Claims**

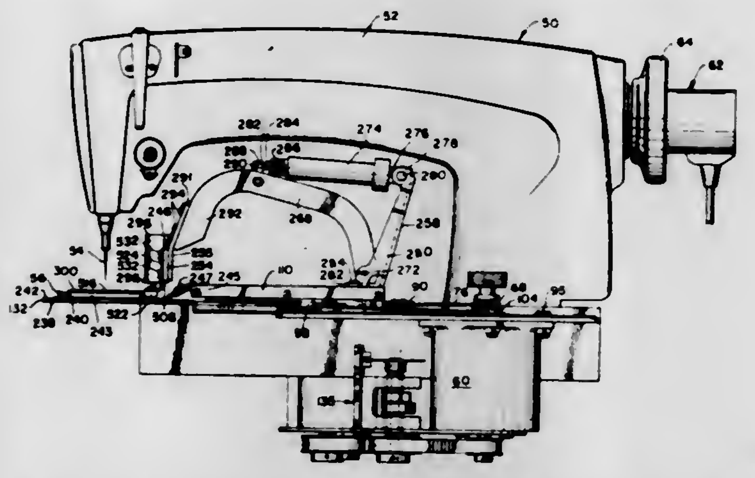
1. Clamping apparatus for an automatic sewing machine having a sewing needle, comprising:
- frame means;
- first clamp means being movable with said frame means toward and away from a work surface of the machine for retaining a first work piece;
- second clamp means secured at a fixed position on said frame means for retaining a second work piece adjacent the first work piece;

means for movably mounting the first clamp means for relative movement toward and away from the second clamp means, with the first clamp means being located intermediate the second clamp means and the work surface;

first means for applying a separating force against said first clamp means to separate said first and second clamp means;

second means for selectively applying a variable force against the frame means in a direction urging the second clamp means toward the first clamp means, the second applying means separately applying a force of a first level less than said separating force during a first mode of operation and a force of a second level greater than said first level and said separating force during a second mode of operation, the second applying means moving the first clamp means toward the work surface with the first and second clamp means being located in a first separated relative position during said first mode of operation, and the second applying means overcoming the separating force of the first applying means during the second mode of operation to move the second clamp means toward the first clamp means from said first position to a second relative clamping position for retaining the first and second work pieces together; and

means for moving said frame means and clamp means relative said needle to perform a sewing operation on said work pieces during said second mode of operation.



4,002,130
AUTOMATIC BOBBIN REWINDING FOR SEWING MACHINES

Herman Rovin, Norwalk; Theodore Opuszenski, Darien; Joseph Pellicano, Greenwich, and Alan F. Swenson, Norwalk, all of Conn., assignors to Automatech Industries, Inc., Bridgeport, Conn.

Filed Sept. 22, 1975, Ser. No. 615,428

Int. Cl.² D05B *57/26*

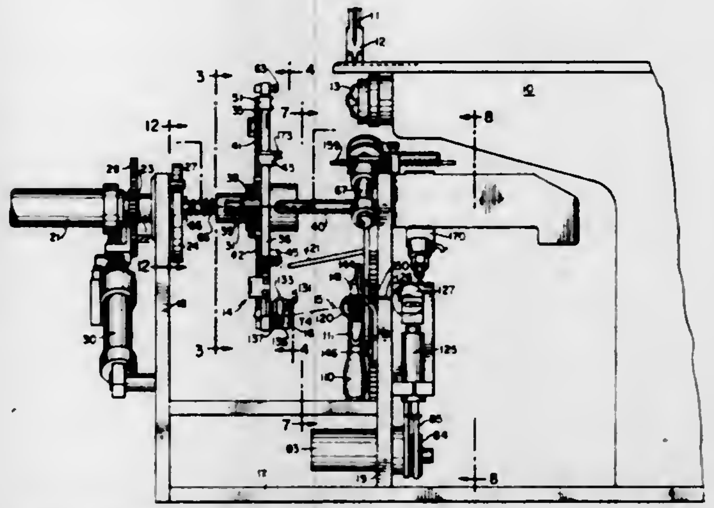
U.S. Cl. 112—180 **16 Claims**

1. In a two-station bobbin replenishing system for use with an industrial type lock stitch sewing machine and including a transfer member mounted for axial motion, for bobbin pickup and deposit, and for rotational movement, for effecting bobbin exchange, an improved means for carrying a bobbin and bobbin case characterized by

a. means on the transfer member for controllably engaging and retaining a bobbin case,

b. said bobbin case having an open end for receiving and discharging bobbins and having an opening in its closed end exposing a portion of the bobbin end wall, and

c. a magnetic element carried by said transfer member and projecting through said opening into close proximity to said bobbin end wall to releasably retain said bobbin in its bobbin case.



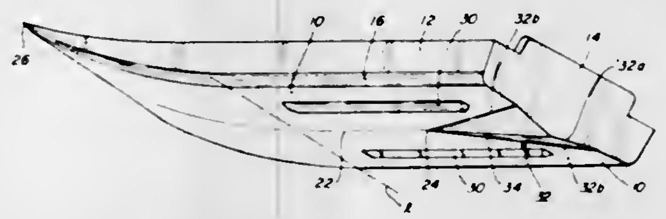
4,002,131
BOAT HULL CONSTRUCTION

Lee R. Mangrum, Rte. 1, Box 98, Lincoln, Tex. 78948

Filed Apr. 16, 1976, Ser. No. 677,518

Int. Cl.² B63B *1/04*

U.S. Cl. 114—56 **15 Claims**



1. A boat hull comprising:

a bottom including first and second laterally opposite wings, the lower surfaces of said wings tapering downwardly and laterally inwardly from respective side edges thereof and converging in a shallow first peak extending partially along the longitudinal centerline of said bottom, said first peak having a rear end disposed forwardly of the stern edge of said bottom;

first and second sides disposed adjacent respective ones of the side edges of said bottom and extending generally upwardly;

first and second chine portions joining respective ones of said sides to the adjacent side edge of said bottom, said chine portions having outer surfaces curved in transverse cross section;

a transom adjoining the stern edges of said bottom and said sides and extending generally upwardly;

a pair of longitudinally extending keelsons depending downwardly from said bottom, disposed on opposite sides of the longitudinal centerline of said bottom and equally spaced therefrom;

a generally triangular delta formation on said bottom, said delta formation having a base disposed adjacent said transom, an apex disposed adjacent the rear end of said first peak and between said keelsons, and side edges converging from the lateral extremities of said base to said apex, the lower surface of said delta formation tapering downwardly and laterally inwardly from the respective side edges of said delta formation to form a second peak extending along the longitudinal centerline of said bottom from said transom to the rear end of said first peak, and said second peak being inclined upwardly from said transom to the rear end of said first peak.

4,002,132
CATAMARAN WITH PLURAL DRIVES

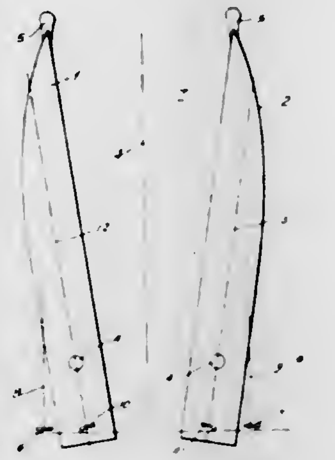
Leopold Nitzki, Bremen, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

Filed May 29, 1975, Ser. No. 581,964

Claims priority, application Germany, June 4, 1974, 2426804

Int. Cl.² B63B *1/10*

U.S. Cl. 114—61 **7 Claims**



1. A catamaran, comprising two elongated huls each having a longitudinal axis and a pair of opposite side portions laterally spaced from said longitudinal axis, said side portions being substantially parallel to each other and to said longitudinal axis over at least a part of the elongation of a respective hull, said hulls being located at opposite sides of a longitudinal symmetry line of the catamaran and the axes of said hulls being longitudinally inclined relative to said line; and propulsion means on said hulls for propelling said catamaran through the water, said propulsion means comprising for each of said hulls a propeller shaft extending substantially parallel to said longitudinal symmetry line.

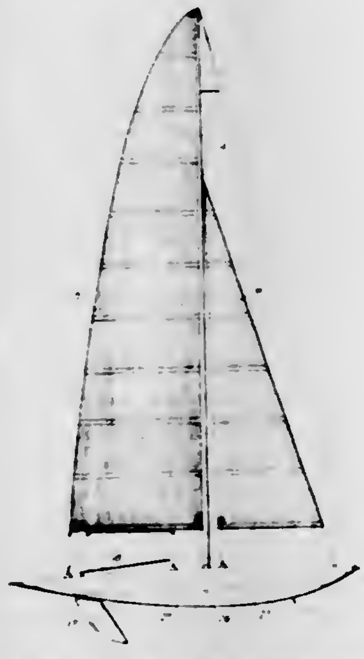
4,002,133
CATAMARAN

John V. Wilbanks, Rte. 1, Box 304, Theodore, Ala. 36582

Continuation of Ser. No. 449,275, March 8, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 616,908

Int. Cl.² B63B *1/12*

U.S. Cl. 114—61 **5 Claims**



1. In a catamaran having a frame supported by a plurality of double-ended complementary hulls having straight parallel keels with each hull symmetrical with respect to itself and having a bow and a stern at which the sides of the hull converge and through which a hull centerline passes, the improvement comprising each hull being arcuate in side elevation along its keel throughout substantially its length from bow to stern and having the surface of the hull bilge rigid and defining a plurality of concentric circular arcs of increasing and then decreasing radii as measured abeam the centerline throughout substantially its length from the bow and stern, said arcuate keel extending forwardly and rearwardly beyond and above the normal water line of said hull, and said hull below the water line having essentially smooth and unobstructed surfaces as to permit the unobstructed flow of water along the hull bow portion to stern portion.

4,002,134
AQUA-PLANING VEHICLE

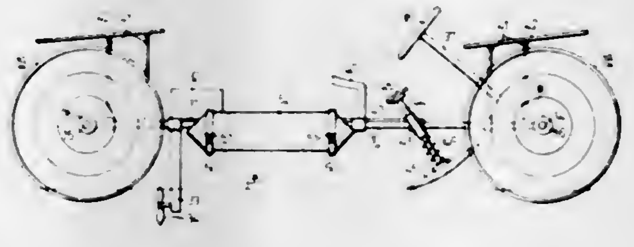
Kuraji Honda, 129 Kita-Kakigase, Gifu, Gifu, Japan

Filed Apr. 8, 1976, Ser. No. 675,130

Claims priority, application Japan, Mar. 12, 1976, 51-29999[U]

Int. Cl.² B63B *1/18*

U.S. Cl. 114—271 **7 Claims**



1. An aqua-planing vehicle comprising:

a base frame mounted with a pair of freely rotatable buoyant wheels on both sides of the front and rear ends of the frame so that said frame can float on a water surface;

means for propelling the frame forward on the water surface;

a steering handle connected to the buoyant wheels on both sides of the front end of the frame for changing the direction of movement of said frame;

wing members disposed above the frame and slanted upward in the direction of advancement;

high-glide impellers provided below the frame so as to be vertically movable and slanted upward in the direction of advancement;

a steering pedal operatively connected to said high-glide impellers for moving said members downward to strike the water surface to thereby cause the frame to bounce upward during forward movement of the frame; and

buffer members provided on both sides of a lower portion of the frame for easing the impact exerted upon the frame when it lands and impacts on the water surface after a bounce.

4,002,135
SHIP FOR COMBINED LOAD

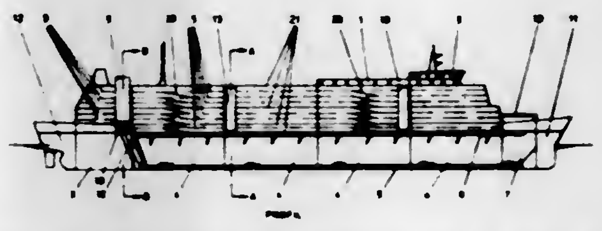
Bengt Wilhelm Tornqvist, Hovslagargatan 5 B, Stockholm, Sweden

Filed Apr. 30, 1975, Ser. No. 572,894

Claims priority, application Sweden, May 15, 1974, 7406502

Int. Cl.² B63B *25/00*

U.S. Cl. 114—72 **6 Claims**



1. A ship for simultaneously transporting a high density

flowable bulk cargo and a lower density general freight comprising a hull having at least one hold to store a flowable bulk cargo therein, general cargo storage means comprising a main deck covering said hold and a plurality of vertically spaced apart loading decks covering said main deck, said loading decks being fixedly mounted on said main deck and extending over a substantial part of the entire length and beam of the ship and preventing access to the hold through that portion of the main deck surmounted by said loading decks, flowable cargo conveying means positioned below said main deck and extending lengthwise of the ship from substantially one to the other end thereof, access means at least one end of the ship beyond the longitudinal ends of the loading decks and above an underlying end portion of said conveying means for supply thereto of said flowable bulk cargo for conveyance thereof from said one to said other end of the ship and for delivery of said cargo during said conveyance to selected sections of the hold, and means forming part of said conveying means for conveying for discharge of said flowable bulk cargo from said hold.

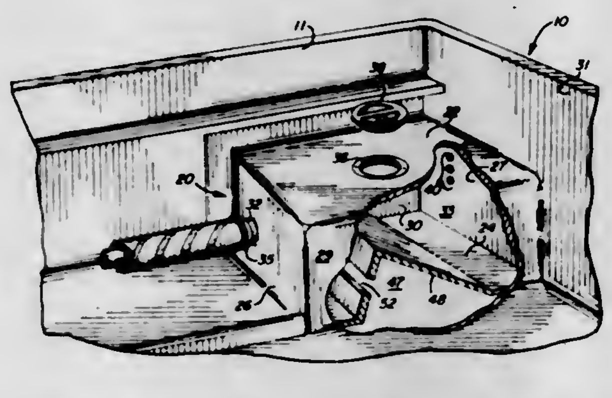
4,002,136
MARINE EXHAUST SYSTEM

Jerome M. Michalak, Cocoa Beach, Fla., assignor to Ray Industries, Inc., Phoenix, Ariz.

Filed Oct. 14, 1975, Ser. No. 621,779

Int. Cl.² B63H *21/32*

U.S. Cl. 115—.5 E **3 Claims**



1. An exhaust system for a boat powered by an internal combustion engine having an exhaust pipe, said boat having a hull including a hull surface normally submerged below the water level, said system comprising:

a. a chamber located within the hull including inlet means located above the normal water level and adapted to be connected to the exhaust pipe of the internal combustion engine;

b. exhaust vent means communicating the interior of said chamber with atmosphere, said vent means located at a location normally above the water level; and

c. exhaust port means communicating said chamber interior with a location below the normal water level, said exhaust port means including a recess in said hull surface, said recess having a surface extending generally forwardly and upwardly in said hull surface, said recess defining an opening at a generally forward location therein and spaced upwardly from the plane of said hull surface,

whereby exhaust is permitted to excape from said chamber at said exhaust vent means when said boat is idling and whereby exhaust is drawn from said exhaust chamber under the influence of water flow at said port when said boat is underway thereby reducing exhaust noise.

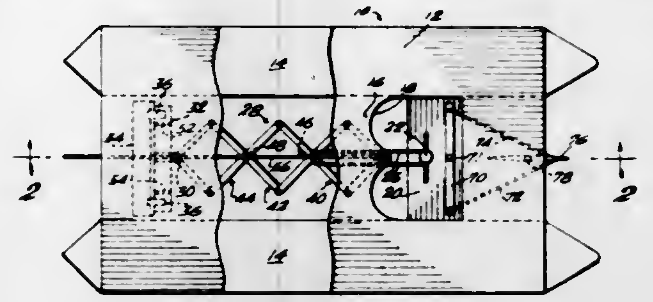
4,002,137
BUOYANT WATER SCOOTER CRAFT

Charles K. Vrana, 60 Helen Lane, Fort Myers Beach, Fla. 33931

Filed Sept. 15, 1975, Ser. No. 613,206

Int. Cl.² B63H *16/12*

U.S. Cl. 115—22 **7 Claims**



1. A buoyant water scooter craft comprising

A. a pair of spaced apart, parallel float members,

B. a deck, fixed to the top sides of said floats and spanning the distance therebetween, said deck including,
  1. a seat portion, and
  2. a cut out portion forwardly of said seat portion;

C. a foot rest fixed to and spanning the distance between said float members beneath said cut out portion;

D. a generally upstanding operating lever pivotally connected to said foot rest at its lower end for back and forth pivotal movement;

E. a flap pivotally connected in a transverse relation between and adjacent the rear ends of said float members;

F. a drive means connecting between said operating lever and said flap oar to impart a back and forth reciprocating movement to said flap oar upon actuation of said operating lever;

G. a rudder, vertically, centrally, pivotally mounted forwardly of said foot rest, and means to actuate said rudder for steering purposes.

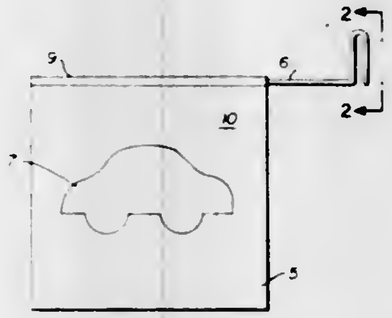
4,002,138
AUTO SAFETY FLAG AND HOLDER

Ronald J. Dobala, 1620 Center Road, West Seneca, N.Y. 14224

Filed Sept. 26, 1975, Ser. No. 616,934

Int. Cl.² B60Q *7/00*

U.S. Cl. 116—28 R **1 Claim**



1. A safety device for motorists consisting of a flag and rod, said flag being made of material with a folded over loop, said rod being received in said loop and having a first straight section where it is contiguous to said flag within said loop, said first straight section also extending away from said flag to terminate in a series of other straight sections and angular bends which are all adapted to hold said first straight section of said rod and said flag away from a vehicle window when said device is in use, said series comprising second and third straight sections, the first and second straight sections being tied by a first bend, the second and third straight sections being tied by a 180° second bend such that said second and third sections are in a common plane, the rest of the rod being tied to said third section by a ninety degree third bend, and the rest of the rod is substantially in a second plane normal to said first plane and adapted to be substantially contiguous to said vehicle window when said device is in use.

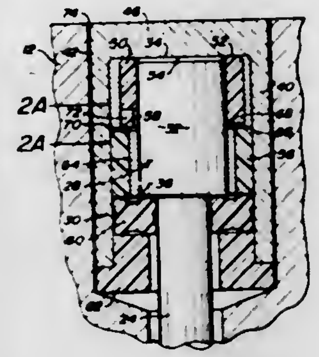
4,002,139
STRAIN INDICATOR

William J. Payne, 1328 Clearview Drive, Greensburg, Pa. 15601

Continuation of Ser. No. 494,638, Aug. 5, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,495

Int. Cl.² G01B *5/30*

U.S. Cl. 116—114 R **17 Claims**



1. An optical stress-strain indicator comprising in combination:

a first member subject to stress-strain and having a head and a recess extending from said head into said member;

a second member received within said first member and having a first end and a second end, said first end being secured to said first member;

a fluid holding member having a window, said fluid holding member being secured to said first member with said window substantially adjacent said head so as to be visible;

light-absorbing indicator fluid within said fluid holding member;

a first indicator area in said fluid holding member disposed substantially adjacent said window;

a second indicator area in said fluid holding member disposed substantially adjacent said window and substantially coplanar with said first indicator area;

means independently operatively connecting said first indicator area and said second indicator area to said second end of said second member such that:

a. as said first member undergoes an elastic change in length said second end of said second member is caused to move with respect to said window with the result that said first indicator area and said second indicator area become separated from said window an equal distance with the consequence that said fluid is caused to flow between said window and said first and second indicator areas;

b. as said first member undergoes a further change in length exceeding the elastic limit of said first member, said first indicator area and said second indicator area move relative to each other and assume a non-coplanar relationship.

4,002,140
RADIO STATION IDENTIFIER

Billy Roy Quinn, 12911 Galoway, Apt. 201, Garden Grove, Calif. 92641, and Jimmy Don Quinn, 425 N. Magnolia, Apt. E, Anaheim, Calif. 92801

Filed Oct. 14, 1975, Ser. No. 621,867

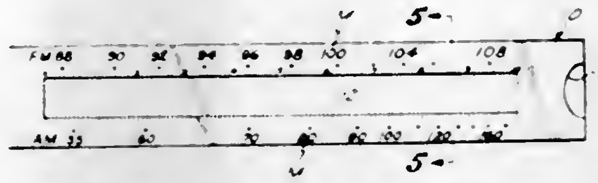
Int. Cl.² G09F *9/40*

U.S. Cl. 116—135 **4 Claims**

1. A radio station identifier for correlating the call letters of a sending station with the frequency thereof, comprising:

a rectangular plastic envelope formed by compressing with heat a section of plastic tubing, said envelope including openings at the ends thereof, a rectangular window in one surface thereof, and a transverse cut-out formed at one of said ends in the other surface thereof for providing an index line for visual alignment;

a rectangular slide receivable within the interior of said envelope and conformed for translation therein having a



longitudinal dimension substantially equal to the longitudinal dimension of said envelope;

frequency markings formed on said envelope adjacent the longitudinal edges of said window; and

call letter markings formed on said slide in corresponding relationship with at least one end thereof for alignment of a predetermined call letter marking in one end of said slide is aligned relative a corresponding frequency marking at one of said edges of said window.

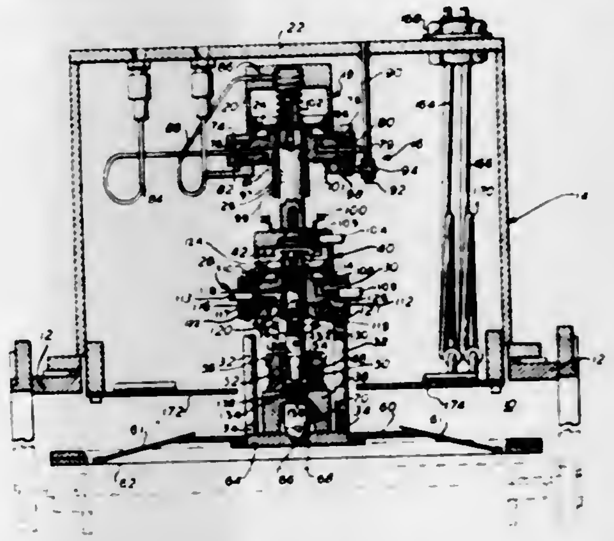
4,002,141
SYSTEM FOR HANDLING SUBSTRATE HOLDERS FOR VACUUM COATING

Robert L. Shrader, Castro Valley, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Nov. 26, 1975, Ser. No. 635,513

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49 **17 Claims**



17. In vacuum coating apparatus, mechanism disposed within a vacuum chamber for vertically moving and rotating a substrate holder, comprising:

a. a main actuator mounted in the chamber and having a first vertically moveable operating member;

b. an auxiliary actuator connected to and bodily moveable with the first operating member and having a second vertically moveable operating member;

c. coacting magnet elements including a permanent magnet and an armature therefor;

d. one magnet element being connected to and bodily moveable with the second operating member and the other element being mounted on the holder to make magnetic coupling between the holder and auxiliary actuator whereby the holder can be bodily elevated by the main actuator for substrate coating;

e. means for independently rotating the elevated coupled magnet elements and holder as a unit, and

f. means fixed with respect to the main operating member and overlying and abutting the holder in its lowered position whereby elevation of the respective magnet element by the second operating member causes separation of the magnet elements to uncouple the holder.

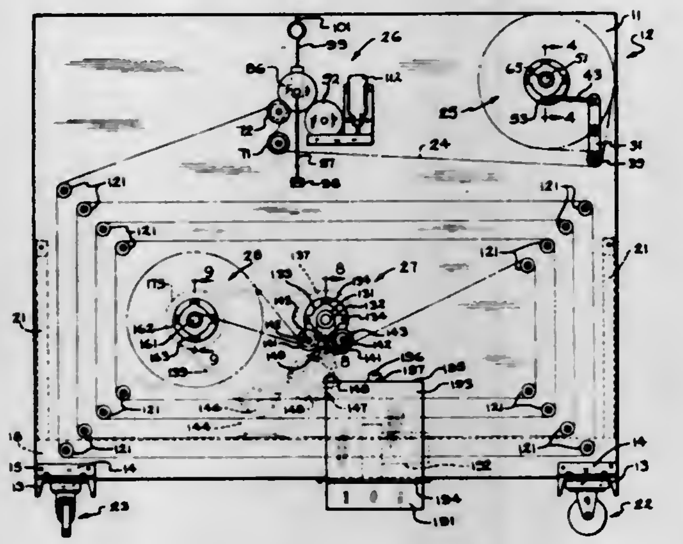
4,002,142
FILM STRIPING APPARATUS

Dean H. Putnam, Toledo, Ohio, assignor to Dietzgen Corporation, Chicago, Ill.

Filed May 9, 1975, Ser. No. 576,093

Int. Cl.² B05C *1/08, 1/16*

U.S. Cl. 118—68 **9 Claims**



1. An apparatus for applying a stripe to a surface of a continuous strip of photographic film, comprising:
  a. means for storing the unstriped photographic film, said storage means including a film strip tensioning means, a rotatably mounted supply reel shaft for receiving a roll of unstriped film wound on a reel and a friction disc attached to said supply reel shaft and cooperating with a fixedly mounted friction plate to prevent overrunning of the reel shaft and the reel;
  b. means for applying striping material to a predetermined zone on the surface of the film as the film is drawn therethrough, said striping means including a drive wheel rotatably mounted and having a peripheral surface in driven contact with the film surface and a striping wheel rotatably mounted in driven relationship with said drive wheel and having a peripheral surface in contact with a predetermined zone of said film surface for applying a liquid striping material thereto;
  c. means for defining an inwardly spiraling drying path for the striped film without engaging the predetermined surface of the film;
  d. means for collecting the dried striped film; and
  e. means for drawing the film from said storage means, through said striping means and said drying path defining means, and to said collecting means, said drawing means including a rotatably mounted drawing roller having a peripheral surface for engagement with the film surface, means for driving said drawing roller, and a pair of flanged rollers rotatably mounted for guiding the film surface into contact with a predetermined portion of said peripheral surface of said drawing roller.

4,002,143
HOT END GLASS CONTAINER COATING SYSTEM

Jerry D. Dover, Ware Shoals, S.C., assignor to Indian Head Inc., New York, N.Y.

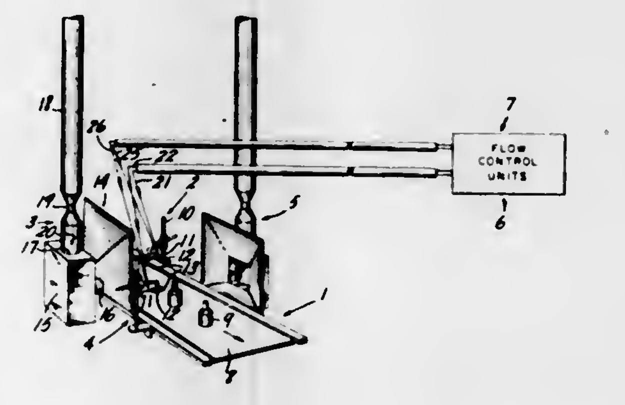
Filed Sept. 8, 1975, Ser. No. 611,003

Int. Cl.² B05C *15/00*

U.S. Cl. 118—610 **1 Claim**

1. A hot end glass container air-atomized liquid spray-coating system comprising, in combination,

1. a conveyor unit having an endless conveyor belt for transporting a single file of hot glass containers from a glass-forming machine to an annealing lehr;
2. a first spray coating unit adjacent the right side of the conveyor belt which comprises
  a. a nozzle holder,
  b. at least one air-atomized coating liquid spray nozzle adjustably mounted on the nozzle holder, and
  c. a rotatable tip on the spray nozzle having a slit opening oriented across the conveyor belt;
3. a first venturi exhaust unit adjacent the left side of the conveyor belt and directly across the conveyor belt from the first spray coating unit which comprises
  a. a tapered shield facing the conveyor belt,
  b. a separate catchbox having an inlet in the face thereof directly connected to the tapered shield and having an outlet in the top thereof,
  c. an exhaust pipe connected to the outlet of the catchbox,
  d. a venturi in the exhaust pipe, and
  e. an air draft inlet in the exhaust pipe between the venturi and the catchbox outlet and connected to an air source;
4. a second spray coating unit identical to the first spray coating unit adjacent the left side of the conveyor belt and beside the first venturi exhaust unit;
5. a second venturi exhaust unit identical to the first venturi exhaust unit adjacent the right side of the conveyor belt and directly across the conveyor belt from the second spray coating unit;
6. an air flow control unit which comprises
  a. first and second air lines connected to the air-atomized coating liquid spray nozzles of the first and second spray coating units, respectively,
  b. an air pressure regulator connected to both the first and second air lines, and
  c. an air pump connected to the air pressure regulator; and
7. a coating liquid measuring and flow control unit which comprises
  a. first and second coating liquid lines connected to the air-atomized coating liquid spray nozzles of the first and second spray coating units, respectively,
  b. flow rate measuring drippers separately connected in each of the coating liquid lines,
  c. flow control valves in each of the coating liquid lines and separately connected to each of the flow rate measuring drippers,
  d. a sediment strainer connected to both flow control valves,
  e. an air pressurized supply tank for a heat decomposable coating liquid connected to the sediment strainer via a dip tube, and
  f. an air pressure regulator connected to the coating liquid supply tank and to the air pump.



4,002,144
INSTALLATION FOR COATING SUBSTANTIALLY U-SHAPED OR V-SHAPED ARTICLES

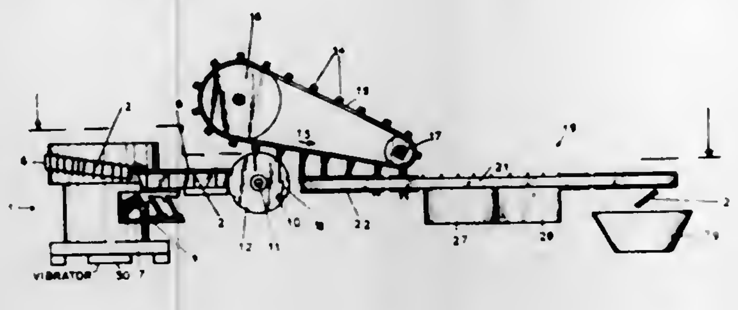
Marcello Lang, Milan, and Leonaldo Ansaldo, S. Alessio (Lucca), both of Italy, assignors to Ato Chimie, Courbevoie, France

Filed May 8, 1975, Ser. No. 575,706

Claims priority, application France, July 17, 1974, 74.24797

Int. Cl.² B05C *19/02*

U.S. Cl. 118—630 **3 Claims**



1. An improved installation including treatment stations for applying a coating onto substantially U-shaped or V-shaped articles, such as hair curlers or hair pins, said treatment stations comprising a coating station at which a powderous plastic material is applied to those portions of said articles which are to be coated, and a heating station for heating the aforementioned article portions, said installation further comprising feeding means for feeding said articles to said coating and heating stations, the improvement wherein said feeding means comprises a substantially cylindrical container, inlet end means for introducing said articles in bulk to said container, vibrating means for vibrating said container in three mutually perpendicular directions, a spiral shaped blade on the bottom of said container and extending to the wall of said container, a helical path on said wall of said container connected to the spiral shaped blade and extending upward from said container to the top thereof, a downwardly extending helical path on the outside of said container connected to said upwardly extending helical path whereby said articles fed to said container in bulk are moved by said vibrations up the inner wall of said container and down the outer wall thereof along said upward and downwardly extending helical paths, a substantially horizontal notched longitudinally vibrating rod having one end near a lower end of said downwardly extending helical path for receiving and linearly displacing articles transported along said downwardly extending helical path from said one end of said rod to the other end thereof, a rotating wheel having regularly spaced notches at the other end of said rod and aligned therewith for receiving said linearly displaced articles and for regularly spacing and upwardly displacing said articles along a circular path, said separation being in accordance with the separation of said notches on said wheel, an endless moving belt provided with regularly spaced outwardly protruding magnets, a portion of said belt being above and adjacent the highest point of said wheel, the speed of said belt and the separation of said magnets being equivalent to the peripheral speed of said notched wheel and the separation between notches of said wheel, the wheel and belt being synchronously moved to register the magnets and the notches in the wheel whereby said magnets lift said articles from the highest point of the wheel and transport said articles away from said wheel, and a pair of abutting synchronously moving additional endless belts proximate the belt provided with said magnets for receiving said articles carried by said magnets and for transporting said articles to said treatment stations with only those portions of the articles to be coated protruding from said pair of abutting endless belts.

4,002,145
APPARATUS FOR APPLYING AND FIXING A MAGNETIZABLE POWDER ON A CHARGED SHEET

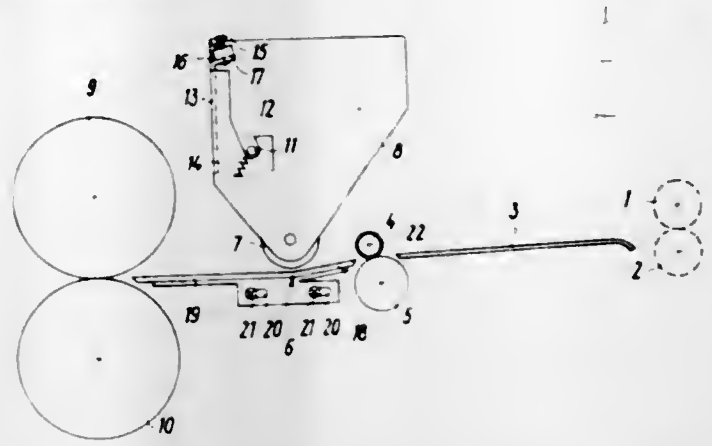
Kurt Moser; Helmut Wegmann, both of Gerlingen, and Reinhold Weigele, Korntal, all of Germany, assignors to Develop KG/Dr. Eisbein and Co., Germany

Filed Aug. 16, 1974, Ser. No. 498,235

Claims priority, application Germany, Aug. 16, 1973, 2341529

Int. Cl.² G03G *13/08*

U.S. Cl. 118—661 **29 Claims**



1. Apparatus for applying and fixing a magnetizable powder on a coated and electrostatically charged sheet of paper or the like being transported therethrough, the apparatus comprising: guide surface means for guiding the movement of the paper, said guide surface means including an inlet side and an outlet side, conveying means disposed at the inlet side of said guide surface means for conveying the sheet thereto, dispenser means positioned above said guide surface means for dispensing and applying the magnetizable powder to the paper on said guide surface means, said dispenser means including a powder container means and a magnetic roller means rotatably mounted therein and projecting therefrom in the direction of said guide surface means, said guide surface means including a planar guide surface from said magnetic roller means, said conveying means being inclined at an acute angle with respect to said planar guide surface, and means provided at the outlet side of said guide surface means for transporting the paper therefrom and setting the powder on the paper including at least one pair of pressure rollers disposed at the outlet side of said guide surface means, each of said pressure rollers being mounted on a shaft, the axis of the shafts being arranged at a mutual angle with respect to each other.

4,002,146
INSECT COLLECTION AND FEEDING

Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522

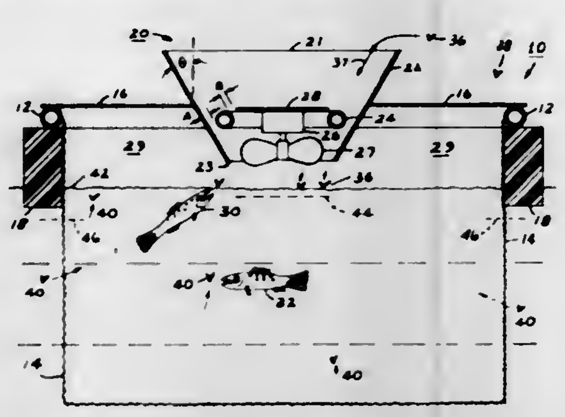
Continuation-in-part of Ser. No. 460,619, April 12, 1974, Pat. No. 3,939,802, which is a continuation-in-part of Ser. No. 213,966, Dec. 30, 1971, abandoned, and a continuation-in-part of Ser. No. 477,839, June 10, 1974, and a continuation-in-part of Ser. No. 497,540, Aug. 14, 1970, Pat. No. 3,951,104. This application Jan. 30, 1975, Ser. No. 545,514

Int. Cl.² A01K *5/00*

U.S. Cl. 119—51 R **11 Claims**

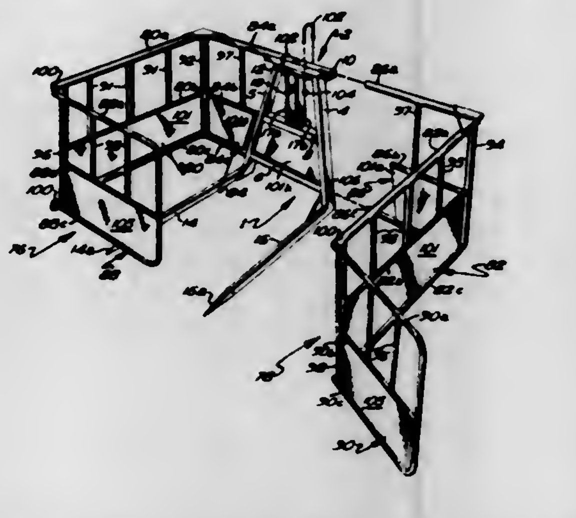
1. A device for feeding aquatic animals, said device comprising means for restraining insects adjacent a body of water containing said aquatic animals, an insect collector operatively connected to said restraining means and having an upwardly facing entrance and a downwardly facing exit opening, an insect attractor mounted substantially entirely within said collector near said exit opening, said exit opening being directed to said restraining means, and said restraining means comprising means for forming an insect enclosure over said body of water, the walls of said collector being substantially

opaque, said attractor being a lamp which is hidden from horizontal view, and means connected to said enclosure for



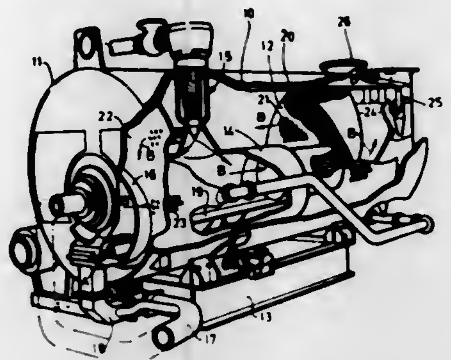
positioning said collector with said exit opening directed into said enclosure.

4,002,147
BALE HANDLING APPARATUS
Leon G. Feterl, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.
Continuation-in-part of Ser. No. 452,440, March 18, 1974, Pat. No. 3,892,202. This application June 27, 1975, Ser. No. 591,112
Int. Cl.² A01K *5/00*
U.S. Cl. 119—60 **17 Claims**



10. A separable assembly of a lift fork and container wall structure for handling and feeding hay bales comprising:
- a lift fork unit comprising an upright frame and a pair of spaced apart lift arms projecting generally horizontally from adjacent the bottom of said frame; and
- a pair of upright wall assemblies removably secured to opposite sides of said upright frame of said lift fork unit and having wall means cooperating with said upright frame to define a hay bale containing enclosure, and said wall means having open spaces therein through which livestock may project their heads to feed on a hay bale contained within said enclosure on said lift arms, whereby said lift fork unit may be used alone for lifting purposes or in combination with said removable, upright wall assemblies for transporting and feeding hay bales; and
- gate means movably mounted at the front end of said wall means for movement from a closed position across the normally open front end of said enclosure to an open, non-obstructing position with respect to the front end of said enclosure for picking up a hay bale therein on said lift arms.

4,002,148
GRATE ASSEMBLY FOR A BOILER
Brian Harding, West Bromwich, England, assignor to Parkinson Cowan GWB Limited, Dudley, England
Filed Apr. 7, 1975, Ser. No. 565,534
Claims priority, application United Kingdom, Apr. 11, 1974, 16133/74
Int. Cl.² F22B *7/12*; F23H *11/10*
U.S. Cl. 122—149 **13 Claims**

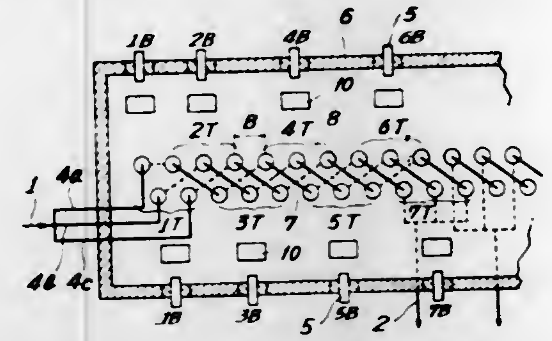


1. A grate assembly comprising a fire bed supporting means including a first support member having a plurality of apertures extending therethrough and a second support member, said members being mounted for mutual relative movement between a first position in which the apertures in the first member are obturated by the second member, and a second position in which the apertures are not obturated by the second member, a drive means for causing said relative movement between said first and second positions at a speed to permit passage of ash through the apertures whilst continuing to support a fire bed and wherein one of the support members is provided with air feed passageways whereby air may be fed to a firebed supported on said means.

11. A shell boiler comprising a tubular shell with its axes arranged horizontally with at least one furnace tube extending inwardly from the front end of the shell with each furnace tube being mounted at its rear end in an opening in the front wall of a combustion chamber including, positioned in each furnace tube, a grate assembly comprising a fire bed supporting means including a first support member having a plurality of apertures extending therethrough and a second support member, said members being mounted for mutual relative movement between a first position in which the apertures in the first member are obturated by the second member, and a second position in which the apertures are not obturated by the second member and a drive means for causing said relative movement between said first and second positions at a speed to permit passage of ash through the apertures whilst continuing to support a fire bed and wherein one of the support members is provided with a feed passageway whereby air may be fed to a fire bed supported on said means.

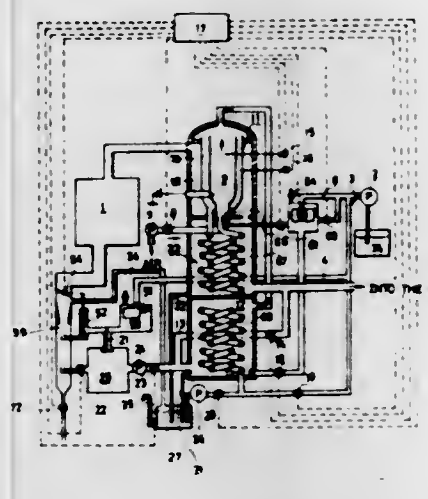
4,002,149
ARRANGEMENT OF HEAT TRANSFER TUBES IN A HEATING FURNACE
Etsuji Yamamoto, Tokyo, and Noriaki Nakase, Osaka, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan
Filed Aug. 28, 1975, Ser. No. 608,622
Claims priority, application Japan, Sept. 4, 1974, 49-101658; June 24, 1975, 50-78156
Int. Cl.² F22B *21/24*
U.S. Cl. 122—356 **9 Claims**

1. A heating furnace for fluid material having a plurality of heat-transfer tubes carrying said fluid through the furnace, each tube having a plurality of parallel heat-transfer portions connected together by return bends, said parallel portions being disposed in two rows, the parallel portions of each tube alternating between said rows, the portions in each row being arranged in groups consisting of one heat-transfer portion of each of said tubes, the fluid in all tubes flowing through the same sequence of groups, and a separate burner means con-



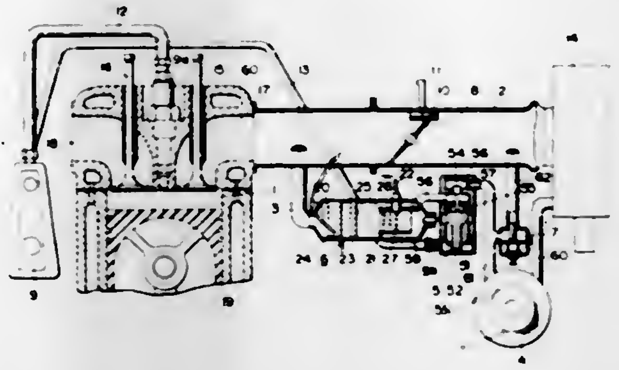
fronting each group to thereby separately control the temperature of the fluid in each heat-transfer portion of the several tubes.

4,002,150
GAS GENERATOR FOR MOUNTING ON AN AUTOMOBILE
Hiroshi Shinohara, Okazaki; Kunihiko Masunaga; Masakatsu Kani, both of Toyota, and Hidetomo Umehara, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Mar. 10, 1975, Ser. No. 557,119
Claims priority, application Japan, Aug. 12, 1974, 49-092199
Int. Cl.² F02B *43/00*
U.S. Cl. 123—3 **11 Claims**



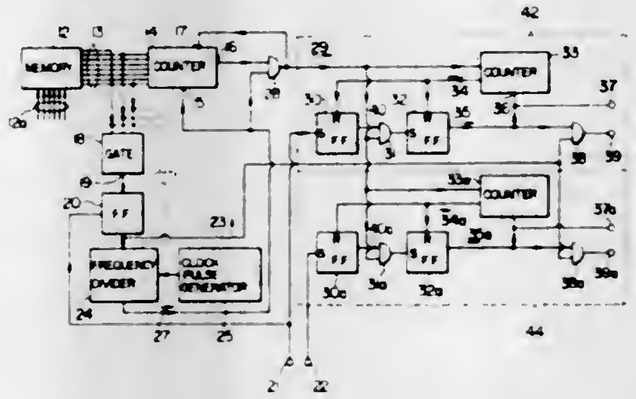
1. A gas generator comprising:
- a. a chamber for holding a liquid fuel,
- b. a catalyst bed connected to receive liquid fuel from said chamber and adapted to at least partially convert said liquid fuel to a gas,
- c. a gas tank connected to said bed to receive gas generated in said catalyst bed when contacted by said liquid fuel,
- d. a carburetor,
- e. first duct means for conveying liquid fuel from said chamber to said carburetor and a first pressure-responsive valve for controlling the flow in said first duct means, said first valve being responsive to the pressure in said gas tank to close said first duct means only when the pressure in said gas tank exceeds a predetermined value, and
- f. second duct means connecting said gas tank to said carburetor and additional valve means for controlling the flow in said second duct means, said additional valve means being connected to open said second duct means when gas is generated in said catalyst bed.

4,002,151
DIESEL ENGINE AND METHOD FOR IMPROVING THE PERFORMANCE THEREOF
Eiji Toyoda, Toyota; Masaaki Noguchi, Nagoya; Yukiyasu Tanaka; Tsuchio Bunda, both of Okazaki, and Masaharu Sumiyoshi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed May 6, 1975, Ser. No. 574,935
Claims priority, application Japan, May 13, 1974, 49-53710
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **17 Claims**



1. A method for improving the performance of a diesel engine comprising the steps of:
- introducing a first mixture of a first quantity of fuel and a second quantity of air into a reformer;
- reforming said first quantity of fuel in the presence of said second quantity of air into a second mixture containing decomposition and oxidation products;
- feeding said second mixture to a combustion chamber of said engine;
- feeding a third quantity of air to said combustion chamber, wherein said third quantity of air has not passed through said reformer;
- injecting a fourth quantity of fuel into said combustion chamber, wherein said fourth quantity of fuel has not passed through said reformer;
- burning said second mixture and said fourth quantity of fuel in said combustion chamber.

4,002,152
FUEL INJECTION CONTROL APPARATUS
Yoshikazu Hoshi, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan
Filed July 14, 1975, Ser. No. 595,498
Claims priority, application Japan, July 19, 1974, 49-82188
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **4 Claims**



1. In a fuel injection control apparatus comprising a memory for producing an output representing a required amount of fuel injection in accordance with the engine operating conditions, a first injection valve for supplying fuel to said engine, a second injection valve for supplying fuel to said engine when

the load on said engine is great, and means for introducing fuel injected through said first and second fuel injection valves to a combustion chamber, said apparatus producing pulses having time intervals corresponding to the data produced from said memory, said first and second fuel injection valves being driven for fuel injection in response to said pulses; the improvement further comprising detector means for detecting an injection control signal produced together with said data produced in accordance with the engine operating conditions, and first gate means for controlling said second injection valve, said first gate means being energized in response to said injection control signal, said second injection valve being driven by said pulses having the time intervals corresponding to the output data from said memory.

4,002,153

INTAKE SYSTEM IN INTERNAL COMBUSTION ENGINE

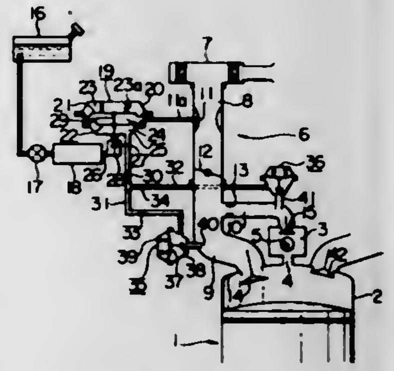
Hisanori Moriya, and Shoji Shimo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 4, 1975, Ser. No. 601,665

Claims priority, application Japan, Aug. 16, 1974, 49-94016

Int. Cl.² F02B *19/10, 19/18*

U.S. Cl. 123—32 ST 10 Claims



1. In an intake system adapted to be used in combination with an internal combustion engine including a main combustion chamber, a sub-combustion chamber equipped with an ignition plug, and a through-hole communicating said both chambers with each other, whereby a lean mixture charge in the main combustion chamber is fired by combustion flames produced in said sub-combustion chamber, the improvements comprising;

- an intake cylinder having a venturi portion allowing the passing of a total amount of air being fed to said main and sub-combustion chambers and a throttle valve controlling the amount of air being fed thereto;
- a main intake passage leading from said intake cylinder to said main combustion chamber;
- a sub-intake passage stemed from said intake cylinder and leading to said sub-combustion chamber;
- a first fuel discharge device attached to at least one of said intake cylinder and main intake passage;
- a second fuel discharge device attached to said sub-intake passage;
- a fuel supplying device;
- a fuel pressure controlling device connected to said fuel supplying device and producing a fuel pressure commensurate with a negative pressure in said venturi portion;
- a first fuel passage communicating said fuel pressure controlling device with said first fuel discharge device; and,
- a second fuel passage communicating said fuel pressure controlling device with said second fuel discharge device.

4,002,154

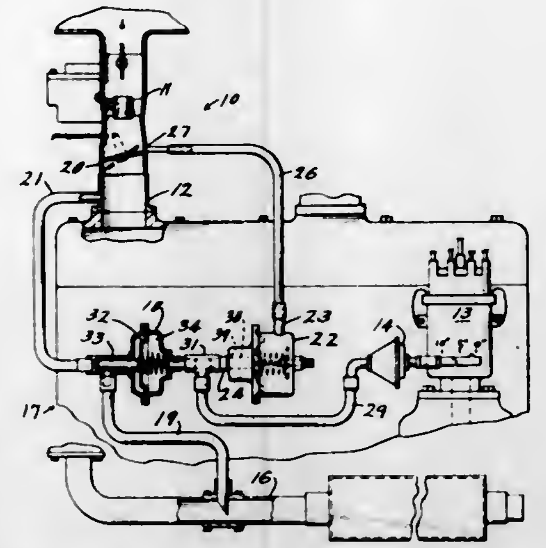
VACUUM DELAY AND SHUTOFF VALVE

Michael A. Kestner, Richmond, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 6, 1975, Ser. No. 547,386

Int. Cl.² F02M *25/00*

U.S. Cl. 123—119 A 2 Claims



1. An exhaust gas recirculation system for an internal combustion engine comprising an EGR valve for admitting, upon opening, a portion of exhaust gases to an intake manifold, a slave vacuum responsive means for opening said EGR valve upon introduction of a vacuum upon said slave means, means for establishing an open circuit between said slave means and a carburetor vacuum source, a master vacuum responsive means within said circuit and in continuous open communication between said slave means and the vacuum source, said master means actuating said slave means, said master comprising a vacuum sensing chamber open to the vacuum source and an atmospheric release chamber open to atmosphere, valve means for opening said atmospheric release chamber into communication with said slave means and said vacuum chamber upon imposition of a first greater vacuum upon said vacuum chamber and for closing said atmospheric release chamber to establish communication between said slave means and the vacuum source upon imposition of a second, lesser vacuum upon said vacuum chamber, whereby said EGR valve remains closed when said first greater vacuum condition is imposed at the vacuum source, and whereby said EGR valve is opened when said lesser vacuum condition is imposed at the vacuum source.

4,002,155

ENGINE AND ENGINE SPARK TIMING CONTROL WITH KNOCK LIMITING ETC.

John L. Harned, Grosse Pointe Woods, and Donald F. Herrick, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

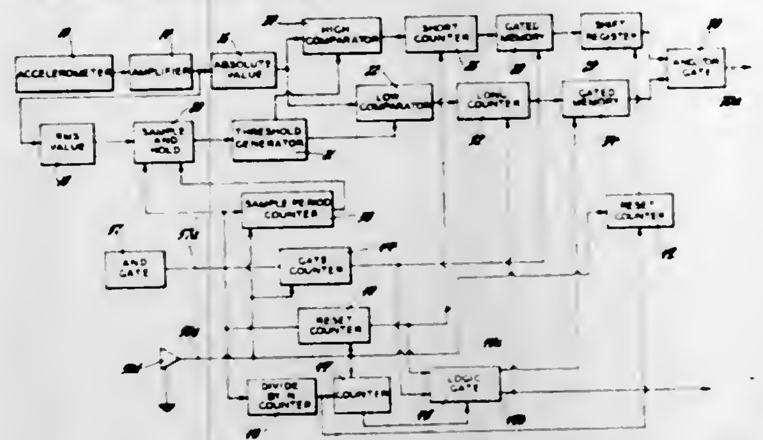
Filed Jan. 12, 1976, Ser. No. 648,313

Int. Cl.² F02P *11/02*

U.S. Cl. 123—148 E 11 Claims

1. In an apparatus to generate sparking voltages at the spark electrodes of the respective cylinders of a spark ignition internal combustion engine in automotive application, the improvement comprising:

- first means responsive at least to engine crankshaft rotation and effective to generate programmed spark voltage pulses and apply the same to the engine cylinders in sequence for the successive firings of each engine cylinder;
- an accelerometer responsive to the background engine vibrations due to engine operation and the individual ringing engine vibrations due to engine knock;
- a sampler responsive to the magnitude of the accelerometer signal during successive sample periods terminating, respectively, before ringing vibrations due to engine knock commence and effective to generate an output signal varying generally with the average magnitude of said accelerometer signal without said ringing vibrations;
- a comparator simultaneously responsive to the sampler output signal and to the magnitudes of the individual ringing vibrations in said accelerometer signal and effective to generate a pulse each time the latter exceeds the former;
- second means effective to count the number of said pulses during a predetermined counting time, said second means being further effective to change a stored number count in one direction by a predetermined number when the number of said pulses during said predetermined counting time exceeds a first reference number and to change said stored number count in the opposite direction by a predetermined number when the number of said pulses during said predetermined counting time does not exceed a second predetermined reference number no greater than said first predetermined reference number;
- and means responsive to said second means to retard the sparking events due to said first means by a predetermined amount for each count stored by said second means and in sense to delay the spark as the second means senses increased numbers of ringing vibrations;
- whereby knock intensity in said engine is limited to a desired level.



4,002,156

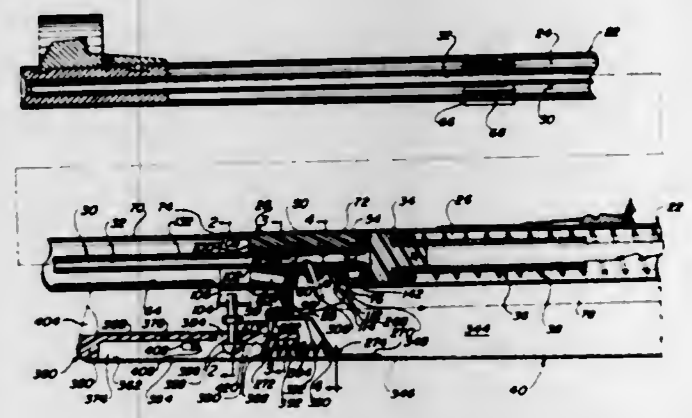
AIR GUN

Earl L. Fischer, Bentonville, Ark., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed May 14, 1975, Ser. No. 577,203

Int. Cl.² F41B *11/00*

U.S. Cl. 124—67 27 Claims



1. An air gun or the like for propelling a projectile by compressed air or the like and comprising:

- a source of compressed air for propelling a projectile from the gun;
- barrel means for guiding the projectile from the gun;
- firing chamber means between said source of compressed air and said barrel means for holding a projectile in a firing position;
- first passage means for connecting said firing chamber means to said barrel means and for guiding a projectile from said firing chamber means to said barrel means;
- trigger means for initiating a firing cycle during which compressed air is delivered to said firing chamber means from said source of compressed air to propel a projectile from the gun through said barrel means;
- projectile holding means for receiving a projectile to be fired from the gun and for holding the projectile in axially spaced relationship to said firing chamber means until the firing cycle is initiated by actuation of said trigger means;
- second passage means for connecting said projectile holding means to said firing chamber means and for enabling movement of the projectile from the projectile holding means to the firing chamber means during an initial portion of the firing cycle; and
- sealing and retention means in said firing chamber means for engaging the projectile and holding the projectile in the firing chamber and sealing said first passage means relative to said firing chamber means during an intermediate portion of the firing cycle and for releasing the projectile for movement into said first passage means during a terminal portion of the firing cycle.

4,002,157

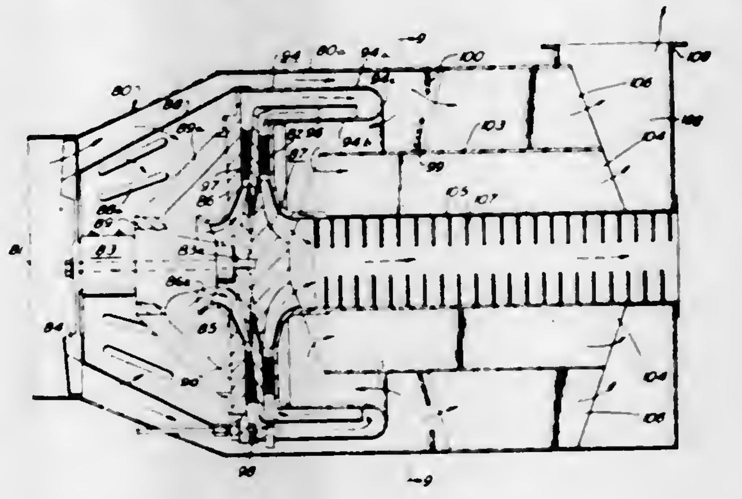
GAS TURBINE HEATING APPARATUS

Rene A. M Toesca, Boyertown, Pa., assignor to Energy Transformation Corporation, Boyertown, Pa.

Filed Dec. 31, 1974, Ser. No. 537,717

Int. Cl.² F24H *3/08*

U.S. Cl. 126—110 B 20 Claims



1. Heating apparatus comprising:

a. a combustion chamber having walls formed to cause exhaust gas to travel initially in a first direction and then to travel in a second direction opposite thereto,

b. an air flow chamber adjacent thereto and being formed to conduct incoming air first past the outer wall of said combustion chamber in said first direction, and then past the inner wall of said combustion chamber in said second direction, and

c. means for causing air to enter said apparatus and for causing a first portion thereof to circulate through said air flow chamber whereupon it is heated by the walls of said combustion chamber prior to its being applied to heat a predetermined area, said means also causing a second portion of said air to enter said combustion chamber thereby to enable combustion therein.

13. Heating apparatus comprising:

a. a chamber having outer and inner, generally cylindrical and parallel walls,

b. a combustion chamber disposed within said (a) chamber and including means for continuously burning a fuel in air therein, said chamber having outer and inner parallel, generally cylindrical, heat-conducting walls,

c. an exhaust duct having a substantial portion thereof surrounded by the inner wall of said (a) chamber, said duct having a heat-conductive wall communicating with said (b) chamber,

d. means for causing air to enter said apparatus, said means including:
   1. means to cause a portion of said air to flow through said (a) chamber and along the outer surface of the heat-conducting wall of said exhaust duct when combustion of said fuel has heated the heat-conducting wall of said combustion chamber, said air thereupon being heated and being adapted to be applied to heat a predetermined area, and
   2. means for causing another portion of said air to enter said combustion chamber thereby to enable combustion of said fuel to occur, the amount of said other portion being such that the air-fuel ratio in said combustion chamber is allowed to approach stoichiometric conditions.

4,002,158
SUPPORT STRUCTURE FOR SOLAR ENERGY CONVERTER

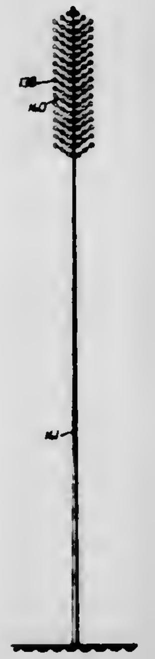
Reinhart Radebold, Quastenhornweg 14a, 1 Berlin 22, Germany

Filed Jan. 29, 1975, Ser. No. 545,134

Claims priority, application Germany, Jan. 30, 1974, 2405134

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **12 Claims**



1. In a solar energy conversion system having a plurality of solar energy absorbing and conversion units, each provided with a reflector to focus solar energy to an absorbing portion of the conversion unit, a support structure, comprising:

a plurality of tubes leading upright from the ground to the conversion units of the plurality, the tubes having means to form the tubes into a need-like bundle; means for anchoring the bundle tubes to the ground; means to resiliently fasten and suspend the reflectors and conversion units to the top of the reed-like bundle;

means included in the bundle for transporting energy from the conversion units to the ground; and

means at the top of the bundle to obtain buoyancy support of the reflectors and the conversion units as fastened to the top of the bundle.

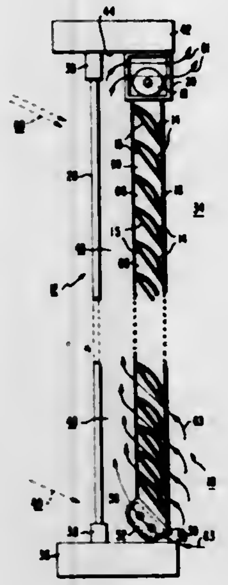
4,002,159
VENETIAN BLIND FOR SOLAR HEATING

Domenick J. Angilletta, 223 E. Knight Ave., Collingswood, N.J. 08108

Filed Nov. 7, 1975, Ser. No. 629,693

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **7 Claims**



1. In a venetian blind for use in a room adjacent the pane of a window disposed to receive solar radiation and spaced therefrom:

a head rail attached to the frame of said window;

a tilt rod pivotably attached within said head rail;

a series of arcuate slats suspended vertically from said tilt rod and means flexibly interconnecting said slats in horizontally-oriented and vertically spaced relation;

a bottom rail flexibly interconnected with said series of slats;

means to pivot said tilt rod whereby said series of interconnected slats is reversibly tilted to present said arcuate slats at certain extreme positions with either concave or convex faces of said slats facing said window and substantially parallel thereto, and at intermediate positions;

means to raise, lower and reversibly fix said bottom rail and portions of said slats whereby said venetian blind is adjusted to expose without obstruction portions of said window;

the improvement therein being:

a highly heat-absorptive surface on the concave face of said arcuate slats, each of said slats when pivoted in said extreme position to expose said concave face to said window having the lower portion of said concave face overlapping and concealed by the upper portion of the adjacent slat as viewed from said window so that said incoming solar radiation is substantially absorbed and partly reflected upon impinging said absorptive surface, a portion of said reflected radiation secondarily reflecting from said adjacent overlapped slat and entering said room,

and an open generally upward extending passage between each of said slats and the upper portion of the slat next lower;

air passage means at said head rail connecting between said room and said window;

whereby solar radiation impinging on said absorptive surface heats said surface and heat transfers to air passing upwardly by natural convection through said passages between said slats and through said passage means at said head rail.

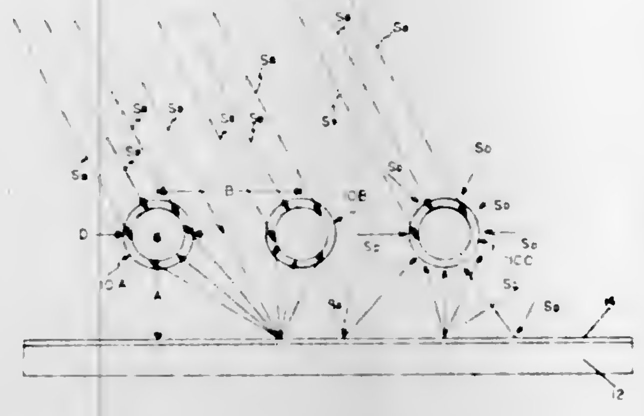
4,002,160
SOLAR ENERGY COLLECTION SYSTEM

George R. Mather, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 12, 1975, Ser. No. 549,291

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



1. A solar energy collector which comprises:

a manifold;

a plurality of double-wall tubular members, the space between said double walls being sealed at a subatmospheric pressure, each having a closed end remote from said manifold and an open end in sealing engagement with said manifold, the outer wall of said double-wall member being a transparent glass material and is transparent about its entire circumference, said double-wall tubular members being spaced apart on centers no more than four times the diameter of said tubular members;

means for supplying a working fluid from said manifold to the interior of said plurality of tubular members and returning said working fluid to said manifold; and

a diffuse-reflecting surface positioned on the side of said tubular members away from the sun and being coextensive with all of said tubular members, said diffuse-reflecting surface being positioned a distance no more than four times the diameter of said tubular members away from the center line of said tubular members.

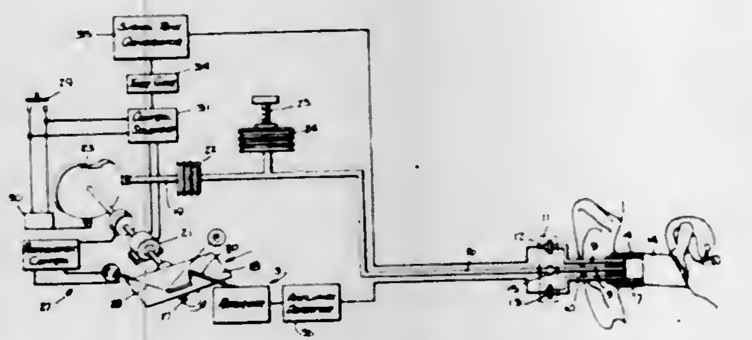
4,002,161
AUTOMATIC MEANS FOR TYMPANOMETRIC TESTING

Irwin Klar, New City; Erwin H. Rock, Dobbs Ferry, both of N.Y., and Arthur W. Rochussen, Nashua, N.H., assignors to American Electromedics Corporation, Dobbs Ferry, N.Y.

Filed Dec. 2, 1975, Ser. No. 637,008

Int. Cl.² A61B *5/12*

U.S. Cl. 128—2 Z **21 Claims**



1. An improved automatic means for tympanometric ear testing including an ear probe having means for transmitting and for receiving audio test signals and having an ear canal seal and an air transmission tube for controlling the sealed ear canal pressure in combination with a recorder including a recording chart with a drive means therefor, means for varying the air pressure in the sealed ear canal through said probe air transmission tube, means for synchronizing the variations of the air pressure with the movement of the driven recording chart, means for generating an audio frequency probe tone signal for said transmitting means, and means for coupling said probe signal receiving means to said recorder.

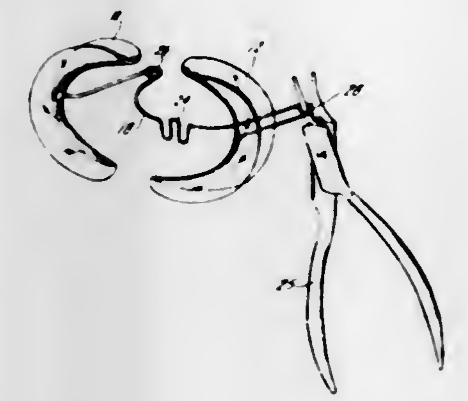
4,002,162
LIP AND CHEEK EXPANDER AND TONGUE RETRACTOR WITH TORTIONALLY ADJUSTABLE SPRING MEANS

Jacob I. Weisser, 28-15 Fair Lawn Ave., Fair Lawn, N.J. 07410

Filed Apr. 26, 1976, Ser. No. 680,433

Int. Cl.² A61B *1/32*

U.S. Cl. 128—17 **8 Claims**



1. A lip and cheek expander and tongue retractor for holding open a patient's mouth and stabilizing his tongue therein so as to facilitate dental and medical procedures, said expander-retractor comprising:

a. first and second arc-shaped shells, each of said shells having a trough-shaped cross-section including first and second side walls; and

b. a spring element having two ends, one of each of said ends secured to said first and second shells respectively, said element disposed in a plane which is (i) substantially transverse to those planes defined by said side walls and is (ii) upon insertion into the oral cavity, substantially coplaner with the plane of the patient's tongue, said spring element including a lingual arch adapted for tongue engagement, said spring element further having a resilient torque which is directed radially outward with respect to the radius of curvature of said arc-shaped shells,

whereby the lips and cheeks of a patient are engaged within the troughs of said shells and the tongue of said patient is engaged within said rake-like lingual arch such that, through the torque action of said spring element, the tongue is stabilized in a retracted position while the lips and cheeks are biased laterally outward with respect to the dental area.

4,002,163
EXERCISER AND ROLLER MASSAGE DEVICE

Andrew Dudly Jackson, Jr., Raymondville, Port Mansfield Station, Tex. 78580

Filed Sept. 15, 1975, Ser. No. 613,117

Int. Cl.² A61H *15/00*

U.S. Cl. 128—57 **7 Claims**

1. An exerciser comprising

a core and

several sleeves rotatably mounted along the length of the core,

the end sleeves being of a diameter and length to provide hand grips,

a center sleeve being of a length comparable to the width of the human body to provide a body roller,

and pivot means at the ends of the core,

said sleeves being three in number and all of the same internal and external diameter disposed end to end along the core, and the center sleeve being provided with a covering of soft material.

4,002,164

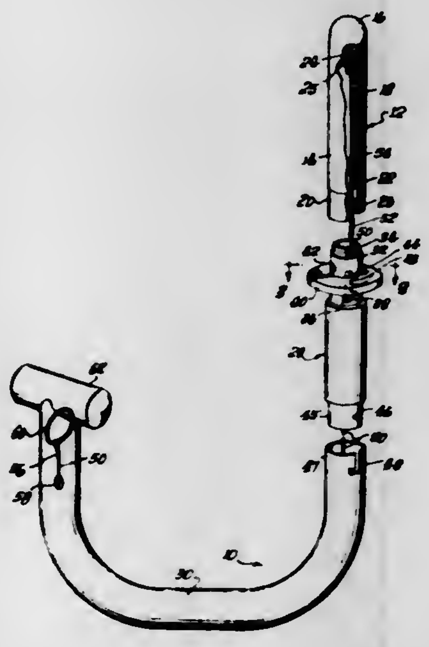
PROSTATE MASSAGER

Willie Ray Bradley, 175 S. Rio Vista St., No. 146, Anaheim, Calif. 92806

Filed Sept. 2, 1975, Ser. No. 609,207

Int. Cl.² A61H *7/00*

U.S. Cl. 128—67 **5 Claims**



1. A prostate-massaging device comprising:

a flexible, digital-massaging head;

a handle means, whereby said digital head is removably attached thereto, said handle being tubular and shaped in a substantially U-shaped configuration, wherein one end thereof is provided with a grip bar;

an insert-depth control means adjustably mounted to said handle adjacent said digital head to selectively control the depth of insertion into the rectum of an individual, whereby said digital head is positioned adjacent the prostate gland; and

manipulating means included therein which is operably attached to said digital head, whereby said head is actuated in a massaging action with respect to said prostate gland, and

wherein said digital head includes:

a base member molded to the base of said digital head, said digital head being formed from a soft, flexible material, and

an elongated, flat spring member secured to said base member and disposed within said digital head, said spring having a free end attached to said manipulating means.

4,002,165

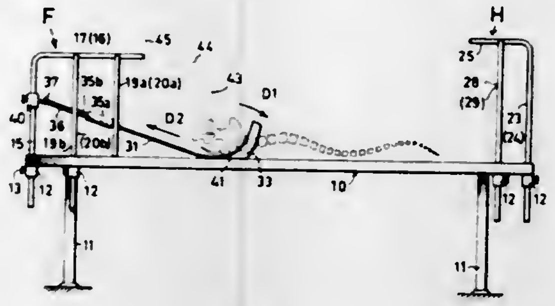
AUTO-TRACTION TABLE

Gertrud Agnes Matilda Lind, Grev Turegatan 22, 114 38 Stockholm, Sweden

Filed May 7, 1975, Ser. No. 575,214

Int. Cl.² A61F *5/00*

U.S. Cl. 128—71 **15 Claims**



1. A traction table having a head and a foot and a top for a patient to lie on and a flexible arrangement that can be fastened around a part of the body such as the waist or the head of the patient lying on the table and a traction strap secured to a holder fastened at one end of the table, a pipe frame at the head (H) and at the foot (F) of the table, said frame at the foot comprising a transverse pipe (18) spaced above the tabletop (10, 10*a* and 10*b*) to provide a foot stop for the patient lying supine with the legs raised and flexed, the frame at the head end having at least two vertical pipes (28, 29, 23, 24) on each side of the longitudinal midline of the table as supports for the patient's hands, at least one of said pipes having a vertically adjustable holder (30) for securing a longitudinally adjustable traction strap (31), which comprises a dynamometer (35, 35*a* and 35*b*) which measures the traction force and gives the traction strap suitable elasticity for auto-treatment, whereby the patient can choose the traction force he himself produces by his own muscular exertion when pulling and pressing against the respective pipe frames.

4,002,166

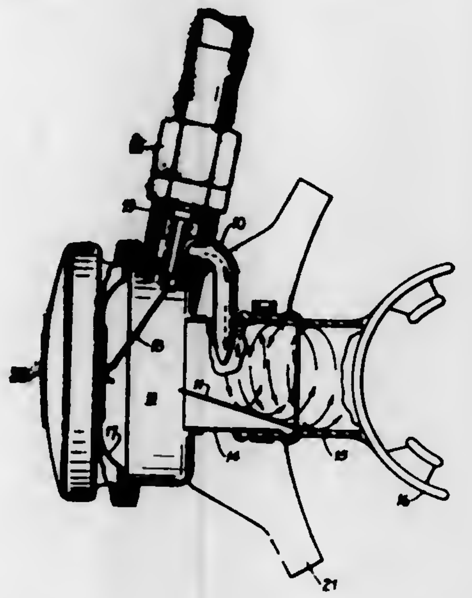
BYPASSED SCUBA REGULATOR

Bill N. Oliver, Huntington Beach, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,755

Int. Cl.² A62B *7/04*

U.S. Cl. 128—142.2 **1 Claim**



1. In a scuba second stage regulator comprising a regulator control chamber, a flexible diaphragm at one end of said chamber, a mouthpiece tube at another end of said chamber, and an air supply connected to a side of said chamber, said air supply including an air valve, and a demand lever in said chamber which is connected to said valve and in engagement with said diaphragm to be adapted to be actuated by said diaphragm to open and close said valve; the improvement of an air bypass tube extending from said air supply to said mouthpiece tube to bypass the incoming air from said air supply around said control chamber, and said bypass tube having a tangential connection with said mouthpiece tube, and an adjustable air baffle positioned inside said mouthpiece tube, said baffle extending lengthwise of said mouthpiece tube and positioned opposite to said tangential connection at an obtuse angle with respect to the longitudinal axis of said tangential connection; said baffle divergently inclined towards the mouthpiece end of said tube.

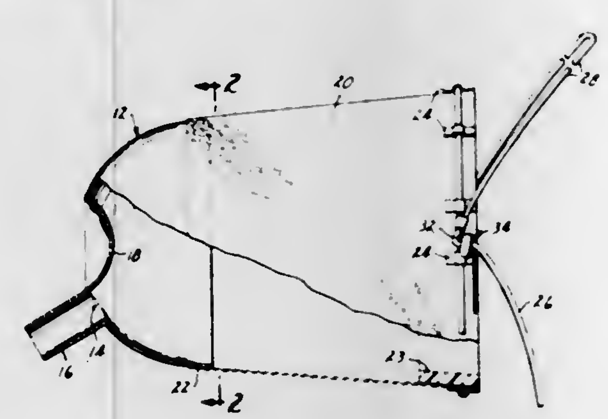
4,002,167

ANIMAL GAS MASK ASSEMBLY

George Phillip Rambosek, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Continuation-in-part of Ser. No. 505,618, Sept. 13, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,840

Int. Cl.² A61M *16/00*

U.S. Cl. 128—205 **4 Claims**



1. A gas mask assembly for snouted animals comprising:

a. means defining a rigid nose cap member for covering the nostrils and anterior portion of the animal's snout and having a generally circular marginal portion and means defining an opening in said nose cap member for the attachment of a breathing tube;

b. abutment means in said nose cap member for preventing the animal's nostrils from becoming occluded by said nose cap member, said abutment means comprising a member positioned symmetrical with respect to an axis through the center of the opening defined by said circular marginal portion of said nose cap and intersecting the center of the end of said nose cap and defining a surface spaced from the inner surfaces thereof;

c. a flexible sleeve member formed from substantially gas-impermeable material and shaped to fit around the animal's snout, said sleeve member being joined to the marginal portion of said nose cap member; and

d. immobilizing cinch means secured to the open end of said sleeve member and including a rope lock for securing and sealing said sleeve member to the animal's snout and for restraining the animal's head and allowing the cinch to tighten as the animal struggles against said immobilizing cinch means.

4,002,168

METHOD OF, AND DISPENSER FOR INTRODUCING AN OPTHALMIC PRODUCT INTO THE OCCULAR CAVITY

Tor Petterson, 31248 Palos Verdes Drive West, palos Verdes Penn., Calif. 90274

Filed Apr. 24, 1975, Ser. No. 571,294

Int. Cl.² A61M *31/00*

U.S. Cl. 128—233 **18 Claims**

1. The method of introducing an ophthalmic product from a dispenser into an occular cavity whereby blinking is substantially eliminated and the dispensing orifice of the dispenser does not contact said occular cavity, said dispenser comprising a container having wall means defining a cavity for containing a product to be dispensed, a dispensing orifice positioned in said wall means and in fluid communication with said cavity, and pump means constructed and arranged with said cavity to develop sufficient internal pressure within said cavity to dispense product from said cavity through said orifice, and a generally ring-shaped positioning/guard means fixedly secured to said container means and generally encircling said dispensing orifice, said positioning/guard means being angularly displaced relative to the longitudinal axis of the container, said method including the steps of positively positioning the generally ring-shaped positioning/guard means of the dispenser around the occular cavity thereby anthropometically locating the dispensing orifice relative to said occular cavity while maintaining the dispensing orifice free from interference with the normal line of sight and activating the pump means of said dispenser to dispense an effective amount of ophthalmic product into said occular cavity.

6. A dispenser suitable for introducing an ophthalmic product into the occular cavity comprising —

a. container means comprising
  1. wall means defining a cavity for containment of the product to be dispensed;
  2. a dispensing orifice positioned in said wall means and in fluid communication with said cavity; and
  3. a pump means constructed and arranged with said cavity to develop sufficient internal pressure within said cavity to dispense product from said cavity through said orifice; and

b. a generally ring-shaped positioning/guard means fixedly secured to said container means and generally encircling said dispensing orifice wherein said positioning/guard means is angularly displaced relative to the longitudinal axis of the container means such that when said positioning/guard means is placed around the occular cavity said dispensing orifice can be anthropometrically located relative to the occular cavity while avoiding contact with said occular cavity and interference with the normal line of sight.

4,002,169

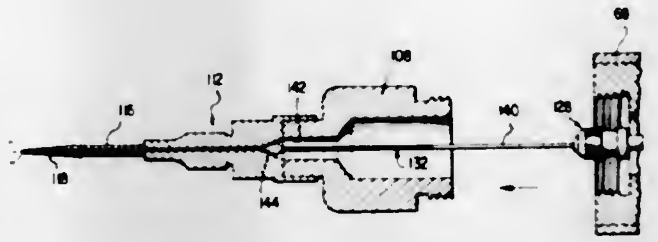
METHOD AND APPARATUS FOR PERFORMING SURGERY WITHOUT TISSUE INCISION

John A. Cupler, II, 10 Cupler Drive, LaVale, Cumberland, Md. 21502

Filed Apr. 18, 1972, Ser. No. 245,121

Int. Cl.² A61M *1/00, 7/00;* **A61B** *17/32;* **A61F** *9/00*

U.S. Cl. 128—276 **4 Claims**



1. A method of removing cataracts, comprising; migrating a hollow needle into an organic eye and into the interior of the crystalline lens capsule containing a cataract; inserting a contractible and expansible masticating tool into said hollow needle in the contracted condition thereof; advancing the contracted masticating tool to the open end of the hollow needle in the interior of the crystalline lens capsule; advancing the masticating tool beyond the open end of the hollow needle and expanding the same within the crystalline lens capsule into masticating contact with the lens contents; rotating the expanded masticating tool and masticating the entire contents of the lens capsule including the cortex, nucleus and cataract while maintaining the structural integrity of the lens capsule; and withdrawing the masticated material through said hollow needle.

4,002,170

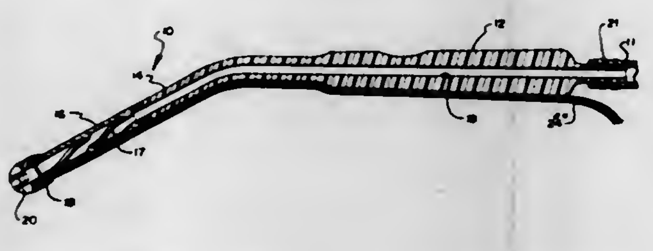
ANTICOAGULANT DELIVERY MEANS FOR ASPIRATION WAND

A. Boyd Hansen, and Gordon S. Reynolds, both of Bountiful, Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 514,055, Oct. 11, 1974, Pat. No. 3,955,573. This application Aug. 25, 1975, Ser. No. 607,407

Int. Cl.² A61M *1/00*

U.S. Cl. 128—276 **4 Claims**



1. An anticoagulant delivery device for aspirating and treating blood during surgery comprising:

a hollow conduit, the hollow of the conduit having a vacuum applied thereto and defining a pathway for the transport of aspirated blood;

a perforated tip joined to the conduit and comprising a passageway facilitating aspiration of blood into the hollow of the conduit;

a channel traversing an arcuate path and opening radially only into the hollow of the conduit in the vicinity of the tip; and

means for delivering the anticoagulant into the channel at a point below the open side of the channel so as to insure flow of the anticoagulant around the arcuate path adjacent the internal surface of the hollow conduit.

4,002,171

WATER-DISPERSIBLE IONIC POLYURETHANE BINDER FOR NONWOVEN FABRICS

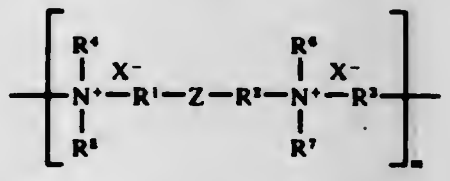
Arnold Jay Taft, East Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Mar. 17, 1975, Ser. No. 558,989

Int. Cl.² A61F *13/16;* **C07C** *87/30*

U.S. Cl. 128—284 **21 Claims**

1. In a nonwoven fabric which comprises a web of substantially uniformly laid fibers and a polyurethane-based binder for said fibers distributed in said web, the improvement which comprises employing as said binder a cationic polyurethane having a repeating unit of the formula:



$$\left[\begin{array}{c} R^4 \\ | \\ N^+ \\ | \\ R^5 \end{array} \overset{X^-}{\ } - R^1 - Z - R^2 - \begin{array}{c} R^6 \\ | \\ N^+ \\ | \\ R^7 \end{array} \overset{X^-}{\ } - R^3 \right]_m$$

wherein R^1 and R^2 are selected from the group consisting of $—CH_2—$ and alkylene containing 2 to 4 carbon atoms, inclusive; Z is a linking condensation residue of a polyisocyanate with a polyol and contains at least four urethane linkages; R^3 is alkylene containing 2 to 4 carbon atoms, inclusive; R^4, R^5, R^6 and R^7 are lower alkyl containing 1 to 4 carbon atoms, inclusive; X is a halogen selected from the group consisting of chlorine and bromine, and *m* is an integer of sufficient magnitude to provide a polymer having a molecular weight sufficient to form a solid material; the equivalent weight of the polymer, expressed as the ratio of the molecular weight of the repeating unit divided by the number of N^+ in the repeating unit, being from about 500 to about 2000, whereby the nonwoven fabric is resistant to body fluids but dispersible in water.

4,002,172

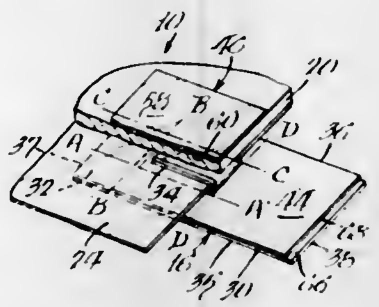
DIAPER HAVING TAB FASTENER WITH CENTRAL FLAP

Mark I. Feldman, Chicago, Ill., assignor to Johnson & Johnson, N.J.

Filed Dec. 19, 1975, Ser. No. 642,284

Int. Cl.² A61F *13/16;* **A41B** *13/02*

U.S. Cl. 128—284 **12 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

an integral elongated tape segment comprising a free working end and a fixed end attached to said diaper at a marginal location thereof, said tape segment being slit to form a central flap within the perimetric limits and spaced from the edges of said tape segment;

an adhesive coating on at least one face of said flap, said free end and said fixed end, said adhesive coating on one face of said free end being pressure-sensitive; and

release means for engagement with said adhesive coating on said free end;

said fixed end being permanently attached to said backing sheet and said flap being permanently attached to said facing sheet by means of said adhesive coatings; and

said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

4,002,173

DIESTER CROSSLINKED POLYGLUCAN HYDROGELS AND RETICULATED SPONGES THEREOF

James H. Manning, Monroe, and John H. Stark, Campbell Hall, both of N.Y., assignors to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 490,968, July 23, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 568,030

Int. Cl.² F23L *3/00*

U.S. Cl. 128—296 **40 Claims**

1. A hydrogel solid comprising diester crosslinked polyglucan selected from the class consisting of amylose, dextran and pullulan succinates and glutarates, said hydrogel solid being water-insoluble and the neutral pH sodium salt of which has a saline retention of isotonic saline solution sufficient to increase the weight of said hydrogel solid to an amount of between about 5 and 90 times its weight.

10. A hydrogel solid in accordance with claim 1, in the form of a reticulated porous sponge.

4,002,174

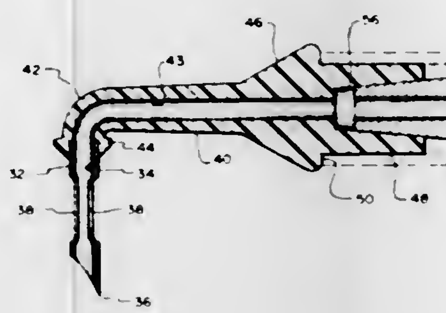
AIR EMBOLUS ASPIRATOR

Charles C. Reed; Denton A. Cooley, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Oct. 14, 1975, Ser. No. 621,922

Int. Cl.² A61B *17/34;* **A61M** *1/00*

U.S. Cl. 128—347 **5 Claims**



1. An air embolus aspirator comprising:

a hollow cannula having a sharpened tip for penetrating a blood vessel and a length less than the diameter of the blood vessel so that the full length of the cannula may be embedded in the blood vessel without damaging the underside of the blood vessel, the cannula presenting means for admitting air into the hollow of the cannula comprising radially spaced, elongated slots in the cannula, said admitting means spanning a plurality of radially spaced locations along the surface of the cannula,

a hollow shank having an annularly enlarged shoulder at a first end of the hollow shank, the hollow shank being mounted upon the cannula at the shoulder, the shoulder limiting the distance of penetration of the cannula, the hollow shank forming an angle of about 90° to the cannula at the shoulder so that the hollow shank will repose essentially flat against the penetrated surface while the cannula is projected transverse to the path of blood flow in the blood vessel thereby permitting rotation of said cannula about its longitudinal axis, the hollow of the shank communicating with the interior of the cannula and the shank defining an angular fluid path of about 90° between the cannula and the hollow shank; and

a hub mounted upon the shank and comprising means for coupling the aspirator to a source of reduced pressure to thereby aspirate away any air embolus in the vicinity of the cannula.

4,002,175

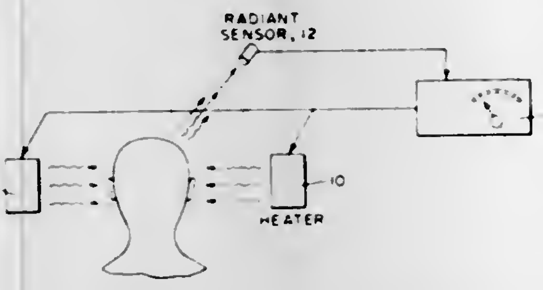
METHOD AND APPARATUS FOR CORTICAL THERMAL THERAPY

David M. Brainard, and Edward C. Brainard, II, both of Marion, Mass., assignors to Environmental Devices Corporation, Marion, Mass.

Filed June 25, 1975, Ser. No. 590,099

Int. Cl.² A61F *7/00*

U.S. Cl. 128—399 **9 Claims**



1. Cortical temperature — elevating apparatus for imposing a selected elevated body-differential cortical temperature to a person, said apparatus comprising

A. controllable thermal means for the localized heatinhg of the head of a person,

B sensor means for sensing the temperature of the person's head, and

C. control means connected with said sensor means to receive a temperature-responsive signal and controlling in response thereto said thermal means to apply a temperature selected from the range between 38° and 50° C to the person's head, with a maximum rate of temperature increase below 1.0° C per minute.

8. A method for enhancing human cerebral functioning comprising the steps of

A. selectively elevating the cortical temperature by imposing a selected elevated body-differential temperature to the person's head,

B. monitoring the head temperature during at least the interval of said temperature-elevation, and

C. controlling the elevation of the head temperature in response to said monitoring to a temperature selected from the range between 38° C and 50° C, and controlling the rate of temperature increase to be less than 0.8° C per minute.

4,002,176

TOBACCO BASED SMOKING MATERIAL

Robert Craig Anderson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 332,115, Feb. 13, 1973, abandoned. This application Aug. 13, 1974, Ser. No. 497,036

Int. Cl.² A24B *3/12, 15/00*

U.S. Cl. 131—2 **18 Claims**

1. A process for the manufacture of an improved material suitable for smoking mixtures, comprising subjecting tobacco to a catalyzed degradation process at a temperature between about 100° to about 300° C until the weight of degraded material is less than 90% but not less than about 70% of the weight of the original tobacco, wherein said catalyzed degradation is carried out in the presence of a catalyst which accelerates the thermal degradation of said tobacco or lowers the thermal degradation temperature, said catalyst selected from the group consisting of strong acids, salts of strong acids with weak bases, alkali salts of weak acids and alkali hydroxides whereby the degraded tobacco material possesses enhanced tobacco flavour as compared to untreated tobacco.

4,002,177

MICROPOROUS STYRENE POLYMERS AND METHOD OF MAKING SAME

Norman B. Rainer, and Peter Allen Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 282,481, Aug. 21, 1972, Pat. No. 3,887,730. This application Mar. 6, 1975, Ser. No. 555,988

Int. Cl.² A24B *15/00*

U.S. Cl. 131—10 R **2 Claims**

1. A tobacco product comprising a tobacco section and a filter section, said filter section comprising a microporous styrene polymer having a randomly interconnected open network of irregularly shaped pores having their walls defined by cohered spherical particles, an average pore size of less than about 20 microns and a pore volume of at least about 1 cubic centimeter per gram, said polymer being in the form of ciliated granules and having a mesh size of from about 40 to about 80 and said filter section being capable of removing 65 per cent of the total particulate material contained in tobacco smoke passing therethrough at a resistance to draw of the tobacco product of about 5 inches of water and said filter section being found characterized by the substantial absence of any bonding agents.

4,002,178
FOAMS AND SPONGE SHEET FOR CIGAR MANUFACTURE

Joseph V. Fiore; T. Kenneth Kelly, both of Fairfield, Conn., and William J. Nellen, Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 428,959, Dec. 27, 1973, Pat. No. 3,872,871. This application Oct. 29, 1974, Ser. No. 518,446

Int. Cl.² A24D *1/02;* **A24B** *3/14*

U.S. Cl. 131—15 R **10 Claims**

1. A stable foam comprising a reconstituted tobacco composition incorporating finely divided cigar tobacco and uniformly dispersed throughout said composition, a multiplicity of fine bubbles, at least 80% of the bubbles being less than about 100 microns in dimension, said bubbles acting to uniformly reduce the density of said composition.

4,002,179
SMOKING COMPOSITIONS INCORPORATING A MENTHOL-RELEASE AGENT

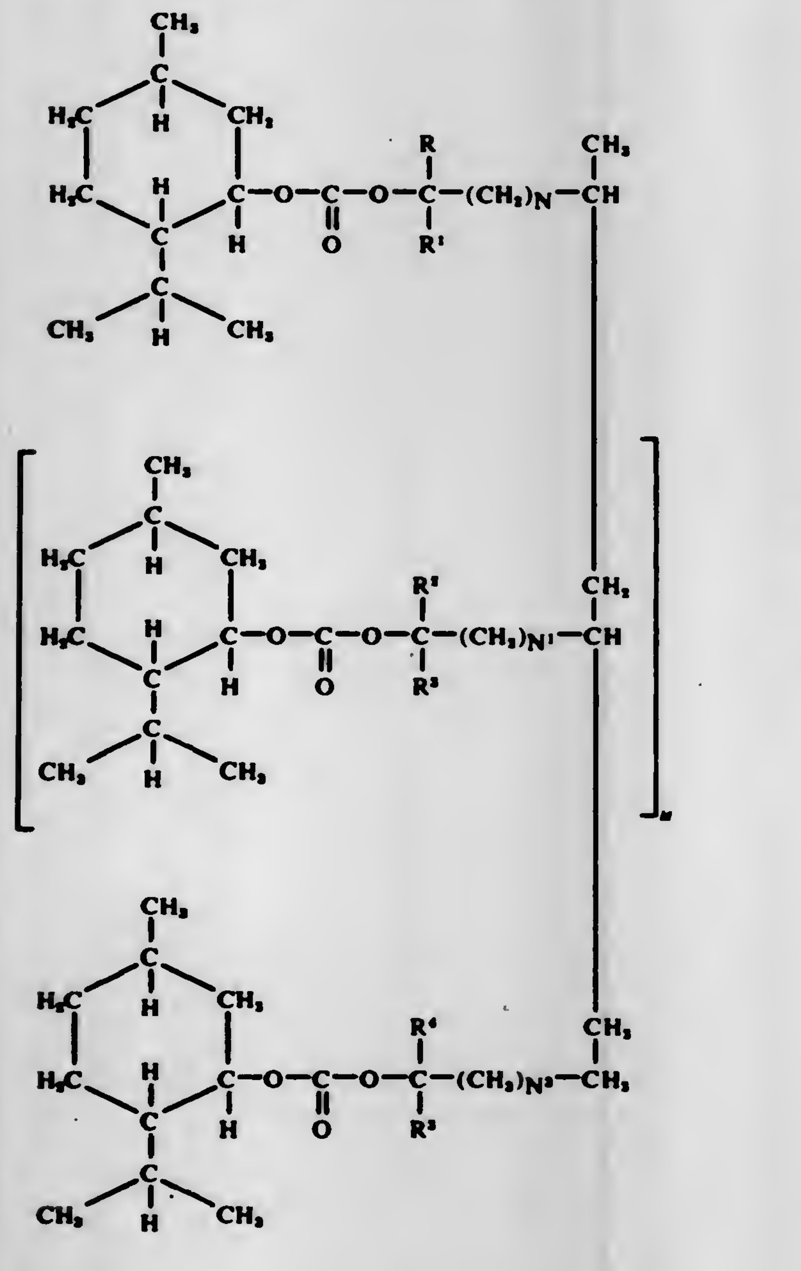
Eric G. S. Rundberg, Jr.; William R. Johnson, Jr., and Harvey J. Grubbs, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 384,048, July 30, 1973, Pat. No. 3,887,603. This application Mar. 18, 1975, Ser. No. 559,574

Int. Cl.² A24B *3/14*

U.S. Cl. 131—17 A **10 Claims**

1. A smoking composition comprising an admixture of a natural or reconstituted tobacco with from about 1 to about 10%, based on the tobacco, of menthol-release agent having the chemical formula:



wherein:

N, N^3 and each N^1 have values of from 0 to 8;

R, R^1, R^4, R^5 and each R^2 and R^3 are each selected from the group consisting of alkyl having from 1 to 6 carbons, cycloalkyl having from 5 to 10 carbons and aromatic carbocyclic having from 6 to 10 carbons; and M has a value of from 0 to 98.

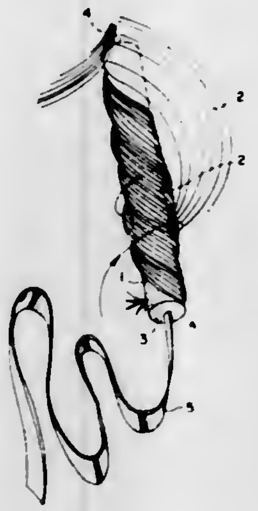
4,002,180
HAIR CURLER

Eugene C. Maier, and Lila M. Maier, both of Moscow, Idaho, assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 6, 1975, Ser. No. 619,643

Int. Cl.² A45D *2/02*

U.S. Cl. 132—39 **1 Claim**



1. A hair curler, comprising

a support member of substantially pliable material for supporting hair wound around it, said support member being of substantially elongated unitary cylindrical configuration having a substantially smooth cylindrical surface and a pair of spaced opposite ends; and

a ribbon type member extending from one of the ends of the support member for wrapping around hair wound around said support member thereby holding the hair in position on said support member.

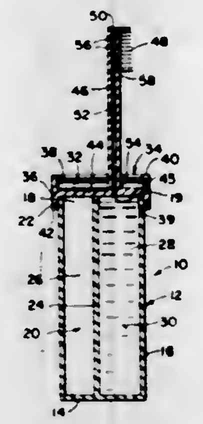
4,002,181
TRAVELING DENTURE TOOTHBRUSH DEVICE

Richard Rivera, Vallejo, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,620

Int. Cl.² A45D *44/18*

U.S. Cl. 132—84 D **3 Claims**



1. A toothbrush, which comprises:

a. a cylindrically shaped case having a sidewall, a closed base, an open top end and an interior chamber therein;

b. a longitudinal intermediate wall contained in said interior chamber, said intermediate wall dividing said chamber into a left and a right compartment;

c. an annular lip contained on an outside periphery of said sidewall at said top end thereof;

d. an elongated stem;

e. a plurality of bristles affixed at one end of said stem, said stem having a bore extending from another end of said stem to a bristle portion of said stem, and said stem having a plurality of openings extending between said bore and an upper surface of said stem within said bristles; and

f. a cap member detachably affixing to said top end of said case, said other end of said stem affixed to said cap, said cap including a cylindrically shaped sleeve, an inside periphery of said sleeve having a pair of annular apertures therein, one said annular aperture disposed towards each end of said sleeve, said lip engaging into either of said two annular apertures and a disc member having a hole therethrough, said disc affixed to said inside periphery of said sleeve, said disc member having a hole therethrough, and said other end of said stem affixed to said disc member at said hole.

4,002,182
DEVICE FOR STORING AND APPLYING COSMETICS

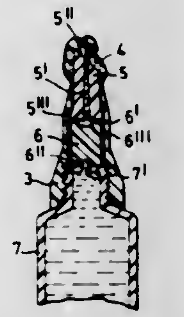
Aubrey Jonathan Michel, Treetops, Mount Park Road, Harrow-on-the-Hill, Middlesex, England

Filed Oct. 9, 1975, Ser. No. 621,191

Claims priority, application United Kingdom, Oct. 9, 1974, 43766/74

Int. Cl.² A45D *40/26*

U.S. Cl. 132—88.7 **1 Claim**



1. Container for flowable material and cap therefor characterised in that a body is provided near the container mouth partially plugging said mouth so that cosmetic material can only flow through a peripheral space between the body and the container wall and in that the cap has a shoulder which, when the cap is in position on the container, presses the container wall inwards, closing or restricting said peripheral space to prevent leakage of cosmetic material.

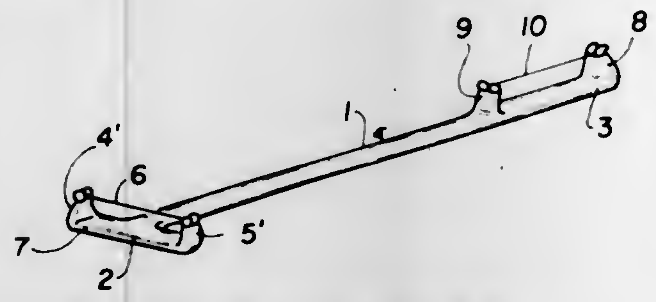
4,002,183
PLAQUE REMOVING DEVICE

Raymond B. Restall, Kamloops, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,564

Int. Cl.² A61C *15/06*

U.S. Cl. 132—91 **1 Claim**



1. A plaque removing device, comprising

a substantially elongated linear handle having spaced opposite ends, the handle having an arm part extending at substantially right angles thereto in substantially T-configuration from one end thereof and a first pair of protruding parts extending from said arm part substantially colinearly with said arm part, in spaced relation;

a second pair of protruding parts extending from the handle at the other end thereof substantially colinearly therewith in spaced substantially parallel relation, the first and second pairs of protruding parts being substantially parallel to each other; and

dental floss releasably affixed to the first pair of protruding parts and extending substantially tautly therebetween and to the second pair of protruding parts and extending substantially tautly therebetween.

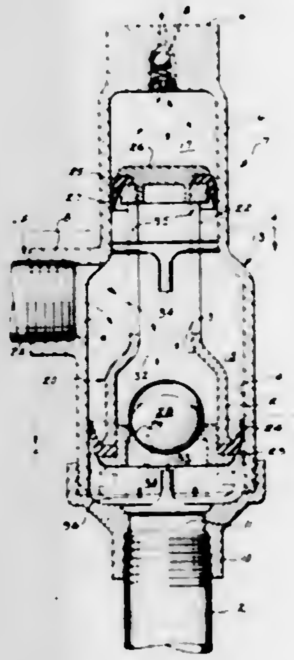
4,002,184
WATER FLOW ACTUATED AIR CHARGING DEVICE

Howard A. Tubbs, 406 S. Elizabeth St., Whitewater, Wis. 53190, and Donald M. Waltz, 1501 Roosevelt Drive, Atlantic, Iowa 50022

Filed Sept. 2, 1975, Ser. No. 609,287

Int. Cl.² F04F *1/00*

U.S. Cl. 137—211 **4 Claims**



1. In a fluid pressure system, the combination comprising:

a. a tank for storing liquid under pressure,

b. a pump for supplying liquid to said tank,

c. a first liquid conduit connected to said pump and with said conduit having a use facility valve connected thereto,

d. a second liquid conduit connected to said tank,

e. and automatic air charging means connected between said first and second conduits, said air charging means comprising:

  1. an elongated housing providing inner and outer chambers and with said inner chamber being connected through said first conduit to said tank,
  2. a one way air valve connected to the outer end portion of said outer chamber,
  3. a plunger disposed for longitudinal sliding movement in said housing and extending between said chambers, the interior of said plunger providing a connection for liquid flow through said second conduit,
  4. longitudinally spaced inner and outer valve seat means disposed within the inner end portion of said plunger,
  5. and a longitudinally movable valve member disposed in said inner end portion of said plunger and confined between said seat means and freely movable therebetween,
  6. said valve member being movably responsive to liquid flow from said tank into said plunger toward said use facility valve when the latter is opened to thereby engage said inner seat means and move said plunger

longitudinally inwardly so that air will be drawn into said outer chamber through said one way valve,

7. said valve member also being movably responsive to liquid flow from said pump into said plunger toward said tank when the pump is actuated to thereby engage said outer seat means and move said plunger longitudinally outwardly so that air in said outer chamber will be compressed and discharged into the liquid flowing into said tank through said second conduit.

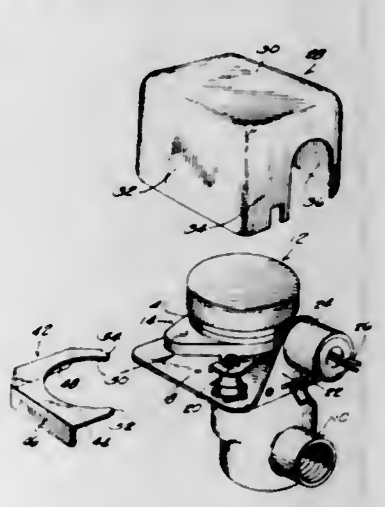
4,002,185
MOTOR OPERATED VALVE UNIT WITH HEAT DISSIPATING CLIP MEMBER

Harry C. Konczal, Milwaukee, Wis., assignor to Erie Manufacturing Company, Milwaukee, Wis.

Filed Oct. 24, 1975, Ser. No. 625,633

Int. Cl.² F16K *49/00*

U.S. Cl. 137—338 **6 Claims**



1. A motor operated valve unit comprising:
a fluid valve unit;
an electric motor for actuating said valve unit;
a drive mechanism mounted between said valve unit and said motor to operatively connect said motor to said valve unit;
an enclosure means for said electric motor and drive mechanism comprising a mounting bracket and a cover member; and
a heat dissipating member of metal material having a first portion thereof positioned in contact with said motor and a second portion thereof positioned in contact with said cover member, said first portion of said heat dissipating member including a curved edge having a diameter which conforms to the outside diameter of said motor and is in contact therewith, said heat dissipating member serving to conduct heat from said motor to said cover member.

4,002,186
QUICK DISCONNECT COUPLING

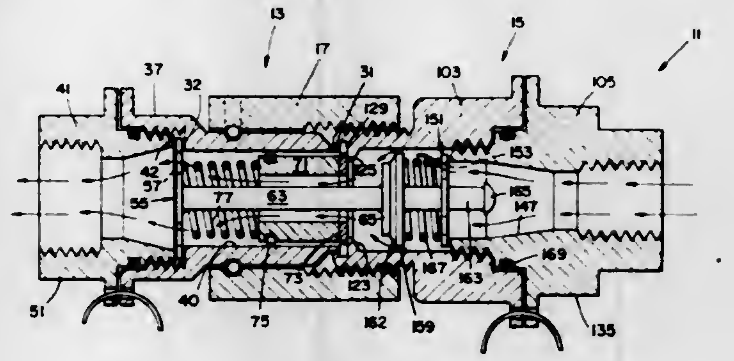
David O. Fink, and Stanley R. McCrary, both of Bremerton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 622,274

Int. Cl.² F16L *29/00, 37/28*

U.S. Cl. 137—614.03 **3 Claims**

1. A quick disconnect coupling comprising:
a. a female section and a male section;
b. said female section including a cylindrical member, a fitting member, a rotatable nut and a spring loaded valve;
c. said cylindrical member having a first section at one end and a second section at the other end;
d. said first section including an interior cylindrical surface and an adjacent flange;
e. said fitting member including an exterior cylindrical surface and an adjacent flange;
f. said interior cylindrical surface having a larger diameter than said exterior cylindrical surface and being positioned exterior of and co-extensive with respect to said exterior cylindrical surface;
g. a cylindrical groove formed inwardly from said exterior cylinder surface and positioned a predetermined distance from the flange of said fitting member;
h. a circular seal positioned in said groove and slidably engaging said interior cylindrical surface;
i. said second section of said cylindrical member including an exterior cylindrical surface, an interior cylindrical surface, and a circular shoulder depending from the end of said second section, said circular shoulder having a diameter that is less than the diameter of said second exterior surface of said second section;
j. said rotatable nut including an interior cylindrical surface at one end and female threads at the other end, a first cylindrical bearing race formed outwardly from said interior cylindrical surface of said rotatable nut, said cylindrical member having a second cylindrical bearing race formed inwardly from said second exterior cylindrical surface, said first and second bearing races being adjacent and filled with bearing balls, said interior cylindrical surface of said rotatable nut having a diameter of from about 1 to 5 thousandths of an inch greater than said exterior cylindrical surface of said second section;
k. said spring loaded valve including a cylindrical seal, said valve being positioned within said cylindrical member and having said seal in slidable engagement with said interior cylindrical surface of said second section;
l. said male member including a circular seal for engaging said circular shoulder; and
m. means for engaging said female section and said male section.



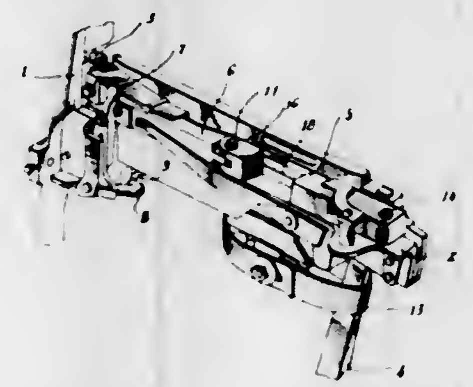
4,002,187
FLY SHUTTLE LOOM SHUTTLE BOX

Joseph E. Stahl, Easthampton, and William J. Hanson, Stow, both of Mass., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,083, Sept. 18, 1974, abandoned. This application May 27, 1975, Ser. No. 581,213

Int. Cl.² D03D *49/54*

U.S. Cl. 139—185 **4 Claims**



1. An improved binder for each shuttle box of fly looms, each binder comprising a leather lining, substantially solid, not significantly compressible high flex life elastomer, each binder being fastened to its respective shuttle box at both ends and positioned so as to encounter the shuttle on entering and while in the shuttle boxes, the elastomer binder being insufficiently compressible to operate except by the bowing out of the binder as the shuttle proceeds in the box, the only significant force decelerating the shuttle as it moves in the box being the force of bowing of the elastomer binder.

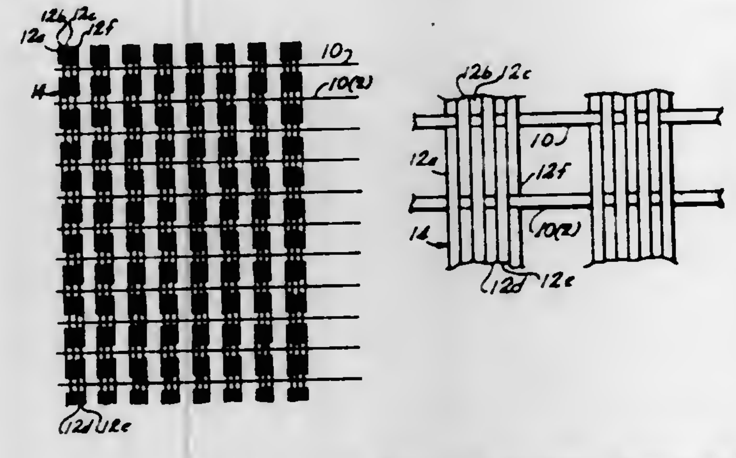
4,002,188
WOVEN SHADE SCREEN

Albert Hanks, Tuscaloosa, Ala., assignor to Phifer Wire Products, Inc., Tuscaloosa, Ala.

Filed Dec. 15, 1975, Ser. No. 640,868

Int. Cl.² D03D *1/00*

U.S. Cl. 139—420 R **3 Claims**



1. A woven shade screening fabric: a plurality of individual, spaced strands in parallel relationship in one direction of either the warp or fill of a woven fabric and comprising individual strands in substantially a uniform pattern, a plurality of groups of six substantially parallel individual strands closely associated in side-by-side relationship in the other direction of the fabric of the warp and fill from that of the preceding described uniform strands, said groups of strands being equally spaced to provide an open weave mesh pattern therebetween for the purpose of admitting some light and air while blocking some of the glare and sunlight, and the strands in each of said groups being arranged one strand over and the next strand under in alternating interlocking relationship at the point of crossing each of the respective individual strands in the other direction whereby in each point of intersection some of said strands are over and some of said strands are under and the next successive crossing of groups of strands alternate from the preceding one, each of the next successive strands alternating from over to under at each intersection and then alternating from under to over at the next intersection.

4,002,189
APPARATUS FOR SELECTING SHUTTLES WITH WEFT WINDINGS OF DIFFERENT YARN TYPES

Alois Steiner, Rieden, and Edgar Strauss, Ruti, both of Switzerland, assignors to Ruti Machinery Works Ltd., Ruti, Switzerland

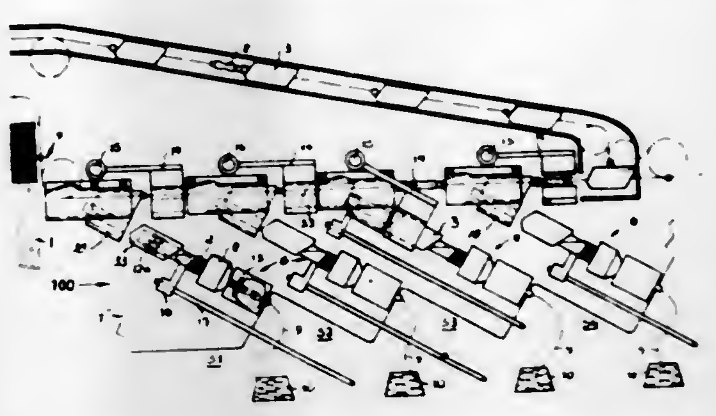
Filed Aug. 11, 1975, Ser. No. 603,515

Claims priority, application Switzerland, Aug. 26, 1974, 11608/74

Int. Cl.² D03D *47/26, 45/00*

U.S. Cl. 139—436 **12 Claims**

1. An apparatus for selecting shuttles with weft windings of different yarn types for a programmed weft insertion on a travelling wave loom, wherein empty shuttles removed from the weaving process receive their weft thread winding through a winding mechanism, wherein the apparatus comprises a plurality of stations arranged in the zone of weft insertion of the travelling wave loom, each station having one winding mechanism and wherein at each station actuating members are operatively connected to a programme control device for the selective insertion into the weaving process of one of the shuttles prepared on the winding mechanism of one of the stations and for the at least approximately simultaneous removal of an empty shuttle from the path of the shuttles and supplying it to the particular winding mechanism.



4,002,190
DEVICE FOR DEPOSITING WEFT THREAD SUPPLIES IN JET LOOMS

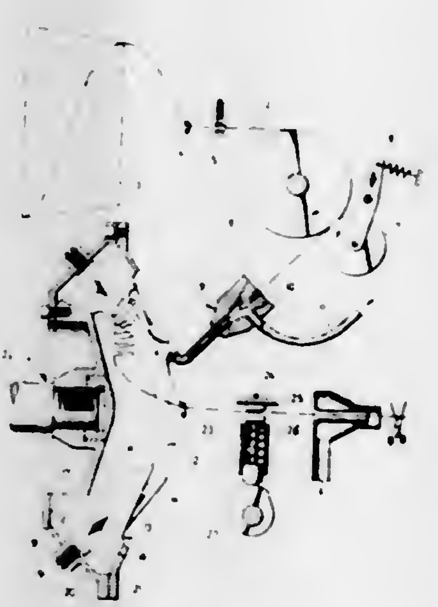
Zdenek Sevcik, Brno; Miroslav Bucek, Brnenske Ivanice, and Jindrich Henzl, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav, Brno, Czechoslovakia

Filed Nov. 17, 1975, Ser. No. 632,859

Claims priority, application Czechoslovakia, Nov. 15, 1974, 7782/74

Int. Cl.² D03D *47/36*

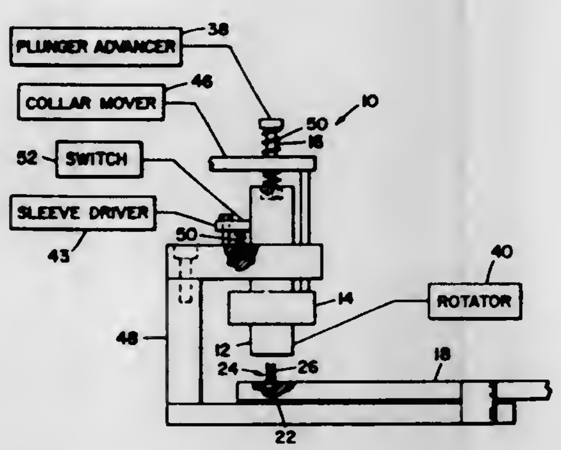
U.S. Cl. 139—452 **4 Claims**



1. A device for depositing weft thread supply for weaving machines having feeding and withdrawing mechanisms for the thread, said device being arranged between the feeding and withdrawing means and comprising an inserter, a magazine in the shape of a body of revolution, a plurality of uniformly arranged ribs projecting towards the axis of said body of revolution and being mounted thereon, said ribs defining gaps therebetween, said inserter being adapted to deposit said thread in said magazine so as to extend across opposite edges of said ribs and into said gaps between adjacent ribs and means for relatively rotatably driving the said magazine and inserter.

4,002,191
APPARATUS AND METHOD FOR STRAIGHTENING SEMI-CONDUCTOR PINS

Gianni Lorenzini, 1049 Oregon Ave., Palo Alto, Calif. 94303
Filed Sept. 15, 1975, Ser. No. 613,497
Int. Cl.² B21F *1/02, 7/00*
U.S. Cl. 140—147 **14 Claims**

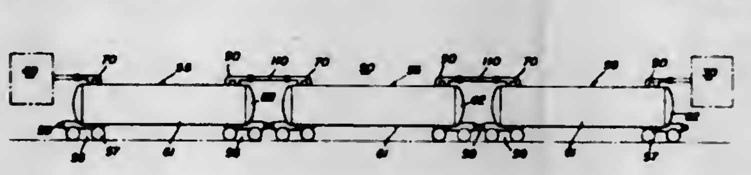


1. Apparatus for parallel alignment of a plurality of stiff bendable pins each proceeding generally in the same direction from a common head, comprising:

1. Means for holding a head having a plurality of stiff bendable generally equally spaced pins each attached to a base end thereof to extend from said head generally in one direction to a free end thereof, the base ends of said pins defining a circular ring having an inner and an outer diameter and an axis;
2. Means for preventing said pins from separating from one another beyond a cylindrical volume defined by said outer diameter and said axis;
3. A plurality of pistons in one to one relation with said plurality of pins generally perpendicular to said pins, each piston aiming towards said axis;
4. Means for inserting said pistons, one between each of adjacent of said pins towards said axis;
5. A round plunger coaxial with said axis and having a diameter generally equal to said inner diameter;
6. Means for advancing said plunger axially towards said ring with a forward end thereof between said pins; and
7. Means for rotating said head relative to said pistons about said axis.

4,002,192
RAILWAY TANK CAR TRAIN HAVING A TWO-WAY LOADING AND UNLOADING SYSTEM

Erling Mowatt-Larssen, Warren, Ohio, assignor to General American Transportation Corporation, Chicago, Ill.
Filed May 30, 1975, Ser. No. 582,197
Int. Cl.² B61D *5/08;* **B65B** *3/04;* **E03B** *7/04;* **F17D** *1/12*
U.S. Cl. 141—35 **15 Claims**



1. A railway tank car for interconnection in fluid communication with associated tank cars by flexible connecting conduits for accommodating consecutive loading, unloading, and transportation of expandable ladings, said tank car comprising a wheeled chassis structure provided with chassis coupling means for coupling to the chassis of associated cars, a tank mounted on said chassis structure, lading conduit means mounted on the top of said tank and having two outer ends extending outwardly from said tank adjacent to the top thereof, an eduction conduit having an outer end in fluid communication with said lading conduit means and having an inner end in fluid communication with the interior of said tank, the inner end of said eduction conduit being positioned near the bottom of said tank to facilitate the emptying of said tank through said eduction conduit, two vent conduits each having an outer end in fluid communication with said lading conduit means and having an inner end in fluid communication with the interior of said tank, the inner end of each of said vent conduits extending into said tank and terminating a predetermined distance below and near the top of said tank, and a plurality of valves for interrupting communication between said vent conduits and said lading conduit means and between said eduction conduit and said lading conduit means, whereby said tank may be loaded and unloaded from either end of said lading conduit means by adjustment of said valves to interrupt communication between the one end of said lading conduit means and the adjacent vent conduit and to interrupt communication between the other end of said conduit means and the eduction conduit.

15. A railway tank car train for accommodating consecutive loading, unloading and transportation of expandable ladings, said train comprising a plurality of railway tank cars connected in tandem relationship, each of said tank cars including a wheeled chassis structure provided with chassis coupling means for coupling to the chassis of associated cars, a tank mounted on said chassis structure, lading conduit means mounted on the top of said tank and having two outer ends extending outwardly from said tank adjacent to the top thereof, an eduction conduit having an inner end thereof in communication with the interior of said tank and being in fluid communication with each of said lading conduits, the inner end of said eduction conduit being positioned near the bottom of said tank to facilitate the emptying of said tank through said eduction conduit, two vent conduits each having an outer end in fluid communication with said lading conduits and an inner end in fluid communication with the interior of said tank, the inner end of each of said vent conduits extending into said tank and terminating a predetermined distance below and near the top of said tank, a plurality of valves for interrupting communication between said vent conduits and said lading conduit means and between said eduction conduits and said lading conduit means, and conduit coupling means on each of said lading conduit means for coupling to an associated end of an associated flexible connecting conduit to place said tank in fluid communication with the tanks of adjacent-like tank cars, whereby said tank train may be loaded and unloaded from either end thereof by adjustment of said valves on each of said tank cars to interrupt communication between the individual ends of said lading conduit means and the adjacent vent conduits and to interrupt communication between the other ends of the lading conduit means and the adjacent eduction conduits.

4,002,193
CONTOUR-COPYING LATHE AND METHOD OF OPERATING SAME WITH PRESHAPED WORKPIECES

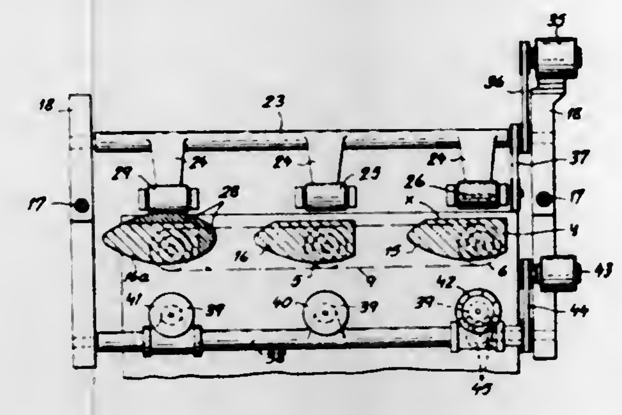
Erich Schmidt, Mauerbach, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges. Wien, Vienna, Austria
Continuation-in-part of Ser. No. 338,814, March 7, 1973, Pat. No. 3,863,691. This application Oct. 7, 1974, Ser. No. 512,607
Claims priority, application Austria, Oct. 9, 1973, 8571/73
Int. Cl.² B23Q *35/04;* **B23B** *3/28*
U.S. Cl. 142—7 **7 Claims**

1. In a method of operating a copying lathe wherein a workpiece and a model are synchronously rotated about respective parallel axes and a feeler riding on and displaceable along the model is so linked to a sanding tool engageable with and similarly displaceable along the workpiece so that said tool closely follows said feeler to copy the contours of said model into said workpiece, the improvement comprising the steps of:

providing a model having extensions in regions corresponding to surfaces on said workpiece which are not to be shaped;
lifting said sanding tool from said workpiece by engagement of said feeler with said extensions; and

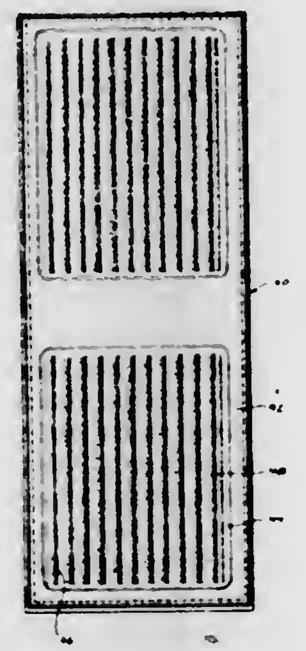
providing a secondary model having the exact shape desired for said workpiece and milling all of the contours of said secondary model in said workpiece in a first pass, then sanding said workpiece according to the shape of the primary model with lifting of said tool from said workpiece at said extensions.

3. In a copying lathe for producing elongated wood articles with a nonuniform configuration wherein at least one workpiece is rotatable about a longitudinal axis and is driven synchronously with at least two models rotatable about corresponding axes parallel to the workpiece axes, each of the models being provided with a separate feeler for controlling a respective tool to shape said workpiece, the feelers and tools being synchronously shiftable axially along said models and workpiece, the improvement wherein said models have essentially the same shapes but one of said models is provided with projections at selected locations therealong to lift the respective tool out of engagement with its workpiece at corresponding locations thereof.



4,002,194
SAFETY WALLET

Charles B. Wright, Sr., 311 N. Lindbergh, St. Louis, Mo. 63141
Filed Nov. 5, 1975, Ser. No. 628,725
Int. Cl.² A45C *1/06*
U.S. Cl. 150—47 **1 Claim**

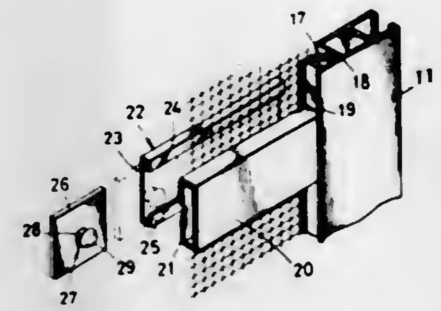


1. A safety wallet for retention in a fabric pocket having pocket side panels, the wallet comprising:

a pair of wallet sections connected to one another at a fold section;
each of said sections being generally rectangular in form and having an outer panel with an exposed surface and with side and end edges;
each of said exposed surfaces having a substantially rectangular area of a dimension such as to be closely adjacent the side and end edges of the respective sections and to substantially cover said sections;
the sections having rim portions surrounding the areas with a relatively low coefficient of friction in relation to that of the rectangular areas;
the rectangular areas having a plurality of closely spaced, outstanding, randomly directed, hirsute surface protuberances thereon;
said rectangular areas further comprising a plurality of heat pressed, integral, indented lines extending essentially parallel to each other from edge to edge to form integral, parallel hirsute ridges;
whereby, said hirsute surface protuberance ridges being soft and flexible provide a high and substantially equal coefficient of sliding friction in all directions in localized fashion between the heat pressed indented lines on respective pocket side panels to prevent inadvertent loss of the wallet and to prevent unauthorized withdrawal of the wallet from the pocket.

4,002,195
MIDDLE RAIL ASSEMBLY FOR USE IN SCREEN DOORS AND SASHES

Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 3, 1976, Ser. No. 682,450
Claims priority, application Japan, May 12, 1975, 50-63524[U]
Int. Cl.² E06B *3/30*
U.S. Cl. 160—379 **4 Claims**



1. A middle rail assembly for centrally clamping the screen in the frame of a screen door or sash, comprising:

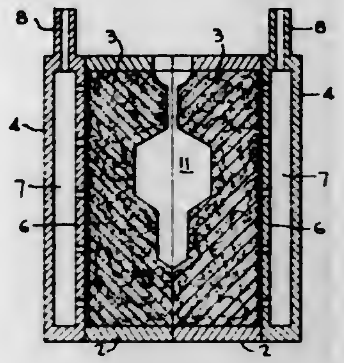
a. a supporting member adapted to be held at its ends by the frame and having a plurality of apertures in a side thereof for being directed toward one side of the screen;
b. a middle rail cover having a C-shaped cross-section defining a channel extending along its length and opening toward the other side of the screen along the length of said supporting member;
c. a plurality of adjusting plates slidably snugly disposed in said channel; and
d. coupling means projecting from each of said adjusting plates, said means being of such configuration as to enable it to be forced through the screen and tightly into one said apertures for thereby clamping the screen therebetween.

4,002,196
METHOD FOR FORMING AN EQUALIZED LAYER TO A SHAPING SURFACE OF A MOLD

Katsutoshi Inadama, 537 Oaza-Sakurado, Koshoku, Japan (387)
Filed Jan. 11, 1974, Ser. No. 432,654
Int. Cl.² B22C *9/02*
U.S. Cl. 164—7 **6 Claims**

1. A method for molding metal comprising the steps of:
forming an equalized layer onto a shaping surface of each of two complementary molds comprising the steps of: placing a mold flask on a pattern member having a surface of

the same shape as a casting; filling the flask with a filling material consisting of a heat resisting particulate material having a volatile binder, a shaping surface defining a cavity being formed in the filling material by the pattern member; setting an evacuation box on top of the flask; inverting the pattern member, the flask and the evacuation box; removing the pattern member from the flask; forming a sealing layer by applying a sealing material having instant drying properties onto the shaping surface; evacuating the flask through the evacuation box to remove the volatile binder from the filling material and to draw the dryed sealing material to the filling material to prevent movement between the particles of filling material;



joining the two complementary molds so that the adjoining cavities of the molds form a larger cavity; and pouring a molten metal into the larger cavity.

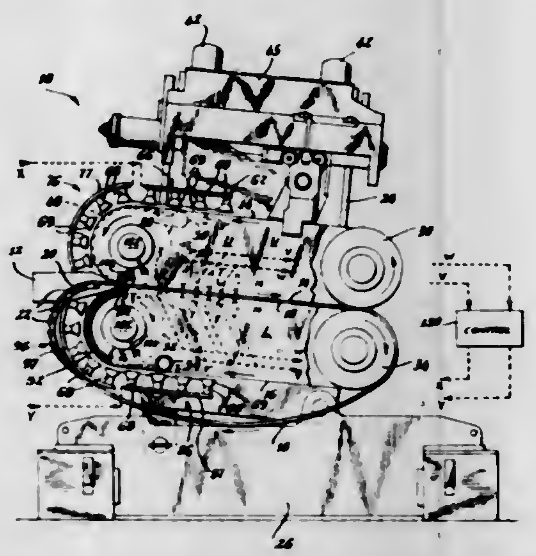
4,002,197
CONTINUOUS CASTING APPARATUS WHEREIN THE TEMPERATURE OF THE FLEXIBLE CASTING BELTS IN TWIN-BELT MACHINES IS CONTROLLABLY ELEVATED PRIOR TO CONTACT WITH THE MOLTEN METAL

Robert William Hazelett, Winooski, and John Frederick Barry Wood, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Division of Ser. No. 414,237, Nov. 9, 1973, Pat. No. 3,937,270. This application Aug. 7, 1975, Ser. No. 602,579

Int. Cl.² B22D *27/02*

U.S. Cl. 164—250 13 Claims



4. In a twin-belt casting machine in which a casting region is defined between opposed portions of the front faces of a pair of revolving endless flexible casting belts and in which the molten metal to be cast is introduced into the casting region to be carried along between the front faces of the belts as it is being solidified, the invention comprising:

a plurality of banks of radiant heaters,

first support means mounting one of the banks of heaters closely adjacent to the front face of one of the casting belts in a position located before the revolving belt enters the casting region,

second support means mounting another of the banks of heaters closely adjacent to the front face of the other casting belt in a position located before the revolving belt enters the casting region,

said first and second support means aiming the banks of heaters to direct intensive radiant energy onto the front faces of the respective belts at close range for pre-heating the belts before they enter the casting region,

a plurality of belt distortion sensors positioned to engage the reverse surfaces of the respective belts, as they travel through the casting region,

said belt distortion sensors being arranged to provide electrical output signals as a function of the belt distortions being sensed, and

control means for said banks of heaters for controlling the amount of radiant heat energy being applied to the respective belts,

said control means being connected to said belt distortion sensors for controlling said banks of heaters as a function of the electrical output signals from said sensors,

thereby to minimize the distortion of the casting belts after they begin carrying the molten metal between them in the casting region.

4,002,198
FINNED TUBE HEAT EXCHANGER USED AS A DESUBLIMATOR FOR ISOLATING SUBLIMATION PRODUCTS, ESPECIALLY PHTHALIC ANHYDRIDE, FROM REACTION GASES

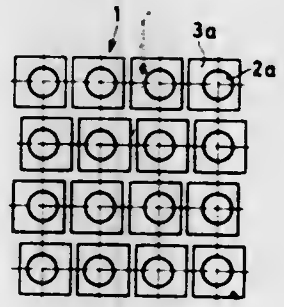
Joachim Wagner, Ludwigshafen, and Harry Kassat, Bochum, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1975, Ser. No. 608,626

Claims priority, application Germany, Sept. 5, 1974, 2442420

Int. Cl.² B01D *7/00*

U.S. Cl. 165—61 9 Claims



1. A finned tube heat exchanger used as a desublimator for isolating sublimation products, especially phthalic anhydride, from reaction gases, which consists of a housing with connections to permit the passage of the reaction gas and the discharge of the molten sublimation product, and of several rows, fitted one above the other, approximately horizontally, within the housing, of identical finned tube bundles, supported so that they can move independently of one another when undergoing thermal expansion or contraction, the bundles being intended alternately to be subjected, from the inside, to a heating medium and a coolant, especially a heat transfer oil, wherein the reaction gas travels, within the housing, transversely to the direction of flow of the heating medium and coolant in the tubes, and finned tube bundles, arranged parallel, above one another and optionally also alongside one another, consist of at least two rows of tubes, arranged above one another, which are connected to one another, at one end, by tube bends, to form a hairpin tube, and at the opposite end, the rows of tubes are connected, by means of a tube plate, to a collecting and distributor chamber for the heating medium or coolant, and the transverse fins mounted on the core tubes

are staggered laterally in rows, in opposite directions, within each tube bundle, wherein each finned tube bundle (1) consists of four superposed rows of tubes, with the said superposed tubes (2, *2a*, *2b*) being aligned with one another relative to the direction of flow of the reaction gases, the tubes of the rows of tubes being connected to one another, by the common header (6), in such a way that the same stream of heating medium or coolant successively flows through the tubes or groups of tubes of the first and third row of tubes and of the second and fourth row of tubes and the transverse fins (3, *3a*, *3b*) fixed on the core tubes (2, *2a*, *2b*) being mounted on the latter eccentrically to the axes of the tubes and staggered in rows, laterally in opposite directions, by an amount corresponding to about from half the spacing to the whole spacing between the laterally adjacent edges of fins.

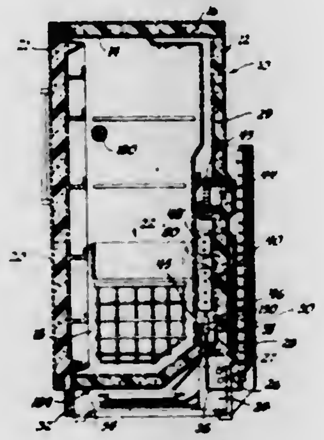
4,002,199
REFRIGERATOR FOOD CONDITIONING APPLIANCE

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,354

Int. Cl.² F25B *29/00*

U.S. Cl. 165—61 4 Claims



1. In a refrigerator, a cabinet having an insulated food storage compartment therein for storage of frozen foods, an evaporator cooling coil within said compartment having a vertically disposed air flue duct, an evaporator cooling coil within said duct, fan means in said air duct for forcibly circulating air in heat exchange transfer relation with said evaporator prior to the air being exited into said freezer compartment, an insulated food storage receptacle disposed in said compartment in a position such that said duct has an air outlet in communication with an air inlet in said receptacle, a reflective damper member pivotally mounted in said receptacle air inlet for controlling the flow of refrigerated air therethrough, infrared lamp means mounted in front of the reflective surface of said damper, selectable damper control means pivoting said damper member to a plurality of positions including a normal refrigerating position and a fast thawing position; said damper member operative in said refrigerating position closing said inlet and directing infrared radiation heat energy from said lamp means by reflective means in said duct onto said cooling coil during a defrost cycle, said damper member operative in said fast thaw position closing said inlet and directing infrared radiation heat energy from said lamp means into said receptacle to fast thaw food items placed therein.

4,002,200
EXTENDED FIN HEAT EXCHANGER PANEL

Walter Raskin, Brooklyn, N.Y., assignor to Dean Products, Inc., Brooklyn, N.Y.

Continuation of Ser. No. 313,180, Dec. 7, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,505

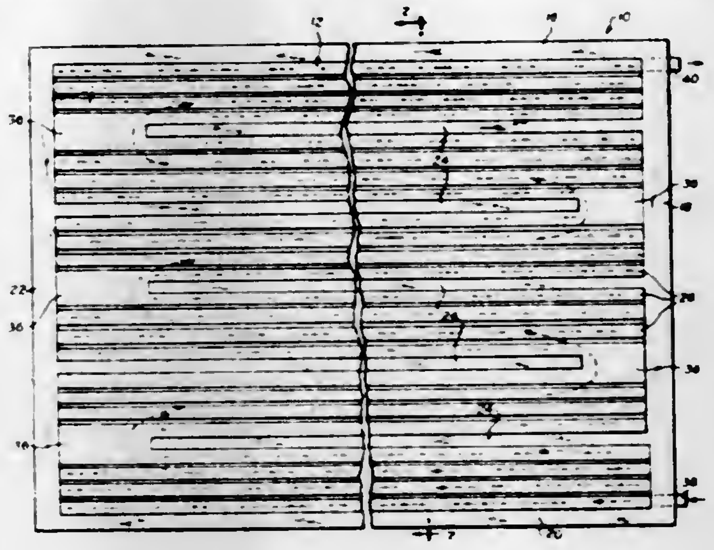
Int. Cl.² F24H *3/00*; **F28F** *3/14*

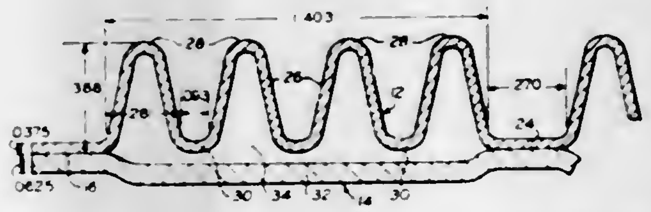
U.S. Cl. 165—131 4 Claims

1. A heat exchange panel formed from two superimposed rectangular plates bonded together along their edges and having an inlet and an outlet for circulating the heat exchange medium;

a. one of said plates being corrugated to form groups of easily cleanable, smoothly rounded open-looped undulating fins having a reduced tendency to become fouled and intervening flat portions;

b. the other one of said plates being substantially flat and sealed to the flat portions of said corrugated plate forming together therewith sealed strips separating said groups of open-looped undulating fins and sealed strips extending alternately from one bonded edge to a distance spaced from the opposite bonded edge to form open unsealed portions permitting the heat exchange medium to pass in heat exchange relationship successively through said groups of open-looped undulating fins in alternately reversed directions across the panel from the inlet to the outlet thereof;





c. said substantially flat plate having a depressed portion extending between each of said strips and being co-extensive in length with each of said groups of undulations and spaced from the undulations facing said depressed portions to provide direct prime heat exchange between the open-looped fins of each of said groups and expose virtually the entire inner heat exchange surface of the panel to such direct prime heat exchange contact with the medium therein and provide a panel having a heat capacity coefficient K of approximately 2.5 BTU per square foot of projected surface times the difference in temperature between the panel and the ambient air.

4,002,201
MULTIPLE FLUID STACKED PLATE HEAT EXCHANGER

Desmond M. Donaldson, Halton, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

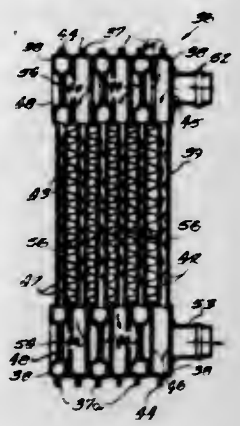
Filed May 24, 1974, Ser. No. 473,254

Int. Cl.² F28F *3/08*

U.S. Cl. 165—140 9 Claims

1. A multiple fluid heat exchanger comprising a first set of self-contained plates and a second set of self-contained plates of substantially identical construction, the second set of plates being reversely arranged and interleaved with the first set of plates, each plate formed of a pair of oppositely disposed metal sheets of dished configuration joined along their periph-

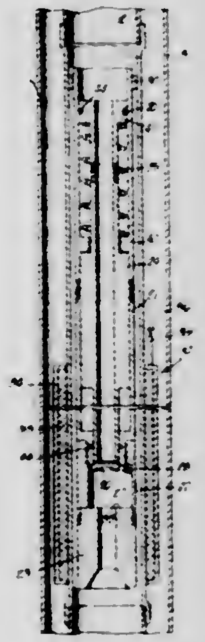
eries to provide an upper and a lower fluid header and a core portion interconnecting said headers, said fluid headers of said interleaved plates being positioned in abutting sealed relation, said first set of plates having inlet and outlet ports in registry and interconnected to provide fluid communication therethrough and said second set of plates having inlet and outlet ports in registry and interconnected to provide separate fluid communication therethrough, each fluid header comprising an enlarged fluid conduit portion extending the full width of the plate and having a port positioned adjacent one end of the header and a recessed portion providing a through-port adjacent the opposite end of the header.



4,002,202
FAIL-SAFE SAFETY CUT-OFF VALVE FOR A FLUID WELL

Donald L. Huebsch, 3716 Prestwick Drive, Los Angeles, Calif. 90027, and Louis B. Paulos, 9616 Yolanda Ave., Northridge, Calif. 91324

Filed Sept. 24, 1975, Ser. No. 616,189
Int. Cl.^{2} E21B *43/00;* **F16K** *31/06, 17/34*
U.S. Cl. 166—65 M **17 Claims**

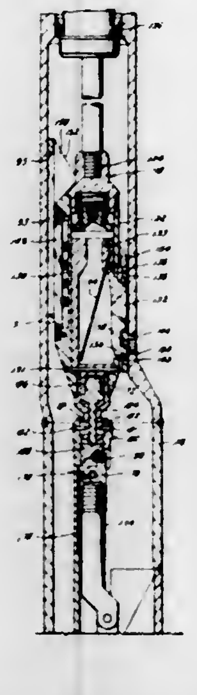


1. A fail-safe safety cut-off valve assembly suitable for use deeply submerged and supported coaxially of the tubing string of a fluid well comprising: an open-ended tubular housing of non-magnetic material forming a tubular portion of said tubing string and supporting a solenoid coil substantially embraced except on its interior side by magnetic material, a tubular armature of magnetic material mounted within said housing and reciprocal between extended and retracted positions axially of said tubular housing and of said solenoid coil and having cut-off valve means operatively associated therewith, spring means biasing said valve means closed and said armature to said extended position when said solenoid coil is de-energized, said solenoid coil, when energized, being effective to shift said armature to said retracted position and to open said cut-off valve, and means providing a fluid seal between the exterior of said armature and the interior of said tubular housing.

4,002,203
WELL INSTALLATION

Ben David Terral, Houston, Tex., assignor to Camco, Incorporated

Filed Sept. 8, 1975, Ser. No. 610,970
Int. Cl.^{2} E21B *23/02*
U.S. Cl. 166—117.5 **12 Claims**



1. A well locator tool for coacting with a well sub positioned in a well tubing, said sub having an orientation sleeve having a downwardly extending guide surface on the top of the sleeve, an upwardly directed actuating shoulder on the sleeve, and a slot in the sleeve having a configuration of at least one ridge and one valley, said tool comprising,

a body having connection means for moving the tool through a well tubing and including means for supporting well apparatus,

actuating means including a finger movably connected to said body for longitudinal movement, and including a well apparatus actuator, said finger including a downwardly directed actuating shoulder for engaging the shoulder in the sleeve,

spring means yieldably urging said finger outwardly,

releasing means initially preventing longitudinal movement between the body and said finger but allowing movement after being released thereby allowing movement between said body and said actuator, and

means allowing but yieldably resisting longitudinal movement between the body and said finger whereby further longitudinal movement of the body, after the releasing means is released, may occur only after movement between said body and said actuator.

4,002,204
TIMING THE DEPOSITION OF AN ASPHALT PLUGGING MATERIAL FROM AN ASPHALT-CATIONIC EMULSION

Daniel C. Cavin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1975, Ser. No. 631,775
Int. Cl.^{2} E21B *33/138*
U.S. Cl. 166—294 **11 Claims**

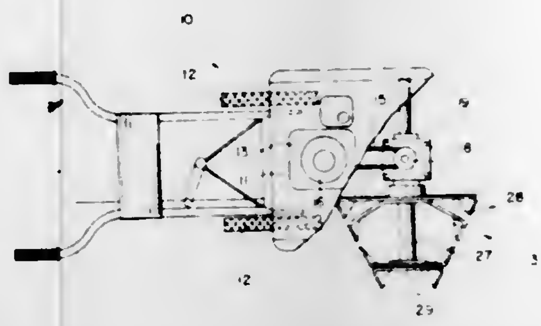
1. In a process in which a cationic emulsion that contains asphalt and a pH-increasing reactant is injected into a subterranean earth formation to plug the earth formation, the improvement comprising:

using, as the pH-increasing reactant, a mixture consisting essentially of urea and urease.

4,002,205
HORTICULTURAL DEVICE

David C. Falk, 4239 Avent Ferry Road, Raleigh, N.C. 27606

Filed Dec. 5, 1974, Ser. No. 529,738
Int. Cl.^{2} A01D *35/00;* **A01B** *23/02*
U.S. Cl. 172—15 **1 Claim**

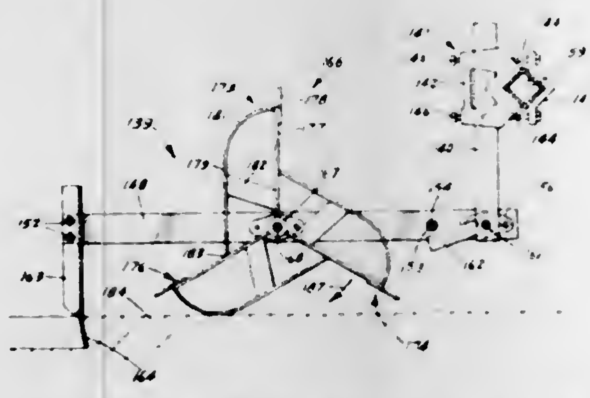


1. A horticultural device for establishing and maintaining the boundary between plant beds and ambient grassy areas comprising: a frame means; a plurality of wheel type means for supporting said frame means relative to a surface of the earth to be transversed; handle means secured to said frame means for user controlling the said horticultural device during traverse; means for causing said supported frame means to traverse said surface; power drive means carried by said frame means for imparting a rotative motion to a shaft means, said shaft being disposed generally parallel to said surface and perpendicular to the direction of traverse; and significantly spaced apart first and second sets of pluralities of elongated earth cutting and scattering blades mounted on one end of said shaft means, each of said sets having outer tips which are so angled that, as such blades rotate with said shaft means, said shaft forms the axis of a generally frustroconical shaped cutting swath, and at least one of the angled tips of each set of blades being disposed toward the other set whereby, as the edge of said cutting swath engages the earth, a wedge-shaped-in-cross-section trench will be cut and the dirt therefrom impelled and scattered toward the small end of said frustrocone thereby establishing a neat, clear-cut eye pleasing demarcation boundary.

4,002,206
DITCHER

Fred W. Eisenhardt, Fargo, N. Dak., assignor to Alloway Manufacturing, Inc., Fargo, N. Dak.

Division of Ser. No. 474,048, May 28, 1974, abandoned. This application Apr. 3, 1975, Ser. No. 564,829
Int. Cl.^{2} A01B *35/32*
U.S. Cl. 172—90 **27 Claims**

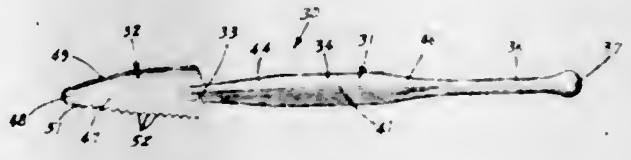


24. An earthworking implement for making separate trenches in the soil comprising: a frame unit having laterally spaced side members, said side members having forward ends and rear ends, an upright support, means pivotally mounting the forward ends of the side members to the lower portion of the support whereby the frame units can sequentially pivot up and down in a generally vertical direction, earthworking tool means secured to the frame unit for forming separate trenches in the soil, wheel means for sequentially moving the frame unit and tool means up and down in a generally vertical direction to make separate trenches in the soil when the implement is moved in a forward direction, means rotatably mounting the wheel means on the frame unit between the ends thereof for rotation about a horizontal transverse axis, said wheel means having a center hub rotatably mounted on the side members between the ends thereof, a plurality of radial members secured to the hub, soil penetrating means being secured to the outer ends of each radial member, and a back member located behind each radial member for limiting the amount of penetration of the soil penetrating means, each back member having a convex curved outer section secured to the outer end portion of the radial member and an inner end secured to the adjacent radial member, a stop leg secured to the lower portion of the support, said stop leg extended rearwardly between the side members, and means located above the stop leg and secured to the side members and engageable with the stop leg to limit downward movement of the frame unit, earthworking tool means and wheel means.

4,002,207
EARTHWORKING TOOL WITH HANDLE HAVING TRIANGULARLY ARRANGED SIDES

Richard O. Bartz, 7017 Mark Terrace Drive, Edina, Minn. 55435

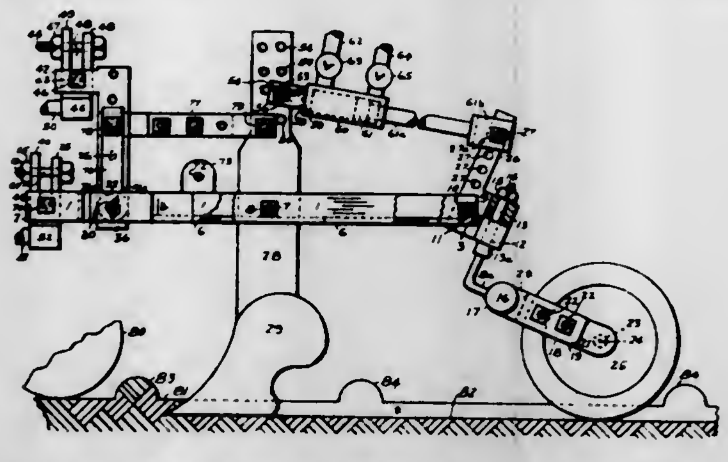
Filed Sept. 18, 1975, Ser. No. 614,507
Int. Cl.^{2} A01B *1/04, 1/14*
U.S. Cl. 172—378 **14 Claims**



11. An earthworking tool comprising: an elongated handle having a longitudinally elongated midsection having a first end and a second end, said midsection having outside first, second and third flat linear sides, said sides being located in a general triangular arrangement relative to each other whereby the midsection can be gripped with the first and second finger and thumb of the hand for manipulating the tool, said midsection of the handle having a longitudinal rib extended along the top of the handle, and a neck portion having a first end and a second end, said first end of the neck portion being attached to the second end of the midsection, said neck portion having first, second and third sides located in general triangular arrangement which extend in such configuration along substantially the entire length of the neck portion, said neck portion tapering inwardly along substantially its entire length in the direction away from said second end of the midsection, and means for working the soil attached to the second end of the neck portion.

4,002,208
PLOWING AND LEVEE CUTTING DEVICE

Adam Rougeau, 8670 Newfield Lane, Beaumont, Tex. 77707
Filed Mar. 12, 1975, Ser. No. 557,466
Int. Cl.^{2} A01B *3/24, 13/00, 63/22, 63/32*
U.S. Cl. 172—398 **5 Claims**

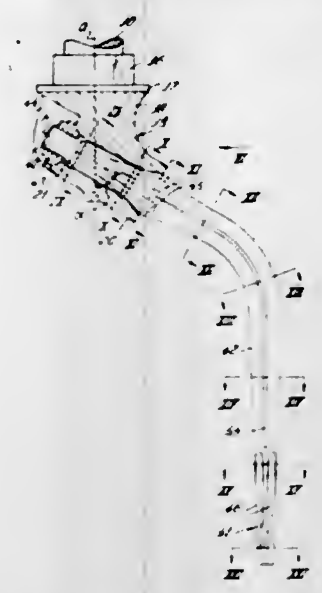


5. A plowing and levee cutting device connected to the rear end of a tractor and having a horizontal frame to which is pivotally connected a vertical plow shank with a plow blade point on its lower end and trailing roller wheel pivotally mounted adjacent the lower bent end of a turning pin which swivels through the lower end of a crank arm that is pivotally mounted on a pivot pin connected adjacent the rear end of said frame, said crank arm having a vertically disposed upper portion the lower end of which is pivotally connected to the rear end of a piston rod, a cylinder having a chamber therein, a piston movable in said cylinder chamber and connected to the forward end of said piston rod, the forward end of said cylinder rigidly connected to the upper end of said vertically disposed plow shank, a vertical post forward of the upper end of said plow shank, the upper ends of said post and plow shank pivotally connected together by a link arm, a hydraulically controlled piston rod extending rearwardly from said tractor with the rear end of said controlled piston rod attached to an upper hitch which is attached to the upper end of said post to keep said post, pivotal link arm and upper plow shank in rigid positions during the plowing opertion after the plow point blade and trailing wheel have been set at desired lowered positions for plowing, operating fluid under pressure introduced through a pipe and a regulating valve into said first named cylinder chamber rearward of said piston therein that extends between the upper ends of said plow shank and said crank arm to move said first named piston rearwardly to pull the upper end of said crank arm forwardly and simultaneously lift said plow point and roller wheel above ground level at desired inoperative position, a transporting bar, the upper end of said bar rigidly attached to said post and the lower end of said bar is rigidly attached to said frame and angularly disposed thereto to hold all pivotal connections on said device in rigid alignment so that when said device is lifted upwardly from the ground as a unit by tractor hydraulic lifting means whereby said device may be safely transported from one location to another location by said tractor, and upon removing said bar from said device said device may again be put into operative position.

4,002,209
SOIL WORKING TINES AND THEIR MOUNTING

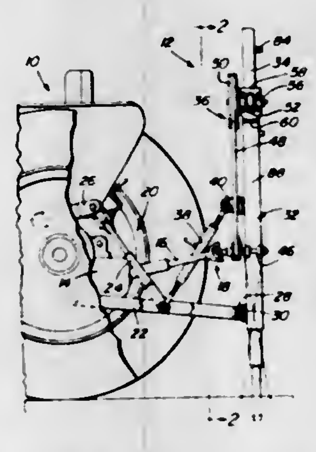
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Mar. 6, 1975, Ser. No. 556,148
Claims priority, application Netherlands, Mar. 7, 1974, 7403071
Int. Cl.^{2} A01B *33/14*
U.S. Cl. 172—762 **21 Claims**

20. A tine and mounting combination for a rotary harrow, said mounting being rotatable about an upwardly extending axis and comprising a bolder with an upwardly extending bore that receives an upper fastening portion of said tine, said bore and fastening portion extending through said holder and said bore having a longitudinal axis that substantially intersects said axis of rotation at an acute angle that opens downwardly towards the ground when viewed from aside, said mounting being connected to a shaft that defines said axis of rotation, said fastening portion being connected to a soil-working portion that includes an elongated lower straight region and an elongated upper straight region, said regions being interconnected by an integral bend, said upper region extending in the same direction as said fastening portion and said lower region extending substantially parallel to said shaft.



4,002,210
FRICTION WHEEL ACTUATED POST DRIVER

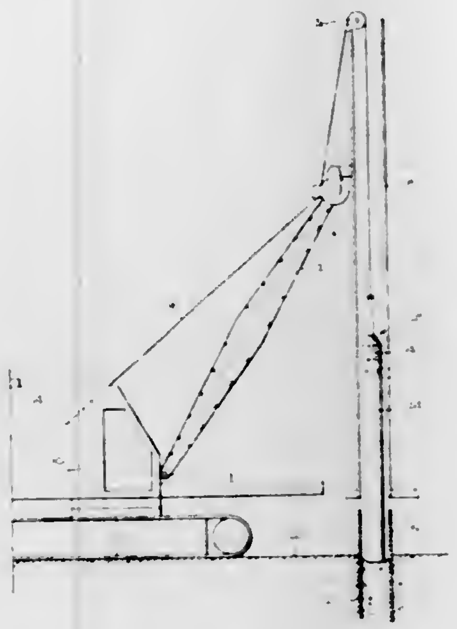
Charles R. White, R.F.D., Calhoun City, Miss. 38916
Filed Aug. 28, 1975, Ser. No. 608,738
Int. Cl.^{2} E21B *1/00*
U.S. Cl. 173—26 **8 Claims**



2. In combination with a tractor vehicle having a longitudinal axis and a hitch including a pair of lift arms and a drawbar interconnected between the lift arms, a post driver apparatus, comprising an elongated guide column, a driver element slidably mounted by said guide column, drive means carried by the guide column for upwardly displacing the driver element along an adjusted vertical direction of travel intersecting said longitudinal axis, and adjustable support means connecting the guide column to the drawbar between said lift arms for angularly adjusting said adjusted vertical direction of travel relative to the longitudinal axis.

4,002,211
CABLE OPERATED APPARATUS FOR FORMING PILES

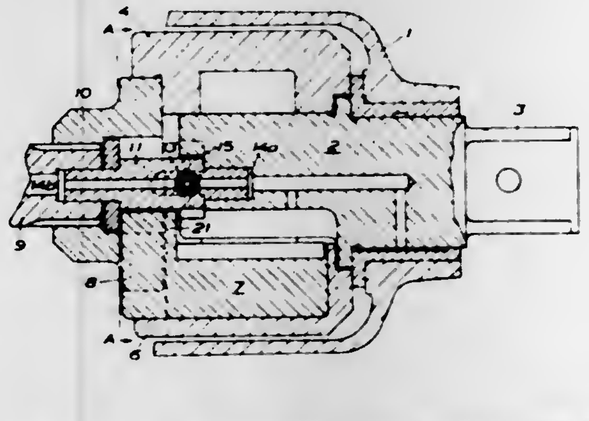
Henry A. Nelson Holland, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.
Filed Sept. 19, 1974, Ser. No. 507,613
Int. Cl. E02D *7/08*
U.S. Cl. 173—87 **15 Claims**



1. A pile hammer rig comprising, a crane, a hoisting drum carried by said crane, driving means and braking means for said drum, a drop-weight, a hoisting rope leading from said drum for lifting said drop-weight, a device for connecting said hoisting rope to said drop-weight including a rod and plunger piston assembly connected to said rope, means for connecting said rod and plunger piston assembly to the upper end of said drop-weight for movement between an upper position and a lower position with respect to said drop-weight, means for absorbing shock of said rod and plunger piston assembly when it approaches its upper position, and means for absorbing shock of said rod and plunger piston assembly when it approaches its lower position.

4,002,212
ROTARY IMPACT MECHANISM

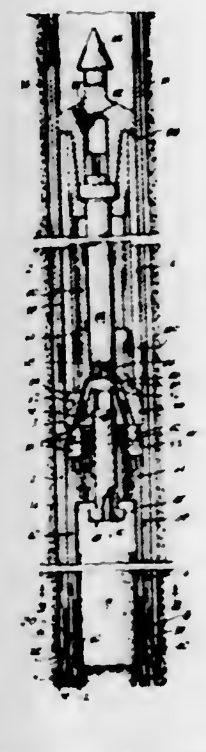
Knut Christian Schoeps, Tyreso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Sept. 22, 1975, Ser. No. 615,429
Claims priority, application Sweden, Oct. 2, 1974, 7412380
Int. Cl.^{2} B25D *15/00*
U.S. Cl. 173—93.5 **7 Claims**



1. A rotary impact mechanism comprising a rotatable anvil (2), a hammer (4) coaxially rotatable relative to the anvil, an impact dog (7) which is shiftable between an impact position and a free-running position and which in its impact position interconnects the hammer (4) and the anvil (2), and a control spindle (11) arranged to initiate impacts by shifting the impact dog (7) from said free-running position to said impact position, the improvement comprising a lock dog (13) movable between an inactive position and a locking position in which latter position the control spindle (11) is caused to initiate an impact, a spring (18) biasing said lock dog (13) toward said locking position and a release cam (21) arranged for instantaneous displacement of said lock dog (13) to said inactive position during rotation of the hammer (4).

4,002,213
DOWN-THE-HOLE MOTOR FOR ROTARY DRILL ROD AND PROCESS FOR DRILLING USING THE SAME

Gerald T. Sweeney, Federal Way, Wash., assignor to Tigre Tierra, Inc., Puyallup, Wash.
Continuation of Ser. No. 447,360, March 1, 1974, Pat. No. 3,733,209, which is a continuation-in-part of Ser. No. 283,208, Aug. 23, 1972, Pat. No. 3,854,537. This application May 7, 1975, Ser. No. 575,346
Int. Cl.^{2} E21B *49/00*
U.S. Cl. 175—58 **19 Claims**



1. A process for removing a core sample from an earth formation comprising excavating a hole in the earth formation by driving a rotary drill rod into the same comprising an elongated pipe having a longitudinally extending bore therethrough and a pair of inner and outer bits at the distal end thereof, the outer of which bits is annular and the inner of which bits is inserted in the rod adjacent the opening of the annular bit and retractable from the rod through the bore of the pipe, retracting the inner bit from the bore, inserting a core barrel and then a down-the-hole motor in the bore, arranging the core barrel adjacent the opening in the outer bit, rotating the rod while operating the motor to drive the rod and barrel forward in unison with one another to collect a core sample in the barrel, and retracting the motor and the core barrel from the bore to remove the sample from the formation.

4,002,214
DRILLING TOOL, ESPECIALLY FOR HAMMER DRILLS

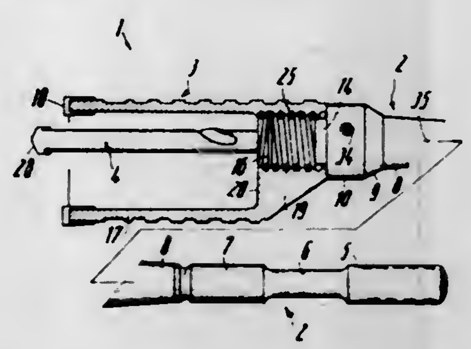
Dietrich Schaumann, Weingarten, Germany, assignor to Hawera Probst Kommanditgesellschaft Hartmetall-Werkzeugfabrik Ravensburgh, Ravensburg, Germany

Filed Apr. 23, 1975, Ser. No. 570,719

Claims priority, application Germany, Apr. 23, 1974, 2419548

Int. Cl.² E21B *9/12*

U.S. Cl. 175—405 **17 Claims**



1. A boring tool, especially for drill hammers, which includes: a borer shank comprising in combination a holding mandrel provided with an outer thread and with an outer helical centering surface between the windings of said outer thread, a hollow drill core bit provided with an inner thread corresponding to said outer thread and together with the latter forming a helical passageway while having an inner helical centering surface located between the windings of said inner thread and in centering engagement with said outer helical centering surface, and a cylindrical wire coil-thread insert located in said helical passageway and firmly interconnecting said bit and said shank, said centering surfaces between said outer and said inner threads being cylindrical and being provided at least within the region of the ends of said wire coil thread insert, said helical centering surfaces extending in an uninterrupted manner between adjacent windings of said wire coil-thread insert.

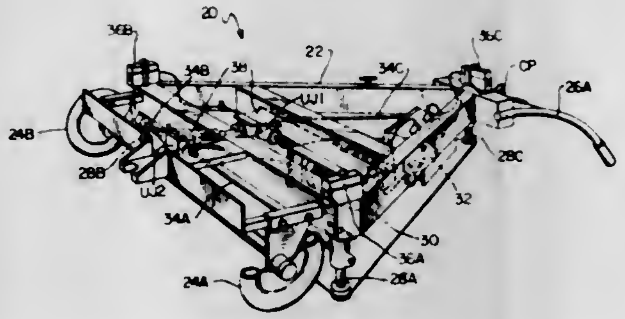
4,002,215
PORTABLE WEIGH APPARATUS FOR MEASURING LIQUID VOLUME

William Andrew Harvill, Decatur, Ga., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Feb. 26, 1976, Ser. No. 661,899

Int. Cl.² G01G *7/02*

U.S. Cl. 177—146 **12 Claims**



1. In a system for measuring the volume of material dispensed into a container, a mobile weigh cart comprising:
- frame means, said frame means having a top surface, a bottom surface and fore and aft ends;
- wheel means rotatably secured to said fore end of said frame means;
- handle means secured to the aft end of said frame means for lifting said frame means to facilitate the transportation of said frame means on said wheel means;
- jack means extending from the bottom surface of said frame means for lifting said frame means and said container;
- load cell means disposed on the top of said frame means for supporting said container, sensing the load generated thereby, and generating a signal proportional to said load;
- display unit means for directly indicating the volume based upon the density of said material in said container in response to said signal generated by said load cell means;
- support means on he top of said frame means for removably supporting said display unit means;
- motive power means supported by said frame means for generating a lifting force to drive said jack means; and
- control means for energizing said motive power means.

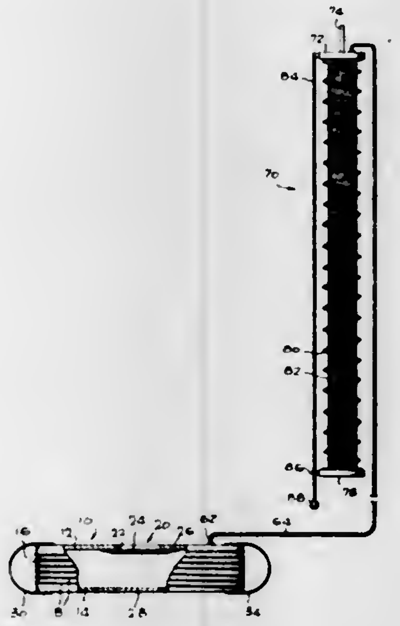
4,002,216
PORTABLE SCALE

Benjamin Solow, 5743 Rhodes Ave., North Hollywood, Calif. 91607

Filed Sept. 24, 1975, Ser. No. 616,495

Int. Cl.² G01G *5/04, 21/00*

U.S. Cl. 177—208 **13 Claims**



1. A portable weight-measuring scale comprising:
- a pneumatic platform having an upper board, a lower board and with a peripheral skirt therearound and attached to both said upper board and said lower board to defined a platform pneumatic volume of substantially constant area, said upper board being free to rock and move in a parallel plane with respect to said lower board so that, when a weight is placed on said upper board, pneumatic pressure in said pneumatic volume is proportional to the weight on said upper board; and
- means separate from said platform and connected to said pneumatic volume for measuring the pressure in said pneumatic volume to indicate the weight on the platform.

4,002,217
AIR COOLED TRACTOR CARBURETOR

David A. Fulghum; David A. Powers, both of La Grange; Ross M. Lathrop, Downers Grove, and Robert W. Swallow, Oak Lawn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

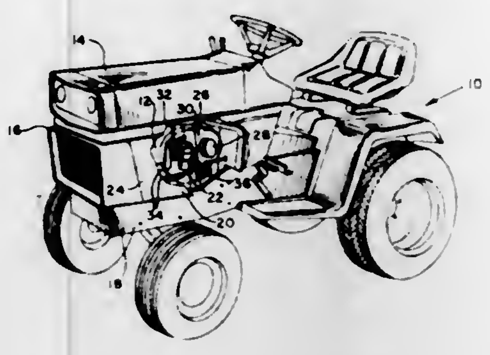
Filed Oct. 14, 1975, Ser. No. 621,978

Int. Cl.² B60K *11/06*

U.S. Cl. 180—54 A **2 Claims**

1. A carburetor cooling arrangement for an air cooled engine including, in combination:
- a carburetor mounted on said engine;
- a cooling air shroud mounted on said engine, having said carburetor outside the enclosure defined by said shroud, and having a diverter aperture in close proximity to said carburetor;

- cooling air means for controlled flow of cooling air through said shroud and over said engine, and for controlled flow of cooling air through said aperture to cause an air flow over said carburetor; and
- an enclosure substantially surrounding said engine, said shroud, said carburetor, and said cooling air means.



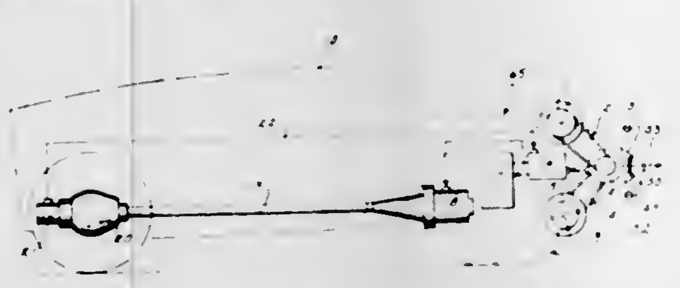
4,002,218
ELECTRICAL VEHICLE

George T. Horvat, 1319 S. 102nd St., West Allis, Wis. 53214

Continuation-in-part of Ser. No. 515,354, Oct. 16, 1974, abandoned. This application July 17, 1975, Ser. No. 596,578

Int. Cl.² B60K *1/00*

U.S. Cl. 180—65 DD **8 Claims**



1. A vehicle, comprising means including an outer body portion for supporting motive means having an electrical input and a mechanical output operatively propelling said vehicle, energy storage means connected to said supporting means and operatively connected to said input and providing electrical power to said motive means and propelling said vehicle, and means providing an energy source connected to said supporting means and including electrical generating means providing an electrical output in response to the operation of a mechanical input mounted externally adjacent to said body portion, said mechanical input including a rotatable member having an axis substantially normal to the direction of vehicle movement and providing a plurality of circumferentially spaced and substantially flat radial vanes, said body portion providing an axially extending substantially impervious groove having a pair of axially spaced end walls with one end wall providing a port and partially surrounding said rotatable member and exposing at least one of said vanes having a radial end portion spaced from said body portion and responding to direct fluid current flow external to said body portion in response to vehicle movement and rotating said mechanical input with a substantial portion of the exhausted direct fluid current flow leaving the relatively flat radial vanes in an outward direction external to said outer body portion with fluid trapped in said groove passing through said port and said electrical output being supplied to said storage means.

4,002,219
AUTOMATIC SAFETY BELT SYSTEM, PARTICULARLY FOR VEHICULAR, ESPECIALLY AUTOMOTIVE USE

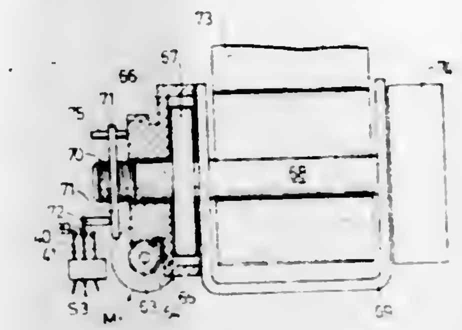
Helmut Steinmann, Baden-Baden, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 24, 1976, Ser. No. 660,857

Claims priority, application Germany, Mar. 15, 1975, 2511442

Int. Cl.² B60R *21/00*

U.S. Cl. 180—82 C **17 Claims**



1. Automatic safety belt system, particularly for vehicular use, comprising
- a belt supply roller unit (69) having a shaft (68) to hold a belt (73) rolled on said unit and permit extension therefrom, the shaft rotating upon wind-up, and paying out of the belt (73);
- a spring (67) coupled to the shaft to hold the belt under resilient spring tension;
- and an electric motor (M) operatively coupled to the roller unit to effect wind-up of the belt thereon,

wherein the improvement comprises
- a drive train (63, 64, 65, 66) mechanically serially connecting the motor (M), the spring (67) and the shaft (68) of the roller unit to permit resilient extension, or retraction of the belt against tension of the spring with approximately uniform belt tension characteristics regardless of the length of extension of the belt from the roller unit.

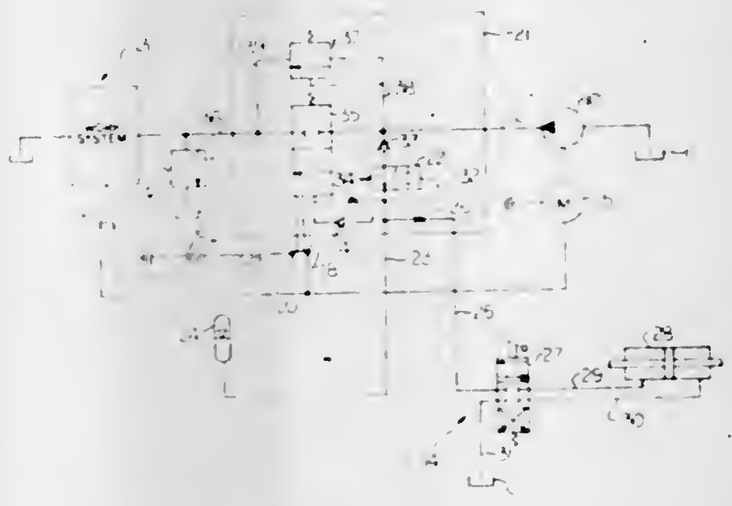
4,002,220
PRIORITY STEER SYSTEM—HYDRAULIC

John E. Wible, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed July 11, 1975, Ser. No. 595,202

Int. Cl.² B62D *5/08*

U.S. Cl. 180—141 **6 Claims**



1. A hydraulic steering system for an electric-powered vehicle comprising in combination:
- a hydraulic pump;
- means for driving said pump including an electric motor and a source of electric power including a circuit for said electric motor;
- steering motor means;

- implement motor means;
- steering circuit means including accumulator means for selectively directing hydraulic fluid for powering said steering motor means;
- implement circuit means including control means for selectively directing hydraulic fluid for powering said implement motor means;
- priority means including first valve means for normally communicating fluid from said source to said accumulator means and responsive to a predetermined maximum pressure in said steering circuit to block said communication; and,
- second valve means for normally blocking communication of fluid from said source to said implement system for establishing a priority of fluid to said steering circuit means and responsive to a predetermined pressure in said steering circuit to communicate fluid from said source to said implement circuit.

4,002,221

METHOD OF TRANSMITTING ULTRASONIC IMPULSES TO SURFACE USING TRANSDUCER COUPLING AGENT

Gilbert Buchalter, 555 Mount Prospect Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 304,713, Nov. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 76,610, Sept. 29, 1970, abandoned, which is a division of Ser. No. 290,402, Sept. 19, 1972. This application Nov. 15, 1974, Ser. No. 524,316

Int. Cl.² G10K *11/00*

U.S. Cl. 181—.5 3 Claims

1. In a method of transmitting ultrasonic impulses to a surface in contact with transducer means with a conductivity gap therebetween, the improvement comprising applying a transducer coupling agent to said conductivity gap formed of a composition consisting essentially of:
- about 1/20th of 1 wt% to 10 wt% of a long chain
- water soluble ionic polymeric thickener having a Brookfield Viscosity (CPS) of approximately 1000 to 100,000 at 1 wt% concentration in H_2O and neutralized with an alkaline agent, said thickener being selected from the group consisting of a copolymer of methyl vinyl ether and maleic anhydride, carboxy polymethylene polymer and mixtures thereof,
- about 1/1000 of 1 wt% to 3 wt% of a hydroxy alkyl cellulose polymer as an auxiliary thickener,
- about 10% to 25% by weight of a polyalkylene glycol humectant, said alkylene group containing 2 to 10 carbon atoms,
- up to about 5 wt% of an alkali metal salt of a weak organic acid,
- up to about 5 wt% of a weak organic acid,
- and the balance essentially water, said gel having a pH of about 3.5 to 11.5.

4,002,222

COMBINATION SCAFFOLD AND UTILITY PLATFORM

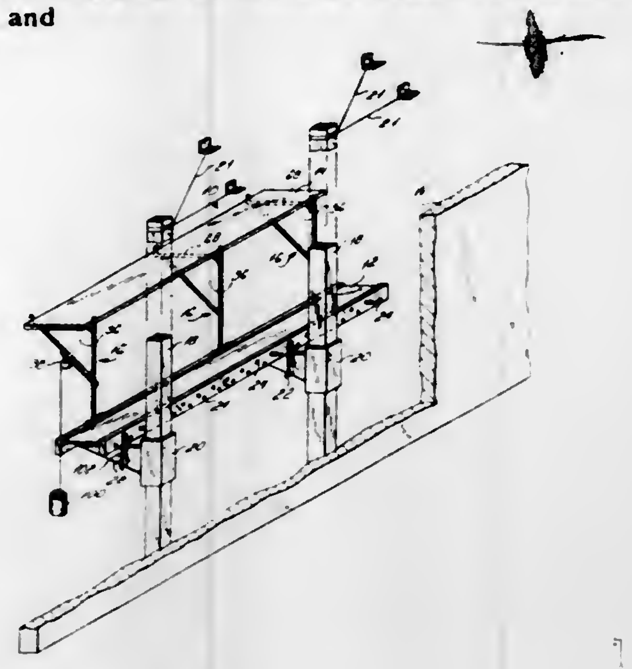
Edward G. Bruno, 141-18 250th St., Rosedale, N.Y. 11422

Filed Feb. 27, 1976, Ser. No. 661,974

Int. Cl.² E04G *1/15*

U.S. Cl. 182—132 10 Claims

1. A combination scaffold and platform assembly for use with at least two spaced apart support members, said assembly comprising:
- a. first elongated platform means adapted to be removably positioned on the support members in spanning relationship therewith, said first platform means including a first plurality of transverse openings therein, said first plurality of openings being spaced apart along the length dimension of said first platform means in a first common plane;
- b. a plurality of coupling means having a portion thereof for removably engaging said openings in said first platform means; and
- c. second elongated platform means positioned on said coupling means in a plane that is above and alongside said first platform means.



4,002,223

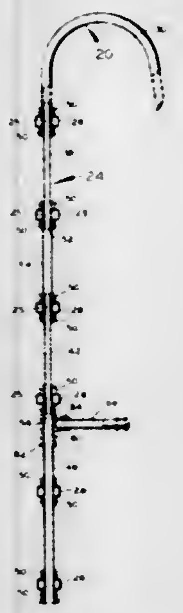
TELESCOPING COLLAPSIBLE LADDER

Keith David Bernkrant, Miami, Fla., assignor to Firearms Import and Export Corporation, Miami, Fla.

Filed Apr. 14, 1976, Ser. No. 677,044

Int. Cl.² E06C *1/36*

U.S. Cl. 182—156 7 Claims



1. In a ladder comprising parallel side members and a plurality of parallel steps traversing said side members and affixed thereto, said ladder having a major plane, the improvements wherein:
- said side members each include a tubular female section and a male section in concentric, telescoping relation with said female section and collapsible and extendable with respect thereto;
- said male and female sections each comprising plastic pipe with said male sections fitting slidably inside said female sections;
- said side members each further including additional male and female telescoping sections of plastic pipe alternating along the length of said ladder;
- said side members further including joints between said male and female sections; and
- sleeves at said joints arranged in pairs embracing said steps;
- said male sections having enlarged ends; and
- one of said sleeves in each pair forming a stop for one of said enlarged ends;
- whereby said side members of said ladder may be telescopically adjusted between collapsed and extended positions for adjusting the length of said ladder.

4,002,224

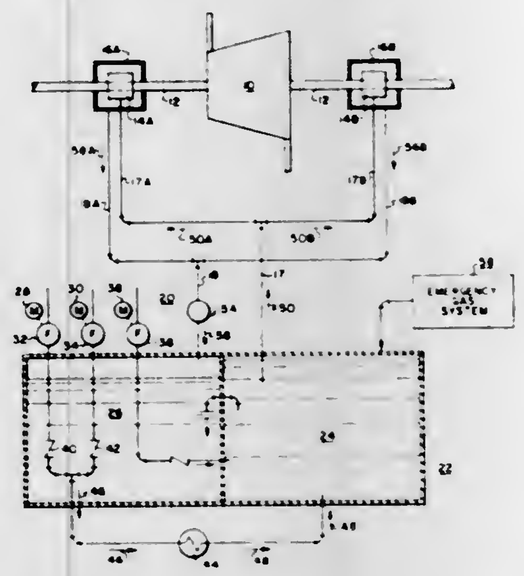
TURBINE LUBRICATION AND EMERGENCY GAS SYSTEM

Michael J. Easter, Aston, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1975, Ser. No. 553,181

Int. Cl.² F02C *7/06*

U.S. Cl. 184—6.11 3 Claims



1. A lubrication system for providing lubricating fluid to a turbine apparatus comprising:
- a lubricating fluid reservoir tank having a pressurized storage section and a nonpressurized collection section therein, said pressurized storage section having said lubricating fluid disposed therein at a predetermined pressure and at a predetermined temperature,
- means for pumping said lubricating fluid from said storage section to said turbine,
- means for conducting lubricating fluid discharged from said turbine to said nonpressurized collection section,
- a cooler element disposed external to said reservoir tank for lowering the temperature of said lubricating fluid to said predetermined temperature, said lubricating fluid passing from said collection chamber through said cooler element and into said pressurized storage section as said lubricating fluid is pumped to said turbine from said storage section, and,
- an emergency gas system for maintaining a flow of pressurized lubricating fluid to said turbine in the event of cessation of operation of said pumping means, said emergency gas system including
- a gas storage section integral with said reservoir tank, said gas storage section having a predetermined quantity of gas having a predetermined pressure disposed therewithin,
- a conduit connecting said gas storage section with said pressurized storage section,
- said predetermined pressure of said lubricating fluid being greater than said pressure within said stored gas when said pump means is operable, said lubricating fluid at said predetermined pressure maintaining said gas entirely within said gas storage section when said pump means is operable,
- said pressure within said lubricating fluid decreasing below said pressure within said gas when said pump means ceases operation, said gas expanding from said storage section and communicating with said pressurized section through said conduit,
- said gas expanding into said pressurized section through said conduit exerting a force on said lubricating fluid therewithin to move said fluid to said turbine.

4,002,225

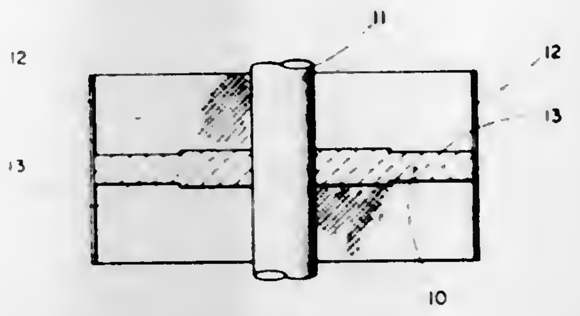
RESURFACED BRAKE DISCS

Glenn R. Marin, Ransomville, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 374,742, June 28, 1973, Pat. No. 3,871,934. This application Feb. 18, 1975, Ser. No. 550,328

Int. Cl.² F16D *65/12*

U.S. Cl. 188—73.2 5 Claims



1. A carbonaceous brake disc, the disc having at least one periphery and including at least one flat surface, the brake disc comprising a flexible, permeable tape which circumvents the periphery of the disc at least once and overlaps and covers at least a portion of the flat surface of the disc to form a flat friction wearing surface thereon; the flexible, permeable tape being bonded to the flat surface by baked impregnated resin.

4,002,226

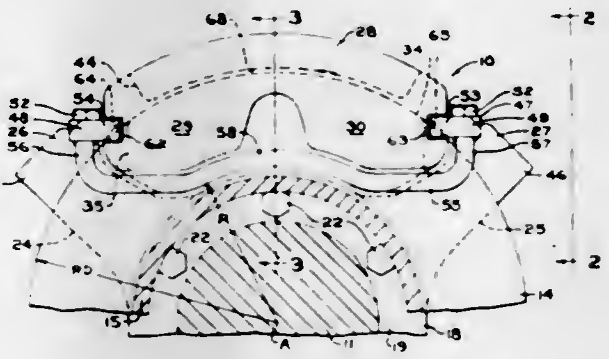
DISC BRAKE

Jack D. Rainbolt, Troy, and Ronald R. Suerdieck, Tipp City, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 15, 1975, Ser. No. 640,590

Int. Cl.² F16D *55/224*

U.S. Cl. 188—73.3 10 Claims



1. A disc brake assembly having a brake disc rotatable about an axis, a floating caliper member extending axially of said disc and having radially extending members overlapping opposite faces of said disc, friction lining carriers disposed on opposite sides of said disc, friction linings mounted on said friction lining carriers, actuating means for urging said lining carriers together and said friction linings into braking engagement with said opposite faces of said disc, and said friction lining carriers being interposed between said disc and said radially extending members of said caliper member wherein said brake assembly comprises a non-rotatable mounting member having arms extending radially outward to circumferentially spaced-apart positions relative to said disc providing a space between said arms for said caliper member, a supporting slider member having axially extending rails mounted on said arms, said caliper member being supported by said rails and in sliding engagement in the axial direction, said friction lining

carriers being supported by and in torque transmitting sliding engagement with said rails in the axial direction, and a tie bar member connecting said axially extending rails, said tie bar member having a circumferentially extending center portion and radially extending end portions connected to said rails at the radially outer ends, said center portion of said tie bar member being located radially inward of one of said radially extending members of said caliper member overlapping one of said faces of said disc to minimize the axial length of said brake assembly and damp the forces exerted on said rails by said lining carriers.

4,002,227
BRAKE DISC ASSEMBLY

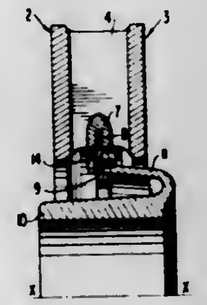
Pierre Simon, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Oct. 8, 1975, Ser. No. 620,681

Claims priority, application France, Oct. 11, 1974, 74.34224

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 X L **5 Claims**



1. A brake disc and hub assembly, comprising:

a. a cylindrical hub adapted to be secured to a wheel, axle or the like to be braked,

b. a flexible cylindrical web integral with the hub and extending back over a portion of the hub from one end thereof in a concentric manner,

c. a circular lip provided on an inner end of said web and being defined by an out-turned peripheral edge thereof,

d. two axially spaced, planar, parallel friction rings interconnected by a plurality of radial ribs, said interconnected rings being circumferentially divided into at least two joined circular sectors,

e. a generally planar, ring-like flange secured between said interconnected rings, being parallel thereto, and extending radially inwardly therefrom, said flange being similarly divided into at least two circular sectors,

f. a circular shoulder adjacent the inner periphery of said flange and defined by an axially extending lip thereon, said shoulder mating with and accommodating said web lip, and

g. a plurality of screws securing said mated web and flange together.

4,002,228
HYDRODYNAMIC DRIVE AND SLIPPING CLUTCH

August H. Borman, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,595

Int. Cl.² F16D *39/00*

U.S. Cl. 192—3.3 **1 Claim**

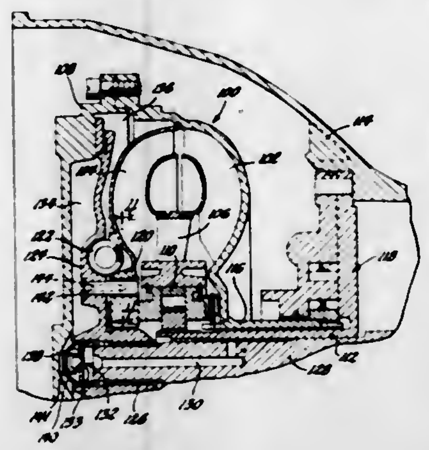
1. A drive mechanism comprising:

a torque converter including an input shell adapter to be driven by a prime mover, an impeller secured to said input shell and cooperating therewith to form an enclosed fluid space, a turbine disposed in the fluid space between said input shell and said impeller and cooperating with said impeller to form a toroidal fluid circuit, and an output hub connected to said turbine;

a fluid operated friction clutch disposed between said turbine and said input shell, an engagement chamber formed between said clutch and said turbine, a disengagement chamber formed between said clutch and said input shell, and a plurality of compression spring means for providing a drive torque transmitting connection between said turbine and said output hub;

variable opening passage means formed on said turbine and output hub for controlling fluid flow to said disengagement chamber in response to the torque transmitted through said spring means to effect an increasing engagement force on said clutch when the torque transmission through said spring means is above a predetermined value to limit the torque transmitted by said turbine and to limit the slip speed between said impeller and turbine, and

output means drivingly connected to said clutch for delivering torque from said drive mechanism.



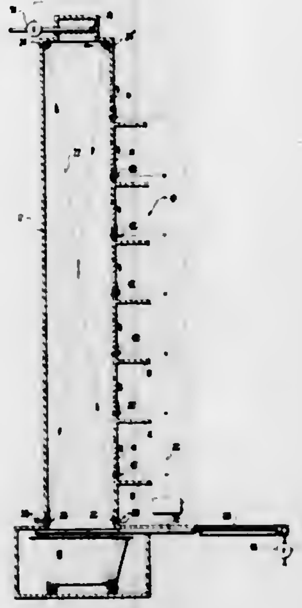
4,002,229
TRASH CHUTE LOCKING SYSTEM

Norris J. Washington, 5419 16th Ave., Terrace 2, Hyattsville, Md. 20782

Filed May 19, 1975, Ser. No. 578,857

Int. Cl.² E04F *17/10*

U.S. Cl. 193—34 **9 Claims**



1. A trash chute system for preventing trash from being deposited in a trash chute which has a blockage in a multi-story structure including:

a trash chute having multiple entrances,

beam-emitting means for transmitting a beam longitudinally of said chute past a plurality of said entrances,

receiver means positioned in the path of said beam to receive said beam,

means connected to the receiver means for generating a malfunction signal when the beam is interrupted between the entrances and between the beam-emitting means and the receiver means, and

access-preventing means at each trash chute entrance operable in response to said malfunction signal to prevent entry to said chute and to prevent trash from being deposited when there is a blockage in the trash chute.

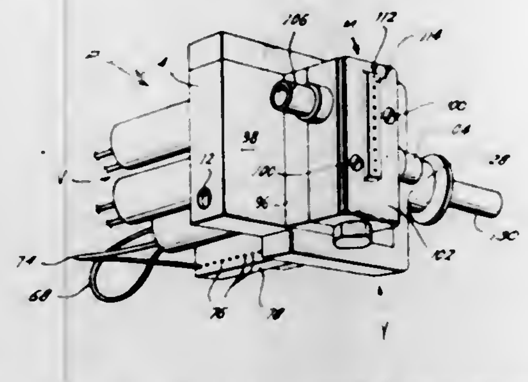
4,002,230
PRINT HEAD APPARATUS

Joseph L. Schweppe; Jerry L. Millie, and Kenneth R. Rhodes, all of Houston, Tex., assignors to Houston Engineering Research Corporation

Filed July 9, 1975, Ser. No. 594,370

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **9 Claims**



1. A print head apparatus for printing a label in the form of a selectively controlled matrix of dots of ink, comprising:

a. a plurality of jet tubes for containing ink, each having a jet formed at the end thereof for passage of ink droplets for application as dots of ink on the label;

b. a plurality of coupling conduits, each for conveying ink to one of said plurality of jet tubes;

c. an ink manifold plate having an inlet opening for receiving ink and a plurality of ink passages formed therein for distribution of ink therein to plural connecting openings;

d. said ink manifold plate further having said jet tubes mounted transversely therethrough with said jets of said jet tubes facing the surface of the label, and further with said jets of said jet tubes arranged in a pattern to form a matrix during relative movement with respect to the surface of the label;

e. a plurality of valves, each of said valves having an inlet mounted in one of said connecting openings in said ink manifold plate and an outlet in communication with one of said coupling conduits; and

f. each of said valves further including means opening in response to control signals to permit ink to pass therethrough to one of said coupling couduits and one of said jet tubes to said jet thereof to displace a droplet of ink from said jet and apply a dot of ink to the label.

4,002,231
LOAD TRANSFER MECHANISM AND JAM PREVENTING CONTROLS FOR A VERTICAL SHELF CONVEYOR

Verle L. Doty, Harrison, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

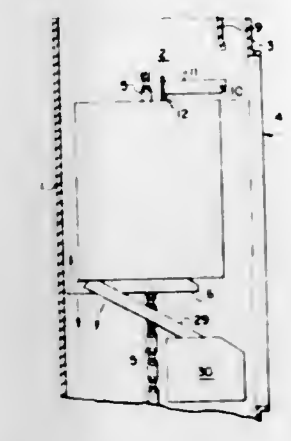
Filed Oct. 17, 1974, Ser. No. 515,676

Int. Cl.² B65G *43/00*

U.S. Cl. 198—483 **30 Claims**

1. In a material handling conveyor, having a plurality of generally horizontal article carrying shelves selectively driven by an electric motor upwardly or downwardly within a casing between vertically spaced load transferring stations at least one of which has an opening extending generally in a vertical plane in one side of the casing providing access for loading and unloading of articles with respect to the conveyor shelves; the improvement being in safety control means for sensing an article that has been improperly transferred and for further stopping the conveyor before the misplaced article can cause material damage, which control mechanism comprises:

a cable; means mounting at least a portion of said cable to extend horizontally, parallel with said opening vertical plane, between opposite sides of said casing, adjacent and inwardly of the upper portion of said opening, and positioned so as to be outwardly of the vertical path of movement of said shelves, out of the normal path of movement of an article being carried by said shelves and in the path of movement of an article improperly transferred to said shelves; electrical switch means responsive to deflection of said cable portion when struck by an improperly transferred article for deactivating said electrical motor and thus stopping the driving of said shelves to prevent jamming of an article between an upwardly moving shelf and the conveyor casing; said mounting means fixedly securing one terminal end of said cable portion to said casing at one of said opposite sides; said mounting means at the other end of said horizontal cable portion, changing the cable direction from vertical to horizontal for the remainder of said cable at the other of said opposite sides; means biasing the vertically extending opposite terminal end of said cable for pulling the horizontal portion of said cable; said switch means being responsive to vertical movement of said opposite terminal end of said cable; and said mounting means including a vertically elongated rod secured at its upper end to said opposite terminal end of said cable, guide means secured to said casing and guiding the upper and lower ends of said elongated rod for controlled vertical movement in response to deflection of said horizontal portion of said cable, and a weight secured to said rod means for movement therewith between said guide means.



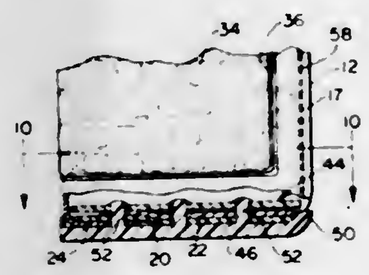
4,002,232
ARTICLE RETAINING POUCH

Richard C. J. Palson, Medfield, Mass., assignor to International Packaging Corporation, Pawtucket, R.I.

Filed Apr. 7, 1975, Ser. No. 565,760

Int. Cl.² A45C *11/04*; **F16B** *19/04*

U.S. Cl. 206—5 **5 Claims**



1. A pouch for retaining an article therein, comprising a first sheet of plastic material, a second sheet of plastic material secured to said first sheet along a seal line to form an interior

pocket between said sheets, a light-weight, flexible sheet of metal material captured in said pocket and conforming generally to the configuration of said sheets, said plastic sheets and metal sheet captured therebetween being bent along a longitudinal axis approximately at the midpoint thereof, wherein the opposed longitudinal edges of said first sheet are secured together to define a longitudinal side edge of said pouch, and a rigid end cap joined to said first sheet at an end thereof to define a closed end of said pouch, an end of said first plastic sheet extending beyond said second plastic sheet and metal sheet as disposed in said pocket and defining end portions, said end cap including a pair of cap portions, one of said cap portions having a plurality of projections formed thereon, the other cap portion having a plurality of openings formed therein that receive said projections in a locking position of said cap portions, said end portions being received between said cap portions for the securement thereof in the locking position to seal the closed end of said pouch, the end of said plastic sheets opposite to said end cap being exposed to define an open end for receiving the article in the pouch.

4,002,233

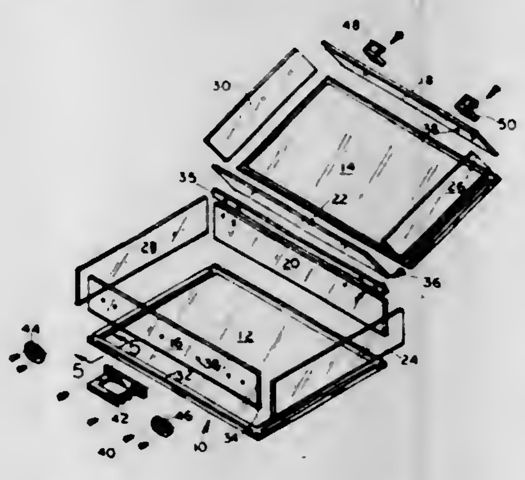
KNOCK-DOWN DISPLAY CASE KIT

Vernon Page, Jr., Montclair, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 20, 1976, Ser. No. 659,667

Int. Cl.² B65O *25/54*; A45C *13/00*

U.S. Cl. 206—45.34 **7 Claims**



1. A knock-down portfolio case kit comprising:
a pair of identical rectangular side panels;
a pair of identical rectangular top panels;
a pair of identical rectangular bottom panels;
a pair of identical rectangular front and back panels;
means on said top, bottom, front and back panels for slidably connecting one of said panels to each of said side panels;
removable hinge means pivotally connecting said bottom panels to each other; and
alternate top, bottom, front and back panels of a different depth interchangeable with said top, bottom, front and back panels.

4,002,234

CONTACT LENS CONTAINER

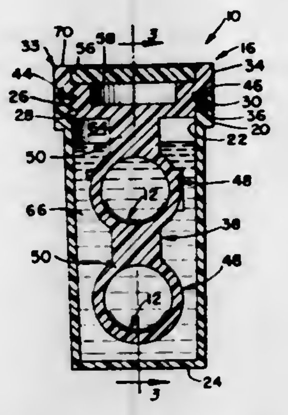
Samuel Loshaek, Chicago, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 545,024

Int. Cl.² A45C *11/04*; B65D *81/24*

U.S. Cl. 206—205 **8 Claims**

1. A container particularly adapted for use in carrying and storing a pair of contact lenses and a storage solution therefor comprising a body means which includes a generally hollow casing member having an open end portion defining a single access opening therethrough, a closed end portion opposite said open end, and first securing means located adjacent said opening; and a carrier means which includes a single integrally formed member, which comprises in integral combination, a closure portion for completely closing said open end whenever in an assembled condition, a second securing means operatively cooperating with said first securing means whenever in the assembled condition for detachably securing said carrier means to said body means, and lens holding means including at least two adjacent lens receptacle means arranged in a tandem relationship, each one of which enables a respective contact lens to be firmly held thereby, said carrier means is formed with a carrier recess means in said cover portion for enabling and facilitating molding of said carrier means in a single, continuous and integral member, and a lid member having an outwardly disposed surface adapted for being snugly received within said carrier recess means such that said outwardly disposed surface faces exteriorly whenever said lid member is received with said carrier recess means.



4,002,235

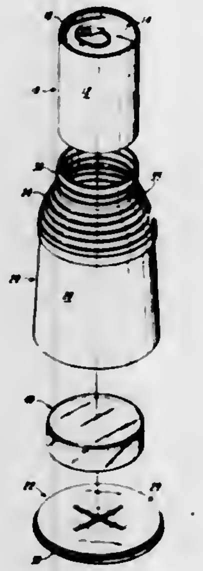
HEAT TRANSFER PACKAGE WITH A COLLAPSIBLE, PLEATED, FRUSTO-CONICAL, UPPER WALL SECTION

William R. Donnelly, Piqua, Ohio, assignor to Readi Temp, Inc., Piqua, Ohio

Continuation of Ser. No. 355,925, April 30, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,822

Int. Cl.² C25D *17/02*

U.S. Cl. 206—219 **11 Claims**



1. A heat transfer package comprising a container including a base and a peripheral outer wall structure which is self-stabilizing and adapted thereby to normally maintain the configuration of said container, said wall structure being configured to receive, interiorly of one end thereof, a receptacle the contents of which are to be subjected to heat transfer, said wall structure having in connection therewith means to engage and form a seal about a portion of said receptacle and to mount said receptacle so as to nest interiorly within one end of said container and in substantially spaced relation to the opposite end thereof, means forming a closure of said opposite end of said wall structure forming said base, said closure being arranged to define, with said receptacle, a sealed chamber, a peripheral wall portion of which is provided by said outer wall structure, said chamber accommodating therein heat transfer material in an inactive state, whereby said material, when activated, induces heat exchange with its environment, and said outer wall structure being an integrated wall structure, portions of which are arranged to nest, one within the other, in response to a predetermined axial force applied to the upper portion of said receptacle while said container is resting on said base, thereby to provide means for locking said wall portions in their nested relationship, thereby to produce a reduction in the axial length of said outer wall structure and to lock said receptacle in an inwardly nested proximity to said heat transfer material, thereby maximizing the potential for heat exchange between said material and the contents of said receptacle.

4,002,236

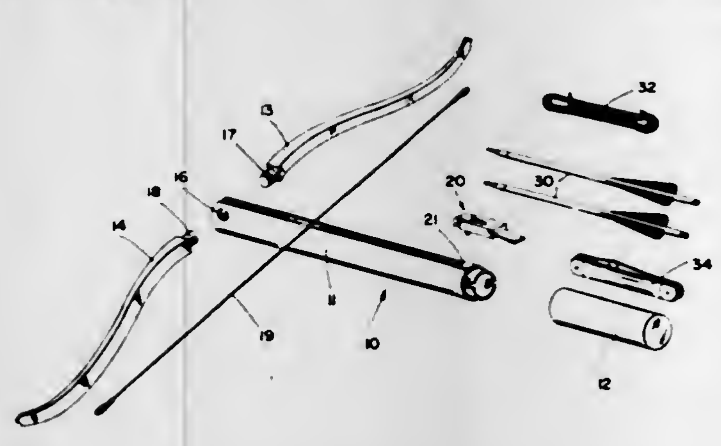
SURVIVAL KIT COMPRISING COLLAPSIBLE CROSS-BOW

Gary L. Tolleson, 25418 Outlook Drive, Carmel, Calif. 93921

Filed Sept. 22, 1975, Ser. No. 615,288

Int. Cl.² F41C *19/00*; A45B *9/06*; A63D *55/00*

U.S. Cl. 206—577 **10 Claims**



1. A survival kit comprising an elongated hollow tubular body of circular cross-section closed at one end by a solid plug, a cap removably sealing the other end of said hollow tubular body water-tight to provide a sealed container of given length, a pair of resilient arms of equal length less than said given length of said sealed container, means removably mounting one end of each of said pair of arms in said solid plug at said one end of said elongated hollow tubular body with said arms extending normally to the axis of said hollow tubular body in a common plane on opposite sides thereof, a bowstring having its opposite ends each removably mounted under tension at the free end of a different one of said pair of resilient arms, and a trigger mechanism releasably holding said bowstring under tension with said resilient arms flexed removably mounted on the exterior of said hollow tubular body at a point spaced along said elongated tubular body from said plug closing said one end thereof in a plane normal to said plane in which said pair of arms extend, whereby said arms, said bowstring and said trigger mechanism may be removed and received within said sealed container provided by said elongated hollow body and said cap.

4,002,237

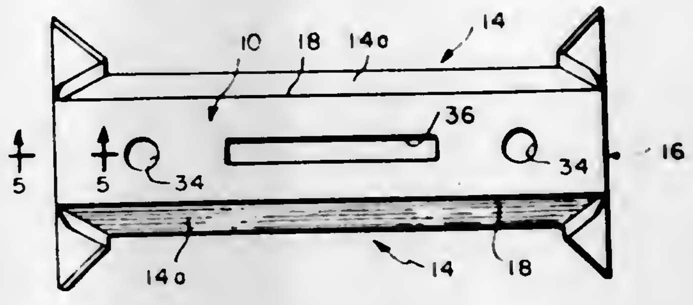
PENCIL CADDY

Gordon E. Nichols, Middleboro, Mass., assignor to Winthrop-Atkins Co., Inc., Middleboro, Mass.

Filed May 5, 1975, Ser. No. 574,746

Int. Cl.² B65D *85/28*; A45C *11/34*

U.S. Cl. 206—371 **6 Claims**



1. A pencil caddy, comprising an elongated hollow body having top, bottom and side walls, said side walls being hinged at their upper and lower edges to the top and bottom walls, and hinged intermediate their top and bottom edges parallel to the hinges at the top and bottom edges, said body having open ends the edges of which are defined by the end edges of the top, bottom and side walls and said edges of the side walls at each end sloping from the edges of the top and bottom walls inwardly and meeting at the hinge line intermediate the side walls, such that the end openings are re-entrant and end members hinged at the opposite ends to the end edges of the top and bottom walls and corresponding in length to the lengths of the end edges of the side wall, said end members being adapted to be sprung into the re-entrant openings to hold the body distended and to be withdrawn from the openings to permit the body to be flattened.

4,002,238

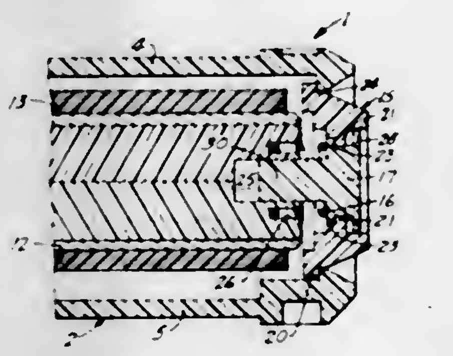
MAGNETIC TAPE CARTRIDGE WITH REMOVABLE SPOOL

Douglas H. Cameron, Stillwater, and Bryan M. Clem, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 542,025, Jan. 17, 1975, abandoned. This application Nov. 21, 1975, Ser. No. 634,287

Int. Cl.² B65D *85/67*; B65H *19/00*

U.S. Cl. 206—408 **7 Claims**



1. In a tape cartridge including a rotatable tape spool enclosed in a housing having a bottom wall, a pair of sidewalls, a pair of end walls each with an aperture opening into said housing and aligned with the ends of said spool, and an open top closed by a cover hinged to one of said sidewalls, wherein said tape spool has a cavity formed in each end and is removably held in the housing by support devices at each end of the housing, said support devices including a collar and a dowel adapted to rotate with said spool and means spring biasing said dowel in a direction away from said spool, whereby:

each collar has an interior flange formed with at least one notch and an exterior flange that is normally seated in said housing end wall aperture; and

each dowel has a head greater in diameter than the opening defined by the interior flange of the collar, a body that extends from one side of said head and terminates in a drive lug that conforms with the cavities in the ends of the spool, and an intermediate shoulder to impede insertion and removal of the body through said opening unless said shoulder is aligned with said notch.

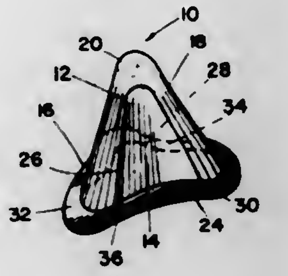
4,002,239
CARDIAC DEFIBRILLATOR CUP

Gilbert Buchalter, 555 Mount Prospect Ave., Newark, N.J. 07104

Filed Nov. 15, 1973, Ser. No. 416,230

Int. Cl.² B65D *5/64*, *5/42*, *81/24*

U.S. Cl. 206—484 **14 Claims**



1. A cup for holding a semi-solid or liquid electrolyte, comprising a container having flexible walls and one open face, the peripheral edges defining said open face having a layer of bonding agent disposed thereon, said container including a protective cover positioned thereon so as to close off said open face and being removably secured to said layer of bonding agent, said protective cover including a sheet material removable from said container without removing said layer of bonding agent therefrom, said bonding agent being also operative after said protective covering is removed to removably secure said container and the electrolyte to a surface of an electrode paddle, the flexible walls of said container being compressible to expel the electrolyte therefrom onto said electrode paddle and said container functioning as a spatula to spread the electrolyte over said electrode paddle after it is expelled thereon.

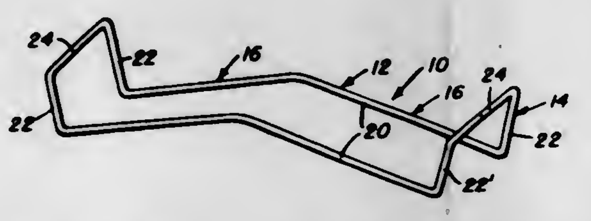
4,002,240
COMBINED BOOKRACK AND BOOK SUPPORT

Edward G. Dorn, 145 S. Belle Ave., Palatine, Ill. 60067

Filed Apr. 10, 1975, Ser. No. 566,697

Int. Cl.² A47B *65/00*

U.S. Cl. 211—42 **3 Claims**



1. An invertible book retaining stand comprising a unitary book receiving base member, said base member having opposed ends, a planar end member rigidly fixed to each of the opposed ends of the base member and angularly directed relative thereto to one side thereof and terminating in an outer end edge, the end members being of equal height, said base member comprising a first portion which, when upwardly directed, defines two rigidly joined angularly related planar sections oppositely inclined downwardly and outwardly from an intermediate location along the length of the base member to the opposted ends thereof, said end members, when the first portion of the base member is upwardly directed, projecting upwardly to a vertical height above that of the intermediate location and defining a bookend-type abutment against which a section supported upright book will engage and be maintained, said base member having a second portion which, when upwardly directed upon an inverting of the stand, is defined by two angularly related planar sections oppositely inclined upwardly and outwardly from an intermediate location along the length of the base member to the opposed ends thereof for reception of an open book thereon, said end members, when the second portion of the base member is upwardly directed, projecting downwardly and defining base member elevating legs, the planar sections of the first portion and the second portion being of approximately equal length, the outer end edge of each end member being inclined, said retaining stand, when inverted with the second portion upwardly directed, having said second portion transversely inclined between the opposed edges thereof.

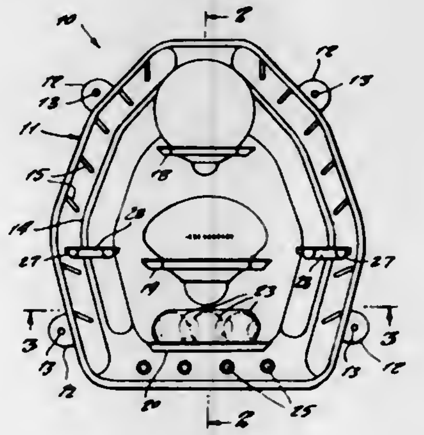
4,002,241
RACK FOR SPORTING EQUIPMENT

Edward Parrilla, Sr., 9480 Ridge Blvd., Lobey B, Brooklyn, N.Y. 11209

Filed Mar. 1, 1976, Ser. No. 662,330

Int. Cl.² A47F *7/00*

U.S. Cl. 211—88 **1 Claim**



1. A rack for sporting equipment, comprising in combination, a back panel made from a plastic sheet that is vacuum-drawn into a rigid three dimensional shape, said back panel being of generally octagonal contour with a horizontal upper edge thereof being shorter than a horizontal lower edge, a set of formed ribs along each opposite side edges, an uppermost of said ribs extending vertically, a lowermost group of said ribs being slightly inclined from a horizontal plane while an intermediate group of said ribs therebetween are more greatly inclined respective to a horizontal plane, a set of sidewardly extending tabs along said opposite side edges each having an opening for receiving a mounting means to support said back panel on a vertical wall, a plurality of forwardly extending ledges formed on said panel, a set of trays formed of plastic having a rear ends thereof supported on said ledges while a rear terminal ends of said trays are fitted and heat-sealed inside shallow recesses formed on said panel thus supporting said trays on a front side of said panel, an uppermost of said trays for supporting a basketball, a lower tray for supporting several baseballs, an intermediate tray therebetween for supporting a football, a pair of forwardly extending, yoke-shaped, formed plastic fittings heat-sealed in shallow recesses formed in each sideward area of said panel for supporting a baseball bat, golf clubs or the like, and a horizontal row of recesses near a lower edge of said panel each having a rear end of a forward extending peg inserted thereinto for supporting a football helmet, cap or sports uniforms.

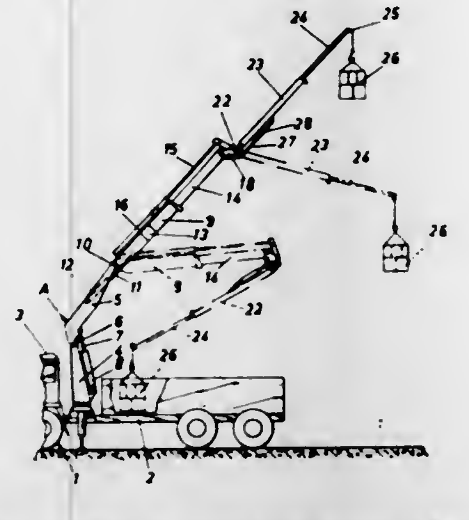
4,002,242
VEHICLE CRANES

Mats Erik Eriksson, Hudiksvall, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed May 21, 1975, Ser. No. 579,718

Int. Cl.² B66C *23/00*

U.S. Cl. 212—8 R **3 Claims**



1. An improvement in vehicle-mounted cranes of the kind comprising a crane post, a hoisting arm arranged for swinging movement in a vertical direction relative to said crane post a first hydraulic piston-and-cylinder unit for effecting said swinging movement of said hoisting arm, said hoisting arm comprising an inner arm section articulated to said crane post and an outer arm section articulated to said inner arm section, a second piston-and-cylinder unit provided to effect swinging movement of said outer arm section, said outer arm section equipped with a boom displaceable substantially in the longitudinal direction of said arm section, the improvement comprising a bracket which is attachable to the outer end of said boom, a rocker arm hingedly connected to said bracket and arranged for swinging movement in a vertical plane, a third hydraulic piston-and-cylinder unit provided to effect said swinging movement of said rocker arm, a second boom mounted for displacement in the longitudinal direction of said rocker arm and provided with means to support a load in said boom said bracket connected with said rocker arm via an articulated joint, and two links hingedly interconnected at a point below said first-mentioned articulated joint likewise connecting said bracket with said rocker arm said third hydraulic piston-and-cylinder unit, provided to effect said swinging movement of said rocker arm, connected both to said rocker arm and to said articulated joint between said links.

4,002,243
JIB CRANE

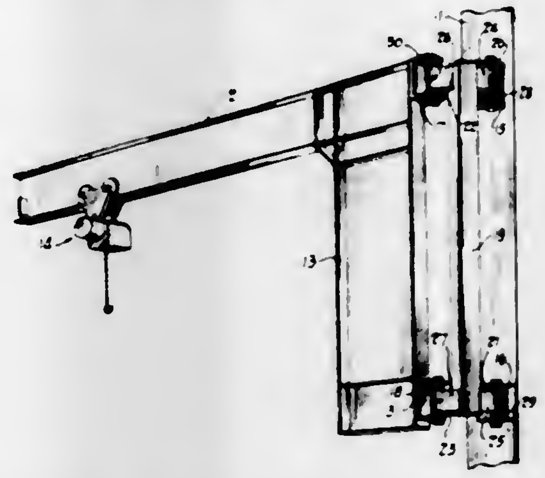
Edward R. Kramer, Macedonia, Ohio, assignor to Stanspec Co., Cleveland, Ohio

Continuation of Ser. No. 531,605, Dec. 11, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,221

Int. Cl.² B66C *23/06*

U.S. Cl. 212—56 **5 Claims**

1. In a jib crane apparatus mountable on an upright supporting member for swinging of the jib crane in a horizontal plane and relative to the supporting member, said jib crane being adapted to carry and swing a load in arcs about two parallel spaced axes in alternative opposite directions on each of said axes whereby twisting actions are imparted by the jib crane dependent on the position of the jib crane upon being swung in one of said alternative directions on said axes, said jib crane including a generally horizontal boom portion and a generally vertical column portion fixedly secured to said horizontal boom portion at its end closest to said supporting member and extending from said boom portion generally parallel to said upright supporting member, the combination of a first pair of hinge parts adapted to be secured to said supporting member at vertically spaced locations thereon, a second pair of hinge parts secured to said vertical column portion of the jib crane at generally vertically spaced locations corresponding generally to the locations of said first pair of hinge parts, respectively, a post member spaced laterally of, and parallel to, said vertical column portion of the jib crane, a first pair of complementary hinge parts secured to and extending from said post member at generally vertically spaced locations corresponding generally to the elevation of the location of said first pair of hinge parts, respectively, to be connected therewith, first pivot means pivotally connecting said first pair of hinge parts and said first pair of complementary hinge parts, respectively, for pivotal movement about a first common axis, a second pair of complementary hinge parts secured to, and laterally extending from, said post member at generally vertically spaced locations corresponding generally in vertical location to the elevation of the locations of said second pair of hinge parts, respectively, to be connected therewith, the lateral dimensions of said post member being substantially greater than the lateral dimensions of the hinge parts of the locations of said pivot means, and second pivot means pivotally connecting said second pair of hinge parts and said second pair of complementary hinge parts, respectively, for pivotal movement about a second common axis, said first and second means each including bearing means, said first and second common axes being spaced apart and disposed parallel to each other, said post member being vertically disposed and spaced substantially equidistantly from said common axes to be subjected to substantially equal degrees of twisting action imparted by the jib crane being swung in either of said arcs about said spaced common axes to positions in any of said alternate directions, the lateral distance between said common axes being substantially less than the maximum vertical extent of the post member between the uppermost and lowermost hinge parts, said post member extending substantially through the vertical extent of said hinge parts providing the said first and second pivot means to assist the said hinge parts to resist said twisting action.



4,002,244
BUFFER, PARTICULARLY SUITABLE FOR USE IN RAILWAY VEHICLES

Kiyoshi Matsumoto, Yokohama, and Toshiyuki Maeda, Tokyo, both of Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan

Continuation of Ser. No. 542,113, Jan. 20, 1975, abandoned. This application May 7, 1976, Ser. No. 684,444

Claims priority, application Japan, Oct. 24, 1974, 49-121959

Int. Cl.² B61G *9/16*

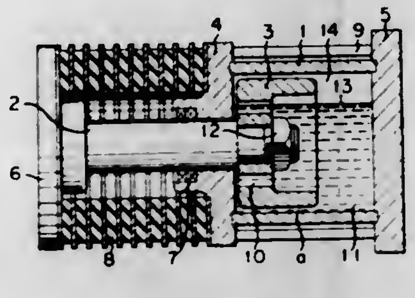
U.S. Cl. 213—43 **6 Claims**

1. A buffer, particularly for use in railway vehicles, comprising

a cylinder means;

a piston means having a piston rod and connected piston

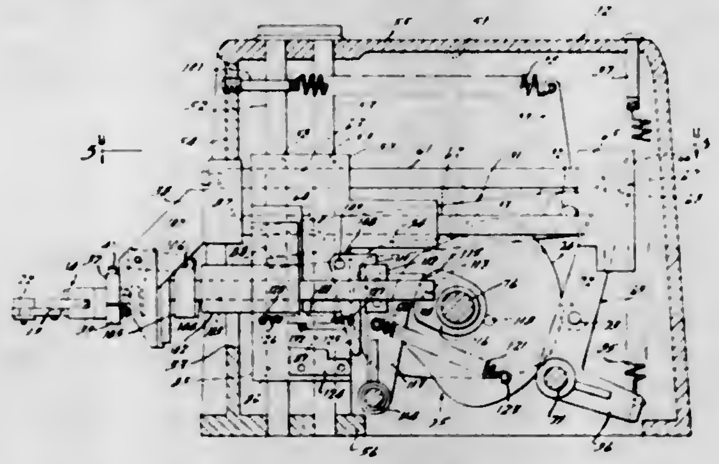
slidably mounted for reciprocable movement within said cylinder means;
the periphery of said piston spaced from said cylinder means to form a gap therebetween;
orifices formed to extend through said piston;
said piston means movable from an at rest position to a first position upon being subjected to low load impact;
said piston means movable further from said first position to a second position upon being subjected to a higher load impact;
a buffer fluid partially filling said cylinder means;
a gaseous medium filling the remainder of said cylinder means;



the volume of said gaseous medium being at least equal to the volume of said rod when fully extended within said cylinder means;
said buffer fluid having a high viscosity of 10^3 to 10^5 poise to allow uniform distribution throughout of fine bubbles of said gaseous medium that are compressible to absorb the low load impact at the first position of said piston means and prevent movement of said high viscosity fluid through said orifices and said gap; and
said buffer fluid flowing through said orifices and said gap to absorb the higher load impact when said piston means moves to said second position; and
means to return said piston means from said second position to said at rest position.

4,002,245
MATERIAL HANDLING APPARATUS HAVING GRIPPING MEANS FOR MOVING ARTICLES IN SEVERAL DIRECTIONS

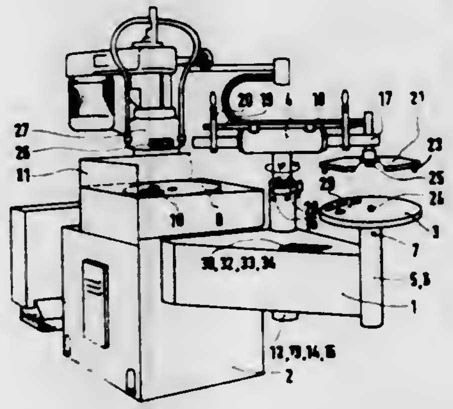
George Mink, 13130 Geoffrey, Warren, Mich. 48093
Continuation-in-part of Ser. No. 506,113, Sept. 16, 1974. This application June 2, 1975, Ser. No. 583,099
Int. Cl.^{2} B65G *47/08*
U.S. Cl. 214—1 BD **23 Claims**



1. A material handling apparatus comprising gripping means for releasably restraining a workpiece, support means for said gripping means, first motion transfer means for moving said supporting means in a first direction between a first extreme position and a second extreme position, second motion transfer means for moving said supporting means in a second directon between a first extreme position and a second extreme position, said second direction being angularly related to said first direction, a single drive means, and timing means operated by said single drive means and operatively coupling said single drive means to said motion transfer means for operating said motion transfer means so that said supporting means is moved in sequence by said motion transfer means from a home position to a work position.

4,002,246
APPARATUS FOR HANDLING WORKPIECES SUCH AS SEMICONDUCTOR SUBSTRATES

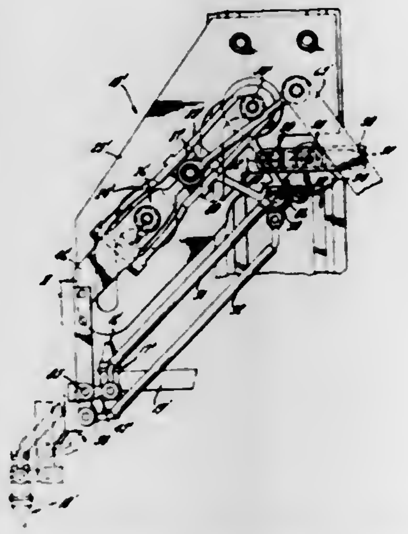
Georg Brandt, Erlangen-Dechsendorf, and Werner Kolar, Lauf, both of Germany, assignors to Georg Muller Kugellagerfabrik K.G., Germany
Filed Mar. 18, 1975, Ser. No. 559,432
Claims priority, application Germany, Oct. 30, 1974, 2451549
Int. Cl.^{2} B25J *15/06*; B24B *7/22*
U.S. Cl. 214—1 BH **6 Claims**



1. In a machine for performing operations simultaneously on a plurality of workpieces such as semiconductor substrates, the machine having a working station where the operations are simultaneously performed on the plurality of workpieces while they are situated at the work station in a common working plane respectively at predetermined locations in said plane, positioning means for preliminarily positioning the plurality of workpieces in a common positioning plane respectively at locations in said positioning plane which have with respect to each other the same relationship as said predetermined locations in said working plane, and transfer means for transferring the workpieces from said locations in said positioning plane respectively to said locations in said working plane while maintaining the workpieces during transfer thereof from said positioning plane to said working plane in a common plane which moves with the workpieces and which at the beginning of transfer coincides with said working plane, while maintaining the workpieces in said common plane at locations, respectively, which have with respect to each other the same relationship as said locations in said positioning plane and said locations in said working plane, said transfer means including a plurality of nozzles respectively situated at said locations in said common plane for respectively engaging the workpieces at said locations in said positioning plane, and means operatively connected with said nozzles for applying suction thereto for respectively holding the workpieces in engagement with said nozzles by suction during transfer of the workpieces from said positioning plane to said working plane, a base situated beneath said work station, mounting means mounting said transfer means and said positioning means on said base, and said transfer means including an upright vertically movable along and turnable angularly about a predetermined upright axis, horizontal guide means carried by said upright at an upper end thereof, an elongated horizontal arm guided by said guide means for movement back and forth along a horizontal axis perpendicular to said upright axis, and plate means carried by said horizontal arm and carrying said nozzles, said working plane, positioning plane, and common plane all being horizontal so that said plate means and nozzles can be freely moved by movement of said arm along said horizontal axis and said upright along and around said vertical axis for placing said nozzles first in engagement with the workpieces at said positioning plane and for then transferring the workpieces to said working plane.

4,002,247
MACHINE FOR PICKING UP, TRANSFERRING, TURNING AND PLACING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon, Trustee of Paul H. Dixon, Trust dated Jan. 28, 1975
Continuation-in-part of Ser. No. 464,627, April 26, 1974, Pat. No. 3,921,822. This application May 27, 1975, Ser. No. 580,597
Int. Cl.^{2} B65G *7/00*
U.S. Cl. 214—1 QA **9 Claims**

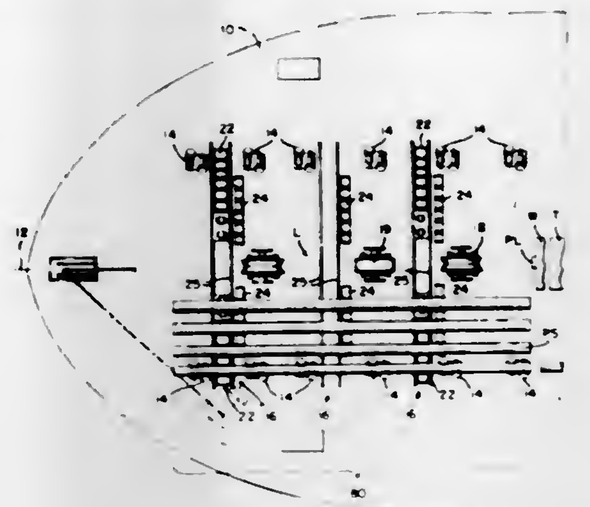


1. A parts handling machine comprising a support, transfer mechanism movable back and forth on said support and operable first to pick up a part at a loading station and then to transfer the part to and release the part at a delivery station while changing the orientation of the part during the transfer, said transfer mechanism comprising a carriage mounted on said support for back and forth movement, a pair of slots formed in said support and defining the path of movement of said transfer mechanism, each of said slots having first and second angularly related legs, said carriage having a pair of transversely extending guides received within said slots to confine movement of the carriage to the path defined by the slots, a pair of part holding jaws mounted on said carriage to move back and forth with the carriage between said loading and delivery stations and to move relative to the carriage between open and closed positions, actuator means operable when the jaws are in each station to move the jaws between its positions and thereafter operable to move said carriage on said support so as to move the jaws from one station to the other, means mounting said jaws on said carriage for turning between first and second positions, and means responsive to movement of said carriage for turning said jaws between said first and second positions as said jaws are moved between said stations.

4,002,248
MULTI-STAGE PIPE FEEDER

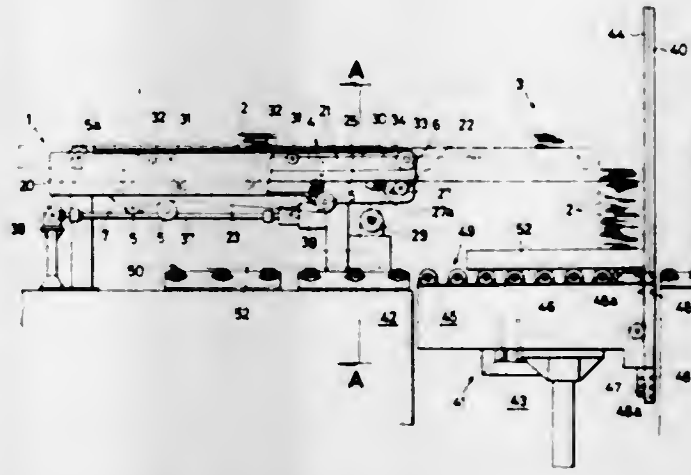
Walter H. Meller, 14834 NE. 11th Place, Bellevue, Wash. 98007
Filed Aug. 28, 1975, Ser. No. 608,765
Int. Cl.^{2} E21B *19/14*
U.S. Cl. 214—1 P **14 Claims**

1. Pipe feeding apparatus for a pipe laying vessel having a pipe supplying station and, laterally spaced therefrom, pipeline tensioning means, pipeline welding means and a pipe lineup station aligned fore and aft on the vessel along a pipeline moving path, the improvement comprising:
movable, wheeled pipe carrying means having a plurality of first pipe holding devices spaced along a path laterally extending from the pipe lineup station in said pipeline moving path to said pipe supplying station,
stationary pipe carrying means having a plurality of second pipe holding devices spaced along said laterally extending path,
means for reciprocating said movable, wheeled pipe carrying means between said pipe supplying station and said pipe lineup station for transporting pipe along said laterally extending path, and
means for alternately transferring said pipe between said second pipe holding devices and said first pipe holding devices for moving the pipe along said laterally extending path during reciprocatory movement of said movable, wheeled pipe carrying means whereby multiple pipes can be advanced simultaneously along said laterally extending path.



4,002,249
APPARATUS FOR STACKING SHEET MEMBERS

Tsutomu Shinomiya, and Eiichi Yoshino, both of Iwatsuki, Japan, assignors to Kabushiki Kaisha Tomoku, Otaru, Japan
Filed June 18, 1975, Ser. No. 587,802
Claims priority, application Japan, Aug. 29, 1974, 49-98379
Int. Cl.^{2} B65H *29/18*, *31/08*
U.S. Cl. 214—6 H **3 Claims**



1. Apparatus for stacking sheet members in a plurality of piles, said apparatus comprising: substantially horizontal conveyor means for conveying a stack of sheets thereon, said conveyor means including a downstream end portion, lifting means disposed adjacent said downstream end portion of the conveyor means for receiving sheets thereon, drive means for extending and retracting said conveyor means with respect to said lifting means, means for raising and lowering said lifting means, a stop member comprising a vertically movable plate mounted on said lifting means for movement between a raised

and a lowered position, said plate being downstream of said downstream end portion of the conveyor means with the latter in extended position, means for raising and lowering said stop member relative to said lifting means, said stop member in said raised position being above the level of the conveyor means so that stacks of sheets successively deposited onto said lifting means form a first pile of sheets abutting against said stop member, said lifting means having a support surface with a horizontal extent sufficient to accommodate a plurality of piles of sheets thereon, said downstream end portion being retracted by the drive means, after formation of said first pile of sheets on said lifting means, a distance equal to the width of the pile such that a second pile of sheets can be formed adjacent said first pile, and support means on said lifting means for displaceable support thereon of said piles of sheet members, said support means comprising a plurality of rollers for support of a pallet on which the sheets can be deposited, said plate in lowered position being disposed below said rollers to permit travel of the pallet on said rollers.

4,002,250

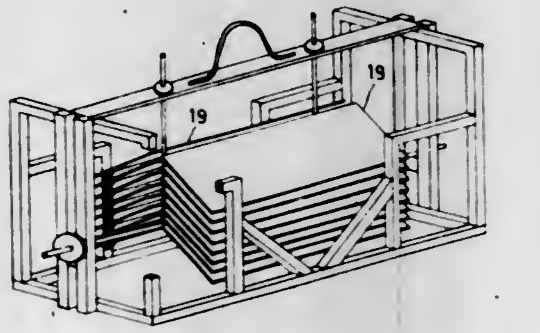
AUTOMATIC UNLOADING METAL PICKLING RACK

Frederick L. Connon, Jr., P.O. Box 88, Erieau, Ontario, Canada (N0P 1N0)

Filed Mar. 10, 1976, Ser. No. 665,640

Int. Cl.^{2} B65G *57/03*

U.S. Cl. 214—8 **4 Claims**



1. A rack for holding metal plates which are to go through a pickling process by being submerged in an oxide and dirt removing acid, comprising a framework having an open rectangular base, two opposite open rectangular end walls, which are joined together by a centrally located flat bar at their tops, a plurality of straight rods which pass freely through holes in said flat bar and are suspended into the rack from it, said straight rods being joined together at their lower ends by a horizontal bar, the ends of which pass through two spaced, parallel, vertical guide bars centrally located in said end wall; two spaced open side walls located on each side of said base abutting but shorter than said end walls; a series of evenly spaced notches in the inner framework of said side walls for supporting the lower edge of plates placed within the rack, these notches in one side of the rack being alternately located in relation to the notches in the opposite side of the rack; the upper edges of said plates leaning towards, and being supported by said removable rods; and a centrally located handle or loop attached to said central flat bar, by means of which the rack can be lifted.

4,002,251

PARTICULATE MATERIAL DISTRIBUTING ASSEMBLY

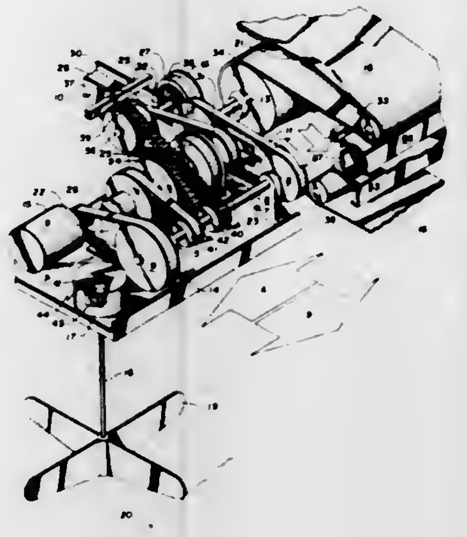
Ralph D. Burgess, Jr., 2800 Pheasant Road, Excelsior, Minn. 55331

Continuation-in-part of Ser. No. 439,342, Feb. 4, 1974, Pat. No. 3,877,585. This application Jan. 30, 1975, Ser. No. 545,471

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.^{2} B65G *65/30*

U.S. Cl. 214—17 CA **15 Claims**



1. In conveying apparatus for automatically delivering material to the forwardmost unfilled portion of a bin

a. a movable material distributing mechanism for distributing material within a bin,

b. powered means for delivering material to said mechanism for distribution thereby,

c. power take-off means associated with said material delivering means and providing a source of rotary power therefrom,

d. electrically controlled moving means driven by said source of rotary power and connected with said material distributing mechanism for automatically selectively moving the latter forwardly and rearwardly,

e. said moving means including selective drive means connected to and powered by said source of rotary power of said power take-off means and constructed and arranged with respect to the remainder of said moving means to cause said material distributing mechanism to automatically deliver material to the forwardmost unfilled portion of the bin at all times.

4,002,252

SELF PROPELLED FEED APPARATUS

Harold Beckman, Jr., 609 E. 5th St., Stromsburg, Nebr. 68666

Filed June 16, 1975, Ser. No. 587,046

Int. Cl.^{2} B60P *1/00*

U.S. Cl. 214—83.32 **7 Claims**

1. A self propelled feed apparatus for supplying feed to a plurality of feed receptacles, said apparatus comprising:

a frame;

a plurality of wheels rotatably supporting said frame;

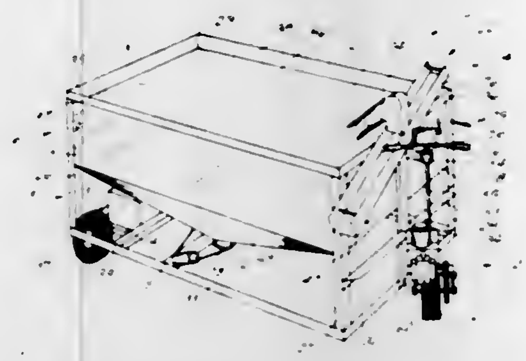
an open topped bin for holding feed mounted in said frame;

auger means mounted in said bin and operable to convey feed therefrom;

adjustable chute means pivotally mounted on said frame and movable from a first position wherein feed from said auger will be conveyed by said chute means to one side of said frame, to a second position wherein the feed will be

conveyed by said chute means to the other side of said frame; said chute means including an L-shaped arm secured to said frame and extending rearwardly thereof a pair of spaced pads secured outwardly of and below said arm to said frame and an open ended chute disposed on said arm and in a first position on one of said pads, said chute movable from said first position to a second position disposed on said arm and said other pad;

a propulsion and steering means secured to said frame and operably connected to at least one of said wheels; power means mounted on said frame and operably connected to said auger means and to said propulsion and steering means.



4,002,253

ATTACHMENT FOR ARTICULATED VEHICLE

Kenneth B. Ridler, and Frank Walsh, both of Thunder Bay F, Canada, assignors to Vesco Manufacturing and Supply Limited, Thunder Bay, Canada

Filed Feb. 3, 1975, Ser. No. 546,740

Int. Cl.^{2} B66C *1/00*

U.S. Cl. 214—147 G **6 Claims**

2. An articulated vehicle comprising forward and rearward articulated wheel mounted members;

a boom mounted on said forward articulated member to extend forwardly therefrom;

the mounting for said boom comprising: a link structure pivotably connected adjacent its lower end to said forward articulated member about a first approximately horizontal axis;

and pivotably connected adjacent its upper end tc said boom at a second axis substantially parallel to said first axis;

a controllably extensible hydraulic cylinder means pivotably connected adjacent one end to said forward articulated frame at a third axis, forwardly of said axis and substantially parallel thereto;

said hydraulic cylinder means pivotably connected adjacent its other end to said boom at a fourth axis, forwardly of said second axis and parallel thereto;

said link being dimensioned and connected to pivot between a retracted position and an advanced position;

said boom moving with said link and hydraulic cylinder means when said link is moved between retracted and extended position;

means for controlling and causing movement of said link, about said first pivot, and with it said boom;

and means fo causing extension and retraction of said cylinder;

wherein said link, boom, and hydraulic cylinder are so designed that with said hydraulic cylinder retracted and said link in the retracted position, said boom is approximately horizontal;

wherein said link and said boom are designed so that the outward end of the boom is lowered and raised, respectively, when, with the hydraulic cylinder means retracted, the link is operated from the retracted position to the extended position, and from the extended position to the retracted position.

4,002,254

METHOD AND A PICK-UP DEVICE FOR LIFTING AND MOVING SEMICONDUCTOR WAFERS

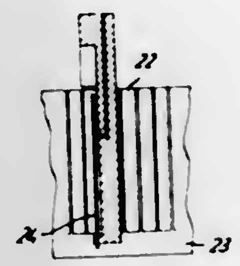
Oluf Per Olofsen, Roskilde, Denmark, assignor to Chemical Reactor Equipment A/S, Roskilde, Denmark

Filed Sept. 5, 1975, Ser. No. 610,713

Claims priority, application Denmark, Sept. 6, 1974, 4728/74; Nov. 20, 1974, 6039/74

Int. Cl.^{2} B65G *65/04*

U.S. Cl. 214—300 **20 Claims**



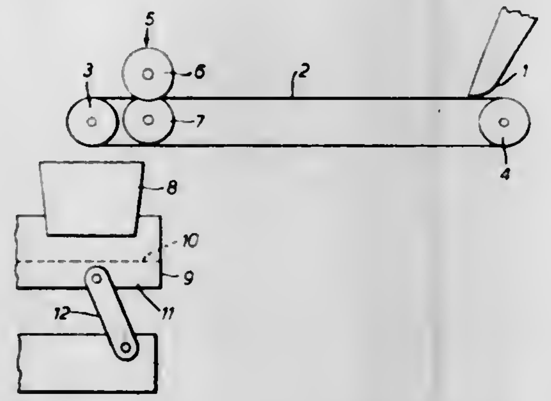
1. A method for unloading individual semiconductor wafers from parallel tracks in a magazine, wherein a working member of a pick-up device operating in accordance with the Bernoulli principle is introduced into the magazine with a suspension surface forming the underside of said working member facing a wafer to be unloaded within a prescribed maximum separation from said wafer, and an air flow is ejected through a jet orifice in said suspension surface for attracting the wafer to the suspension surface without physical contact, subsequent to which the pick-up device is retracted from the magazine, whereby the wafer is prevented from leaving the suspension surface in lateral directions, wherein the improvement comprises the steps of introducing said working member into the magazine to a depth of introduction only, at which said jet orifice is positioned at a predetermined distance in front of the center of gravitation of the wafer to be unloaded and ejecting a unidirectional air flow through said jet orifice in a symmetry pian perpendicular to the suspension surface and parallel to the unloading direction and under a predetermined angle relative to a normal to the suspension surface, whereby to move said wafer relative to the suspension surface towards guide means depending from said working member at the forward end of the suspension surface before retracting the pick-up device from the magazine.

5. A pick-up device operating in accordance with the Bernoulli principle for lifting and moving a disc-shaped mechanically brittle work piece, in particular a semiconductor wafer without physically contacting said work piece, comprising a handle, a working member connected with said handle and having an underside forming a suspension surface to be positioned over the surface of a work piece, an air jet having its orifice located on said suspension surface for ejecting an air flow to create a low pressure in the space separating the suspension surface from the work piece and circumferential guide means depending from said suspension surface to prevent the work piece from leaving the suspension surface in lateral directions, wherein the improvement comprises that a single inclined air jet only has its orifice located in said suspension surface, the axis of said jet extending substantially in a symmetry plan perpendicular to the suspension surface and

forming a predetermined angle with a normal to the suspension surface, said guide means including a protrusion forming a limiting surface at one end of said suspension surface, said limiting surface being intersected by said symmetry plan under a right angle, as well as guide means at the opposite end of said suspension surface, the axis of said inclined jet being directed toward said limiting surface, and the jet orifice being positioned on the suspension surface at such a location that the portion of the area of the suspension surface between said opposite end thereof and a line through the center of the jet orifice perpendicular to said symmetry plan corresponds to at least one third the area of the surface of a work piece to be lifted which faces said suspension surface.

4,002,255
RECOVERY OF A COMMODITY FROM A SACHET OR BAG CONTAINING THE COMMODITY

Sydney Robert Fincham, Beckenham, and Richard John Munday, Hornchurch, both of England, assignors to Tingey and Company (Engineers) Limited, London, England
Filed Apr. 4, 1975, Ser. No. 565,173
Int. Cl.² B65G *65/04*
U.S. Cl. 214—305 **11 Claims**



1. Apparatus for use in the recovery of a commodity from faulty bags containing the commodity, the apparatus including:

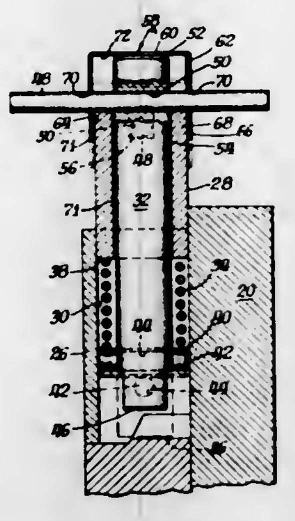
- **a cutting station,**
- **a conveyor for transporting bags towards and away from said cutting station, and**
- **gripping means adjacent said cutting station and operatively associated with said conveyor to feed said bags into said cutting station, said gripping means comprising at least one roller and at least one pivoted mounting rotatably carrying said at least one roller, said mounting being swingable to bring said at least one roller into biassed contact with said conveyor so as to be rotated thereby, said roller defining a nip with said conveyor for gripping the bags,**
- **said cutting station comprising at least one pair of slitting wheels, each pair including opposed upper and lower slitting wheels in close face-to-face proximity, said slitting wheels of each pair having overlapping cutting peripheries operable to shear the bags when fed therebetween.**

4,002,256
LIFT ASSEMBLY

Richard J. Kroboth, Garfield Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Aug. 28, 1975, Ser. No. 608,489
Int. Cl.² B66F *9/14*
U.S. Cl. 214—731 **5 Claims**

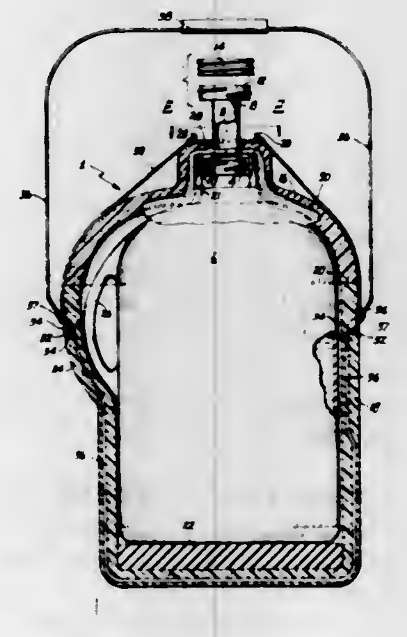
1. In a liftable assembly comprising a carriage liftably attachable to mast means, the carriage including a notch along an upper edge thereof; a lifter which extends generally perpendicularly forwardly from and generally upwardly and generally parallel to said carriage to adjacent an upper edge of said carriage and a member extending from said lifter over said upper edge and downwardly behind said carriage, said member including a guide sleeve extending upwardly over said upper edge and a bore coaxial with said guide sleeve and extending through said member; a lock rod slidably fitting within said guide sleeve and said bore; means for biasing said lock rod downwardly to impel a lower end thereof into said notch and means for fastening said lock rod in a fixed position against said biasing means with said lower end removed from said notch; and improvement comprising:

- **a cap affixed over an upper end of said lock rod to move therewith, said cap having a generally disc-like top with a skirt extending downwardly thereabout, an inner surface of said skirt fitting slidingly about an outer surface of said upwardly extending portion of said guide sleeve.**



4,002,257
THERMAL COVER

Charles L. Hatridge, Rte. 3, Salem, Mo. 65560
Filed Dec. 18, 1975, Ser. No. 641,904
Int. Cl.² A47J *41/00*
U.S. Cl. 215—13 A **9 Claims**

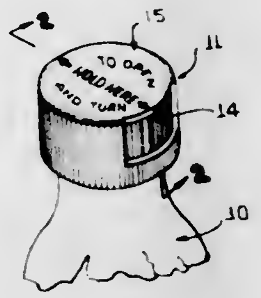


1. A thermally insulating cover for a jug, said jug having a threaded apertured section for pouring liquid therethrough, said cover comprising:

- **a. a thermally insulating upper cover portion for covering an upper part of said jug,**
- **b. a pouring spout positioned through an aperture in said upper cover portion,**
- **c. means for threadably securing the pouring spout to the threaded apertured section of said jug,**
- d. a thermally insulating lower cover portion for covering a lower part of said jug, and
- e. means for releasably biasing said upper and lower portions together whereby said jug is substantially surrounded by said upper and lower cover portions.

4,002,258
CHILD RESISTANT CLOSURE

John J. Curry, Westchester, Ill., assignor to Plastisonics Company, Inc., Chicago, Ill.
Filed Feb. 20, 1976, Ser. No. 659,912
Int. Cl.² B65D *55/02, 85/56;* **H61J** *1/00*
U.S. Cl. 215—206 **8 Claims**

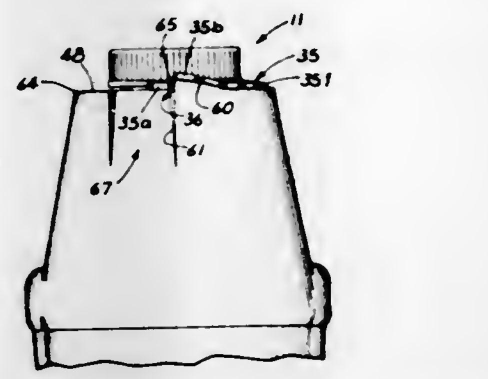


1. A child-resistant closure assembly for a container of the type including a neck finish adapted to have rotationally removed therefrom a closure, said closure assembly comprising a closure member and an overcap telescoped over said closure member, said closure member including a closure panel and a skirt connected to said closure panel, means on the interior of said skirt for interlocking with a container neck finish, said overcap including an end panel overlying said closure panel, a sleeve connected to said end panel and telescoped over said skirt, and a radially inwardly directed flange on said skirt remote from said end panel, said end panel and said flange having retained therebetween said closure member restraining said closure member against separation from said overcap, said sleeve having an internal diameter in excess of an external diameter of said skirt to normally provide a spacing between said skirt and said sleeve facilitating relative rotation between said skirt and said sleeve, interlockable means carried by said sleeve and said skirt for rotationally interconnecting said sleeve and said skirt upon radial displacement of said sleeve relative to said skirt, said sleeve having a finger receiving window therethrough diametrically opposite to said interlockable means for facilitating the manual radial displacement of said sleeve into rotational interlocking engagement with said skirt in response to the manual gripping of said skirt and said sleeve at diametrically opposite points.

4,002,259
SAFETY CLOSURE

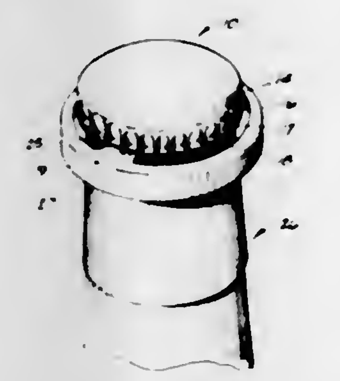
Milton L. Geiser, Millersville, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.
Filed Oct. 6, 1975, Ser. No. 620,221
Int. Cl.² B65D *55/02, 55/56;* **A61J** *1/00*
U.S. Cl. 215—216 **9 Claims**

1. A container and a closure comprising, in combination, a fastening means on the container, a fastening means on the closure for securing the closure to the container and for bringing portions thereof into closed and sealed engagement with said container to prevent leakage of the container contents, a single detent member on said container, a series of individual detent members formed on the said closure closely adjacent each other in a circumferential direction each for individual abutment with said container detent member, said detent members on said closure having a limited arcuate extent and each adapted for deflection by the cooperating detent member on said container when the closure is being secured, the degree of turning of the closure required to effect the closed and sealed engagement of the closure with the container determining which of said closure detent members have been deflected, an abutment wall on each of said closure detent members positioned for abutting said single container detent member after having been deflected thereby to lock said closure against removal, said abutment walls being spaced by about 15° from each other, said detent members being spaced by gaps of several degrees extending between adjacent walls of adjacent detent members, and means on said closure detent members for permitting individual manual manipulation thereof to allow displacement of the closure detent members to positions to move their abutment walls past the container detent member when the closure is turned in the removal direction.



4,002,260
PRY-OFF CLOSURE

Jackie A. Coop, New Lisbon, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Sept. 25, 1975, Ser. No. 616,569
Int. Cl.² B65D *41/12*
U.S. Cl. 215—305 **3 Claims**



1. In a container-closure combination including a container having an upwardly projecting substantially cylindrical neck portion with an entrance mouth therein and an externally disposed bead around the neck portion adjacent the entrance mouth and a sheet metal closure secured on the container including a top panel over the container entrance mouth, a depending skirt around the periphery of the top panel, said skirt including a plurality of flutes securing the closure on the container and a substantially rigid pull ring disposed generally beneath the bottom edge of said skirt substantially concentric with the skirt and integrally connected to said skirt, said pull ring comprising a bead curled inwardly from the connection of the ring to said skirt and disposed adjacent the container neck below the ring connection to the closure skirt to be cammed against the container neck when the ring is pivoted to partially wrap the end of said skirt around a portion of the curled bead and initiate expansion of at least some of said flutes and allow said closure to be lifted off of said container.

4,002,261
CONSTRUCTION OF PANELS, ENCLOSURES OR CONTAINERS

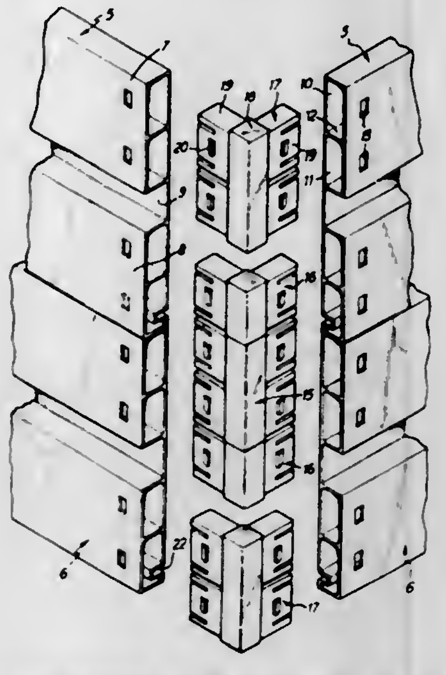
Leon George Litchfield, Youlgreave, England, assignor to L.B. (Plastics) Limited, Belper, England

Filed Oct. 29, 1975, Ser. No. 626,968

Claims priority, application United Kingdom, Oct. 30, 1974, 46910/74

Int. Cl.² B65D *7/00, 7/42;* **E04B** *1/00*

U.S. Cl. 220—80 **16 Claims**



1. A panel constituted by at least two panel members disposed edge to edge and each having cavities in the ends thereof, the panel members being interconnected at at least one end by a connecting member having spigot formations engaged in said cavities such that the connecting member bridges the panel members and retains same in abutment with one another to form the panel.

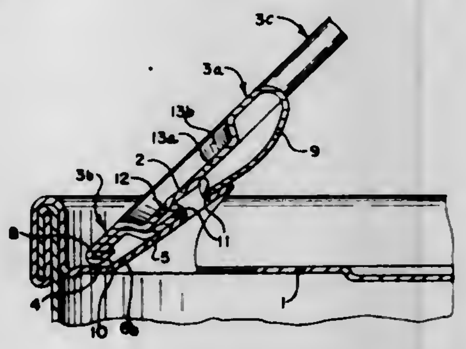
4,002,262
VENTED EASY-OPEN END CLOSURE WITH ANTI-TEAR MECHANISM

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 10, 1976, Ser. No. 684,684

Int. Cl.² B65D *41/32*

U.S. Cl. 220—271 **9 Claims**



1. An improved easy-open end closure of the type comprising an end panel and a pull tab, said end panel having an opening score line defining an opening flap therein, said flap having a vent score line defining a vent therein, said vent score line including distal end portions spaced apart from said opening score line, said pull tab comprising a body including a nose portion and a grasping portion; the improvement comprising force-redirecting attachment means attaching said pull tab to said flap whereby tearing of the end panel portions between said opening score line and said distal end portions is prevented, said attachment means including means including a tether integrally connected to said pull tab intermediate said portions, said tether being folded under said pull tab body and toward said nose portion and secured to said flap by said attachment means, whereby said pull tab body is displaceable prior to rupture of said opening score line to a position relative to said end panel whereat the stress loading on said end panel in the areas immediately adjacent said distal ends of said vent score line is primarily in tension and the stress components thereon normal to said end panel are substantially reduced.

4,002,263
LEAKPROOF MOUNTING DEVICE FOR THE SUPPORT PLATE OF A FLUIDIZATION REACTOR GRID

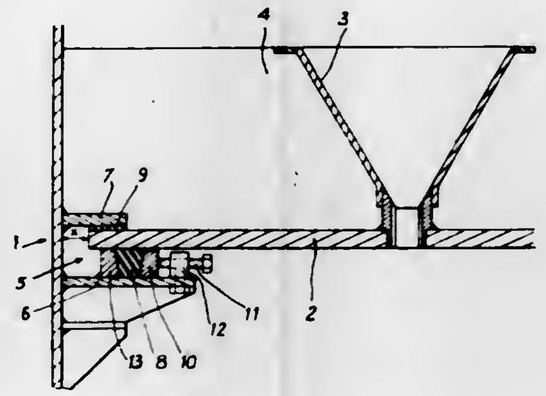
Robert Marcellini, Freyming-Merlebach, France, assignor to Charbonnages de France, Paris, France

Filed June 6, 1975, Ser. No. 584,414

Claims priority, application France, June 11, 1974, 74.20106

Int. Cl.² B65D *53/06*

U.S. Cl. 220—378 **2 Claims**



1. A leakproof mounting device for a support plate of a grid of a fluidisation reactor comprising
- a one piece grid support plate,
- a peripheral bracket mounted inside the reactor on its inside peripheral surface,
- a peripheral ring also mounted inside the reactor on its wall spaced from said bracket forming an annular space bounded in height by said peripheral ring and said peripheral bracket, and by an inner wall of the reactor between said ring and said bracket,
- annular seals respectively disposed on both sides of said plate in annular spaces separating said plate from said bracket and said ring,
- said lower seal and said bracket supporting said plate with a slight radial clearance relative to the inside wall of the reactor,
- means to clamp said lower seal to expand said lower seal in its direction between said plate and said bracket,
- said clamping means including
  - wedges which are substantially contiguous annular segments along a circumference of said lower seal, and
  - clamping screws located to clamp said lower seal against said wedges.

4,002,264
DISPENSING MEANS FOR MOIST TISSUES

Cesare N. Marchesani, Union City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

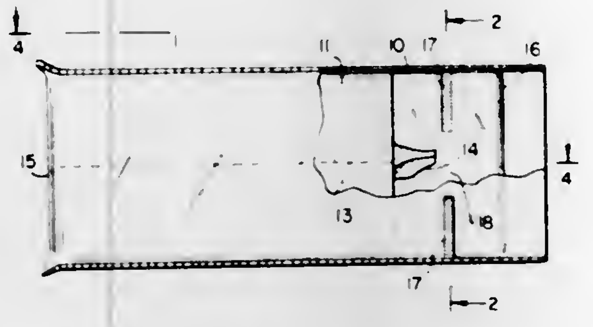
Filed Jan. 30, 1975, Ser. No. 545,368

Int. Cl.² B65H *49/02*

U.S. Cl. 221—63 **6 Claims**

1. A package of moist tissues comprising:
- a. a flexible bag having a closed end and a dispensing end,
- b. a plurality of separably interconnected liquid impregnated tissues in the form of a flattened coreless roll having an oval cross section,
- c. said bag being elongated and closely conforming to the shape of said roll,
- d. a reclosable closure disposed at said dispensing end and,

- e. restricting means for facilitating separation of said tissues disposed between said reclosable closure and said tissues,
- f. said restricting means including two sealed strips extending inwardly from opposed outer edges of said bag to define a centrally located opening for the passage of said tissues from inside of said roll,



- g. said tissues being separably interconnected by lines of weakness therebetween,
- h. the size of said opening being chosen to provide sufficient drag to said tissues to permit separation of said tissues at said lines of weakness during withdrawal from said package.

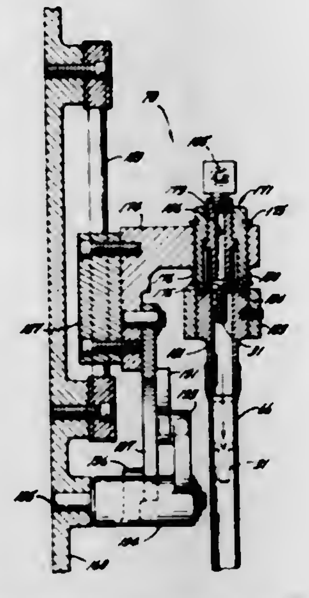
4,002,265
APPARATUS FOR PNEUMATICALLY DELIVERING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon, Trustee of Paul H. Dixon, Trust dated Jan. 28, 1975, Belvidere, Ill.

Division of Ser. No. 517,920, Oct. 25, 1974, Pat. No. 3,929,176. This application June 6, 1975, Ser. No. 584,479

Int. Cl.² B65G *51/02*

U.S. Cl. 221—210 **4 Claims**



1. Apparatus for delivering a part to an automatic part driving machine, said apparatus comprising a tube leading to said machine and having an open part-receiving end, a member having a part-holding device, said member being mounted for movement between a first position in which said holding device is spaced from the end of said tube and a second position in which said holding device is contiguous the end of said tube, said member establishing a substantially air-tight seal at the end of said tube when in said second position said member including a bore which is alined with said tube in all positions of said member, said holding device comprising a resiliently yieldable sleeve telescoped into and secured within said bore and adapted to telescope over and resiliently grip a part, mechanism for placing a part in said sleeve when said member is in said first position, means for moving said member to said second position after a part has been placed in said sleeve, and means for thereafter delivering pressurized air into said member to blow said part out of said sleeve and into and through said tube for delivery to the part driving machine.

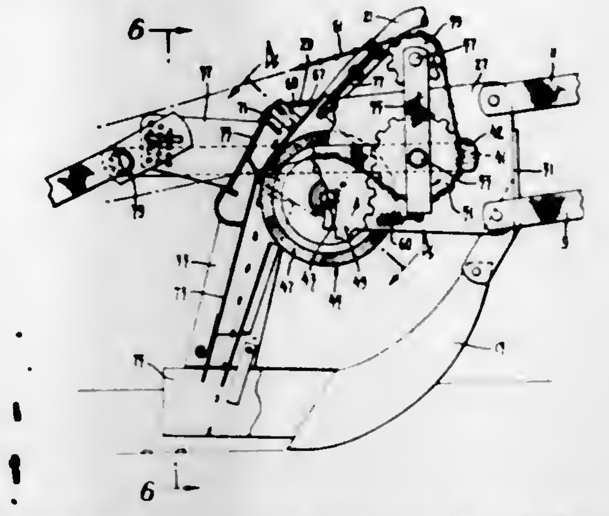
4,002,266
SEED DECELERATING DEVICE

Raymond A. Beebe, Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 280,682, Aug. 14, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,432

Int. Cl.² B65H *5/22*

U.S. Cl. 221—260 **11 Claims**



1. Apparatus for conveying seed from a seed dispenser to the ground and for reducing the velocity of moving spaced seeds prior to impact of said seeds on soil including conveyor means for conveying seed in moving air at a given velocity, means for positively lowering the given velocity of said seeds and passing the seeds along a path at a velocity less than said given velocity and openings for the escape of at least a portion of the air in which the seed is carried to the means for positively lowering the velocity of the seeds.

4,002,267
METHOD AND APPARATUS FOR PREPARING PHOTOPROCESSING SOLUTIONS, AND THE LIKE

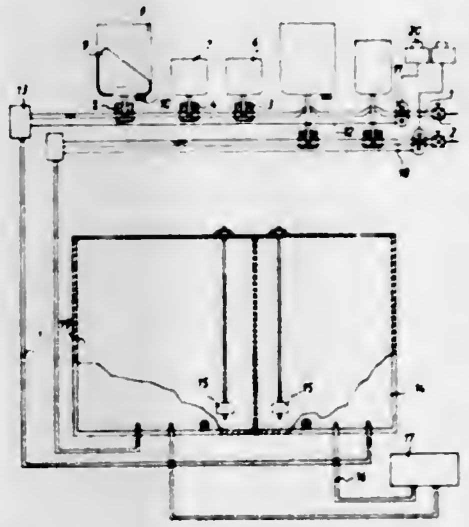
Marcel Aelterman, Mortsel; Gustaaf De Loucker, Berchem; Leo Van Bouwel, Mortsel; Emile Stievenart, Mortsel; Horst Köninger, Munich; Helmut Schausberger, Unterhaching; Franz Ertl, Munich; Horst Röhr, Garching, and Erwin Geyken, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed May 8, 1974, Ser. No. 468,170

Claims priority, application Germany, May 8, 1973, 2323160

Int. Cl.² B67D *5/14*

U.S. Cl. 222—1 **48 Claims**



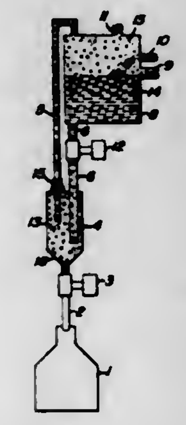
1. A method of mixing at least one liquid chemical concentrate with a thinning fluid to form a predetermined amount of

a mixture or solution having a predetermined composition, particularly for use in photographic processing, comprising, in combination, the steps of placing a predetermined amount of said at least one liquid concentrate into at least one respective holding unit; substantially completely emptying the contents of the holding unit into a mixing conduit leading to a supply tank while passing thinning fluid through the mixing conduit; and terminating the flow of thinning fluid through the mixing conduit when the amount of thinning fluid which has been passed through the mixing conduit reaches an amount corresponding to said predetermined amount of said concentrate and to said predetermined composition.

11. A method as defined in claim 1, wherein said step of emptying comprises simultaneously initiating the flow of thinning fluid through said mixing conduit and the emptying of the contents of the holding unit, and further emptying the contents of the holding unit into the mixing conduit and passing the thinning fluid through the mixing conduit at such respective volumetric flow rates that the time required for the requisite amount of thinning fluid to pass through the mixing conduit is at least equal to the time required for the concentrate to pass through the mixing conduit.

4,002,268
VOLUMETRIC FILLING SYSTEM

Harold D. McKinney, Rte. 4, Box 404, Pine Bluff, Ark. 71601
Filed Mar. 19, 1975, Ser. No. 559,859
Int. Cl.^{2} G01F *11/28*
U.S. Cl. 222—1 **12 Claims**

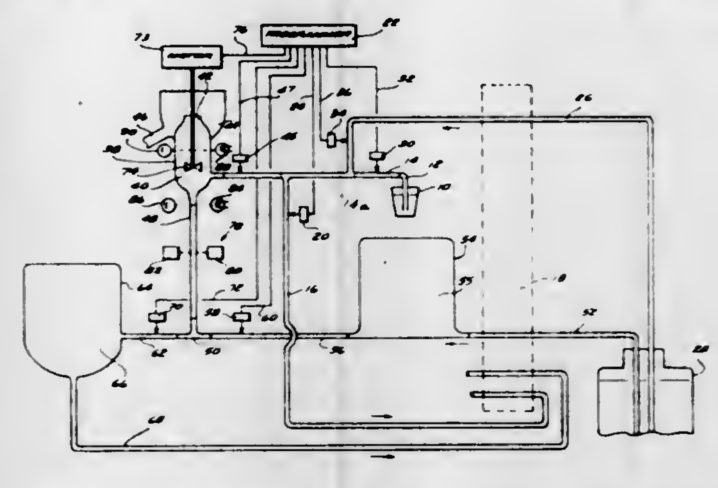


1. The process of controllably regulating and depositing a quantity of substantially liquid material in a measuring means from a material containing supply tank wherein at least one feed line extends from said supply tank to said measuring means and at least one return line extends from said measuring means to said supply tank to form a closed loop comprising the steps of: providing a pressure differential between the said tank and said measuring means by way of said substantially liquid material and another immiscible fluid so that said differential is nonexistent when the said measuring means substantially contains its measured amount of said material, flowing said substantially liquid material through said closed loop system by way of the pressure differential from said supply into said measuring means until said

differential is nonexistent and a static condition exists, thereby controllably regulating the quantity of said material; interrupting the loop system and emptying said measuring means of the material therein; completing the loop and repeating said flowing and interrupting steps.

4,002,269
LIQUID PROPORTIONING SYSTEM IN A LIQUID SAMPLE ANALYZER

Kent M. Negersmith, Carmel, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Continuation-in-part of Ser. No. 498,015, Aug. 16, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,583
Int. Cl.^{2} B67D *5/60*; G01N *31/22*, *33/16*
U.S. Cl. 222—1 **20 Claims**



1. A method of proportioning liquids in a fluid sample analyzer, comprising the steps of:

filling a first chamber of fixed-volume with a first liquid;

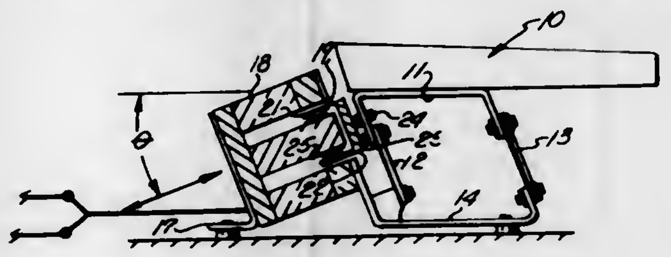
filling a second larger chamber of fixed-volume with a second liquid to be combined with said first liquid;

displacing the volume of said first liquid in said first chamber into said filled second chamber, using a quantity of said second liquid as a pilot liquid; and

exhausting concurrently a volume of said second liquid by overflow from said second chamber equal to said volume of said first liquid and any pilot fluid introduced into said second chamber.

4,002,270
VIBRATORY FEEDER SYSTEM

Robert Leopold Reiner, Shaker Heights, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio
Filed May 2, 1975, Ser. No. 574,344
Int. Cl.^{2} B65G *27/24*; H02K *33/02*
U.S. Cl. 222—58 **17 Claims**



1. A vibratory feeder system comprising:

a vibratory feeder including a tray for receiving product to be conveyed along and then discharged therefrom,

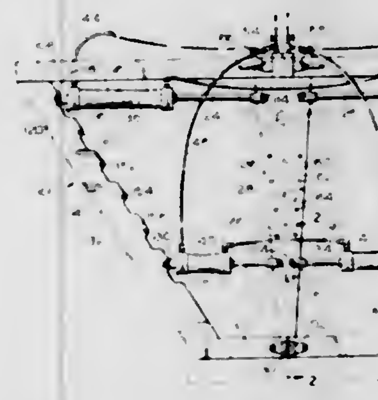
a driver unit for imparting reciprocal vibratory motion to said tray to convey product including electromagnetic driver means coupled to said tray for imparting drive forces thereto to achieve tray velocity,

driver control means for controlling said driver unit and including circuit means for applying drive current to said driver means to provide said drive forces in proportion to the magnitude of said drive current and means for providing a tray velocity signal having a magnitude dependent upon said tray velocity and means for varying the magnitude of said drive current in dependence upon the value of a velocity reference signal to thereby adjust the tray velocity; and,

product density control means for controlling the rate of discharge of product from said tray and including means for providing a product weight signal representative of the weight of the product in said tray as a function of the magnitude of said drive current, and means for varying said velocity reference signal dependent upon the magnitude of said product weight signal.

4,002,271
PROPORTIONING SYSTEMS

Erville C. Buck, Springfield, Oreg., assignor to The Willamette Valley Company, Eugene, Oreg.
Filed May 21, 1975, Ser. No. 579,509
Int. Cl.^{2} B67D *5/64*
U.S. Cl. 222—134 **7 Claims**



1. In a proportioning system,

a frame,

a lever pivotally connected at one end thereof to the frame for pivotal movement about a fulcrum point,

a first pair of double-acting cylinder pumps each of a predetermined diameter and each including a cylinder and a piston,

the frame including a pair of arms on opposite sides of the fulcrum point,

means connecting the outer ends of the cylinders pivotally to the arms and rods of the pistons pivotally to the lever at opposite sides of the lever and at equal distances from the fulcrum point to mount the cylinder pumps in opposed positions,

a second pair of cylinder pumps each of a predetermined diameter and each including a cylinder and a piston,

means connecting the outer ends of the cylinders of the second pair pivotally to the arms and rods of the pistons of the second pair pivotally to the lever at opposed sides of the lever and at equal distances from the fulcrum point, the last-mentioned distances being a predetermined proportion of the first-mentioned distances,

first supply means forming a source of a first liquid under pressure,

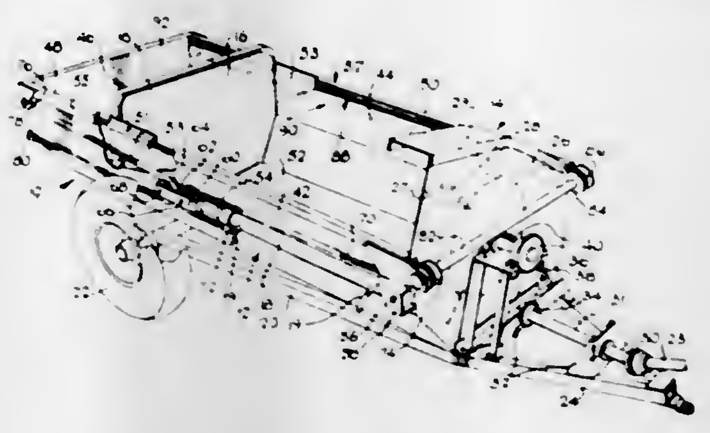
second supply means forming a source of a second liquid under pressure,

mixing means,

and valve means for alternately connecting the first supply means to the outer ends of the first pair of cylinders and connecting the outer ends of the first pair of cylinders alternately to the mixing means and for alternately connecting the second supply means to the outer ends of the second pair of cylinders and connecting the outer ends of the second pair of cylinders alternately to the mixing means.

4,002,272
MATERIAL UNLOADING IMPLEMENTS

Alexander Crawford, Guy's Cliff, and Alfred J. Bailey, Coventry, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles
Filed May 8, 1975, Ser. No. 575,896
Claims priority, application United Kingdom, May 10, 1974, 20667/74
Int. Cl.^{2} B67D *5/08*; A01C *19/00*
U.S. Cl. 222—392 **8 Claims**



1. A material unloading implement comprising:

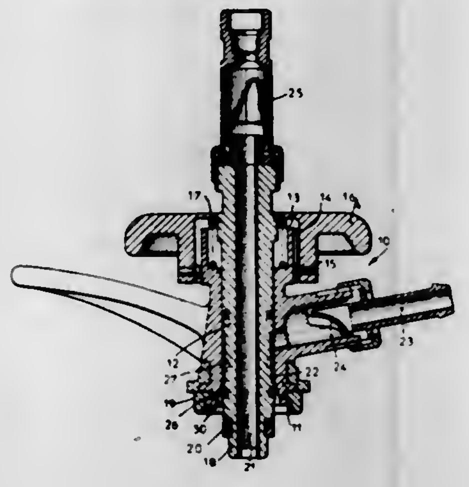
a material container, the material container having a material unloading station; a material pushing member which can be mounted on the material container for movement towards the material unloading station to move material within the container towards the unloading station; a thrust device actuable by fluid pressure; and thrust transmission means to transmit thrust from the thrust device to the material pushing member to move the material pushing member towards the material unloading station, wherein the thrust transmission means comprises a flexible tension member, there being also provided a training member around which the flexible tension member can be trained, whereby in use the flexible tension member draws the material pushing member towards the training member, a further training member on the implement at a position spaced from said training member and the flexible tension member trained round said training member and said farther training member with at least one end of the tension member fastened to another portion of the tension member to form a closed loop having two runs extending between the training members, the tension member being coupled to the material pushing member in one of the runs and being coupled to the thrust device in the other run through a velocity change device whereby a given degree of movement of the thrust device causes more than said given degree of movement of the tension member, said velocity change device including a further flexible tension member which passes round at least one wheel mounted so as to be displaceable under the action of the thrust device, the further flexible tension member having one end connected to said other run of the tension member and its other end anchored, and wherein at least one of the training members drivably engages the tension member.

4,002,273
DISPENSE HEAD FOR LIQUID CONTAINERS

Cyril George Golding, Sedgley, and Eugene Leonowicz, Wolverhampton, both of England, assignors to GKN Sankey Limited, Telford, England
Filed Aug. 29, 1975, Ser. No. 609,027
Claims priority, application United Kingdom, Sept. 3, 1974, 38364/74
Int. Cl.^{2} B65D *83/06*
U.S. Cl. 222—400.7 **1 Claim**

1. A dispense head for a liquid container of the type used for

dispensing liquid under a pressure derived from a supply of gas, the container having an outlet fitting which includes a pair of coaxially disposed valves controlling the inlet of gas and the outlet of liquid respectively, both valves being openable by insertion of a probe into the fitting, the dispense head comprising a body adapted to be secured to the container outlet fitting and a probe mounted in the body, the dispense head defining respective passageways for gas and liquid, the probe being keyed for axial and rotational movement to a manually rotatable member mounted for rotation relative to the body, cam means being provided between the manually rotatable member and the body to cause the member and the probe to move axially and rotationally on manual rotation of the member, such movement of the probe being selectively manually operable independently of the action of attaching the body to the container, and a gas shut off valve being provided in the gas passageway adapted to close the passageway when the probe is in the withdrawn condition and to open it when the probe is in the extended position, said gas passageway being defined between the exterior of the probe and a conical counterbore formed in the interior of the body, the probe having an annular groove defined in its exterior and surrounding the probe, and said gas shut off valve comprising an O-ring provided in said groove and co-operable in the withdrawn position of the probe with the interior surface of the counterbore to close the gas passageway and spaced from the interior surface of the counterbore in the extended position of the probe.



4,002,274

PARTICULATE MATERIAL FEEDER FOR HIGH TEMPERATURE VACUUM SYSTEM

Dale W. Rice, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 537,042, Dec. 27, 1974, Pat. No. 3,960,503. This application Dec. 22, 1975, Ser. No. 643,349

Int. Cl.² B65G *65/48*; **G01F** *11/20*

U.S. Cl. 222—410 **3 Claims**

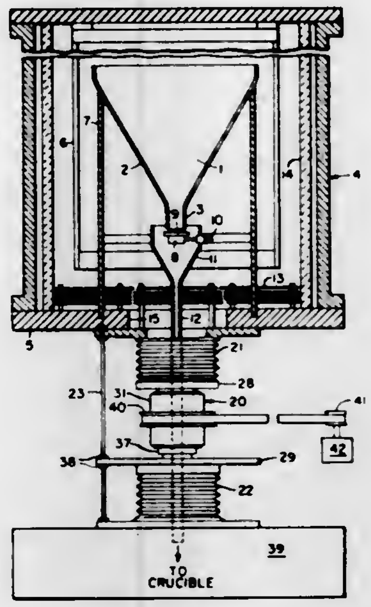
1. A particulate raw material feeder mechanism for delivering the material at a constant rate to a processing area, which mechanism comprises:

A. a raw material hopper having an inlet opening at the top thereof for receiving raw material and an outlet opening at the bottom thereof for discharging raw material,

B. a rotatable funnel member located substantially axially beneath the hopper outlet opening for receiving raw material discharged therefrom, and including conduit means extending axially downwardly from the funnel member for transporting discharged raw material a distance away from the hopper to the processing area,

C. metering means mounted on the funnel member for rotation therewith and for rotation relative to the hopper outlet opening, positioned substantially axially to the outlet opening and above the receiving means, and having a flat upper surface positioned at such a distance below the hopper outlet opening and being of such size relative thereto that when the metering means is stationary, the raw material falls from the hopper and accumulates on the metering means upper surface, and when rotating, the raw material falls from the hopper to the metering means upper surface and steadily flows to an edge of the upper surface, thence constantly to the funnel member, and

D. rotation means for rotating the metering means and rotatably supporting the funnel member.



4,002,275

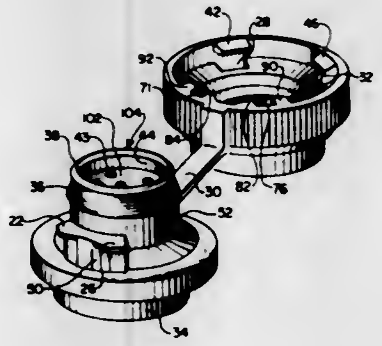
SAFETY CAP

William G. Crowle, Deerfield, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to VCA Corporation, Baton Rouge, La.

Filed Nov. 12, 1975, Ser. No. 631,033

Int. Cl.² B67D *5/06*

U.S. Cl. 222—543 **16 Claims**



1. A safety dispensing cap for fluid containers comprising:

a. a tubular discharge member, having an opening for discharging said fluid from said container and having container attachment means for attaching said tubular discharge member to said container;

b. a tubular closing member, for attaining a rotating, overlying, removable fit onto said tubular discharge member, said tubular closing member having a sealing means for sealing said opening when said fit is attained and said tubular closing member and said tubular discharge member having attaching means for attaining said fit, said attaching means comprising an undercut annular, outwardly extending conical closing bead carried by said discharge member and an undercut annular groove carried by said closing member, said groove snappingly receivable of said bead to attach said closing member to said discharge member;

c. a first latching lug connected to said tubular discharge member, said first latching lug being overlaid by said tubular closing member when said fit is attained;

d. a second latching lug in the interior of and connected to said tubular closing member, said second latching lug cooperating with said first latching lug to lock said members together when said second latching lug underlies said first latching lug; and

e. tab means connected to said tubular closing member for rotating said tubular closing member to lock and unlock the members and for pulling said tubular closing member from said tubular discharge member when said members are unlocked.

5. The cap of claim 1 wherein said discharge member and said closing member are permanently connected one to the other by means of a hinge.

6. The cap of claim 5 wherein said hinge is a resilient strap.

4,002,276

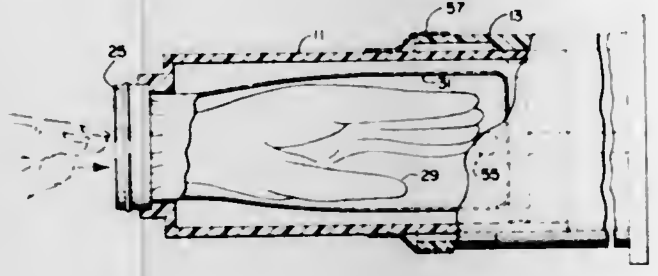
SURGICAL GLOVE DONNING SYSTEM

Mark P. Poncy; George W. Poncy, and Richard P. Poncy, all of 3670 E. Indus. Way, Riviera Beach, Fla. 33404

Filed Aug. 1, 1975, Ser. No. 600,893

Int. Cl.² A47J *51/06*

U.S. Cl. 223—111 **10 Claims**



1. A method of donning a glove comprising mounting said glove on a ring by stretching the cuff portion of said glove around the end edge of said ring to open the cuff portion of said glove for entry of the hand, then inflating said glove, inserting the hand into said glove while inflated, then deflating said glove around said hand and releasing the cuff portion of said glove from said ring by exerting air pressure between said cuff portion and said ring to explode said cuff portion off of said ring.

4,002,277

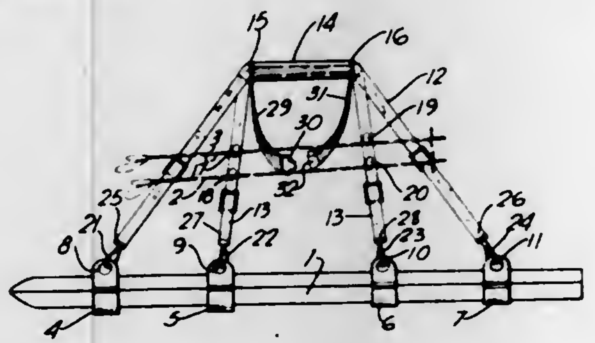
SKI TOTE DEVICE

Wayne P. Westerholm, Redondo Beach, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 14, 1975, Ser. No. 577,435

Int. Cl.² A45C *71/00*

U.S. Cl. 224—45 S **1 Claim**



1. A ski tote device for carrying skis and ski poles, said ski tote device comprising

a plurality of sling type members each supporting skis in spaced relation with the other sling type members and each comprising a strip of flexible material having bores formed through both ends so that when the strip supports skis as a sling the bores are in alignment;

a handle of substantially tubular configuration;

a pair of straps passing through the handle and extending from the handle at both ends, each of the straps having spaced opposite first and second ends, each of the straps comprising an adjustable strap, one of said straps having a plurality of holes formed therethrough in positions whereby ski poles are supported by said one of the straps via the holes and the handle; and

fastening means at the first and second ends of each of the straps for releasably fastening each end of each of the straps to a corresponding one of the sling type members via the bores thereof to support skis supported by said members via the handle.

4,002,278

METHOD AND APPARATUS FOR FEEDING A FILLER CORD FOR SLIDE FASTENERS

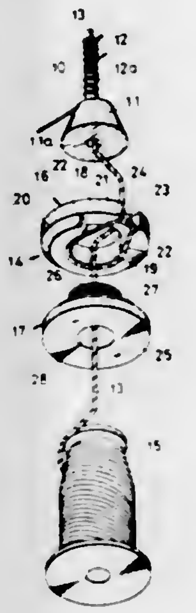
Shigenori Omori, Uozu; Isamu Maeda, Kurobe, and Fumio Terada, Uozu, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1975, Ser. No. 608,172

Claims priority, application Japan, Sept. 5, 1974, 49-102237

Int. Cl.² B65H *17/22*

U.S. Cl. 226—1 **5 Claims**



1. A method of feeding a filler cord through a coiled slide fastener element being formed by winding a filament about an axis generally coincident with the direction the filler cord is fed through the coiled fastener element, which method comprises the steps of directing the filler cord along a path of longitudinal movement extending from a source of filler cord supply to and along said axis, said path having a loop portion, gripping and engaging the cord at said loop portion of the path to drive the cord longitudinally along said path; and adjusting the rate of driving said cord in accordance with the winding rate of said filament whereby the rate at which the cord is fed through the coiled fastener element corresponds to the rate of formation thereof as established by said winding rate.

4,002,279

RECORD FEEDING APPARATUS AND METHOD

Rudolph J. Klein, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

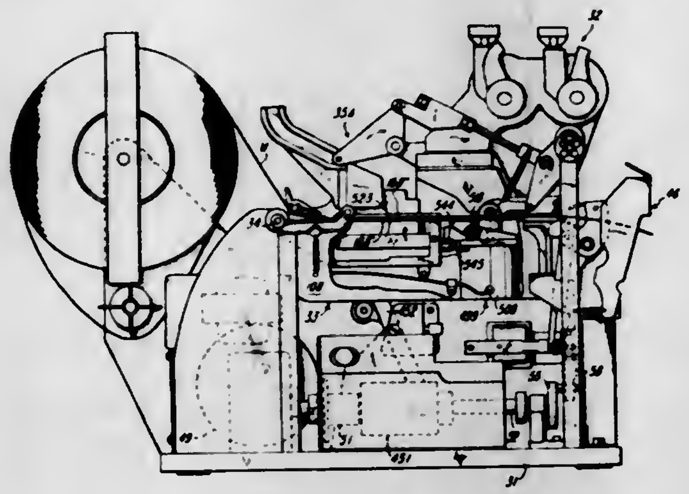
Filed Dec. 30, 1974, Ser. No. 537,481

Int. Cl.² B65H *23/18*

U.S. Cl. 226—2 **11 Claims**

9. The method of transporting a record through a transport mechanism untilizing a drive mechanism which includes a stepping motor having an incrementally rotatable drive shaft and a plurality of windings, comprising the steps of: alternately energizing the stepping motor windings in a predetermined

sequence and at a predetermined sequencing rate thereby incrementally rotating the drive shaft at a predetermined rate for transporting the record at a first predetermined speed; gradually increasing the sequencing rate for gradually accelerating the record to a second speed; thereafter gradually decreasing the sequencing rate for decelerating the record; and terminating the sequencing to stop the rotation of the drive shaft and the movement of the record.



4,002,280

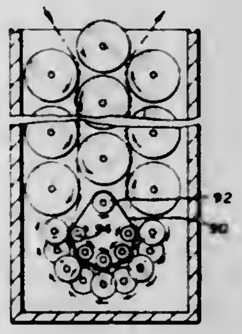
FILM TRANSPORT APPARATUS UTILIZING ROLLERS TO PROVIDE A U-PATH

Kenneth R. Coleman, Warren; Hans G. Steinebach, Hackensack; H. Werner Waden, Paramus, and Paul Zamek, Westwood, all of N.J., assignors to Colenta American Corporation, Paramus, N.J.

Filed May 12, 1976, Ser. No. 685,761

Int. Cl.^{2} B65H *17/22*

U.S. Cl. 226—171 **17 Claims**



11. A transmitting apparatus for film, paper and rolls and the like and providing for an automatically advanced sheet in a U-path through and from a tank of selected size, said path being downward and upward with no squeezing action on the sheet material, said transport including: (a) a redirecting sheet transport assembly provided at the terminal end of a first transport path and when the sheet material has entered this redirecting transport a U-turn path is provided and at the end of this U-turn path the sheet material is discharged to a second path, this redirecting transport apparatus including an inner guideway providing a powered transporting surface and providing a curved path by which that sheet material in contact with the transporting surface is moved forwardly at a determined speed and there is in association with this inner guideway an outer guideway provided by a multiplicity of small rollers arranged in a U-shaped pattern and powered to provide transporting means, the rollers carried in a spaced array and on a common shaft as assemblies, each shaft assembly having a multiplicity of similar small rollers, these assemblies in mounted and driving condition having the roller assembly on one shaft fitting into the space portions on an adjacent shaft to provide an intermeshed arrangement whereby the driving transport surfaces provided by the intermeshed rollers are approximately one-half the diameter of the small rollers carried on these shafts, the outer small rollers spaced from the inner curved guideway so that at least one-sixteenth of an inch between the inner and outer contact transporting surfaces is maintained, (b) gear driving means carried on and secured on the shafts carrying the rollers so that the rollers are driven at a speed where the sheet material is transported at a selected speed at all positions in this U-turn transport apparatus, and (c) power transmitting means connected to the shafts of at least one roller to drive all the shafts at selected speeds.

4,002,281

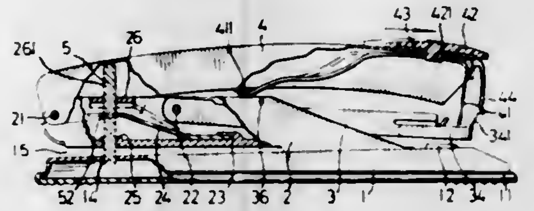
MULTI-PURPOSE STAPLER

Sheau-Po Hsu, Hu Wei Town, China /Taiwan, assignor to Eic International Corporation, Taipei, China /Taiwan

Filed Dec. 4, 1975, Ser. No. 637,663

Int. Cl.^{2} B25C *11/00*

U.S. Cl. 227—63 **3 Claims**



1. A multi-purpose stapler comprising a hole punching means, a staple removing means and a stapling means mounted on a common base wherein

A. the stapling means comprises the base having a punch receiving aperture provided at one end and a clinching die provided at the other end thereof, a supporting bracket having a front portion fixedly mounted on said base, a middle portion, and a rear portion having a hole in the bottom thereof and spaced from said base to provide for insertion of material to be punched, a press handle pivotally mounted to said rear portion of said supporting bracket having a longitudinal slot in a front portion thereof, a button slidably mounted on said press handle and having an integral protrusion which extends into said slot, a staple magazine pivotally mounted to said middle portion of said supporting bracket, a stapling blade having a vertical staple driving portion and rearwardly extending horizontal portion secured to said integral protrusion of said button whereby upon movement of said button to a rearward position the stapling blade is aligned with a foremost staple positioned in the staple magazine above the clinching die, thereby upon depression of said press handle a staple is driven out of said magazine into material placed over said clinching die and clinched by said clinching die, and upon movement of said button to a forward position the stapling blade, when in its forward position is not aligned with a staple in said magazine and therefore is incapable of driving said staple into said material, and;

B. wherein said staple removing means comprises an upper jaw depending from the forward end of said press handle, and a lower jaw comprising a U-shaped member fixedly mounted to the front end of said staple magazine with a mid-section of said U-shaped member extending upwardly in opposing relationship to said upper jaw whereby the upper and lower jaws are adapted to cooperatively engage and remove a staple from the material upon the application of pressure to the press handle in the direction of the base when said button is in said forward position and

C. wherein said hole punching means comprises a bearing plate fixedly mounted to said rear portion of said support bracket and having a hole which is vertically aligned with said hole in the bottom of the rear portion of the support bracket and with said punch receiving aperture in said base, a spring strap the forward end of which is secured to said support bracket and the other end of which has a fork-like configuration and, a punch rod slidably received in the holes of said bearing plate and support bracket, and having a circular groove adapted to receive the fork-like configuration of said spring strap, said punch rod being slidably engaged by said press handle whereby the lower end of the punch rod passes through the punch receiving aperture upon the application of pressure to the press handle to punch a hole in material inserted into said space between the base and said rear portion of said support bracket.

4,002,282

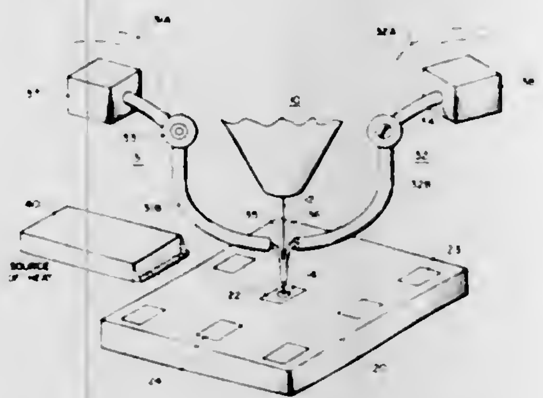
INSULATION OF MICROCIRCUIT INTERCONNECTING WIRES

Francis J. Murdoch, Monmouth Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,302

Int. Cl.^{2} H01L *21/60*

U.S. Cl. 228—4.5 **9 Claims**



1. A device, for insulating a wire issuing from an orifice, comprising:

at least two capillary tubes pivotably mounted to the structure surrounding said orifice;

means for moving said capillary tubes to a first position wherein the outlets of said capillary tubes oppose each other on opposite sides of said wire just below said orifice;

at least one source of liquid, adhesive, insulating material;

means for connecting the inputs of said capillary tubes to said source of liquid, adhesive, insulating material; and

means for expressing said liquid, adhesive, insulating material from said capillary tubes to converge around said wire as it is drawn from said orifice to provide an insulation along any desired length of said wire.

4,002,283

METHOD FOR REINFORCING A LOAD-BEARING SURFACE

Tikahiro Nonoyama, 3984-148, Aza-Iwagane, Aichi, Japan

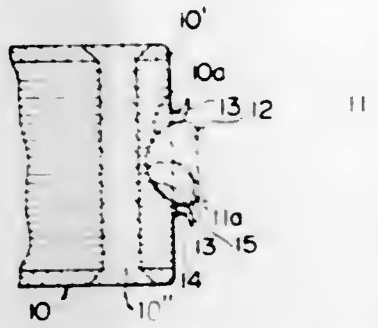
Filed May 6, 1975, Ser. No. 575,115

Claims priority, application Japan, June 25, 1974, 49-72581

Int. Cl.^{2} B23K *21/00*

U.S. Cl. 228—112 **3 Claims**

1. A method for reinforcing a load-bearing surface of a laminated plunger in a solenoid, including a step to rotate one of said laminated plunger and a reinforcing material relative to the other, a step to contact the reinforcing material with the load-bearing surface formed by the side edges of the laminated silicon steel plates of said plunger, a step to apply an initial pressure, sufficient to make the reinforcing material penetrate into said laminated plunger, between said reinforcing material and said plunger, a step to reduce said initial pressure so long as the melting of both said reinforcing material and said laminated plunger is possible, a step to weld frictionally the contacting surfaces of said reinforcing material and said laminated plunger with the frictional heat generated in the contacting portions of said reinforcing material and said laminated plunger, and a step to stop the relative rotation to cool and coagulate the welded portion.



4,002,284

METHOD OF MAKING A COLD WELDED CONNECTION

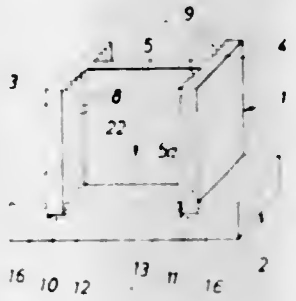
Heinz F. W. Suppus, Meschede, Germany, assignor to Metall-Werk Merkur GmbH, Velmede, Germany

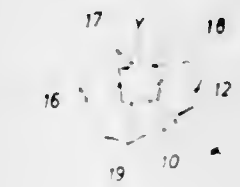
Continuation of Ser. No. 266,542, June 27, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,712

Claims priority, application Germany, June 29, 1971, 2132139

Int. Cl.^{2} B23K *21/00*

U.S. Cl. 228—115 **9 Claims**





1. The method of connecting two light metal members which comprises: forcing one portion of one member into a groove in the other member, in which the one portion is of greater transverse dimension between opposite engaging surfaces than the corresponding dimension of said groove, the opposite engaging surfaces on one member converging in the direction of movement of said one portion into said groove, and at least one engaging surface of said portion and groove has a plurality of ribs extending in the direction of movement of said portion into said groove, said ribs being adapted to engage a complementary surface on the other member, the height of said ribs being substantially greater than the amount of convergence of said converging surfaces, said ribs removing any light metal oxidation coating on the corresponding engaging surface and being deformed under pressure as said portion is forced into said groove to cold weld said members together.

4,002,285

METHOD OF METALLURGICALLY JOINING TUBING

Michael E. Wendt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 24, 1976, Ser. No. 670,062

Int. Cl.^{2} B23K *31/02*

U.S. Cl. 228—141 A **3 Claims**

1. The method of joining tube members comprising:

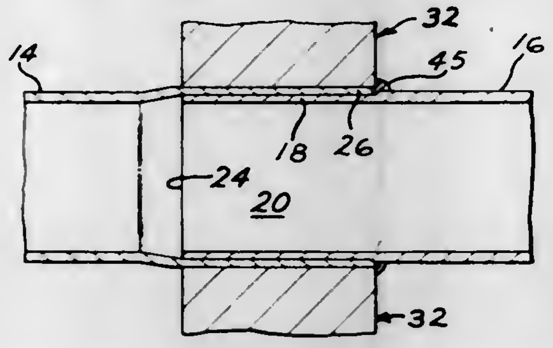
providing a first tube having an end portion adapted to receive the end portion of a second tube with radial clearance between the contiguous surfaces to be joined;

coating at least one of the surfaces to be joined with a layer of solder;

telescoping the end portions so that the contiguous surfaces to be joined are oppositely disposed;

applying a heated crimping means having a temperature sufficient to reflow the solder on said telescoped members; and simultaneously

applying sufficient pressure radially with the heated crimping means to initially crimp and reduce said radial clearance to a minimum thickness adjacent the open end of the second tube; and continuing to apply radial pressure



in a manner that progressively reduces said radial clearance in an axial direction toward the open end of the first tube while providing melted solder between the surfaces to be joined as said crimping proceeds to hydraulically force the solder out of the radial clearance with sufficient energy to cause the solder to scrub oxide from the surfaces to be joined and effect a joint therebetween.

4,002,286

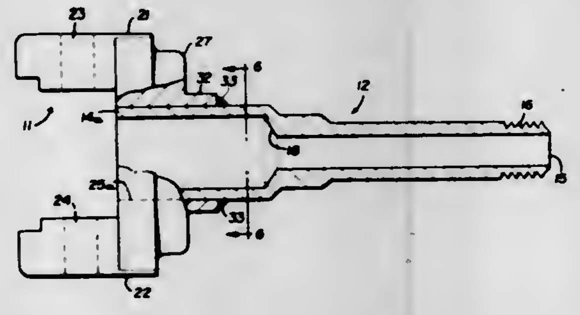
METHOD OF MANUFACTURING A STEERING KNUCKLE AND SPINDLE

Joseph A. Simon, 17755 Masonic Blvd., Fraser, Mich. 48026

Filed Nov. 3, 1975, Ser. No. 628,356

Int. Cl.² B23K *31/00*

U.S. Cl. 228—174 **10 Claims**



1. An improved method for manufacturing an integral steering knuckle and spindle unit for a vehicle such as a truck comprising:

cold forming a hollow elongated metal spindle portion having first and second ends;

forging a knuckle portion having a base and two spaced apart bosses on opposite ends of said base;

machining an aligned bore in each boss to receive a king pin;

machining a bore through the base of said knuckle portion to be aligned with the hollow portion of said spindle; and

welding said knuckle portion base and spindle portion first end together to form an integral unit with the bore of said knuckle base aligned with the hollow portion of said spindle.

4,002,287

RELATIVELY FLAT BLANK FOR A CONTAINER AND THE CONTAINER MADE THEREFROM

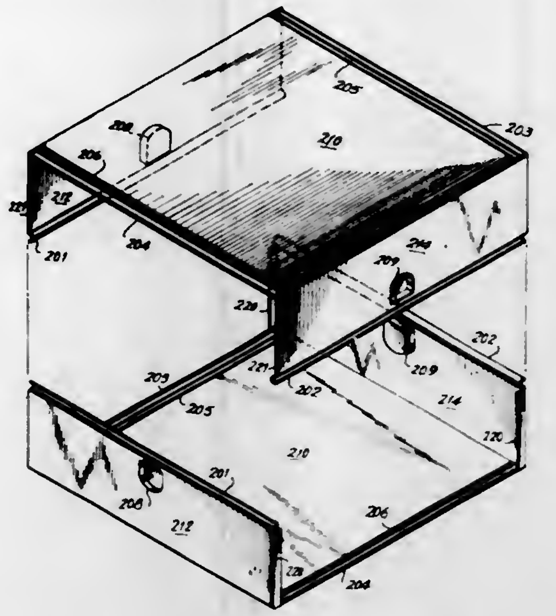
Saul Saveth, 132-29 33rd Ave., Flushing, N.Y. 11354

Continuation-in-part of Ser. No. 526,371, Nov. 22, 1974, Pat. No. 3,924,798. This application Dec. 5, 1975, Ser. No. 638,058

Int. Cl.² B65D *11/10, 11/22*

U.S. Cl. 229—23 AB **13 Claims**

1. A collapsible container comprising first and second sections each including hingeably connected, generally quadrilateral central and wing sectors with the wing sectors being connected on opposite sides of the central sector so that each central sector has two opposite free edge sides and two further sides connected to the associated wing sectors, the sectors of the first section corresponding at least substantially in size and shape to the sectors of the second section, the sections each being foldable into a U-shape and being interengageable in cross-wise relation with each other to form a parallelpiped structure enclosing a chamber, each wing sector having a side connected to the associated central sector and a free opposite parallel side with a free end, each wing sector further having two free lateral sides extending between the first two said sides thereof, and hook-shaped portions on said free ends of the wing sectors and on the free edge sides of the central sectors, the hook-shaped portions on the wing sectors being engaged with the hook-shaped portions of the central sectors to lock the sectors together, each central sector being provided with grooves extending along and adjacent the hook portions thereof for preventing inward movement of the free ends of the wing sectors of the other section.



4,002,288

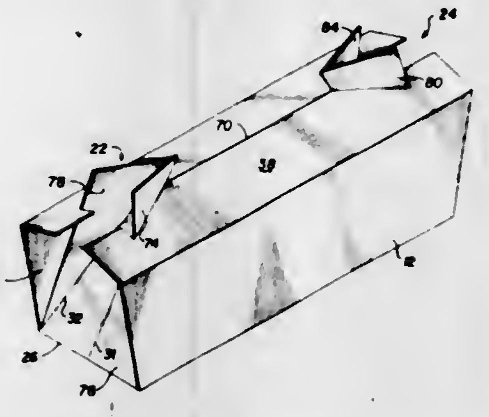
FOOD CONTAINER

Carle D. Klupt, 8218 Arrowhead Road, Baltimore, Md. 21208

Filed Apr. 21, 1976, Ser. No. 678,783

Int. Cl.² B65D *5/10*

U.S. Cl. 229—39 R **13 Claims**



1. A one-piece blank for a container comprising:

a quadrilateral bottom panel,

first and second quadrilateral side panels hingedly connected along longitudinal fold lines to said bottom panel,

a top panel hingedly connected along a longitudinal fold line to said first side panel,

a pair of quadrilateral end panels hingedly connected along lateral fold lines to said bottom panel,

each of said end panels include a pair of fold lines dividing the end panel into three triangles, and

a pair of means, defining an opening beginning on opposite lateral edges of said top panel, for removably receiving and locking said pair of end panels respectively.

4,002,289

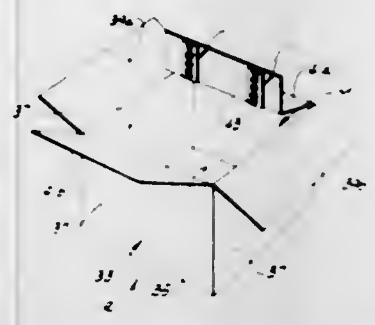
STATIC-TYPE MIXER AND RECEPTACLE

Thomas B. Moore, 32 Progress Parkway, Maryland Heights, Mo. 63043

Division of Ser. No. 473,415, May 28, 1974, Pat. No. 3,927,868. This application July 15, 1975, Ser. No. 596,171

Int. Cl.² B65D *5/66*

U.S. Cl. 229—44 R **1 Claim**



1. A receptacle for receiving an item to be packaged and for having plastic foamed in place around the item for protecting the item from damage durin shipping, said receptacle having a mouth for placement of the item in the receptacle and for introduction of plastic, and one or more disposable static-type mixers secured to said receptacle adjacent its mouth, said receptacle comprising a carton having at least one closure flap for closing the mouth of the carton, said one or more static-type mixers being secured to said flap for discharge of plastic foam material therefrom and for introduction of said foam material into the carton, said one flap being hingedly folded along a line parallel to the outer edge of the flap intermediate said outer edge and the attachment of the flap to the box so that the outer end portion of the flap may be hingedly bent to extend generally upwardly when said one flap is folded closed, said mixer being secured to the inner surface of the outer end portion of said one flap such that with said one flap folded closed and with said outer end portion thereof extending generally vertically, said mixer is disposed for ready introduction of said plastic foam material into the box.

4,002,290

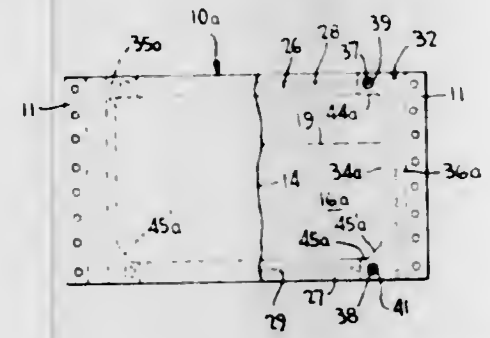
ENVELOPE ASSEMBLY

Edmund G. Van Malderghem, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 495,924, Aug. 8, 1974, Pat. No. 3,941,307. This application Jan. 12, 1976, Ser. No. 648,059

Int. Cl.² B65D *27/10*

U.S. Cl. 229—69 **7 Claims**



1. A continuous envelope assembly having spaced transverse lines of weakening defining a succession of interconnected sealed envelopes, comprising: front and back panels, and insert material within each sealed envelope, said insert material at least comprising interconnected upper and lower panels forming a return envelope, one of said return envelope panels being separable along a keen line of weakening provided therealong, the other of said return envelope panels having a flap foldable over and securable to said one panel for closing said return envelope, said panels of said return envelope being so constructed that all marginal edges thereof are free from attachment to said front and back panels; a portion of said one panel which is separable along the line of weakening being superimposed over said flap and being connected to one of said front and back panels by attaching means; registration means including chip elements in abutting engagement with and unattached to said marginal edges for immobilizing said insert material relative to said front and back panels, said chip elements being adhesively secured to said front and back panels; and a tear strip on each said sealed envelope for opening said sealed envelope, said portion of said one panel being retained with said sealed envelope upon the removal of said return envelope from said sealed envelope.

4,002,291

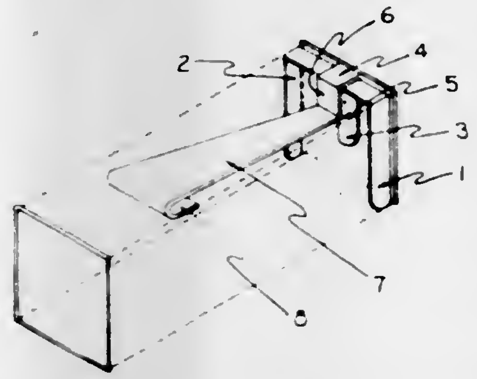
NEWSPAPER DELIVERY TUBE INSERT

Joel W. Hodge, 208 Riverview Court, Elizabethton, Tenn. 37643

Filed June 29, 1976, Ser. No. 700,917

Int. Cl.² B65D *91/00*

U.S. Cl. 232—17 **4 Claims**



1. A readily insertable newspaper support bracket device for insertion into a newspaper delivery tube of one piece, elongated, hollow body construction open at one end and closed at the other; which support device comprises three descending legs connected at a common point, two of which are opposing legs which substantially follow the contours of the interior of the tube terminating at the lower inside edges of the rear end of the tube when the device has been inserted in the tube, and the third leg flat against the closed end of the tube when inserted; and a spring clip attached at the hereinbefore defined common point, which spring clip descends to about the mid-point of the tube then forms a wide ascending arch nearly to the top of the tube terminating in the front one-half of the tube in a reverse bend to act as a finger hold.

4,002,292

TIMING DEVICE FOR THERMOSTATIC-CONTROL UNITS

James G. Parks, 2463 Riverside Place, Los Angeles, Calif. 90039

Filed Aug. 25, 1975, Ser. No. 607,441

Int. Cl.² F23N *5/20;* **H01H** *37/02*

U.S. Cl. 236—46 R **5 Claims**

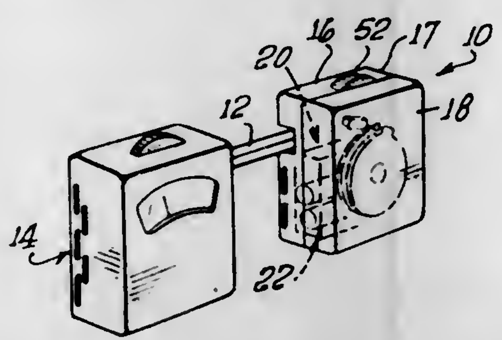
1. A timing device for thermostatic- controlled heating units wherein the combination thereof comprises:

a clock mechanism having an output shaft projecting therefrom;

a threaded, support bushing removably mounted to said output shaft and having a flat-keyed portion formed thereon;

a plurality of cam plates arranged to be selectively positioned on said bushing, said plates having at least one

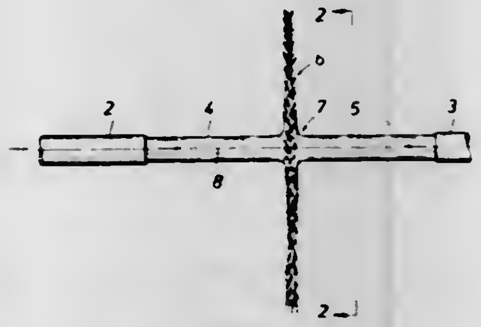
radially-projecting, cam head integrally formed thereon and a central opening disposed therein;
a timing plate positioned to be superposed over said cam plates whereby said cam plates are selectively positioned relative to said timing plate, wherein said timing plate includes a central aperture having a keyed, flat side to correspond to said keyed portion of said bushing, whereby rotation on said bushing is prevented thereby;
means for securing said plates to said bushing;
a timing-switch means arranged to be activated by said cam heads at predetermined intervals;



power means removably connected to said clock mechanism for the operation thereof;
a first temperature-control-switch means electrically connected to said timing-switch means, said first temperature-control switch being operated by a selective, ambient, temperature range; and
a second temperature-control-switch means electrically connected to said heating unit and being selectively operative within a lower predetermined temperature range than the selective temperature range of said first temperature-control-switch means.

4,002,293
METHOD AND APPARATUS FOR SHAPING AND POSITIONING FLUID DISPERSAL PATTERNS

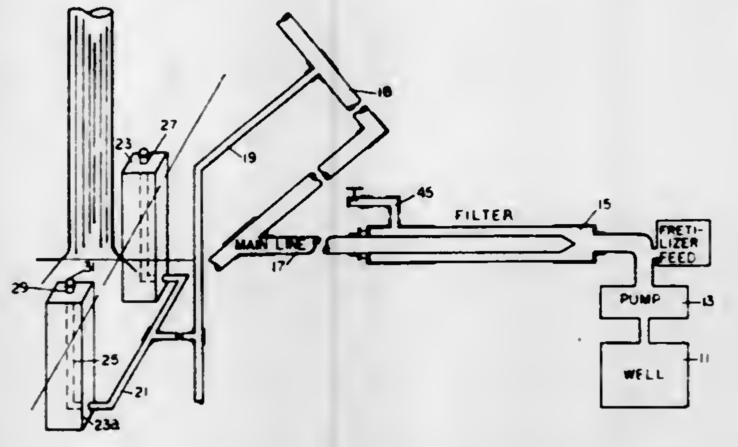
Thomas R. Simmons, 3510 Lobit, Dickinson, Tex. 77027
Continuation-in-part of Ser. No. 349,252, April 9, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,549
Int. Cl.² B05B *1/26*
U.S. Cl. 239—11 **18 Claims**



12. A method of establishing and positioning a free traveling circular and substantially non-aerated dispersal of liquid, comprising
forming and aiming a first substantially cylindrical jet of substantially non-aerated liquid in one direction along a first preselected axis,
forming and aiming a second substantially cylindrical jet of substantially non-aerated liquid in the opposite direction along a second preselected axis parallel with said first axis to collide with said first jet and produce said dispersal, and
discharging said jets at velocities to position said dispersal at a preselected location along said axes.

4,002,294
GROVE IRRIGATION SYSTEM

Elbert (Bert) Alvin McLeod, P.O. Box 447, Frostproof, Fla. 33843
Filed June 25, 1975, Ser. No. 590,025
Int. Cl.² B05B *15/02, 15/06*
U.S. Cl. 239—104 **1 Claim**

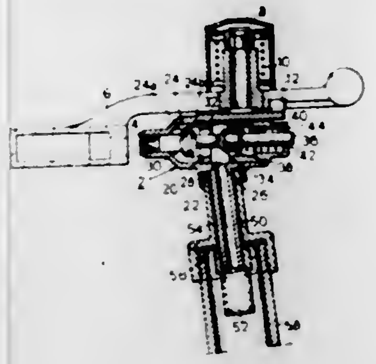


1. An irrigation system including an elongated filter (15) comprising:
a. an elongated cylindrical outer casing (33) having input and output ports (37,44) at the longitudinal ends thereof;
b. an elongated cylindrical inner treating unit (35) longitudinally disposed in said outer casing, one end of said inner treating unit associated with said output port, the other end of said inner treating unit having an end wall with samll filter apertures (41) on said inner treating unit extending from said end wall along a substantial length of said inner treating unit but less than the entire length of the inner treating unit, so that said filter apertures prevent undesirable particles from entering said inner treating unit, an outer chamber defined by said outer casing and said treating unit wherein said outer chamber is adapted to receive fluid from said input port (37) into said outer chamber;
c. spigot valve means attached to said outer casing along the circumference of said outer casing near the longitudinal end associated with the output port and furthest from said filter apertures, for controlling fluid flow from said outer chamber through said filter apertures into said inner treating unit, and into said output port when said valve means is in its closed position, and for controlling fluid flow from said outer chamber through said spigot and valve means, when said valve means is in its open position, so as to flush out undesirable particles from the outer chamber;
d. an elongated rectangular concrete block post (23), a longitudinal post pipe (25) in said post, said post pipe extending outwardly of said block post, a spray head (31) spanning an arc between 45° to 180 ° attached to the outwardly extending end of said post pipe, a pipe elbow (26) connected to the other end of said post pipe; and,
e. piping means for coupling said pipe elbow (26) to the output port (44) of said elongated cylindrical outer casing which comprises, a main pipe line (17) connected to said output port, a T-shaped connection (21) coupled to said main pipe line having at least one connection pipe connected to said pipe elbow (26), whereby the system is adapted to provide fluid to the roots of trees.

4,002,295
SELF-REGULATING SPRINKLER

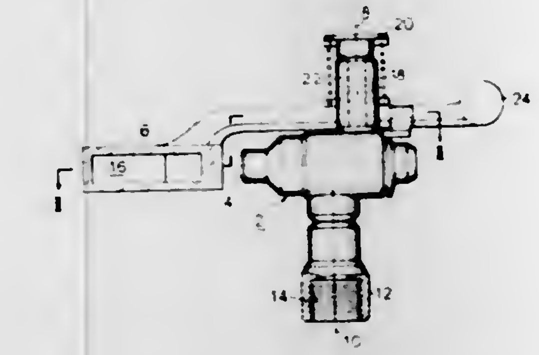
Mordeki Drori, 89 Zahal St., Kiron, Israel
Filed Feb. 17, 1976, Ser. No. 658,608
Claims priority, application Israel, Feb. 19, 1975, 46669
Int. Cl.² B05B *3/02*
U.S. Cl. 239—230 **7 Claims**

1. A pressure-regulated water sprinkler including a sprinkler head carrying a nozzle at one end through which the water discharges in the form of a jet, characterized in that the sprinkler head includes a housing defining an internal chamber communicating at one end with the nozzle and having an inlet at another end; the nozzle end of the housing being formed with a plurality of internal ribs spaced circumferentially and extending longitudinally to a point within the chamber intermediate the nozzle and inlet ends; said ribs being formed with a first annular shoulder adjacent to the nozzle end of the chamber, and with a second annular shoulder more remote from the nozzle end and of larger diameter than the first annular shoulder; an annular ring fixedly disposed within the chamber and having one side bearing against said second annular shoulder and its opposite side facing the housing inlet; a regulator member movably disposed within the chamber between said ring and first annular shoulder; and pressure-sensing means for sensing the inlet pressure and automatically moving the regulator member towards and away from said one side of the annular ring to regulate the flow therethrough to the nozzle.



4,002,296
ROTARY SPRINKLER PARTICULARLY FOR USE WITH LOW-ENERGY WATER JETS

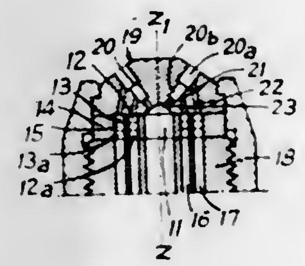
Mordeki Drori, 89 Zahal St., Kiron, Israel
Filed Feb. 17, 1976, Ser. No. 658,610
Claims priority, application Israel, Feb. 19, 1975, 46668
Int. Cl.² B05B *3/02*
U.S. Cl. 239—230 **4 Claims**



1. A rotary sprinkler particularly for use with low energy water jets, comprising: a sprinkler head, a mounting for the sprinkler head for mounting same on a pipe to rotate about a vertical axis, a nozzle carried by the sprinkler head through which the water is discharged in the form of a jet, and a pivotably mounted arm urged in one direction by a spring and driven by the water jet in the opposite direction, causing the arm to oscillate and to impact against the sprinkler head to rotate same about a vertical axis; characterized in that the sprinkler includes a pair of stops limiting all the oscillations of the arm; one of said stops being located to fix the normal position of the arm, as urged by said spring, in alignment with the water jet so as to be impinged and to be driven thereby; the other of said stops being located to permit the oscillating arm to be driven through a forward stroke, against the force of the spring, for a short distance to apply an impact against the sprinkler head and to rotate same about its vertical axis, said other stop being continuously located to permit the oscillating arm to pivot during said forward stroke only through a short arc of less than 20° before impacting against the sprinkler head, which short arc is sufficient to remove the oscillating arm from the path of the water jet, but not sufficient to load the spring with enough energy to cause the arm to rotate the sprinkler head during the return stroke of the arm by the spring.

4,002,297
BURNERS OF LIQUID FUELS ATOMIZED BY THE EXPANSION OF A COMPRESSED AUXILIARY FLUID

Jean-Claude L. Pillard, Marseille, France, assignor to Entreprise Generale de Chauffage Industriel Pillard, Marseille, France
Filed Oct. 9, 1975, Ser. No. 621,153
Claims priority, application France, Oct. 24, 1974, 74.41031
Int. Cl.² B05B *7/04, 7/08*
U.S. Cl. 239—429 **7 Claims**



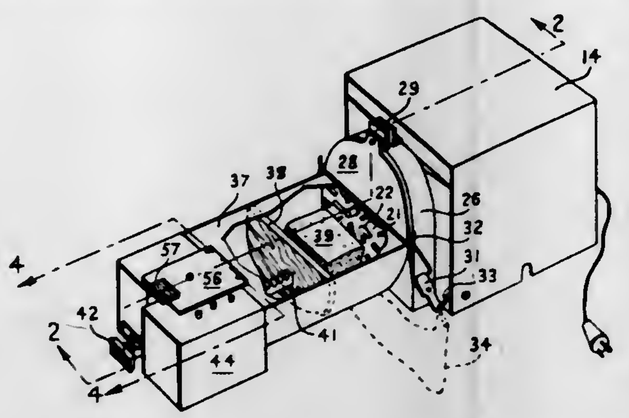
1. A burner of liquid fuels atomized by the expansion of a compressed auxiliary fluid, said burner being composed of:
a central conduit fed with auxiliary fluid,
a first annular conduit, coaxial with said central conduit, fed with a liquid fuel,
a multi-nozzle head comprising nozzles which open out into a combustion chamber and which are disposed along a frustum of a cone diverging towards said chamber, each of these nozzles comprising a mixing chamber into which opens a channel injecting auxiliary fluid communicating with said central conduit and at least one channel injecting liquid fuel communicating with said first annular conduit, which burner comprises, in addition, supplementary annular conduits, coaxial with said central conduit, each of these supplementary conduits being fed with an auxiliary liquid and being connected by at least one channel to each of the mixing chambers, so that each nozzle injects into the flame an atomized mixture of said liquid fuel and of at least one auxiliary liquid.

4,002,298
CHEESE GRATING MACHINE

Salvatore C. Latora, 3159 Baker St., San Francisco, Calif. 94123
Filed Oct. 16, 1975, Ser. No. 622,860
Int. Cl.² B02C *18/14, 18/22*
U.S. Cl. 241—36 **8 Claims**

1. A cheese grating machine comprising a disk formed with grating teeth on its surface, means for rotating said disk, an enclosure around the periphery of said disk having a grated cheese dispensing aperture, a trough parallel to the axis of rotation of said disk, a pusher reciprocable in said trough to push a block of cheese in said trough into contact with said disk, pusher advancing means to push said pusher toward said disk, a cover for said trough, hinge means for said cover and means for securing said cover in closed position and safety

means to interrupt operation of said means for rotating said disk and said pusher advancing means, said safety means being responsive to said cover being open or to said pusher being in close proximity to said disk.



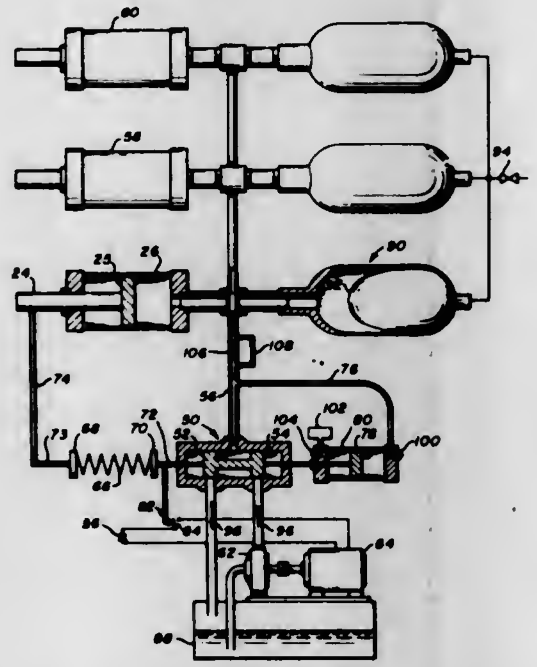
4,002,299
HYDRAULICALLY LOADED PULVERIZER JOURNAL

Clemens John Skalka, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 29, 1975, Ser. No. 617,357

Int. Cl.² B02C *4/32*

U.S. Cl. 241—37 **5 Claims**



1. In a pulverizing mill, an upright grinding bowl, means for rotating the bowl, a grinding roll cooperating with the upper surface of the bowl to perform the pulverizing therebetween, fluid loading means forcing the roll toward the bowl, control means for controlling the pressure of the fluid contained in the fluid loading means, said control means including a pump, a reservoir for supplying fluid to the pump, a first pipe extending from the pump to the loading means, a servo valve located in the first pipe, a second pipe extending between the servo valve and the reservoir, the servo valve having three positions, a first position in which fluid can pass from the pump to the loading means, a second position in which fluid can pass from the loading means to the reservoir, and a third position in which no fluid flow takes place, a mechanical spring, a piston and cylinder arrangement which is subjected to the pressure contained in the fluid loading means, a first spring seat on one end of the spring which is interconnected to the roll in such a manner that it moves with the roll, a second spring seat on the other end of the spring which is connected to the piston and cylinder arrangement and moves therewith, the spring, piston and cylinder arrangement all being related to the servo valve such that when the roll is in a steady state the servo valve is in its third position, if the roll moves towards the upper surface of the bowl, the servo valve is moved to its second position, and if the roll moves away from the upper surface of the bowl the servo valve is moved to its first position.

4,002,300
CHIP-FORMING APPARATUS

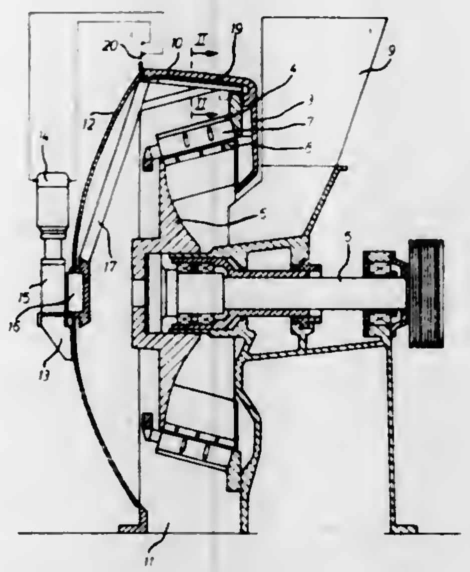
Hans-Joachim Mruck, Bielefeld, and Gerhard Maier, Brackwede, both of Germany, assignors to Maschinenfabrik B. Maier KG, Brackwede, Germany

Filed Apr. 22, 1975, Ser. No. 570,482

Claims priority, application Germany, Apr. 26, 1974, 2420189

Int. Cl.² B02C *18/14*

U.S. Cl. 241—37.5 **6 Claims**



1. Chip-forming apparatus comprising housing means having a peripheral inner wall surface, a cutter cage mounted within said housing means and spaced from said peripheral inner wall surface, said cutter cage having a plurality of chip-cutting blades, means for feeding coarse material to said cutter cage to be formed into chips by said chip-cutting blades and hurled radially outwardly against said peripheral inner wall surface, rotatable first drive shaft means disposed in said housing means and connected with a rotor having cleavage knives at its periphery, said cleavage knives cooperating with said cutter cage, cleaning means mounted in said housing means adjacent said peripheral inner wall surface thereof, and second drive shaft means rotatable independently of said first drive shaft means, said cleaning means being carried by said second drive shaft means and being rotatable therewith in brushing engagement with said inner wall surface.

4,002,301
VENTED HAMMERMILL CRUSHER

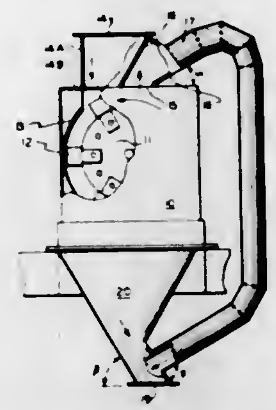
George S. Shurtleff, Coon Rapids, Minn., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Nov. 6, 1975, Ser. No. 629,286

Int. Cl.² B02C *23/34*

U.S. Cl. 241—48 **7 Claims**

1. A vented hammermill crusher comprising:
- a. a housing and rotary crusher means having an upper inlet opening above that portion of the rotary crusher means where the crusher direction is downward, a vent opening above that portion of the rotary crusher means where the crusher direction is upwards,
- b. a crusher particulate collector having a large upper opening communicating with the housing bottom, said collector having sloping sides and a small discharge opening,
- c. a discharge conduit communicating with the discharge opening of the collector, said conduit having substantially the same angle as the collector wall relative to the horizontal and having an opening therein,
- d. a vent duct external to said housing connecting said vent opening of the crusher housing and the opening in the discharge conduit, said vent duct connecting to said discharge conduit at an angle of about 90° to the discharge conduit sidewall.



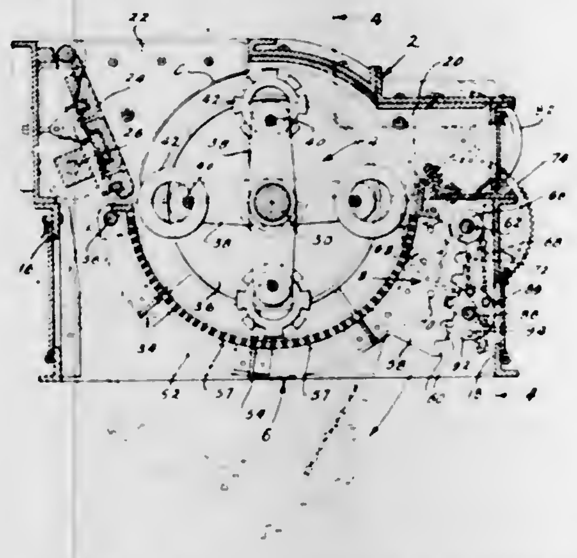
4,002,302
REDUCING MACHINE HAVING A POSITIVELY DISPLACED GRATE

Donald G. Miller, Glendale, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed Jan. 21, 1976, Ser. No. 651,120

Int. Cl.² B02C *13/284*

U.S. Cl. 241—89 **9 Claims**



1. A reducing machine comprising: a housing having an inlet through which material is introduced; a rotor which revolves in the housing and has breaker elements which pass by the inlet and strike the material, reducing the material to a smaller size; a cage located in the housing beneath the rotor and having apertures through which the reduced material passes; a chain suspending the cage from the housing so as to retain the cage in the proper position beneath the rotor; a sprocket rotatable in the housing and having the chain passed over it such that when the sprocket is rotated in one direction the chain will pay off of the sprocket and the cage will be permitted to descend and when rotated in the opposite direction the chain will be drawn over the sprocket and the cage will be elevated; and means for exerting a downwardly directed force on the cage so as to urge the cage downwardly in the event that it fails to descend under its own weight when the chain is released, the means for exerting a downwardly directed force on the cage comprising a gear segment on the cage and a gear in the housing and meshed with the gear segment, the sprocket and gear rotating in unison such that the rotation of the gear is synchronized with the movement of the chain, the chain being of sufficient length to enable the cage to drop downwardly past the point at which the gear is engaged with the gear segment.

4,002,303
DEVICE FOR SECURING THE WINDING ENDS OF ELECTRICAL COILS ON TERMINAL PINS

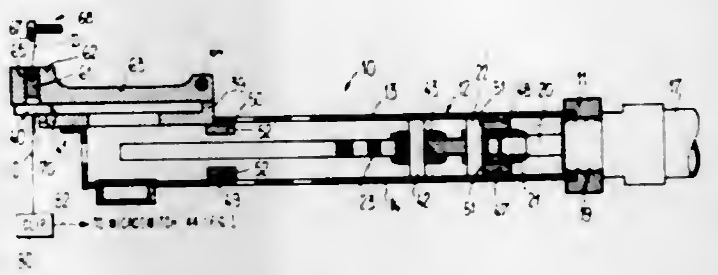
Hans Schmid, Ruschlikon, Switzerland, assignor to A. Christiaens Societe Anonyme, Brussels, Belgium

Filed Apr. 16, 1975, Ser. No. 568,657

Claims priority, application Switzerland, Apr. 23, 1974, 5530/74

Int. Cl.² H01F *41/10*

U.S. Cl. 242—7.17 **17 Claims**



16. Device for securing the wire at the end of an electrical coil on a terminal pin of a coil body comprising:
- bearing means,
- a coiling member rotatably mounted in said bearing means,
- drive means for rotating said coiling member,
- an axial recess in one end of said coiling member and extending along the axis of rotation thereof for accommodating a terminal pin,
- a longitudinal slot in said bearing means, and
- a groove extending axially all the way through said coiling member and arranged differentially eccentrically throughout at least most of its length with respect to said axis of rotation for accommodating said wire,
- said groove being alignable on rotation of said coiling member with said longitudinal slot to allow said wire to pass through said slot into said groove.

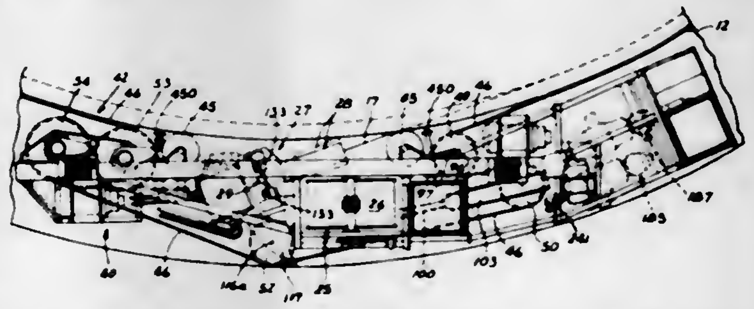
4,002,304
METHOD AND APPARATUS FOR STRESSING A TENDON AND BANDING A STRUCTURE

Endre F. Peszeszer, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed June 6, 1975, Ser. No. 584,337

Int. Cl.² B21F *17/00*

U.S. Cl. 242—7.21 **17 Claims**



1. A wire winding apparatus for banding a wall of a structure with a tensioned tendon comprising:
- a carriage movable about the structural wall to apply a tensioned tendon to the structural wall,
- means on said carriage for tensioning the tendon and for paying out the tendon to the structural wall,
- belt means encircling said structural wall and in frictional engagment with a substantial peripheral portion of said structural wall,
- means on said carriage for engaging said belt means and pulling thereon with sufficient force to propel said carriage circumferentially about said wall, and
- said belt means comprising an upper belt extending about an upper portion of said carriage and a lower belt extending about a lower portion of said carriage, said belts being spaced vertically from each other and extending circumferentially about said structure.

4,002,305

DEVICE FOR FORMING A TAIL WIND AROUND A BOBBIN HELD BY A TAKE-UP MECHANISM OF A RINGLESS SPINNING MACHINE

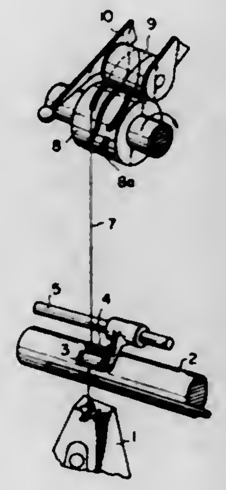
Tatsuo Takeuchi; Kozo Motobayashi, both of Aichi, and Kazuo Kamiya, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed June 25, 1975, Ser. No. 590,042

Claims priority, application Japan, June 26, 1974, 49-75573

Int. Cl.² B65H *54/34*; **D01H** *1/12*

U.S. Cl. 242—18 PW **6 Claims**



1. In a production unit of a ringless spinning machine provided with means for delivering a yarn from a spinning unit and a take-up mechanism for making a yarn package on a bobbin turnably held by said take-up mechanism, said take-up mechanism being provided with a traverse motion mechanism for forming said yarn package in cross winding by traversing said yarn, a device for forming a transfer-tail wind on said bobbin at a position outside said cross winding comprising an auxiliary yarn guide disposed at a position along a yarn passage formed between said delivery roller means and said traverse motion mechanism, said auxiliary yarn guide being provided with a smoothly formed yarn guide edge portion, a grooved portion formed at a position outside the terminal of said yarn guide edge portion, and a curved edge portion connecting said yarn guide edge portion to said grooved portion extending into the yarn guide edge portion traversed by said yarn during said traverse motion, said yarn guide edge portion positoned at a particular position wherein it is capable of engaging with said traversing yarn and said grooved portion being capable of taking a position outside the stroke of said traverse motion of said yarn along said yarn guide edge portion when said yarn is reciprocally traversed along said yarn guide edge portion, whereby when said yarn is urged to said yarn guide edge portion during said traverse motion thereof, said yarn is guided by said curved edge portion and displaced automatically to said grooved portion so that said yarn is forced to leave said traverse mechanism and stop the motion caused thereby, and is directed to an end portion outside the normal winding portion of said bobbin, and when said yarn is manually moved from said grooved portion of said auxiliary yarn guide, said yarn is caught by and resumes the motion caused by said traverse mechanism.

4,002,306

METHOD AND APPARATUS FOR WINDING CONICAL CROSS-WOUND COILS OR BOBBINS WITH CONSTANT THREAD-FEEDING VELOCITY

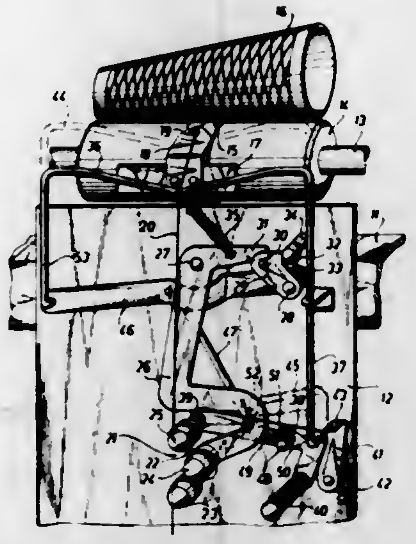
Hans Raasch, Monchengladbach, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Nov. 20, 1975, Ser. No. 633,706

Claims priority, application Germany, Nov. 20, 1974, 2454916

Int. Cl.² B65H *54/02*

U.S. Cl. 242—18 R **7 Claims**



1. Method of winding conical cross-wound coils at constant thread feed velocity wherein compensation is provided by a storage device for the varying winding speeds from the larger to the smaller diameters of the coils which comprises setting a thread storage device in zero position thereof, wherein no thread is being stored, after alternative occurrence of a coil change and a thread break; initially holding with an auxiliary thread guide a thread that is to be wound into a coil; advancing a thread guiding member in a direction from the larger toward the smaller diameter ends of the coil and, after releasing the thread from the auxiliary thread guide, taking over the thread with the thread guiding member.

4,002,307

LOSS-FREE WINDING APPARATUS

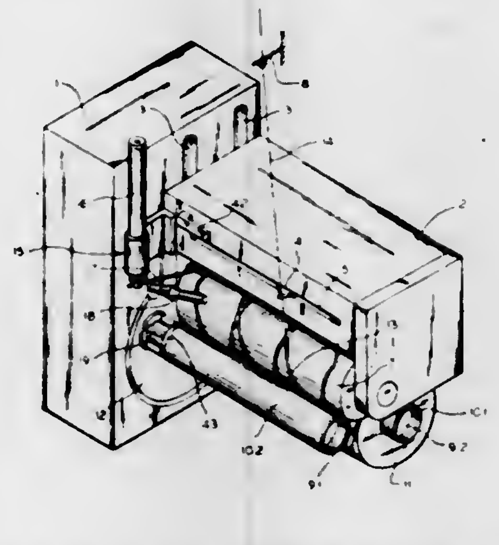
Herbert Turk, Remscheid, and Herbert Schiminski, Huckeswagen, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 18, 1975, Ser. No. 642,187

Claims priority, application Germany, Dec. 23, 1974, 2461223

Int. Cl.² B65H *54/06*, *67/04*

U.S. Cl. 242—18 A **10 Claims**



1. A thread changeover combination for shifting thread from a thread winding package to an empty winding tube without loss of thread comprising a bobbin revolver adapted to rotate and stop in predetermined positions, at least two rotatable chucks mounted on said revolver and adapted to orbit as said revolver rotates between at least a thread winding position and a winding package removal position, each chuck being adapted to releasably hold a winding bobbin or tube thereon, means for traversing the thread in a traverse plane across the winding of the bobbin or tube on the chuck which is in the winding position, means for rotatably driving each winding on each chuck while it is in the winding position, and a thread changeover mechanism embodying an auxiliary thread guide having a thread guide surface at an obtuse angle relative to said traverse plane, means for moving a thread-engaging portion of said guide surface into and out of said traverse plane adjacent one end of the traverse stroke of the thread, said thread guide further having a thread trap at the end of said guide surface which is remote from said thread-engaging surface, said thread trap lying outside said traverse plane, said thread trap being adapted to receive and hold therein thread which is running to the winding package when said thread runs along said guide surface after its thread-engaging portion has moved into said traverse plane and the thread moves along said guide surface to said thread trap, and means for shifting said thread guide with the thread running through said thread trap to a position wherein the running thread can be caught by another of said chucks or the winding tube or bobbin thereon.

4,002,308

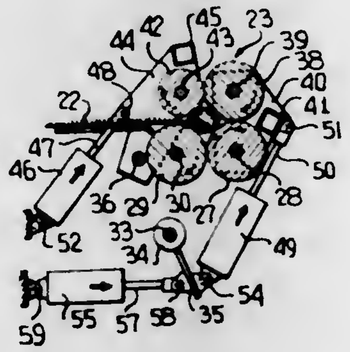
CARPET ROLL-UP MECHANISM

James M. Feighery, Dalton, Ga., assignor to Tex Del Inc., Dalton, Ga.

Filed Aug. 5, 1975, Ser. No. 601,980

Int. Cl.² B65H *17/12*, *19/26*

U.S. Cl. 242—66 **5 Claims**



1. A carpet roll-up mechanism comprising a support frame, a pair of fixed axis parallel rolls journaled on the support frame in side-by-side close relationship, a pair of swing axis rolls which are parallel to each other and parallel to the fixed axis rolls and bodily movable on arcuate paths relative to the fixed axis rolls, end carrier frames for the swing axis rolls including interconnecting beams, the swing axis rolls being journaled on said end carrier frames, the end carrier frames for one swing axis roll rockably mounted on the shaft of one fixed axis roll, fixed axis shaft means on said support frame spaced from and parallel to the other fixed axis roll and rockably supporting the end carrier frames of the other swing axis roll, reversible power drive means coupled with all of said rolls for turning them in unison in one direction on their parallel axes, first extensible and retractable power cylinder means interconnecting said support frame and end carrier frames for the last-named swing axis roll, second extensible and retractable power cylinder means connected with the end carrier frames of the first-named swing axis roll, intermediate fixed axis rockable support means on the support frame and connected with said second power cylinder means and supporting one end thereof, and third extensible and retractable power cylinder means interconnecting said support frame and intermediate fixed axis rockable support means.

4,002,309

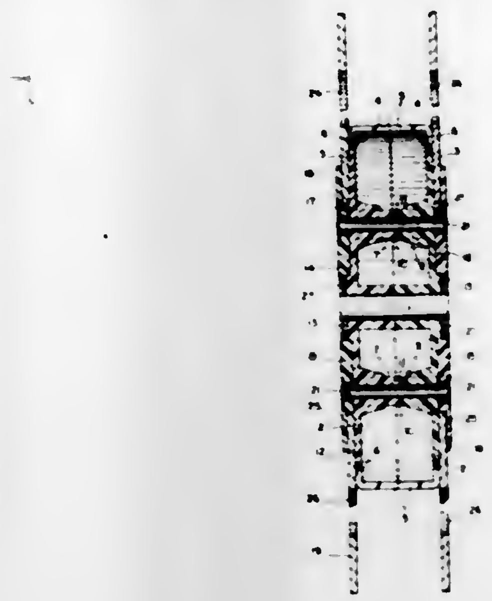
BOBBIN FOR CINEMATOGRAPHIC FILMS

Alejandro Ruiz-Barbotteau, Escobedo Sur 733, Ste. 201, Monterrey, Neuvo Leon, Mexico

Filed July 10, 1975, Ser. No. 594,730

Int. Cl.² B65H *75/18*

U.S. Cl. 242—71.8 **3 Claims**



1. Improved bobbin structure for films comprising in combination, a pair of film retaining panels defining a central circular aperture, a rotatable center hub of "Nylon" comprised of a plurality of interfitting pieces held in registration to define crevices on opposite sides thereof with two spaced walls held a fixed distance apart greater than the thickness of said panels for receiving thereinto loosely the circular aperture of said panels to rotate on the hub.

4,002,310

REEL FOR PHOTOGRAPHING PAPER OR THE LIKE

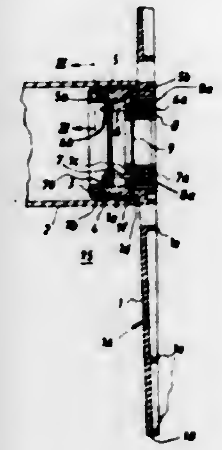
Friedrich Gauser, Feldkirchen; Thomas Hammer, Munich; Hans Dieter Frick, Taufkirchen; Wolfgang Viehrig, Munich; Karl Heinz Ritter, Karlsfeld; Wolfgang Kwiatkowski, Unterhaching; Viktor Osegowitsch, Taufkirchen; Josef Glass, Ottobrunn, and Erwin Laar, Taufkirchen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 22, 1975, Ser. No. 615,792

Claims priority, application Germany, Sept. 26, 1974, 7432380[U]

Int. Cl.² B65H *75/18*

U.S. Cl. 242—71.8 **11 Claims**

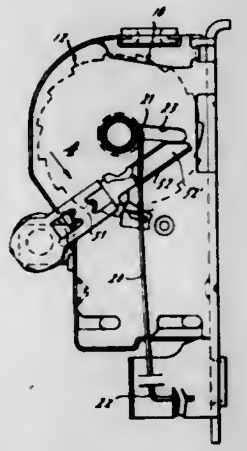


1. In a reel for collection or paying out of flexible web material, particularly photographic paper, a combination comprising a core having two end portions and a cylindrical external surface; and at least one substantially disk-shaped

flange connected with and adjacent to one end portion of said core, said flange having a periphery, a short cylindrical portion having an outer surface of the same diameter as said external surface of said core and merging with the same, and a conical surface extending between said cylindrical portion of said flange and said periphery and tapering outwardly in a direction away from said one end portion.

4,002,311
BELT TENSION ELIMINATOR FOR SEAT BELT SYSTEM

Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407, and Cecil A. Collins, 1355 Edgeorge, Pontiac, Mich. 48054
Filed Jan. 12, 1976, Ser. No. 648,400
Int. Cl.² A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107.7 **8 Claims**

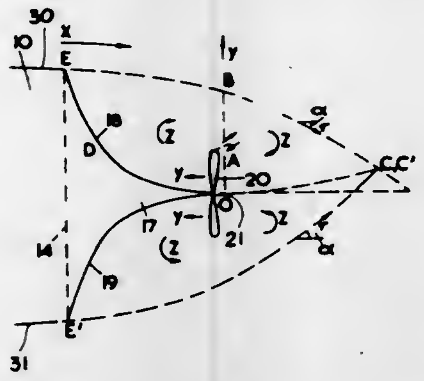


1. A safety belt retractor comprising a frame and a spool mounted on said frame, means resiliently biassing said spool in a belt retraction direction, said spool having an end flange combined with improved means for controlling protraction and retraction of the belt, said means including a disc attached to said end flange for rotation therewith, said disc having a first annular track adapted to receive a stop-follower resiliently urged into said track, a second annular track disposed outwardly of said first track and in communication therewith to receive said stopfollower upon initial retraction of a withdrawn belt and to permit continuous retraction of the belt when the belt is unlatched by the user, and a third control track which communicates with the second track to receive said stop-follower upon further limited protraction of the belt, a stop in said control track engageable by said stop-follower when said limited protraction is released to prevent further retraction of the belt until released by the user.

4,002,312
TRUNCATED AEROFOILS HAVING SPANWISE SPLITTERS

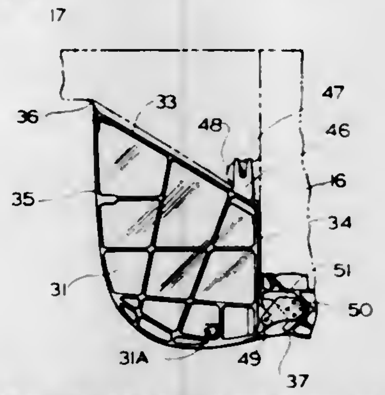
Edward Granville Broadbent, Farnham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Sept. 5, 1975, Ser. No. 610,849
Claims priority, application United Kingdom, Sept. 6, 1974, 39127/74
Int. Cl.² B64C *23/00*
U.S. Cl. 244—40 R **4 Claims**

1. An aerofoil comprising: an upper surface and a lower surface and having on each surface, aft of the point of maximum thickness of the aerofoil, a discontinuity; a spanwise splitter extending downstream of said discontinuities to a trailing edge, there being between each of said discontinuities and said trailing edge a concavely contoured surface; and a plurality of fans mounted on said trailing edge and arranged to blow air over said concave surfaces in the upstream direction relative to free stream airflow over the aerofoil.



4,002,313
AIRCRAFT CONFORMAL LOAD CARRYING PALLET

Walter G. Blank, Sr., Florissant; Frank Laacke, Des Peres; Jacob W. Priser, St. Charles, and Robert W. White, Florissant, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed July 28, 1975, Ser. No. 599,823
Int. Cl.² B64D *9/00*
U.S. Cl. 244—118 R **6 Claims**



1. In an aircraft a fuselage and wing meeting at a wing root area constituted by surfaces having a predetermined surface configuration; an elongated load carrying and enclosing pallet comprising a hollow body having a fixed geometry presenting an exposed wetted surface outwardly of said wing root area and other surfaces presented to and conforming substantially to said predetermined surface configuration of said fuselage and wing; means between said aircraft fuselage and other surfaces and spaced along the length of said hollow body and securely connecting said hollow body to the aircraft; and means carried by said hollow body in position engaging and forming a seal between the margins of said wetted surfaces and said fuselage and wing root area having said predetermined surface configuration.

4,002,314
TRAIN VEHICLE SPEED CONTROL SIGNAL PROVIDING APPARATUS

Isaac R. Barpal, McMurray, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 7, 1975, Ser. No. 593,816
Int. Cl.² B61L *3/20*
U.S. Cl. 246—63 C **10 Claims**

1. In a train vehicle control apparatus for determining the operation of a train vehicle along a track including a plurality of signal blocks, the combination of:

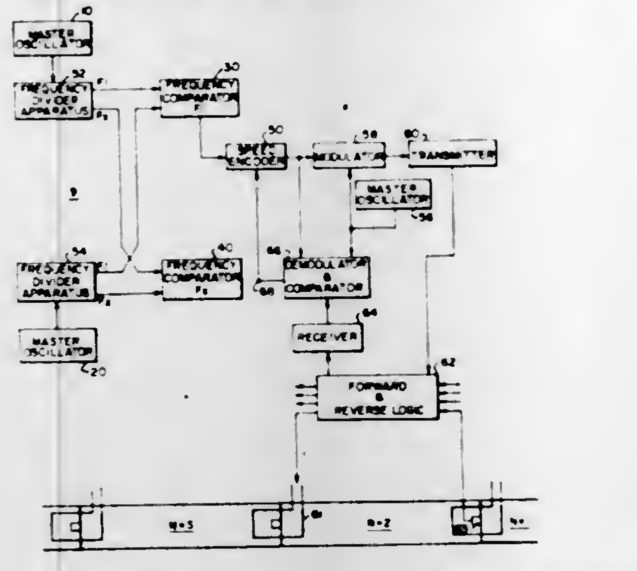
means for providing a first frequency signal having one predetermined frequency for controlling the operation of said train vehicle,

means responsive to said first frequency signal for providing a first output signal,

means for providing a second frequency signal having a different predetermined frequency for controlling the operation of said train vehicle,

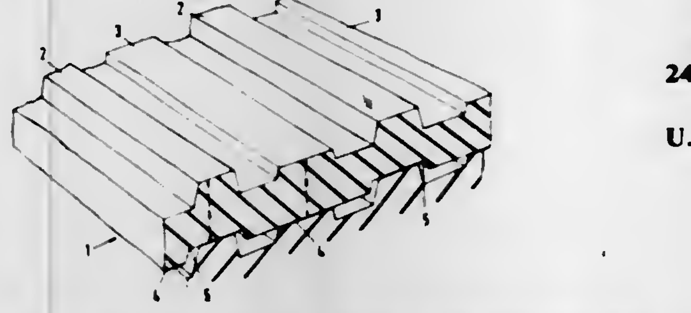
means responsive to said second frequency signal for providing a second output signal, and

means for comparing the respective frequencies of said first output signal and said second output signal for providing a control signal for controlling the operation of said train vehicle when the respective frequencies of said first output signal and said second output signal are substantially the same.



4,002,315
VIBRATION DAMPER

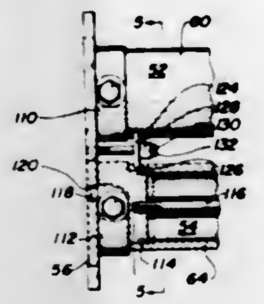
Willy Van Goubergen, Kraainem-Brussel, Belgium, assignor to N.V. Imexin S.A., Brussels, Belgium
Filed May 14, 1975, Ser. No. 577,472
Claims priority, application Germany, May 21, 1974, 7417627[U]
Int. Cl.² F16F *16/00*
U.S. Cl. 248—24 **3 Claims**



1. A vibration damper formed of a shelf-damping material, such as rubber or like elastomer, said damper being provided with upwardly and downwardly extending projections from upper and lower surfaces, respectively, of said damper, said projections having end faces parallel to said surfaces and arranged in groups of different heights, characterized in that said upwardly extending projections are comprised of a group having a specific height with an alternate group of upwardly extending projections of less height, said downwardly-extending projections being disposed on said lower surface about substantially the entire lower plate surface except areas of said lower plate surface opposite said upwardly extending projections of said specific height, the distance between said end faces of said upwardly extending projections of said specific height and said lower surface being substantially equal to the distance between said end faces of said upwardly extending projections of said less height and said downwardly extending projections.

4,002,316
TELESCOPIC SHOCK ABSORBER MOUNT FOR A HYDRAULIC CUSHIONING UNIT IN A RAILWAY CAR TRAILER HITCH

Harvey O. Parchmont, Stafford, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed May 6, 1975, Ser. No. 574,993
Int. Cl.² B60P *7/00*
U.S. Cl. 248—119 S **13 Claims**



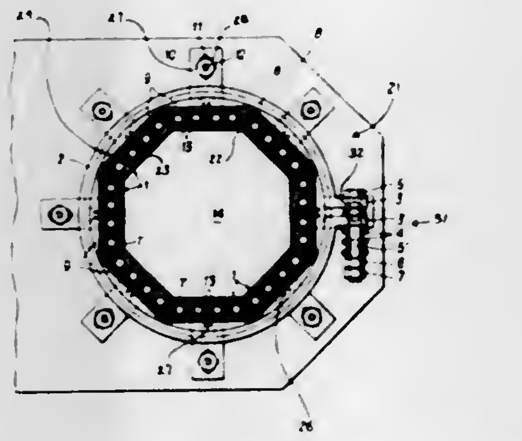
1. In a collapsible trailer hitch for releasably securing a trailer or the like to the deck of a railroad car for piggyback operation wherein the trailer hitch has a normally vertically disposed and movably mounted leg assembly, a movably mounted normally inclined leg assembly, and a cushioning unit operably connected to the inclined leg assembly, said cushioning unit having a plurality of energy-absorbing telescopic shock absorbers with one end portion of said plurality of shock absorbers being mountable on a connecting end plate, an improvement comprising means to mount said shock absorbers on said end plate which includes:

a. an indention in a side portion of each of said shock absorbers, said indentions being substantially spaced from one end of said shock absorbers, and

b. means to rigidly secure said shock absorbers to said end plate having a bar member being engageable in and extending between said indentions and said bar member being operably connectable to said end plate.

4,002,317
CASTING MOLD ASSEMBLY

Ernst Fischer, Vienna, Austria, assignor to Gebr. Bohler & Co. AG, Vienna, Austria
Filed Jan. 30, 1975, Ser. No. 545,437
Claims priority, application Germany, Feb. 6, 1974, 2405598
Int. Cl.² B22D *27/04;* **B41B** *11/46*
U.S. Cl. 249—79 **6 Claims**



1. In a liquid-cooled casting mold assembly, a plurality of elongated plates successively arranged in a closed path about a mold axis to define a mold wall whose internal surfaces define a central mold cavity of regular polygonal cross section, each plate having a planar outer surface and exhibiting at least one bore extending axially therethrough for passage of the cooling liquid, the adjoining surfaces of the successive plates

in the mold wall being disposed in abutting relation, and a securing ring extending around the outer periphery of the mold wall, the ring terminating in a pair of spaced parallel legs extending transverse to the circumference of the ring, a threaded member having a shaft extending through both legs of the ring, spring means positioned on the shaft and having one end disposed in abutting relation with the outer surface of one of the legs of the ring, means carried by the shaft in abutting relation with the other end of the spring means for compressing the legs of the ring toward each other to tightly secure the joints between the successive plates of the mold wall, and a transition member having an inner surface coextensive with and mating with the outer surface of the respective plates and an outer surface which abuts the inner surface of the securing ring and has a curvature that is complementary thereto.

4,002,318

ELECTOMAGNETIC PRESSURE CONTROL VALVE FOR INCOMPRESSIBLE MEDIA

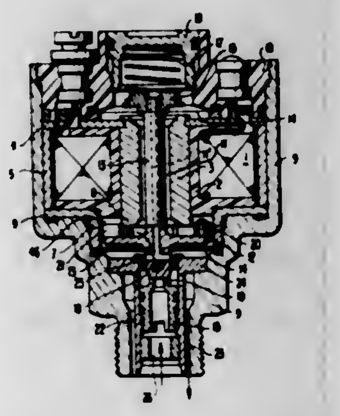
Arwed von Koch, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed July 15, 1974, Ser. No. 488,443

Claims priority, application Germany, July 20, 1973, 2336927

Int. Cl.² F16K *31/06*

U.S. Cl. 251—129 **27 Claims**



1. A pressure control valve for an incompressible medium in which the medium is conducted through a valve gap formed by a valve seat means and a valve closure means, and in which the valve closure means is acted upon by a force dependent on a control magnitude, the control valve being constructed as an electrically energized solenoid valve including an energizing coil, a magnet armature means operatively connected with the valve closure means and an armature support means for the armature means, a predetermined force produced by a force storage means acting on the valve closure means in the deenergized condition of the coil, said force being variable by energization of the coil in dependence on the control magnitude, magnetic casing means surrounding the energizing coil and terminating in two substantially concentrically disposed pole shoe means enclosing therebetween a magnet gap, and housing means for the coil and casing means, characterized in that the armature means comprises a ring-shaped provided on the armature support means, said ring-shaped armature is attracted axially into the gap with a more or less large force depending on the coil energization, and in that the armature support means consists of a material whose coefficient of thermal expansion at least approximately corresponds to that of the material of the housing means receiving the coil and magnetic casing means.

4,002,319

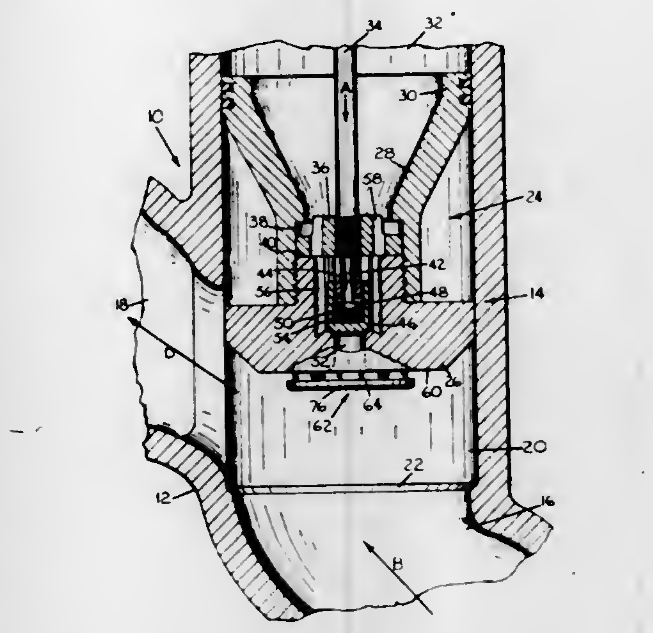
BI-DIRECTIONAL PRESSURE BALANCED VALVE

Eldert B. Pool, Pittsburgh, Pa., and Lalji J. Pavagadhi, Mission Viejo, Calif., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1975, Ser. No. 631,286

Int. Cl.² F16K *1/32*

U.S. Cl. 251—282 **3 Claims**



1. In a bi-directional pressure balanced valve of the type which includes a body having a cylindrical valve chamber and first and second flow passages intersecting a lower portion of said cylindrical valve chamber at different axial positions, an annular valve seat between said flow passages and above said second flow passage, a main valve disc assembly slidably supported within said cylindrical valve chamber for axial movement between a closed position sealingly engaging the valve seat and an open position spaced therefrom substantially above both flow passages, said disc assembly defining thereabove a sealed upper chamber, means including a valve stem extending through the upper chamber and operatively connected to the disc assembly for moving the latter between said positions, an axial opening through the disc assembly fluidly communicating the upper chamber with the flow passages, normal fluid flow being from said first flow passage past the valve seat to the second passage with the opening being substantially isolated from fluid velocity pressure thereat whereby only static pressure is communicated to the upper chamber, abnormal fluid flow being from the second flow passage to the first passage with the opening being directly exposed to fluid velocity pressure which is communicated to the upper chamber establishing a pressure differential on the disc and exerting a closing force thereon directed toward the valve set, means to substantially control fluid forces acting on the opposite sides of said main valve disc assembly to facilitate opening and closing of said valve regardless of the direction of fluid flow through said valve; the improvement comprising:

a flow deflecting device carried by the disc assembly below the opening for preventing the opening from being directly exposed to fluid velocity pressure during said abnormal fluid flow from said second flow passage to said first flow passage and thereby reducing the effect of velocity pressure increasing the pressure in the upper chamber and establishing said pressure differential on the disc and exerting said closing force thereon.

4,002,320

RAIL-LIFTING IMPLEMENT

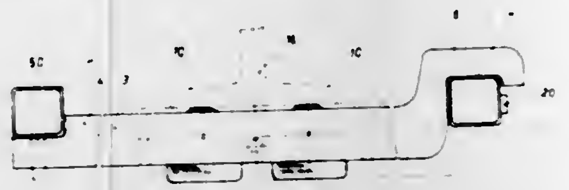
Walter Weber, Sanatoriumstr. 35, Vienna 14, Austria

Filed Oct. 29, 1975, Ser. No. 626,873

Claims priority, application Austria, Oct. 31, 1974, 8797/74

Int. Cl.² E01B *29/22*

U.S. Cl. 254—121 **5 Claims**



1. An implement for lifting a rail which lies on ties, comprising

a frame comprising cross-members,
two longitudinal beams associated with said frame, at least one of said beams being detachably associated with said cross-members,
an arm extending transversely to said beams between the same,
an articulated joint pivotally connecting said arm to said frame,
drive means operable to impart a pivotal movement to said arm about said articulated joint, and
upwardly facing, low-friction bearing means carried by said arm between said beams and spaced from said articulated joint,
said frame being adapted to be pushed under a rail and to assume a condition in which said beams extend along said rail on opposite sides thereof and rest on two spaced apart ties supporting said rail and said bearings engage said rail from underneath between said two ties.

4,002,321

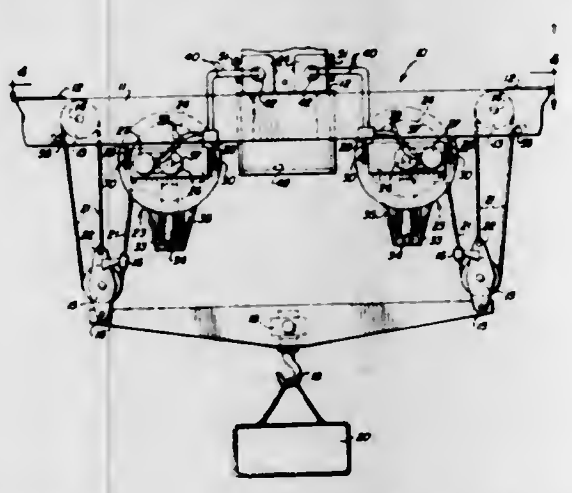
TILTABLE DRUMS FOR WINDING HOIST LINES

John B. Shaw, Phoenix, and Cecil T. Pelts, Glendale, both of Ariz., assignors to Cecil A. Pelts, Phoenix, Ariz.

Filed July 7, 1975, Ser. No. 593,639

Int. Cl.² B66D *1/26*

U.S. Cl. 254—184 **9 Claims**



1. A hoisting device for controlling the deflections of its load carrying line on a pair of power driven rotatable drums comprising:

a frame means having a pair of columns and supporting a cross-beam assembly,
a pair of traveling block means arranged for substantially vertical movement and comprising an equalizer beam means therebetween for supporting a load therefrom,
a pair of line receiving drums rotatably mounted on said frame between said columns for receiving and dispersing load carrying lines,
said pair of traveling block means being positioned between said pair of drums and said equalizer beam means,
a load carrying line for winding on to and off of each of said drums,
one end of each line being secured to an associated drum and the other end threaded around an associated traveling block means, and dead ended on a selected anchoring means,
operator actuated means for tiltably mounting each of said drums,
said means comprising a first pivot means for supporting one end of a drum for pivotal movement of the drum about a given point and tilting means for supporting the other end of the drum,
said tilting means causing lateral movement of said other end of said drum a given distance vertically each side of a substantially horizontal position thereof to properly and tightly wind and unwind said line in multiple layers from the drum during load lifting and lowering operations, and
means for selectively rotating each of said drums.

4,002,322

INTERLOCKING HANDRAIL CONSTRUCTION FOR BALUSTRADES

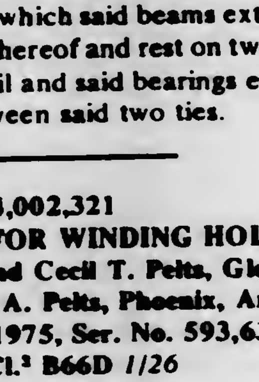
Isamu Matsubara, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,146

Claims priority, application Japan, Oct. 2, 1974, 49-119582[U]

Int. Cl.² E04H *17/14*

U.S. Cl. 256—65 **7 Claims**



1. An interlocking construction for balustrades to be secured to a foundation, which comprises:

a. a bracket having means at one end adapted to be mounted on the foundation, said bracket having an arm at its other end, said arm terminating in a first locking prong;
b. a securing member connected at one end to said bracket and having its other end formed into a second locking prong;
c. A handrail having a pair of peripherally spaced-apart locking means each extending along the length of the handrail, said first and second locking prongs engaging said locking means to grip said handrail in place on said arm and said securing member; and
d. said arm and said securing member jointly providing a continuous surface conforming to the portion of the peripheral surface of said handrail lying between said pair of locking means, and supporting said handrail thereon.

4,002,323

ARRANGEMENT FOR MIXING AND TREATING POWDERED AND GRANULAR MATERIAL

Gustav Grün, Ortenberg, Lissberg, Germany, assignor to Luco-Technic AG, Zurich, Switzerland

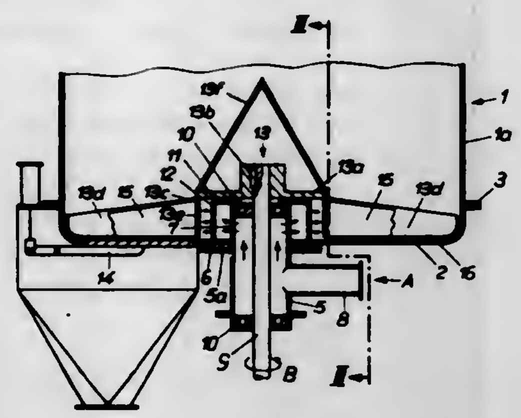
Filed Aug. 7, 1975, Ser. No. 602,744

Int. Cl.² B01F *7/16, 15/00*

U.S. Cl. 259—8 **7 Claims**

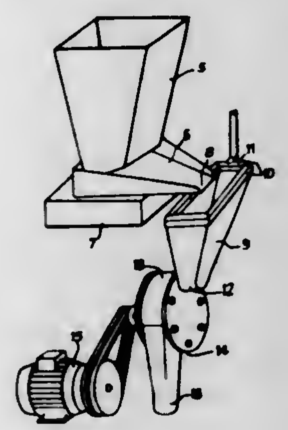
1. Apparatus for mixing and treating powdered and granular

material by means of compressed gas comprising, in combination, mechanically driven mixing means with an upright cylindrical mixing tank having an intake for the material to be mixed and an outlet for the mixed material, said tank having a flat bottom; rotating hub means directly above said flat bottom of said mixing tank; at least one stirring paddle with wall panels fastened to said hub and leaving a vacant space between said flat bottom of said tank and said wall panels of said stirring paddle, said vacant space extending from said hub means to the outside wall of said mixing tank; supply channel means for passing compressed gas through said hub means into said vacant space; slit means between said hub means and said wall panels of said stirring paddle and adjacent tank wall sections for the exit passage of compressed gas into said mixing tank along the entire stirring paddle from said hub means to said outside wall.



4,002,324
METHOD FOR CONTINUOUSLY MIXING A POWDER IN A LIQUID

Joël Huet, Vernon, France, assignor to The Societe Dilumelt, Vernon, France
Filed Nov. 12, 1974, Ser. No. 523,153
Claims priority, application France, Mar. 20, 1974, 74.09512; Nov. 14, 1973, 73.40496
Int. Cl.² B01F *7/04, 15/02;* **B02C** *13/08*
U.S. Cl. 259—9 1 Claim



1. A method of dispersion of a powder in a liquid and particularly a powder having a considerable solvation capacity with respect to a liquid in which said powder is intended to be dispersed, wherein said method entails the successive steps which consist:

in discharging the liquid about a perimeter in an overall direction substantially orthogonal to said perimeter at each point of discharge, to form a liquid envelope which defines a liquid flow passage between a pouring point and an atomization station,

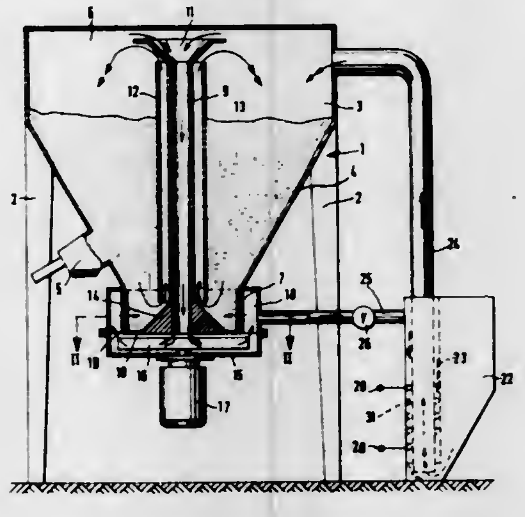
in continuously introducing the powder into the liquid flow passage at the pouring point so as to guide said powder to the atomization station within and together with its liquid envelope, the ratio of flow rates of powder and of liquid being equal to the desired dispersion ratio,

in atomizing the liquid flow passage containing the powder at the atomization station to disperse the powder in the liquid, and

in producing a partial pressure at the lower end of the liquid flow passage in order to subject the powder and the liquid to suction and to carry out subsequent atomization and dispersion in an aerated medium.

4,002,325
APPARATUS FOR MIXING POWDERY OR GRANULATED MATERIALS

Friedrich W. Herfeld, Wall 1, Neuenrade, Germany
Filed Mar. 22, 1976, Ser. No. 669,022
Int. Cl.² B01F *5/00, 5/16;* **F26B** *17/00*
U.S. Cl. 259—23 14 Claims

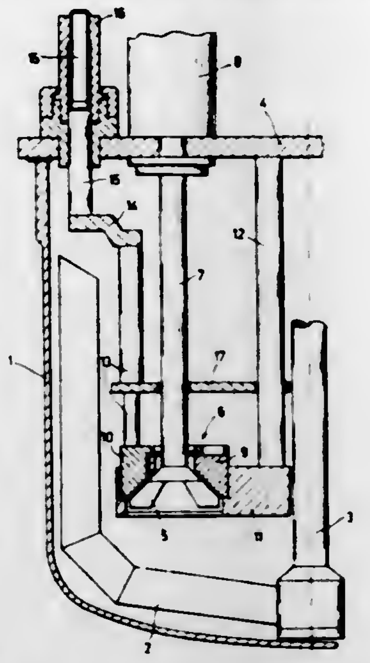


1. Apparatus for mixing powdery or granulated materials, comprising a mixing container narrowing downwards like a funnel, an ascending pipe placed in the vertical axis thereof, an air supply pipe concentrically provided within the ascending pipe, a radial fan situated in the root portion of the mixing container, whereby the air supply pipe extends into the suction space thereof, and the annular pressure space of which containing blast openings which are directed on to the inlet opening of the ascending pipe.

4,002,326
HOMOGENIZATION STIRRER

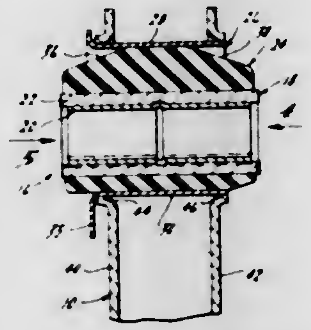
Hans G. Brogli, 42 Gotthelfstrasse, Basel, and Werner F. Brogli, 3 Kindergartenstrasse, Reinach, both of Switzerland
Filed Mar. 7, 1975, Ser. No. 556,327
Claims priority, application Switzerland, Mar. 11, 1974, 3353/74
Int. Cl.² B01F *5/06, 5/16*
U.S. Cl. 259—95 2 Claims

1. A homogenization stirrer for use with materials having differing ranges of viscoscity and homogeneity, the stirrer comprising; a rotor, a stator spaced from said rotor and defining a rubbing gap, means for rotating said rotor relative to said stator and including rotor blades for sucking a medium axially from one side and thrusting it axially towards the side opposite said one side, said stator comprising two interengaging parts both located on one and the same side of said rotor and defining a plurality of passage gaps between said two parts, said passage gaps forming a plurality of passages through which said medium is passed out of said stator for homogenizing the same, and means for axially adjusting spacing of one of said two parts in relation to the other part of said two parts for adjusting the width of said passage gaps in said stator and thus back pressure and flow rate to determine dwell time of the medium in the rubbing gap.



4,002,327
RESILIENT BUSHING

James J. Damon, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 23, 1974, Ser. No. 535,929
Int. Cl.² F16F *1/16*
U.S. Cl. 267—57.1 A 1 Claim



1. A suspension construction for a motor vehicle comprising a suspension link, a vehicle frame component and a resilient bushing assembly interconnecting said link and said component;

said bushing assembly comprising an inner cylindrical member having serrated ends engaging said component;

an annular elastomeric body surrounding said inner cylindrical member;

an outer generally tubular member surrounding said elastomeric body and connected to said suspension link;

said outer member having first and second halves disposed on either side of a plane containing the axis of aid inner cylindrical member and arranged perpendicular to the longitudinally axis of said suspension link;

said first half of said outer member being semi-cylindrical in shape;

said second half being generally semi-cylindrical with a pair of circumferentially spaced apart inwardly extending flutes;

said inner cylindrical member being coaxially arranged with respect to said outer member;

the radial distance between said inner member and said flutes of said outer member being substantially less than the radial distance between said inner member and said outer member;

said elastomeric member having a cylindrical inner surface complementing the outer surface of said inner member and an outer surface with a pair of circumferentially spaced flutes complementing the inner surface of said outer member;

said inner and outer surfaces of said elastomeric member being in flush engagement with said inner and outer members, respectively;

said elastomeric member having beveled edge portions adjacent said first half that extend inwardly of the outer edges of said first half,

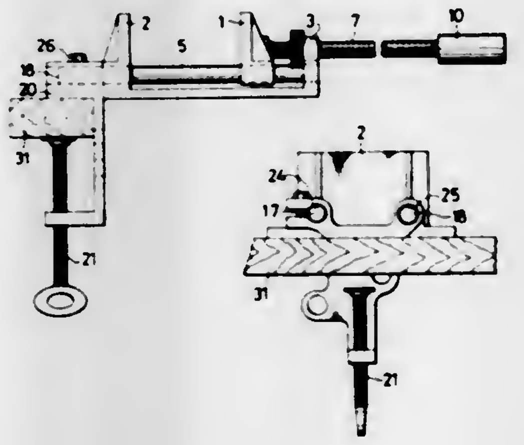
said resilient bushing assembly being constructed to provide a first spring rate for linear displacement of said suspension link in a first direction perpendicular to said plane in which said inner member is displaced toward the center of said first half of said outer member;

said resilient bushing assembly being constructed to provide a second spring rate for linear displacement of said suspension link in a second direction that is opposite to said first direction;

said first spring rate being substantially less than said second spring rate.

4,002,328
VISE

Robert Wolf, Im Kiesacker, 5446 Engeln; Klaus Walter Moller, Karlstrasse 25, 7016 Gerlingen, and Leo Klapperich, 5441 Weibern, all of Germany
Filed Oct. 6, 1975, Ser. No. 619,916
Claims priority, application Germany, Feb. 6, 1975, 2504897; Mar. 26, 1975, 2513319; July 10, 1975, 2530776
Int. Cl.² B23Q *3/02*
U.S. Cl. 269—97 9 Claims



1. A vise in combination with a C clamp for attaching the vise to a work bench in various positions, said vise comprising:

a movable jaw;

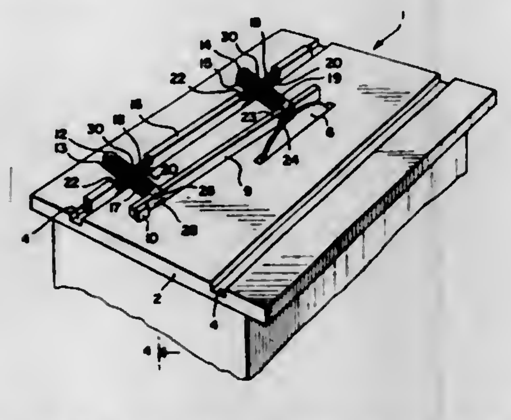
a spindle to move said movable jaw;

a quick release mechanism to provide coarse adjustment of said spindle and said movable jaw;

a base plate with a fixed jaw and with a fixed abutment block, which is penetrated by said spindle, and two parallel guide bars for said movable jaw extending between said fixed jaw and said abutment block, said bars penetrating said fixed jaw and extending to form two plugs projecting at the outside of said fixed jaw; said C clamp having clamping screw means for clamping a work bench or the like and a basic body which is provided with a first receiving hole to receive one of said plugs and further provided with at least three further holes extending parallel to the first hole and distributed over a circular arc spaced apart at 90° with respect to said first hole as a center and adapted to receive alternatively the other of said plugs and said first center hole used for all positions being provided with a further clamping means to clamp the inserted plug in any of its diametral directions.

4,002,329
WORKPIECE SUPPORT DEVICE

Adam Petrowski, Port Chester, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Mar. 17, 1976, Ser. No. 667,717
Int. Cl.² B23Q *3/18*
U.S. Cl. 269—318 **4 Claims**



1. A device for supporting a workpiece for the cutting thereof on a power saw of the type having a table, a blade extending from the table and a miter gauge groove disposed on the table parallel to the plane of the blade, said device comprising:

a. a guide member slidably mountable in the miter gauge groove;

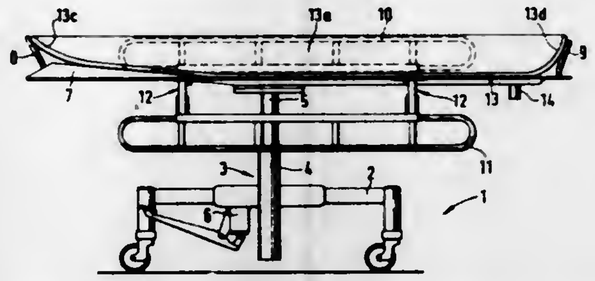
b. a workpiece holder disposed between the blade and said guide member and including an elongated first portion having two end portions and configured to abut against an edge of the workpiece during the cutting thereof and a second portion disposed at one of the end portions of said first portion and having an edge substantially perpendicular with said first portion and configured to abut against another edge of the workpiece for urging the workpiece into the blade;

c. means connecting said workpiece holder to said guide member for both rotational and translational movement of both end portions of said first portion with respect to said guide member, said connecting means comprising a pair of joining means each including at least one arm member spaced apart a given distance from the arm member of the other joining means and having an end portion rigidly connected to said first portion of said workpiece holder and disposed substantially perpendicular thereto and extending toward said guide member, said joining means further including a first longitudinal slot of a given width in each arm member and wherein said connecting means further comprises two colinear second longitudinal slots in said guide member having two innermost and two outermost points with respect to each other and having said given width, wherein the distance between the two outermost points thereof is greater than said given distance and the distance between the two innermost points thereof is less than said given distance, and a pair of fastener means each engaged in the first longitudinal slot of one arm member and the corresponding second longitudinal slot of said guide member; and

d. means for releasably fixing said workpiece holder in a desired position with respect to said guide member.

4,002,330
PATIENT SUPPORTING TABLE

Hans Arne V. Johansson, Treharadsvagen 36, Eslov, Sweden (S-241 OO)
Filed Dec. 5, 1975, Ser. No. 638,059
Int. Cl.² A47C *27/08*
U.S. Cl. 269—327 **12 Claims**



1. A supporting table for a recumbent patient, comprising: supporting chassis means;

a table plate mounted on said chassis means, and including a head edge, a foot edge, and side edges;

a plurality of gate members, one mounted along each of said edges of said table plate in an erect position extending upwardly from the plane of said plate;

means mounting the gate member along at least one of said side edges for pivotal movement between said erect position, and an inoperative position disposed beneath the plane of said table plate;

a mattress received on said table plate, and including a central portion, a head portion, a foot portion, and side portions, said head, foot and side portions being supported in upwardly extending relationship relative to said central portion by said erect gate members whereby said mattress forms a trough, said mattress side portion supported by said downwardly pivotable side gate member being adapted to fold downwardly when said gate member is lowered to its inoperative position;

drain means connected with said mattress for draining liquid from the trough formed by said mattress, said drain means emptying below said table plate, and said central portion of said mattress being arranged to slope toward said drain means to facilitate removal of said liquid; and

at least one pair of attachment members carried by said mattress and adapted to detachably secure said mattress to said table plate, said attachment members including first hook means adapted to grip a first one of said side edges, and second hook means adapted to grip the other of said side edges, whereby said mattress will remain in place on said table plate as a patient is transferred to or from said supporting table.

4,002,331
FLAT MATERIAL FOLDING DEVICE

Brett W. Kraft, and Barbara J. Porter, both of P.O. Box 7184, Country Club Station, Kansas City, Mo. 64113
Filed June 4, 1975, Ser. No. 583,622
Int. Cl.² B65H *45/00*
U.S. Cl. 270—61 R **11 Claims**

1. An apparatus for folding napkins and the like and comprising:

a. a housing having an entrance for napkins to be folded, said napkins having opposed ends and opposed sides;

b. napkin advancing means adjacent said entrance for receiving and engaging an intermediate portion between ends of a napkin forming a fold and advancing the napkin along a path with said fold being a leading fold edge thereof and the napkin sides being adjacent sides of said path;

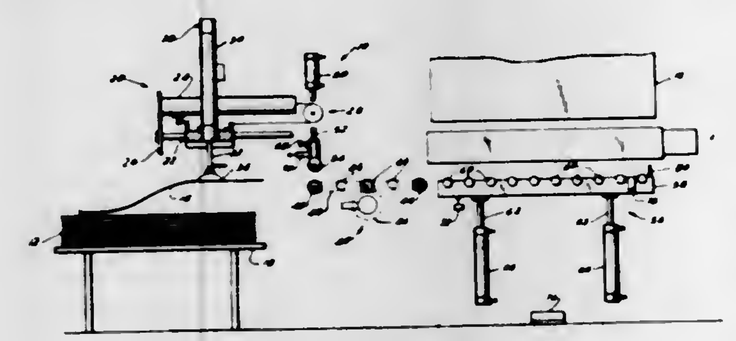
c. means on said housing and positioned in the napkin path and engageable by said leading fold edge of the napkin and operative to stop the advancing movement thereof;

d. gripper means movably mounted relative to said housing and operative to engage and grip portions adjacent said opposed sides of the napkin in spaced relation to said leading fold edge thereof and to move portions of the napkin between said gripper means forwardly relative to said path into folded overlying relation to napkin portions adjacent said leading fold edge and then release said side portions;

e. folding means engageable with the folded overlying napkin portions at a central portion between the napkin sides and operative to move said central portion transversely to form a transverse fold in the napkin; and means on said housing cooperating with said gripper means for urging same laterally outwardly relative to the napkin path to tension the napkin portions between said gripper means.

4,002,332
AUTOMATIC FEED MECHANISM FOR POWER BRAKE OR THE LIKE

Gustave Hoenigmann, Ridgewood, N.Y., assignor to Acme Steel Door Corporation, Brooklyn, N.Y.
Filed Apr. 9, 1975, Ser. No. 566,173
Int. Cl.² B65H *3/08, 5/06, 5/04*
U.S. Cl. 271—11 **8 Claims**



1. A feed mechanism for a power brake or the like comprising:

a frame;

means for supporting a stack of sheets to be fed to said power brake;

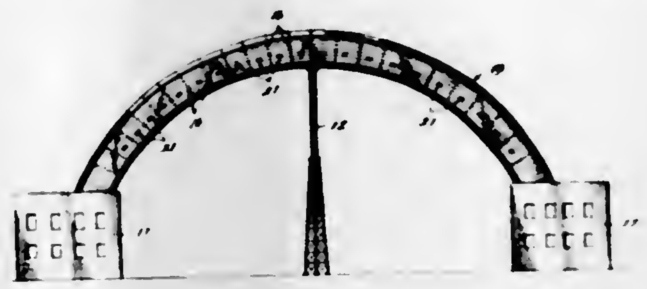
means secured to said frame for lifting a single sheet vertically from said stack and for transporting said sheet horizontally to a roller means, said lifting means comprising a trolley mounted to said frame for horizontal movement between a first position over said stack support and a second position, means for driving said trolley between said first and second positions, a cylinder mounted to said trolley for movement therewith, a piston disposed within said cylinder for vertical movement, said piston having a lower end extending out of the bottom of said cylinder, means for moving said piston within said cylinder between a lowered position and a raised position, suction cup means affixed to said piston lower end, and means for applying and removing suction from said suction cup;

roller means for transporting said sheet horizontally to a lifting station, said roller means including a first roll substantially aligned with said trolley second position and affixed to said frame at a height substantially equal to the level of said suction cup when said piston is in said raised position, a plurality of additional rolls extending between said first roll and said lifting station, means for driving said rolls, a pinch roll mounted to said frame for vertical movement aligned with said first roll, means for moving said pinch roll vertically between an upward position spaced apart from said first roll and a downward position, switch means in controlling relationship with said pinch roll moving means and disposed in the path of movement of said trolley, said switch means being operative to cause said pinch roll moving means to drive said pinch roll to said downward position when said trolley is in said second position;

a lifting station adjacent said power brake, said station including an elevator bed for receiving said sheet and raising said sheet from a first level equal to that of the roller means to a second level above said first level and substantially equal to that of the power brake inlet; and, means for driving said elevator bed.

4,002,333
RAINBOW PHENOMENON DEVELOPING DEVICE

Hideyuki Gotoh, 405, Shioya 1-chome, Otaru, Hokkaido, Japan
Filed Aug. 4, 1975, Ser. No. 601,305
Claims priority, application Japan, Jan. 11, 1975, 50-5664
Int. Cl.² F21P *1/02*
U.S. Cl. 272—8 D **6 Claims**



1. A rainbow phenomenon developing device comprising an arched framework secured at the opposite ends to spaced support structures and upheld at the apex by an intermediate supporting means and including a pair of spaced and parallel side frames and an arched top frame connecting the upper portions of said side frames, a plurality of differently colored transparent panels surrounding said side frames in a spaced and parallel relationship to the side frames, illumination means mounted on said side frames for illuminating said transparent panels, from within, water supply pipes positioned between said side frames and panels and a plurality of fine water spray nozzles extending from said water supply pipes through said panels for spraying fine water particles in a mist form so as to provide a mist atmosphere about said framework whereby a rainbow phenomenon is developed about the framework when said mist atmosphere is struck upon by the light rays from said illumination means which have passed through said colored transparent panels.

4,002,334
DUAL FRAME OFFSET DISC IMPLEMENT WITH TONGUE MEMBERS AND A TOW BAR ARRANGED FOR MOVEMENT BETWEEN SIDE BY SIDE RELATION AND A TRAILING RELATION

Jerry L. Wilbeck, South Hutchinson, Kans., assignor to Wilbeck Machine and Manufacturing, Inc., South Hutchinson, Kans.
Filed Sept. 17, 1975, Ser. No. 614,007
Int. Cl.² A01B *65/00*
U.S. Cl. 172—581 **12 Claims**

1. An earth working apparatus comprising:

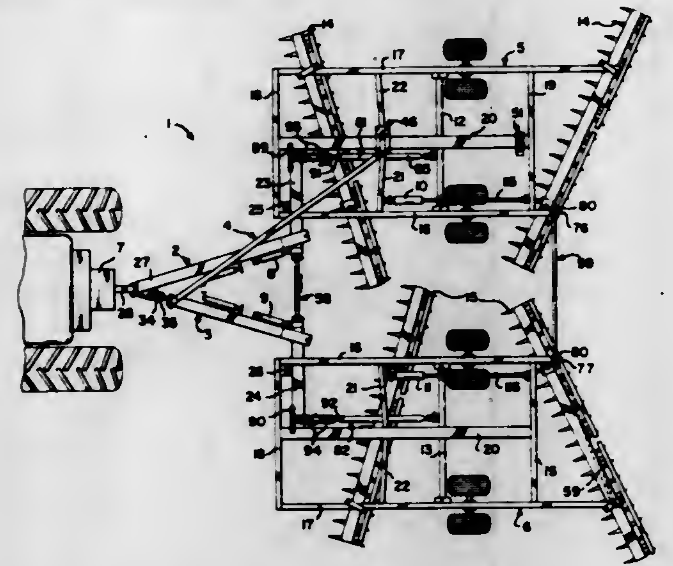
a. first and second spaced mobile frames each having a forward end portion and a rear end portion and laterally spaced side members extending therebetween;

b. means on each of said frames for earth working as said frames are moved forward;

c. first and second tongue members having one end thereof pivotally mounted on the forward end portion of respective first and second of said mobile frames and an other end thereof having connecting means for effecting connection of said frames to each other and to a prime mover for operation in side-by-side relation;

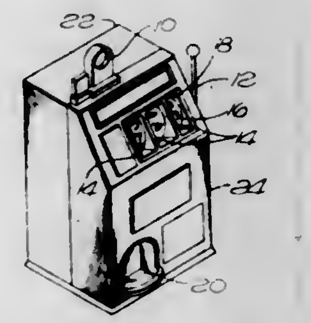
d. spacer means having ends releasably connecting said spacer mobile frames in side-by-side relation and cooperating with said tongue members to maintain spacing of said frames during side-by-side operation, said spacer means being separated from one of said mobile frames for change of relative positions of said frames; and

e. tow bar means having one end portion thereof pivotally mounted on said first mobile frame and the other end portion thereof pivotally mounted on said tongue member of the second mobile frame whereby said mobile frames may be moved from side-to-side relation to a position with said second mobile frame in trailing relation with said first mobile frame upon disconnecting said second tongue from said first tongue and separating of said spacer means from one of said mobile frames, said pivotal mounting of said one end portion of the tow bar means on said first mobile frame and said other end portion of the tow bar means on the tongue member of the second mobile frame being maintained during side-by-side relation and trailing relation and movement of the mobile frames from one to the other of said relations.



4,002,335
TOY BANK WITH COIN RETURN

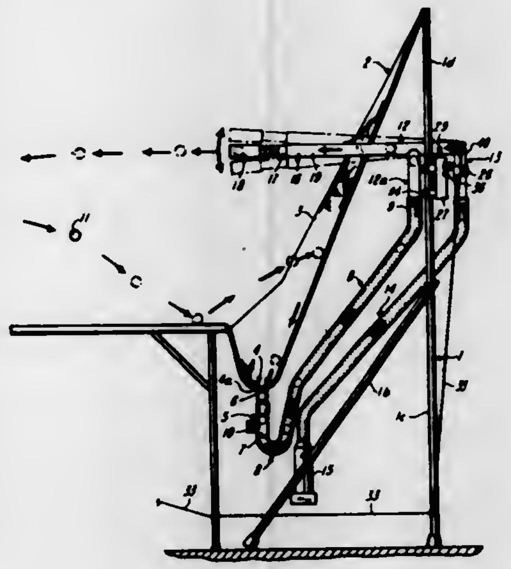
Richard B. Bailey, 3000 Dunes Circle, Reno, Nev. 89502
Continuation of Ser. No. 440,908, Feb. 8, 1974, abandoned.
This application July 28, 1975, Ser. No. 599,742
Int. Cl.^{2} A63H *33/30*; A63F *5/04*
U.S. Cl. 273—1 E **2 Claims**



1. A toy bank, as for accumulating coins, comprising:
spinning-reel means movable to designate a plurality of predetermined winning positional combinations;
drive means for actuating said spinning-reel means and to halt said spinning-reel means in sequence under manual control in various positional combinations;
coin-delivery means including a sliding leaf and rotary means to move said leaf in a reciprocal pattern for dispensing coins;
a set of feeler arms for mechanically sensing winning positional combinations of said reels;
a plurality of switch means selectively closed by said feeler arms in accordance with specific of said winning positional combinations;
an electric motor;
a gear train for coupling said motor to said rotary means of said coin-delivery means;
a plurality of switch terminal contacts individually connected to said like plurality of switch means;
a rotary contact means including a conductive segment upon which said terminal contacts dwell;
a gear segment means coupled to said rotary contact means and actuated by said drive means for resetting said rotary contact means to receive said terminal contacts upon actuation of said drive means, said gear segment means also being actuated by said gear train for sequential stepping motion to sequentially advance said conductive segment from positions of contact with said terminal contacts in incremental steps related to rotations of said rotary means of said coin-delivery means; and
means for energizing said electric motor through said switch means and said conductive segment to actuate said coin-delivery means whereby to operate said coin-delivery means in accordance with the states of said switch means as closed by said feeler arms.

4,002,336
TABLE TENNIS TRAINING DEVICE

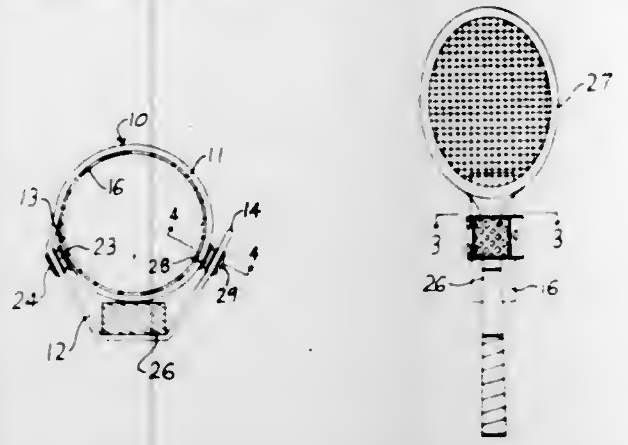
Dennis Beaver, 962 Eden Isle Drive N.E., St. Petersburg, Fla. 33704; J. R. Hensley, 1335 Old Country Drive, Dayton, Ohio 45414, and Jerry Duff, 4240 Wagner Road, Dayton, Ohio 45440
Filed May 12, 1975, Ser. No. 576,557
Int. Cl.^{2} A63B *39/00*
U.S. Cl. 273—30 **11 Claims**



1. A table tennis training device for use in connection with a table tennis table, which includes: a stand adapted to be placed at one end of a table tennis table, a tennis ball catcher supported by said stand and comprising a screen having a front side forming the side intended to face the table tennis table in connection with which said training device is to be used, said screen also comprising a rear side and being provided with a pocket on said front side for catching and gathering table tennis balls thrown onto the front side of said screen, a gun supported by said stand and arranged on the rear side of said screen, said gun having a barrel extending from the rear side of said screen through the latter to the front side thereof, first conduit means leading from said pocket to said barrel for establishing communication between said pocket and said barrel and for conveying table tennis balls from said pocket into said barrel, air blower means, second conduit means having one end thereof connected to said air blower means for communication therewith and having its other end connected to said barrel for communication therewith at an area more remote from the front side of said screen than the area where said first conduit leads into said barrel, and a partition with an orifice of substantially smaller diameter than the internal diameter of said second conduit, said partition being interposed between those areas where said first and second conduit means respectively lead into said barrel.

4,002,337
DEVICE FOR SUPPORTING A BALL CONTAINER FROM A TENNIS RACKET

Donald K. Rayfield, No. 9 Crestwood Drive, Oneonta, Ala. 35121
Filed Oct. 2, 1975, Ser. No. 618,744
Int. Cl.^{2} A63B *61/00*
U.S. Cl. 273—73 R **1 Claim**

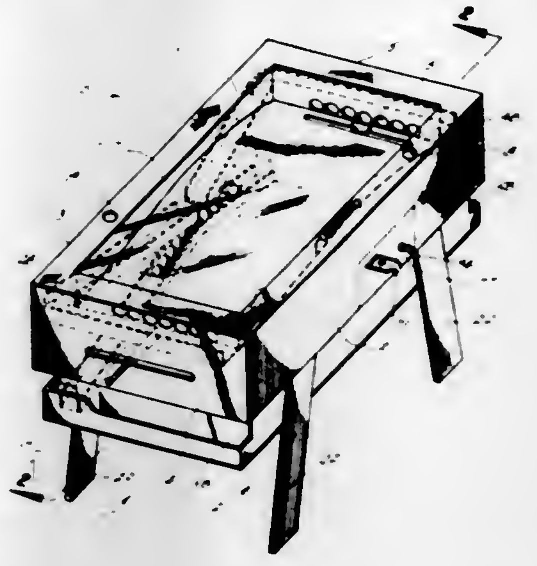


1. The combination with a cylindrical tennis ball container and an elongated handle of a tennis racket:
a. an elongated, wide flexible member having a first portion formed integrally with a second portion with said first portion having a free end and said second portion having a free end,
b. said first portion being of a length to surround said tennis ball container with one end of said first portion overlapping said free end of said first portion,
c. means detachably connecting said one end of said first portion to said free end of said first portion with said tennis ball container secured within said first portion,
d. said second portion defining an extension of said one end of said first portion and being of a length to extend around said handle of a tennis racket positioned alongside said tennis ball container secured within said first portion with the free end of said second portion terminating at a location alongside the outer surface of said first portion to provide sufficient length in said second portion to surround said handle of a tennis racket, and
e. means detachably connecting the free end of said second portion to said first portion at said location with said handle of a tennis racket secured in place between said second portion and said first portion.

4,002,338
AMUSEMENT GAME DEVICE

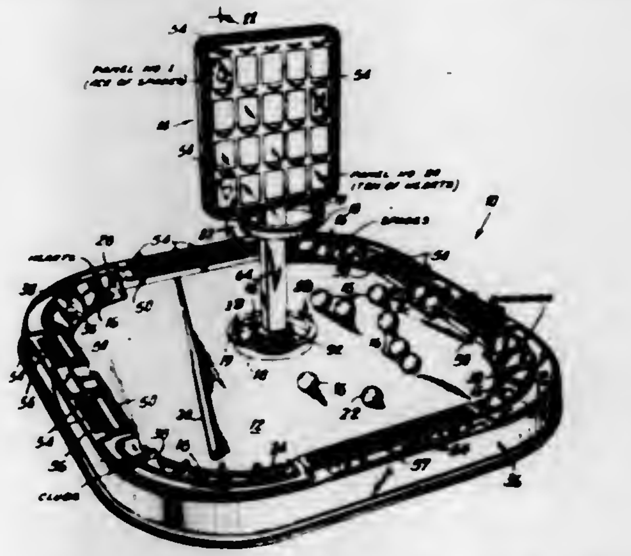
William V. Gamber, Huron, S. Dak., assignor to Jerry D. Elias
Filed June 12, 1975, Ser. No. 586,365
Int. Cl.^{2} A63F *7/06*, *7/10*
U.S. Cl. 273—122 A **8 Claims**

1. An amusement game device comprising:
support means;
frame means secured to said support means;
a longitudinal arcuate playing surface having depending ends mounted in said frame means;
a pair of spaced goal means secured to said frame means with one of said goal means disposed proximate each end of said playing surface;
at least one ball rollerably supported on said playing surface;
a pair of flipper means mounted in said frame means with one of said flipper means disposed proximate each goal means for striking said ball and propelling it away from said goal means on one end of said playing surface and toward said goal means on the other end of said playing surface;
wherein each said flipper means includes a rod disposed transversely of said playing surface and secured on its ends to said frame means; a sleeve slidably mounted on said rod; a tube transversely secured to said sleeve; a plunger slidably mounted in said tube and having one end projecting axially thereof; a vertically disposed post pivotally secured on one end to said tube; a flipper bar secured to the other end of said post and disposed above said playing surface proximate said goal means; and a linkage having one end secured to said plunger and having another end thereof secured to said post, wherein movement of said plunger causes said linkage to pivot said post and the said flipper bar from a first position to a second position.



4,002,339
POKER POOL GAME

Lawrence L. Reiner, 1 Hickory Lane, Woodbury, N.Y. 11797, and William A. Brady, 243 Teaneck Road, Ridgefield Park, N.J. 07660
Filed Nov. 20, 1974, Ser. No. 525,287
Int. Cl.^{2} A63F *7/00*
U.S. Cl. 273—123 A **20 Claims**



1. A pool-like game employing a plurality of balls comprising: a level or horizontal playing surface, a plurality of ball receiving pockets about said playing surface, conductive contact means in each of said pockets responsive to a pocketed ball, means in the form of a score board having a predetermined indicium for each of said pockets, and being electrically connected to said conductive contact means, for scoring said indicium upon response to a pocketed ball; at least one, but not all of said conductive contact means being normally closed and removing from said score board means the scored indicium for at least one pocketed ball; and means for supplying electrical power to said score board means.

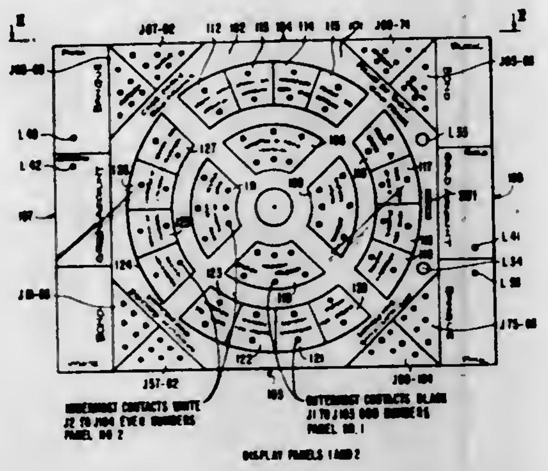
4,002,340
GAME APPARATUS

LeForest V. Alcorn, Forestville, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 26, 1975, Ser. No. 590,605

Int. Cl.² A63F *3/00*

U.S. Cl. 273—131 A **5 Claims**



1. Game apparatus, comprising

a housing of substantially rectangular parallelepiped configuration having a top and a bottom in spaced substantially parallel relation, a first pair of sides in spaced substantially parallel relation substantially perpendicular to the top and bottom and a second pair of sides in spaced substantially parallel relation substantially perpendicular to the top and bottom and to the first pair of sides;

a pair of display panels each at a corresponding one of the first pair of sides of the housing and each having a plurality of display lamps thereon positioned in spaced relation in rows and columns, a pair of rotary switches thereon, a pair of ON-OFF switches and a pair of color indicating display lamps;

a first plurality of spaced electrical contact sockets positioned in a predetermined arrangement on the top of the housing;

a second plurality of spaced electrical contact sockets positioned on one of the second pair of sides of the housing;

a source of electrical energy in the housing;

memory means in the housing;

electrical circuit means electrically connecting the second plurality of contact sockets to the memory means and electrically connecting the first plurality of contact sockets and the lamps and switches of the display panels in a plurality of circuits via the memory means and the source of electrical energy;

a plurality of electrical contact plugs each removably insertable into any of the first plurality of contact sockets to make electrical contact therewith and thereby close selected ones of the circuits; and

a plurality of programming means each having electrical contact plugs and each removably insertable into selected ones of the second plurality of contact sockets to program the memory means.

4,002,341
BOARD GAME OF THE HARE AND TORTOISE

Kenneth Gan Gee Chin, Elmhurst, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 23, 1976, Ser. No. 651,803

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 G **6 Claims**

1. A board game, which comprises:

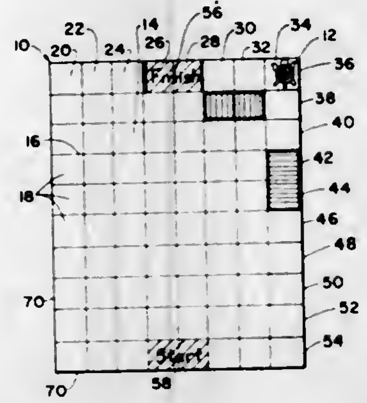
a. a playing board having a top playing surface thereon, said top playing surface subdivided into a plurality of playing squares;

b. two of said playing squares being a start position;

c. two of said playing squares being a finish position;

d. vertical boards extending upwardly from each side of said finish and said start positions;

e. two movable playing pieces movable on said playing squares;



f. a plurality of obstacle members movably contained on said playing surface, each said obstacle member occupying two said playing squares; and

g. a die for indicating the number of said playing squares to move each said movable playing piece.

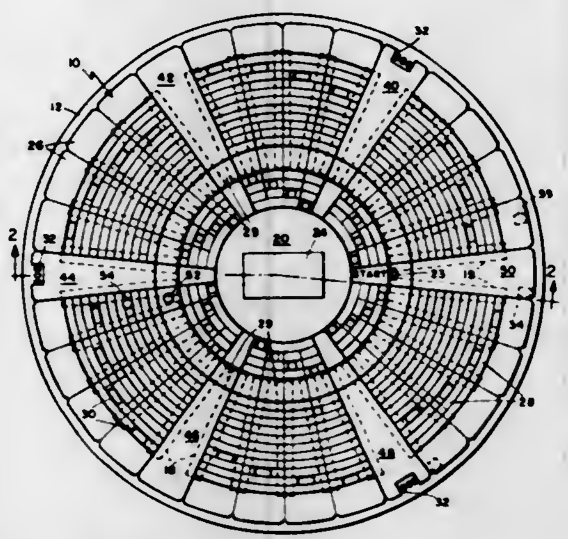
4,002,342
STOCK MARKET INVESTMENT GAME

Fred Conner Biggs, 751 Rosecrans St., San Diego, Calif. 92106

Filed Jan. 15, 1976, Ser. No. 649,212

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 AE **10 Claims**



1. A game comprising:

a game board having a continuous path divided into a plurality of spaces representing individual stocks,

a playing piece for progressing along said path from space to space,

recording means for recording the purchase price of stock shares corresponding to the location on said path of said playing piece, said recording means comprising a series of radial spaces each marked with market condition averages,

random number generating means for designating a number of spaces to be moved by said playing piece,

and market conditions biasing means for adjusting the market condition average and biasing share prices of said stocks according to a number generated by said random number generator.

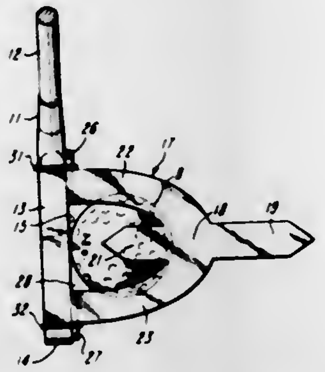
4,002,343
PUTTER POINTER

Albin F. Eckert, 5068 Scotsman Drive, Dayton, Ohio 45414

Filed July 7, 1975, Ser. No. 593,701

Int. Cl.² A63B *53/00*

U.S. Cl. 273—163 R **10 Claims**



1. A direction indicator for a golf club comprising a plate-like object including a first portion and a second portion, said first portion being bent at substantially a right angle to said second portion and providing means to be placed in contact with at least one face of the head of a golf club to position said second portion to project outwardly of the striking face of the club and in overlying relation to a golf ball positioned adjacent the striking face, said plate-like object being formed to provide an opening in said second portion through which said golf ball may be observed, within the limits of which opening projects a portion of the plate-like object which defines a first pointer the projected extremity of which will terminate over a ball properly positioned at the striking face of said club, and a second pointer, said first and second pointers being directly aligned and oppositely projected to provide that one thereof may be directed towards a hole or flag while the other thereof is directed to a landmark positioned rearwardly of the striking face of the club, to provide thereby a line of sight through which the head of the club should be swung in moving the golf ball to the hole or flag.

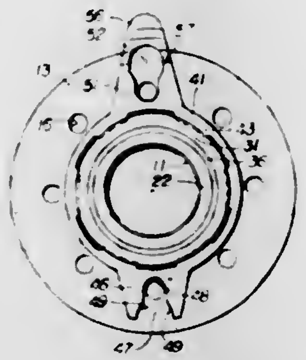
4,002,344
SNAP-IN FLANGE SEAL AND LOCATOR

Franklyn D. Smith, 88 W. Jackson St., Hayward, Calif. 94544

Filed Nov. 12, 1975, Ser. No. 630,972

Int. Cl.² F16J *15/06*

U.S. Cl. 277—11 **11 Claims**



1. A seal to be interposed between the two flanges of the abutting pipes or conduits, said flanges each having a plurality of bolt holes arranged in one of at least two plurality of bolt circles of different radii, said seal comprising a seal proper having means to form a tight pressure differential seal against both said flanges when said flanges are drawn together by tightening bolts through aligned bolt holes, said seal proper having an inside diameter no less than the inside diameter of said pipes or conduits, and a locating ring engaging the outside edge of said seal proper, said locating ring formed with a radially projecting ear, said ear formed with an opening which has a narrower portion near said seal proper and wider portion farther from said seal proper, said narrower portion being tangent to a first bolt hole on the smaller of said bolt hole circle, said wider portion being tangent to a second bolt hole on the larger of said bolt hole circles, whereby said seal proper may be located concentric with the pipe or conduit by moving said ear so that it is tangent to the proper bolt hole of one of said flanges.

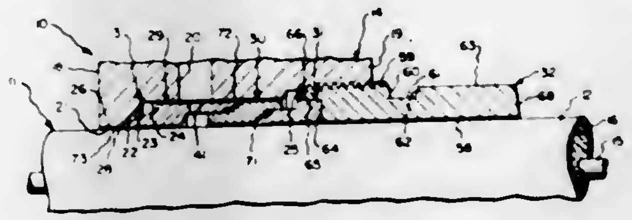
4,002,345
SEAL ASSEMBLY SEQUENTIALLY PROVIDING SPACED SEAL ZONES

Roman Jankowiak, Cheektowaga, and David M. Okonzak, Elma, both of N.Y., assignors to Conax Corporation, Buffalo, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,233

Int. Cl.² F16J *15/08*

U.S. Cl. 277—110 **9 Claims**



1. A seal assembly adapted to provide a seal between a body member having an opening therethrough and an object having a cylindrical outer surface arranged to penetrate said opening, said body member being bounded by a cylindrical surface portion and a rearwardly-facing annular shoulder, said seal assembly comprising:

a lead ferrule surrounding said object and having a forwardly-convergent frusto-conical first surface proximate its front end adapted to engage said body member shoulder to receive a radial unit load, and having a rearwardly-divergent frusto-conical second surface proximate its rear end, said second surface being adapted to receive a smaller radial unit load than said first surface;

an intermediate annular follower surrounding said object and having a forwardly-facing annular shoulder adapted to engage said second surface, and having a rearwardly-facing annular shoulder;

a rear ferrule surrounding said object and having a forwardly-convergent frusto-conical third surface adapted to engage said rearwardly-facing follower shoulder, and having a bearing surface proximate its rear end, said third surface being adapted to receive a smaller radial unit load than said second surface; and

thrust means surrounding said object and adapted to selectively exert a desired longitudinal force on said rear ferrule bearing surface,

whereby, when said thrust means exerts such desired force, seal zones are sequentially provided between a forward marginal portion of said lead ferrule and said object, a rearward marginal portion of said lead ferrule and said body member, and a forward marginal portion of said rear ferrule and said object, to provide a seal between such penetrant object and said body member.

4,002,346
ROLLER SEALING HEAD FOR OVERPRESSURE AND UNDERPRESSURE CONTAINERS

Karl Peter Lopata, and Gunter Schiffler, both of Krefeld, Germany, assignors to Kleinewefers Industrie Companie GmbH, Krefeld, Germany

Filed July 2, 1975, Ser. No. 592,782

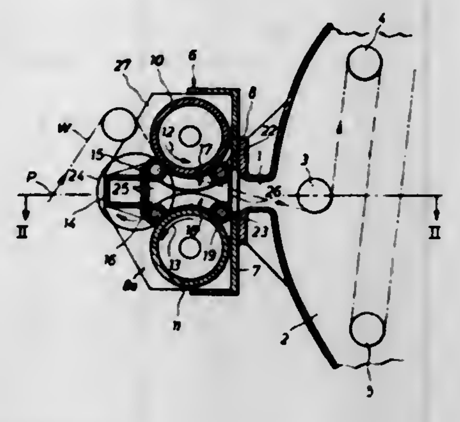
Claims priority, application Germany, July 3, 1974, 2431900

Int. Cl.² B65D *53/00*

U.S. Cl. 277—237 R **8 Claims**

1. A roller sealing head for overpressure and underpressure

containers, especially for use in the textile industry, which includes in combination: a housing, a first rotatable sealing roller supported by said housing, a second rotatable sealing roller supported by said housing and arranged in spaced relationship to said first sealing roller, a rotatable auxiliary roller formed by a hollow roller and supported by said housing while being located adjacent to both said first sealing roller and said second sealing roller. said auxiliary roller having a width less than that of said first and second sealing rollers, said auxiliary roller and one of said sealing rollers being operable to directly convey therebetween a web of goods to be processed, two



endless sealing strips respectively associated with said first and second sealing rollers and each sealing strip having two oppositely located substantially straight sections and two curved sections respectively interconnecting the ends of said straight sections, only one of the straight sections of each endless sealing strip engaging the inside of said auxiliary roller while the curved sections of the sealing strips as well as the second straight sections of each sealing strip are operable to engage the respective adjacent sealing roller when no web of goods is passing therebetween and seal a web of goods when such web passes therebetween.

4,002,347
TORQUE-TRANSMITTING SYSTEM

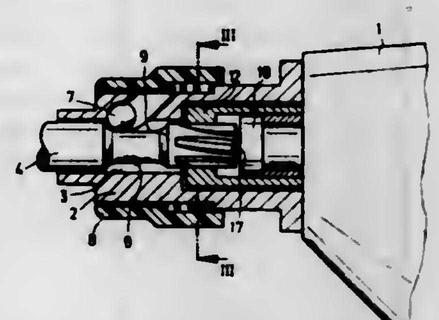
Karl Wanner, Echterdingen; Jorg Falchle, Bempflingen; Wolfgang Schmid, Plattenhardt; Manfred Bleicher, Leinfelden; Reinhard Hahner, Kemnat, and Werner Kleine, Jr., Uphusen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 16, 1975, Ser. No. 541,222

Claims priority, application Germany, Jan. 17, 1974, 2402113; Feb. 22, 1974, 2408557

Int. Cl.^{2} B23B *31/10*; **B25D** *9/04*

U.S. Cl. 279—19.3 **10 Claims**



9. In a torque-transmitting system, a combination comprising a housing having a tool holder section rotatable in a predetermined direction; a driven output shaft journalled in said housing and having a free end portion at said tool holder section; a tool having a shank provided with a front portion and with a rear portion which is of profiled cross-section and has a rear end face, the profiling of said rear portion extending lengthwise of said shank and also being inclined relative to the longitudinal axis of said tool towards said front portion at an angle of twist of between substantially 70°–85° and circumferentially of said rear portion in said predetermined direction; and a receiver for said rear portion formed in said tool holder section and having portions configurated for matingly receiving the profiled rear portion and coacting with the latter for drawing said tool axially inwardly into said tool holder section in response to rotation of the latter due to the coaction between the inclined profiling and said portions of said tool holder section, whereby said rear end face is held in motion-transmitting relationship with said free end portion of said shaft.

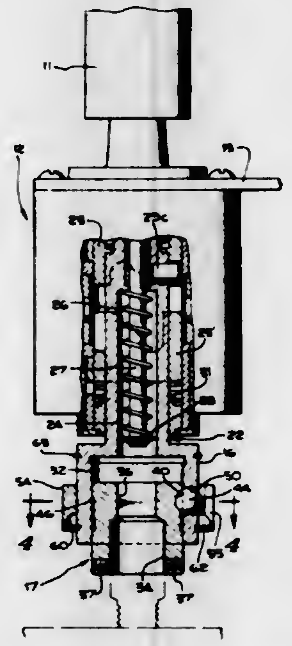
4,002,348
SAFETY RELEASE DEVICE USEFUL IN TAPPING ATTACHMENTS

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Filed May 7, 1975, Ser. No. 575,359

Int. Cl.^{2} B23B *5/22*

U.S. Cl. 279—75 **3 Claims**



1. As an article of manufacture, an apparatus for providing a releasable joint between telescoping cylindrical members comprising an inner member and an outer member, radially movable means carried by the outer member, and the inner member having means constructed to be engageable by said radially movable means in a manner to prevent relative axial movement of the inner and outer members, and relatively movable actuator means carried by the outer member and having means positionable in a manner to allow the said radially movable means to move outward radially to disengage from the said inner member whereby to allow for relative axial movement as between the inner and outer members, wherein said actuator means is deformable sufficiently whereby in response to predetermined torque load, said radially movable member can be moved radially sufficiently to disengage from the inner member, wherein the said actuator means is in the form of a split ring, wherein said inner member has a recess having the shape of a part of a sphere, said radially movable means being a ball, said inner member having a helical groove in it, said recess being at one end of the said groove whereby upon stoppage of rotation of the inner member while the outer member continues to rotate, said radially movable ball can follow said helical groove, causing the outer member to move axially relative to the inner member.

4,002,349
SKI CLIP DEVICE

Kip H. Dopp, 810 7th Ave., Salt Lake City, Utah 84103

Filed Nov. 24, 1975, Ser. No. 634,427

Int. Cl.^{2} A63C *11/02*

U.S. Cl. 280—11.37 A **13 Claims**

1. A device for securing a pair of skis together in a base to base relationship, said device comprising a first clip member which includes a bottom wall and side walls formed to present a generally U-shaped cross section defining a generally elongate channel therein, each end of said clip member being open and the outer terminations of the side walls defining the sides of the opening of the channel, said channel being dimensioned to receive thereinto a portion of the sides of the pair of skis and the outer terminations of the side walls being formed into generally flat surfaces, with the sides of the channel opening being tapered to accommodate the taper of the top surfaces of the skis when positioned in a base to base relationship, the generally flat surfaces of the outer terminations thereby contacting and gripping the top surfaces of the skis to hold the skis together.

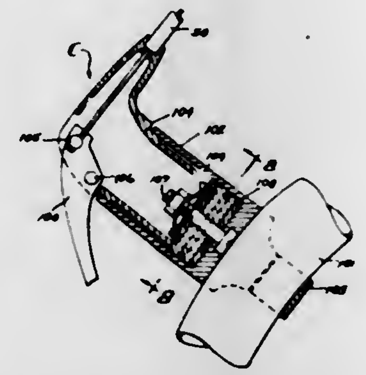
4,002,350
SINGLE LEVER CONTROL FOR VARIABLE SPEED BICYCLES AND THE LIKE

Norman E. Timbs, 10421 Beckford Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 558,673, March 17, 1975, Pat. No. 3,934,492, which is a continuation of Ser. No. 428,029, Dec. 26, 1973, abandoned. This application Oct. 16, 1975, Ser. No. 622,817

Int. Cl.^{2} B60K *20/02*

U.S. Cl. 280—236 **7 Claims**



1. A vehicle and single lever control for the simultaneous actuating and conditioning of the brakes and transmission thereof, and including; a frame with wheeled suspension for mobility, brake means operating with at least one wheel to decelerate the vehicle, transmission means operating with at least one wheel to propel the vehicle with torque applied therethrough from a prime mover, and a single manually operable lever compressible in one plane to actuate the brake through coupling means therebetween, and rotatable in an other plane to condition the transmission through coupling means therebetween.

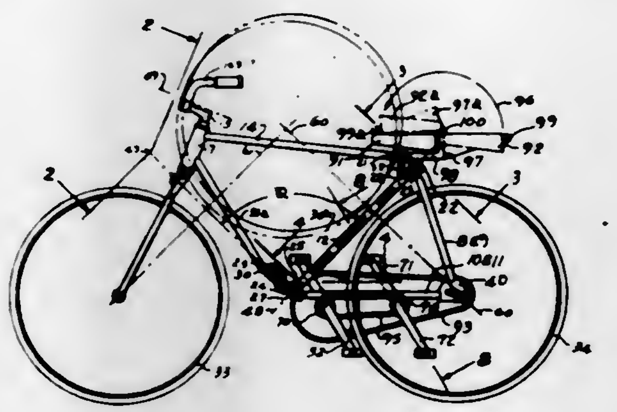
4,002,351
FOLDING BICYCLE

Daniel R. Zuck, 14273 Beaver St., San Fernando, Calif. 91342

Filed Mar. 17, 1972, Ser. No. 235,532

Int. Cl.^{2} B62K *3/14*, *15/00*

U.S. Cl. 280—278 **3 Claims**



1. A folding bicycle frame foldable on two axes for tandem riders comprising a front wheel fork assembly, a frame assembly with a rider's seat support, and a rear wheel fork assembly with a pedal crank housing, the rear wheel fork assembly having a lower folding hinge forward of the pedal crank housing attaching the lower rear fork assembly and an upper folding hinge adjacent and aft of the rider's seat support on the frame assembly attaching the upper end of the rear fork assembly to the frame assembly, the frame assembly having rear hinge means to interconnect with the hinges of the upper and lower rear forks and having forward hinge means to connect to the front wheel fork, the front wheel fork assembly having a folding hinge above the wheel and below the frame assembly having hinge axis means on the said fork assembly to permit the front wheel with the rear wheel to fold substantially side by side with the frame assembly between the wheels, seat means and tandem pedal means for a tandem rider comprising a forward seat means and an aft seat means, pivot support means at the aft seat on a level for forward folding of the seat over the forward seat when the bicycle is folded, a pair of aft individual pedal cranks and individual pedal crank support housing means supporting the aft pedal cranks aft of the forward pedal crank housing and forward of the rear wheel axle with the aft pedal crank support housings located to permit the rear wheel to rotate between the said rear pedal crank support housings, interconnecting driving means from the rear pedal cranks to the forward pedal crank to deliver driving torque to the front pedal crank and the rear wheel generated by the tandem rider in the tandem seat.

4,002,352
VEHICLE COUPLING APPARATUS

Clarence H. Hager, Rockford, Ill., assignor to Modern Suspension Systems, Inc., Rockford, Ill.

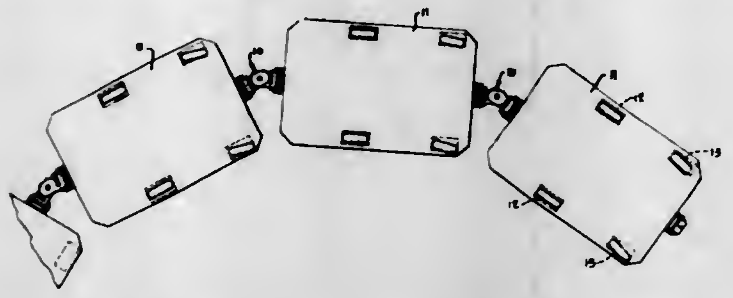
Filed Jan. 22, 1976, Ser. No. 651,509

Int. Cl.^{2} B60D *1/00*

U.S. Cl. 280—408 **21 Claims**

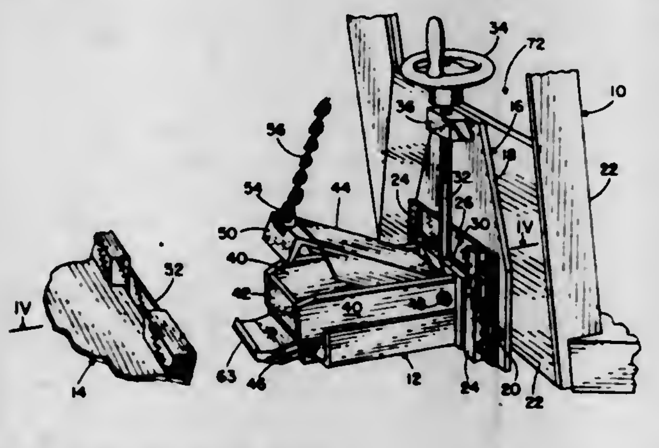
1. A vehicle coupling apparatus for interconnecting vehicles in a train comprising a first coupler plate, a first connecting means for connecting the first coupler plate to one vehicle, a second coupler plate overlapping a side of the first coupler

plate, a second connecting means for connecting the second coupler plate to a second vehicle, coupler pin means pivotally interconnecting said first and second coupler plates for relative movement about an axis perpendicular thereto; friction brake means including brake pad means mounted on said second coupler plate to engage said first coupler plate at a location spaced outwardly from the coupler pin means, and resilient brake actuating means yieldably biasing said brake pad means against said first coupler plate to provide a preselected frictional force resisting relative angular movement between the first and second coupler plates, one of said coupler plates having a latch receiving depression therein, cam latch means mounted on the other of said coupler plates and having resilient latch actuating means yieldably biasing said cam latch means in a direction to engage said latch receiving depression when said first and second coupler plates are in a preselected angular position for releasably restraining relative movement between said coupler plates out of said preselected angular position until the forces tending to cause relative angular movement substantially exceed the preselected frictional force provided by said friction brake means.



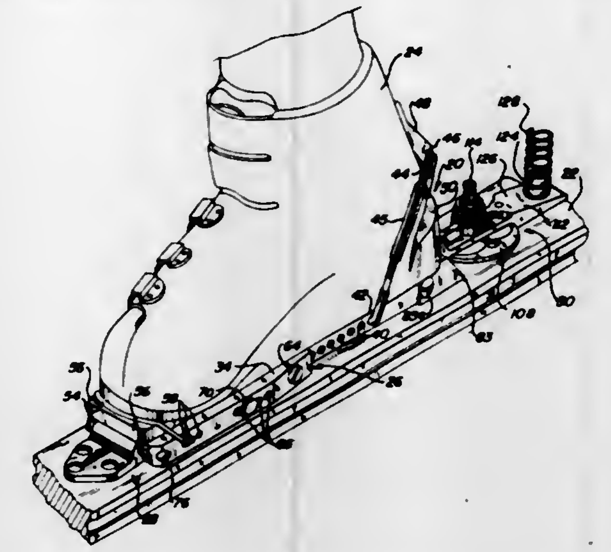
4,002,353
TOWING VEHICLE HAVING A CART-HITCHING MECHANISM
Jerry Sysyn, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1975, Ser. No. 608,130
Int. Cl.² B60D *1/16*
U.S. Cl. 280—490 R **5 Claims**



1. In a towing driving vehicle;
a cart hitch mechanism having upper and lower mutually pivotally mounted jaws movable vertically for releasably clamping a cart to be towed;
the pivotal connection being so arranged that said jaws are biased by gravity to a normally closed position;
vertically disposed control means connected to said upper jaw and accessible to the operator of said towing vehicle at his driving station for controlling the opening movement of said jaws;
means mounted on said vehicle for adjustably supporting and guiding said hitch assembly in a vertical direction so that the jaws are vertically movable to accommodate carts of different heights;
means connected to the hitch mechanism and accessible to said operator at his driving station for controlling the vertical position of said hitch assembly.

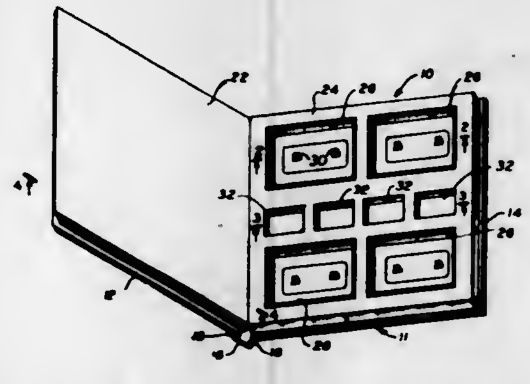
4,002,354
SKI BINDING
Paul C. Ramer, Rte. 4, P.O. Box 344, Golden, Colo. 80401
Continuation-in-part of Ser. No. 552,970, Feb. 26, 1975, abandoned. This application Oct. 20, 1975, Ser. No. 623,623
Int. Cl.² A63C *9/086*
U.S. Cl. 280—614 **10 Claims**



1. A binding for releasably connecting a boot to a ski comprising in combination:
a toe piece mounted on said ski,
laterally extending pin means having cam surfaces on opposite ends thereof, said pin means being operably connected to said toe piece,
a boot plate releasably connectable to said boot having a body portion and semi-rigid elongated member means extending longitudinally of said ski, said elongated member means having recesses on forward ends thereof for releasably receiving said ends of the pin means, said elongated member means flexing laterally outwardly upon release from said pin means, and selectively movable anchor means on said boot plate for anchoring the elongated member means to the boot plate at selected locations along the length of the elongated member means, and
a heel piece mounted on said ski for selectively holding the heel of the boot plate adjacent to the ski.

4,002,355
BOOK WITH SOUND TRACK AND VISUAL DISPLAY
Bernard T. Sendor, 608 Blair Drive, Westbury, Long Island, N.Y. 11429

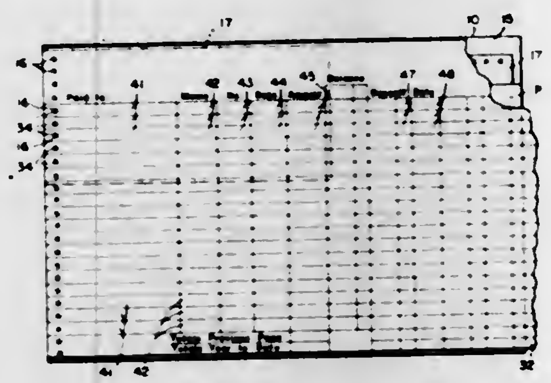
Filed July 16, 1975, Ser. No. 596,250
Int. Cl.² B42D *1/06*
U.S. Cl. 281—29 **10 Claims**



1. A hard cover book including in combination a cover having panels comprising front and back covers of the book, said panels including a first panel and a second panel connected with a spine panel of the cover, a socket panel of much greater thickness than the cover panels of the book, the socket panel being secured to the inside surface of the first panel and constituting an integral part of one cover of the book, the socket panel having a socket therein facing away from the panel to which it is secured, a filler bound to and within the cover, said filler comprising a group of pages bound together, a tape to which the filler is secured, the tape being secured, immediately beyond a spine portion of the filler, to inner sides of the front and back covers of the book whereby the pages are supported by the front and back covers, in substantially flat condition, when the pages are held open by a reader, end-papers of the filler adhered to and covering the surface of the second panel and part of the surface of the first panel, the filler pages and socket panel being secured to the cover with the top, bottom and front edges of the filler pages and the socket panel being spaced back by substantially equal distances from the corresponding edges of the cover panels to present the appearance, when closed, of a conventional hard cover book.

4,002,356
FOLDABLE CHECKBOOK WITH PEGBOARD STYLE JOURNAL SHEETS
Raymond C. Weidmann, 326 Palmyra Road, Macedon, N.Y. 14502

Filed Aug. 11, 1975, Ser. No. 603,721
Int. Cl.² B41L *3/00*
U.S. Cl. 282—29 B **10 Claims**

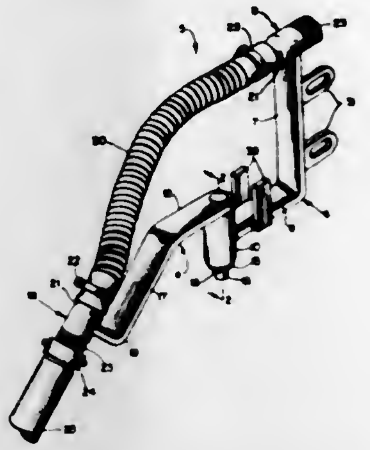


1. A checkbook, comprising
a flexible cover,
means for storing a plurality of checks in said cover, each of said checks having on its face a row of data spaces and on its back a strip of carbon which registers with said row of data spaces,
a journal sheet releasably attached to said cover to overlie one side thereof and having on its face a plurality of data spaces arranged in intersecting horizontal rows and vertical columns, and
means for releasably securing said checks on said journal sheet in different operative positions in which the carbon strip on the back of each check registers with a different horizontal row of data spaces on said sheet, and overlies at least certain of the data spaces in the last-named row,
each of said checks having the data spaces on the face thereof arranged so that, when the check is secured in an operative position on said sheet, the data spaces on the check will register with said certain spaces on the sheet which are covered by the check's carbon strip, whereby data entered in said spaces on the face of said check will be entered simultaneously by said carbon strip onto the journal sheet spaces covered thereby.

4,002,357
ARTICULATED HOSE SUPPORT
David F. Bennett, 1100 Fleetwood Ave., Daytona Beach, Fla. 32014

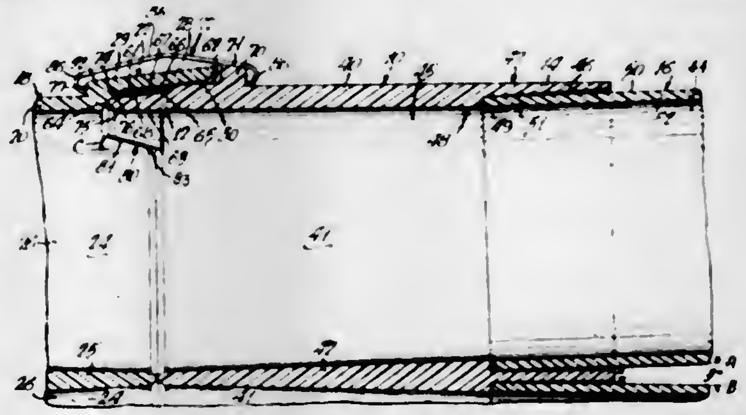
Filed July 16, 1975, Ser. No. 596,258
Int. Cl.² F16L *3/00*
U.S. Cl. 285—61 **7 Claims**

1. An articulated hose support comprising a mechanical support including a rigid bracket having a first leg and a second leg disposed at an angle to said first leg, an arm forming a part of said mechanical support having an inner end pivotally connected to a distal end of said second leg for swinging movement about an axis disposed substantially parallel to said first leg, a first rigid conduit section secured intermediate its ends to the distal end of said first leg normal thereto, a second rigid conduit section secured intermediate its ends to the distal end of said arm normal thereto, said conduit sections having adjacently disposed inner ends and remotely disposed outer ends, and a flexible hose extending between and having its ends coupled to said inner ends of the conduit sections, and supported thereby for swinging movement with the arm across the pivotal connection of the arm second leg.



4,002,358
ADAPTER FOR CONNECTING CONDUIT TO PIPE
Kenneth F. Streit, Mt. Prospect, Ill., assignor to Phone-Ducs, Inc., Ill.

Filed Jan. 27, 1975, Ser. No. 544,496
Int. Cl.² F16L *39/00*
U.S. Cl. 285—137 R **13 Claims**

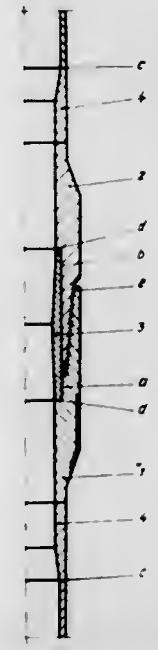


1. A light-weight, integral plastic adapter for connecting a unitary multiple duct conduit section to a plurality of individual single bore cylindrically shaped pipes comprising: a generally rectangularly shaped sidewall defining a passage therein; means at one end of said sidewall for connecting said adapter to an end of a multiple duct conduit section; partition walls integral with and extending transversely between said sidewall for dividing said passageway into a plurality of individual passages which are generally rectangular shaped in cross-section at one end of said adapter, said partition walls extending from said one adapter end and terminating at a location spaced inwardly from a second opposite end of the adapter, said partition walls tapering generally uniformly to produce an increasing wall cross-sectional thickness from said one adapter end to said location so that each of said passages are generally circular in cross-section at said location and smaller in cross-sectional area at said location than at said one adapter end; and further wall means integral with said sidewall and said partition walls and extending from said second adapter end to said location, said further wall means providing a plurality of cylindrical sleeves each aligned with one of said

passages, each of said sleeves being adapted to be connected to one of said individual single bore pipes to provide a smooth transition between the rectangularly shaped end of said passages and said pipes.

4,002,359
TOOL JOINT FOR DRILL PIPES

Ion Lari, Cimpina, Romania, assignor to Institutul de Cercetari si Proiectari de Petrol si Gaze, Cimpina, Romania
Filed Oct. 29, 1975, Ser. No. 626,870
Claims priority, application Romania, Aug. 16, 1974, 79803
Int. Cl.² F16L *25/00*
U.S. Cl. 285—331 **1 Claim**



1. A joint for a pair of pipes of a drill string, comprising:

a cylindrical box fixed to one of said pipes and formed with an internal tapered thread and with a cylindrical recess beyond said thread said recess terminating in a shoulder formed in said box;

a cylindrical pin fixed to the other pipe and having a tapered external thread screwed into the internal thread of said box, said pin being formed with an inner cylindrical recess said recess terminating in a shoulder formed in said pin;

a nipple having a smooth cylindrical outer surface snugly received within said recesses and having end faces engaged by said shoulders, said nipple having an interior which converges from one of said end faces toward a central region of the nipple and diverges from said central region to said other end face.

4,002,360
WINDOW HARDWARE

Gerhard Frank, and Ernst Roth, both of Wilnsdorf-Obersdorf, Germany, assignors to Siegenia-Frank KG, Siegen, Germany
Filed Sept. 6, 1974, Ser. No. 503,975
Claims priority, application Germany, Sept. 8, 1973, 2345496
Int. Cl.² E05B *9/00, 9/06;* **E05C** *1/06, 1/12*
U.S. Cl. 292—336.3 **6 Claims**

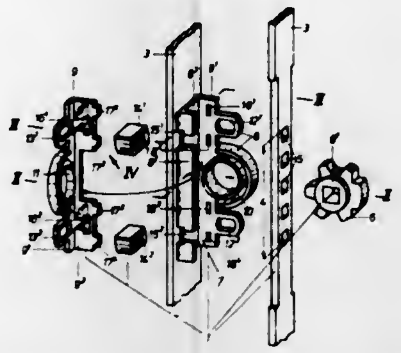
1. Window hardware, comprising

a. a housing consisting of two interconnected of two interconnected parts forming a guide channel, one of the said parts of the housing having a generally U-shaped cross-section and the other part of the housing having an L-shaped cross-section,

b. a track on which the housing is fastened,

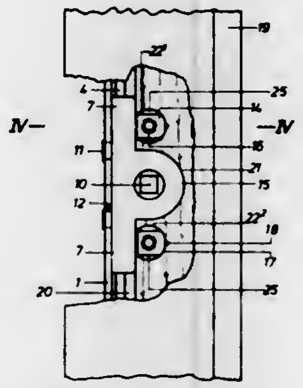
c. a pinion supported in the housing, and

d. a drive rod slidably carried in the guide channel of the housing for driving engagement with the pinion, the two said parts of the housing being of different cross-sectional heights and being also mountable together, so that first legs are positioned parallel to and adjacent to the track to form a guide channel for the drive rod, while secondary legs are positioned at right angles to the plane of the track and parallel to each other to act as supports for the pinion which is located in both parts of the housing.



4,002,361
WINDOW FASTENER

Willy Laufenburg, BRD, Torwiesenweg 20, Wilnsdorf-Niederielfen, Germany
Continuation of Ser. No. 433,101, Jan. 14, 1974. This application May 9, 1975, Ser. No. 575,950
Claims priority, application Germany, Jan. 23, 1973, 2303114
Int. Cl.² E05B *3/00, 9/00, 9/08*
U.S. Cl. 292—336.3 **13 Claims**



1. A locking arrangement for use on the frames of doors and windows, the frame having a planar side face and a planar edge face substantially perpendicular to said side face, comprising

a. a recess formed in the frame, said recess being formed of a combination of

i. a groove of uniform depth formed in the edge face, and having a floor spaced from and parallel to the edge face,

ii. a main hole having a first cylindrical peripheral surface formed in the frame through the side face and spaced from the edge face, the axis of the main hole being parallel to the edge face with the first surface intersecting the groove floor,

iii. two side holes each having a second cylindrical peripheral surface formed in the frame and opening onto the side face, each side hole being spaced from the edge, the axis of the side hole being outside of the main hole and parallel to the edge face with the second surface intersecting the groove floor, each side hole being substantially separated from the main hole so that a bridge of frame material lies between them,

b. a locking device which allows a rotation of a handle to cause locking action, comprising

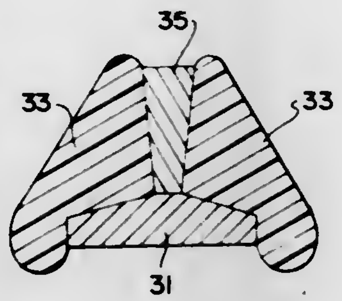
i. a drive housing including an elongated base part having a side and mounted in the groove, a pinion housing extending from the side and into the main hole, and an extension extending from the side spaced from the drive housing and extending into the side hole,

ii. a pinion mounted in the pinion housing for engagement by the handle, and

iii. a push member mounted in the base part for engagement with the pinion for effecting the locking action.

4,002,362
BUMPER CUSHION RUB STRIP

Henry Eldon Sears, North Kitchener; John Charles Prast, Kitchener; Raymond Wiefred McNally, Kitchener; Calvin C. Lee, Kitchener, and William F. McAvey, Waterloo, all of Canada, assignors to B. F. Goodrich Canada Limited, Canada
Continuation of Ser. No. 406,484, Oct. 15, 1973, abandoned. This application July 1, 1975, Ser. No. 592,345
Int. Cl.² B60R *19/08*
U.S. Cl. 293—62 **2 Claims**

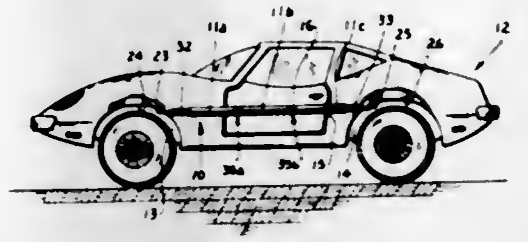


1. A rub strip structure for automotive use comprising a composite plastic strip formed by a continuous extrusion process, the composite plastic strip being made up of a hard resilient plastic base member, constituting an integral part of said strip, the hard resilient plastic base member having a relatively flat bottom surface and a slightly arched upper surface with a thickness which is relatively small compared to the width of said bottom surface; and a yieldable cushion member of generally trapezoidal cross sectional shape, having its largest width adjacent said base member and adapted to surround the top surface and side surfaces of said base member and permanently bonded to said base member, and fastening means supported solely by said base member, said fastening means extending into an opening in said base member and being gripped by the inner walls of said opening within the bottom surface of said base member so as to be held in engagement with said base member.

2. A rub strip structure for automotive use comprising a composite plastic strip, the composite plastic strip being made up of a hard resilient platic base member constituting an integral part of said strip; the hard resilient plastic base member having a relatively flat bottom surface and a slightly arched upper surface with a thickness which is relatively small compared to the width of said bottom surface; and a yieldble cushion member of generally trapezoidal cross sectional shape, having its largest width adjacent said base member and adapted to surround the top surface and side surfaces of said base member and permanently bonded to said base member; said yieldable cushion member consisting of three portions integrally attached together in the form of two longitudinal side members and an intermediate wedge-like member between said two side members.

4,002,363
AUTOMOTIVE BODY PROTECTIVE APPARATUS

John R. James, 6334-A Crestline Terrace, Norcross, Ga. 30071
Filed Sept. 12, 1975, Ser. No. 612,940
Int. Cl.² B60R *13/04*
U.S. Cl. 293—62 **10 Claims**



1. Protective apparatus for removable attachment to an exterior portion of an automotive vehicle or the like, comprising:

a plurality of separate elongate members each having a mar-resistant surface for contact with the side of a vehicle or the like, and having an outer protion which is spaced apart from said mar-resistant surface;

resilient means connecting together confronting ends of said separate elongate members to selectively provide an extended configuration wherein said separate elongate members extend in substantially linear end-to-end alignment for disposition alongside the vehicle, and a folded configuration wherein said resilient means is yieldingly deformed to permit said separate elongate members to be folded back alongside one another; and

means disposed at the nonconfronting ends of said elongate members, which form the free ends of said extended configuration, to removably attach said protective apparatus in said extended configuration to a side of the vehicle

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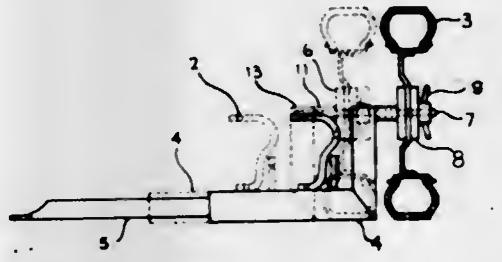
4,002,364
BACK MOTION TIRE BUFFER

Cheston Lee Eshelman, 621 NE. 30 Terrace, Miami, Fla. 33137
Filed Nov. 13, 1975, Ser. No. 631,630
Int. Cl.² B60R *19/10*
U.S. Cl. 293—67 **6 Claims**



1. In a motor vehicle, an energy absorbing backmotion tire buffer, comprising, in combination, a wheel mounted pneumatic tire postioned substantially vertical, with a circumference parallel to the lateral plane of the vehicle, forward of the vechicle movable bumper rail, so as to extend forward of other vehicle elements with the bottom of said tire and wheel being substantially level with the bottom of the vehicle bumper, and said tire and wheel being mounted on a carrier frame comprising a vertical arm element constructed and arranged at right angles to the longitudinal axis of the vehicle, at the top of said vertical arm element, a right angle attaching element facing forward from said vehicle for the purpose of attaching the hub of the wheel; at the bottom of said vertical arm element means for securing said vertical arm to the movable bumper of said vehicle comprising attaching flanges and a piston and a cylinder strut arrangement facing rearwardly of the vertical arm

element or a longitudinal plane of the vehicle, having the rear of said piston strut secured to said vehicle axle frame and the front of said cylinder strut secured to said vertical arm element and bumper, so as to allow limited back motion of the tire, wheel, vertical arm, cylinder strut, and vehicle bumper, as a unit when being forced back against stops in the cylinders without touching or denting the vehicle body, when striking an obstruction in front of the exposed tire and wheel.

4,002,365

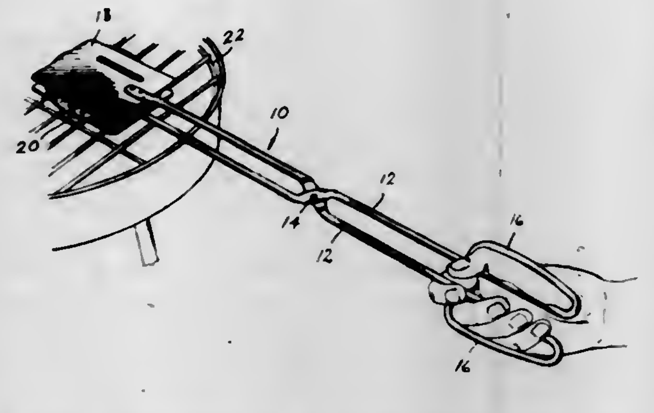
FOOD HANDLING TONGS

James A. Rader, Rte. 3, Lamar, Mo. 64759

Filed June 27, 1975, Ser. No. 591,130

Int. Cl.² A47J *43/28*

U.S. Cl. 294—8 **2 Claims**



1. Tongs for handling a food item upon a grill, said tongs comprising a pair of arms each having first and second ends, said arms overlapping at a corresponding location between said first and second ends, means pivotally connecting said arms together at said corresponding location, said first arm ends being formed into cooperating handle means, a pair of plate members, one plate member connected to each arm at its second end, said tongs having a closed food item gripping position wherein said plate members spacedly overlie one another in a generally superimposed orientation and an open position wherein said plate members are laterally offset and further spaced apart, said handle means for pivotally moving said arms about said pivot connecting means, said pivot connecting means including means for shifting said arms in a plane extending at an acute angle to the plane of each plate member to cause said tongs to be shifted between their open and closed positions with said lateral offset between the plate members when said tongs are in their open position permitting viewing of the food item as said item is being gripped.

4,002,366

ACCESSORY SERVING AS LIFE SAVING AID

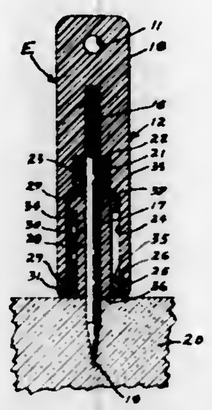
Robert B. Hammes, 132 Knollcrest Drive, Burlington, Wis. 53015

Filed Nov. 28, 1975, Ser. No. 636,218

Int. Cl.² F25C *5/16*

U.S. Cl. 294—26 **7 Claims**

1. An ice piercing device comprising a substantially vertically directed outer casing forming a hand gripping handle; a pick having its upper end secure with the casing and internally thereof; said casing having a first bore therein; a second bore diametrically greater than the first bore; a pick guard positioned in the second bore for reciprocation therein; said guard having a passage extending therethrough and being reciprocably mounted on the pick; a shoulder formed on the casing at the upper end of the first bore; a spring encircling the pick and interposed between the shoulder and the guard for normally urging the guard downwardly; means within the casing for limiting the downward travel of the guard; said pick having an ice piercing pointed nose at its lower end.



4,002,367

INSULATION FOR A VEHICLE ROOF

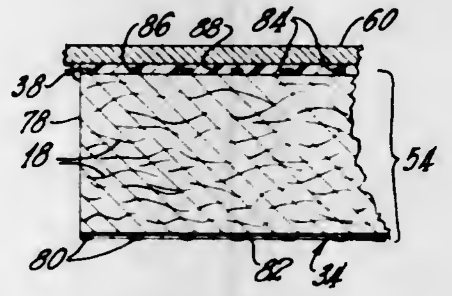
William R. Thomas, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 228,782, Feb. 14, 1972. This application Mar. 18, 1974, Ser. No. 452,034

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B60J *7/00*

U.S. Cl. 296—137 A **5 Claims**



1. In combination, a vehicle roof panel, adhesive extending over a substantial portion of a lower surface of said roof panel, a compressible, flexible layer of glass fibers held together by a binder, said layer being of substantially uniform thickness and having a shape at least in part corresponding to at least part of the shape of said roof panel, an upper, non-woven, porous fabric adhered to the upper surface of said layer, with a portion of said adhesive extending through interstices in said porous fabric and into contact with fibers of said layer to adhere said layer to the lower surface of said panel with said porous fabric serving as a net-like reinforcement in the adhesive, a lower, cloth-like, non-woven fabric adhered to the lower surface of said layer by the same binder which holds the glass fibers together, said lower, non-woven fabric extending substantially over the entire surface of said layer and also having a shape at least in part corresponding to at least part of the shape of said roof panel, and a headliner separate from said lower, non-woven fabric and located therebelow and covering substantially all of said lower, non-woven fabric.

4,002,368

HANGING CHAIR

Eileen S. Ortize, P.O. Box 585, Pawleys Island, S.C. 29585

Filed Jan. 9, 1976, Ser. No. 648,106

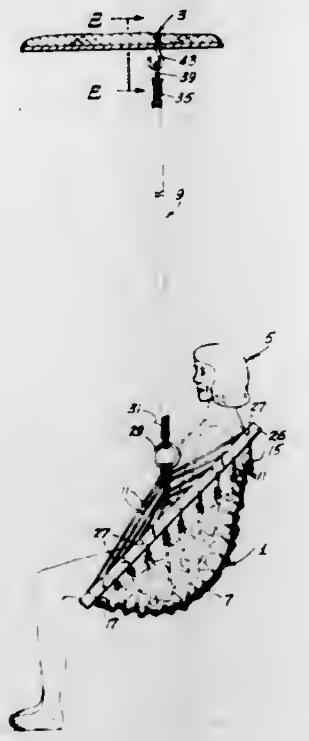
Int. Cl.² A47D *13/10*

U.S. Cl. 297—273 **8 Claims**

1. A chair for hanging from an overhead support, which chair comprises:

a. a flexible seat having a substantially trapezoidal configuration formed substantially of loosely woven material which permits the seat to expand in all directions wherein:

1. the shorter parallel side forms the back portion of the chair;
2. the longer parallel side forms the front portion of the chair; and
3. the two non-parallel sides form the side portions of the chair;



b. a rigid frame member carried by each side portion, wherein each frame member includes a plurality of aperture through which portions of the seat material are passed for maintaining the side portions in a stretched condition; and

c. means carried by the seat for hanging the chair from the overhead support.

4,002,369

CHAIR AND METHOD OF MAKING SAME

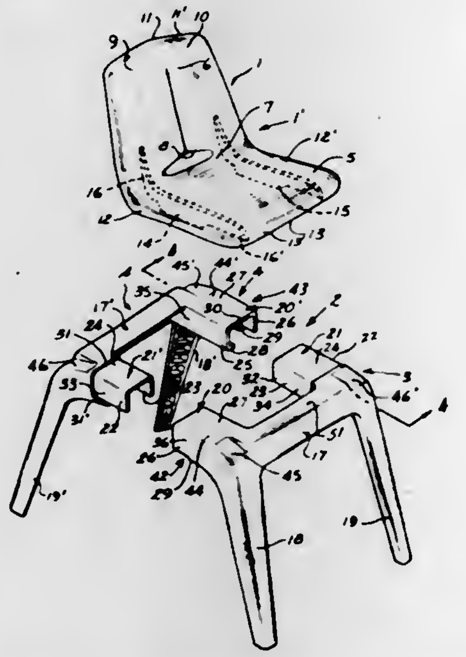
Roy E. Jennings, Temple, Tex., assignor to Royal Seating Corporation, Cameron, Tex.

Continuation of Ser. No. 198,175, Nov. 12, 1972, abandoned. This application Mar. 17, 1972, Ser. No. 235,673

The portion of the term of this patent subsequent to Oct. 11, 1992, has been disclaimed.

Int. Cl.² A47C *3/04, 3/20, 5/12*

U.S. Cl. 297—445 **10 Claims**



1. A chair base structure comprising, in combination

a first unitary plastic material base piece having a pair of spaced apart legs;
a second unitary plastic material base piece having a pair of spaced apart legs;
interfitting means on said first and second base pieces to facilitate assembling said pieces to provide a base having four legs and in which two of the legs diverge relative to the other two legs;
said interfitting means on said first and second base pieces including
 a rail portion projecting from one side of the first base piece,
 a rail portion projecting from the other side of the first base piece,
 a rail portion projecting from one side of the second base piece, and
 a rail portion projecting from the other side of the second base piece;
said rail portions including two female rail portions and two male rail portions;
each male rail portion comprising
 an upright outside wall,
 an upright inside wall spaced from the outside wall, and
 a top wall integrally joining said inside and outside walls;
each of said female rail portions comprising
 an outside wall,
 an inside wall spaced from the outside wall,
 a top wall integrally joining said inside and outside walls, and
 wall means extending from the lower edge of said inside wall toward said outside wall, and from the lower edge of said outside wall toward said inside wall;
said male portions being slidably receivable respectively in said female portions, and said wall means engaging bottom edges of said inner and outer walls of the male rail portions to provide beam strength for the rails;
means securing the respective male and female rail portions together;
each of the four legs of the base including
 a first rigid upright side wall,
 a second rigid upright side wall integral with and extending at an angle to the first wall;
said walls of the legs being devoid of frangible sections;
a multiplicity of strengthening means for each leg, said strengthening means comprising a multiplicity of rigid webs in spaced apart generally parallel relation to each other along the length of each leg,
 each of said webs extending transversely between and being integral with said first and second upright walls of a leg, and each of the webs presenting a bottom surface which faces downwardly when the base is in its normal upright position, so that the legs can be severed along the bottoms of selected coplanar webs to provide a base of the desired height with an integral floor engaging glide for supporting the bottom of each leg;
said webs rigidly joining said first and second upright walls against deflection relative to each other to rigidify and strengthen the leg, the bottom web of a leg providing a floor engaging glide, and webs above said bottom web providing strength and rigidity for the leg.

6. A chair base structure comprising, in combination

a first unitary plastic material base piece having a pair of spaced apart legs;
a second unitary plastic material base piece having a pair of spaced apart legs;
means for joining said base pieces to provide a base having four legs and in which two of the legs diverge relative to the other two legs;
said first and second base pieces including
 a rail portion projecting from one side of the first base piece,
 a rail portion projecting from the other side of the first base piece,
 a rail portion projecting from one side of the second base piece, and

a rail portion projecting from the other side of the second base piece;

each of the rail portions including

a horizontal wall, and

upright side walls projecting in the same direction from the horizontal wall;

said base pieces being oriented with said legs extending downwardly and with said rail portions of the respective base pieces in facing, aligned, adjacent relation with each other so the rail portions at one side of the aligned base pieces form a first rail and the rail portions at the other side of the aligned base pieces form a second rail;

said means for joining said base pieces including first and second connectors joining the rail portions of the respective first and second rails, each connector comprising

a horizontal wall, and

upright sidewalls projecting in the same direction from the horizontal wall;

the walls of the first connector engaging the horizontal and upright walls of the rail portions of the first rail, and the walls of the second connector engaging the horizontal and upright walls of the rail portions of the second rail, said connectors being of a size to be a close sliding fit with respect to the rail portions; at each rail, one of the joining connector and rail having inwardly projecting wall means extending across and engaging generally horizontal edges of the upright walls of the other of the joining connector and rail to add beam strength to the connected rails;

means securing the first connector to each rail portion of the first rail;

means securing the second connector to each rail portion of the second rail;

each of the four legs of the base including

a first rigid upright side wall,

a second rigid upright side wall integral with and extending at an angle to the first wall;

said walls of the legs being devoid of frangible sections;

a multiplicity of strengthening means for each leg, said strengthening means comprising a multiplicity of rigid webs in spaced apart generally parallel relation to each other along the length of each leg,

each of said webs extending transversely between and being integral with said first and second upright walls of a leg, and each of the webs presenting a bottom surface which faces downwardly when the base is in its normal upright position, so that

the legs can be severed along the bottoms of selected coplanar webs to provide a base of the desired height with an integral floor engaging glide for supporting the bottom of each leg;

said webs rigidly joining said first and second upright walls against deflection relative to each other to rigidify and strengthen the leg, the bottom web of a leg providing a floor engaging glide, and webs above said bottom web providing strength and rigidity for the leg.

4,002,370

VALVE ASSEMBLY FOR EXHAUST SYSTEM

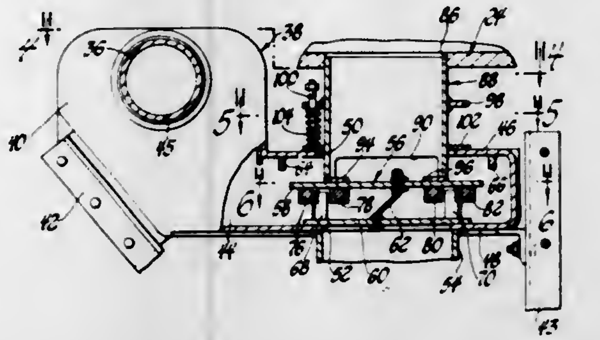
Donald F. Blackmore, Wadsworth, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1976, Ser. No. 665,801

Int. Cl.² B60P *1/00*

U.S. Cl. 298—1 H **3 Claims**

1. A valve assembly for a vehicle having a chassis supporting an operator's cab and a pivoted material-handling container having a hollow body structure, the valve assembly adapted to direct exhaust gases upwardly into said hollow body structure when the material-handling container is in a lowered load-retaining position and adapted to direct the exhaust gases downwardly toward the ground when the material-handling container is in a raised dumping position, said valve assembly comprising a housing having a first outlet opening and a second outlet opening formed therein, a closure member comprising spaced upper and lower plate members, a flexible member interconnecting said plate members, said closure member adapted to move between a first position wherein said upper plate member closes the first outlet opening and said lower plate member opens the second outlet opening and a second position wherein said lower plate member closes the second outlet opening and said upper plate member opens the first outlet opening, first and second holding means, said first holding means serving to maintain said closure member in said first position when the material-handling container is in the raised dumping position, a conduit secured to and projecting downwardly from said material-handling container and communicating with said hollow body structure, said conduit extending into said first outlet opening when the material-handling container is in the lowered load-retaining position so as to directly contact the upper plate member and cause the latter to be moved into the second position against the influence of the first holding means while the second holding means causes the upper plate member to be held by the conduit.



4,002,371

VARIABLE TRACK VEHICLE WHEEL

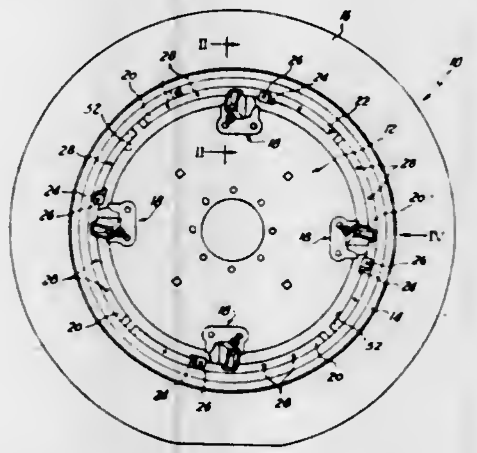
Jean-Claude Bonne, Eaubonne, France, assignor to Acieries de Gennevilliers Anciens Ets. C. Delachaux, Gennevilliers, France

Filed Apr. 21, 1975, Ser. No. 569,774

Claims priority, application France, Apr. 29, 1974, 74.14817

Int. Cl.² B60B *23/12*

U.S. Cl. 301—9 TV **5 Claims**



1. Adjustable tread wheel comprising a rim provided on its inner surface with a plurality of helical guide rails, each rail having a pair of flanks and an axially extending bearing surface, a wheel disc carrying a plurality of clamping devices each adapted to cooperate with a guide rail for connecting the wheel disc to the rim in any given relative axial position, each clamping device comprising a fixed jaw secured to the disc, a movable jaw, each jaw having a bearing surface for engagement with the facing flank of the corresponding guide rail and a radial shoulder for engagement with the bearing surface of the guide rail, and a screw and nut assembly extending in a hole provided in each jaw, for urging the movable jaw towards the fixed jaw to clamp the guide rail therebetween, the axis of

the screw being inclined with respect to the bearing surface of the guide rail so that the tightening of the screw and nut assembly results in a relative outward radial displacement of the movable jaw and the rail engaged thereby.

4,002,372

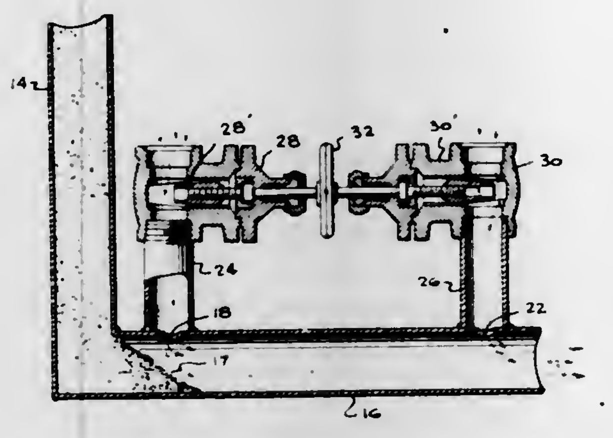
PULVERULENT MATERIAL METERING AND DELIVERY SYSTEM AND METHOD

Joseph Franklin Edwards; Johnny Milton Brown; James Vernon Christian, all of Kingsport, and Clayton Elkins, Jonesboro, all of Tenn., assignors to General Shale Products Corporation, Kingsport, Tenn.

Filed Dec. 1, 1975, Ser. No. 636,649

Int. Cl.² 222 *193;* **B65G** *53/16*

U.S. Cl. 302—25 **9 Claims**



1. A solid fuel metering and delivery system for feeding particulate fuel to a combustion chamber comprising a source of finely ground solid fuel particles, conduit means extending between said source of finely ground solid fuel particles and said combustion chamber, said source of fuel particles including a feed pipe having a vertical component of axial orientation and upper and lower ends, a metering conduit having a horizontal component of orientation and an upstream end and a downstream end, said upstream end of said metering conduit being connected to the lower end of said feed pipe, the lower end of said feed pipe being full of finely ground solid fuel particles which flow outwardly into said metering conduit to provide a surface of repose of said finely grould fuel in said metering conduit, an air inflow opening in said metering conduit positioned over said surface of repose, means connected to said metering conduit at said downstream end for creating a pressure drop in said metering conduit between said air inflow opening and said downstream end so that air flows into said air inflow opening to engage said surface of repose to entrain fuel particles therefrom and convey said entrained fuel particles to said downstream end of said metering conduit for effecting the discharge of air and solid fuel particles from said downstream end into said combustion chamber.

4,002,373

BRAKE OPERATING SYSTEM FOR USE IN ELECTRICALLY DRIVEN VEHICLES

Katsuyoshi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 8, 1975, Ser. No. 566,612

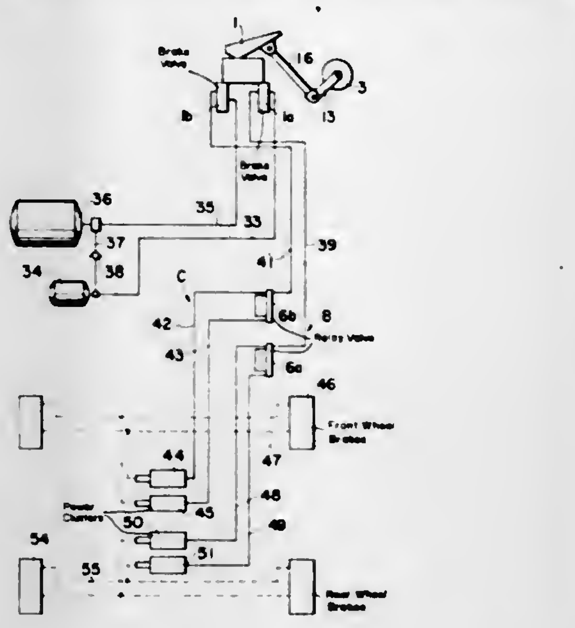
Int. Cl.² B60T *13/74*

U.S. Cl. 303—3 **2 Claims**

1. In a brake operating system for use in an electrically driven vehicle said system including an electric brake system, pneumatically operated fron and rear wheel brake systems, a first fluid supply source coupled to said front wheel brake system and a second fluid supply source coupled to said rear wheel brake system, a pair of treadle type brake valves, each being pneumtically connected to one of said fluid supply sources, a brake pedal connected to said pair of brake valves and operating means for independently operating said electric and pneumatically operated brake systems, the improvement wherein said operating means comprises:

a. pneumatic operating means for operating said pneumatically operated brake system, said pneumatic operating means having a pair of independent penumatic circuits, one of said circuits being connected between on of said brake valves and said front wheel brake system and the other circuit being connected between the other brake valve and said rear wheel brake system; and

b. mechanical operating means including a linking means for operating said electric brake system said linking means being directly connected to said brake pedal independent of said pneumatic operating means and having a rheostat for controlling the field of an electric motor driving said vehicle and a mechanism for mechanically operating said rheostat said linking means being connected between said brake pedal and said rheostat, wherein upon depression of said brake pedal said electric brake and pneumatically operated brake systems are respectively operated through their respective operating means independently of each other.



4,002,374

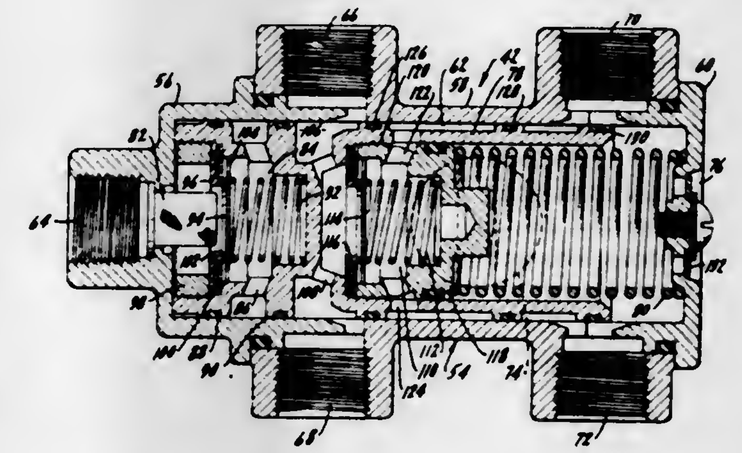
TRAILER AIR DISTRIBUTION VALVE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed May 7, 1975, Ser. No. 575,468

Int. Cl.² B60T *15/48, 17/04*

U.S. Cl. 303—29 **15 Claims**



1. In a trailer air distribution valve, a housing, a chamber in said housing, said housing having an air inlet port, an exhaust port, at least one service tank port, an emergency tank port and at least one brake chamber port, all opening into said chamber, and a shuttle movable in said chamber to control air pressure flow between said ports,

spring means biasing said shuttle to a position connecting said brake chamber port and exhaust port and closing communication between said inlet port and said service tank and emergency tank ports, air pressure at said inlet causing said shuttle to move to a position closing communication between said brake chamber port and exhaust port,

passage means carried by said shuttle between said inlet port and said service tank port and spring biased valve means carried by said shuttle for closing said passage means between said inlet port and said service tank port,

passage means for connecting said emergency tank port and inlet port and spring biased valve means for closing said passage means.

4,002,375

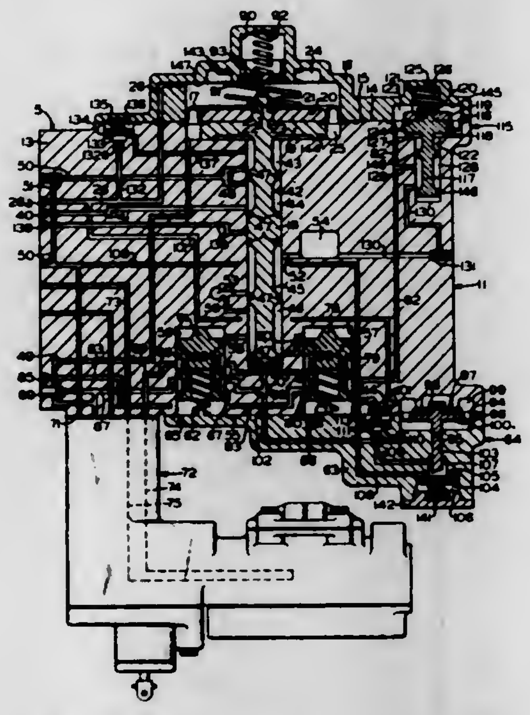
SERVICE PORTION FOR BRAKE CONTROL VALVES

Charles L. Weber, Jr., North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Apr. 5, 1976, Ser. No. 673,730

Int. Cl.² B60T *15/22*

U.S. Cl. 303—33 **10 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure and a brake cylinder, a fluid-pressure-operated triple valve device comprising;

a. a casing having therein a plurality of bores and a plurality of passageways, at least one end of certain of said passageways opening at the wall surface of one of said bores and the other end connected respectively to the brake pipe, the auxiliary reservoir and the emergency reservoir, one end of a first pair of said plurality of passageways other than said certain passageways opening at the wall surface of said one bore and the other end of each of said first pair of passageways opening respectively at the wall surface of one and the other of a first pair of said plurality of bores other than said one bore, wherein the improvement comprises:

b. a main spool-type valve having thereon a plurality of spaced-apart elongated peripheral annular grooves, said valve being slidably mounted in said one bore,

c. a movable abutment operatively connected to said main spool-type valve and subject on its respective opposite sides to the pressure in the brake pipe and in the auxiliary reservoir, the deflection of said abutment responsive to the pressure on either side thereof exceeding that on the other side being effective to cause shifting of said main valve in said one bore,

d. a spool-type piston valve having thereon a plurality of spaced-apart elongated peripheral annular grooves slidably mounted in each of said pair of bores, and

e. means for biasing the piston valve in each one of said pair of bores to one of two positions whereby, while the piston valve in each of said pair of bores occupies its said one position, the brake cylinder is open to atmosphere, one of said piston valves being shiftable to the other of its two positions to cut off the brake cylinder from atmosphere upon the supply of fluid under pressure thereto responsive to shifting of said main valve to one position in said one bore, and the other of said piston valves being shiftable to the other of its two positions to establish a communication between the auxiliary reservoir and the brake cylinder upon the supply of fluid under pressure thereto responsive to shifting of said main valve to another position in said one bore.

4,002,376

ANTI-SKID BRAKE CONTROL ASSEMBLY

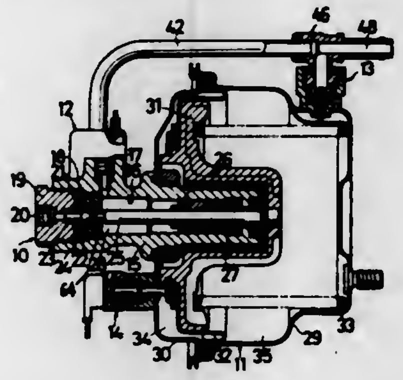
Toshiyuki Kondo, Toyota, and Masamoto Ando, Toyohashi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 22, 1975, Ser. No. 624,582

Claims priority, application Japan, Nov. 12, 1974, 49-130223

Int. Cl.² B60T *8/02*

U.S. Cl. 303—115 **3 Claims**



1. An anti-skid brake control assembly for a vehicle comprising:

a hydraulic controller including an inlet port connected to a master cylinder generating hydraulic pressure, an outlet port connected to at least one wheel cylinder of a wheel, cut off valve means disposed between said inlet and outlet ports for selectively blocking the communication therebetween, a pressure chamber disposed between said cut off valve means and said outlet port, and plunger means slidably disposed within said pressure chamber for varying the volume of said pressure chamber, said plunger means being operatively connected at one end thereof to said cut off valve means to thereby urge said cut off valve means to its open position when the volume of said pressure chamber is minimal;

servo means including a casing, diaphragm piston means dividing said casing into a first chamber and a second chamber, said diaphragm piston means being displaceable due to a pressure difference between said first and second chambers and being operatively connected to the other end of said plunger means, and biasing means disposed within said second chamber for normally urging said diaphragm piston and said plunger means in that direction in which said plunger means decreases the volume of said pressure chamber;

valve means for communicating said first chamber with a low pressure source through conduit means when the normal braking action is applied, and for communicating said first chamber with a high pressure source when the wheel is locked in or about to be locked;

restricting means communicating said conduit means with said second chamber; and

one way valve means permitting unrestricted free flow from said second chamber to said conduit means.

4,002,377

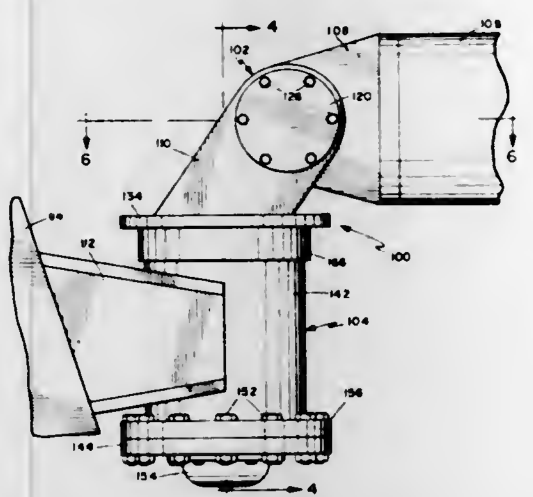
SEALED BEARING FOR LOAD CARRYING BOOMS

Sverre Jangaard, Alpine, Calif., assignor to Campbell Industries, San Diego, Calif.

Filed July 31, 1975, Ser. No. 600,268

Int. Cl.² F16C *1/24*

U.S. Cl. 308—36.1 **7 Claims**



1. A sealed bearing for supporting the end of a boom carrying a load for movement of the boom in two axes comprising:

a boom heel bearing means for rotation of the boom about a first axis,

a boom pivot bearing means for rotation of the boom about a second orthogonally related axis,

said boom pivot bearing means and boom heel bearing means being structurally interconnected,

said boom heel bearing means comprising a sealed bearing enclosure,

a boom heel pin in said sealed bearing enclosure for relative rotational support between said boom and said boom pivot bearing.

said pivot bearing means comprising a sealed cylindrical bearing enclosure having a generally planar end plate and a bearing post in said sealed cylindrical bearing enclosure.

said bearing post having a sliding bearing relationship with said end plate and with the walls of said sealed cylindrical bearing enclosure,

said pivot bearing incorporating a top plate which overlies the upper edges of said sealed cylindrical bearing enclosure,

said bearing post comprising a cylindrical member having an open central chamber and a bottom plate,

said bottom plate being in bearing relationship with said end plate through a bearing insert.

4,002,378

VERTICALLY SUPPORTED ROTARY BODY

Peter Meinke, Grobinzemoos, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Munich, Germany

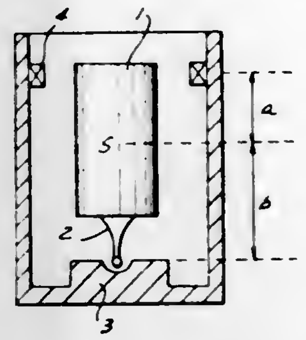
Filed Jan. 20, 1975, Ser. No. 542,154

Claims priority, application Germany, Jan. 24, 1974, 2403293

Int. Cl.² F16C *13/06, 15/00, 17/08, 19/12*

U.S. Cl. 308—147 **4 Claims**

1. A rotational arrangement comprising a rotary body, support means resiliently supporting said rotary body at least at one of its ends, and a rigid extension means between the end of said rotary body and said support means for reducing the radial forces produced on said support means during rotation of said body, said extension means being rotatable with said rotary body and having a substantially smaller diameter than said rotary body, the mass per unit axial length of said extension means being less than the mass per unit axial length of said rotary body, so as to minimize any displacement of the center of gravity of said combined rotary body and extension means as compared to the center of gravity of said rotary body alone, said extension means having its only support at said support means, whereby the radial restoring forces on said support means is reduced,



4,002,379

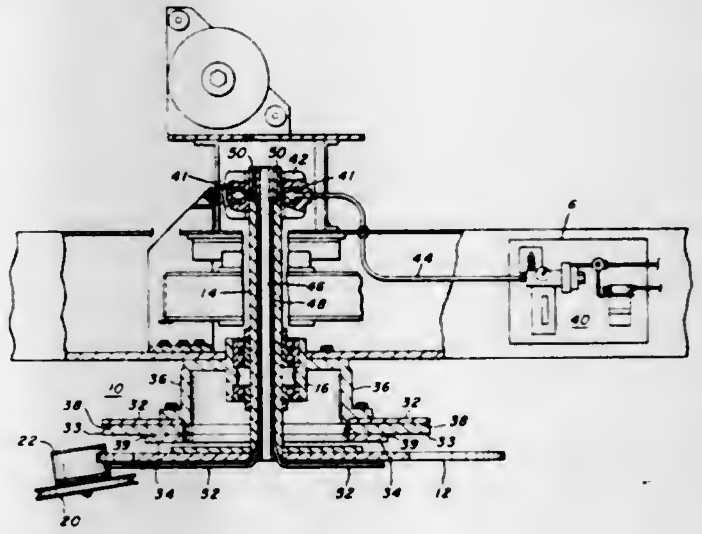
OIL MIST LUBRICATION OF CENTRIFUGALLY LOADED BEARINGS

Guy E. Martin, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 10, 1975, Ser. No. 630,357

Int. Cl.² F16C *33/30*

U.S. Cl. 308—187 **4 Claims**



1. In combination,

a substantially planar supporting member adapted to be rotated about an axis extending generally perpendicular to the plane of the member, and at relatively high rotational speeds,

at least one bearing unit supported on and adjacent the periphery of said member, such that the bearing unit is eccentrically located with respect to the axis of rotation of the supporting member, and is subjected to high centrifugal forces when the supporting member is rotated at high rotational speeds, and,

means adapted to supply the bearing unit with an essentially weightless lubricating mist.

4,002,380

ROLLER BEARING OF SUPERIOR RUN-OUT CHARACTERISTICS

Willard L. Bowen, Harwinton, Conn., assignor to The Torrington Company, Torrington, Conn.

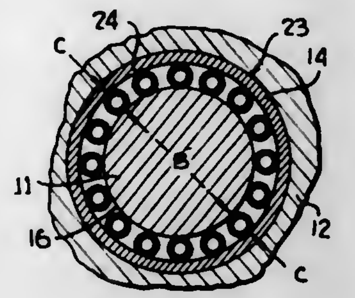
Continuation of Ser. No. 287,010, Sept. 7, 1972, Pat. No. 3,765,071, which is a continuation-in-part of Ser. No. 39,767, May 22, 1970. This application Aug. 7, 1973, Ser. No. 386,318

Int. Cl.² F16C *13/00*

U.S. Cl. 308—207 R **19 Claims**

1. A roller bearing of superior runout characteristics for the dimensional control of the components thereof in accordance with an acceptable standard of grading bearings and bearing

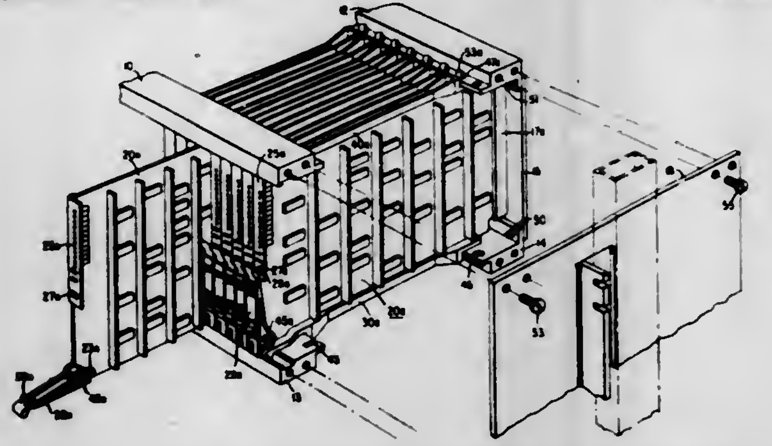
components wherein the quality of bearings and bearing components are graded in a predetermined sequence, said roller bearing comprising companion bearing races of known inferior grade in accordance with said standard, and hollow metal rollers of a known grade, said hollow rollers having a diameter greater than the maximum spacing between said races with said rollers being in a preloaded condition between said races, and said bearing having the runout characteristics of a bearing of a grade in accordance with said standard superior to that required for a bearing utilizing races of said known inferior grade and solid rollers of said known grade without clearance between each roller and said races.



4,002,381
CARD MOUNTING ASSEMBLY

Guy Robert Wagner, Arvada, and David Allan Weisheit, Broomfield, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 31, 1975, Ser. No. 600,595
Int. Cl.² A47B *63/00*
U.S. Cl. 312—183 11 Claims

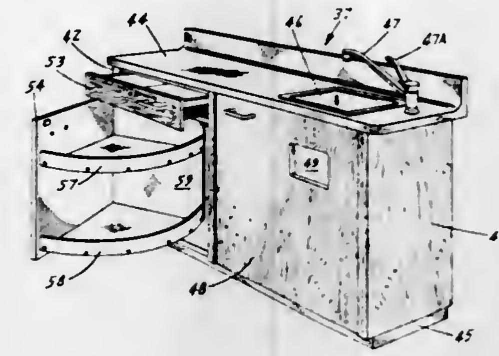


1. A component assembly comprising at least one component card, a frame for supporting said component card including a card receiving end member, a base end member, a guide member for slidably guiding said card between said card receiving end and base end members, a lever pivotally mounted on said card for engaging said guide member at said receiving end member, said lever being adapted to lock into a fixed position on said card when said card is in a home position against said card receiving end member, said guide member being fixedly attached to said base end member and slidably attached to said receiving end member, said guide member having an elastically elongatable section intermediate said receiving end member and base end member, said elastically elongatable section of said guide member being longitudinally elongated responsive to the pivoting of said lever towards said card, said guide member and said lever cooperating to urge said card against said base end member and to controllably restrain said card in said home position against said base end member.

4,002,382
CABINET STRUCTURE FOR DENTAL TREATMENT ROOM

Hugo M. Wolf, 1451 NE. Glacier Lane, Minneapolis, Minn. 55421, and Leo H. Wolf, 2000 Idaho Ave. South, Minneapolis, Minn. 55426

Division of Ser. No. 558,322, March 14, 1975, which is a division of Ser. No. 292,478, April 3, 1972, Pat. No. 3,902,246. This application July 24, 1975, Ser. No. 598,840
Int. Cl.² A47B *81/00*
U.S. Cl. 312—209 7 Claims



1. A cabinet for use in a dental treatment room comprising: a base support, a pair of upright wall means providing upright side panels mounted on the base support, a generally horizontal top mount on upper portions of the side panels, sink means mounted on the top, first upright door means located on a portion of the front of the cabinet, means pivotally mounting the first door means on one side panel for movement about a generally upright axis to selective open and closed positions, generally horizontal shelf means mounted on the inside of the first door means, second door means located on another portion of the front of the cabinet, and first means pivotally mounting the second door means on the other side panel for movement about a generally upright axis to selective open and closed positions, said second door means having an opening providing access to the interior of the cabinet, and container means attached to the inside of the second door means below the opening for receiving and storing objects moved through the opening, and a drawer located above the first door means and below the top, means movably mounting the drawer on the wall means for selective generally horizontal movement to an out open position and in closed position, and a drawer located above the first door means and below the top, means movably mounting the door on the wall means for selective generally horizontal movement to an out open position and in closed position.

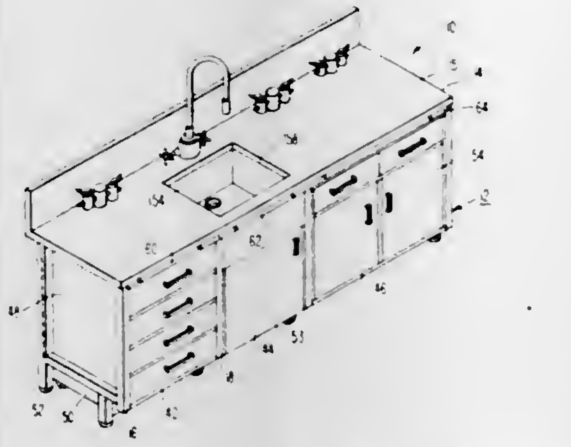
4,002,383
MODULAR LABORATORY BENCH ASSEMBLY

Caswell Francis Holloway, Jr., Haverford, Pa., assignor to The Holloway Corporation, Haverford, Pa.

Filed Sept. 11, 1975, Ser. No. 612,532
Int. Cl.² A47F *5/08*; A47B *55/00*
U.S. Cl. 312—209 31 Claims

1. A modular laboratory bench assembly including a counter top and a floor mounted frame for supporting said counter top at a predetermined height above the floor, said frame comprising:

- a. at least two rigid, preassembled side support members, each of which comprises:
  - i. a rear leg having an upper end with a pair of receiving apertures therein, a lower end and opposing side surfaces positioned to face adjacent side support members when assembled into a frame, said side surfaces having a plurality of apertures therein;
  - ii. a front vertical support bar having an upper end, with a pair of receiving apertures therein, and a lower end, said front vertical support bar being shorter than said rear leg;
  - iii. an upper horizontal support bar rigidly connected between the upper ends of the front vertical support bar and the rear leg;
  - iv. a lower horizontal support bar rigidly connected between the lower end of the front vertical support bar and the rear leg; and
  - v. a front leg rigidly attached to the lower horizontal support bar and extending downwardly therefrom in substantially parallel spaced relation to the rear leg;
- b. means for engaging the receiving apertures and rigidly interlocking adjacent side support members at a distance which defines a predetermined modular spacing therebetween, said means comprising:
  - i. a front angle bar having a substantially L-shaped cross-section with intersecting inner surfaces and a first pin depending from one of said inner surfaces adjacent one end of said bar for engaging a receiving aperture in the upper end of the front vertical support bar of a first side support member and a second pin depending from said one inner surface adjacent the other end of said bar for engaging a receiving aperture in the upper end of the front vertical support bar of a second side support member adjacent said first side support member, the distance between said first and second pins being fixed such that said predetermined modular spacing is maintained between said adjacent side support members;
  - ii. a rear angle bar having a substantially L-shaped cross-section with intersecting inner surfaces and a first pin depending from one of said inner surfaces adjacent one end of said bar for engaging a receiving aperture in the upper end of the rear leg of the first side support member and a second pin depending from said one inner surface adjacent the other end of said bar for engaging a receiving aperture in the upper end of the rear leg of the adjacent side support member, the distance between the first and second pins being fixed such that said predetermined modular spacing is maintained between said adjacent side support members; and
  - iii. a rear spacer bar having hooks extending from each end thereof, said hooks being adapted for locking engagement in the facing side surfaces of adjacent side support members; and
- c. means for levelling said frame.

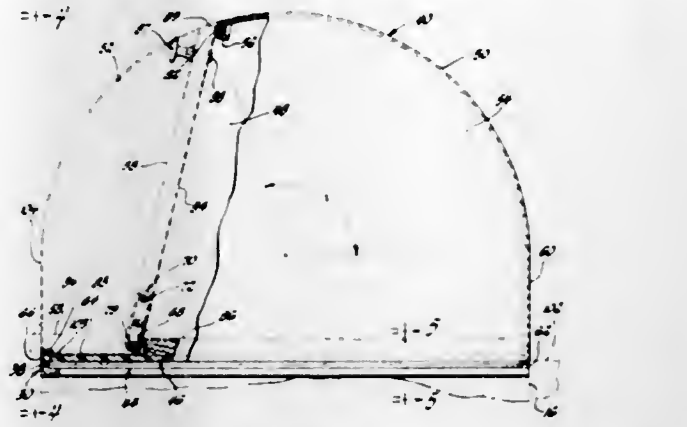


4,002,384
COMPACT REFRIGERATOR COMBINED WITH TOP STORAGE CONTAINER

Richard C. Brown, Dayton, Ohio, and Stuart B. Shuster, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1975, Ser. No. 610,140
Int. Cl.² A47F *5/08*; A47B *47/00*
U.S. Cl. 312—284 3 Claims

1. A top storage container adapted to be removably retained on the top of a domestic refrigerator cabinet, said cabinet having a U-shaped trim strip positioned along the front and side edges of the refrigerator cabinet upper wall, said trim strip providing opposed trackways along the cabinet upper side edges to normally slidably receive a removed top wall panel, the improvement wherein said storage container including flange means on the underside thereof slidably received in the cabinet trackways, said container having half-round side walls joined by a concavo-convex top wall of single curvature including a lateral rear wall portion extending substantially tangentially downwardly from the rearward terminal end of said concavo-convex top wall, said container having a base wall coextensive with the cabinet upper wall, said concavo-convex top wall extending through a predetermined obtuse angle to define a front rearwardly and upwardly inclined access opening, said base wall having a transverse shoulder formed by a notched portion extending inwardly from the base wall front edge, and a door pivotally supported adjacent said shoulder whereby said door opens downwardly from an upstanding overcenter position closing said access opening to a horizontally disposed position substantially flush with the upper surface of said base wall forming an extension thereof for use as a service area or the like.

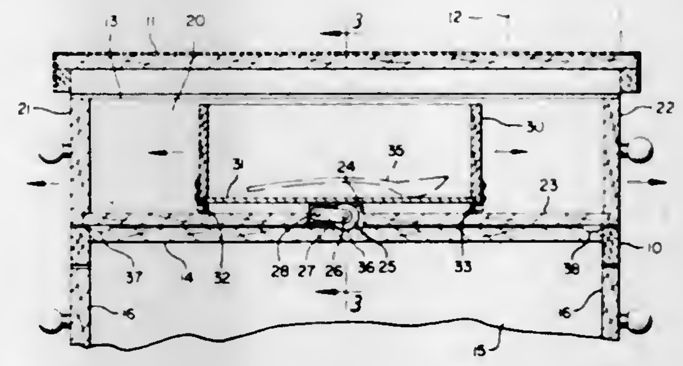


4,002,385
DOUBLE PULL DRAWER

Vernon R. Hone, Bridge Rte., Box 79A, Myrtle Point, Oreg. 97458

Filed Dec. 12, 1975, Ser. No. 640,007
Int. Cl.² A47B *81/00*
U.S. Cl. 312—286 10 Claims

U.S. Patent Jan. 11, 1977 4,002,385



1. In a kitchen cabinet and the like having a drawer arranged to be pulled out from opposite sides of the cabinet, said drawer having bottom and side walls and having opposite end walls each equipped with a handle for pulling the drawer in said opposite directions, a receptacle in said drawer having a bottom wall, said receptacle being half the length of said drawer, and opening at mid length in the bottom of said drawer, a roller mounted on said drawer for rotation in said opening, and a supporting surface in said cabinet for the under side of said roller, said bottom wall of said receptacle resting on the upper side of said roller to shift said receptacle toward the outer end of said drawer when said drawer is pulled in either direction out of said cabinet, said receptacle being confined at all times within said drawer and said receptacle being at the outer end of said drawer when the drawer is pulled half way out of said cabinet.

4,002,386

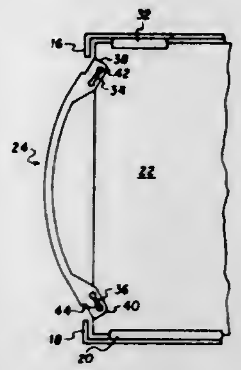
LOCKING HANDLE APPARATUS

Robert W. McKenzie, Lewisville, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 28, 1975, Ser. No. 635,833

Int. Cl.² A47B *88/00*

U.S. Cl. 312—320 **3 Claims**



1. A flexible handle for use with track mounted apparatus containing a plurality of pulling pins wherein protection against accidental disengagement from the track mount is desirable comprising, in combination:

an elongated central flexible handle member consisting of acetal copolymer plastic material;

slot means at each extremity of said central member, said slot means comprising a deformable elongated restricted portion for restraining movement therethrough of the coacting pulling pins thereby creating a detect position, the handle member assuming a bowed condition when in a detented condition; and

locking lip means on each extremity of said central member.

4,002,387

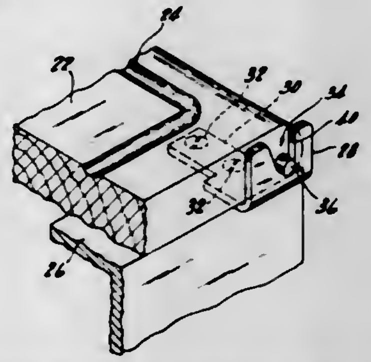
CABINET ARRANGEMENT FOR TRASH COMPACTORS

David W. Wolbrink, 42 Church St., Hartford, Wis. 53027

Filed Sept. 16, 1975, Ser. No. 613,924

Int. Cl.² A47B *91/00, 51/00*; B30B *15/06*

U.S. Cl. 312—350 **4 Claims**



1. In a free standing trash compactor having a cabinet for containing a compacting mechanism and a receptacle in which compaction occurs, said cabinet having sidewalls and an upper end, the improvement comprising:

a reversible cutting board positionable on said cabinet upper end, said cutting board being hinged at one of its ends on said cabinet for upward pivotal movement by a hinge arrangment comprising a pair of brackets mounted adjacent the sidewalls of the cabinet, one of said brackets being contiguous with each of the sides of said cutting board adjacent said end for embracing said end of said cutting board, said brackets having upwardly facing notches formed for freely receiving pins extending from the center of the thickness of said cutting board at said embraced end by a downward movement of said board and restraining said pins at a pivot point during upward pivotal movement of said cutting board.

4,002,388

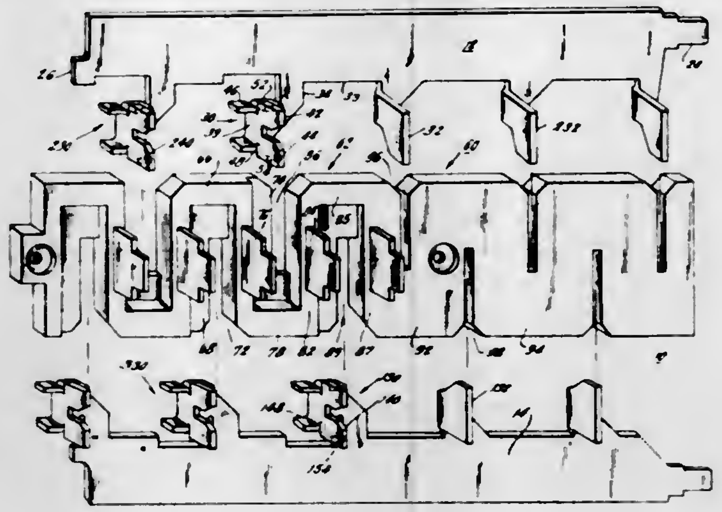
STAB ARRANGEMENT FOR BUSBARS

Gustavo A. Menocal, Delran, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Nov. 20, 1975, Ser. No. 633,622

Int. Cl.² H01R *13/04*; H02B *1/04*

U.S. Cl. 339—22 B **10 Claims**



1. A bus bar contact stab structure formed integrally from a single sheet of conductive material, said structure including an elongated bus bar section located in a first plane and a stab unit section laterally offset from the longitudinal axis of said bus bar section, said stab unit section including a planar central stab portion bent forward out of said first plane into a plane perpendicular thereto and perpendicular to said axis, said stab unit central section also including first and second planar side stabs in a first common plane perpendicular to said first plane and parallel to said axis, said side stabs positioned on opposite sides of the central stab portion and extending the same distance forward of the first plane.

4,002,389

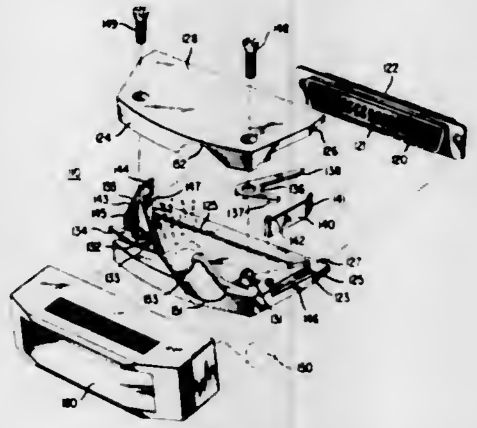
SELF LATCHING AND UNLATCHING CONNECTOR ASSEMBLY

Lewis Howard Mammel, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 11, 1975, Ser. No. 595,224

Int. Cl.² H01R *13/54, 13/58*

U.S. Cl. 339—91 R **16 Claims**



1. An electrical connector assembly including:

first and second connectors having mating electrical contacts, said first connector having affixed thereto a pair of barbed latch members; and

a connector mounting assembly, said connector mounting assembly including;

means for securing said second connector to said connector mounting assembly;

first and second leaf springs each having one end affixed to said connector mounting assembly;

means, integral with an opposite end of each of said leaf springs, for latching said connector mounting assembly to said pair of barbed latch members upon engagement of said first and second connectors;

first and second pivotable levers, each lever having a pair of arms connected together at a predetermined angle; and

a sleeve assembly enclosing said connector mounting assembly, said sleeve assembly including first and second locking pins for engaging one arm of each of said levers as a disconnection force is applied to said sleeve assembly at any point on its periphery, the other arm of each of said levers engaging said first and second leaf springs at a point adjacent said latching means thereby deflecting said leaf spring latching means outwardly away from said pair of barbed latch members and releasing said connector mounting assembly from said first connector barbed latch members.

4,002,390

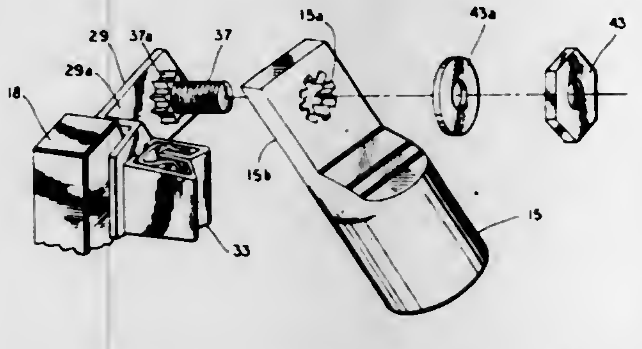
ARRANGEMENT FOR AND METHOD OF PREVENTING RELATIVE ROTATION OF ELECTRIC TERMINALS DURING A TIGHTENING OPERATION

William H. Perry, Atlanta, and William G. Morgan, III, Lilburn, both of Ga., assignors to Kearney-National, Inc., Atlanta, Ga.

Filed Oct. 28, 1975, Ser. No. 626,216

Int. Cl.² H01R *9/10*

U.S. Cl. 339—95 R **7 Claims**



1. An arrangement for preventing relative rotation between cooperating electric terminals having flat face contacting contact surfaces and for securing said contact surfaces together, said arrangement comprising a threaded stud integral with one terminal and arranged to protrude from the contact surface thereof and disposed within a circular aperture formed in the other terminal, the contact surface of the other terminal being disposed generally normal to the axis of said stud, said stud having an enlarged circular base portion on the periphery of which serrations are formed and said aperture having complementary serrations formed in the circular walls thereof and selectively engageable with the serrations in said base portion to prevent relative rotation between said terminals in planes parallel to said contact surfaces, and fastening means threadedly related with said stud for securing said contact surfaces together.

4,002,391

INSULATION SLICING TERMINAL

Robert Brian Dunn, Ottawa, and John Davidson Lee, Manotick, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Mar. 3, 1976, Ser. No. 663,260

Int. Cl.² H01R *13/38*

U.S. Cl. 339—98 **7 Claims**

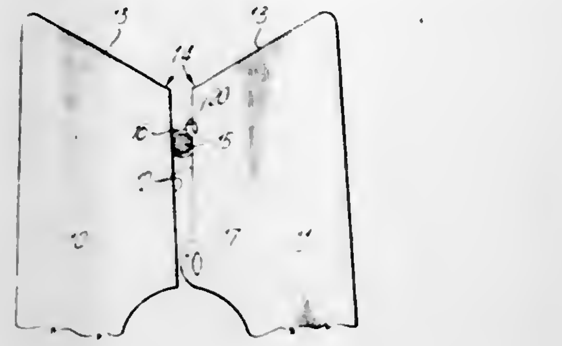
1. An insulation slicing terminal for insulated electrical conductors, said terminal of electrically conducting sheet material, comprising:

a base portion;

a pair of adjacent legs cantilevered from said base portion, said pair of legs including opposed side edges for reception of a conductor therebetween;

each of said legs further including a top edge, said top edges inclined towards each other in a shallow Vee formation, the top edge of each leg intersecting the related side edge at an abrupt angle to form insulation slicing edges;

a first swage on the side edge of one of said legs, said first swage positioned near the junction of said leg with said base portion and extending from the plane of the side edge to maintain a small gap between said opposed side edges;



a further swage on the side edge of one of said legs, said further swage at a position between said first swage and said shallow Vee formation;

the arrangement such that on positioning an insulated connector in said Vee formation, the insulation is sliced from opposed sides of the conductor by said insulation slicing edges as the conductor is forced into said small gap between the opposed side edges and past said further swage, said further swage adapted to prevent movement of said conductor out of said terminal.

4,002,392

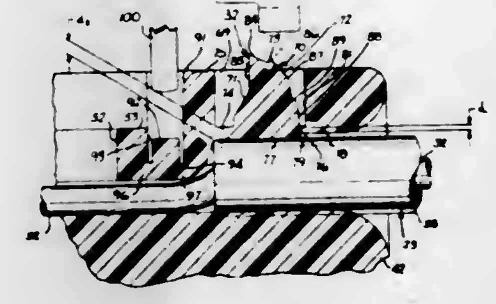
DEVICE ARMED WITH A TERMINAL FOR MAKING ELECTRICAL CONNECTION WITH A CONDUCTOR

Edwin Charles Hardesty, Perry Hall, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 521,429, Nov. 6, 1974, Pat. No. 3,954,320, which is a continuation-in-part of Ser. No. 377,154, July 6, 1973, Pat. No. 3,860,316. This application Oct. 6, 1975, Ser. No. 620,630

Int. Cl.² H01R *13/38, 13/58*

U.S. Cl. 339—99 R **21 Claims**



1. An electrical connector for terminating a cord having a plurality of insulated conductors and for making electrical contact external to the connector, which comprises:

an unipartite dielectric housing having one free end with internal surfaces of the housing defining a cavity that opens to the other end of the housing for receiving and substantially enclosing an end portion of a cord, with at least one portion of the housing adjacent the cavity being disposed in an initial position in a well and connected pivotally to the remainder of the housing toward the free end thereof, the pivotally connected portion having two intersecting externally facing surfaces, one of which has a stop formed thereon, the pivotally connected portion capable of being moved from the initial position to an actuated position at least partially into the cavity to clamp portions of the cord, and with a portion of the one externally facing surface of the pivotally moveable portion engaging an inwardly facing surface of the cavity of the remainder of the housing adjacent the cord-input end of the housing and the stop engaging a wall of the well adjacent the inwardly facing surface, the dual engagement of the one surface and of the stop with portions of the housing being effective to maintain the pivotally moveable portion in locked engagement with the cord during the application of retrograde forces to the cord; and

a plurality of electrically conductive terminals positioned within the housing and extending between the cavity where the terminals pierce the insulation of and make electrical engagement with associated conductors of the cord and an external surface of the housing where the terminals make electrical contact external to the connector.

4,002,393

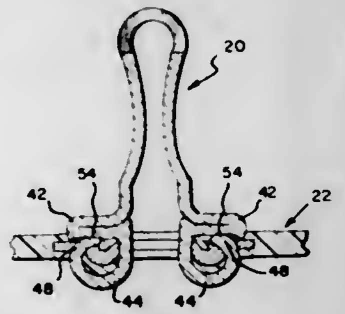
CONTACT MEANS FOR FLAT CONDUCTOR CABLE AND METHOD OF CONNECTING SAME

Roydon William Merry, Harrisburg, and James Lee Sherman, Bethel Park, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 529,767, Dec. 5, 1974, abandoned, which is a continuation of Ser. No. 333,579, Feb. 20, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,160

Int. Cl.² H01R *11/20*

U.S. Cl. 339—97 C **4 Claims**



1. An assembly comprising contact means and a flat electrically conductive cable comprising a flat conductive layer, with said contact means being crimped to make electrical contact with said conductive layer in said flat electrically conductive cable, and in which said contact means comprises:

a contact portion;

a first backing member connected to and supporting said contact portion and having a first surface portion positioned upon a first section of a first side of said conductive layer and generally parallel to said first section; and

a first conductive leg integrally connected at one end to said first backing member with its other end extending through said conductive layer of said cable;

said other end of said first conductive leg being crimped in a curled configuration back upon itself and penetrating through said conductive layer and then extending towards the junction of said first conductive leg and said first backing member in a path adjacent to and generally parallel with the first surface portion of said first backing member, and exerting a force upon said first surface portion of said first backing member due to the tendency of the first conductive leg to relax.

4,002,394

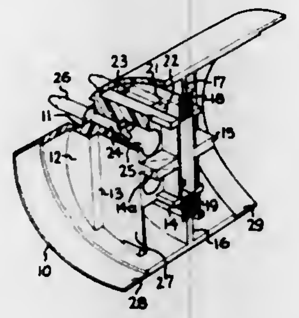
SINGLE LATCH SNAP-LOCK BASE FOR ANNULAR FLUORESCENT LAMPS

Dominic D. Cordiano, South Euclid; Joseph D. Kastelic, Euclid, and Vernon E. Thomas, Rocky River, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,500

Int. Cl.² H01R *33/74*

U.S. Cl. 339—50 C **11 Claims**



1. A base for an annular lamp comprising:

a pair of parts having a semicylindrical external surface, said parts containing channels and legs having fitted cross sections formed on the interior thereof and spaced from said external surface;

at least one of said legs comprising locking means and at least the one of said channels receiving said one leg comprising means for engaging said locking means;

a recess formed in one of said parts for receiving electrically conductive contact pins, said recess forming a boss on the interior of said part; and

reinforcing means on the interior of said parts and located at the middle portion thereof for preventing flexure of said portion, said reinforcing means comprising semicircular discs orthogonal to said surface and connecting said boss to the inner surface of said one part and attached to the interior of the other part.

4,002,395

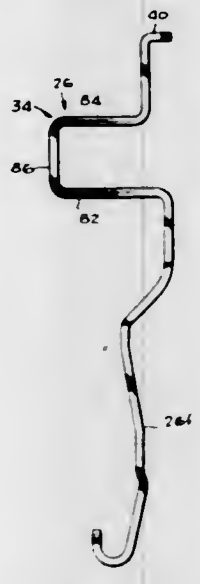
CONNECTOR

Robert Everett Wilson, Agoura, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Division of Ser. No. 531,924, Dec. 12, 1974, Pat. No. 3,958,853. This application Jan. 22, 1976, Ser. No. 651,615

Int. Cl.² H01R *13/38*

U.S. Cl. 339—99 R **2 Claims**



1. An insulation-penetrating contact element comprising:

a metal contact element having a wire-receiving slot, said slot having a slot portion which, as seen in an imaginary sectional view taken transverse to the length direction of an edge of the slot portion, forms a concave edge surface with a pair of corners that can readily press into the conductive core of an insulated wire.

4,002,396

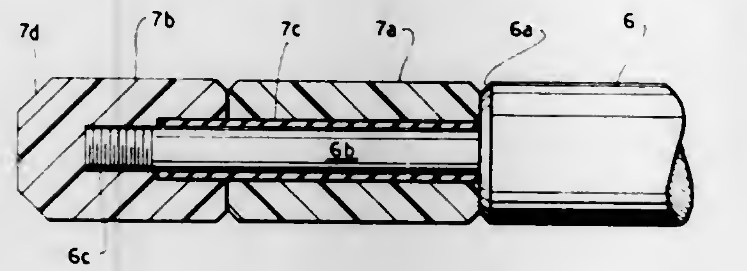
ELECTRIC CONNECTOR APPARATUS

Robert E. Murdock, Atlanta, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Feb. 13, 1976, Ser. No. 657,856

Int. Cl.² H01R *13/52*

U.S. Cl. 339—111 **7 Claims**



1. A contact pin constituting a component of an electric connector apparatus, said contact pin comprising a tubular conducting part of conducting material having a coaxial stem of conducting material projecting from the end of said tubular conducting part which is subjected to arcing, said stem being of substantially smaller diameter than said conducting part, a hollow tubular sleeve of brittle arc extinguishing material disposed about said stem and in coaxial relation therewith and having one end in snug engagement with the adjacent end of said tubular conducting part of conducting material which is subjected to arcing, the outer diameter of said hollow tubular sleeve being substantially equal to the diameter of said tubular conducting part, and a separate nose piece formed of mechanically strong insulating material and secured to said stem in coaxial relation therewith and having a part in engagement with the other end of said sleeve, the outer end of said nose piece being bevelled externally.

4,002,397

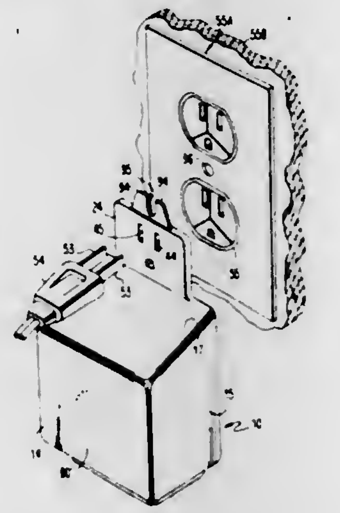
CONNECTOR FOR ELECTRIC PLUG

James P. Wang, and David I. Wolsk, both of Lexington, Ky., assignors to Wolsk Associates, Ltd., Lexington, Ky.

Filed Sept. 29, 1975, Ser. No. 617,706

Int. Cl.² H01R *3/00*

U.S. Cl. 339—147 R **12 Claims**



1. A connector for mounting on an electrical plug for disposition in an electrical receptacle without preventing prongs of the plug from being inserted sufficiently into the receptacle for connection to a source of power including:

a housing of an electrically insulating material;

said housing having a receptacle therein, said housing fully enclosing said receptacle;

said housing having a relatively thin portion extending from one side thereof and away from said receptacle;

said thin portion having at least two openings extending therethrough;

a pair of electrically conductive strips mounted within said thin portion, each of said electrically conductive strips having an opening therein with each of said openings aligned with the corresponding opening in said thin portion to enable one of the prongs of the plug to pass therethrough;

said openings in said electrically conductive strips being smaller than the prongs of the plug to grasp the prongs of the plug when the prongs are inserted therein;

each of said electrically conductive strips being formed of a material capable of expanding to receive the prongs of the plug and returning substantially to its original shape after the prongs of the plug are withdrawn therefrom;

and electrical means disposed in said receptacle in said housing and connected to said electrically conductive strips to receive power therefrom when the plug is connected to a source of power through the electrical receptacle.

4,002,398

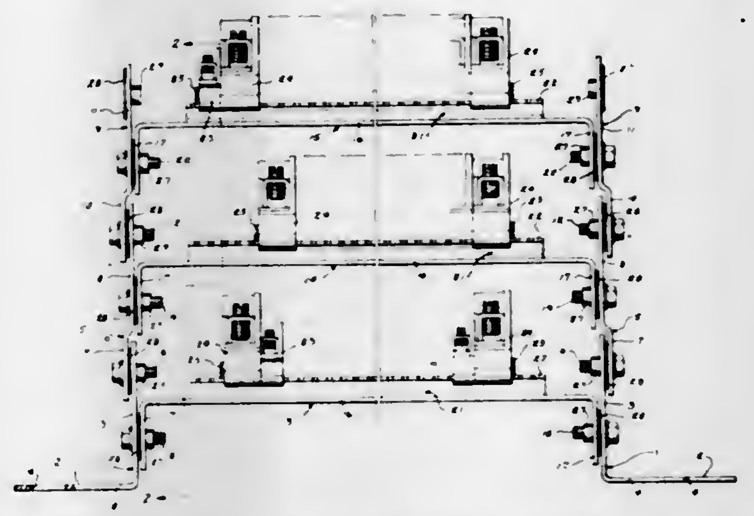
TERMINAL BLOCK RACK

Alfred H. Hanisch, Milwaukee, Wis., and Edward C. Fensholt, Overland Park, Kans., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 17, 1975, Ser. No. 559,198

Int. Cl.² H01R *9/00;* H02B *1/04*

U.S. Cl. 339—198 GA **5 Claims**



1. In combination with an electrical control panel wherein electrical equipment is mounted, and wherein terminal blocks are positioned, the improvement which comprises:

a pair of longitudinally opposed supports mounted to said control panel and extending outwardly therefrom;

a pair of intermediary members, each being connected to one of said supports and being normally disposed substantially coplanar with said supports, but being selectively pivotal in either a clockwise or counterclockwise direction away from its normal position to assume a second position outside of the plane of said supports;

a mounting bridge having a pair of ends depending from a span longitudinally extending between said ends, each of said ends being pivotally connected to one of said intermediary members and said span having a plurality of terminal blocks mounted thereon;

the span of said mounting bridge being normally disposed substantially perpendicular to the plane of said intermediary members, but being selectively pivotal in either a clockwise or counterclockwise direction away from its normal position to assume a second position; and

the span of said mounting bridge and said intermediary members being independently pivotal and capable of pivoting in opposite directions with respect to one another.

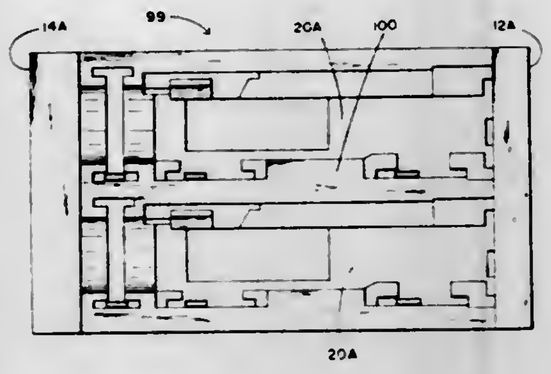
4,002,399
PRINTED CIRCUIT JACK

James C. Deitch, Bloomington, and Lawrence F. Leistiko, Minneapolis, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Oct. 6, 1975, Ser. No. 619,594

Int. Cl.^{2} H01R *13/50*; H05K *1/04*

U.S. Cl. 339—221 M **5 Claims**



1. A molded dual jack especially suitable for direct connection on its bottom side to a printed circuit board comprising an elongated molded non-conducting housing having an elongate axis and first and second generally parallel end surfaces generally perpendicular to the elongate axis at opposite ends of the housing, said end surfaces connected together by elongated first, second and third side walls extending therebetween, parallel to the elongate axis, said end surfaces also connected together by an elongated intermediate side wall which is positioned between said first and second side walls, and perpendicular to said third side wall and said housing having two entrance holes in said first end surface to accept plugs along side the elongate axis therethrough into the spaces between the side walls and on each side of the intermediate wall, with a plurality of spring metal contacrs mounted in said housing by means of a plurality of vertical slots, said slots formed in the first, intermediate, and second side walls generally orthogonal to the elongate axis of said housing, said slots open on the side opposite said third side so as to accept the spring contacts from the open side of the housing, said contacts having lugs extending therefrom which extend through the bottom of the housing to make contact with the circuit board, and said spring contacts in each space including at least one pair of balanced spring contacts comprising a first spring contact over the open side of the housing proximate the first end surface mounted in a vertical slot in the first side wall and a vertical slot in the intermediate wall so as to press against the side of a plug inserted into the housing, and a second spring contact extending along the third side wall parallel to the elongate axis and mounted proximate the second end surface in vertical slots in the intermediate, and side walls so as to press against the other side of the plug inserted into the housing to balance the force of said first spring contact.

4,002,400
ELECTRICAL CONNECTOR

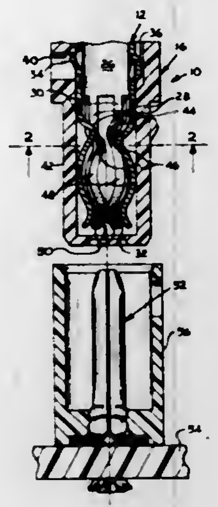
Robert Franklin Evans, New Cumberland, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1975, Ser. No. 601,073

Int. Cl.^{2} H01R *13/12*

U.S. Cl. 339—258 R **11 Claims**

7. An electrical connector comprising a conductive female socket terminal having a tubular portion, contact means at one end of said portion for forming an electrical connection between with an insulated conductor, and a plurality of contact beams projecting longitudinally from the other end of said portion and arranged generally cylindrically around the longitudinal axis of the terminal, each beam including first and second electrical contacts facing the axis, said first and second electrical contacts being spaced apart from each other along the axis, and a pivot contact facing away from the axis and located between the first and second electrical contacts; and a collar surrounding said beams, the inner surface of the collar engaging the pivot contacts to prevent movement thereof away from the axis, alternate first electrical contacts being spaced differentially from said portion whereby, upon insertion of a pin into the space between the beams, the lead end of the pin passes said second electrical contacts, engages alternate first contacts and then the remaining first contacts to move the same away from the axis and rock the beams about the pivot contact so that the second electrical contacts are forced against the pin.



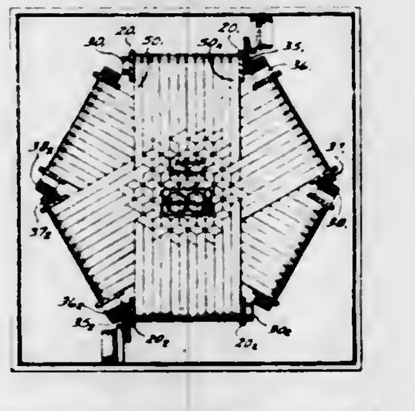
4,002,401
MULTIPLE PATTERN DISPLAY DEVICE

Kenneth E. Malberg, 2673 Greenbrier, Anaheim, Calif. 92801

Filed Sept. 18, 1975, Ser. No. 614,744

Int. Cl.^{2} G02B *27/08*; B44D *2/00*

U.S. Cl. 350—4 **11 Claims**



1. A display device for cyclically exposing a plurality of messages to view, comprising:

a housing;

an aperture formed in the surface of said housing;

a plurality of parallel first strips disposed in said housing and aligned along a first axis of translation below said aperture;

a plurality of parallel second strips disposed in said housing and aligned along a second axis of translation below said aperture, alternative ones of said second strips being interlaced with alternative ones of said first strips; and

means for advancing said first and second strips in coherent advancement

4,002,402
LENS HOOD FOR ZOOM LENSES

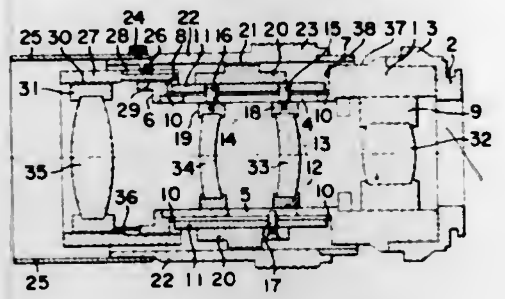
Hiroshi Mito, 527 Minaminakamaru, Omiya, Saitama, Japan

Filed Jan. 15, 1975, Ser. No. 541,204

Claims priority, application Japan, Feb. 27, 1974, 49-23486

Int. Cl.^{2} G02B *7/10*; G03B *11/04*

U.S. Cl. 350—58 **2 Claims**



1. A lens hood device for a zoom lens system, comprising:

a fixed lens barrel for supporting an image forming lens component;

an operating ring rotatably mounted about the periphery of said fixed lens barrel, and further mounted for movement along the optical axis of said image forming lens component;

a lens hood comprising a lens hood ring detachably secured to a forward end of said operating ring;

a zoom operating ring threadedly engaged with said operating ring by a first helicoid portion for movement together with said operating ring along the optical axis, and being disposed against rotation relative to said fixed lens barrel;

a cam ring mounted for rotation at a fixed position about the optical axis relative to said fixed lens barrel and being capable of rotation together with the movement of said zoom operating ring along the optical axis relative to said fixed lens barrel, said cam ring having a cam slot for effecting movement of a zoom lens component which is disposed against rotation relative to said fixed lens barrel along the optical axis, and said cam slot of said cam ring being so disposed as to move said zooming lens component along the optical axis relative to said image forming component so that said zooming lens system may be zoomed to the Tele side when said operating ring is moved forwardly along the optical axis relative to said fixed lens barrel;

said lens hood ring being so disposed as to be capable of preventing light rays from any point outside the field angle in the zooming lens system during a zooming operation from coming into said focusing lens component when said operating ring is moved along the optical axis relative to said fixed lens barrel; and

a focusing operating ring in threaded engagement with said fixed lens barrel by a second helicoid portion, said focusing operating ring being mounted for rotation together with said operating ring and a focusing lens component being supported by said focusing operating ring, whereby together with the rotation of said operating ring relative to said fixed barrel said first helicoid portion effects movement of said operating ring along the optical axis relative to said fixed lens barrel and concurrently said operating ring moves said focusing operating ring along the optical axis via the second helicoid portion, the pitch of said first and second helicoid portions being substantially equal whereby said focusing operating ring moves said focusing lens component along the optical axis relative to said fixed lens barrel and said operating ring moves said lens hood ring in the same direction along the optical axis by substantially the same amount as the amount said focusing lens component is moved.

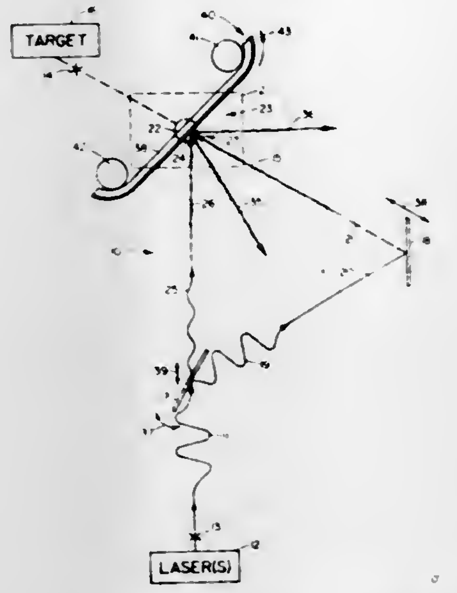
4,002,403
SUPPRESSING SUPERRADIANCE

Philip J. Mallozzi; Harold M. Epstein; David C. Applebaum, all of Columbus; William J. Gallagher, Worthington, and Bernerd E. Campbell, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 11, 1973, Ser. No. 405,444

Int. Cl.^{2} G02B *5/23*

U.S. Cl. 350—160 R **24 Claims**



1. A method of directing a radiation pulse from a source to a selected location and preventing undesired earlier radiation from the source having less than a selected intensity from reaching the selected location, comprising

directing a major portion of the radiation pulse energy along a main path to a predetermined region and continuing on toward the selected location,

positioning a reflective surface comprising a thin reflective layer in the predetermined region to prevent energy impinging thereon from continuing on toward the selected location,

directing a minor portion of the radiation pulse energy along a secondary path, and

using the energy of the minor portion to actuate a substantial removal of the reflective layer in the predetermined region when the minor portion has the selected intensity and before the corresponding major portion of the radiation pulse reaches the predetermined region, so that when the minor portion of the radiation pulse energy along the secondary path has at least the selected intensity, and thus causes the reflective layer to be substantially removed, the major portion of the radiation pulse reaching the predetermined region thereafter can continue on through the region toward the selected location.

4,002,404
IMAGING SYSTEM WITH LATENT ALIGNMENT IMAGE

Gary A. Dir, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 7, 1975, Ser. No. 539,146

Int. Cl.^{2} G02F *1/16*

U.S. Cl. 350—160 LC **22 Claims**

1. A method of imaging comprising:

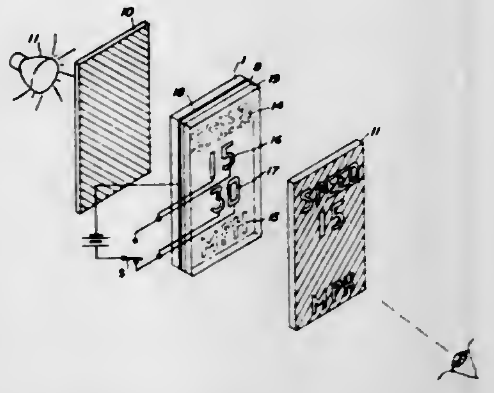
a. providing a uniformly treated substrate capable of aligning a liquid crystalline composition substantially uniformly in a first direction;

b. forming a latent alignment image on said treated substrate without removal of material therefrom; and

c. developing said latent alignment image by contacting said treated substrate with a liquid crystalline composition wherein background areas of the treated substrate align molecules of said liquid crystalline composition in said first direction and said latent alignment image of said substrate aligns molecules of said liquid crystalline composition in a second direction.

9. A latently imaged member, comprising:

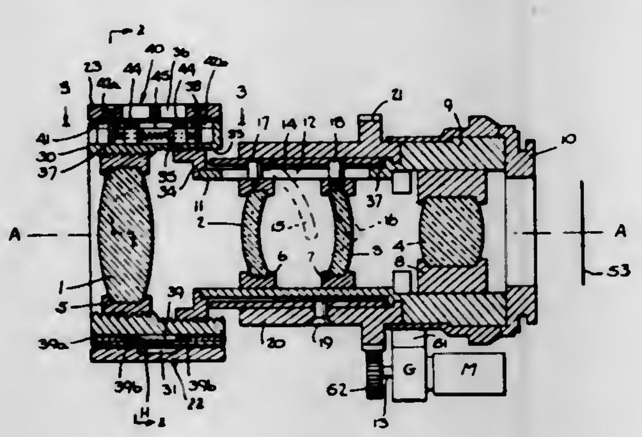
a. a uniformly treated substrate capable of aligning molecules of a liquid crystalline composition substantially uniformly in a first direction; and



b. a latent alignment image thereon capable of aligning molecules of said liquid crystalline composition in a second direction.

4,002,405
VARIABLE SPEED CONTROL FOR ZOOMING

Curt Stahl, 1 Gilmore Court, Scarsdale, N.Y. 10583
Filed Apr. 3, 1975, Ser. No. 564,917
Int. Cl.² G02B *15/00; G03B 3/00*
U.S. Cl. 350—187 **12 Claims**



1. A zoom control for a lens system having a movable zoom component for selectively increasing and decreasing the image magnification of an object on a given focal plane, comprising:

variable speed drive means cooperating with said zoom component for driving said zoom component toward and away from said focal plane at any of a plurality of different speeds,

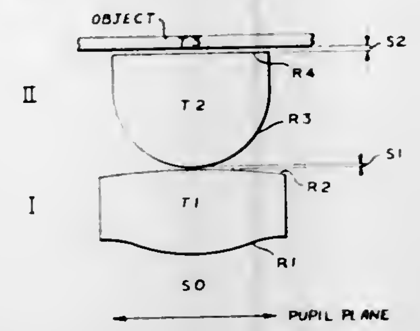
control means including a control member movable between a null position and a plurality of spaced positions on each side of said null position, said null position corresponding to zero speed of said drive means and each of said positions on one side of said null position corresponding to a respective one of said speeds of said drive means for driving said zoom component in a direction toward said focal plane and each of said positions on the other side of said null position corresponding to a respective one of said speeds of said drive means for driving said zoom component in a direction away from said focal plane,

electric circuit means operatively connecting said control means to said drive means for actuating said drive means at a speed which corresponds to the selected one of said plurality of positions of said control member in response to movement of said member to such selected position, and

cylindrical housing means housing said lens system and adapted to be stabilized by the hand of the operator, said control means being supported by said housing means substantially within the axial dimension of said housing means so that the operator can with one hand stabilize the lens system and operate said control means.

4,002,406
MICROSCOPE CONDENSER

Milton H. Sussman, Amherst, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 8, 1975, Ser. No. 638,486
Int. Cl.² G02B *9/06, 21/02, 13/18*
U.S. Cl. 350—189 **2 Claims**



1. An improved microscope condenser having a front focal plane external to the glass comprising, in sequence, a bioconvex positive singlet I and a convex-plano positive singlet II aligned along an optical axis, which singlets have parameters of lens radii (R), and minus sign (−) indicates center of curvature on the pupil side of the lens, thickness (T), spacing (S), index of refraction (ND and Abbe number (ν) as follows:

Lens	Radius	Thickness	Spacing	Index of Refraction	Abbe Number
			S_0= 0.5828X		
	R_1= 1.4794X				
I		T_1= 0.7869X		1.522<ND_1 <1.524	$\nu_1 \cong 58$
	R_2= −6.5954X				
			S_1= 0.0095X		
	R_3= 0.7313X				
II		T_2= 1.0618X		1.522<ND_2 <1.524	$\nu_2 \cong 58$
	R = ∞				
			S_2= 0.0381X		

wherein X is 9 to 11mm, the surface having radius R_1 is axially symmetrical aspherical with a conic coefficient (k) of −1·0 and deformation coefficients d of $+0.229394 \cdot 10^{-6}$, e of $-0.906333 \cdot 10^{-7}$, f of $+0.105699$ 10^{-8} and g of $-0.139724 \cdot 10^{-10}$

4,002,407
OBJECTIVE

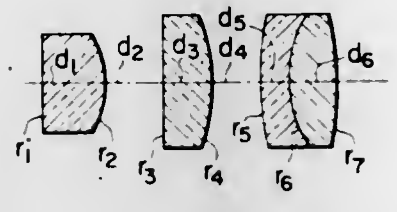
Haruo Maeda, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 4, 1975, Ser. No. 637,682
Claims priority, application Japan, Dec. 6, 1974, 49–140718
Int. Cl.² G01B *21/02, 9/12*
U.S. Cl. 350—229 **1 Claim**

1. An objective comprising a first positive lens component, a second positive lens component and a third positive cemented doublet lens component, and said objective having the following numerical data:

f = 1.0, NA = 0.35, WD = 0.164, β = 13.5x

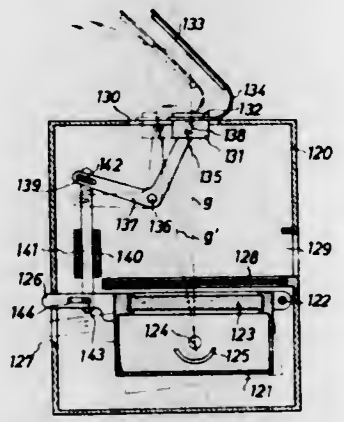
$r_1 = \infty$			
	$_1 = 0.4861$	$n_1 = 1.51633$	$\nu_1 = 64.1$
$_2 = -0.5612$			
	$_2 = 0.4111$		
$_3 = \infty$			
	$_3 = 0.3897$	$n_2 = 1.51633$	$\nu_2 = 64.1$
$_4 = -1.3446$			
	$_4 = 0.3592$		
$_5 = 2.3324$			
	$_5 = 0.2109$	$n_3 = 1.74077$	$\nu_3 = 27.8$
$_6 = 0.8853$			
	$_6 = 0.3782$	$n_4 = 1.51633$	$\nu_4 = 64.1$
$_7 = -2.1008$			

wherein the reference symbols r_1 through r_7 represent radii of curvature on the surfaces of the lens components, the reference symbols d_1 through d_6 denote thicknesses of the lens elements and air spaces, reference symbols n_1 through n_4 designate refractive indices of the lens elements and reference symbols ν_1 through ν_4 represent Abbe's numbers of the lens components.



4,002,408
SYSTEM AND DEVICE FOR OVERHEAD PROJECTION

Michito Amma, Tokyo, Japan, assignor to Gakken Co. Ltd., Tokyo, Japan
Filed Dec. 10, 1971, Ser. No. 205,832
Int. Cl.² B03B *21/00*
U.S. Cl. 353—70 **21 Claims**



1. An overhead projector comprising in combination:

a casing;

a stage on which an object to be imaged is placed and said stage being supported by said casing;

illumination means for said object disposed on one side of said stage and said illumination means being disposed within said casing;

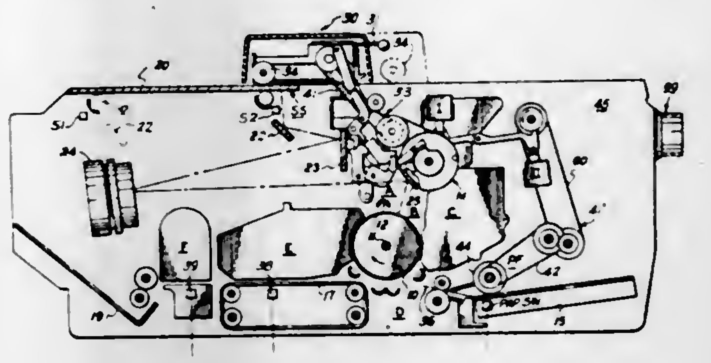
a projection lens system disposed on the opposite side of said stage and having a predetermined optical axis;

said projection lens system being so positioned that the axis of light from said illumination means passes through the center of said projection lens system at an angle relative to said predetermined optical axis of said projection lens system, and

wherein said stage is a substantially horizontal stage within said casing, said illumination means is mounted below said stage and adjustable between horizontal and inclined conditions, said projection lens system is disposed above said stage and parallel thereto, said projection lens system being slidably received in the top of said casing and operatively connected to said illumination means in such a manner that the axis of the light therefrom passes through the center of said projection lens system at right angles when said illumination means is horizontal and obliquely when said illumination means is inclined, and including a mirror connected to said projection lens system for slidable movement therewith.

4,002,409
CHAIN FEED CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR

William L. Valentine, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 1, 1975, Ser. No. 564,172
Int. Cl.² G03G *15/00*
U.S. Cl. 96—1 R **26 Claims**



1. A multi-mode copier/duplicator comprising:

an optical system for operation of said copier/duplicator in a first mode for copying a document up to a first size onto a copy sheet up to said first size or for copying a document up to a second size larger than said first size onto a copy sheet up to said second size;

document feeding means operative in said first mode for moving documents relative to said optical system;

first sensing means for sensing a document at said document feeding means;

second sensing means for sensing whether said copy sheets are up to said first size or are larger than said first size up to said second size;

first timing means for controlling in said first mode a first portion of said copier/duplicator machine cycle;

second timing means for controlling in said first mode a second portion of said copier/duplicator machine cycle responsive to said second sensing means sensing said copy sheets up to said first size; and

said first timing means in said first mode being responsive to said second sensing means sensing copy sheets up to said first size and to said first sensing means for automatically starting said first portion of said copier/duplicator machine cycle during and simultaneously with said second portion of said copier/duplicator machine cycle.

4,002,410
APPARATUS AND METHOD FOR ORIENTING MONOCRYSTALLINE MATERIAL FOR SAWING

Roger A. Frederick, St. Louis, and Thomas E. Reichard, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Mar. 17, 1975, Ser. No. 559,194
Int. Cl.² G01N *21/04*
U.S. Cl. 356—31 **13 Claims**

1. A portable device adapted for being quickly secured to and removed from a body of monocrystalline material to be sawed for aligning said body with respect to a saw balde in order to permit sawing of said monocrystalline material by the blade with precisely predetermined crystallographic orientation, said device comprising:

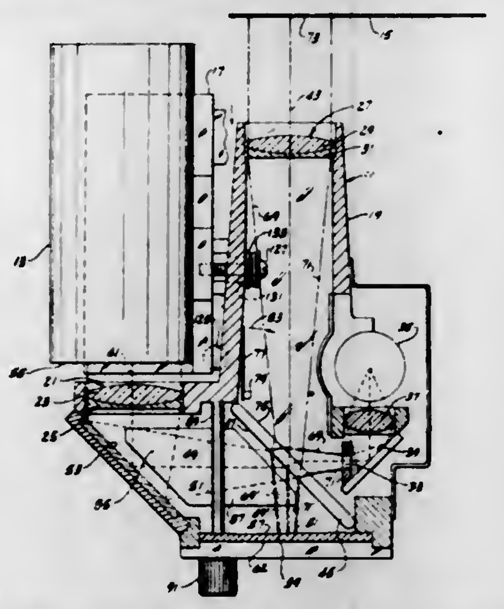
a viewing screen for displaying imaged light patterns;

at least one light source;

first collimator means, including a first lens, for collimating the light from the light souce to provide a first collimated light beam directed toward a surface of the monocrystalline material for reflection in the reverse direction, the reverse reflection being directed back through the first lens;

means for imaging the first said reverse reflection on the screen to display on the screen a light pattern characteristic of a crystallographic plane of the monocrystalline material, the position of said pattern on the screen correspondig to the orientation of said device with respect to said crystallographic plane;

second collimator means, including a second lens, for collimating the light from the light source to provide a second collimated light beam directed toward the surface of the blade for reflection in the reverse direction, the reverse reflection being directed back through the second lens;



means for imaging the second said reverse reflection on the screen to display on the screen a light pattern the position of which on the screen corresponds to the orientation of the blade with respect to said device;

a small enclosure for containing the screen, the light source both collimator means, and both said imaging means; and

means for clamping said enclosure to the body of monocrystalline material and for selectively orienting said device with respect to said body.

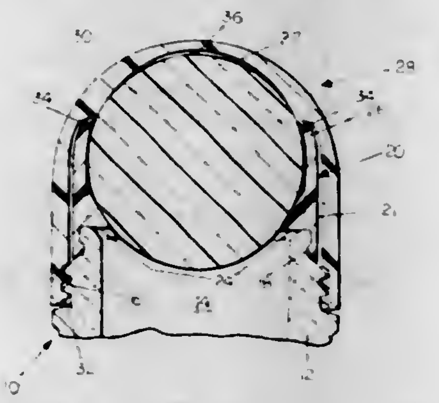
4,002,411
BALL TYPE DISPENSING PACKAGE

Paul W. Harbauer, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 2, 1975, Ser. No. 609,338

Int. Cl.² B43K *9/00, 7/10*

U.S. Cl. 401—213 **1 Claim**



1. An improved ball applicator dispensing package comprising, in combination:

a container having a neck portion defining an opening at the end thereof for dispensing the contents of said container, said neck portion including external threads and a circumferential groove formed above said threads;

an annular ball-retaining fitment of a resilient material having an inwardly extending rib adjacent one end thereof in engagement with said groove in said neck and a plurality of inwardly extending flanges intermediate said rib and the opposite end of said fitment, the end of said fitment opposite said rib terminating in a generally flat, downwardly and outwardly tapering rim portion defining an opening through said fitment;

a dispensing ball, having a diameter greater than the diameter of the opening in said fitment defined by said rim, with a majority portion thereof inserted and held by said fitment, the lower portion of said ball being seated on said flanges, with a minority portion of said ball extending beyond said fitment to define a dispensing surface; and

a closure member having internal threads for engagement with the threads on said neck, said closure member including a downwardly depending annular sealing fin inclined away from the center line of said closure and having a normal diameter substantially equal to the diameter of the downwardly and outwardly tapering rim portion of said fitment, said sealing fin being distorted outwardly into sealing engagement with said rim portion when said closure member is fully engaged on the neck portion of said container to thereby create a primary seal between said closure member and said retaining fitment without distorting said retaining fitment or said dispensing ball, and further including an interior cavity terminating adjacent the inner edge of said sealing fin and having a maximum chordal dimension at said terminus slightly less than the chordal dimension of said ball at the point to thereby create a secondary seal between said wall and said interior cavity at this location with the remainder of said ball minority part being out of engagement with said interior cavity.

4,002,412
STABILIZING OPEN GRADED ASPHALT-CONCRETE

Richard J. Bennett; Lew T. Gray, and Dale F. Levy, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 501,203, Aug. 28, 1974, Pat. No. 3,907,449. This application Mar. 27, 1975, Ser. No. 562,914

Int. Cl.² E01C *7/00*

U.S. Cl. 404—17 **2 Claims**

1. An open graded course of asphalt-concrete stabilized against lateral displacement under a moving load comprising:

1. an open graded course of asphalt-concrete,
2. particulate matter within the interstices of said course of asphalt-concrete, and
3. a cured composition of cohering material comprising a thermoplastic elastomer and a resinous material consolidating said particulate matter within the interstices.

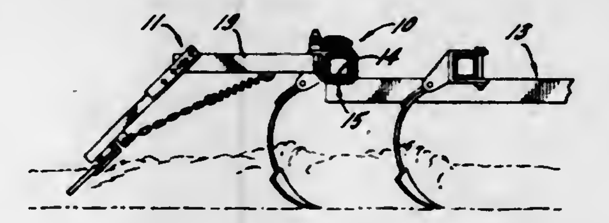
4,002,413
ADJUSTABLE MOUNTING FOR AUXILIARY FARM IMPLEMENT

Phillip W. Foster, Rochelle, Ill., assignor to Lee Blacksmith, Inc., Rochelle, Ill.

Filed Sept. 8, 1975, Ser. No. 611,508

Int. Cl.² F16B *7/04*

U.S. Cl. 403—234 **3 Claims**



1. A mounting for securing an auxiliary farm implement to the frame of a first implement, said mounting including a bracket rigidly secured to the forward end of the auxiliary implement and having a first portion disposed in a generally vertical plane to abut the rear of said frame, said bracket having a second portion formed integrally on the upper end of said first portion and disposed in a generally vertical plane with at least a part of said second portion projecting rearwardly of said first portion, said part having a hole, a tongue rigid with the upper side of said second portion and spaced above the latter, said tongue projecting rearwardly and terminating adjacent the forward edge of said hole, an elongated vertical bolt having threads formed along its upper end portion, an elongated flexible chain comprising a plurality of connected links with one end of the chain being pivotally connected to the lower end of said bolt and the other end being free, one of said links adjacent the free end of said chain being received on said tongue and the portion of the chain between said one link and said bolt extending across the top, the forward side and the bottom of said frame, said bolt being behind said first portion of said bracket with the threaded end portion projecting through said hole and above said tongue, and securing means including a nut threaded on the upper end of said bolt and bearing on the rear end of said tongue, said securing means being operable to tighten said chain securely around said frame.

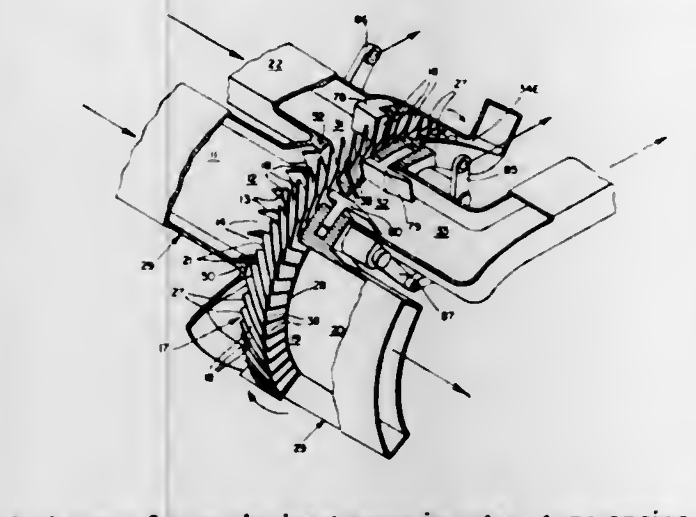
4,002,414
COMPRESSOR-EXPANDER ROTOR AS EMPLOYED WITH AN INTEGRAL TURBO-COMPRESSOR WAVE ENGINE

Richard R. Coleman, Jr., 8 Colonial Way, Malvern, Pa. 19355, and Helmut E. Weber, 2005 Welsh Valley Road, Valley Forge, Pa. 19481

Division of Ser. No. 191,410, Oct. 21, 1971, Pat. No. 3,811,796. This application Apr. 25, 1974, Ser. No. 464,047

Int. Cl.² F04B *11/00*

U.S. Cl. 416—223 A **2 Claims**



1. A rotor for producing torque in rotary type engine comprising in combination: a rotor hub means having an axis of rotation and first and second sides disposed substantially perpendicular to said axis of rotation; a plurality of chambers formed integral with said hub and formed to hold gases therein; each of said chambers having first and second sections; each of said first sections is disposed to lie along a direction having a component which is parallel to said axis of rotation and which component is larger in the first section than the corresponding component in said second section and further formed to have parallel walls and a constant cross-section dimension of A and further formed to have an opening at said first side of said hub; each of said second section is disposed to lie in a direction having a large component perpendicular to said axis of rotation and formed to have parallel walls and a constant cross-section dimension of B, wherein B is very much smaller than A so that there is a constriction in each chamber whereat its first section joins its second section, said second section further formed to have an opening at said second side of said hub whereby when gas is in any of said chambers and a shock wave is transmitted through said gas in said first section, it will be transformed into a reflected shock wave by said constriction to compress said gas into high pressure gas in said first section and whereby when said high pressure gas passes through said second section said hub is driven around its axis of rotation by a reaction phenomenon.

4,002,415
DISTRIBUTOR TYPE FUEL INJECTION PUMPS

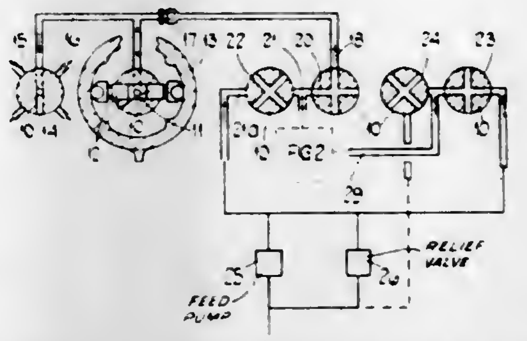
Wilfrid Edward Walter Nicholls, East Molesey, and Paul Lakra, Wembley, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Aug. 4, 1975, Ser. No. 601,432

Claims priority, application United Kingdom, Aug. 13, 1974, 35578/74

Int. Cl.² F04B *25/00*

U.S. Cl. 417—245 **12 Claims**



1. A distributor type fuel injection apparatus comprising a body, a rotary distributor member located in the body, an injection pump including a pumping chamber in which is located a reciprocable pump plunger, cam means for imparting movement to the plunger to displace fuel from said pumping chamber, a delivery passage in said distributor member in communication with said pumping chamber, a plurality of outlet ports in said body and with which said delivery passage registers in turn during successive delivery strokes of the injection pump, a source of fuel under pressure, first valve means through which fuel can flow to the injection pump during the filling strokes thereof and means for controlling the amount of fuel supplied to the injection pump during the filling strokes, said means including a shuttle movable axially in a bore, one end of said bore being connectible through said first valve means to said pumping chamber, second valve means operable to place said one end of the bore in communication with said source of fuel, an electrically operable valve for allowing fuel to escape from the other end of said bore during at least part of the time said one end of the bore is in communication with said source of fuel, third valve means operable to connect said other end of the bore to said source of fuel, and control circuit means including a sensor for sensing the position of the shuttle during the time said electrically operable valve is open, and for effecting closure of said electrically operable valve when the shuttle has moved the required amount away from said one end of the bore, the fuel contained in said one end of the bore being delivered to the injection pump at the next filling stroke thereof.

4,002,416
MOTOR POWERED BY WAVE ACTION

Roy Morgan Axford, No. 5 Ringbit, Rolling Hills, Calif. 90274

Filed Jan. 15, 1976, Ser. No. 649,269

Int. Cl.² F04B *35/00*

U.S. Cl. 417—330 **6 Claims**

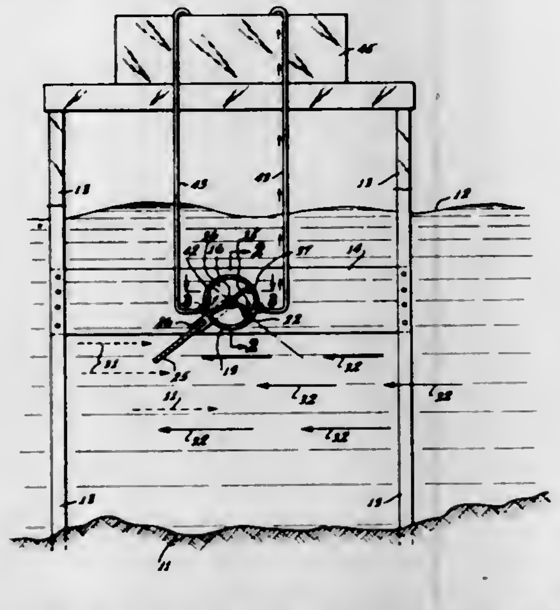
1. A motor activiated by ocean wave action comprising:

a shaft disposed on a subsantially horizontal axis which is substantially parallel to the wave action;

a water paddle radially disposed from said shaft and to rotate about the axis so that any wave action in said ocean causes said paddle to tortionally oscillate about said axis;

means for converting the oscillating motion of said paddle to useful work, said means comprising:

a cylindrical housing with annular end caps:
said shaft protruding through said annular end caps;
a radially disposed fixed vane in said housing;
a radially disposed oscillating vane mounted within said housing and onto said shaft, to divide said housing into two compartments:

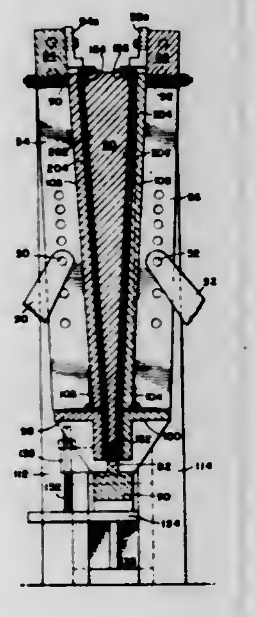


an inlet valve and an outlet valve formed through the wall of said housing to communicate with respective ones of said compartments; and
a standpipe coupled to each outlet valve to deliver water to a place of use.

4,002,417
APPARATUS FOR FOLDING A SHEET OF PLASTIC MATERIAL

Camillo M. Vecchiotti, Ridgewood, and Bruce S. Goldberg, Clifton, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,980
Int. Cl.^{2} B29C *17/02*
U.S. Cl. 425—385 **15 Claims**

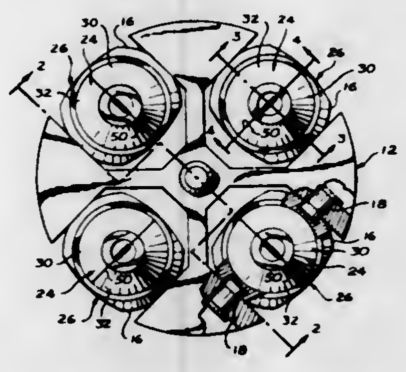


1. Apparatus for folding a sheet of brittle material comprising a support frame; support means pivotably mounted with respect to said frame and defining a support surface for at least part of said sheet; means operatively associated with said frame and said support means for pivoting said support means relative to said frame from a first position to a second position to form a fold in said sheet; said support means including a first member adapted to engage a first portion of said at least part of said sheet in said second position of said support means; and a second member movable with respect to said first member, said second member adapted to support a second portion of said at least part of said sheet for movement relative to said first member for folding said sheet to form additional fold therein spaced from said first-mentioned fold in said sheet; and means mounted relative to said support frame for applying heat to said sheet material in the region of said first-mentioned fold and said additional fold in a sequence corresponding to said pivoting of said support means from said first position to said second position, and said movement of said member with respect to said first member, respectively; wherein said support means first position is a substantially horizontal plane relative to said support frame and wherein said support means is adapted to lie in a substantially vertical plane in said second position.

4,002,418
CASTING APPARATUS

Henry W. Wallace, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 10, 1975, Ser. No. 594,905
Int. Cl.^{2} B29C *5/04*
U.S. Cl. 425—425 **10 Claims**



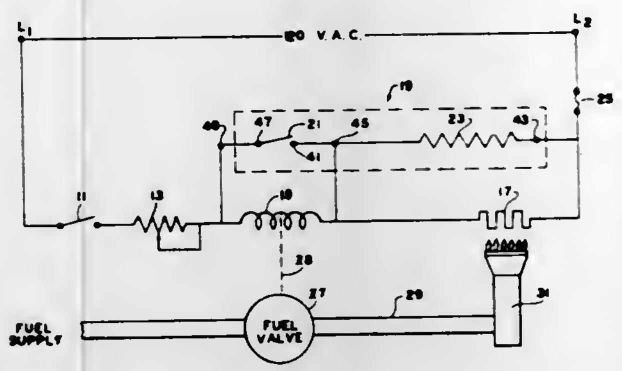
1. Centrifugal casting apparatus comprising the combination of:
a mold having an internal casting cavity with communication into said cavity adjacent a first end of the mold, an opposite second end of the mold normally being closed, said mold further being exteriorly tapered from a point adjacent said first end thereof inwardly toward and extending to said opposite second end;
a mold clamping sleeve having an internal taper substantially matching the external taper of said mold for receiving the mold, and external portions of said sleeve being constructed and arranged to adapt said sleeve to a centrifuge.

4,002,419
DIRECT BURNER IGNITION SYSTEM

Melvin E. Hantack, St. Louis, and Paul D. Frazier, West Plains, both of Mo., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 26, 1975, Ser. No. 553,342
Int. Cl.^{2} F23H *5/14*
U.S. Cl. 431—67 **7 Claims**

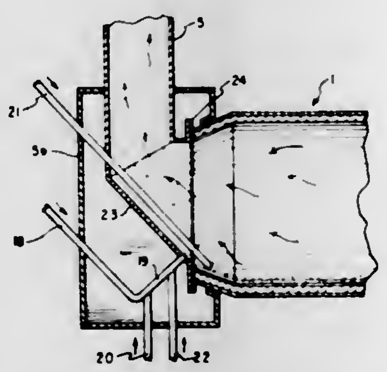
1. Electrical circuitry for controlling the operation of a fuel supply valve which regulates the flow of fuel to a direct ignition system fuel burner, said electrical circuitry comprising:
means for igniting said flow of fuel, said igniting means adapted to be mounted in promimity to said burner;
means for actuating said fuel supply valve, said valve actuating means being connected electrically in series with said igniting means; and
thermal switch means including electrical heater means and switching means actuated by said electrical heater means, said electrical heater means being connected electrically in series with said switching means and connected electrically in parallel with said igniting means, said switching means being connected electrically in parallel with said valve actuating means and operable to shunt said valve actuating means until a predetermined minimum voltage has been applied to said electrical heater means for a period of time sufficient to permit said electrical heater means to be heated to a steady state condition, said predetermined minimum voltage being of sufficient magnitude to heat said igniting means to the ignition temperature of said fuel during the time said electrical heater means is being heated to said steady state condition.



4,002,420
METHOD OF BURNING CALCINED AND UNCALCINED PULVEROUS RAW MATERIAL AND ROTARY KILN PLANT THEREFOR

Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed May 7, 1975, Ser. No. 575,407
Claims priority, application United Kingdom, May 10, 1974, 20839/74
Int. Cl.^{2} F27B *15/00*
U.S. Cl. 432—14 **49 Claims**

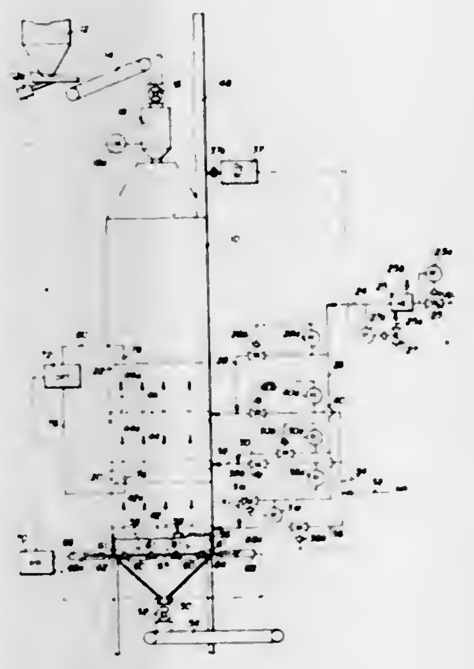


1. A method of heat treating pulverous raw material consisting entirely of or at least containing a portion of the time to produce at least a partial calcination thereof prior to passing the material down through an inclined rotary kiln for further heat treatment, the kiln having hot gases generated therein and communicating at its material inlet end portion with a multistage raw material preheating means and a calcination chamber through which the hot kiln gases are directed comprising:
a. introducing into at least one of the upper material inlet end portion and lower material outlet end portion of the kiln, an amount of fuel sufficient for preheating, at least partially calcining, and substantially completely burning the material, at least part of said fuel being introduced into the lower end portion of the kiln;
b. introducing into the lower end portion of the kiln an amount of oxygen-containing gas sufficient for substantial combustion of the fuel introduced into said kiln;
c. introducing pulverous raw material into the multistage preheating means;
d. preheating the raw material in said multistage preheating unit by contact with hot gases exiting from the kiln;
e. introducing the preheated material from the penultimate stage of the preheating means into the upper material inlet end portion of the kiln proper at a location and in a manner to cause substantially all of the material to be entrained by the hot kiln exit gases exiting from the upper inlet end portion of the kiln;
f. directing said hot kiln exit gases and entrained material from the upper material inlet end portion of the kiln into the calcination chamber communicating therewith and permitting said material to be at least partially calcined by the contact with said hot kiln exit gases;
g. directing the hot kiln exit gases and the at least partially calcined material entrained therein to the last stage of the preheating means;
h. separating the at least partially calcined material from said hot kiln exit gases in said last stage; and
i. re-introducing said separated material into the upper material inlet end portion of the kiln proper along a separate path and at a location downstream with respect to the material flow in the kiln, of the location of initial introduction of the preheated material into the kiln, and causing the material to pass through the kiln for further heat treatment while substantially avoiding entrainment by the hot kiln exit gases.

4,002,421
CONTROL OF VERTICAL HEAT TREATING VESSELS

James R. Summer, Blum, Tex., assignor to Round Rock Lime Company, Blum, Tex.

Division of Ser. No. 457,139, May 6, 1974, Pat. No. 3,884,621, which is a continuation-in-part of Ser. No. 383,484, July 30, 1973, Pat. No. 3,849,061. This application Mar. 7, 1975, Ser. No. 556,282
Int. Cl.^{2} F27D *7/00*; F27B *9/40*
U.S. Cl. 432—19 **15 Claims**



1. In a process for heat treating particulate material of nonuniform gradation in a vertical vessel wherein the particulate material is passed to the particulate inlet at the upper end of the vessel causing the material to gravitate at a constant rate through a heat treating zone in the vertical vessel wherein it is contacted with upwardly moving heat treating fluid and thereafter removed from the particulate outlet at the lower end of said vessel, the improvement comprising:
sensing a quality indicative of the bulk density of said particulate material passing through said heat treating zone and regulating the heat input carried by said heat treating fluid to said heat treating zone in response to variations in the measured quality indicative of the bulk density of said particulate material passing through said heat treating

zone to yield a product which has been heat treated equivalent to a charge of standard particles having a predetermined bulk density.

4,002,422
PACKED BED HEAT EXCHANGER

Robert Milton Escott, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed Sept. 22, 1975, Ser. No. 615,460

Int. Cl.² F27D *1/08, 1/12;* **F27B** *9/10*

U.S. Cl. 432—99 **7 Claims**

1. Apparatus for treating particulate material with hot gases comprising:

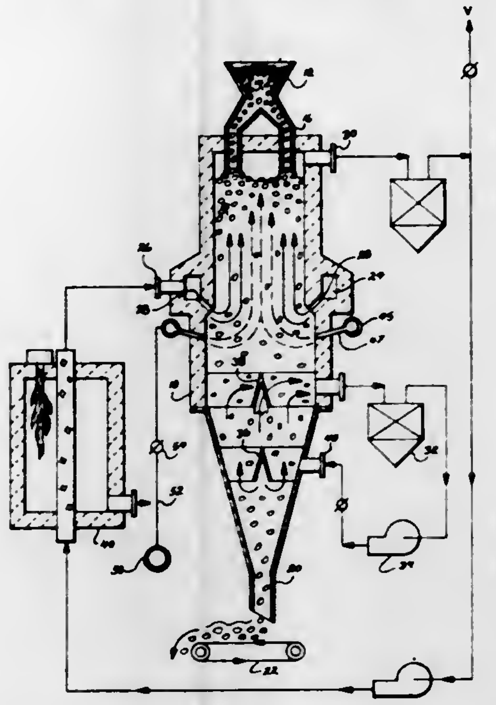
a. a substantially vertical shaft furnace;

b. means for introducing particulate material at one end of said shaft furnace to form a packed bed therein;

c. means for removing treated particulate material at the other end of said furnace, thereby setting up a gravitational flow of material therein;

d. means intermediate said material introduction means and said material removal means for introducing hot process gas to said bed of material;

e. means intermediate said hot gas introduction means and said material removal means for introducing cold process gas to said packed bed, and for moving said cold process gas inwardly through said packed bed, whereby a portion of the heat of said descending bed is transferred to said cold process gas, heating and upgrading said gas which then flows upwardly through the bed contributing to the process in the same manner as the hot process gas.



CHEMICAL

4,002,423
BENZOFURAN DERIVATIVES PROCESS FOR THEIR PREPARATION AND THEIR USE AS OPTICAL BRIGHTENERS

Wilfried Sahm, Kelkheim, Taunus; Erich Schinzel, Hofheim, Taunus, and Gunter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

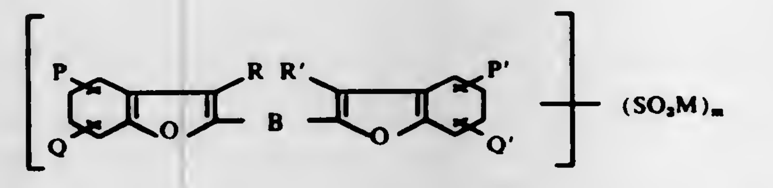
Division of Ser. No. 279,531, Aug. 10, 1972, Pat. No. 3,859,350. This application Oct. 11, 1974, Ser. No. 513,997

Claims priority, application Switzerland, Aug. 13, 1971, 11924/71

Int. Cl.² D01F *2/14, 2/16;* **D06L** *3/12*

U.S. Cl. 8—1 W **8 Claims**

1. A process for the optical brightening or acetyl cellulose, polyesters, polyolefins, polyvinyl chloride, polyvinylidene chloride, polyacrylonitrile, native or regenerated cellulose, wool or polyamide which comprises adding to said materials 0.01 to 2% by weight of a compound of the formula

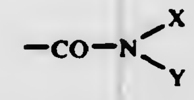


in which B' is a direct bond, vinylene or a bivalent radical being in conjugation with the adjacent double bonds of the furane nuclei selected from the group consisting of phenylene, biphenylene, terphenylene, styryl, biphenylylethylene, stilbylene, naphthylene, furanylene and thienylene;

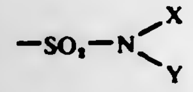
R and R' which are identical or different, are hydrogen, halogen, lower alkyl, phenyl, or SO_3M;

M is a colorless cation;

P, Q, P' and Q', which are identical or different, are hydrogen, halogen, lower alkyl, lower alkoxy, phenyl, COOM, SO_3M, lower carboalkoxy, sulfonic acid lower alkyl ester, cyano, or a group of the formulae



$$-CO-N\begin{matrix}X\\Y\end{matrix}$$



$$-SO_2-N\begin{matrix}X\\Y\end{matrix}$$

in which X and Y, which are identical or different, are hydrogen, or lower alkyl, or stand together with the nitrogen for piperidyl, morpholyl or piperazyl, and P and Q together or P' and Q' together are the same or different bivalent radicals selected from the group consisting of lower alkylene and an anellated benzene nucleus; and m is a number from 0 to 4.

4,002,424
SOLUTION OF ISOMER MIXTURE OF NAPHTHYLAZOPHENYLAZONAPHTHYL DISULFONATE DYE

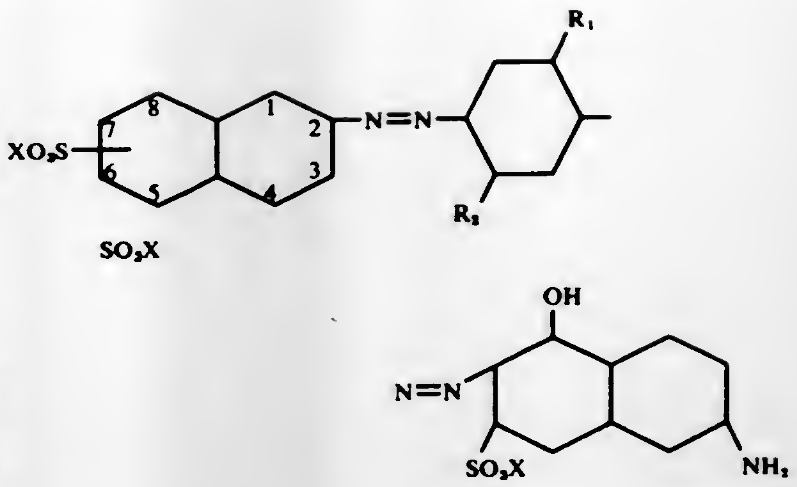
Sanford Byrom Smith, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 14, 1973, Ser. No. 369,816

Int. Cl.² C09B *31/02;* **D06P** *1/00, 1/615;* **D21H** *1/46*

U.S. Cl. 8—26 **7 Claims**

1. A dye solution consisting essentially of two or three mixed isomers, water, triethanolamine, a lithium base, and urea, wherein the mixed isomers are at least 10% by weight of the solution and have the formula



wherin the isomers differ from each other in the location of at least one of the two $-SO_3X$ substituents on the naphthyl radical, said substituents being located in at least two of the following three locations, the 4,8 positons, the 6,8 positions and the 5,7 positions, each of two of the isomers being present in the amount of at least 25% by weight of the mixed isomers, and

wherein R_1 and R_2 are independently H, or alkyl or alkoxy of 1 to 2 carbons, and X is a cation selected from the group consisting of Na^+, Li^+, K^+ and $(HOC_2H_4)_n$-N^+H_{4-n} where n is 2 or 3.

4,002,425
WATER-INSOLUBLE MONOAZO DYESTUFFS

Ernst Heinrich; Horst Kindler, both of Frankfurt am Main-Fechenheim, and Joachim Ribka, Offenbach (Main)-Burgel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

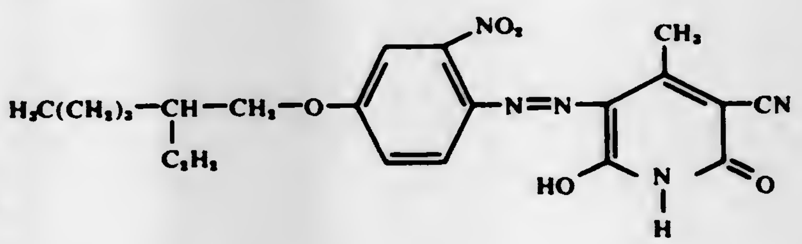
Division of Ser. No. 516,360, Oct. 21, 1974. This application July 18, 1975, Ser. No. 597,018

Claims priority, application Germany, Oct. 22, 1974, 2352858

Int. Cl.² C09B *27/00;* **D06P** *1/02, 3/12*

U.S. Cl. 8—41 C **3 Claims**

1. In the process of dyeing or printing a hydrophobic synthetic material, the improvement wherein the dyestuff is a water-insoluble monoazo dyestuff of the formula



4,002,426
PRODUCTION OF STABILIZED NON-BURNING ACRYLIC FIBERS AND FILMS

Edward Clarence Chenevey, North Plainfield, and Robert Michael Kimmel, Springfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 109,669, Jan. 25, 1971, abandoned. This application Mar. 5, 1974, Ser. No. 448,235

Int. Cl.² C01B *31/07*

U.S. Cl. 8—115.5 **18 Claims**

1. A process for the production of stabilized acrylic fibers and films which are capable of undergoing carbonization comprising:

a. providing a solution consisting essentially of (1) an acrylic polymer selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith wherein the pendant nitrile groups present in said acrylic polymer are uncyclized, (2) about 1 to 10 percent by weight based upon the weight of said acrylic polymer of a stabilization promoting agent selected from the group consisting of hydrochloric acid, phosphoric acid, nitric acid, methane sulfonic acid, an aromatic sulfonic acid, and a carboxylic acid having a pK_A value below about 4.5, and (3) a solvent for said acrylic polymer and said stabilization promoting agent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, dimethyl sulfoxide, butyrolactone, and N-methyl-2-pyrrolidinone, with said acrylic polymer being present in said solution in a concentration of about 10 to 25 percent by weight based upon the weight of said solvent, and with any heating utilized during the formation of said solution being insufficient to produce cyclization of said pendant nitrile groups of said acrylic polymer,

b. extruding said solution through a shaped orifice via solution spinning to form an acrylic fibrous material or film wherein the pendant nitrile groups present in said acrylic polymer remain uncyclized and have incorporated therein about 0.1 to 10 percent based upon the weight of said acrylic polymer of said stabilization promoting agent which was initially present in said solution of step (a), and

c. heating said acrylic fibrous material or film having about 0.1 to 10 percent based upon the weight of said acrylic polymer of said stabilization promoting agent which was initially present in said solution of step (a) incorporated therein in an oxygen-containing atmosphere at a temperature of about 200° to 350° C. until a thermally stabilized fibrous material or film is formed which is black in appearance, non-burning when subjected to an ordinary match flame and which is capable of undergoing carbonization.

4,002,427

PROCESS FOR THE MANUFACTURE OF DYED MULTICOMPONENT FILAMENTS

Hilmar Möller, and Joachim Wiegand, both of Hofheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 24, 1975, Ser. No. 589,864

Claims priority, application Germany, June 26, 1974, 2430626

Int. Cl.² D06B *5/16*

U.S. Cl. 8—155.1 **6 Claims**

1. A process for making crimped, dyed multicomponent filaments, consisting of at least two polyester components, which comprises combined spinning of said polyester components in side-by-side relationship or in eccentric sheath-core relationship, stretching and heating the spun filaments to develop the crimp, winding the spun crimped filaments at a Shore hardness of from 15° to 70° on a bobbin having a tube containing orifices, and dyeing the spun crimped filaments while wound on said bobbin without significant loss of crimp, wherein said dyed filaments are capable of further processing into textile fabric without rewinding.

4,002,428

DEDUCTIVE METHOD FOR MEASURING ION CONCENTRATION ELECTRICALLY

Carl L. Blanchard, Stone Mountain, Ga., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 21, 1976, Ser. No. 688,657

Int. Cl.² G01N *27/00, 31/02*

U.S. Cl. 23—230 R **8 Claims**

1. A method for measuring the concentration of a desired ion in a sample solution containing multiple ionic species without removing ions from solution comprising the steps of:

a. measuring the pH and specific conductivity of the sample solution and of a reagent solution;

b. adding and reacting a measured excess amount of said reagent solution of known constitution to a measured amount of sample solution wherein said reagent solution is capable of reacting with the desired ion to give a substantially non-ionic product without substantial reaction with other ions in solution;

c. measuring the pH and specific conductivity of the mixture obtained in step (b);

d. mathematically deducing the concentration of the desired ion by comparing the specific conductivity expected in a mixture of the sample solution and the reagent solution, assuming no reaction had taken place, with the measured specific conductivity for the solution obtained in (b) and by making any necessary corrections for pH changes and corrections for the solubility product of reaction between the desired ion and the reagent solution.

4,002,429

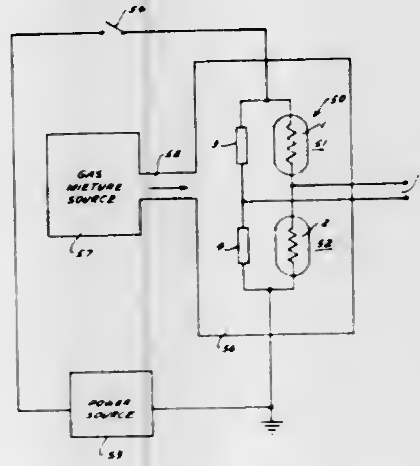
METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF COMBUSTIBLE COMPONENTS OF A GAS MIXTURE

Tomáš Bartovský, and Jiří Sládeček, both of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed May 13, 1974, Ser. No. 469,453

Int. Cl.² G01N *27/16*

U.S. Cl. 23—254 E **2 Claims**



1. For use with a catalytic electrical bridge wherein the burning of combustible components of a gas mixture in the catalytic portion of the bridge is effective to cause changes in the electrical balance of the bridge when the latter is electrically excited, an improved arrangement for efficiently measuring small concentrations of the combustible gas components in the gas mixture, which comprises:

means positioning the catalytic facilities of the bridge in a closed chamber;

means introducing the gas mixture into the closed chamber to be catalytically burned, thereby to induce changes of the output voltage of the bridge, when the latter is electrically excited in accordance with a characteristic that reaches equilibrium over a first interval following the commencement of excitation of the bridge when the concentration of combustible gas components in the mixture is zero;

means operative for exciting the bridge;

first and second capacitors;

switching means rendered effective at the conclusion of the first predetermined interval following the operation of the bridge exciting means and operable over a pescribed second interval for coupling the bridge output voltage to the input of the first capacitor;

an operational amplifier;

means for coupling the output of the first capacitor to the input of the operational amplifier; and

means for coupling the second capacitor between the output of the operational amplifier and the input thereof, whereby the voltage output of the operational amplifier during the prescribed second interval is indicative of the change of the bridge output voltage over the prescribed second interval.

4,002,430

EXTRACTION TUBE FOR POLYAMIDES

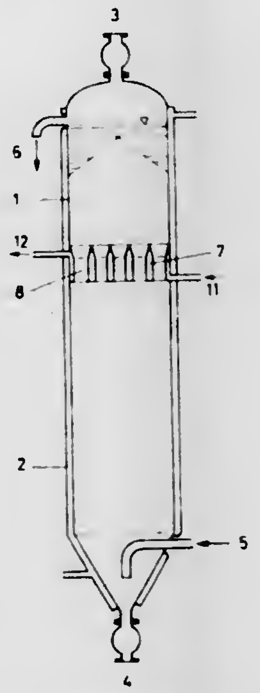
Werner Hoerauf; Ernst Guenther; Ernst Kissel; Guenter Valentin, all of Ludwigshafen, and Ernst Dietrich, Worms, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 27, 1975, Ser. No. 544,305

Claims priority, application Germany, Jan. 31, 1974, 2404510

Int. Cl.² B01D *11/02*

U.S. Cl. 23—270 R **3 Claims**



1. A tubular extraction apparatus for the continuous removal of low molecular weight components from polylactam granules by extraction with hot water using the countercurrent principle of operation, the water being fed upwardly and the granules downwardly, said apparatus comprising:

A. a vertically positioned, elongated extraction tube having inlet and outlet means for the granules and the water; and

B. at least one heat exchanger disposed laterally within the tube to divide the tube vertically into separate extraction zones with heating means in each heat exchanger to decrease the density of the water in a zone immediately above said heat exchanger in comparison to the density of the water immediately below the same heat exchanger, said at least one heat exchanger dividing the tube into an upper section extending above said at least one heat exchanger and a lower section extending below said at least one heat exchanger, the ratio of said sections to each other being from 50:50 to 85:15 by volume, excluding the volume of each heat exchanger and also excluding the free space above the level of granules in the tube, the smaller section being above the lowermost heat exchanger in the tube, each heat exchanger having a plurality of vertical ducts joined in a honeycomb pattern distributed over the entire cross-section of the tube for the uniform downward flow of granules with upper inlet surfaces leading into each duct on the upper side of said heat exchanger facing the stream of granules, said inlet surfaces being inclined to taper inwardly toward the vertical ducts at an angle β to the horizontal of from about 45° to about 83°, the vertical length of each heat exchanger being 1/20 to 1/7 of the total length of the extraction tube.

4,002,431

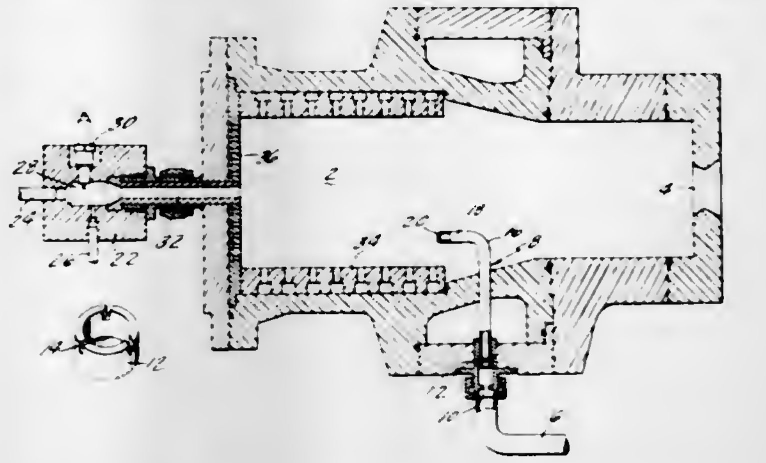
NITROUS OXIDE DECOMPOSITION REACTOR

George D. Lewis, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1975, Ser. No. 642,515

Int. Cl.² B01J *1/00, 7/00*

U.S. Cl. 23—284 **6 Claims**



1. Apparatus for decomposing liquid nitrous oxide including:

a chamber having a side wall and opposite ends and having a discharge opening at one end;

an igniter at the other end of the chamber;

an injector for nitrous oxide in the wall of the chamber, said injector including a tube with one end extending into the chamber, said one end of the tube having a nozzle thereon and being positioned to discharge nitrous oxide toward the igniter, swirl means to impart a swirl to the nitrous oxide entering the tube, and

an orifice upstream of the swirl means for dropping the pressure below the vapor pressure of the nitrous oxide to convert a part of the liquid to a gas.

4,002,432

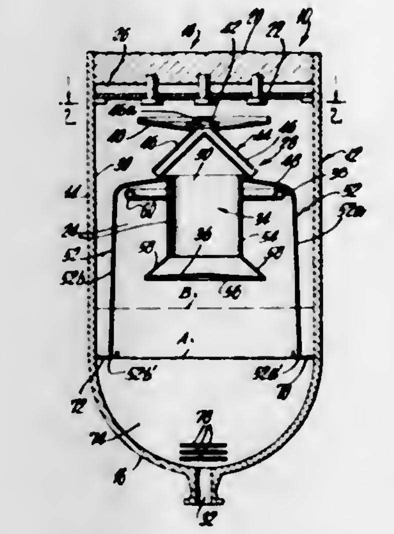
VAPOR-LIQUID SEPARATOR

John C. Brice, London, England, and Jose M. A. Peruyero, Morris Plains, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 25, 1975, Ser. No. 571,782

Int. Cl.² B01D *19/00;* **B01J** *8/02*

U.S. Cl. 23—284 **9 Claims**



1. A vapor-liquid separator comprising, in combination, a substantially vertically disposed housing having an inner periphery and including a vapor-liquid separation zone; vapor-liquid inlet means connected to said housing at one end

thereof for introducing vapor-liquid mixture downwardly into said separation zone; liquid collecting and diverting means disposed in said separation zone for receiving liquid from said vapor-liquid inlet means and directing said liquid downwardly about said inner periphery of said housing; liquid outlet means disposed at the opposite end of said housing; vapor collection means disposed in said separation zone below said liquid diverting means for receiving vapor from said vapor-liquid inlet means causing it to flow downwardly and spaced inward from the inner periphery of said housing and said liquid diverting means in the location where said liquid flows downwardly about said inner periphery; vapor diverting means disposed in said housing and operably connected for cooperation with said vapor collection means at the end thereof opposite from said liquid diverting means and spaced inward from the inner periphery of said housing for diverting the downwardly directed vapor flow in said vapor collection means in an upward direction externally of said vapor collection means; and vapor outlet means disposed in said separation zone externally of said vapor collection means and spaced upward from said vapor diverting means in the flow path of said upward flow of said vapor for receiving and expelling the vapor flow.

4,002,433
HEAT SHIELD FOR A CATALYTIC EMISSION CONTROL DEVICE

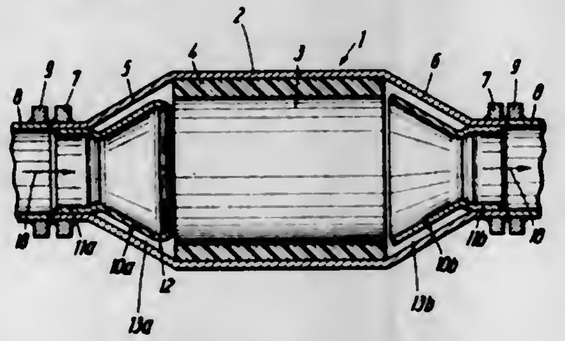
Polat Oser, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 452,704, March 19, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,293

Claims priority, application Germany, Mar. 23, 1973, 2314465

Int. Cl.^{2} B01J *8/02, 35/04;* **F01N** *3/15*

U.S. Cl. 23—288 FC **4 Claims**



1. In a device for catalytic purification of exhaust gas from an internal combustion engine including:

a. an annular housing having funnel shaped inlet and outlet means arranged at opposite ends thereof, said annular housing having an internal wall surface;
b. monolithic catalyst carrier means arranged within the housing, and
c. annular, elastic support means arranged between the carrier means and the housing, the carrier means being securely mounted in the housing exclusively by the support means which is stressed radially in compression by the housing to mount the carrier means, the inlet and outlet means being adapted to communicate with an exhaust gas line of the engine so that exhaust gas flows through the carrier means entering the exiting through different ends of the carrier means,

the improvement comprising heat shield means disposed within, coupled to and supported by the housing for shielding a portion of said internal wall surface of the housing against heat from exhaust gas flowing therethrough, the heat shield means including a funnel shaped shield member located within at least one of said inlet and outlet means adjacent an end of the carrier means with the larger funnel opening facing said end of the carrier means, without applying any supportive force thereto in the axial direction, at least a portion of the shield member being oriented substantially parallel to and spaced from a portion of said internal wall surface of the housing,

whereby the heat shield means retards thermal expansion of the housing from reducing the radial compression to the point where the carrier means is no longer securely mounted.

4,002,434
PROCESS FOR THE PRODUCTION OF ABRASION RESISTANT PERBORATE MONOHYDRATE

Edmund Simmersbach, late of Willaringen-Egg, Germany (by Ingeborg Simmersbach, heiress), and Artur Schaller, Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Feb. 17, 1972, Ser. No. 227,307

Claims priority, application Germany, Jan. 25, 1972, 2203285

Int. Cl.^{2} B01J *17/02*

U.S. Cl. 23—293 R **13 Claims**

1. A process for the production of abrasion resistant sodium perborate monohydrate comprising treating preformed sodium perborate monohydrate in a moistening unit by adding water in an amount of 5 to 30 weight % of the sodium perborate monohydrate at a temperature of 20°–90° C. and then drying the monohydrate at a temperature beginning at 40° C. and increasing to a maximum of 90° C.

4,002,435
CLEAR AND STABLE LIQUID FUEL COMPOSITIONS FOR INTERNAL COMBUSTION ENGINES

Edward C. Wenzel, 553 W. Shore Trail, and Henry W. Steinmann, 13 Heighwood Trail, both of Sparta, N.J. 07871

Continuation-in-part of Ser. No. 199,773, Nov. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 84,507, Oct. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 56,746, July 20, 1970, abandoned. This application June 30, 1975, Ser. No. 592,083

Int. Cl.^{2} C10L *1/32*

U.S. Cl. 44—51 **6 Claims**

1. A clear, liquid composition stable below the freezing point of water and suitable for use as a fuel in an internal combustion engine, which comprises:

a. a hydrocarbon fuel suitable for use in an internal combustion engine;
b. about 0.1% to about 10% water;
c. about 0.1% to about 20% of an alcohol which is completely soluble in water; and
d. a surface active amount of a combination of surface-active agents consisting of:
   i. a mixture of ammonium and sodium oleate;
   ii. an organic acid selected from the group consisting of oleic, linoleic, stearic acids, and mixtures thereof; and
   iii. an ethylene oxide condensation product.

4,002,436
POLYMER SOLUTION

Desmond Wilfrid John Osmond, Windsor; Norman Douglas Patrick Smith, and Frederick Andrew Waite, both of Farnham Common, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 79,701, Oct. 9, 1970, abandoned. This application Apr. 11, 1973, Ser. No. 349,942

Claims priority, application United Kingdom, Oct. 10, 1969, 49834/69

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.^{2} C10L *1/22*

U.S. Cl. 44—62 **5 Claims**

1. A liquid hydrocarbon jet aviation fuel of flash point at least 90° F suitable for use in gas turbine engined aircraft, and having a reduced tendency to particulate dissemination on being subjected to shock, the fuel containing dissolved therein 0.01 to 1% by weight of an addition polymer of ethylenically unsaturated monomer which is soluble in said hydrocarbon fuel of molecular weight greater than 10^6 (viscosity average) or of intrinsic viscosity greater than 2.5 dls./gm. in a concentration such that there is molecular overlap of the polymer molecules in the liquid but the viscosity is less than 1 poise at zero shear rate at ambient temperature, the dissolved polymer containing polar groups which form inter-molecular associative bonds arising from electrostatic attraction between polar and/or dipolar charges in the polar groups, the bonds being hydrogen or electrovalent bonds.

4,002,437
DIESEL FUEL COMPOSITION

Willy P. Broeckx, Reet, and Lothar G. Dulog, St. Martens-Latem, both of Belgium, assignors to S.A. Texaco Belgium N.V., Brussels, Belgium

Filed Feb. 27, 1975, Ser. No. 553,712

Int. Cl.^{2} C10L *1/18*

U.S. Cl. 44—66 **1 Claim**

1. A pollution free, anti-wear diesel fuel composition comprising a non-lubricating mixture of hydrocarbons boiling in the range from about 310° to 475° F. containing from about 0.01 to 0.05 weight percent of an additive mixture composed of (A) from 100 to 200 parts by weight of a polymeric acid selected from the group consisting of (1) dimeric acid produced by the condensation of unsaturated aliphatic monocarboxylic acids having between about 16 and about 18 carbon atoms per molecule (2) dimeric acid produced by the condensation of hydroxy-aliphatic monocarboxylic acids having between about 16 and about 18 carbon atoms per molecule, (3) trimeric acids produced by the condensation of unsaturated aliphatic monocarboxylic acids having between about 16 and about 18 carbon atoms per molecule and (4) trimeric acids produced by the condensation of hydroxy-aliphatic monocarboxylic acids having between about 16 and about 18 carbon atoms per molecule, (B) 50 to 150 parts by weight of a normally liquid completely or partially neutral amine salt of an oxo-alkyl acid ester or orthophosphoric acid in which salt esterifying oxo-alkyl group contains 13 to 16 carbon atoms and the amine is an aliphatic hydrocarbon mono-amine of 6 to 24 carbon atoms in which each aliphatic hydrocarbon radical is attached to the nitrogen through a saturated carbon atom, (C) from 5 to 15 parts by weight of an aliphatic ester demulsifier consisting of the alkoxylated product from the reaction of a monocarboxylic acid selected from the group consisting of palmitic acid and oleic acid and ethylene oxide or propylene oxide to a molecular weight ranging from 1000 to about 2000, and (D) an amount of saturated hydrocarbon solvent effective to provide a homogeneous solution of said additive mixture.

4,002,438
ORGANIC CONVERSION SYSTEM

Joseph Fleming, 15925 McDermitt St., Fountain Valley, Calif. 92708

Filed Jan. 22, 1975, Ser. No. 543,176

Int. Cl.^{2} C10J *3/48, 3/56*

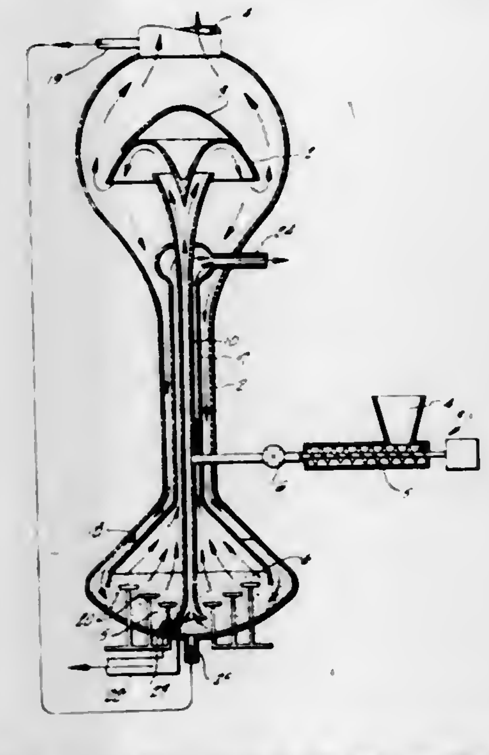
U.S. Cl. 48—76 **3 Claims**

1. Apparatus for the pyrolytic conversion of organic waste material into a fuel product comprising:

three generally vertically positioned substantially concentric conduits wherein the innermost conduit is open at both ends and forms a pyrolysis chamber, said pyrolysis chamber being provided with an organic waste material inlet means enabling the introduction of organic waste material into said innermost conduit from outside of said apparatus;

the middle conduit is open at the bottom end and forms a combustion chamber having oxygen inlet means positioned at the bottom thereof, said combustion chamber functioning to enable the regeneration of hard, dense, particulate matter by combustion and to enable heating of said pyrolysis chamber by channelling combustion gases through said combustion chamber along the outside of said pyrolysis chamber into a gas outlet chamber formed at the top end of said conduit closing off said top end said outlet chamber enabling the discharge of said combustion gases out of said apparatus, said innermost conduit extending through said gas outlet to open into the outermost conduit;

said outermost conduit closed at both ends to enclose said innermost and middle conduits and form a collecting chamber, said collecting chamber functioning to enable the recirculation of said hard, dense, particulate matter within said apparatus, said outermost conduit having a product outlet to enable removal of fuel product from said apparatus, and a char outlet at the bottom thereof to enable the removal of char from the apparatus;



an arcuate shaped static cyclone positioned over the top of said innermost conduit, said cyclone functioning to separate hard, dense, particulate matter exiting said innermost conduit from product gas exiting said innermost conduit;

a seal comprising a fluidized bed of said hard, dense, particulate matter and formed between said middle conduit and outermost conduit, said seal functioning to separate product gases from combustion gases.

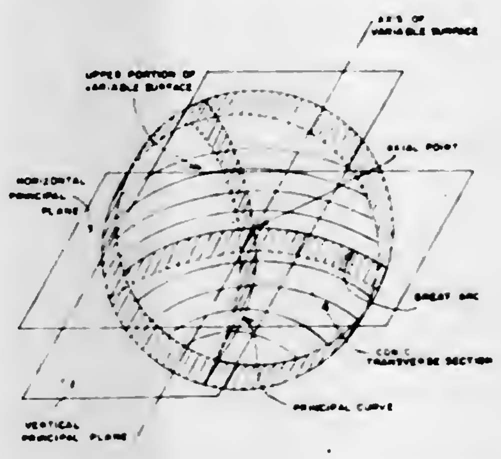
4,002,439
METHOD OF FORMING AN OPHTHALMIC LENS FOR PRESBYOPIA AND APHAKIA

David Volk, 2460 Fairmount Blvd., Cleveland, Ohio 44106

Division of Ser. No. 322,488, Jan. 10, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,519

Int. Cl.^{2} B24B *1/00, 13/04*

U.S. Cl. 51—284 **2 Claims**

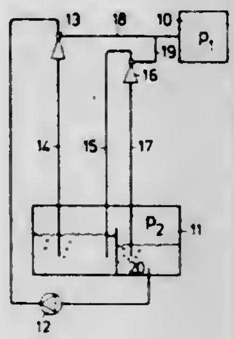


1. The method of forming a convex front surface portion of

variable curvature for use in the formation of spectacle lenses for correction of presbyopia and aphakia which surface is characterized by having a pair of orthogonal principal planes which intersect said front surface normally at all points, the first of said principal planes, generally horizontal, intersecting said front surface in a great arc, and the second of said principal planes, generally vertical, intersecting said front surface in a principal curve; comprising mounting a workpiece in a holder, causing an abrading tool to cut said workpiece symmetrically on opposite sides of said principal curve while following a path in a plane at right angles to said principal curve and to said second principal plane, and causing the abrading point of said tool to follow a conic pattern of eccentricity zero and greater than zero, after each cut causing movement of said workpiece with respect to said tool by a small increment along a predetermined substantially elliptical portion of said principal curve and keeping said principal curve in said second plane, repeating said cuts while causing said movement through successive increments to follow said predetermined elliptical curve in said second plane while varying the eccentricity and apical radius of curvature of said conic pattern progressively and regularly for successive cuts, said increments being so closely spaced that said workpiece has an almost smooth contour.

4,002,440
METHOD AND APPARATUS FOR OPERATING ON LIQUIDS AND GASES

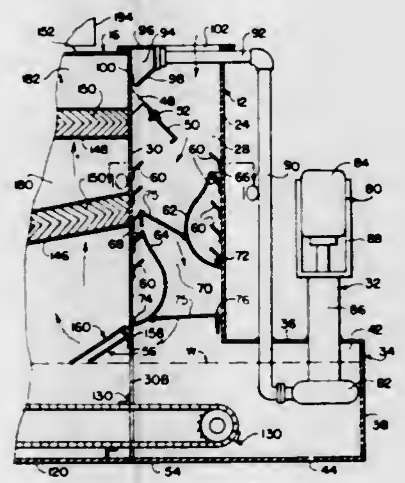
Risto Saari, Harjula, 2440 Luoma, Finland
Filed Oct. 29, 1974, Ser. No. 518,873
Claims priority, application Finland, Oct. 29, 1973, 3347/73
Int. Cl.^{2} B01D *47/06*
U.S. Cl. 55—25 **19 Claims**



1. In a method for operating on liquids and gases, the steps of providing for a liquid a flow path upwardly along the interior of a first tube from a first body of said liquid and downwardly along the interior of a second tube, which communicates with the first tube and which together with the first tube and a connection therebetween is closed off from the outer atmosphere, to a second body of said liquid, while maintaining a continuous flow of said liquid upwardly along the interior of said first tube, through said connection, and downwardly along the interior of said second tube, while subjecting the liquid, at a location of said flow path near to and including at said connection a transfer region where the liquid flows continuously from the first to the second tube, to the influence of at least one of two factors including a predetermined hydrostatic head and an increase in flow velocity, for reducing the liquid pressure at said location as compared to the liquid pressure at said bodies of said liquid, combining with the liquid at said location a gas to be conveyed with the liquid downwardly along the second tube, delivering the gas to the liquid at said location from a source where the gas is at a pressure at least as high as the pressure of the liquid at said location but less than the pressure of the liquid at said bodies of said liquid, so that the gas is pumped to the second body of said liquid where the gas has a higher pressure, providing for the liquid a second flow path, from one to the other of said bodies of liquid, substantially the same as said first-mentioned flow path, while subjecting the liquid at the said location of said second flow path to the influence of at least one of said factors, and delivering additional gas from said source to the liquid at said location of said second flow path, so that the pumping of the gas is carried out in a plurality of stages.

4,002,441
WASH SECTION FOR AIR-CLEANING DEVICE

Willard Lewis Johnson, 12923 Lincoln Ave., Huntington Woods, Mich. 48070
Filed Mar. 21, 1975, Ser. No. 560,614
Int. Cl.^{2} B01D *47/10*
U.S. Cl. 55—226 **18 Claims**



1. An improved wash section in air cleaning apparatus to remove solid particulate matter from a contaminated air stream introduced into the wash section,

said apparatus having, as respective portions thereof and communicating with said wash section,

first means for introducing said contaminated air stream into said wash section at a relatively high input velocity and second means for discharging a wash liquid into said wash section at a relatively low input velocity in comparison with the input velocity of said air stream and into the path of said air stream for intimate intermixing therewith,

the improvement comprising

a housing defining a wash section and having conjoined front, rear and lateral walls, an air stream input opening at the upper end of said housing and a discharge opening adjacent the lower end of said housing through one of said walls, said second means including wash liquid discharge means adjacent and below said air stream input opening, comprising

a wash liquid discharge chamber housing secured to one of said wash section housing walls and having a wash liquid discharge opening at its lower end so that said wash liquid is discharged downwardly therefrom and substantially in a gravitational direction, and a wash liquid baffle plate secured to said one wall adjacent and below said wash liquid discharge opening and extending partially across the cross-sectional area of said wash section housing to deflect wash liquid discharged thereonto into the path of said air stream,

said wash liquid discharge chamber housing, said wash liquid discharge opening and said wash liquid baffle plate extending substantially the entire width of said one wall,

said wash liquid discharge means providing a broad forceful stream of wash liquid in a wide torrent at a relatively low discharge output velocity adjacent and below said air stream input opening to create considerable turbulence with said air stream entering said wash section housing at a relatively high input velocity in the vicinity of and below said baffle plate,

and a pair of baffle members disposed and secured in venturi forming relationship on opposite facing walls of said wash section housing, somewhat below said wash liquid baffle plate and above said wash section housing discharge opening,

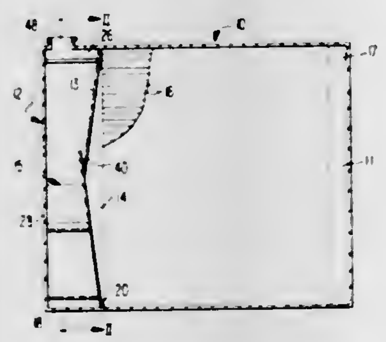
a turbulence chamber defined by said wash liquid baffle plate, said wash section housing walls and said venturi forming baffle members for intimate intermixing of said wash liquid and air stream to form a moisture-laden air stream,

means on said opposite facing walls for adjustably and removably securing said baffle members to said wash section housing walls in substantially opposing relationship to form a venturi passage between said baffle members of selectively adjustable and variable capacity,

whereby the turbulence of the moisture-laden air stream is substantially increased and more intimate intermixing of said wash liquid and said solid particulate matter is effected adjacent and in said venturi passage to form a volume of moisture covered solid particles in proportion to the measure of turbulence generated in said turbulence chamber and said venturi passage.

4,002,442
EQUALIZING TANK FOR THE VOLUME EQUALIZATION AND THE AIR SEPARATION OF A LIQUID HEAT CARRIER FLOWING THROUGH A CIRCULATORY SYSTEM

Josef Merz, Ostfildern, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed Apr. 22, 1975, Ser. No. 570,993
Int. Cl.^{2} B01D *46/42*
U.S. Cl. 55—309 **39 Claims**



37. Equalizing tank apparatus for volume equalization and air separation of a liquid heat carrier flowing through a circulating system, especially for a circulatory system for combustion engine cooling spaces and the like; said apparatus comprising:

tank housing means,

separation chamber means arranged in said housing means,

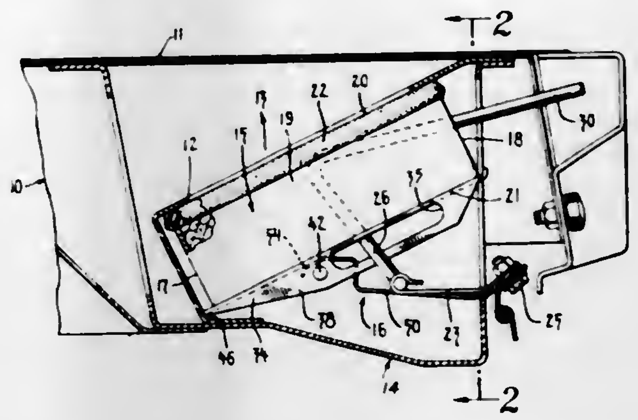
air chamber means arranged above said separation chamber means,

said separation chamber means being constructed and arranged to form liquid-air separating means and including a plurality of separate separation chambers, a first of said separation chambers including an inlet portion coupled with a separation flow entrance leading from the circulatory system and an outlet portion coupled directly with a second of said separation chambers, said outlet portion being constructed and arranged to permit passage therethrough of at least a substantial portion of the flow of liquid through said first of said separation chambers to said second of said separation chambers,

and separate vent connections leading from said air chamber means to each of said first and second separation chambers for accommodating escape of entrapped air from the liquid flowing through said first and second separation chambers to said air chamber means.

4,002,443
AIR FILTER CLAMPING MECHANISM FOR CAB

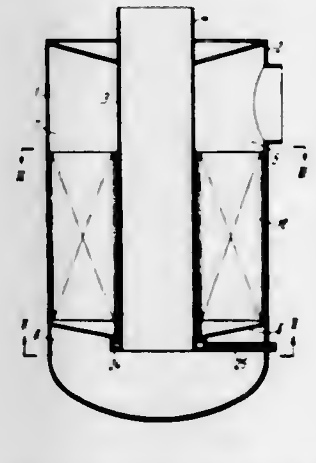
Leo J. Lorenz, Farmington, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed Mar. 31, 1975, Ser. No. 563,942
Int. Cl.^{2} B01D *46/00*
U.S. Cl. 55—357 **7 Claims**



1. An air filter installation including a filter housing, an air inlet aperture in the filter housing, a filter element covering the air inlet aperture in the filter housing and a clamping assembly for clamping the filter element in position in the filter housing, said clamping assembly including at least one blade spring with one end rigidly attached to the filter housing and a free end, at least one floating lever engagable with the filter element, a slot in the floating lever and a cranked rod rotatably attached to the free end of the blade spring and having a portion remote from said blade spring passing through said slot in the floating lever for biasing the floating lever toward the filter element and biasing the filter element toward the air inlet aperture.

4,002,444
VERTICAL SEPARATOR

Lev Nikolaevich Artemov, ulitsa Pravdy, 24a, kv. 44; Anatoly Fedorovich Bakanov, ulitsa Ordzhonikidze, 13, kv. 40; Anatoly Arkadievich Bilyavsky, ulitsa Entuziastov, 12, kv. 1; Vera Evdokimovna Gorodnitsyna, ulitsa Filippova, 4a, kv. 70, all of Podolsk; Evgenia Dmitrievna Elkina, ulitsa Lensoveta, 62, korpus 1, kv. 26, Leningrad; Valery Ivanovich Manaenkov, ulitsa Generala Ermolova, 4, kv. 5, Moscow; Ljudmila Nikolaevna Polyanskaya, ulitsa Mashinostroitelei 28 "b", kv. 58, Podolsk; Jury Leonidovich Sorokin, ulitsa Zapadnaya, 12, kv. 11, Leningrad; Anatoly Zakharovich Taran, ulitsa Entuziastov, 3, kv. 18, Pololsk, and Evgeny Alexeevich Fadeev, Sevanskaya ulitsa, 7, korpus. 1, kv. 64, Moscow, all of U.S.S.R.
Filed Apr. 2, 1975, Ser. No. 564,357
Int. Cl.^{2} B01D *45/04*
U.S. Cl. 55—413 **4 Claims**



1. A vertical separator for separating a liquid - gas medium, comprising: a cylindrical housing (1); a lateral inlet (2) for

admitting the medium; a gas-discharge pipe (3) axially mounted within said housing; a substantially axial annular space (5) being defined between the inner surface of said housing and the outer surface of said pipe; a partition wall (6) dividing said annular space crosswise into a first space (7) for the medium, closer to said inlet, and a second space (8) for the gas, farther away from said inlet, and communicating with the internal space of said pipe; openings (9) in said partition wall for passage of the gas; blocks (10) disposed substantially axially in said first space and radially outward of said gas discharge pipe for separating the medium into the liquid and the gas, each of said blocks having an extension in the radial direction of said housing and each including an inlet side wall and an outlet side wall, each said inlet side wall comprising guide vanes (12) for the preliminary separation of the medium, said louvers (13) between said inlet and outlet side walls for the final separation of the medium, said louvers being mounted relative to each other in such a manner as to define gas passages (14); each said outlet wall comprising a perforated plate (15) providing uniform loading of said louvers; and gas discharge means (11) for said blocks, accommodated in spaces between adjacent blocks and embracing said openings for the gas passage.

4,002,445

METHOD OF FORMING AND SIZING GLASS FIBERS

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 464,861, April 29, 1974, Pat. No. 3,932,193. This application Sept. 2, 1975, Ser. No. 609,252

Int. Cl.^{2} C03C *25/02*

U.S. Cl. 65—3 C **5 Claims**

4. A method of forming glass fibers which comprises drawing glass filaments from molten cones of glass at a high rate of speed; applying to the filaments during formation an aqueous glass fiber size comprising a starch, a lubricant, a textile softener, and a nonionic wetting agent, wherein the size contains 150 to 100 percent by weight of said nonionic wetting agents based on the weight of said lubricant and winding the strand on a rapidly rotating forming tube.

4,002,446

GLASS BEAD FORMING METHOD

Joseph J. Hammel, Pittsburgh, Pa., and Eugene J. Cone, Yorba Linda, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

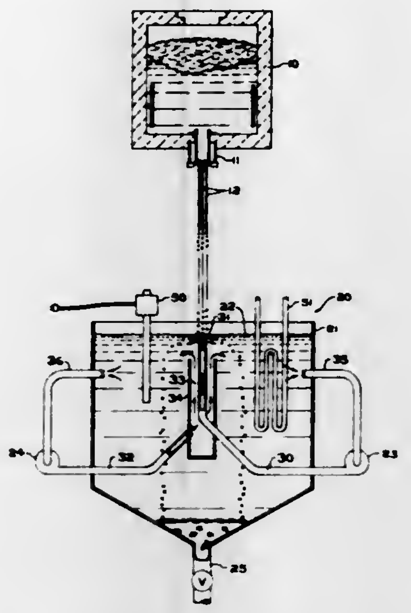
Filed Sept. 2, 1975, Ser. No. 609,631

Int. Cl.^{2} C03B *19/10*

U.S. Cl. 65—21 **5 Claims**

1. In the method of forming glass beads wherein a stream of molten glass is established which dissociates into falling droplets of molten glass, and said droplets are caught in a bath of quenching liquid before they have cooled to a temperature below their softening point, whereby the beads flatten upon impact with the liquid, the improvement comprising:

using as the quenching liquid a liquid whose viscosity is an inverse function of temperature, thermally controlling the viscosity of said liquid by extracting heat from the quenching bath with cooling means, and thereby modulating the viscosity of the liquid to maintain the rate of heat exchange from the beads to the liquid below a predetermined maximum rate so that the beads remain at a temperature above their softening point for a sufficient period of time after entering the quenching liquid to enable their assuming a substantially regular spherical shape.



4,002,447

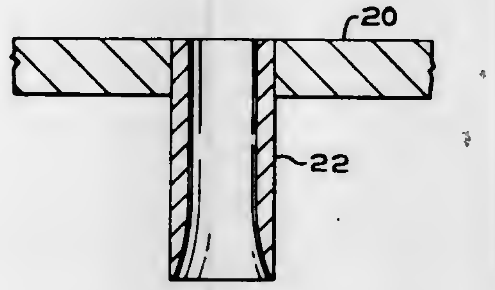
GLASS BEAD FORMING NOZZLES AND METHOD

Eugene J. Cone, Yorba Linda, Calif., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 2, 1975, Ser. No. 609,632

Int. Cl.^{2} C03B *19/10*

U.S. Cl. 65—21 **4 Claims**



1. A method for forming beads of glass of a predetermined cross sectional size and shape comprising:

establishing a flow of molten glass through an opening having a linearly extending first portion which is of uniform cross section and a second portion which is progressively larger in cross section, and

alternately flowing the molten glass through said opening at a first velocity sufficient to cause a jet of glass issuing from said opening to assume the cross section of said first portion and at a second velocity sufficient to cause a stream of glass to issue from the opening with the cross section of said second portion, wherein said jet dissociates into freely falling beads of a first predetermined size and said stream dissociates into freely falling beads of a second, larger predetermined size.

4,002,448

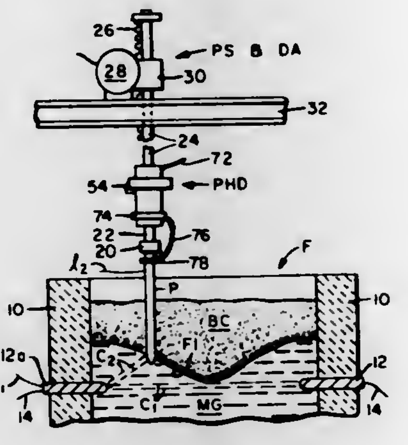
METHOD AND APPARATUS FOR DETERMINING THE ELEVATION OF THE FUSION INTERFACE IN AN ELECTRIC GLASS MELTING FURNACE

James L. Griffith, Painted Post, and Paul F. Spremulli, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,459

Int. Cl.^{2} C03B *5/24*

U.S. Cl. 65—29 **4 Claims**



1. In combination with an apparatus for indicating various elevations of a fusion interface between a batch cover and a bath of molten glass having electrical heating currents supplied thereto, including an electrical probe of rod form having a bottom tip for penetrating the batch cover; means for continuously driving the probe vertically downwardly into the batch cover; and means for detecting flow of electrical current from the probe, thus indicating when the probe has penetrated into the molten glass through the fusion interface, the improvement comprising pneumatic means for intermittently hammering the probe into the said batch cover simultaneously with the continuous driving thereof.

3. An improved method of determining the location of a portion of a fusion interface between a batch cover and molten glass within an electrically heated furnace of the type including the steps of, providing an electrical probe at a selected horizontal and vertical position relative to the batch cover; continuously vertically downwardly driving the probe, to thereby continuously push the probe downwardly into the batch cover; and detecting current flow from the probe to determine when the probe has penetrated the fusion interface, whereby the elevation of the fusion interface is ascertainable; from the vertical displacement of the probe from its initial selected vertical position; the improvement comprising; while continuously downwardly pushing the probe, simultaneously cyclically hammering the probe into the batch cover.

4,002,449

METHOD OF MELTING LASER GLASS COMPOSITIONS

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 21, 1975, Ser. No. 579,300

Int. Cl.^{2} C03B *5/22*

U.S. Cl. 65—32 **13 Claims**

1. A method of melting laser glass compositions that includes double melting steps, the method comprising the steps of:

I. melting the glass composition in a ceramic container in an oxidizing atmosphere in which the partial pressure of oxygen is greater than about 10^{-3} atmospheres for a time sufficient to oxidize the ingredients of the glass composition to a higher valence state; and

II. melting the resultant melt of Step I in a platinum container containing at least about 50% by weight of platinum in a reducing atmosphere in a buffered gas mixture of the group consisting of CO/CO_2, H_2/H_2O, CO_2/NH_2, CO_2/H_2, H_2O/NH_3 and H_2O/CO and mixtures thereof in which the partial pressure of oxygen is less than about 10^{-3} atmospheres for a time sufficient to obtain homogenization of the glass with stirring and still have the ingredients of the glass composition in an oxidized state to thereby produce a laser article substantially free from detrimental lower valence state ingredients, such as Fe^{++}, and a minimum of platinum inclusions in the glass.

4,002,450

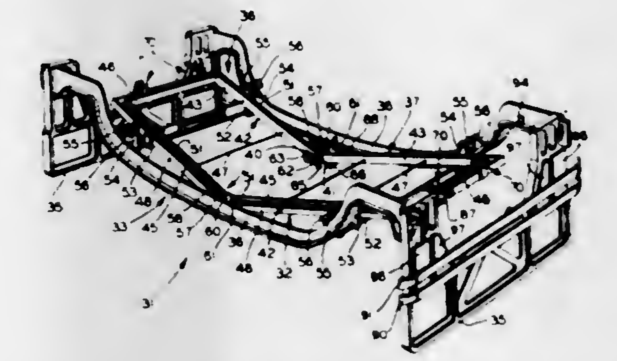
METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS TO RELATIVELY SHARP ANGLES

Harold E. Hamilton, Toledo; Paul V. Pastorek, Rossford; Floyd T. Hagedorn, Oregon, and Robert G. Revells, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Mar. 14, 1975, Ser. No. 558,288

Int. Cl.^{2} C03B *23/02*

U.S. Cl. 65—107 **21 Claims**



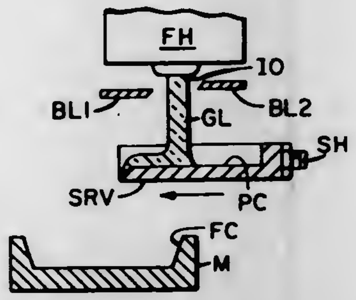
1. A method of bending a glass sheet to a relatively sharp angle comprising: applying a first electrically conducting path to at least one surface of the glass sheet along the line about which it is desired to bend the sheet, applying a second electrically conducting path to said surface extending from the opposite end of said path in opposite directions along first opposite marginal edge portions and then along angularly related second opposite marginal edge portions and terminating at ends therealong disposed inwardly of said first opposite marginal edge portions of said glass, introducing an electrical current into said second electrically conducting path along said second opposite marginal edge portions whereat the least amount of glass displacement occurs during the subsequent bending operation, said current being transmitted along said first opposite marginal edge portions to said first electrically conducting path to heat the sheet in the area immediately adjacent said first path to a temperature above the bending point of the glass, and causing said sheet to bend sharply along said first electrically conducting path.

5. Apparatus for bending a glass sheet to a relatively sharp angle comprising: a frame, an outline type bending mold supported on said frame and having a substantially continuous shaping surface formed thereon and conforming to the margin of the glass sheet to be bent, electrically conducting means mounted on said frame and including oppositely disposed electrical contacts mounted on the mold in spaced relation to said shaping surface and engageable with the opposite marginal edge portions of the glass sheet supported on said mold, means maintaining said contacts in engagement with said glass sheet marginal edge portions upon movement of said glass sheet during the bending thereof, and means coupling said electrical conducting means to a source of electrical energy.

4,002,451
GLASS GOB HANDLING

Warren R. Knapp, Addison, and Richard L. West, Sr., Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,748
Int. Cl.² C03B *5/34*
U.S. Cl. 65—127 **8 Claims**



1. The method of receiving a gob of a relatively viscous molten glass issuing from the outlet orifice of a forehearth and preforming such gob into a relatively elongate mold charge and then delivering such charge to the forming cavity of a forming mold with the virgin surface of the charge facing downwardly in such cavity, such method comprising;

A. longitudinally and slowly moving a serving cup having an elongate cavity beneath said outlet orifice so that said gob as it issues such orifice is spread along a substantial part of the length of the cavity of the serving cup to form said elongate mold charge;

B. severing said glass gob with a pair of molten glass shears before the mold charge is spread along the entire length of the cavity of the severing cup, the lower blade of said glass shears during the severing operation also striking the severed end of the glass gob to cause such end to be moved in a direction to fill the remainder of the length of the cavity of the severing cup during continuation of said movement thereof; and

rapidly inverting said serving cup over the forming cavity of said forming mold at a speed sufficient to deliver said mold charge to the forming cavity by gravity with the virgin side of such mold facing downwardly in such cavity.

4. Apparatus for performing into an elongate mold charge a gob of molten glass issued from the outlet orifice of a forehearth and delivering the preformed mold charge to the forming cavity of a forming mold located below but offset from said orifice, such delivery being performed with the virgin side of the mold charge facing downward in said forming cavity, such apparatus comprising, in combination;

A. a support plate horizontally disposed below and adjacent to said outlet orifice;

B. a shaft rotatably and longitudinally slidably supported adjacent the upper surface of said support plate,

C. a longitudinal serving cup embodying an elongate cavity having an initial end disposed beneath said outlet orifice with one end of such cup affixed to a first end of said shaft,

D. first motor means coupled with the second end of said shaft for longitudinal movement of such shaft and thereby of said serving cup,

E. second motor means connected with said shaft for rotation thereof and thereby inversion of said serving cup,

F. a pair of molten glass shears between said outlet orifice and said cavity of said serving cup, and

G. control means actuated in synchronism with the issuance of a gob of molten glass from said outlet orifice for:

I. energizing said first motor means in a first mode to slowly longitudinally move said serving cup and thereby said cavity therein beneath said outlet orifice to thereby receive said gob as it issues from said orifice and spread the gob along the length of said cavity to form said preformed mold charge;

II. actuating said shears to shear said gob from the parent stream of molten glass issued from said orifice, the lower blade of such shears striking the severed end of the gob to move such end in the direction opposite to the direction of movement of said serving cup during slight continuation of such movement;

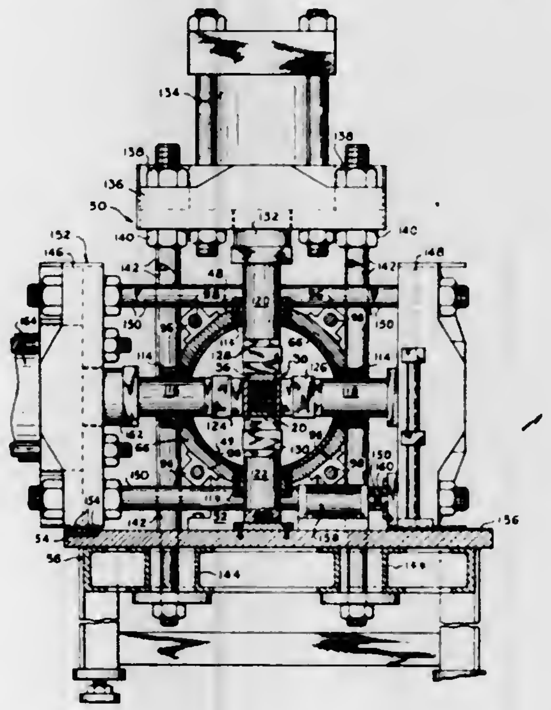
III. energizing said second motor means in a first mode to rapidly rotate said shaft and thereby invert said serving cup to deliver the preformed mold charge to said cavity of said forming mold with the virgin side of such mold charge facing downwardly in such cavity; and

IV. energizing each of said first and second motor means in a second mode to return said severing cup and said cavity therein to said initial position thereof and reinverting such cup in preparation for preforming another gob into an elongate mold charge and for delivering such other mold charge to the forming cavity of a forming mold.

4,002,452
APPARATUS FOR MAKING FUSED FIBER ENERGY-CONDUCTING DEVICES

Ethan C. Hopkins, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 604,455, Dec. 23, 1966. This application May 23, 1968, Ser. No. 797,287
Int. Cl.² C03B *23/20*
U.S. Cl. 65—152 **6 Claims**

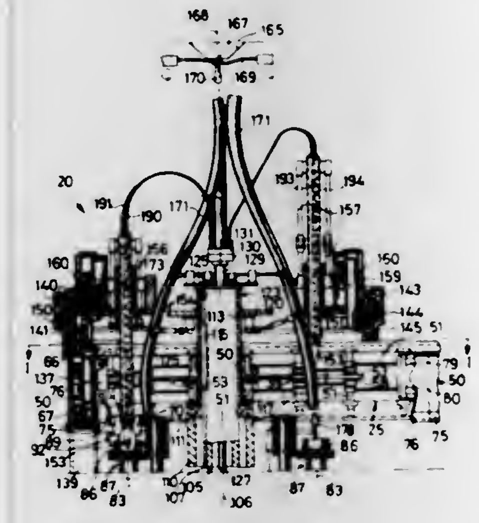


1. Apparatus for making permanently vacuum tight fused bundles of glass fibers comprising a base, a furnace fixed to said base, a stand within said furnace including a first heating block adapted to receive a bundle of fibers thereupon, a rectangular die insertable longitudinally into and removable from said furnace for supporting therewithin said bundle of fibers on said first heating block, said die including a platen movable thereinto against a side of said bundle, a second heating block arranged to engage said platen, third and fourth heating blocks arranged to engage respective opposite sides of said die and fifth and sixth heating blocks arranged to engage opposite ends of said die, a system of longitudinally movable plungers extending through the top, opposite sides and ends of said furnace to which said second through sixth heating blocks are affixed, fluid operated high pressure cylinder means operatively interconnected to said plungers for moving the same and the heating blocks respectively affixed thereto toward said die, said cylinder means being disposed externally of said furnace, a system of rods of high tensile strength supporting said cylinders whereby, when said cylinders are actuated to move said heating blocks toward and compressively against said die, forces inherently reacting equally and oppositely to those applied to said die are absorbed tensilely in said system of rods independently of and without affect upon the structure of said furnace.

4,002,453
ARRANGEMENT FOR FEEDING GOBS OF PLASTICIZABLE MATERIAL IN MOLDS OF A MACHINE FOR THE PRODUCTION OF BOTTLES OR THE LIKE

Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Continuation-in-part of Ser. No. 197,076, Nov. 9, 1971, Pat. No. 3,803,877, which is a division of Ser. No. 716,196, March 26, 1968, Pat. No. 3,622,305. This application Oct. 10, 1973, Ser. No. 405,047
Claims priority, application Germany, Apr. 1, 1967, 62338
Int. Cl.² C03G *5/30*
U.S. Cl. 65—207 **14 Claims**

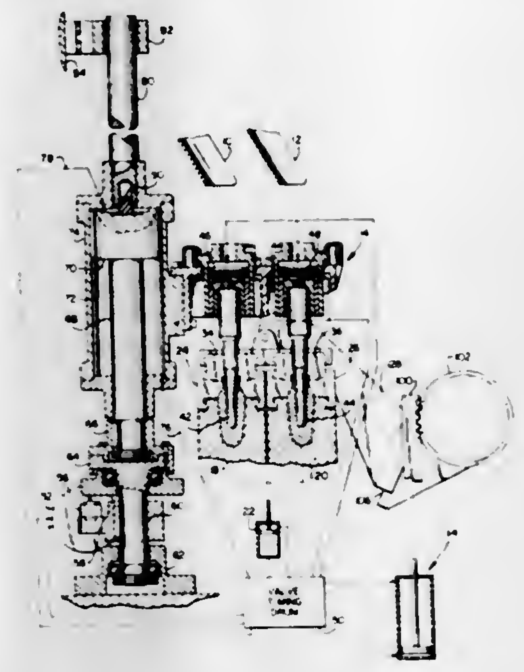


1. In a machine for the production of bottles and similar hollow articles from plasticizable material, a combination comprising means rotatable about a substantially vertical axis; a plurality of molds carried by said rotatable means radially spaced from said axis and circumferentially spaced from each other, each of said molds having a vertical axis, a plunger for each mold carried by said rotatable means reciprocable along the axis of the respective mold between an active position in which a lower end portion of the plunger extends into the respective mold and an upwardly withdrawn inactive position; means located at a higher elevation than said molds and having a vertically downwardly extending outlet for successively supplying gobs of plasticizable material; and means for feeding such gobs seriatim from said gob supplying means into said molds during movement of the latter with said rotatable means, said feeding means comprising a plurality of continuous feed channels, one for each mold, and each having an upper and a lower end, and support means for each of said feed channels carried by said same rotatable means for movement therewith about said vertical axis and connected to the respective feed channel for periodically aligning the upper end of the respective feed channel with said outlet end of said gob supplying means for receiving a gob from the latter and for periodically aligning the lower end of the feed channel with the respective mold for feeding the received gob into said mold while the plunger coordinated with said mold is in said upwardly withdrawn inactive position.

4,002,454
GLASSWARE FORMING MACHINE OF THE I. S. TYPE FOR UPRIGHT PRESS AND BLOW PROCESS

George E. Rowe, deceased, late of Wethersfield, Conn., by Selma S. Rowe, executrix, assignor to Emhart Industries, **Inc., Hartford, Conn.**

Division of Ser. No. 545,777, Jan. 31, 1975. This application Nov. 26, 1975, Ser. No. 635,666
Int. Cl.² C03B *9/00, 11/00, 11/06*
U.S. Cl. 65—229 **5 Claims**



1. In a glassware forming machine having a blank mold station, the improvement comprising:

a. structure defining at least two blank mold cavities for receiving gobs of glass dropped downwardly therein,

b. partible neck ring mold structures including neck ring molds mating with said blank mold cavity defining structure at the blank station,

c. parison forming plungers for insertion downwardly into said blank mold cavities,

d. support means for said plungers including a vertically oriented fluid motor with a vertically movable part,

e. a plunger supporting arm carried by said movable fluid motor part,

f. individual fluid motor means associated with each plunger, each individual fluid motor means having a first part mounted in said supporting arm and a second part movable with respect to the first and connected to an associated plunger, and

g. means for moving said plunger supporting arm horizontally between an active position wherein said plungers are located above the blank mold cavities and an inactive position to one side thereof to permit said gobs to be so dropped into the blank mold cavities.

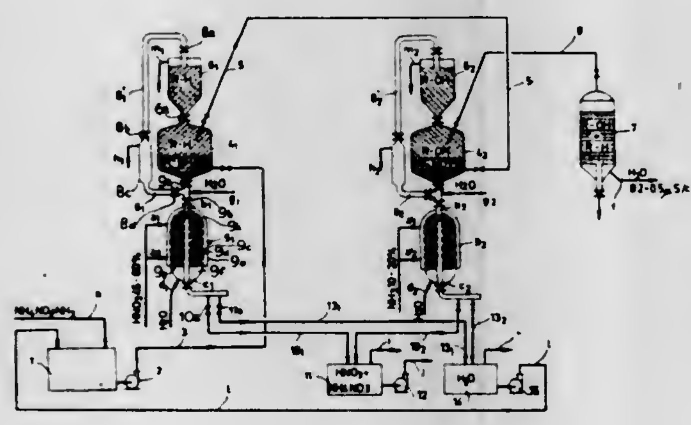
4,002,455
PROCESS FOR TREATING AND RECOVERING WASTE WATER FROM THE FERTILIZER MANUFACTURE

Nicolae Mihai Arion, Bucharest, Romania, assignor to Institutul de Proiectari Pentru Industria Chimica Anorganica si a Ingrasamintelor, Bucharest, Romania

Continuation of Ser. No. 474,020, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 313,091, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 80,019, Oct. 12, 1970, abandoned. This application July 23, 1975, Ser. No. 598,361
Int. Cl.² B01D *15/06*
U.S. Cl. 71—1 **4 Claims**

1. A continuous process for treating and recovering an ion containing waste water from the manufacture of fertilizers with nitrogen and others, with ion exchange resins, by portions, comprising

1. ascendent flowing a stream of said waste water through a first fixing zone of a cation exchange unit, of a loop system, containing therein a compacted bed of strongly acidic cation exchange resin, of styrene-divinyl-benzene type, with high cross-linking degree, having 16–20% divinyl-benzene, sulphonated at 100° C, in beads, macroporous, whereby the stream of waste water with cations, flowing through said first zone of said cation exchange unit, contacts said cation exchange resin and exchanges the cations in the stream of waste water for the hydrogen ions of the cation exchange resin;
2. withdrawing a decationized waste water stream from said first zone of said cation exchange unit;
3. hydraulically passing said cation exchange resin, loaded with cations at step (1), into a second zone of said cation exchange unit, discharging the waste water and removing any non-discharged waste water remainder between the compacted beads of said exchange resin, with a flow of inert gas;
4. contacting the cation exchange resin, loaded with cations and with the transport waste water removed from its interstices at step (3), with a strongly concentrated nitric acid of 45 to 60%, by weight, used in great excess, as regenerant, to regenerate said cation exchange resin, under the conditions of maintaining the resin temperature at the interface of the regenerant acid/resin bead at a maximum of about 20° C, by suitably correlating the values of the regeneration parameters, i.e. the regenerant temperature of 0°–15° C, the regenerant volume of 10–30 times the resin bulk volume, the circulating bulk velocity of the regenerant of 10–50 m/h, and the thickness of the resin bed of a maximum of 0.600 m;



5. withdrawing an effluent strongly concentrated in nitric acid and with the eluated cation salts from the regeneration of said exchange resin, at step (4), from said cation exchange unit;
6. removing any remainder of said strongly concentrated effluent, from step (5), which has remained non-discharged in the interstices between the beads of said exchange resin, with a flow of inert gas;
7. rinsing the regenerated cation exchange resin from step (6) with cooled rinsing water;
8. hydraulically passing said cation exchange resin, rinsed at step (7), into a third loosening zone of said cation exchange unit, wherein fine resin particles, which have resulted in steps (1)–(7) are eliminated, in an ascendent water flow, said fine particles being eliminated by overflowing, drawn out by the loosening water;
9. hydraulically passing said cation exchange resin, loosened by water at step (8), into a fourth feeding zone of said cation exchange unit, wherein the transport water is then removed by overflowing, while the resin is compacted;
10. hydraulically passing said cation exchange resin, compacted at step (9), from the feeding zone, into the first cation fixing zone of said cation exchange unit, at step (1), and discharging therefrom the hydraulic transport water;
11. and repeating the same cycle of steps (1)-(10), in said cation exchange unit, as long as desired;
12. ascendent flowing the stream of waste water, decationized in step (1) and withdrawn in step (2), through a first fixing zone of an anion exchange unit, of a loop system, containing therein a compacted bed of middle basic anion exchange resin, of polyacrylic type, in beads, macroporous, whereby the stream of decationized waste water with anions, flowing through said first zone of said anion exchange unit, contacts said anion exchange resin and exchanges the anions in the stream of decationized waste water for the hydroxyl ions of an anion exchange resin;
13. withdrawing a stream of demineralized water from said first zone of said anion exchange unit;
14. hydraulically passing said anion exchange resin, loaded with anions at step (12), into a second zone of said anion exchange unit, discharging the demineralized water and removing any non-discharged dimineralized water remainder between the compacted beads of said anion exchange resin, with a flow of inert gas;
15. contacting the anion exchange resin, loaded with anions and with the water removed from its interstices at step (14), with strongly concentrated ammonia solution of 18 to 25%, by weight, used in small excess, as regenerant, to regenerate said anion exchange resin;
16. withdrawing an effluent, concentrated in the eluated anion salts, also containing the small ammonia excess, from the regeneration of said exchange resin at step (15), from said anion exchange unit;
17. removing any remainder of said effluent concentrated in eluated salts, from step (16), which has remained non-discharged in the interstices between the beads of said exchange resin, with a flow of inert gas;
18. rinsing the regenerated anion exchange resin from step (17) with rinsing water;
19. hydraulically passing said anion exchange resin, rinsed at step (18), into a third loosening zone of said anion exchange unit, wherein fine resin particles which have resulted in steps (12)–(19), are eliminated, in an ascendent water flow, said fine particles being eliminated by overflowing, drawn out by the loosening water;
20. hydraulically passing said anion exchange resin, loosened by water at step (19), into a fourth feeding zone of said anion exchange unit, wherein the transport water is removed then by overflowing, while the resin is compacted;
21. hydraulically passing said anion exchange resin, compacted at step (20), from the fourth feeding zone into the first anion fixing zone of said anion exchange unit, at step (12), and discharging therefrom the hydraulic transport water;
22. and repeating the same cycle of steps (12)–(21) in said anion exchange unit, as long as desired;
23. mixing said effluent strongly concentrated in nitric acid and with the eluated cation salts, from step (5), with said effluent concentrated in the eluated anion salts, from step (16), and directly introducing the resulting mixed effluent at a suitable stage in the manufacture process of fertilizers with nitrogen and others, wherein there are directly reclaimed both the excess acid and the contained salts; and
24. circulating the demineralized water flow, from step (13), through ion exchange resins, in a mixed bed, to remove any escaped cations and anions, and utilizing the effluent as highly demineralized water.

4,002,456

PLANT-GROWTH PROMOTING AGENT WHICH IS PROVIDED WITH TRACE ELEMENTS AND WHICH IS SUITED FOR USE IN ULTRA-LOW-VOLUME APPLICATIONS

Willem Maas, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,970

Claims priority, application Netherlands, Mar. 8, 1974, 7403129

Int. Cl.² C05G *3/00*

U.S. Cl. 71—3 **8 Claims**

1. A plant growth promoting composition particularly adapted for use in U.L.V. applications, said composition comprising a solution in a solvent comprising N-methylpyrrolidene of 5–40 g per 100 ml of at least 1 micronutrient selected from the group consisting of the chlorides of the trace elements and boric acid and 1–15 g per 100 ml of a nitrogen source selected from the group consisting of acetamide and formamide.

4,002,457

SOIL CONDITIONERS AND FERTILIZERS FROM SPENT SULFITE LIQUOR

Karl David Sears, and Franklin Willard Herrick, both of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 498,753, Aug. 19, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,399

Int. Cl.² C05F *7/02*

U.S. Cl. 71—25 **10 Claims**

1. A process for preparing a nitrogen containing water insoluble product useful as a soil conditioner comprising the following two sequential steps:

said first step consisting essentially of heating acidic spent sulfite liquor in the open atmosphere at a temperature of from 170° to 260° C. to form a partially pyrolyzed water insoluble material, and

said second step consisting essentially of reacting ammonia with said water insoluble material at a temperature of from 170° to 260° C. to produce a water insoluble product containing substantial amounts of organic combined nitrogen.

4,002,458

CONTROLLED RELEASE CAPSULES

David A. Hofacker, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 196,807, Nov. 8, 1971, which is a continuation-in-part of Ser. No. 823,164, May 8, 1969, abandoned. This application July 30, 1975, Ser. No. 600,314

Int. Cl.² C05G *1/00, 3/02*

U.S. Cl. 71—27 **14 Claims**

1. A capsule comprising a liquid fill and a microporous capsule wall, said microporous capsule wall comprising a dispersed solid phase comprising a first material and a continuous solid phase comprising a second material, said first and second materials being miscible and capable of forming a single phase when both of said materials are in a liquid state, but being capable of forming separate phases upon being cooled to a solid state, the volume contraction ratio being at least about 1.2, said first material being present in a quantiy sufficient to provide micropores which extend completely through said capsule wall, said liquid fill comprising an active ingredient selected from the group consisting of pesticides and fertilizers.

4,002,459

GERMINATION FACTORS

Alan W. Johnson, and Gerald Rosebery, both of Brighton, England, assignors to International Development Research Center, Ottawa, Canada

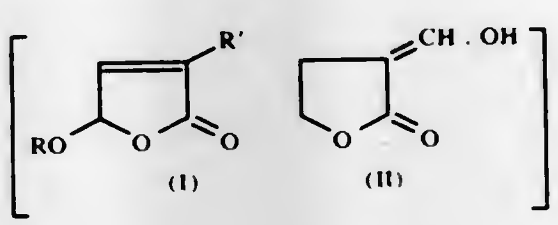
Filed Apr. 8, 1975, Ser. No. 566,098

Claims priority, application United Kingdom, Apr. 18, 1974, 16990/74

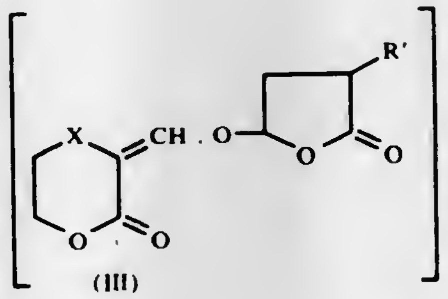
Int. Cl.² C07D *407/12*

U.S. Cl. 71—88 **18 Claims**

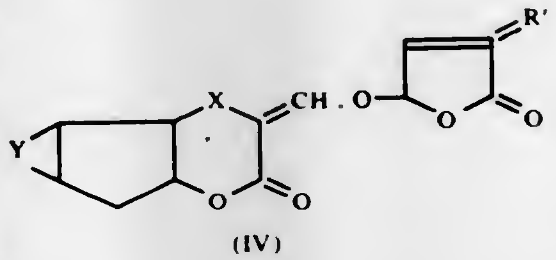
1. A method for the control of at least one of the parasitic weeds, *Striga hermonthica*, *S. asiatica* (lutea); *Orobanche crenata*, *O. ramosa* and *O. aegyptiaca*, which comprises contacting dormant seeds thereof, in the absence of an actively growing host plant, with a compound corresponding to the formula:



(I) (II)



(III)



(IV)

wherein R′ is H or C_1 to C_5 alkyl, X represents a single bond or a $-CH_2-$ linkage, and Y represents two hydrogen atoms, and additional bond or an epoxy group.

4,002,460

TRIAZINE-ANTIDOTE COMPOSITIONS AND METHODS OF USE FOR COTTON

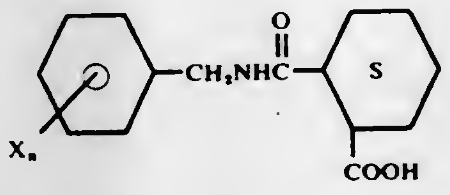
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 450,949, March 13, 1974. This application Apr. 10, 1975, Ser. No. 566,652

Int. Cl.² A01N *9/22*

U.S. Cl. 71—93 **7 Claims**

1. An herbicide composition comprising a mixture of an effective amount of a triazine herbicide and an antidotally effective amount of an antidote compound therefor corresponding to the formula



in which X is fluorine, chlorine, bromine or trifluoromethyl, and *n* is an integer from 1 to 3, inclusive, wherein said antidote compound is present in an amount ranging between about

0.01 to about 15 parts by weight for each part by weight of triazine herbicide.

4,002,461
SUBSTITUTED 2-AZABICYCLOALKANES AS SELECTIVE HERBICIDES

Elmar Sturm, Aesch, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

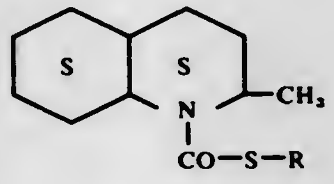
Division of Ser. No. 417,303, Nov. 19, 1973, Pat. No. 3,936,458, which is a continuation-in-part of Ser. No. 52,986, July 7, 1970, abandoned. This application Nov. 7, 1975, Ser. No. 630,057

Claims priority, application Switzerland, July 16, 1969, 10833/69; June 11, 1970, 8773/70

Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 **6 Claims**

1. A selective herbicidal composition which comprises a herbicidally effective amount of a compound of the formula



wherein R is ethyl, n-propyl or isopropyl, together with an agriculturally acceptable carrier therefor.

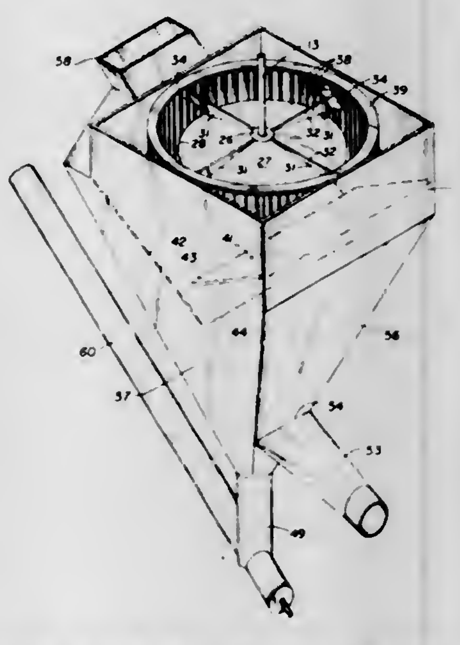
4,002,462
ORE BENEFICIATION METHOD AND APPARATUS

Chesford M. Maddox, Box 213, Clifton, Colo. 81520

Filed Dec. 31, 1974, Ser. No. 537,739

Int. Cl.² C22B *1/00*

U.S. Cl. 75—1 R **14 Claims**



1. A method for the beneficiation of sedimentary type ores wherein the gangue materials have a characteristic grain size that is larger than the particle size for values constituents of the ore and harder than said values constituents comprising crushing and sizing the total ore charge until all materials are of a size corresponding to the largest particle grain size for said gangue materials, further reducing the size of the largest particles of the charge in an impact-abrasion zone by introducing forces assuring impacting contact between the charged ore particles and reaction elements in said zone, introducing an initial fluid flow directed through said impact-abrasion zone to carry the materials and fluid away from said zone, interposing guide elements at positions away from said zone in the directed flow path from said zone to intercept and divert said materials and initial fluid whereby the materials are spread and distributed as they pass said guide element to provide a curtain type flow pattern moving away from said guide elements in a primary direction, and subsequently introducing a secondary cross-current fluid input that intercepts the movement pattern for said materials and initial fluid while moving along said primary direction, said secondary cross-current fluid input being of regulable intensity whereby materials of the smaller particle size are separated from said primary direction movement pattern and are entrained for movement along a secondary flow path as energized by said secondary fluid flow.

4,002,463
UPGRADING THE NICKEL CONTENT FROM LOW GRADE NICKEL LATERITIC IRON ORES

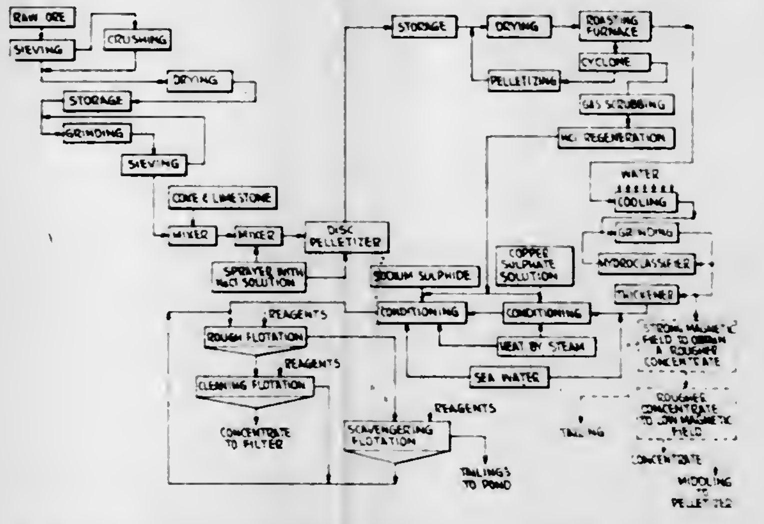
Antonios Nestoridis, Athens, Greece, assignor to Financial Mining - Industrial and Shipping Corporation, Athens, Greece

Filed Mar. 25, 1976, Ser. No. 670,224

Claims priority, application Greece, Apr. 4, 1975, 6410

Int. Cl.² C22B *1/08*

U.S. Cl. 75—1 R **9 Claims**



1. A process of upgrading nickel from nickel lateritic iron ore having an iron content by weight of over 10%, silica of over 25% and a nickel content of at least 0.5%, comprising, grinding the ore, thoroughly mixing the ground ore with calcium carbonate, calcium sulphate and coke, spraying the mixed ore with a solution of sodium chloride and making pellets therefrom, drying the pellets, heating at a temperature not greater than 1050° C for up to 90 minutes, roasting at the above temperature for a predetermined period of time so as to convert all the nickel from the ore to a metalic condition in a neutral or a slightly reducing atmosphere, grinding the roasted pellets in a water medium, and adjusting the density of the pulp resulting from grinding for a subsequent process to obtain a concentrate by one of a flotation and a magnetic separation treatment so as to thereby obtain a rich nickel concentrate.

7. A process of upgrading nickel from nickel lateritic iron ore having an iron content by weight of over 10%, silica of over 25% and a nickel content of at least 0.5%, comprising, grinding the ore, thoroughly mixing the ground ore with sodium chloride gypsum and coke breeze, heating the mixed ore at a temperature not greater than 1050° C for up to 90 minutes, roasting at the above temperature for a predetermined period of time so as to convert all the nickel from the ore to a metallic condition in a neutral or a slightly reducing atmosphere, grinding the roasted mixture in a water medium, and adjusting the density of the pulp resulting from the grinding for a subsequent process to obtain a concentrate by one of a flotation and a magnetic separation treatment so as to thereby obtain a rich nickel concentrate.

4,002,464
METHOD OF AND APPARATUS FOR TRANSPORTING OF METAL FIBERS

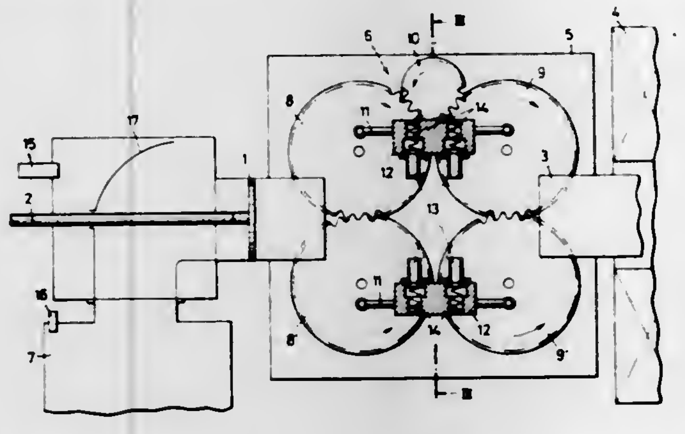
Walther Dawihl, Illinge, Saar, and Walter Eicke, Scheidt, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Continuation-in-part of Ser. No. 568,026, April 14, 1975, Pat. No. 3,955,962. This application July 17, 1975, Ser. No. 596,739

Claims priority, application Germany, Apr. 13, 1974, 2418235; July 25, 1974, 2435802

Int. Cl.² B22F *9/00*; H01F *1/06*

U.S. Cl. 75—.5 AA **19 Claims**



1. A method of producing metal fibers in a magnetic field, comprising the steps of generating magnetic flux lines which extend normal to a planar supporting surface located in an enclosed space; feeding metallic substances into said enclosed space for travel lengthwise of said flux lines and normal to said supporting surface; heating said space to a decompostion temperature at which said substances undergo thermal decomposition and liberate metal atoms which agglomerate under the influence of said flux lines on said supporting surface and form thereon metal fibers which project from the supporting surface in direction normal thereto; moving said supporting surface in said direction of travel; engaging the metal fibers upstream of said supporting surface; and transporting the metal fibers in said direction of travel during continued formation and elongation of said metal fibers.

4,002,465
PROCESS FOR CONTINUOUSLY HEATING AND MELTING PREREDUCED IRON ORES

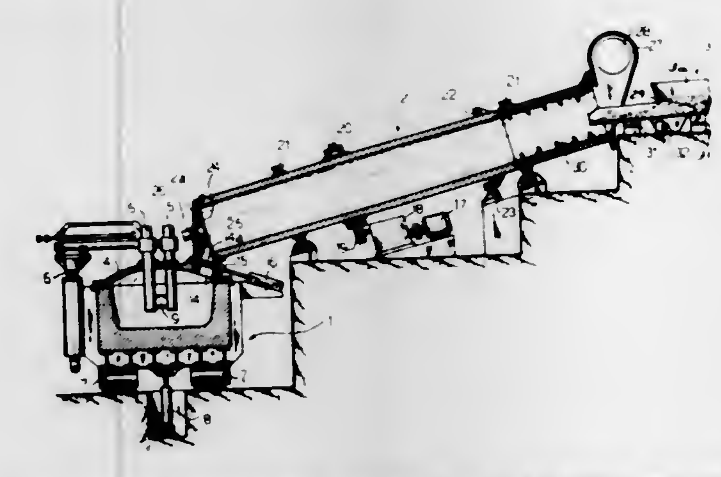
Ugo Brusa, Via Borgnis, Domodossola, Italy

Filed Apr. 9, 1975, Ser. No. 566,393

Claims priority, application Italy, Apr. 16, 1974, 68207/74

Int. Cl.² C21C *5/52*

U.S. Cl. 75—11 **2 Claims**



1. Process for continuously preheating and melting at least substantially pre-reduced iron ores, which comprises in combination:

a. continuously introducing at least substantially pre-reduced iron ore into a rotary, inclined heating zone at the upper end thereof;

b. rotationally moving said ore from said upper end of said heating zone to the lower end thereof;

c. discharging said ore from said lower end of said heating zone into a melting zone abuttingly juxtapositioned with said lower end;

d. introducing hot flue gases from said melting zone into said lower end to heat in a reduced atmosphere said pre-reduced ore countercurrently to its movement;

e. additionally heating said hot flue gases at said lower end by an auxiliary heating means to increase the heat delivered to said heating zone;

f. lowering the rate of travel of said ore in said heating zone by means of a plurality of ribs positioned in the upper portion of said heating zone, whereby the residence time of said ore in said heating zone is increased; and

g. discharging from said melting zone at predetermined intervals a portion of the ore melted therein, thus leaving in the said melting zone a predetermined amount of molten ore to form a bath onto which said pre-heated ore is discharged.

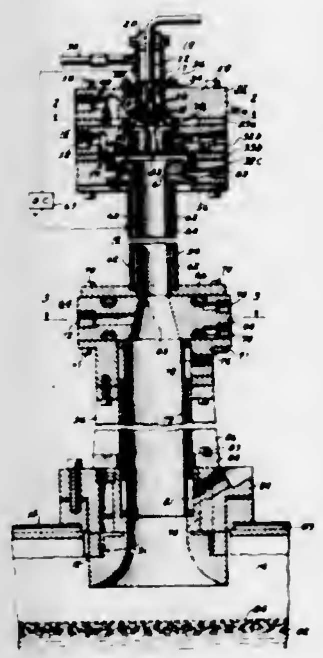
4,002,466
METHOD OF REDUCING ORES

Donald R. MacRae, Bethlehem; Richard G. Gold, Coopersburg; William R. Sandall, Bethlehem; Charles D. Thompson, and Peter G. Cheplick, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 3, 1975, Ser. No. 627,993

Int. Cl.² C21C *5/52*

U.S. Cl. 75—11 **5 Claims**



1. A method of reducing metal oxides in a plasma arc torch comprising a cathode and an anode having two ends, said method comprising:

a. supplying a swirling vortical stabilizing gas stream adjacent to said cathode and said anode;

b. introducing into said torch, between the ends of said anode, solid particles comprising said metal oxides, in a direction such that said particles combine with said gas stream to form a vortical path swirling in the same direction as said stabilizing gas stream, and establishing an arc between said cathode and said anode, said arc providing sufficient heat to convert said metal oxides into a film of material on the wall of said anode;

c. reducing said metal oxides by providing a reductant in contact with them during the formation of said film and thereafter; and

d. collecting the effluent from said torch in a receiving vessel.

4,002,467

METHOD FOR RECOVERING REACTION GASES FROM STEEL CONVERTERS WHICH ARE BOTTOM BLOWN WITH OXYGEN AND COOLED WITH HYDROCARBONS

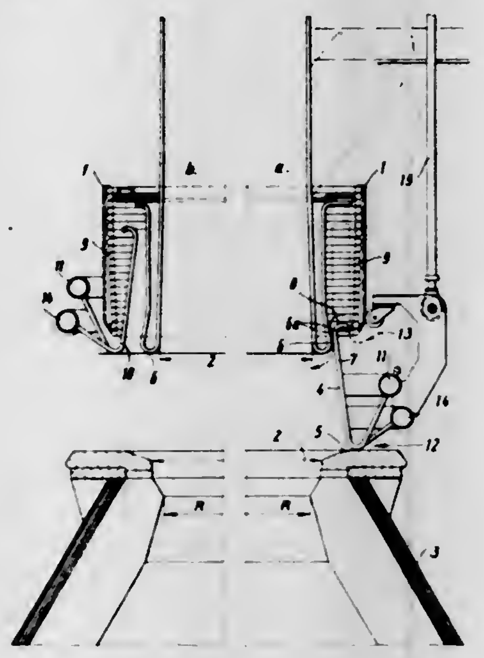
Kurt Baum, Essen, Germany, assignor to Verfahrenstechnik Dr.-Ing. Kurt Baum, Essen, Germany

Filed Oct. 15, 1974, Ser. No. 514,364

Claims priority, application Germany, Jan. 30, 1974, 2404288

Int. Cl.² C21C *5/38*

U.S. Cl. 75—60 **2 Claims**



1. In a method for recovering reaction gases from a hydrocarbon cooled steel converter which is bottom blown by oxygen; with the converter comprising a vessel tippable between an upright position and an inclined position, the vessel provided with bottom tuyeres, the vessel having a mouth and provided with a setting ring detachably connectable to the vessel in substantially sealed engagement about the mouth, the setting ring also in substantially sealed engagement with a suction line which communicates in flow series with gas cleaning means; a method for handling excess hydrogen buildups in the converter and characterized by steps as follows:

- Step a. detecting by means of a gas analyzer a predetermined buildup in hydrogen content of the reaction gases during the blowing with oxygen,
- Step b. on the detecting of the hydrogen buildup per Step a preceding, causing the gas analyzer to effect the connection of the setting ring to the vessel,
- Step c. on the detecting of the hydrogen buildup per Step a preceding, causing the converter to be automatically tipped to operate valves for shutting off the oxygen and bottom blowing the vessel with an inert gas for flushing of the cleaning means to provide a barrier of the inert gas between atmospheric air and combustibles in the gas cleaning means.

4,002,468

SCRAP SMELTING PROCESS

William O. Stauffer, Moraga, Calif., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

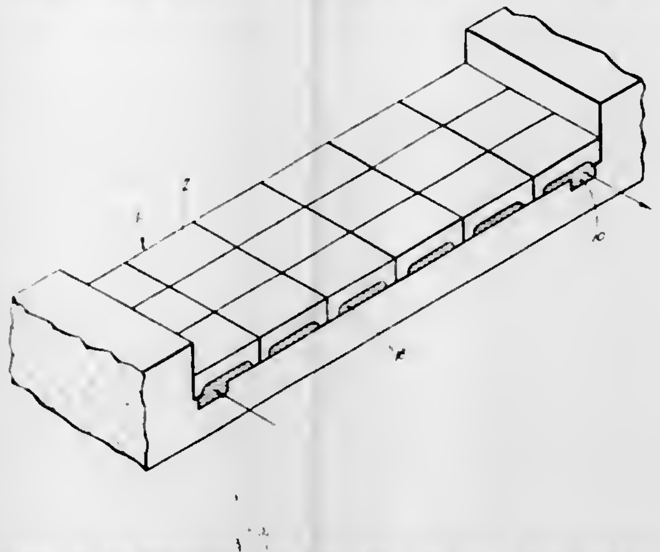
Filed Apr. 28, 1975, Ser. No. 571,983

Int. Cl.² C22B *21/00*

U.S. Cl. 75—68 R **8 Claims**

1. A process for melting a scrap metal in molten metal which comprises:

- A. conducting a flow of a quantity of molten metal through a metal heating surface to form a shallow bath of up to 1 inch in depth therein, wherein said bath is covered by a plurality of thermally conductive ceramic tiles and wherein a heating source is located above said bath and the upper surface of said tiles;
- B. superheating said metal to at least 1400° F in said furnace;
- C. removing the superheated metal of step B from said furnace and placing said removed superheated metal in contact with a quantity of scrap metal whereby said scrap metal is submerged therein and melted, and impurities are generated, thereby forming a scrap melt;



- D. removing said impurities from the scrap melt of step C; and
- E. returning the melt of step D to said furnace and then repeating step A.

4,002,469

SEPARATION OF METALS

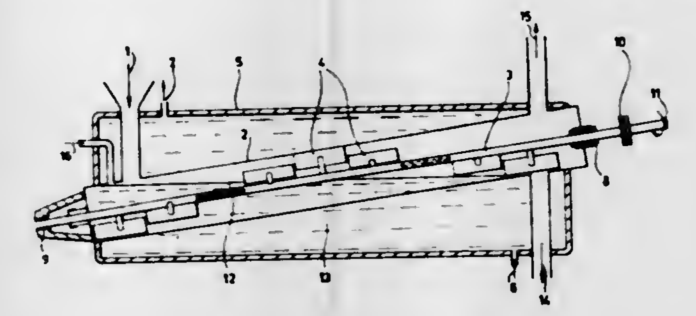
Raymond Edward Oliver, Johannesburg, South Africa, and George McGuire, London, England, assignors to Matthey Rustenburg Refiners (Pty) Ltd., Johannesburg, South Africa

Filed Mar. 18, 1975, Ser. No. 559,425

Claims priority, application United Kingdom, Mar. 21, 1974, 12599/74

Int. Cl.² C22B *11/04*

U.S. Cl. 75—101 R **10 Claims**



1. A process for the separation of base metal and silver components from a solid particulate mixture thereof with precious metal which comprises the steps of:

- a. contacting said solid particulate mixture of base metal, silver and precious metal components, any of which may be in metallic or in chemically combined form, with substantially anhydrous sulphuric acid at a temperature within the range of 140° to 250° C and which is sufficiently high to convert most of the base metal and silver components to water soluble sulphates while leaving the precious metal component in an essentially water insoluble solid state and
- b. separating the said water soluble sulphates from the solid precious metal component by contacting the product from step (a) with water and dissolving therein the said water soluble sulphates formed in step (a).

4,002,470

PROCESS FOR RECOVERING RUTHENIUM

Isao Isa, Misato, and Tutomu Takahashi, Shibukawa, both of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1975, Ser. No. 633,096

Claims priority, application Japan, Dec. 10, 1974, 49-141809; Dec. 10, 1974, 49-141810; Dec. 10, 1974, 49-141811

Int. Cl.² C22B *61/00;* **C01G** *55/00*

U.S. Cl. 75—101 R **22 Claims**

1. A process for recovering ruthenium which comprises: treating a ruthenium-containing substance, sparingly soluble in any of water, an acid solution and a basic solution, with an alkaline fusion mixture containing from 10 to 70% by weight of an inorganic peroxide at a temperature of from 250° to 750° C., dissolving the fusion product in a first acid solution with an acid concentration of from 2 to 50% by weight, then oxidizing the ruthenium compound dissolved in the resulting solution in a second acid solution to liberate ruthenium tetroxide, said second acid solution having an acid concentration of from 1 to 90% by weight and containing from 1 to 2000 parts by weight of an oxidizing agent per 1 part by weight of ruthenium as metal, distilling ruthenium tetroxide under a reduced pressure of from 90 to 700 mmHg and at a temperature of from 50° to 90° C. in a gas stream of a stabilizing agent for ruthenium tetroxide, collecting the distillate in a solution selected from the group consisting of a third acid solution and a basic solution, reducing the collected product and recovering from the resulting reduction product ruthenium metal or a compound thereof, soluble either in water, an acid solution or in a basic solution, said stabilizing agent being selected from the group consisting of oxygen, chlorine, carbon dioxide and nitrogen.

4,002,471

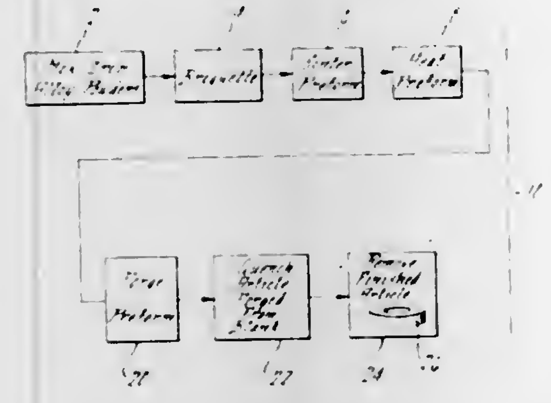
METHOD OF MAKING A THROUGH-HARDENED SCALE-FREE FORGED POWDERED METAL ARTICLE WITHOUT HEAT TREATMENT AFTER FORGING

Myron C. Sarnes, and Robert N. Haynie, both of Northville, Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

Filed Sept. 24, 1973, Ser. No. 400,071

Int. Cl.² B22F *3/00*

U.S. Cl. 75—200 **6 Claims**



1. A method of making a through-hardened scale-free forged powdered metal article having a density of at least about 99.5% of theoretical, a surface hardness of at least Rc 40, and an as forged dimension requiring no further machining other than surface grinding, all directly from quenching comprising:

- compressing an iron alloy powder into a briquette,
- sintering said briquette into a sintered preform;
- adjusting the temperature of said preform to such degree as to put said preform in an austenetic condition;
- forging said heated preform in one step while at said austenetic condition into a forged article;
- quenching said forged article in an oil quenching bath substantially immediately after said forging step while remaining in said austenetic condition; and
- removing said quenched forged article from the quenching bath, and stress relieving said forged article to produce a forged powdered metal article having a surface hardness of at least Rc 40 and a surface finish and dimension requiring no further machining other than surface grinding.

4,002,472

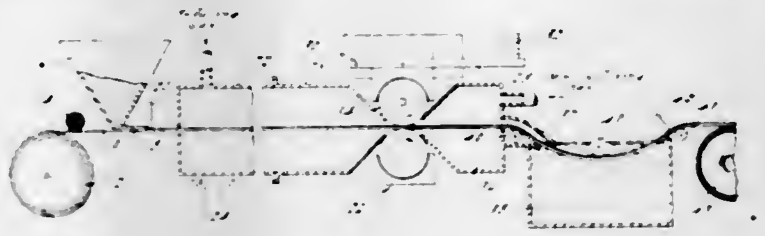
PROCESS FOR MAKING COMPOSITE BEARING MATERIAL

Gordon J. LeBrasse, and Victor Gallatin, both of Ann Arbor, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed May 1, 1975, Ser. No. 573,977

Int. Cl.² B22F *3/18*

U.S. Cl. 75—208 R **10 Claims**



1. A process for making a composite bearing material comprising a steel backing strip having a copper-lead bearing alloy lining tenaciously bonded to at least one side thereof which comprises the steps of applying a layer of a prealloyed powder on the surface of a steel backing strip, said prealloyed powder containing about 64% to about 88% copper, about 8% to about 35% lead and up to about 10% tin and ranging in average particle size of from about one micron up to about 147 microns, heating the prealloyed powder layer and said backing strip to a temperature of about 1450° F to about 1600° F in a reducing atmosphere for a period of time sufficient to effect a liquid phase sintering of the powder and the formation of a bond between said layer and said backing strip, cooling the sintered layer and backing strip to about 1000° F to about 1200° F in a protective atmosphere and applying pressure thereto to effect a substantially complete densification of said powder layer and a further diffusion bonding of the powder particles to each other and to the surface of said backing strip, and thereafter cooling the composite strip in a protective environment to a temperature below about 800° F.

4,002,473

METHOD OF MAKING AN ANODE

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 196,328, Nov. 8, 1971, Pat. No. 3,809,552. This application Nov. 29, 1973, Ser. No. 420,140

Int. Cl.² B22F *1/00*

U.S. Cl. 75—211 **9 Claims**

1. A method of making capacitor anodes comprising providing a mold having cavities therein which have been filled with a slurry of film-forming metal, moving headed or barbed ends of risers made of film-forming metal into the cavities, freezing slurry around ends of the risers while maintaining the ends in the cavities to form shaped masses, removing the shaped masses from the cavities, sintering the shaped masses at an elevated temperature to form rigid bodies, and forming a dielectric oxide over the rigid bodies.

6. In a method of making a body suitable for use as an anode in a capacitor, the steps of shaping a mass including film-forming metal powder and a freezable bonding agent around a headed or barbed portion of an anode riser, freezing the bonding agent to bond powder together around the headed or barbed portion of the anode riser to provide a shaped mass, sintering the shaped mass to form a rigid body including the anode riser, and forming a dielectric oxide film of the film-forming metal over the body.

4,002,474

LUBRICANTS FOR POWDERED METALS

John Blachford, Westmount, Canada, assignor to H. L. Blachford Limited, Montreal, Canada

Filed July 31, 1975, Ser. No. 600,777

Int. Cl.^{2} B22F *3/00*

U.S. Cl. 75—211 12 Claims

1. A method of producing a sintered metal part from powdered metal comprising

blending said powdered metal with a lubricant comprising discrete pressure-rupturable microcapsules comprising a core of a non-corrosive liquid organic lubricant able to wet said powdered metal, and surrounding said core a thin polymeric solid shell, to form an intimate mixture,

compacting said mixture in a mould at a pressure effective to rupture said shell and release said liquid lubricant and to form said mixture into a self-supporting shaped body,

removing said body from said mould,

heating said body to decompose and remove organic material, and

sintering said metal particles.

4,002,475

PHOTOCONDUCTIVE PROCESS FOR MAKING ELECTROGRAPHIC MASTERS

Robert J. Ott, Rochester, and Hans G. Franke, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 5, 1975, Ser. No. 574,204

Int. Cl.^{2} G03G *13/22*; **B44C** *1/04*

U.S. Cl. 96—1 E 11 Claims

1. A process of forming an image on a photoconductive element, at least one surface of the element having an exposable zone coextensively contacting a solution of non-photosensitive, polymeric, cationic resin, the process comprising the simultaneous steps of

positively biasing the photoconductive element to establish a substantially uniform field across the element and resin solution; and

imagewise exposing the exposable zone to activating radiation to preferentially adhere the resin to exposed portions of the surface whereby said exposed portions form an image.

4,002,476

METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT

John Wales, Bishops Stortford, England, assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 580,460, May 23, 1975. This application May 3, 1976, Ser. No. 682,826

Int. Cl.^{2} G03G *13/10*

U.S. Cl. 96—1 LY 2 Claims

1. A method of liquid development of electrostatic latent images which comprises moving into developing contact a resilient photoreceptor bearing a latent electrostatic image and a rigid liquid applicator carrying liquid developer, said photoreceptor having a resilient surfaced base, a shrunk polymeric film in compressive contact with said base, a layer of conductive material over said film, and a layer of less than about 80 microns of photoconductive material overlying the conductive material.

4,002,477

DIFFUSION TRANSFER PROCESSES AND ELEMENTS USING OR CONTAINING INERT TRANSITIONAL METAL COMPLEX OXIDIZING AGENTS

Vernon Leon Bissonette, Brookport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 420,193, Nov. 28, 1973, abandoned, and a continuation-in-part of Ser. No. 256,072, May 23, 1972, Pat. No. 3,834,907, and a continuation-in-part of Ser. No. 189,289, Oct. 14, 1971, abandoned, said Ser. No. 256,072, is a continuation-in-part of Ser. No. 150,741, June 7, 1971, abandoned. This application Aug. 22, 1975, Ser. No. 606,999

Int. Cl.^{2} G03C *7/00, 5/54, 1/40, 1/76*

U.S. Cl. 96—3 27 Claims

1. In a photographic image-transfer film unit comprising (1) a support having thereon at least one layer containing a silver halide emulsion having associated therewith an image dye-providing material, (2) an image dye-receiving layer containing an image dye mordant and (3) means for discharging an alkaline processing solution within said film unit, the improvement wherein said film unit comprises (a) a silver halide developing agent and (b) a positively charged inert transition metal ion complex oxidizing agent capable of having at least two valence states and having a coordination number of 6, which undergo redox reaction in the presence of metallic silver, and which are substantially inert to said redox reaction in the absence of a metal or chalcogen catalyst.

4,002,478

METHOD FOR FORMING RELIEF PATTERN

Tomoo Kokawa; Yoshikathu Nakao, and Kunio Akiyama, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Continuation-in-part of Ser. No. 451,504, March 15, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,345

Claims priority, application Japan, Mar. 15, 1973, 48-29394; Mar. 29, 1973, 48-35052

Int. Cl.^{2} G03C *5/00, 11/12*

U.S. Cl. 96—38.1 11 Claims

1. A method for forming a relief pattern on a substrate which comprises the steps of:

adhering under pressure a photosensitive sheet on the surface of a substrate to be treated, said photosensitive sheet comprising: a photo-pervious base film, a photo-impervious ink layer printed in the part other than desired pattern portion on said photo-pervious base film, a releasing layer, a photosensitive resin layer and a layer of a photo-curable ink in said pattern portion between said releasing layer and photosensitive resin;

II. radiating actinic rays through said photo-pervious base film on said photosensitive sheet on said substrate to cure said photosensitive resin layer in portions corresponding to said pattern portion;

III. peeling off the upper layer of said photo-pervious base film, photo-impervious ink layer and releasing layer, while leaving said photosensitive resin layer and said photo-curable ink layer on said substrate; and

IV. contacting a washing solution with said photosensitive resin layer and said photo-curable ink layer on said substrate to wash away any un-cured portions of said photosensitive resin layer.

4,002,479

2-THIOURACIL IN HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIALS

Nobuo Suzuki; Yasuhiro Noguchi, and Takao Masuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 25, 1975, Ser. No. 590,524

Claims priority, application Japan, June 26, 1974, 49-72992

Int. Cl.^{2} G03C *1/02, 1/34*

U.S. Cl. 96—114.1 10 Claims

1. A heat-developable light-sensitive material which comprises a support containing therein or in one or more layers thereon at least (a) an organic silver salt which is substantially colorless, which is comparatively stable to light and which forms a silver image by reaction with a reducing agent when heated to a temperature above 80° C in the presence of an exposed light-sensitive silver halide, (b) a light-sensitive silver halide or a component capable of forming a light-sensitive silver halide on reaction with the organic silver salt, (c) a reducing agent, and (d) at last one of a 2-thiouracil.

4,002,480

PHOTOGRAPHIC SILVER HALIDE EMULSION

Masanao Hinata; Yuji Mihara; Reiichi Ohi; Keiichi Adachi, and Akira Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

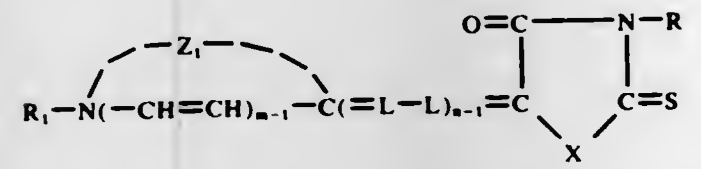
Filed Mar. 6, 1975, Ser. No. 555,912

Claims priority, application Japan, Mar. 7, 1974, 49-26620

Int. Cl.^{2} G03C *1/08*

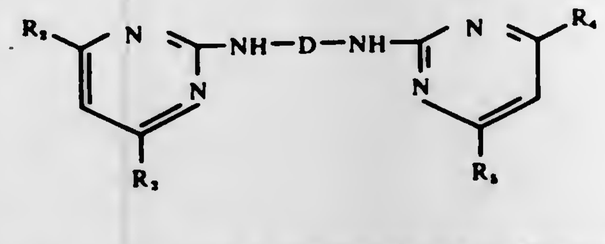
U.S. Cl. 96—122 9 Claims

1. A photographic silver halide emulsion containing at least one dinuclear merocyanine dye represented by the formula (Ia):



(Ia)

wherein R and R_1, which may be the same or different, each represents an aliphatic group; Z_1 represents the nonmetallic atoms required to form a 5- or 6-membered heterocyclic nucleus selected from the group consisting of a thiazole nucleus, a thiazoline nucleus, an oxazole nucleus, a selenazole nucleus, a 3,3'-dialkylindolenine nucleus, an imidazole nucleus, a tetrazole nucleus, a pyridine nucleus and a quinoline nucleus; X represents a sulfur atom, an oxygen atom or a N—R' wherein R' represents an alkyl group or an aryl group; L represents a methine group; m represents 1 or 2; and n represents 1, 2, or 3, and at least one compound of the formula (II):



(II)

wherein D represents a divalent aromatic group, R_2, R_3, R_4, and R_5, which may be the same or different, each represents a hydrogen atom, a hydroxy group, an alkoxy group, an aryloxy group, a halogen atom, a heterocyclic group, a mercapto group, an alkylthio group, an arylthio group, a heterocyclic thio group, an amino group, an alkylamino group, a cycloalkylamino group, an arylamino group, a heterocyclic amino group, an aralkylamino group, or an aryl group.

4,002,481

COMPOSITION FOR CORROSION PROTECTION USING METAL SILICIDES OR ALLOYS OF SILICON AND METALS

James P. McKaveney, Claremont, Calif., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Apr. 9, 1975, Ser. No. 566,483

Int. Cl.^{2} C09K *3/00;* **C23F** *11/00;* **C09D** *5/08*

U.S. Cl. 106—14 24 Claims

1. A composition suitable for the anodic protection of corrodible metallic surfaces which comprises a binder and a filler, the filler being present in an amount sufficient to impart corrosion resistant characteristics to the composition and selected from the group consisting of:

a. alloys of silicon and barium, calcium, magnesium, lithium, cerium, titanium, lanthanum, manganese and mixtures thereof,

b. silicides of barium, calcium, magnesium, lithium, cerium, titanium, lanthanum, manganese and mixtures thereof, and

c. mixtures of (a) and (b).

4,002,482

GLASS COMPOSITIONS SUITABLE FOR INCORPORATION INTO CONCRETE

Matthias Christian Coenen, Mainz, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Continuation-in-part of Ser. No. 549,973, Feb. 14, 1975, abandoned. This application Nov. 18, 1975, Ser. No. 633,078

Int. Cl.^{2} C03C *13/00;* **C04B** *7/02*

U.S. Cl. 106—40 V 14 Claims

1. Glasses suitable for use as a long term reinforcing agent in concrete or in other cementitious matrix and having a composition consisting essentially of:

	Weight Percent
SiO_2	20–70
TiO_2	3–12
ZnO	5–70
CuO	0–10
Fe_2O_3	0–5
BaO	0–30
CaO	0–10
MgO	0–15
Al_2O_3	0–30

wherein the ratio of the molar sum of $Al_2O_3 + MgO + CaO$ to the molar sum of $ZnO + CuO + TiO_2 + Fe_2O_3$ present in the composition is equal to or less than 0.5, in which metallic oxides selected from the group consisting of As_2O_3, Sb_2O_3, V_2O_5, B_2O_3, PbO, CdO, SnO_2 and M_2O wherein M is an alkali metal, if present, amount to not greater than 0.4 mole % altogether, and whereby said composition delays the curing of said concrete or cementitious matrix and increases the formation of heat when said composition reacts with said concrete or cementitious matrix.

4,002,483

EXPANSIVE CEMENT

Kenneth E. Daugherty, Lewisville; John P. Luker, Comanche; Joseph H. Allen, Irving, all of Tex., and Waldemar A. Klemm, Columbia, Md., assignors to General Portland, Inc., Dallas, Tex.

Filed June 12, 1975, Ser. No. 586,225

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—89 36 Claims

1. An expansive cement composition made of argillaceous and calcareous materials and containing from about 1 to about 70% by weight thereof of free CaO and from about 2 to about 7% by weight thereof of MgO uniformly distributed therein, with the remaining portion of said materials being primarily tricalcium silicate and containing substantially no dicalcium silicate.

4,002,484
PROCESS FOR THE MANUFACTURE OF A FINE WHITE FILLER FOR INDUSTRIAL PURPOSES

Jacques Baudouin, Montelimar, France, assignor to Ciments Lafarge S.A., France

Filed Nov. 9, 1973, Ser. No. 414,449

Claims priority, application France, Nov. 13, 1972, 72.40247

Int. Cl.² C09C *1/02*

U.S. Cl. 106—306 **23 Claims**

1. A process for preparing ettringite or calcium trisulfoaluminate ($3\ CaO \cdot Al_2O_3 \cdot 3CaSO_4 \cdot 32\ H_2O$) according to a reaction depicted by at least one of the following reaction schemes:

a. $CaO{\cdot}Al_2O_3 + 2(CaO{\cdot}H_2O) + 3(CaSO_4{\cdot}2H_2O) + 24H_2O \rightarrow$ ettringite

b. $(CaO)_3Al_2O_3 + 3(CaSO_4{\cdot}2H_2O) + 26\ H_2O \rightarrow$ ettringite

c. $CaO(Al_2O_3)_2 + 5(CaO{\cdot}H_2O) + 6(CaSO_4{\cdot}2H_2O) + 47H_2O \rightarrow 2$ ettringite

d. $12\ CaO{\cdot}7Al_2O_3 + 9(CaO{\cdot}H_2O) + 21(CaSO_4{\cdot}2H_2O) + 173H_2O \rightarrow 7$ ettringite

e. $CaO{\cdot}6Al_2O_3 + 17(CaO{\cdot}H_2O) + 18(CaSO_4{\cdot}2H_2O) + 139H_2O \rightarrow 6$ ettringite

which comprises forming a substantially stoichiometric mixture of calcic aluminate and calcium sulfate in an amount of water which is at least a stoichiometric proportion and at most sufficient to yield a product containing 5 percent by weight of (dry) ettringite and 95 percent by weight of water, and effecting reaction at a temperature in the range of from 20° to 90° C; the calcium sulfate having as white a color as possible, and the stoichiometric mixture and the stoichiometric proportion being based on the reaction.

4,002,485
PROCESS FOR THE PRODUCTION OF THERMOPLASTIC SYNTHETIC MATERIALS OF CHEMICALLY MODIFIED PROTEIN AND PLASTIC SHAPING MATERIALS OF CHEMICALLY MODIFIED PROTEIN AND A CHEMICAL PLASTICIZER

Klaus-Dieter Hammer, Mainz; Wolfgang Kiendauer, Wiesbaden, and Max Bytzek, Naurod, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

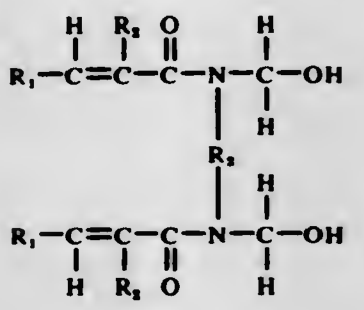
Filed Oct. 3, 1975, Ser. No. 619,222

Claims priority, application Germany, Oct. 7, 1974, 2447679

Int. Cl.² C07G *7/00;* **C08L** *89/00*

U.S. Cl. 106—136 **15 Claims**

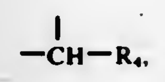
1. A process for the production of a thermoplastic synthetic material of chemically modified protein which comprises mixing an aqueous alkaline protein solution with an aqueous solution of a tetrafunctional, doubly unsaturated compound of the general formula



in which

R_1 and R_2 are hydrogen or an alkyl group with 1 to 6, preferably 1 to 3, carbon atoms, and

R_3 is the group $-(CH_2)_n-$, n being an integer from 1 to 8, or the group



$$-\overset{|}{\mathrm{C}}\mathrm{H}-R_4,$$

in which R_4 is an alkyl group with 1 to 18 carbon atoms, subjecting the liquid mixture to a dwell time, causing a precipitating liquid to act upon the liquid, viscous mixture, freeing the formed precipitate from excess liquid, drying, mixing the precipitate with an at least bifunctional, saturated, organic compound, and subjecting the mixture to heat and pressure.

4,002,486
GLYOXAL COMPOSITION

Yasuo Kotani, Hirakata, and Kunio Kageyama, Amagasaki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 434,339, Jan. 17, 1974, Pat. No. 3,912,529. This application Feb. 5, 1975, Ser. No. 547,269

Claims priority, application Japan, Feb. 1, 1973, 48-13929; July 9, 1973, 48-77651; July 13, 1973, 48-79549

Int. Cl.² C08L *3/02*

U.S. Cl. 106—213 **1 Claim**

1. A powdery composition consisting essentially of glyoxal, at least one water-soluble starch selected from the group consisting of soluble starch, oxidized starch, hydroxyethyl starch, acetate starch, phosphate starch, and cationized starch, and water; the ratio of glyoxal and the water-soluble starch being in the range of about 1:2 to about 10:1 and water being in the range of about 5 to about 25 percent by weight in the composition.

4,002,487
PROCESS FOR BLEACHING KAOLIN

Robert F. Conley, Scotch Plains, N.J., assignor to IMC Chemical Group, Terre Haute, Ind.

Filed May 13, 1976, Ser. No. 685,850

Int. Cl.² C04B *33/04, 33/13*

U.S. Cl. 106—288 B **4 Claims**

1. In a process for treating raw kaolin clay to improve the color and brightness by bleaching the clay in an aqueous dispersion with sodium dithionite, the improvement consisting of treating the dispersion with hydroxylamine or salt thereof within about 1 to 5 hours after the treatment with sodium dithionite is complete.

4,002,488
CLEANING, POLISHING, AND DRYING NAILS BY MOVING THEM THROUGH VIBRATORY TROUGHS

Tony Campanelli, 243 Flora Parkway, Addison, Ill. 60101

Filed May 5, 1975, Ser. No. 574,312

Int. Cl.² B08B *3/10*

U.S. Cl. 134—7 **10 Claims**

1. A process for treating nails comprising the steps in sequence of:

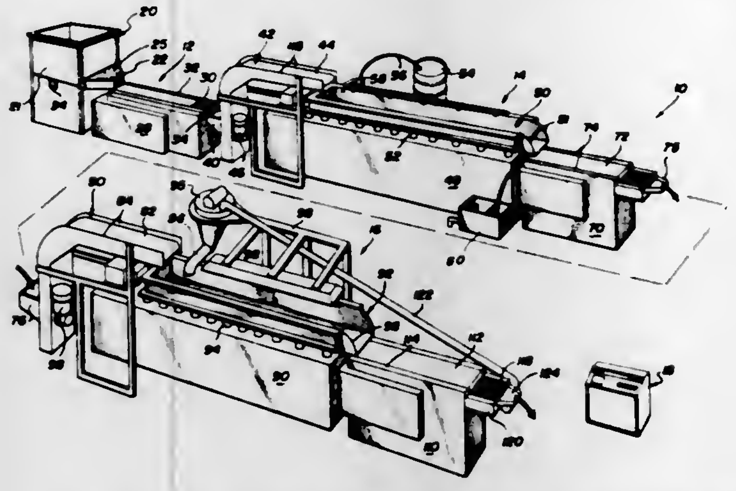
a. providing a continuous flow of nails which may include unwanted particles of matter mixed therewith from a source,

b. subjecting the nails to a vibratory separating mechanism to remove unwanted particles of matter,

c. cleaning the nails by moving same through a first vibratory trough while flowing cleaning solution over the nails,

d. polishing and drying the nails by moving same through a second vibratory trough filled with a drying and polishing media to thereby mix and agitate the nails with the media, and

(e) separating the used media from the nails, whereby polished and clean nails are produced in a continuous manner.



4,002,489
METHOD OF PICKLING METALLIC MATERIAL

Tore Hedqvist; Einar Gunnarsson, and Benny Flodin, all of Torshalla, Sweden, assignors to Nyby Bruk AB, Sweden

Filed June 25, 1974, Ser. No. 482,999

Int. Cl.² C23G *1/02, 1/08*

U.S. Cl. 134—28 **20 Claims**

1. A method of pickling metallic material consisting of stainless steel by the continuous treatment of said material in strip and wire forms wherein said material is subjected to a two-step pickling treatment which comprises a first step of subjecting the material to chemical attack of a first aqueous solution heated to a temperature above room temperature and containing HF in an amount of about 7 to 25% and a second step of subjecting said material to chemical attack of a second aqueous solution containing an acid different from the first aqueous solution, said second aqueous solution being heated to a temperature above room temperature and containing HF in an amount between about 1 and 7 % and HNO_3 in an amount between about 10 and 25%.

4,002,490
PAINT SPRAY BOOTH CHEMICAL TREATMENT

Raymond J. Michalski, Riverdale, and Alan H. Fisher, Calumet City, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 20, 1975, Ser. No. 551,806

Int. Cl.² B08B *3/08*

U.S. Cl. 134—38 **3 Claims**

1. In a process for controlling pollution and contamination in paint or lacquer spray booths in which water is used to wash the air in the spray booth and to remove over-sprayed paints or lacquers and solids are removed from the water which is then recirculated for further use in washing the air in the spray booth, of the type which comprises adding to said water a quantity of a blend of a water soluble electrolyte salt of an amphoteric metal and a polycationic water dispersible polymer, said quantity being sufficient to reduce the tackiness of paints and lacquers and thereby reduce the tendency of over-sprayed paints and lacquers to adhere to walls, ceilings and floors of said spray booths, said polymer also being effective to condition paint and lacquer solids removed with said water so that they can be separated from the water which is then returned for recirculation in the process, the improvement comprising adding to said water containing the blend of a water soluble electrolyte salt of an amphoteric metal and a cationic water dispersible polymer, from 1–30 ppm of a polypropylene glycol, said polypropylene glycol having an average molecular weight of from 100 to 1,000.

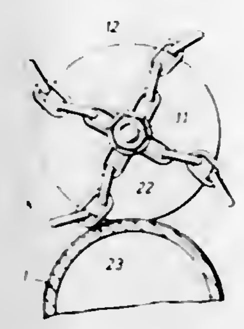
4,002,491
REMOVAL OF COATINGS BY ROTATING CHAIN FLAILS

Jose O. Esparza, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 25, 1975, Ser. No. 607,395

Int. Cl.² B08B *1/04*

U.S. Cl. 134—6 **12 Claims**



9. A method for removing a coating from a substrate without significantly damaging the substrate comprising rotating several chain-like flails against the coating while maintaining each flail oriented and positioned with respect to the coating surface so that the next-to-last terminal link of each flail barely strikes the coating on the edge of the link, twists and then whips the terminal link flat against the coating on the side of the link.

4,002,492
RECHARGEABLE LITHIUM-ALUMINUM ANODE

Bhaskara M. L. Rao, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 1, 1975, Ser. No. 592,219

Int. Cl.² H01M *35/02*

U.S. Cl. 429—194 **7 Claims**

1. An improved high energy density electrochemical cell for operation at temperatures below about 150° C which comprises an anode consisting essentially of between about 63 and 92% lithium and the balance essentially aluminum, a cathode and a nonaqueous electrolyte of an organic solvent having a lithium salt dissolved therein.

4,002,493
FUEL CELL STRUCTURE AND SYSTEM, MORE PARTICULARLY FOR A CARBON FUEL AND ATMOSPHERIC AIR

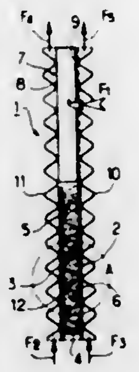
Bernard Warszawski, Paris, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Paris, France

Filed Jan. 17, 1975, Ser. No. 541,996

Claims priority, application France, Jan. 25, 1974, 74.02516

Int. Cl.² H01M *8/06*

U.S. Cl. 429—26 **24 Claims**



1. Fuel cell comprising a plurality of elements (1) arranged substantially in side-by-side relationship and in electrical contact with one another, each element including a pervious

cathode electrode (2) and a pervious anode electrode (3), each electrode containing a catalyst, the electrodes being mounted in spaced relation relative to each other with mutually facing inner surfaces; and an aqueous electrolyte (6) in the space between the inner surfaces of the electrodes and contacting said electrodes;

- a plurality of condenser-heat exchanger means (7) each having at least one generally upwardly directed heat exchange surface located above the electrodes of at least one element and in fluid communication with the space between the electrodes to condense water vapor formed during operation of the fuel cell;
- a first corrugated bipolar current collector (10), the tip portions of the corrugations of one side of the first collector bearing against the outer surface of the cathode electrode ( ) of one element and the tip portions of the corrugations at the other side of said first collector bearing against the outer surface of the anode electrode of an adjacent element (1), said first collector further extending along at least a substantial portion of an upwardly directed heat exchange surface of a condenser-heat exchanger means (7) with tip portions thereof in communication with said heat exchange surface, said corrugations of said first collector defining a path for flow of a combustive gas adjacent and in contact with said cathode electrodes and adjacent with said heat exchange surface, said path defined adjacent said heat exchange further defining a condensing space for water vapor;
- a second corrugated bipolar current collector (11), the tip portions of the corrugations of one side of said second collector bearing against the outer surface of the anode electrode (3) of one element and the tip portions of the corrugations at the other side of said second current collector bearing against the cathode electrode of another adjacent element (1), said second collector further extending along at least a substantial portion of another upwardly directed heat exchange surface of a condenser-heat exchanger means (7) with tip portions thereof in communication with said another heat exchange surface, said corrugations of said second collector defining a path for flow of a gaseous fuel adjacent and in contact with said anode electrode and adjacent with said another heat exchange surface;

said paths defined by said corrugations being substantially in parallel planes; and

fluid guide means (12) in fluid communication with said condensing space and with said space of an element to provide a downward flow path to return condensed water to the electrolyte within said space.

4,002,494

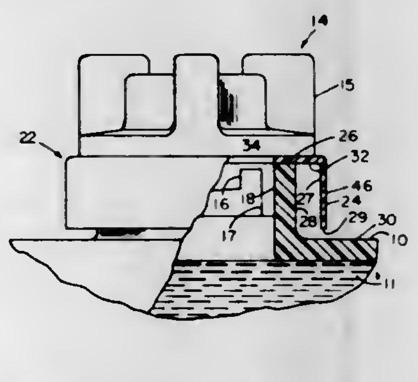
VENT PLUG

Frank A. Vengrofski, Rockledge, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed July 17, 1975, Ser. No. 596,900

Int. Cl.² H01M *2/00*

U.S. Cl. 429—89 **4 Claims**



1. In a storage battery comprising:
a. a container;
b. a cover for the container;
c. an electrolyte within the container;
d. a vent well formed in the cover, the vent well providing access from outside the container to the interior thereof, the vent well including an upstanding annular filler neck raised above the outside surface of the cover, and;
e. a vent plug having means for securing it in said filler neck, the improvement comprising means for eliminating the formation of current conducting electrolyte paths resulting from electrolyte creepage originating at a point in the interior of the battery and terminating at a point exterior of the battery and having an electrical potential different from said originating point, said means comprising a one piece gasket cooperating with portions of the vent plug and being sealingly disposed between the top surface of said filler neck and said portions of the vent plug, said gasket being further defined as having an inwardly flanged skirt, the flange of said skirt being positioned on said top surface of said filler neck and the skirt thereof depending from the flange and concentrically surrounding said filler neck with the inner surface of said skirt spaced from the outer surface of said filler neck, the lower edge portion of said skirt being spaced from the upper surface of the cover for the container.

4,002,495

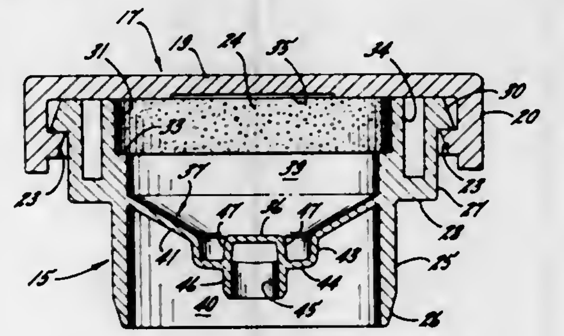
EXPLOSION-PROOF VENT BARREL FOR A BATTERY

Duane D. Hakarine, Minneapolis, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 549,304, Feb. 12, 1975, abandoned. This application Feb. 12, 1976, Ser. No. 657,567

Int. Cl.² H01M *2/12*

U.S. Cl. 429—87 **25 Claims**



1. An explosion-proof vent for closing the cell opening of a storage battery comprising a top frame plate and a tubular body releasably mounted in depending fashion from said top plate, said tubular body being molded of plastic for sealing engagement in said cell opening, said body defining a compartment with an aperture therein to permit gas from within said battery cell to flow into said compartment, a disc made of porous material interposed between an upper end of said body and said frame for covering the upper end of said body compartment, and means for maintaining a spatial separation of less than 0.015 inches between said top frame plate and at least a portion of said disc for allowing gases within said compartment to readily escape through said disc while retarding the entrance of a flame into the space between said frame plate and disc.

4,002,496

CATALYTIC DEVICE FOR STORAGE BATTERY

Hidethugu Nitta, and Masaru Watanabe, both of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

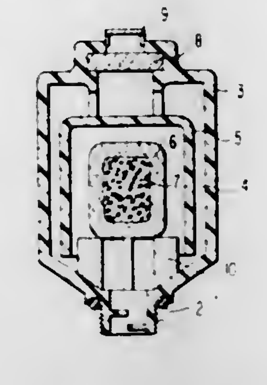
Filed Dec. 19, 1974, Ser. No. 534,410

Int. Cl.² H01M *2/12*

U.S. Cl. 429—53 **9 Claims**

1. In a catalytic device for a battery containing an aqueous electrolyte into which oxygen and hydrogen gases generated as a result of electrolysis of the aqueous electrolyte pass and are catalytically recombined into water, which returns to the electrolyte; the improvement which comprises
a. a catalyst body;

b. a gas-permeable catalyst vessel having said catalyst body arranged therein;
c. a condenser vessel housing said catalyst vessel, said condenser vessel having an opening only at the lower portion thereof;



d. an outer vessel of said catalytic device housing said condenser vessel; and
e. means for passing a gas from said condenser vessel through a gap between said condenser vessel and said outer vessel.

4,002,497

THERMOELECTRIC BATTERIES

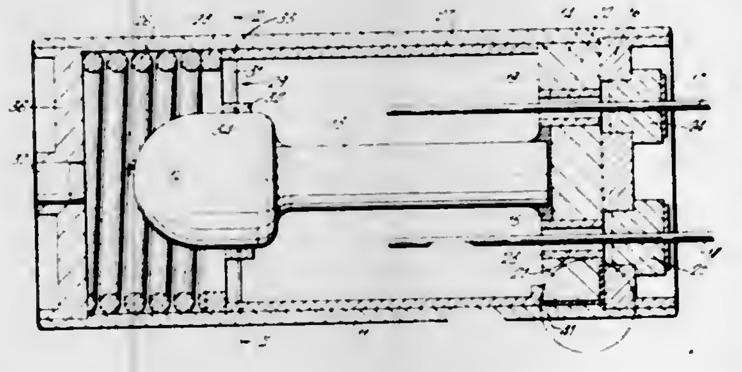
Michael Harold Brown, Didcot, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Sept. 17, 1975, Ser. No. 614,178

Claims priority, application United Kingdom, Sept. 30, 1974, 42423/74

Int. Cl.² H01L *37/00*

U.S. Cl. 136—202 **5 Claims**



1. A thermoelectric battery comprising a casing enclosing an assembly comprising a heat source secured to one end of a thermoelectric unit, the other end of the thermoelectric unit being mounted in heat conducting contact with the casing, there being a space surrounding at least the heat source end of the assembly between the assembly and the casing, the heat source end of the assembly being provided with a fibre support for restraining movement of the heat source relative to the casing.

4,002,498

ELECTROLYTE-DEPOLARIZERS FOR THERMAL BATTERIES

Richard L. Blucher, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed Mar. 22, 1962, Ser. No. 182,714

Int. Cl.² H01V *1/30;* **H01M** *10/00*

U.S. Cl. 136—205 **8 Claims**

1. A unitary electrolyte-depolarizer wafer for thermal deferred action cells, the wafer being a pressure compacted composition consisting essentially of an intimate finely divided mixture of a depolarizer, a fusible alkali metal salt electrolyte, and a finely divided inert absorbent, said absorbent being present in an amount sufficient to absorb said electrolyte when in a fluid condition.

4,002,499

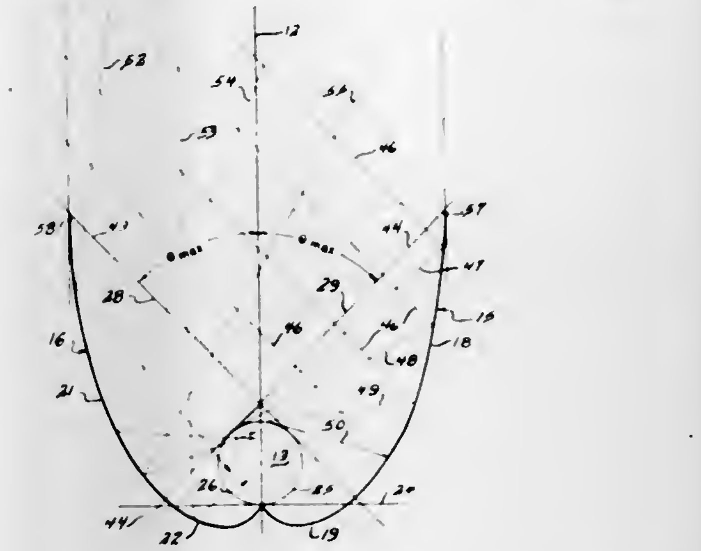
RADIANT ENERGY COLLECTOR

Roland Winston, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,074

Int. Cl.² H01V *1/30*

U.S. Cl. 136—206 **17 Claims**



1. A radiant energy concentration device, comprising, an energy receiver positioned tangent to a reference plane, said energy receiver having a first reference axis extending therethrough, with said first reference axis being perpendicular to said reference plane so that said energy receiver extends along said first reference axis away from said reference plane, a first side wall for directing radiant energy positioned on a first side of said energy receiver and having first and second portions, said second portion of said first side wall having the shape of the involute of said first side of said energy receiver and extending from a point of tangency of said energy receiver to said reference plane to a first shadow line of said energy receiver, said first shadow line being defined as the line which crosses said first reference axis at a point on the same side of said reference plane as said energy receiver at an angle $\theta_{1\ max}$ and further which is tangent to said energy receiver on the same side of said first reference axis as said first side wall, said first portion of said first side wall being an extension of said second portion of said first side wall and extending from said first shadow line to no further than a first terminal point, $\theta_{1\ max}$ thereby being the maximum angle from said first reference axis at which all radiation energy crossing said first reference axis at an angle equal to or less than $\theta_{1\ max}$ is directed into said energy receiver by said first side wall, said first portion of said first side wall being shaped so that all radiant energy crossing said first reference axis at said angle $\theta_{1\ max}$ and striking any point on said first portion of said first side wall is directed along a line tangent to said energy receiver, said first terminal point being the point wherein with said first portion of said first side wall extending to said first terminal point a tangent to said first side wall at said first terminal point is parallel to said first reference axis.

4,002,500

THERMOCOUPLE EXTENSION WIRE

Teh Po Wang, North Caldwell, N.J., assignor to W. B. Driver Company, Newark, N.J.

Continuation-in-part of Ser. No. 129,460, March 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 822,786, April 1, 1969, abandoned. This application July 31, 1975, Ser. No. 600,282

Int. Cl.² H01L *35/20;* **136** *241;227;236 R*

U.S. Cl. 136—241 **3 Claims**

1. A negative thermocouple extension wire composition for use with a positive copper thermocouple extension wire in a Platinum/Platinum-Rhodium thermocouple system wherein

the positive thermoelement of the system is a Platinum-Rhodium alloy selected from the group consisting of Platinum-10 percent Rhodium and Platinum-13 percent Rhodium, the composition consisting essentially of in percent by weight:

Nickel	0.5–1.5%
Manganese	0.25–0.40%; and
Copper	Balance

4,002,501

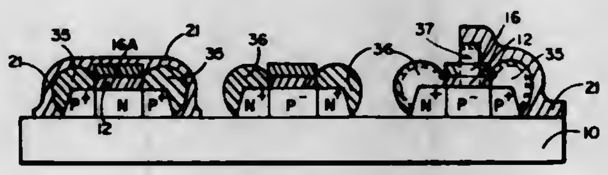
HIGH SPEED, HIGH YIELD CMOS/SOS PROCESS

Ronald K. Tamura, Buena Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 16, 1975, Ser. No. 587,465

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **7 Claims**



1. A process for making complementary metal-oxide semiconductor devices in silicon sapphire comprising the steps of

1. providing a wafer comprising a layer of silicon of a first conductivity type on a sapphire substrate;
2. forming a first silicon oxide layer over the silicon layer;
3. providing a first mask over said first silicon oxide layer to define regions of the first silicon oxide layer which are to be removed;
4. removing those portions of the first oxide layer which are not protected by the first mask to expose the silicon thereunder;
5. removing the first mask;
6. providing a second mask over the patterned first oxide layer and the exposed silicon to exclude ions which are to be ion implanted from entering the silicon underlying masking portions of the second mask;
7. ion implanting into the portions of the silicon layer which are not ion-masked by the second mask, conductivity-type-determining ions which induce a second conductivity type in order to convert the ion implanted portions of the silicon from the first conductivity type to the second conductivity type;
8. removing the second mask;
9. removing the portions of the silicon which were exposed by steps (4) and (8) to form a plurality of separate silicon islands each having an upper surface protected by those portions of the first silicon oxide layer which were not removed in step (4);
10. removing any remaining portions of the first silicon oxide layer to expose the upper surface of each of the islands;
11. thermally growing a second silicon oxide layer on the silicon islands;
12. depositing a first silicon nitride layer at least over those portions of the second silicon oxide layer which overlie the upper surfaces of silicon islands;
13. providing a third mask on said wafer to protect selected portions of said first silicon nitride layer which overlie the silicon islands;
14. removing those portions of the first silicon nitride layer which are left exposed by the third mask;
15. removing the third mask;
16. depositing a third silicon oxide layer over the wafer;
17. providing a fourth mask on the wafer to protect the third silicon oxide layer except for those portions of the third silicon oxide layer which overlie the silicon areas which are to be exposed to a second conductivity type dopant or which are over the area of the sapphire which is adjacent to silicon areas which are to be exposed to the second conductivity type dopant;
18. removing those portions of the second and third silicon oxide layers which are not protected by the fourth mask;
19. removing the fourth mask;
20. depositing a source of a second conductivity type dopant on the wafer;
21. driving the second conductivity type dopant for a sufficient period of time to insure adequate concentration of second conductivity type dopant in the exposed portions of the silicon islands;
22. removing the source of the second conductivity type dopant;
23. thermally growing a fourth silicon oxide layer;
24. depositing a second silicon nitride layer over the wafer, said second silicon nitride layer covering both those portions of the silicon islands which were exposed to the second conductivity type dopant and the areas of the sapphire adjacent thereto which were exposed to the second conductivity type dopant in order to surround, with the second silicon nitride layer, those portions of the silicon islands which were exposed to the second conductivity type dopant;
25. providing a fifth mask on the wafer to protect said second silicon nitride layer except for those portions of the second silicon nitride layer which overlie those portions of the wafer which are to be exposed to a first conductivity type dopant, the protected portions of the second silicon nitride layer including those portions which cover the sapphire adjacent to, and surround the portions of the silicon islands which were exposed to said source of the second conductivity type dopant in step (20);
26. removing those portions of the second silicon nitride layer and any portions of the second, third and fourth silicon oxide layers which are not protected by the fifth mask;
27. removing the fifth mask;
28. depositing a source of a first conductivity type dopant on the surface of the wafer;
29. driving the first conductivity type dopant for a period of time sufficient to insure an adequate concentration of the first conductivity type dopant in those portions of the silicon which are to be converted from the second conductivity type to first conductivity type;
30. removing the source of the first conductivity type dopant;
31. removing the first and second silicon nitride layers and any remaining portions of the second silicon oxide layer;
32. thermally growing a fifth silicon oxide layer;
33. depositing a third silicon nitride layer over the wafer;
34. providing a sixth mask to protect the third silicon nitride layer except for those portions of the third silicon nitride layer which are to be removed prior to deposition of the metallization which will form contacts to the silicon;
35. removing those portions of the third silicon nitride layer and any silicon oxide which are not protected by the contact mask;
36. removing the sixth mask;
37. depositing a layer of metallization on the wafer to form contacts;
38. providing a seventh mask over the metallized wafer to protect those portions of the metallization which are to be retained; and
39. removing any exposed metallization.

4,002,502

ALUMINUM BASE ALLOYS

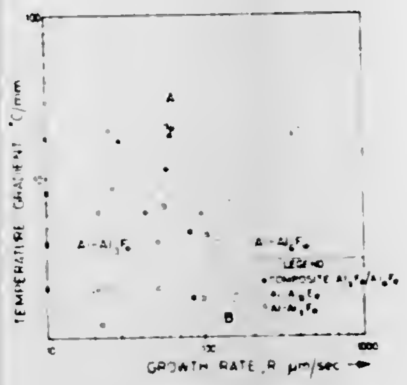
Ian Frank Bainbridge, Lower Templestowe, Australia, and Colin McLean Adam, Pakuranga, New Zealand, assignors to Comalco Aluminium (Bell Bay) Limited, Tasmania and The University of Queensland, Queensland, both of, Australia

Continuation-in-part of Ser. No. 277,511, Aug. 3, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,286

Claims priority, application Australia, Aug. 9, 1971, 5827/71

Int. Cl.² C22F *1/04*

U.S. Cl. 148—3 **6 Claims**



1. In a method of casting aluminum-iron alloy from a melt with a controlled temperature gradient between the solid and liquid metal and with a controlled rate of growth of the alloy phases as they solidify, said alloy consisting essentially of aluminum and 0.5 to 10% by weight of iron and having a cast microstructure containing aluminum and eutectic compounds including Al_3Fe and Al_6Fe and mixtures thereof, the improvement which comprises providing in said melt at least one constituent from the group consisting of lithium, sodium, strontium or barium in an amount which is effective to improve the strength or ductility of said alloy by producing in said alloy a refined form of Al_3Fe or very fine Al_6Fe, the amount of each constituent being up to 0.1% by weight of said melt and the total amount of such constituents not exceeding 0.4% by weight of said melt.

3. Method according to claim 1 wherein the resultant alloy is subjected to prolonged thermal treatment just below the eutectic temperature for more than 8 hours, followed by air cooling or water quenching, whereby improved ductility is obtained.

4,002,503

TREATMENT OF METALS AND ALLOY

Alan Arthur Bourne; Jack Chambers Chaston, and Alan Sydney Darling, all of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Continuation of Ser. No. 76,615, Sept. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 581,443, Sept. 23, 1966, Pat. No. 3,547,712. This application Apr. 1, 1975, Ser. No. 564,203

Int. Cl.² B22F *3/20*; **B01J** *23/42, 23/46*

U.S. Cl. 148—11.5 P **2 Claims**

1. In a method of improving the mechanical properties of a previously strengthened metal composition comprising a platinum-rhodium alloy and including, as a dispersed phase, zirconium oxide as a strengthening element, said method comprising the steps of cold-working said composition by working the same at a temperature below that at which substantial recrystallization occurs and subsequently annealing the composition, the improvement whereby all of said cold-working at a temperature below that at which substantial recrystallization occurs is carried out prior to any annealing and the extent of cold-working is such that the recrystallization effected during annealing results in an elongated grain structure highly oriented in the direction of working.

4,002,504

MULTIFILAMENT SUPERCONDUCTORS

David G. Howe, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1975, Ser. No. 643,899

Int. Cl.² H01L *39/00*

U.S. Cl. 148—11.5 R **8 Claims**

1. A composite superconductor which comprises:

multifilaments of an alloy selected from the group consisting of a vanadium-gallium alloy with a gallium content from 0.4 at. % to 12.5 at. %, a niobium-tin alloy with a tin content from 0.1 to 12 at. % and a vanadium-silicon alloy with a silicon content of 0.5–10 at. %;

a matrix sheath of an alloy selected from the group consisting of a copper-gallium alloy with a gallium content from about 0.4 to about 22 at. %, a copper-tin alloy with a tin content from about 1 to about 11 at. %, a copper-silicon alloy with a silicon content from about 0.5 to 14 at. %, so that the matrix alloy has the same metal solute as the core alloy; and

an intermediate layer of an A-15 compound produced by a solid state reaction between said core rod and said matrix sheath.

4,002,505

STABILIZATION OF ALUMINUM ARSENIDE

Roelof P. Bult, Fruitvale, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed July 28, 1975, Ser. No. 599,514

Claims priority, application Canada, June 20, 1975, 229814

Int. Cl.² C22F *1/02*

U.S. Cl. 148—20.3 **6 Claims**

1. In a method for the preparation of aluminum gallium arsenide crystals having improved chemical stability, said crystals being represented by the general formula $Al_{1-x}Ga_xAs$ wherein x has values in the range of about 0.02 to 0.30, the improvement which comprises annealing said crystals at a temperature in the range of from 700° to 1050° C. in the presence of arsenic vapour at an arsenic vapour pressure of about 1 kg/cm^2.

4,002,506

SEMI-HARD MAGNETIC GLASS SEALABLE ALLOY SYSTEM OF COBALT-NICKEL-TITANIUM-IRON

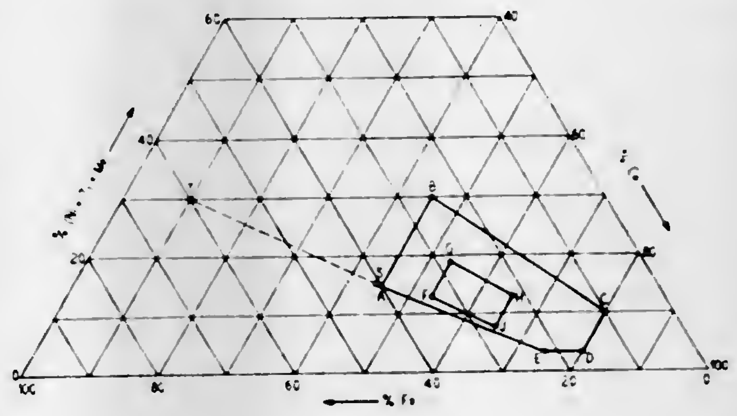
Christian Radeloff, Bruchkobel, and Horst Herrmann, Hanau, both of Germany, assignors to Vacuumschmelze GmbH, Germany

Filed Aug. 7, 1975, Ser. No. 602,779

Claims priority, application Germany, Aug. 7, 1974, 2437921

Int. Cl.² C04B *35/00*

U.S. Cl. 148—31.55 **7 Claims**



1. A solid, semi-hard, magnetic alloy adapted to be sealable in glass, said alloy being characterized by having a coercive force of from about 16 to 60 amperes per centimeter, a remanence ratio of from about 0.75 to 0.95, a remanence flux

density of from about 1.3 to 1.6 Tesla and a saturation flux density of from about 1.5 to 1.75 Tesla, said alloy being further characterized by being substantially free from a thermal expansion hysteresis, said alloy consisting essentially of a multicomponent system of cobalt- (nickel, titanium, Me) iron wherein Me is at least one metal selected from the group consisting of aluminum, copper, tungsten, molybdenum, vanadium, and chromium, and wherein on a 100 weight percent total alloy basis the amount of cobalt ranges from about 45 to 80 weight percent, the amount of iron ranges from about 10 to 40 weight percent, and the total amount of nickel, titanium and Me ranges from about 3 to 30 weight percent and wherein, on such basis, the amount of nickel ranges from about 1.9 to 21 weight percent, the amount of titanium ranges from about 1 to 5 weight percent, and the amount of Me ranges from about 0.1 to 4 weight percent, and the sum of titanium and Me ranges from about 2.2 to 7 weight percent, said alloy being defined by the polygonal region ABCDE of FIG. 1 which is delimited by the polygonal course -

A (45% Co; 15% (Ni+Ti+Me); 40% Fe) -
B (45% Co; 30% (Ni+Ti+Me); 25% Fe) -
C (80% Co; 10% (Ni+Ti+Me); 10% Fe) -
D (80% Co; 3% (Ni+Ti+Me); 17% Fe) -
E (75% Co; 3% (Ni+Ti+Me); 22% Fe) - A,

said alloy having been prepared by the steps of sequentially -

a. melt fusing the starting metals at temperatures ranging from about 1500° to 1560° C.,
b. preliminarily annealing said alloy at temperatures ranging from about 600° to 1100° C.,
c. cold deforming said alloy by at least about 70%, and
d. finally annealing said so deformed alloy at temperatures from about 500° to 700° C for a time of from about 0.5 to 4 hours.

4,002,507

NIOBIUM-FREE SEMI-HARD MAGNETIC GLASS SEALABLE ALLOY SYSTEM OF COBALT- (NICKEL, ALUMINUM, TITANIUM)- IRON

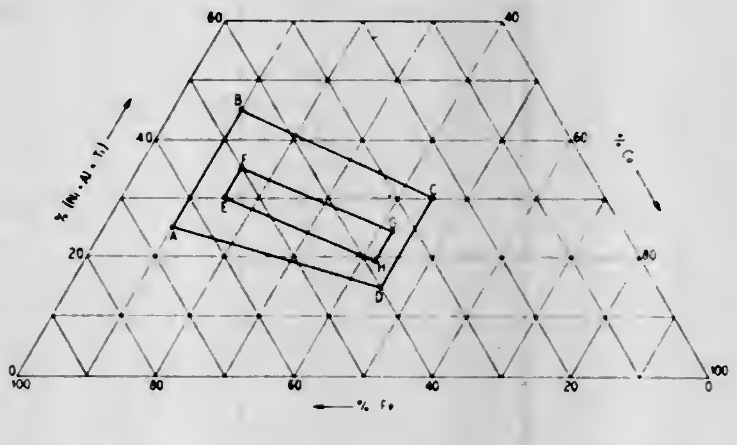
Christian Radeloff, Bruchkobel, and Horst Herrmann, Hanau, both of Germany, assignors to Vacuumschmelze GmbH, Germany

Filed July 1, 1975, Ser. No. 592,242

Claims priority, application Germany, July 3, 1974, 2431874

Int. Cl.² C04B *35/00*

U.S. Cl. 148—31.55 **5 Claims**



1. A solid, semi-hard, magnetic heat-treated and worked alloy adapted to be sealable in glass consisting essentially of a multicomponent system of cobalt- (nickel, aluminum, titanium) - iron wherein on a 100 weight percent basis the amount of cobalt ranges from about 10 to 45 weight percent, the amount of iron ranges from about 25 to 65 weight percent, and the total amount of nickel, aluminum, and titanium ranges from about 15 to 45 weight percent and wherein, on such basis, the amount of nickel ranges from about 10 to 40 weight percent, the amount of aluminum ranges from about 1 to 4 weight percent, and the amount of titanium ranges from about 0.5 to 4 weight percent, and the sum of aluminum and titanium ranging from about 2 to 5 weight percent, said alloy being defined by the polygonal region ABCD of FIG. 1 which is delimited by the polygonal course.

A (10 % Co; 25 % (Ni+Al+Ti); 65 1 % Fe) —
B (10 % Co; 45 % (Ni+Al+Ti); 45 % Fe) —
C (45 % Co; 30 % (Ni+Al+Ti);25 % Fe) —
D (45 % Co; 15 % (Ni+Al+Ti); 40 % Fe) — A,

said alloy having been prepared by the steps of sequentially

a. melt fusing the starting metals at temperatures ranging from about 1500° to 1560° C.,
b. preliminarily annealing said alloy at temperatures ranging from about 700° to 900° C.,
c. cold deforming said alloy by at least about 70%, and
d. finally annealing said so deformed alloy at temperatures from about 500° to 700° for a time of from about 1 to 3 hours.

4,002,508

COMPOSITION FOR PERMANENT MAGNETS OF THE FAMILY "RARE EARTHS-TRANSITION METALS" AND PROCESS FOR PRODUCING SUCH A MAGNET

Jean-Paul Haberer, Saint Martin d'Heres, France, assignor to Aimants Ugimag S.A., France

Filed Aug. 14, 1975, Ser. No. 604,747

Claims priority, application France, Aug. 27, 1974, 74.29345

Int. Cl.² H01F *1/04*

U.S. Cl. 148—31.57 **6 Claims**

1. A permanent magnet having a residual intrinsic induction of at least 7,400 Gauss and an intrinsic coercive field of at least 29,200 Oersteds and having as the active magnetic component a degassed and sintered product of compacted particulate material, said material containing an amount of 35 to 42 % by weight of samarium, an amount of 64.5 to 43 % by weight of cobalt and an amount of 0.5 to 15 % by weight of nickel.

4,002,509

PROCESS FOR THE MANUFACTURE OF A HIGH STRENGTH CHAIN AND THE PRODUCT OBTAINED THEREBY

Barbro Marie Rohlin, Sandviken; Sten Lennart Bergh, Vaxholm, and Gustav Nils Herman Westerberg, Borlange, all of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Dec. 22, 1975, Ser. No. 643,122

Claims priority, application Sweden, Dec. 23, 1974, 7416252

Int. Cl.² C21D *9/00*

U.S. Cl. 148—34 **5 Claims**

1. In a process for the manufacture of a chain having an ultimate tensile strength of at least 90 kg/mm² and an impact value at ±0° C of at least 2.8 kgm, the improvement comprising hot rolling a steel ingot consisting essentially of:

C	=0.04 - 0.10	% by weight
Si	=0.1 - 1.2	% by weight
Mn	=2.2 - 3.0	% by weight
Cr	=1.5 - 3.0	% by weight
Mo	=0.10 - 0.60	% by weight
N	=0.005 - 0.020	% by weight
Al Acid soluble	=0.015 - 0.10	% by weight
Nb or V up to	=0.1	% by weight.
Fe containing normal contaminants = remainder		

to a bar of a dimension suitable for use in a chain, cutting said bar into pieces of adjusted length and resistance heating the same to 700° - 900° C, bending and flash-butt welding said pieces to connect the same into links of a chain, heat treating said chain by heating to a temperature of 700° - 900° C and then cooling the chain in air.

4,002,510

STAINLESS STEEL IMMUNE TO STRESS-CORROSION CRACKING

Bryan E. Wilde, Indiana Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 1, 1975, Ser. No. 573,652

Int. Cl.² C22C *38/02, 38/40*

U.S. Cl. 148—38 **4 Claims**

1. An austenitic stainless steel virtually immune to stress-corrosion cracking and intergranular stresscorrosion cracking consisting essentially of 0.005 to 0.08% carbon, 0.01 to 0.04% nitrogen, 16.0 to 20.0% chromium, 8.0 to 10.0% nickel, 3.5 to 5.5% silicon, up to 1.5% manganese, up to 0.15% copper and the balance iron with conventional residual impurities, and having a microstructure consisting of from 7 to 45 volume % delta ferrite in an austenitic matrix.

4,002,511

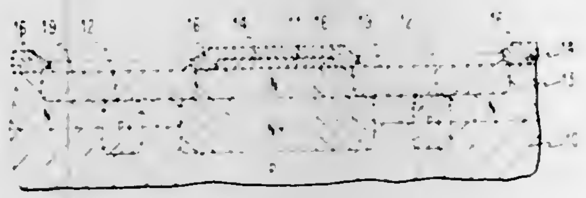
METHOD FOR FORMING MASKS COMPRISING SILICON NITRIDE AND NOVEL MASK STRUCTURES PRODUCED THEREBY

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,546

Int. Cl.² H01L *21/308*

U.S. Cl. 148—187 **9 Claims**



1. In the fabrication of integrated circuits, a method for altering the characteristics of exposed portions in a masked silicon substrate comprising

forming a first mask comprising silicon dioxide on said silicon substrate having at least one opening exposing the substrate,
forming on said first mask, a mask comprising silicon nitride having at least one opening laterally smaller than said at least one opening in said first mask and respectively in registration with at least one opening in said first mask whereby said second mask contacts and covers a portion of said exposed silicon substrate under said at least one registered opening, and
thermally oxidizing the substrate remaining exposed in said at least one opening to convert the exposed silicon into silicon dioxide recessed into said substrate.

4,002,512

METHOD OF FORMING SILICON DIOXIDE

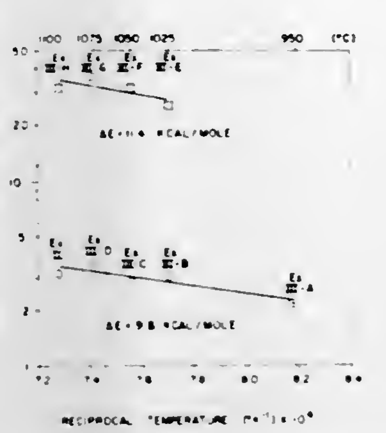
Mahn-Jick Lim, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 506,622, Sept. 16, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 568,215

Int. Cl.² H01L *21/18*

U.S. Cl. 148—187 **23 Claims**

1. A method of depositing a glass layer comprising SiO_2 on a surface of a substrate which comprises initially combining gaseous SiH_2Cl_2 with an oxidizing gas, selected from the group consisting of O_2, CO_2, N_2O, H_2O and mixtures thereof in a liquid phase free ambient at a temperature ranging from about 450° C to about 1200° C to directly form and deposit SiO_2 on the substrate surface at a rate which is substantially temperature independent.



4,002,513

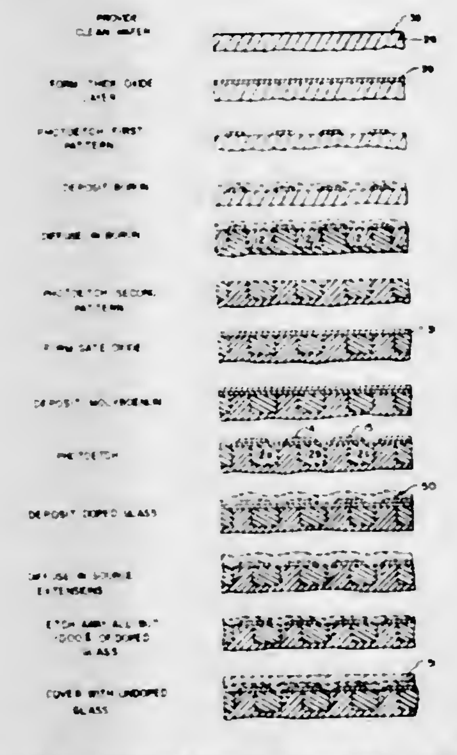
BUCKET-BRIGADE DELAY LINE HAVING REDUCED PARASITIC CAPACITANCES AND METHOD FOR MAKING THE SAME

Walter J. Butler, Scotia; Mark B. Barron, Camillus, both of N.Y., and Bruno F. Kurz, deceased, late of Schenectady, N.Y. (by Elizabeth Kurz-Beerli, executrix), assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1975, Ser. No. 552,940

Int. Cl.² H01L *21/225*

U.S. Cl. 148—187 **9 Claims**



1. A method for making a bucket brigade delay line comprising

selectively diffusing a plurality drain-source regions of a first conductivity type into one surface of a substrate of opposite conducting type,
forming a gate oxide layer on said surface,
forming a plurality laterally spaced apart gate electrodes on said oxide layer, each of said gate electrodes having first and second laterally separated edges, said first edge overlapping one of said drain regions,
diffusing extensions of said drain-source regions by utilizing said gate electrodes as a diffusion mask so that the lateral extent of said extensions is limited by said second edge.

4,002,514

NITROCELLULOSE PROPELLANT COMPOSITION

John J. Plomer, Midland; Gerald R. Staudacher, Bay City, and Keith Roberson, Freeland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 30, 1965, Ser. No. 493,306

Int. Cl.^{2} C06D *5/06*

U.S. Cl. 149—19.4 **5 Claims**

1. A propellant composition which comprises on a weight basis;

- a. from about 5 to about 60 percent of a nitramine oxidizer, said oxidizer being a member selected from the group consisting of cyclotrimethylene trinitramine, cyclotetramethylene tetramine or mixtures thereof,
- b. from about 5 to about 60 percent of triaminoguanidinium azide, triaminoguanidinium hydrazinium diazide or mixtures thereof, and
- c. from about 35 to about 60 percent of a plasticized nitrocellulose binder.

4,002,515

HYDROXYETHYL CELLULOSE THICKENED HYDRAZINE AND SUBSTITUTED HYDRAZINES

Thomas J. Galvin, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Oct. 22, 1965, Ser. No. 502,440

Int. Cl.^{2} C06B *47/08*

U.S. Cl. 149—36 **8 Claims**

1. A thickened composition comprising:

- 1. a major amount of a compound selected from the group consisting of hydrazine, methyl hydrazine, unsymmetrical dimethyl hydrazine, and mixtures thereof, and
- 2. a minor amount of hydroxyethyl cellulose.

4,002,516

HERMETIC CLOSURE

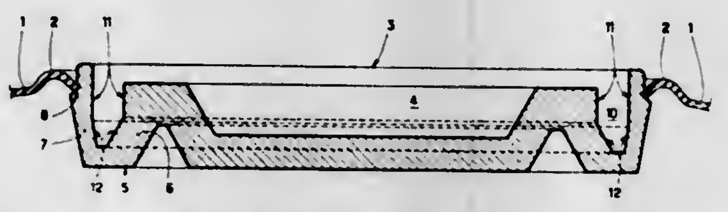
Jean-Yves Gaborieau, Velizy, and Bernard Baumann, Courbevoie, both of France, assignors to CEBAL, Paris, France

Filed Sept. 24, 1975, Ser. No. 616,407

Claims priority, application France, Sept. 26, 1974, 74.33138; July 25, 1975, 75.23870

Int. Cl.^{2} B32B *31/20*

U.S. Cl. 156—69 **16 Claims**



1. A closure device of a generally resilient material comprising a sealing cap adapted to be fitted herematically into an aperture in a rigid wall of a vessel and to be retained therein by a generally rigid peripheral annular part which is adapted to be urged against the edge of a wall defining the aperture and which under the stress of a tension on the sealing cap exerted towards the inside of the vessel folds back in the direction of the axis of symmetry of the said sealing cap around a hinged or articulated zone constituted by the bottom of an annular slot comprising side walls which are parallel over a substantial proportion of their height separating the annular part from a central part of the sealing cap, the hinged or articulated zone being located out of the plane of the aperture, and an annular locking member which is adpated to be press-fitted into the annular slot and to cooperate therewith wherein the annular locking member can only be separated from the annular slot by the positive application of an external force.

12. A process for applying a thermoplastic sealing cap having an annular slot in the top surface thereof in a container having an aperture with a surrounding wall comprising the steps of;

- a. locating said sealing cap within the container aperture;
- b. locally heating the portion of said cap in contact with the edge of the surrounding wall until it begins to soften; and
- c. inserting an annular, nondeformable locking member into said annular slot while said cap portion is soft, whereby a hermetic seal is formed between the edge of said wall and the portion of said cap in contact therewith.

4,002,517

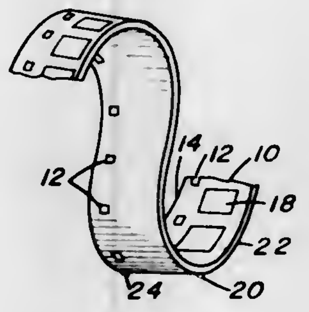
TACKED FILM ROLL AND METHOD OF MAKING SAME

Robert I. Edelman, Rochester; Willis L. Stockdale, Fairport; Robert A. Sylvester, Hilton, and Corrado Zollo, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 499,381, Aug. 21, 1974, Pat. No. 3,958,870. This application Dec. 24, 1975, Ser. No. 644,228

Int. Cl.^{2} B32B *31/20*

U.S. Cl. 156—73.4 **4 Claims**



1. The method of forming a film-loaded photographic cartridge of the type having a film supply chamber defined in part by an intermediate cartridge wall and by an outer cartridge wall carried, respectively, by a cartridge body and a cartridge cover and comprising the steps of:

- providing a strip of photographic film of the type having a first web face carrying a raised stripe adjacent one longitudinal edge of said strip and a second web face carrying a photosensitive emulsion;
- forming said strip into a roll thereof having a plurality of convolutions;
- supporting an end face of said roll on the intermediate wall of a cartridge body; and
- so applying heat to the opposite end face of said roll as to melt the emulsion layer of one convolution at the interface thereof with the raised stripe of an adjacent convolution to cause said convolutions to adhere at said interface.

4,002,518

HELICALLY FLUTED DEEP HOLE CATHODE AND METHOD OF MAKING SAME

Richard H. Shaw, Hampden, Mass., assignor to United Technologies Corporation, Hartford, Conn.

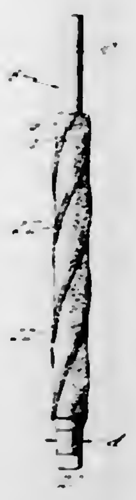
Division of Ser. No. 455,839, March 28, 1974, Pat. No. **3,880,745. This application Jan. 16, 1975, Ser. No. 541,668**

Int. Cl.^{2} B32B *5/08, 31/16*

U.S. Cl. 156—154 **5 Claims**

1. The method of producing a hollow cathode for use in electrochemical drilling deep holes of small diameter in a workpiece comprising the steps of:

- A. providing a conductive metal cathode tube having an exterior dielectric coating of selected thickness,
- B. attaching a plurality of threadlike members to one end of the cathode tube at substantially equally spaced circumferential stations therearound,
- C. helically winding the threadlike members around and toward the other end of the cathode tube while maintaining the circumferential spacing to form helical flutes around the tube,
- D. securing the other ends of the threadlike members to the other end of the cathode tube,
- E. applying an insulating layer over the exterior of the cathode tube and helically wound threadlike members to produce a helically fluted cathode tube with an electrically insulated exterior, and



- F. providing an electrode tip of selected diameter at one end of the cathode tube.

4,002,519

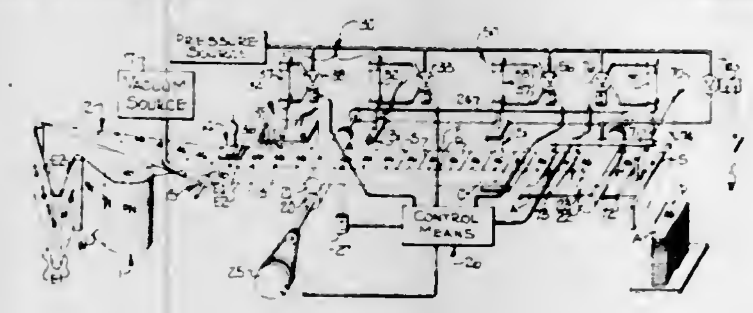
APPARATUS AND METHOD FOR FORMING POUCHES

Ronald E. Moseley, Rock Hill, S.C., and Henry G. Stewart, Harrisburg, N.C., assignors to Engraph, Inc., Charlotte, N.C.

Filed Feb. 12, 1975, Ser. No. 549,462

Int. Cl.^{2} B31B *1/14, 1/22, 19/14, 21/14*

U.S. Cl. 156—204 **19 Claims**



3. A method of forming successive pouches from a web of plastic film comprising

- advancing the web of plastic film from a supply source to a folding station and folding the web along a longitudinal fold line so as to position one free longitudinal edge of the web between the fold line and the other free longitudinal edge of the web to thereby define a two-ply portion between the fold line and said one free longitudinal edge of the web and a single ply portion adjacent thereto between the said one free longitudinal edge of the web and said other free longitudinal edge,
- advancing the folded web from the folding station to a sealing station and sealing together confronting surfaces of the two-ply portion along longitudinally spaced apart seal areas extending transversely across the two-ply portion to thereby define in the two-ply portion of the folded web a series of successive pouches interconnected by the seal areas,
- advancing the thus sealed folded web from the sealing station to a flap forming station and succęssively severing and removing from the single ply portion of the web, in areas adjacent to and in transverse alignment with each of the seal areas, longitudinally spaced transversely extending waste areas to thereby form the single ply portion into a series of successive flaps extending alongside each of the succesive pouches and adapted for being folded over the pouches to close the same,
- each successive severing and removing operation comprising the steps of supporting the single ply portion of the web surrounding the waste area to be removed while piercing the web at a predetermined point spaced from the free longitudinal edge of the single ply portion and corresponding to one end of the waste area, thereafter severing the single ply portion from the point of piercing along two spaced apart cut lines extending generally transversely across the single ply portion toward the free longitudinal edge while grasping the single ply portion of the web in said waste area and closely adjacent to said free longitudinal edge, maintaining grasping the web while continuing severing along the two transversely extending cut lines and on opposite sides of the point of grasping and to and through the free longitudinal edge of the web to thereby cut the waste area free from the remaining web, and releasing the cut-out waste area and ejecting the same clear of the advancing web, and
- advancing the thus formed series of interconnected pouches from the flap forming station to a cut-off station and successively cutting transversely across the folded web and across a medial portion of each seal area to thereby separate the interconnected pouches from one another.

15. Apparatus for forming successive pouches from a web of plastic film comprising

- a folding station including means for receiving a web of plastic film from a supply source and folding the web along a longitudinal fold line so as to position one free longitudinal edge of the web between the fold line and the other free longitudinal edge of the web to thereby form a two-ply portion between the fold line and said one free longitudinal edge of the web and a single ply portion adjacent thereto between said one free longitudinal edge of the web and the other free longitudinal edge,
- means for advancing the web through the folding station and forwardly therefrom along a predetermined path,
- a sealing station positioned forwardly of the folding station and including means for sealing confronting surfaces of the two-ply portion of the web together along longitudinally spaced apart seal areas extending transversely across the two-ply portion to thereby define a series of successive pouches interconnected by the seal areas as the folded web is advanced through the sealing station,
- a flap forming station positioned forwardly of the folding station and including means for successively severing and removing from the single ply portion, as the folded web is advanced through the flap forming station, longitudinally spaced transversely extending waste areas of predetermined shape to thereby form the single ply portion into a series of successive flaps adapted for being folded over the pouches formed in the two-ply portion,
- said severing and removing means including means for supporting the single ply portion of the web surrounding the predetermined shaped waste area to be removed, a reciprocating cutter blade having one end thereof sharpened and positioned for piercing the single ply portion of the web at a predetermined point spaced from the free longitudinal edge of the single ply portion and corresponding to one end of the waste area to be removed and having a pair of spaced apart sharpened cutting edges extending from said one sharpened end and being inclined at an angle to the plane of the web for thereafter severing the single ply portion from the point of piercing along two spaced apart cut lines extending generally transversely across the single ply portion to the free longitudinal edge thereof, means operating in timed relation with said cutter blade for grasping the single ply portion of the web in said waste area closely adjacent the free longitudinal edge during severing of the waste area along said cut lines, and for releasing the cut-out waste area upon completion of severing thereof from the remaining web, and means operating in timed relation with said cutter blade for ejecting the cut-out waste area clear of the advancing web after the piercing and severing operation is completed,
- and a cut-off station located forwardly of the sealing station and the flap forming station and including means for

successively cutting transversely across the folded web and across a medial portion of each seal area to thereby separate the interconnected pouches from one another.

4,002,520
MANUFACTURE OF VEHICLE SEATS

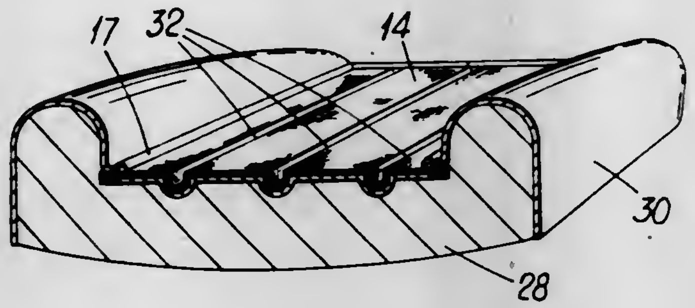
Sidney Desmond Fenton, Forton, near Preston, England, assignor to Storey Brothers and Company Limited, White Cross, England

Filed Feb. 5, 1973, Ser. No. 329,953

Claims priority, application United Kingdom, Feb. 11, 1972, 6544/72

Int. Cl.² B29C *9/00, 27/06;* **B29D** *7/02, 27/04*

U.S. Cl. 156—246 10 Claims



1. The method of making a loose cover for a padded item comprising:

A. forming a thermoplastic sheet comprising a sealing surface layer and a foam backing layer by casting a skin coating of a plasticized vinyl chloride polymer followed by a foamable vinyl chloride polymer coating on an embossed temporary support, fusing and blowing said coating to give said thermoplastic sheeting, and removing said thermoplastic sheeting from said temporary support;

B. shaping said thermoplastic sheet by vacuum forming to give a shaped thermoplastic cover which generally corresponds to the shape of the desired padded item;

C. welding the edges of at least one fabric panel to said shaped thermoplastic cover, said panel being secured by said welding to the underside of said shaped thermoplastic cover; and

D. removing thermoplastic sheet material from the region within that defined by the edges of the welded fabric and being over said fabric panel to expose said fabric panel from the outside of said shaped thermoplastic cover, and thereby obtaining said loose cover.

4,002,521
METHOD OF FORMING, MOUNTING AND USING FLUSH VALVES FOR FLUSH TANKS AND THE LIKE

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805

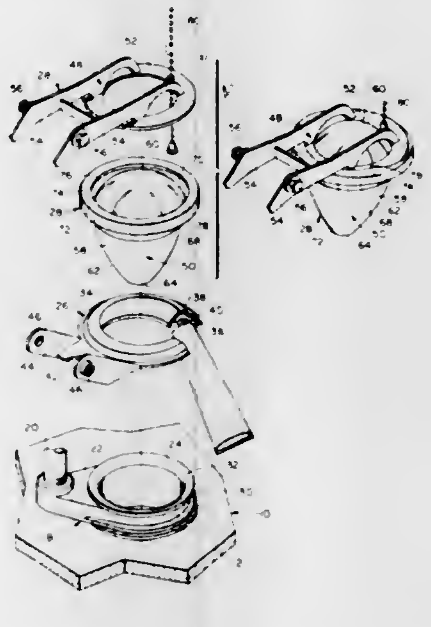
Division of Ser. No. 497,524, Aug. 15, 1974. This application Apr. 9, 1975, Ser. No. 566,211

Int. Cl.² B29C *19/00;* **B32B** *31/00*

U.S. Cl. 156—293 10 Claims

1. In a method of mounting a flush valve in a flush tank and the like, the flush tank being of the type having a flush valve seat portion opening downwardly therethrough with an upper end portion having a generally upwardly facing annular end surface; the steps of: forming a valve seat ring completely separate of said flush valve seat portion; forming a closure member completely separate of said flush valve seat portion; hingedly assembling said valve seat ring directly with said closure member into a hinged integrated unitary assembly still completely separate of said flush valve seat portion and with guiding portions between said valve seat ring and said closure member positively guiding said closure member hingedly movable upwardly angled away from and downwardly angled toward a downward sealing position abuttingly sealing against said valve seat ring; and mounting said previously assembled separate valve seat ring and closure member integrated unitary assembly directly on and totally confined to said upper end portion over said end surface of said tank flush valve seat portion in free standing hingedly operable condition without other mounting connection including free of any flush tank walls by mounting said valve seat ring securely solely on said upper end portion of said tank flush valve seat portion with sealing means between said ring and end portion.

6. In a method of forming and using a flush valve in a flush tank and the like, the flush tank being of the type having a flush valve seat portion opening downwardly therethrough with an upper end portion having a generally upwardly facing annular end surface; the steps of: forming a generally upwardly facing annular valve seat on the upwardly facing end surface of the flush valve seat portion; during said forming of said upwardly facing annular valve seat, forming two annular concentric radially adjacent ring portions facing generally upwardly thereon with one being a greater projecting and the other being a lesser projecting ring portion; mounting a closure member movable downwardly to and upwardly away from a sealing position with a resilient sealing surface facing said valve seat ring portions in said sealing position; sealing said closure member sealing surface in said closure member sealing position primarily abutting said greater projecting of said two annular concentric radially adjacent ring portions on said valve seat during initial use of said closure member; and after said closure member initial use and during later use, sealing said closure member sealing surface in said closure member sealing position abutting both said greater projecting and said lesser projecting of said two annular concentric radially adjacent ring portions on said valve seat.



4,002,522
FILM SPLICING DEVICE

Leo Catozzo, Bivio per Tolfa, Km. 0,700, 00050 S. Severa, Italy

Filed July 14, 1975, Ser. No. 595,725

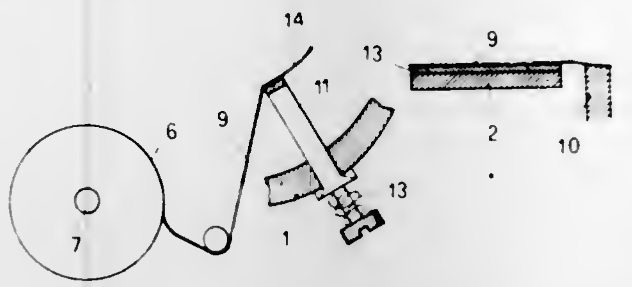
Claims priority, application Italy, Aug. 2, 1974, 52414/74

Int. Cl.² B31F *5/00;* **G03D** *15/04*

U.S. Cl. 156—506 8 Claims

1. A device for splicing together, strips of material with adhesive tape, the device comprising:

a lower dieplate for supporting the strips of material to be spliced together on a flat surface thereof; and a front bridge and a rear bridge located respectively adjacent lateral edges of said flat surface with respective tops projecting slightly above said flat surface and between which adhesive tape is to be stretched above the strips in vicinity of that area at which they are to be jointed, at least one of said bridges being an oscillatable bridge mounted for movement between its position adjacent said flat surface and a retracted position away from said lower dieplate which provides a gap between said lower dieplate and said oscillatable bridge; whereby an operator may readily insert his finger into the gap in order to grip an end of an adhesive tape carried by the oscillatable bridge subsequent to cutting of the tape.



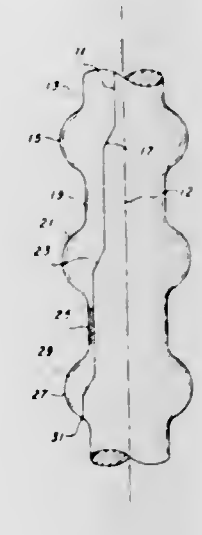
4,002,523
DISLOCATION-FREE GROWTH OF SILICON SEMICONDUCTOR CRYSTALS WITH <110> ORIENTATION

Lawrence Dean Dyer, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 396,654, Sept. 12, 1973, abandoned. This application May 19, 1975, Ser. No. 579,297

Int. Cl.² B01J *17/18;* **C01B** *33/02*

U.S. Cl. 156—617 SP 2 Claims



1. In a method of forming silicon crystals with <110> crystallographic orientation, which comprises the steps of:

pulling a <110> crystal silicon stem having a long thin portion from a silicon melt, said crystal having a first diameter and dislocations propagating in a direction substantially parallel to the stem axis, said portion being sufficiently long to remove dislocations on 111 planes that are inclined to the <110> axis.

the improvement comprising (a) enlarging said crystal stem to a second diameter sufficiently great to divert the dislocation propagation path away from the stem axis,

b. then reducing said crystal stem to a third diameter sufficiently small to cause said dislocation to terminate at a crystal edge, and then

c. growing the remainder of the crystal.

4,002,524
METHOD AND APPARATUS FOR EVAPORATING LIQUID

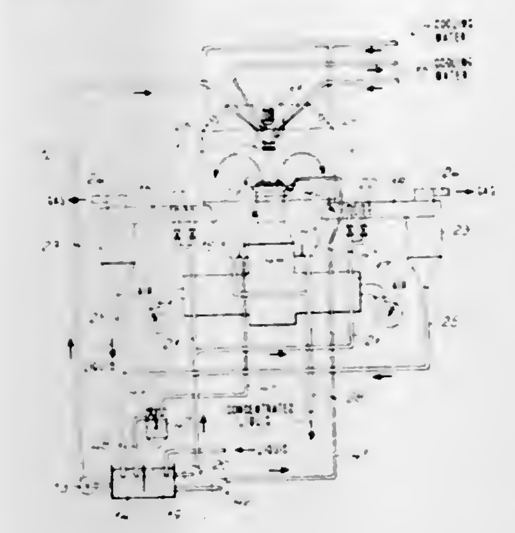
Jorgen Damgaard-Iversen, Birkerod; Klaus Erik Gude, Vedbaek; Ove Emil Hansen, Vaerlose; Bjorn Lund, Frederiksberg, and Mogens Petersen, Lyngby, all of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Continuation of Ser. No. 287,868, Sept. 11, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,607

Claims priority, application Denmark, Sept. 10, 1971, 4464/71

Int. Cl.² B01D *1/16;* **F26B** *3/12*

U.S. Cl. 159—4 B 17 Claims



9. An apparatus or a system according to claim 8, wherein the gas inlet duct or tube is connected to supply means for particulate material downstream of and preferably adjacent to a Venturi throat on the gas inlet duct or tube.

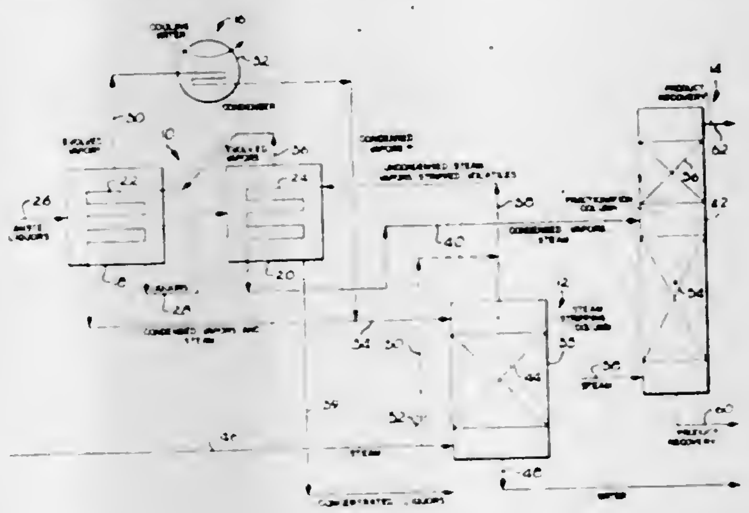
4,002,525
CHEMICAL RECOVERY FROM WASTE LIQUORS UTILIZING INDIRECT HEAT EXCHANGERS IN MULTI-STAGE EVAPORATION PLUS CONTACT STEAM STRIPPING

Kenneth W. Baierl, Appleton, Wis., assignor to Flambeau Paper Company, Park Falls, Wis.

Filed Mar. 13, 1975, Ser. No. 558,003

Int. Cl.² B01D *1/26, 1/00, 1/22*

U.S. Cl. 159—47 WL 23 Claims



1. A process for treating waste liquors such as condensates and spent liquors derived from chemical processing operations, comprising the steps of:

directing said liquors to an evaporation zone;

heating said liquors in said evaporation zone to effect concentration of the liquors therein with consequent evolution of vapors, said heating including the step of directing a heating medium which includes steam to the evaporation zone for indirectly heating and concentrating at least a portion of said liquors therein;

condensing said vapors;

- directing at least a portion of the condensed vapors to a stripping zone;
- stripping at least a portion of the chemical constituents within said condensed vapors by subjecting the latter to the action of stripping steam in the stripping zone; and
- directing at least a fraction of said stripping steam, after the latter has acted to strip chemical constituents from the condensed vapors in said stripping zone, back to said evaporation zone as at least a part of said heating medium for heating and concentrating additional volumes of liquor in the evaporation zone.

4,002,526

OXYGEN-ALKALI DELIGNIFICATION OF LOW CONSISTENCY WOOD PULP

Kenton J. Brown, Suffern, and Arthur W. Kempf, Warwick, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,355

Int. Cl.^{2} D21C *9/10*

U.S. Cl. 162—57 **13 Claims**

1. An improved process for increasing the yields of wood pulp and improving the viscosity of the pulp during oxygen-alkali delignification, which consists of treating with oxygen and alkali an aqueous wood pulp slurry having a consistency of between about 1 and 10% based on oven-dried pulp and a pH within the range of between about 9 and 13 and containing a member selected from the class consisting of ammonia in an amount of between about 0.1 and 3% by weight of oven-dried pulp and a compound releasing ammonia in an amount of between about 0.1 and 6% by weight of oven-dried pulp, at a temperature between about 200° and 260° F. and at an oxygen pressure of between about 30 and 300 psig.

4,002,527

SOLVENT-DISTRIBUTED, POWDERED RUBBER IN BEATER SATURATED SHEETS

Jay L. Piersol, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 375,496, July 2, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,883

Int. Cl.^{2} D21F *11/00*

U.S. Cl. 162—155 **9 Claims**

1. A beater saturation process which comprises

a. forming a slurry of fibers in water;
b. adding powdered chlorinated natural rubber particles to the slurry in an amount of about 25% by weight based on the dry weight of the fibers;
c. adding a synthetic latex binder, the binding properties of which will remain substantially unchanged by subsequently applied solvent for the chlorinated rubber particles;
d. precipitating said binder onto said fibers whereby said powdered rubber is carried with said binder to said fibers;
e. forming sheet from the rubber coated fibers;
f. drying the sheet;
g. treating the dried sheet with a solvent for the chlorinated rubber particles for a period of time sufficient to cause substantial swelling and smearing of the rubber particles throughout the fibers of the sheet without causing any significant swelling of the binder; and
h. removing the solvent.

5. The process according to claim 1 in which said fibers comprise asbestos.

4,002,528

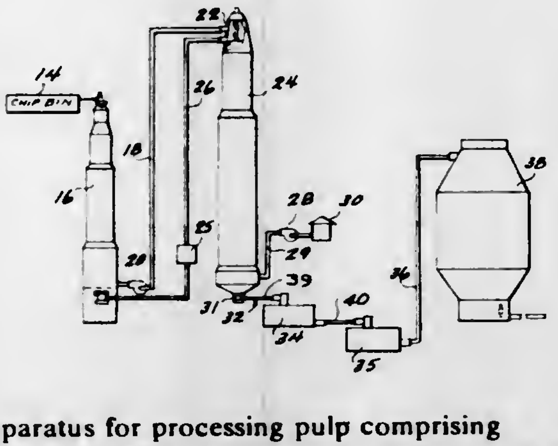
APPARATUS FOR PROCESSING PULP

Oliver A. Laakso, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Continuation of Ser. No. 227,438, Feb. 18, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,926

Int. Cl.^{2} D21C *7/00*

U.S. Cl. 162—237 **2 Claims**



1. Apparatus for processing pulp comprising

- a continuous cellulose digester including a discharge and means for washing digested material in said digester before discharge therefrom,
- means for feeding material to be digested to said digester,
- a blow line communicating with said digester discharge to receive digested material at a 6–15% solids content and at a pressure of about 10–20 atmospheres,
- a first refiner for breaking up the solids in said digested material into individual fibers, said refiner including a pair of grinding surfaces that are spaced a distance X from each other,
- means for connecting said first refiner in said blow line so that no pressure reduction will occur during transport of digested material to said first refiner other than pressure reductions that necessarily result from the transport of the digested material over a distance, and so that no decrease in solids content occurs,
- a second refiner for breaking up the solids in said digested material into individual fibers, said refiner including a pair of grinding surfaces that are spaced a distance Y from each other, and wherein Y is substantially less than X,
- means for connecting said second refiner in said blow line in series with said first refiner so that no pressure reduction will occur during transport of digested material to said second refiner from said first refiner other than pressure reductions that necessarily result from the transport of the digested material over a distance, and so that no decrease in solids content occurs, and
- means for discharging refined digested material from said second refiner to a subsequent treatment station at a pressure of about 5–10 atmospheres, the pulp moving as an essentially air-free mass of digested material from said digester discharge through said refiners to said subsequent treatment station.

4,002,529

NUCLEAR FUEL HANDLING APPARATUS

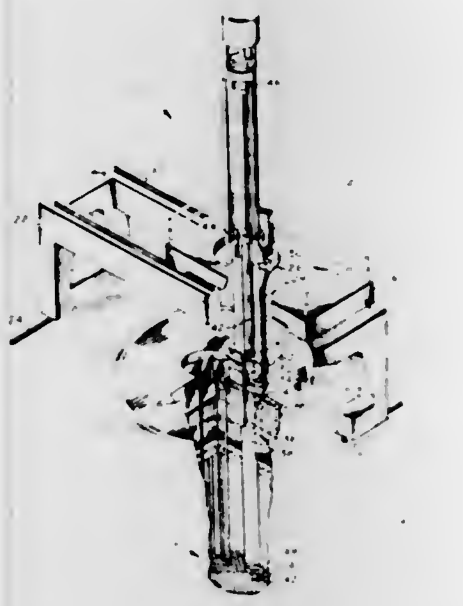
Christo Andrea, Windsor Locks, Conn.; Clive Frederick George Dupen, San Diego, Calif., and Richard Croissant Noyes, Hartford, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1974, Ser. No. 430,292

Int. Cl.^{2} G21C *19/20*

U.S. Cl. 176—30 **5 Claims**

1. In combination, a liquid metal cooled nuclear reactor and a fuel handling machine for the reactor, said reactor including: a vessel containing liquid metal coolant; a core surrounded by said coolant, said core containing a plurality of fuel subassemblies, the level of coolant above said subassemblies being at least equal to the length of the subassemblies; a closure head for said vessel having an entrance port therein; said fuel handling machine comprising: control and drive assembly means positionable above and spaced from said entrance port; a tubular barrel extending down from said control and drive assembly means; a seal valve attached to the bottom of said barrel for making sealed communication with said entrance port, said communication extending into said barrel; a handling tube mounted within said barrel for passing through said entrance port into said reactor and defining an annular space between said tube and said barrel; a closure valve in the bottom of said handling tube through which a fuel subassembly may be passed; means for opening and closing said closure valve; means extending from said control and drive assembly means for lowering said handling tube into said vessel to a position adjacent to the upper end of said fuel subassemblies and for retracting said handling tube back into said tubular barrel; gripper means vertically movable within said handling tube for being lowered and extended down through said open closure valve for engaging a selected fuel subassembly; means extending from within said control and drive assembly means, through said handling tube, for raising and lowering said gripper means; heat transfer means for continuously removing heat from liquid metal trapped within said handling tube; whereby upon engaging said seal valve with said entrance port, lowering said handling tube into said reactor, opening said closure valve, lowering said gripper means to a position adjacent a subassembly, engaging said subassembly with said gripper means, raising said gripper means to draw said subassembly into said handling tube, closing said closure valve, and raising said handling tube into said barrel, said fuel subassembly is contained in said handling tube immersed in liquid metal coolant which has been captured in said tube and is cooled by said heat transfer means.



4,002,530

6-AMINOPENICILLANIC ACID DERIVATIVE

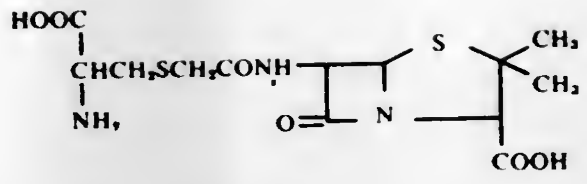
Hugo Troonen, Hoeilaart; Piet Roelants, Watermaal-Bosvoorde, and Bernard Boon, Ohain, all of Belgium, assignors to Recherche et Industrie Therapeutiques (R.I.T.), Belgium

Division of Ser. No. 449,180, March 7, 1974, Pat. No. 3,883,511. This application Jan. 9, 1975, Ser. No. 539,900

Int. Cl.^{2} C12D *9/08*

U.S. Cl. 195—36 P **3 Claims**

1. A method of producing the compound 6-[(D)-(2-amino-2-carboxyethylthio)acetamido]penicillanic acid of the formula



which comprises cultivating Acremonium chrysogenum ATCC 20,389 in a culture medium containing assimilable sources of carbon and nitrogen, inorganic salts, L-lysine, and L-carboxymethylcysteine under submerged aerobic conditions until a substantial amount of the said compound is produced.

4,002,531

MODIFYING ENZYMES WITH POLYETHYLENE GLYCOL AND PRODUCT PRODUCED THEREBY

Garfield P. Royer, Worthington, Ohio, assignor to Pierce Chemical Company, Rockford, Ill.

Filed Jan. 22, 1976, Ser. No. 651,240

Int. Cl.^{2} C07G *7/02*

U.S. Cl. 195—68 **1 Claim**

1. A process for the preparation of the monoalkyl polyethyleneglycol derivative of an enzyme containing free amino groups comprising reductively alkylating the free amino groups of the enzyme with the aldehyde derivative of a monoalkyl polyethyleneglycol.

4,002,532

ENZYME CONJUGATES

Joel K. Weltman, 4 Wildacre Lane, Barrington, R.I. 02806, and M. Boris Rotman, 11 Mayflower St., Providence, R.I. 02906

Filed Oct. 21, 1974, Ser. No. 516,331

Int. Cl.^{2} G01N *31/14;* **C07G** *7/02*

U.S. Cl. 195—103.5 A **16 Claims**

1. A process for producing an enzyme conjugate with other non-enzyme proteinaceous macromolecules which consists essentially of reacting together an enzyme; a poly-functional coupling agent selected from the group consisting of diisocyanates, carbodiimides, p,p'-di-fluoro-m,m'-dinitrodiphenylsulfone, glutaraldehyde, dimethyladipimate, formaldehyde, bisdiazobenzidine and aromatic halide disulfonates; a polyamine selected from the group consisting of albumin or a diamine selected from a group consisting of phenylenediamine, 4.4'-diaminobenzophenone, p,p'-diaminodiphenyl methane, naphthalene diamine, benzidine, 2,6-diaminopurine, ethylene diamine, propylene diamine diaminodipropylamine and hexamethylene diamine; and a non-enzyme proteinaceous macromolecule selected from the group consisting of antibodies, antigens, allergens and hormones under conditions which preserve enzymatic activity and form said enzyme conjugate.

12. A process for the detection of antibodies which includes the steps of adhering to a solid support, material which specifically binds antibodies to be detected, adding a body fluid to said adhered material to band antibodies therein to the adhered material, washing the support to remove unbound components of the body fluid, adding the enzyme conjugate of claim 7 to said washed support whereby the conjugate becomes bound to the solid support in proportion to the amount of bound antibodies, washing the support to remove unbound conjugate, and determining the presence of bound antibodies by determining enzymatic activity of said conjugate.

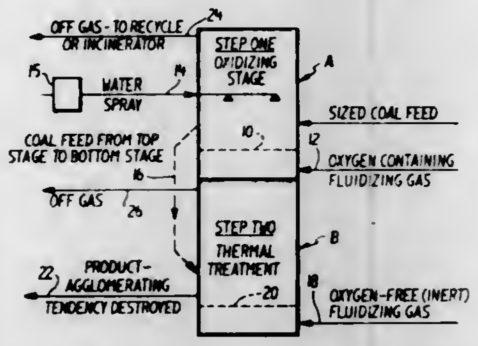
4,002,533
TWO-STEP PROCESS FOR CONDITIONING SIZED COAL AND RESULTING PRODUCT

Albert J. Repik, Charleston; Charles E. Miller, Mount Pleasant, and Homer R. Johnson, Charleston, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 269,300, July 6, 1972, abandoned. This application May 9, 1974, Ser. No. 468,616

Int. Cl.^{2} C10L *9/06*

U.S. Cl. 201—1 **6 Claims**


OFF GAS - TO RECYCLE OR INCINERATOR
24
STEP ONE OXIDIZING STAGE
A
15
WATER SPRAY
14
SIZED COAL FEED
10
12
COAL FEED FROM TOP STAGE TO BOTTOM STAGE
OXYGEN CONTAINING FLUIDIZING GAS
16
OFF GAS
26
STEP TWO THERMAL TREATMENT
B
22
PRODUCT-AGGLOMERATING TENDENCY DESTROYED
20
18
OXYGEN-FREE (INERT) FLUIDIZING GAS

1. A process for conditioning high volatile coal particles to be used for making activated carbon or obtaining a synthesis gas consisting essentially of:

a. sizing the coal to a particulate size in the range of b 6 to 325 mesh;

b. fluidizing said sized high volatile coal particles with an oxidizing medium containing from about 2% to about 21% oxygen by volume at a temperature in excess of about 500° F. but less than the fusion temperature of said coal particles for from about 10 minutes to 1 hour until the particles have an oxygen pickup value of from about 0.1 to about 0.25 pounds of oxygen per pound of coal, which is insufficient to render the particles non-agglomerative;

c. spraying water directly onto said fluidized coal particles being oxidized for maintaining the oxidizing temperature within ±5° F. of the desired temperature; and

d. fluidizing said oxidizing particles in a non-oxidizing atmosphere and thermally treating the particles at a temperature in excess of about 750° F. but less than about 1,000° F. to render said particles non-agglomerative and having at least 15% by dry weight of volatiles.

4,002,534
CONTINUOUS COKING PROCESS

Roland Rammler, Konigstein, Taunus, and Paul Lange, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 278,679, Aug. 7, 1972, abandoned. This application July 23, 1974, Ser. No. 491,029

Claims priority, application Germany, Aug. 20, 1971, 2141876

Int. Cl.^{2} C10B *53/08, 47/20, 51/00*

U.S. Cl. 201—6 **9 Claims**

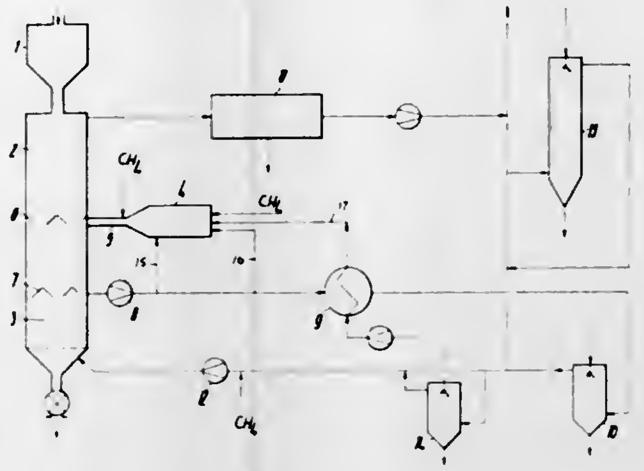
1. Coking process for converting shaped fuel bodies into shaped coke bodies having high mechanical strength, said shaped fuel bodies containing about 6–14% volatile constituents and being selected from the group consisting of briquettes and pellets made by hot-briquetting or hot-pelletizing fine-grained coke and fine grained caking coal, which comprises:

i. continuously coking said shaped fuel bodies which bodies are at temperatures above 750° C in a shaft oven by direct heating with a hot scavenging gas;

ii. producing said scavenging gas by partial combustion of the coking gas and conducting same upward through the shaft oven countercurrent to the descending shaped fuel bodies;

iii. adding to the hot scavenging gas, before it enters the shaft oven, a reactive material selected from the group consisting of flue dust and high hydrocarbon gases in an amount corresponding to 0.5–3% of the coke throughput; and

iv. at least partly consuming gasifying agents carbon dioxide and steam in the hot scavenging gas before it enters the shaft oven by reacting said gasifying agents with said reactive material thereby avoiding detrimental endothermic gasification reactions which would otherwise attack the structure of the shaped coke bodies.



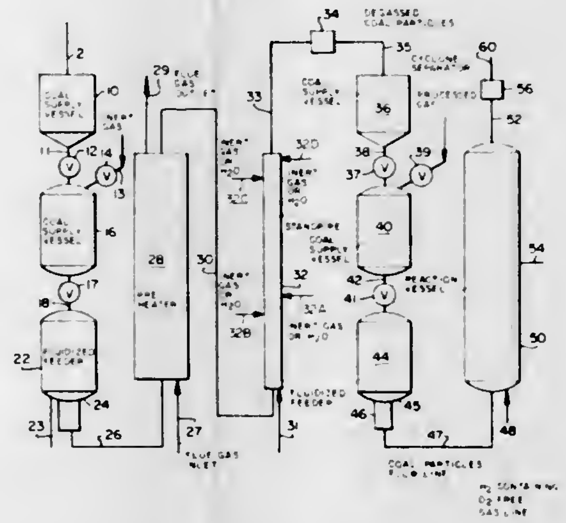
4,002,535
PRECONDITIONING TREATMENT OF COAL TO MINIMIZE AGGLOMERATION

Charles William Albright, South Charleston, and Hubert Greenidge Davis, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,870

Int. Cl.^{2} C10B *57/08;* **C10L** *9/06*

U.S. Cl. 201—9 **10 Claims**



1. A method of preconditioning coal particles to substantially prevent agglomeration of said particles in a fluid-bed reaction zone of a reactor comprising:

a. preheating a dense phase flow of said particles in the absence of oxygen to a first predetermined temperature between about 280° C and about 420° C for a preheat time sufficiently brief to avoid significant agglomeration of said particles;

b. preheating an oxygen-containing gas to a temperature substantially equal to said first predetermined temperature;

c. introducing said preheated particles and said preheated gas into a vertically elongated standpipe in an upwards direction, said gas having a superficial gas velocity greater than the free fall velocity of the largest of said coal particles, the amount of oxygen in said gas and said superficial gas velocity being controlled so that said oxygen is substantially consumed exothermically, the amount of said oxygen in said gas being between about 0.5 and about 6 weight percent of said particles the exothermic oxidation increasing the temperature of said particles up to 80° C per weight percent oxygen to said particles, said particles leaving said standpipe in about 20 seconds to about 300 seconds;

d. regulating the oxidation temperature of said particles within said standpipe to a second predetermined temperature between about 380° C and about 480° C, a temperature within the plastic transformation-temperature of said particles;

e. introducing said oxidized particles at said second predetermined temperature into a cooling zone wherein the temperature of said particles is regulated to a third predetermined temperature between about 300° C and about 400° C;

f. pressurizing said oxidized particles to a pressure above the pressure in said reaction zone; and

g. introducing said particles into said reaction zone, whereby agglomeration of said particles in said zone is substantially prevented as said particles react at reaction pressure with a reagent.

4,002,536
ARRANGEMENT FOR PREVENTING UNDESIRED FLUID BACKFLOW DURING START-UP AND SHUTDOWN OF TWO-STAGE EVAPORATION INSTALLATIONS

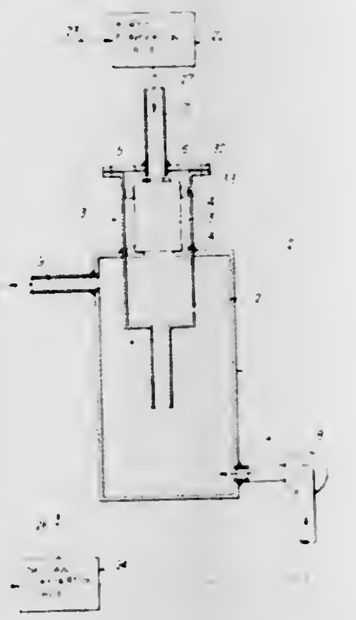
Gundolf E. Rajakovics, Vienna, Austria, assignor to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Jan. 23, 1975, Ser. No. 543,421

Claims priority, application Austria, Jan. 25, 1974, 639/74

Int. Cl.^{2} B01D *1/30*

U.S. Cl. 202—173 **6 Claims**



1. In a two-stage evaporation installation for the purification of liquids, wherein a mixing condenser is disposed intermediate first and second evaporation stages, the first stage being normally maintained at a pressure above that of the second stage, and a pump for normally forcing a portion of the liquid from the second stage to the mixing condenser; and wherein vapor generated in the first stage is conducted via a first conduit to the mixing condenser where such vapor is condensed by contact with the portion of the liquid of the second stage that is forced into the mixing condenser by the pump, the first conduit being disposed so that the liquid is maintained at a first level in the first conduit when both the first stage and the pump are inoperative, the liquid in the first conduit being displaced by the vapor coming from the first stage when said first stage is operative, an improved arrangement for preventing backflow of liquid through the first conduit to the first stage when said pump is operative and said first stage is inoperative, which comprises float valve means disposed in said conduit and separating said first conduit into a first section originating in the first stage and into a second section leading to the mixing condenser, said float valve means being open when the first conduit exhibits the first liquid level, said float valve means closing upon a rise in the liquid level from the first level resulting from the forcing of liquid into the second section of the first conduit by the pump when the pump is made operative and while the first stage remains inoperative.

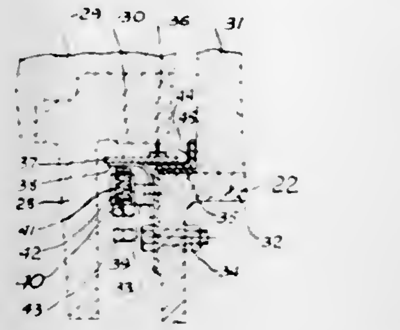
4,002,537
POLLUTION CONTROL OF COKE OVENS

Albert Calderon, 1065 Melrose Drive, Bowling Green, Ohio 43402

Filed Sept. 30, 1974, Ser. No. 510,659

Int. Cl.^{2} C10B *25/16*

U.S. Cl. 202—248 **11 Claims**



1. Apparatus comprising a coke oven door having a seal assembly for sealing a space between a coke oven door and door jamb when the door is disposed in a position in which it substantially closes an opening in a coke oven, said seal assembly comprising a pressure plate connected to said door, and having a first surface facing toward the jamb and a second surface facing away from the jamb when the door is in the position in which it substantially closes the opening in the oven, said pressure plate further including inner and outer surfaces joining the first and second surfaces, first seal means connected with said first surface of said pressure plate for sealingly engaging a surface of the door jamb which faces the first surfaces of the pressure plate, positioning means for moving said pressure plate in a path extending perpendicular to the first and second surfaces of the pressure plate to press said first seal means into sealing engagement with the door jamb, said positioning means being effective to move said pressure plate along said path between a retracted position in which the pressure plate is closely adjacent to a portion of the door and an extended position in which the pressure plate is spaced from the portion of the door while maintaining said first and second surfaces of said pressure plate perpendicular to the path of movement of said pressure plate.

4,002,538
DISTILLATION APPARATUS AND METHOD

John E. Pottharst, Jr., 861 Carondelet St., New Orleans, La. 70130

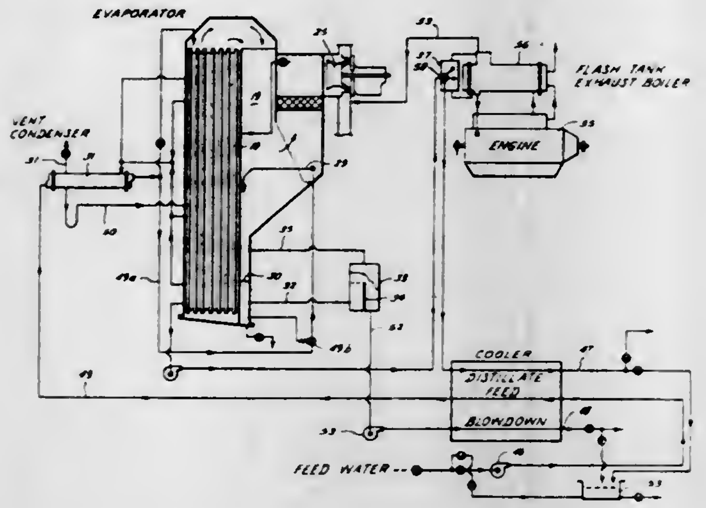
Continuation-in-part of Ser. No. 414,293, Nov. 9, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,891

Int. Cl.^{2} B01D *3/00, 3/10*

U.S. Cl. 203—10 **10 Claims**

1. A method of distilling brackish water or seawater using a vertical shell and tube vaporizer including an array of tube having a width substantially greater than its depth comprising the steps of establishing a body of water at the lower end of the vaporizer along substantially the entire width of said array and with a level such as to extend into the lower end of said tubes to be heated therein in such a manner that the discharge from the upper ends of the tubes is a frothy mixture of vapor and liquid, compressing such vapor and then passing it in heat exchange relation with the water being vaporized in said tubes, flowing the liquid discharged from the upper ends of said tubes laterally to one side of the array of tubes and then downwardly into said body of water along a major portion of its width; flowing feed water into said body of water adjacent one end of said array and flowing blowdown from said body of

water adjacent the other end of said array; whereby the concentration of dissolved salts in said body of water increases



from substantially that of the feed water at said one end of the array to substantially that of the blowdown at the other end of the array.

4,002,539

RECOVERY OF CARBOXYLIC ACIDS FROM OXO RESIDUES

Max Strohmeyer, Limburgerhof; Werner Hagen, Heidelberg, and Heinz Hohenschutz, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 23, 1974, Ser. No. 508,162

Claims priority, application Germany, Oct. 6, 1973, 2350313

Int. Cl.² B01D *3/34*

U.S. Cl. 203—34 **8 Claims**

1. A process for isolating a carboxylic acid selected from the group consisting of propionic acid and butyric acid from the residue which is obtained in the production of propanol or butanol by the catalytic hydroformylation of ethylene or propylene, subsequent hydrogenation of the resulting crude propionaldehyde or butyraldehyde, treatment of the hydrogenated product mixture with an aqueous alkali metal hydroxide solution in order to saponify propyl propionate or butyl butyrate formed as a byproduct and distilling off the propanol or butanol product, said residue consisting essentially of high-boiling alcohols, water and alkali metal propionate or butyrate, which process comprises:

acidifying said residue with a strong mineral acid selected from the group consisting of sulfuric acid and hydrochloric acid to form the corresponding alkali metal sulfate or chloride, the amount of acid being sufficient to yield a mixture with a pH of from 2 to 4 with the proviso that the resulting acidified mixture does not contain more than 5 parts by weight of water per part by weight of the propionic or butyric acid;

separating the organic phase thus obtained from the aqueous phase; and

isolating propionic or butyric acid by distillation from the organic phase.

4,002,540

SCREEN HAVING PARALLEL SLOTS

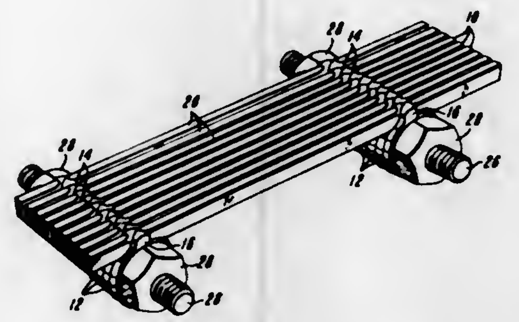
Leon C. Bixby, Owensboro, Ky., assignor to Hendrick Manufacturing Company, Carbondale, Pa.

Division of Ser. No. 496,094, Aug. 9, 1974. This application June 16, 1975, Ser. No. 587,258

Int. Cl.² C25D *7/00, 3/04*

U.S. Cl. 204—24 **4 Claims**

1. In the method of forming an interflexing screen which may be vibrated in use which comprises the steps of forming loops spaced apart along the length of a plurality of wires, and assembling said wires on support rods passing through said loops, the improvement including the step of lubricating the surfaces of said wires which will contact adjacent wires after



the foregoing assembly by electrolytically depositing hard chrome on said screen wires after the same are looped and before the same are assembled into a screen.

4,002,541

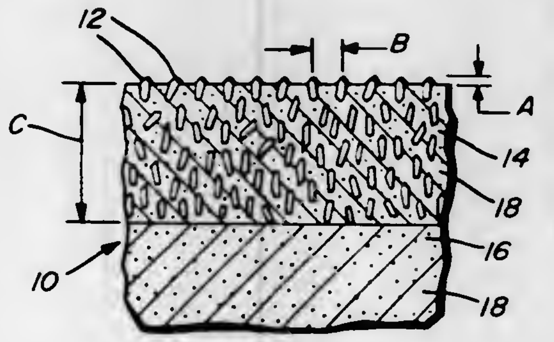
SOLAR ENERGY ABSORBING ARTICLE AND METHOD OF MAKING SAME

George W. Streander, Alamogordo, N. Mex., assignor to Design Systems, Inc., Alamogordo, N. Mex.

Continuation-in-part of Ser. No. 303,393, Nov. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 210,072, Dec. 22, 1971, abandoned. This application Jan. 31, 1975, Ser. No. 545,735

Int. Cl.² C25D *5/44*

U.S. Cl. 204—33 **18 Claims**



17. A method of making a solar energy absorbing article consisting essentially of the steps of:

providing an aluminum-silicon alloy base having predominantly aluminum and from trace amounts up to 18% by weight silicon;

treating a surface of the base with a solution that selectively etches aluminum from the surface to provide etched aluminum surfaces and exposes silicon surfaces between the etched aluminum surfaces that protrude above the etched aluminum surfaces; and

anodizing the exposed protruding silicon surfaces and etched aluminum surfaces to grow silicon dioxide crystals and an aluminum oxide supporting matrix layer from the etched aluminum surface so that the silicon dioxide crystals are embedded in, protrude from a surface of said matrix layer and are substantially perpendicular to said matrix layer to conduct solar energy to said alloy base and said aluminum oxide matrix layer forms a physical and chemical bond with the original surface of said alloy base treated by said solution.

4,002,542

THIN FILM CAPACITOR AND METHOD

Peter L. Young, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,525

Int. Cl.² C25D *5/00;* **C23C** *15/00;* **H01G** *7/00*

U.S. Cl. 204—38 A **5 Claims**

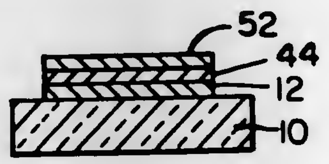
1. A method of forming a capacitor comprising the steps of providing a dielectric substrate,

applying to said dielectric substance a non-tantalum electrically conductive film to form a first capacitor electrode,

disposing said substrate and conductive film within a vacuum environment,

applying a film of tantalum oxide of desired thickness over said conductive film within said vacuum environment,

removing said composite so formed from said vacuum environment



providing a liquid anodizing bath, thereafter

disposing said composite in said liquid anodizing bath,

passing an electrical current through said tantalum oxide film, said current being substantially constant until a predetermined desired voltage is reached, and

removing said composite from said anodizing bath.

2. The method of claim 1 wherein said film of tantalum oxide was applied by r-f sputtering.

4,002,543

ELECTRODEPOSITION OF BRIGHT NICKEL-IRON DEPOSITS

Richard John Clauss, Allen Park, and Robert Arnold Tremmel, Woodhaven, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 456,032, April 1, 1974, abandoned. This application May 6, 1975, Ser. No. 575,092

Int. Cl.² C25D *3/56, 5/12*

U.S. Cl. 204—41 **15 Claims**

1. An aqueous acidic bath suitable for the electrodeposition of a bright iron-nickel electrodeposit onto a substrate susceptable to corrosion, which comprises iron ions and nickel ions, the ratio of nickel ions to iron ions being from about 5 to about 50 to 1, about 0.5 to 10 g/l of an organic sulfo-oxygen compound, a bath soluble complexing agent in the amount of about 10 to 100 g/l which is a carboxylic acid having both carboxyl and hydroxyl groups and in addition, about 0.1 mg/l to 25 mg/l of a reaction product of a polyalkylene polyamine and an alkylating or sulfonating agent, said polyamine having a molecular weight of from about 300 to 24,000.

13. A process for producing an iron-nickel alloy, chromium coated article comprising electrodepositing an iron nickel alloy onto a substrate in the bath of claim 1 and subsequently electrodepositing chromium upon the iron-nickel coating.

4,002,544

HYDROMETALLURGICAL PROCESS FOR THE RECOVERY OF VALUABLE COMPONENTS FROM THE ANODE SLIME PRODUCED IN THE ELECTROLYTICAL REFINING OF COPPER

Seppo Olavi Heimala; Olli Viljo Juhani Hyvarinen; Jorma Peatti Eenokki Kinnunen, all of Pori, and Heikki Aukusti Tiitinen, Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Oct. 1, 1975, Ser. No. 618,510

Claims priority, application Finland, Apr. 3, 1975, 991/75

Int. Cl.² C25C *1/20, 1/22*

U.S. Cl. 204—109 **5 Claims**

1. A hydrometallurgical process for the recovery of silver, selenium and tellurium from anode slime from copper or lead bearing raw materials, in which the raw material and concentrated sulfuric acid or oleum are heated at approximately 160°-300° C. to dissolve Ag, Se, Te and Ba, comprising separating the concentrated sulfuric acid containing the silver, selenium, barium and tellurium dissolved from the raw mate-

rial and treating said sulfuric acid separately for recovering Ag, Se, and Te.

4,002,545

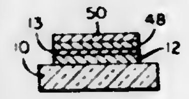
METHOD OF FORMING A THIN FILM CAPACITOR

Francis P. Fehiner, Corning; Arthur J. Whitman, Elmira, and Peter L. Young, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,526

Int. Cl.² C23C *15/00;* **H01G** *7/00*

U.S. Cl. 204—192 **10 Claims**



1. A method of forming a capacitor comprising the sequential steps of providing a dielectric substrate,

applying to said dielectric substrate a non-tantalum electrically conductive film to form a first capacitor electrode,

applying over said electrode a thin film of tantalum which together with said electrically conductive film forms a duplex film,

disposing said substrate and said duplex film within a vacuum environment containing an oxygen-inert gas mixture,

r-f sputtering a film of tantalum oxide of desired thickness over said duplex film within said vacuum environment, said tantalum oxide being sputtered from a tantalum oxide target,

cooling said dielectric substrate and duplex film while said film of tantalum oxide is being sputtered thereon, and thereafter

applying an electrically conductive film over said film of tantalum oxide to form a counter capacitor electrode.

4,002,546

METHOD FOR PRODUCING A MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto, and Masaaki Suzuki, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 10, 1975, Ser. No. 639,493

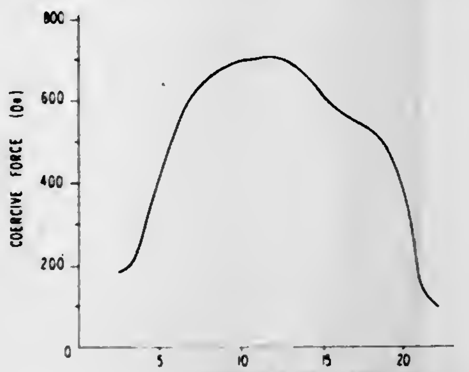
Claims priority, application Japan, Dec. 10, 1974, 49-142160

Int. Cl.² C23C *15/00;* **B05D** *5/12*

U.S. Cl. 204—192 **6 Claims**

1. In the method of forming a magnetic recording medium comprising a support carrying a magnetic thin film thereon which comprises ion plating a magnetic alloy from an evaporation source onto a support, the polarities of said evaporation

source and said support being positive and negative, respectively, in an inert gas atmosphere by applying a high tension voltage between said evaporation source and said support, the improvement wherein said magnetic alloy consists essentially of Co and Si.



4,002,547

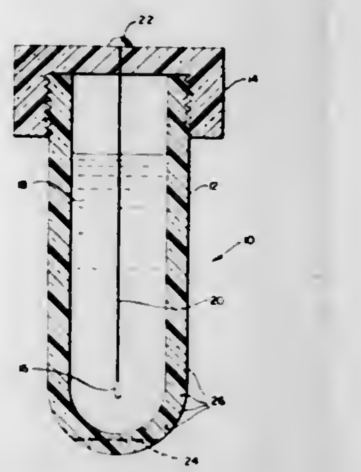
ELECTROCHEMICAL REFERENCE ELECTRODE

Radhakrishna M. Neti, Brea, and Colin C. Bing, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 65,898, Aug. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 818,935, April 24, 1969, abandoned. This application July 22, 1974, Ser. No. 490,544

Int. Cl.² G01N *27/40, 27/46*

U.S. Cl. 204—195 F **4 Claims**



1. An electrochemical reference electrode comprising:
an electrode body of liquid impermeable polymeric material, said electrode body forming a closed internal chamber;
a water soluble salt selected from the group consisting of potassium chloride, sodium chloride, and potassium nitrate distributed through at least a portion of said liquid impermeable polymeric material to form a liquid junction structure in said electrode body, at least some of said water soluble salt being in particulate form and being held in place by a filamentary coating of said polymeric material;
an internal half cell disposed in said chamber;
means for making an electrical connection to said internal half cell; and,
an internal filling solution in said internal chamber;
said electrode having no path for leakage of a test solution into said internal chamber or for leakage of said internal filling solution into a test solution when said electrode is immersed in a test solution.

4,002,548

ACTIVE GRIGNARD ELECTRODE

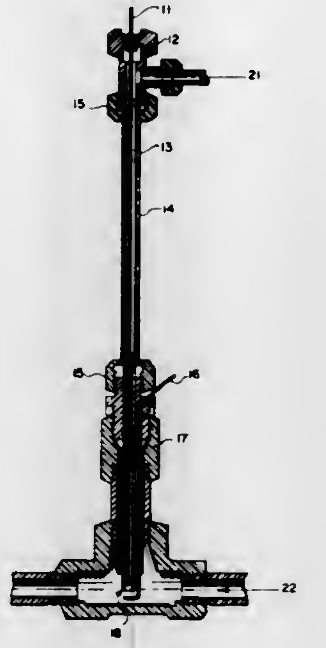
Charles L. Baimbridge, Sweeny; James R. Minderhout, Lake Jackson; Robert W. Bearman, Lake Jackson, and Donald E. Carpenter, Lake Jackson, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 342,346, Mar. 19, 1973, Pat. No. 3,925,169

Filed June 27, 1975, Ser. No. 590,836

Int. Cl.² G01N *27/30, 27/46*

U.S. Cl. 204—195 F **4 Claims**



1. A reference half cell comprising a housing containing $PbCl_2$, $MgCl_2$, anhydrous solvent/Pb° and a porous member connected to said housing acting as a bridge.

4,002,549

APPARATUS AND METHOD FOR CONTINUOUS ELECTROLYTIC COLORING OF ALUMINUM ARTICLES

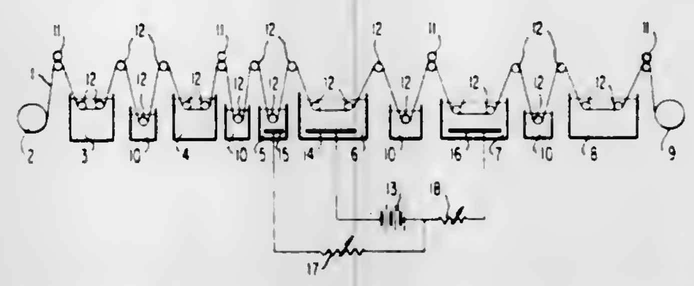
Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,259

Claims priority, application Japan, Mar. 9, 1973, 48-28143

Int. Cl.² E25D *17/00*

U.S. Cl. 204—211 **2 Claims**



1. An apparatus for the continuous electrolytic coloring of an aluminum strip or wire comprising:
means for continuously supplying an aluminum strip or wire;
current supplying bath means for supplying direct current to said aluminum strip or wire and having a first electrode as an anode disposed therein;
a degreasing bath and an etching bath disposed in that order between said supply means and said current supplying bath;
anodic oxidation bath means for anodizing said aluminum strip or wire and having a second electrode as a cathode disposed therein;
electrolytic coloring bath means for electrolytically coloring said aluminum strip or wire and having a third electrode as an anode disposed therein;
a sealing bath positioned to receive said strip or wire subsequent to passing through said electrolytic coloring bath;
a direct electric current power source;
first electric circuit means for connecting said first electrode as an anode and said second electrode as a cathode to said power source and capable of causing said aluminum strip or wire to function as an anode in said anodic oxidation bath without connecting said aluminum strip or wire directly to the power source;
second electric circuit means for connecting said second electrode as a cathode and said third electrode as an anode to said power source and capable of causing said aluminum strip or wire to function as an anode in said anodic oxidation bath and said aluminum strip or wire to function as a cathode in said electrolytic coloring bath without connecting said aluminum strip or wire directly to the power source;
a plurality of wash baths, said baths being interspersed between said degreasing bath and said etching bath, between said etching bath and said current supplying bath, between said anodic oxidation bath and said electrolytic coloring bath, and between said electrolytic coloring bath and said sealing bath; and,
means for passing said aluminum strip or wire continuously and successively through said baths in the order recited.

4,002,550

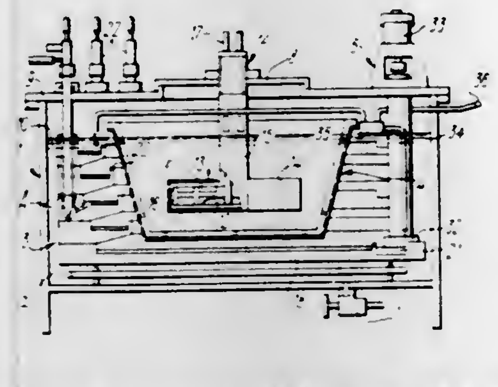
ELECTROLYZER FOR PRODUCING AND REFINING METALS

Svetoslav Georgievich Smirnov, Davydkovskaya ulitsa, 22, kv. 88; Nadezhda Semenovna Gorbacheva, Tishinskaya ploschad, 6, kv. 51, both of Moscow; Ljubov Valentinovna Ershova, ulitsa Sadovaya, 13, kv. 48, Boxitogorsk Leningradskoi oblasti; Nina Andreevna Ljubimova, 11 Parkovaya ulitsa, 44, korpus 4, kv. 36, Moscow; Galina Grigorievna Pestova, ulitsa Zavodskaya, 5, kv. 30, Boxitogorsk Leningradskoi oblasti; Nina Pavlovna Selekhova, Bolshaya Cherkizovskaya ulitsa, 6, korpus 9, kv. 61, Moscow; Margarita Ilinichna Smirnova, Bolshaya Cherkizovskaya ulitsa, 6, korpus 9, kv. 61, Moscow; Alexandr Vladimirovich Tiflov, Birjulevskaya ulitsa, 11, korpus 2, kv. 246, Moscow, and Nina Alexeevna Fomina, Nagatinskaya naberezhnaya, 18, kv. 92, Moscow, all of U.S.S.R.

Filed Apr. 15, 1975, Ser. No. 568,369

Int. Cl.² C25C *7/00, 7/02, 7/04*

U.S. Cl. 204—222 **4 Claims**



1. An electrolyzer for producing and refining a metal from its liquid alloy, comprising: an electrolyte tank closed by covers; a cathode made of a refined metal and having a current lead; a device for holding said cathode in said tank; means for receiving the metal being refined, independent from said tank, and being in the form of a plurality of shelves arranged in a stepped relationship, having a box-shaped cross-section and being installed horizontally about said cathode and with a clearance relative to the inner surface of said tank; an anode made of the metal being refined, disposed over said shelves about said cathode; and a pump to feed the metal being refined from the bottom of said tank to a top shelf of said receiving means; wherein the metal being refined is fed by said pump onto said top shelf, and on flowing by gravity down over said shelves, the metal is dissolved electrochemically in the electrolyte of said tank and is deposited on said cathode as the refined metal.

4,002,551

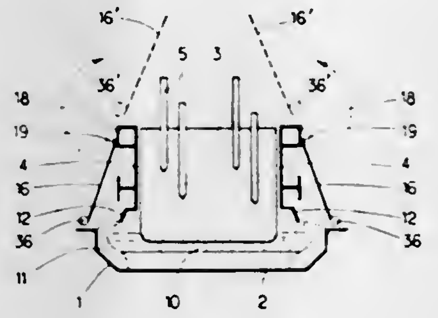
PROCESS AND APPARATUS FOR COLLECTING THE FUMES GIVEN OFF DURING THE PRODUCTION OF ALUMINIUM IN AN ELECTROLYSIS CELL WITH A CONTINUOUS ANODE

Daniel Duclaux, Lille; André J. A. Pontier, and Georges Paul Ferret, both of St. Jean de Maurienne, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, Lyon, France

Filed Apr. 17, 1975, Ser. No. 569,080

Int. Cl.² C25C *3/06, 3/22, 7/00*

U.S. Cl. 204—247 **7 Claims**



1. An apparatus for collecting fumes produced during the fabrication of aluminum in a continuous anode electrolysis vat formed of a carbonaceous mass enclosed in a sheath and immersed into an electrolysis bath housed within a tank which is sealed at its lower portion by a cathode, said apparatus comprising a hood means, a longitudinal movable panel on opposite sides of the tank lining the surface of the electrolysis bath between the sheath of the anode and the tank, said panel having a sealing gasket on its upper side while its lower side is spaced a short distance from the edge of the tank to permit a slight ingress of air, a fixed member mounted on the vat head, the lateral closing of which is assured with interposition of the sealing gaskets by the panels, a pipe conduit communicating the space delimited above the vat head by the fixed parts of the hood means and the panel to a gas treatment installation.

4,002,552

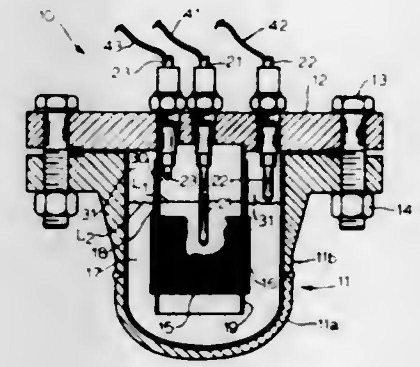
LIQUID LEVEL CONTROL SYSTEM

Julian W. Bunn, Jr., Raleigh, N.C., and Charles O. Buckley, Lewisburg, W. Va., assignors to Trienco, Inc., Raleigh, N.C.

Filed Sept. 19, 1975, Ser. No. 614,755

Int. Cl.² C25B *1/02, 15/02, 1/12*

U.S. Cl. 204—266 **9 Claims**



1. In a pressurized vessel containing a volume of conductive liquid and having partition means therein defining a pair of spaces each having its own liquid level, said partition means serving to isolate an upper pressurized gas filled area within

each of said spaces and said partition means being adapted to allow liquid flow from one space to another without allowing intermixing of the gases within said upper pressurized areas whereby the respective liquid levels in said spaces are interdependent and vary according to the relative pressures maintained in said upper pressurized areas, a system for controlling the respective levels of said liquid within each of said pair of spaces, comprising in combination:

- a. a first constant level electrode probe extending downwardly into said vessel and terminating at a point defining the desired constant liquid level to be maintained within the space into which said first probe extends, said first probe being electrically connected through associated circuitry to means for introducing liquid into said vessel when said liquid drops below said first probe; and
- b. a second high level electrode probe extending downwardly into said vessel and terminating at a point defining the upper limit for the liquid level within the space into which said second probe extends, said second probe being electrically connected through associated circuitry to means for lowering the liquid level within the space into which said second probe extends when such level rises to contact said second probe.

4,002,553

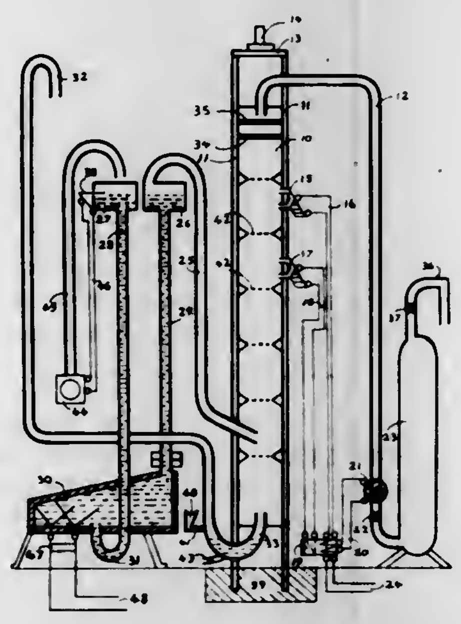
APPARATUS FOR THE SEPARATION, AND STORAGE OF HYDROGEN GAS

Friedrich Ottokar Wilhelm Arntz, Rte. No. 1 Summit Grove, Clinton, Ind. 47842

Continuation-in-part of Ser. No. 586,648, June 13, 1975, abandoned. This application Mar. 4, 1976, Ser. No. 663,783

Int. Cl.² C25B *1/02, 1/04*

U.S. Cl. 204—278 **10 Claims**



1. Apparatus for separating, accumulating, compressing and storing hydrogen gas comprising:

- a vertical, airtight gas cell container column wherein the individual gas cell containers are stacked one on top of the other, each gas cell being in gaseous communication with the adjoining cell;
- a means to keep said gas cells separated from each other yet in gaseous communication;
- a structural means to keep said gas cell container column in a stable vertical position;
- a waste gas exhaust duct exiting said gas cell container column at an elevation at or near it's bottom said waste gas exhaust duct within it's bottom segment including a means to effect a check valve effect;
- a segment at the bottom of waste gas exhaust duct at the exit point out of gas cell container column having a U-tube configuration wherein the bottom part of said U-shaped duct is kept filled with a volume of liquid which assumes the function of a check valve;
- a motor compressor pump connected to a hydrogen outlet suction duct exiting at the top of aforesaid gas cell container column aforesaid motor compressor pump pumping hydrogen gas periodically into a storage tank wherein a check valve is inserted into the duct connection between motor compressor pump and the storage tank;
- a gas mixture input feed duct discharging into the gas cell container column at an elevation near the lower segment of said gas cell container column;
- a means to channel electric signals in conjunction with electric feed current switching mechanism to hydrogen motor compressor which means are connected by control connections to two oxygen content sensor probe relais units inserted into two gas cells in the uppermost segment of the gas cell container column and containing switching mechanism for turning off respectively on supply current to the motor compressor pump aforesaid means to channel electric signals in conjunction with electric feed current switching mechanism, said switching mechanism turning off respectively on supply current to the motor compressor pump depending on which sensing signal it receives;
- two oxygen content sensor probe relais units inserted into two gas cell containers in the uppermost segment of the gas cell container column in such a manner that the first oxygen content sensor probe relais unit is inserted into a gas cell within the upper segment of the gas cell container column, which gas cell is located at an elevation below the elevation of yet another gas cell of said gas cell container column, which said other gas cell has inserted into it the second and upper oxygen content sensor probe relais unit;
- and a preprogrammed arrangement of functions wherein the first or lower oxygen content sensor probe relais unit upon finding no traces of oxygen within the gas cell it is inserted into sends a signal to the electric control means which effects the switching on of supply current to the motor compressor pump and wherein the second or upper oxygen content sensor probe relais unit upon subsequently finding traces of oxygen within the gas cell it is inserted into sends a signal to the electric control means which effects the switching off of the supply current to the motor compressor pump thereby stopping the hydrogen pumping action until the hydrogen content is concentrated enough again to repeat the pumping cycle of the compressor, further wherein upon sensing a complete absence of oxygen in it's gas cell after the hydrogen in the upper gas cell containers has been replenished the first or lower oxygen content sensor probe relais unit sends a corresponding signal again to the electric control signal conductors thereby switching on supply current again to the motor compressor pump repeating aforementioned function and followed by the second or upper oxygen content sensor probe relais unit again sending a switch-off signal to the electric control signal conducting means and switching mechanism upon the recurrence of oxygen dilution in it's cell.

4,002,554

PROCESS OF MINIMIZING OR PREVENTING FOULING

Magne Borge, Rosieres, and Torger Lode, Overijise, both of Belgium, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 8, 1974, Ser. No. 513,078

Claims priority, application United Kingdom, Oct. 17, 1973, 48266/73

Int. Cl.² C10G *9/16*

U.S. Cl. 208—48 AA **6 Claims**

1. A process for minimizing the fouling in the internal surface area of a metallic heating unit into which a hydrocarbon feedstock comprising a member selected from the group consisting of C_4 diolefins, C_5 diolefins or mixtures thereof is introduced, which comprises the steps of:

1. purging said heating unit with an inert gas,
2. introducing from 0.15 to 500 gm. of nitric oxide per square meter of the internal surface area into said heating unit purged in step (1),
3. purging said heating unit passivated in step (2) with an inert gas, and, thereafter,
4. introducing the hydrocarbon feedstock into said heating unit purged in step (3) with said heating unit being at an elevated temperature.

4,002,555

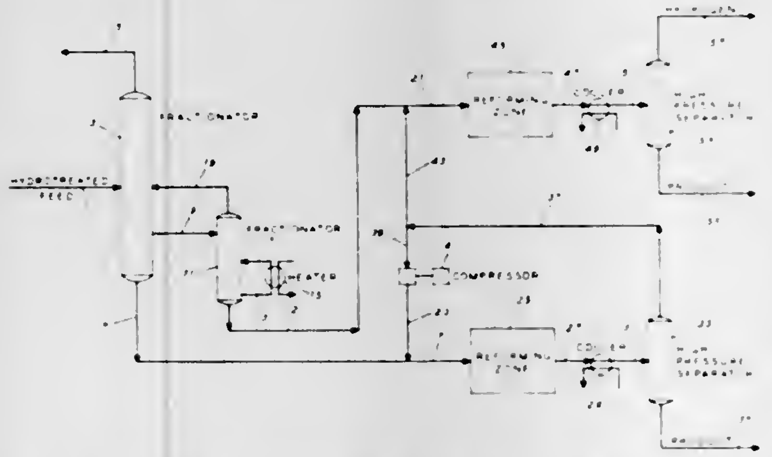
HYDROCARBON REFORMING PROCESS

Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 7, 1976, Ser. No. 647,035

Int. Cl.² C10G *35/08, 39/00*

U.S. Cl. 208—80 **9 Claims**



1. A process for reforming a first hydrocarbon feedstock and a second hydrocarbon feedstock, which comprises the steps of:

- a. contacting said first feedstock and hydrogen with a reforming catalyst in a first reforming zone at reforming conditions including a first reforming pressure;
- b. separating a hydrogen-rich gas and a first liquid hydrocarbon product from the effluent from said first reforming zone at a separation pressure below said first reforming pressure;
- c. recycling a first portion of said hydrogen-rich gas to provide at least a portion of the hydrogen passed into said first reforming zone;
- d. contacting said second feedstock and a second portion of said hydrogen-rich gas with a reforming catalyst in a second reforming zone at reforming conditions including a second reforming pressure lower than said first reforming pressure, with all the hydrogen gas introduced into said second reforming zone being provided solely from said hydrogen-rich gas; and
- e. recovering a second hydrocarbon product from the effluent from said second reforming zone.

4,002,556

MULTIPLE POINT INJECTION OF HYDROGEN DONOR DILUENT IN THERMAL CRACKING

Donald P. Satchell, Jr., Morenci, Ariz., assignor to Continental Oil Company, Ponca City, Okla.

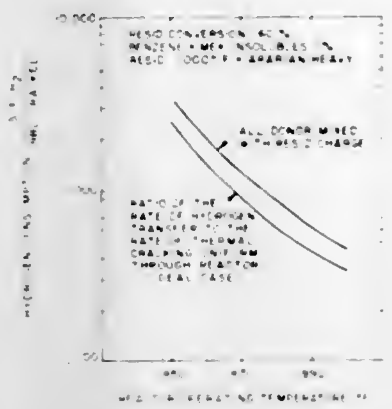
Filed Apr. 12, 1976, Ser. No. 675,841

Int. Cl.² C10G *9/14, 13/00, 1/06*

U.S. Cl. 208—107 **5 Claims**

1. In a conversion process wherein a heavy petroleum residuum is subjected to hydrogen donor diluent cracking conditions in the presence of a hydrogen donor diluent material in a cracking unit, the improvement comprising:

adding a first portion of the hydrogen donor diluent to said petroleum residuum as it is charged to said cracking unit, and adding a second portion of the hydrogen donor diluent to said petroleum residuum at a point in said cracking unit downstream from the petroleum residuum inlet thereto.



4,002,557

CATALYTIC CONVERSION OF HIGH METALS FEED STOCKS

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 473,608, May 28, 1974. This application Mar. 7, 1975, Ser. No. 556,251

Int. Cl.² C10G *11/04;* B01J *8/24*

U.S. Cl. 208—120 **6 Claims**

1. A method for converting residual hydrocarbons comprising greater than 1 ppm of nickel and vanadium as metal contaminants which comprises,

- mixing said metal contaminated residual hydrocarbons with at least 25 wt. percent of low molecular weight carbon hydrogen fragment contributing material of less than 5 carbon atoms and contacting the mixture with a crystalline zeolite cracking catalyst of a pore size opening within the range of 4 to 15 Angstroms under conditions providing a contact mix temperature within the range of 800° F. to 1200° F.,
- providing a hydrocarbon residence time in contact with said catalyst within the range of 0.5 to 10 seconds and recovering a product of said conversion operation comprising improved yields of isobutane and aromatic gasoline than obtained in the absence of said carbon hydrogen fragment contributor.

4,002,558

REMOVING WATER HAZE FROM DISTILLATE FUELS

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 22, 1976, Ser. No. 651,405

Int. Cl.² C10G *33/04*

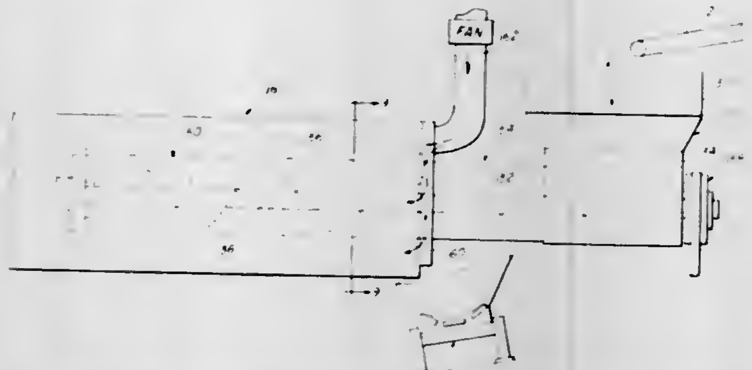
U.S. Cl. 208—188 **7 Claims**

1. A method for removing water haze from a middle distillate fuel which comprises contacting said fuel with from 0.002 to 2 volumes per 100 volumes of said fuel, of a solution of an inorganic halide or nitrate of calcium, magnesium, cadmium, copper or nickel dissolved in a water-miscible, fuel-immiscible aliphatic monohydric alcohol, polyhydric alcohol or glycol ether, said solution containing from 0.1 to 50 wt. % of said inorganic halide or nitrate.

4,002,559
SCREW CONVEYOR WITH DEWATERING MEANS

Malcolm M. Paterson, Atkinson, N.H., and Michael J. Theodore, Weston, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 25, 1975, Ser. No. 607,414
Int. Cl.² B03B *1/00*
U.S. Cl. 209—3 **15 Claims**

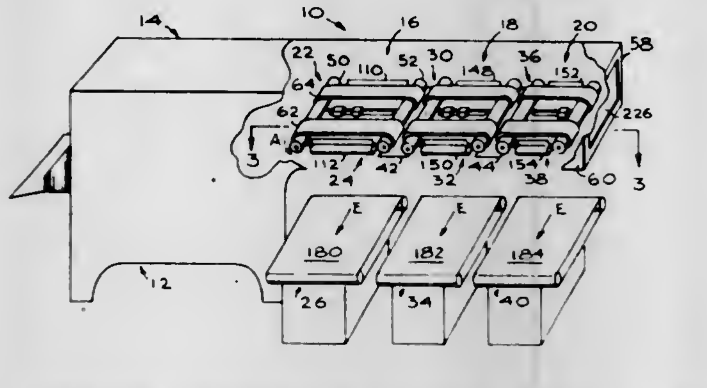


1. Material conveying apparatus comprising an elongated casing, a feed screw for moving material longitudinally within the casing, and dewatering means enclosing at least a portion of said screw for removing water from material being moved by said screw, said dewatering means comprising an apertured dewatering cylinder extending longitudinally within the casing and in close encircling relation to the feed screw, and means for directing a high velocity air flow within the casing and over the outer surface of the cylinder for creating a venturi effect at the apertures in the cylinder to assist in removal of water from the material through the apertures.

4,002,560
AUTOMATIC ARTICLE SORTING APPARATUS

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90066

Filed July 24, 1975, Ser. No. 598,862
Int. Cl.² B07C *1/10*
U.S. Cl. 209—73 **20 Claims**



1. Apparatus for automatically sorting a plurality of intermixed laundry pieces differing according to a predetermined parameter and segregating them in separate stacks according to at least two different values of said parameter, the apparatus comprising:

a. conveying means adapted for receiving sequentially a quantity of articles to be sorted and for conveying received articles therealong, the conveying means including at least an input conveyor assembly, an output conveyor assembly and a pair of intermediate conveyor assemblies arranged in series;

b. receiving means associated with the conveying means and adapted for receiving sorted articles therefrom, the receiving means including a plurality of receiving assemblies individually associated with corresponding ones of the intermediate assemblies;

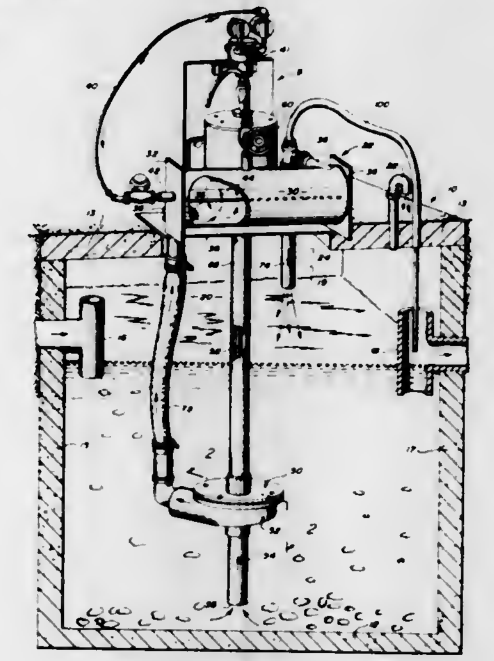
c. a plurality of sorting means individually associated with corresponding ones of the intermediate conveyor assemblies for sensing articles being conveyed along the associated intermediate conveyor assemblies according to at least two selected values of a predetermined article parameter and for momentarily stopping the corresponding intermediate conveyor assembly upon sensing said predetermined parameter; and

d. discharging means responsive to each sorting means for discharging a positively sorted article from its corresponding intermediate conveyor assembly to a predetermined receiving assembly.

4,002,561
METHOD AND APPARATUS FOR AEROBIC SEWAGE TREATMENT

Charles E. Traverse, Lake Waynewood, Lake Ariel, Pa. 18436

Continuation-in-part of Ser. No. 525,656, Nov. 24, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,799
Int. Cl.² B01F *3/04*; C02B *3/08*; C02C *1/08*
U.S. Cl. 210—14 **20 Claims**



1. In a septic tank system for collecting and treating contaminated liquids such as domestic sewage, the improvement which comprises in combination:

means for simultaneously withdrawing a portion of the contaminated liquid from said tank and reducing the size of floc particles contained therein;

means for introducing the contaminated liquid into an elongated generally cylindrical treatment vessel, said vessel containing a tangential inlet on one end and a tangential outlet on the other end to cause the liquid to circulate around the circumference of said vessel and along its axis, thus creating hydraulic turbulence in said fluid;

said vessel having therein surface means to contact and reduce said floc particles in size by mechanical shear forces; and

means to introduce an oxygen-containing gas into said liquid in said vessel; whereby said floc particles are subjected to optimum size reduction and optimum transfer of oxygen to maximize aerobic treatment of the contaminated liquid.

17. A method of treating a contaminated liquid such as domestic sewage normally discharged into a septic tank comprising the steps of:

continuously withdrawing a portion of the contaminated liquid from the septic tank;

injecting the withdrawn liquid into a closed treating vessel having therein surface means to contact floc particles contained in the liquid;

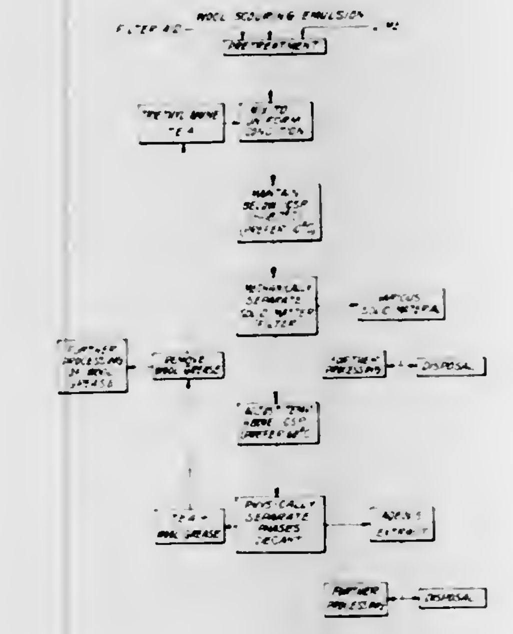
causing said liquid to flow tangentially through said vessel under conditions of hydraulic turbulence so that said floc particles are subjected to shear forces by moving across said contacting means in said vessel; and

simultaneously injecting an oxygen-containing gas into said vessel; whereby said portion of the contaminated liquid in said vessel is given a maximum aerobic treatment of micro-liquefaction of the floc particles in the contaminated liquid and returning said treated portion of said contaminated liquid to said septic tank.

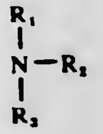
4,002,562
OIL EMULSION PROCESSING

Robert K. Ames, Seattle, and Hans H. Peters, Federal Way, both of Wash., assignors to Resources Conservation Co., Renton, Wash.

Filed Sept. 18, 1975, Ser. No. 614,511
Int. Cl.² B01D *17/04*
U.S. Cl. 210—22 R **11 Claims**



1. A method of breaking oil-water emulsions and recovering the oil component thereof without acidification comprising forming a mixture of the emulsion with a liquid amine having the formula:



$$R_1-\underset{R_3}{\underset{|}{N}}-R_2$$

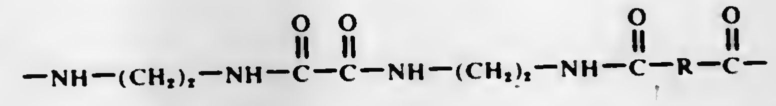
wherein R_1 is hydrogen or alkyl, R_2 and R_3 are alkyl of 1 to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms, the total number of carbon atoms in the molecule being in the range of 3 to 7 inclusive, in which the oil of the emulsion is soluble and which has an inverse critical solution point in a two phase system with water, at a temperature below the phase separation temperature of the amine and water so as to form a single liquid phase of amine, oil and water, the amount of amine being sufficient that substantially complete miscibility with the emulsion occurs below the said inverse critical solution temperature, then raising the temperature of the said single liquid phase above the critical solution temperature to effect liquid phase separation whereby an amine phase containing substantially all of the oily material of the emulsion and a water phase containing substantially no oily material are formed, separating the two liquid phases and separately recovering the oily material and amine from the amine phase.

4,002,563
REGULAR COPOLYAMIDES AS DESALINATION MEMBRANES

Otto F. Vogl, Amherst, Mass., and Donald R. Stevenson, Brunswick, Ohio, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 471,513, May 20, 1974, Pat. No. 3,935,172. This application May 23, 1975, Ser. No. 580,444
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 H **4 Claims**

1. In a process for desalination of saline water by reverse osmosis comprising contacting the saline water under pressure with a reverse osmosis membrane, the improvement comprising using as the reverse osmosis membrane a membrane comprising a film of a regular copolyamide consisting essentially of the repeating units:



$$-NH-(CH_2)_2-NH-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-NH-(CH_2)_2-NH-\overset{O}{\overset{\|}{C}}-R-\overset{O}{\overset{\|}{C}}-$$

where R is selected from the group consisting of the isophthaloyl radical, the sebacyl radical and the pyridyl radical.

4,002,564
CATION-EXCHANGE RESINS HAVING CROSS-LINKED VINYL AROMATIC POLYMER MATRIX WITH ATTACHED AMINO ALKYLENE PHOSPHONIC ACID GROUPS, THEIR USE, AND PREPARATION

Jack Carbonel; Paul D. A. Grammont, and Jean E. E. Herbin, all of Chauny, France, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

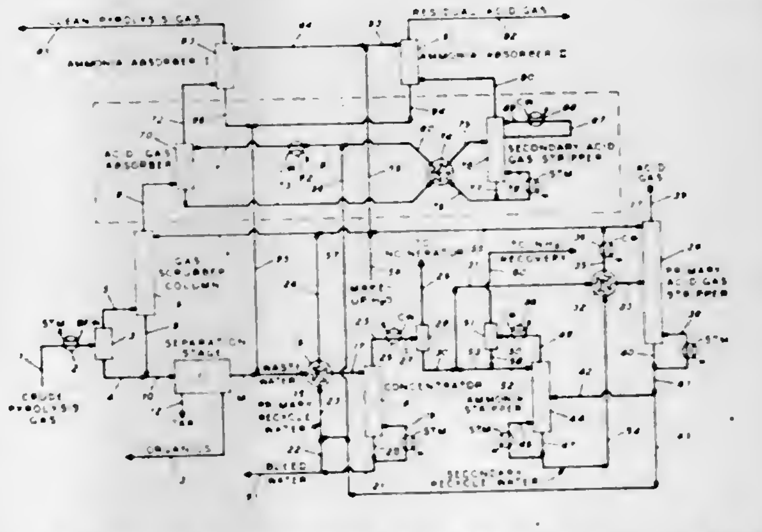
Filed July 23, 1975, Ser. No. 598,526
Claims priority, application France, July 24, 1974, 74.25610
Int. Cl.² C08F *212/08, 8/40*; C22B *3/00*
U.S. Cl. 210—38 R **5 Claims**

1. A cation-exchange resin having a cross-linked vinyl aromatic polymer matrix and characterized, in the acid form, by active groups attached to the aromatic rings of the formula: $-CH_2NHRPO(OH)_2$, wherein R is C_1–C_3 lower alkylene.

4,002,565
WASTE-WATER PROCESS

Thomas R. Farrell, El Sobrante; Robert J. Klett, San Francisco, and James A. Craig, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1975, Ser. No. 607,309
Int. Gl.² B01D *3/06*
U.S. Cl. 210—60 **8 Claims**



1. A process for separating acid gas and ammonia from waste water having an appreciable content thereof and for the production of recycle water, comprising the steps:

1. producing a first recycle water stream and an effluent gas stream comprising acid gas, ammonia and water vapor by passing said waste water into an acid gas-ammonia stripping column, said column being maintained at a bottoms temperature in the range from about 93° to 149° C and at a pressure in the range from about 1 to 5 atmospheres absolute, said first stream having an acid gas and ammonia content which is less than 15 percent of the content thereof for said waste water;
2. separately withdrawing said first recycle water stream and said effluent gas stream from said acid-gas ammonia stripping column;
3. Producing a liquid aqueous concentrate of ammonia and acid gas by decreasing the temperature of said effluent gas stream, said temperature decrease being an amount in the range from about 55° to 110° C.
4. producing an effluent acid-gas stream and an aqueous bottoms stream by passing said concentrate into a primary acid-gas stripping column, said column being maintained at superatmospheric pressure acid-gas stripping conditions;
5. separately withdrawing said acid-gas stream and said bottoms stream from said acid-gas stripping column; and
6. producing an effluent gas stream comprising ammonia and a second recycle water stream by passing said bottoms stream into an ammonia stripping column, said column being maintained at superatmospheric pressure ammonia stripping conditions, said second stream having an acid gas and ammonia content which is less than 15 percent of the content thereof for said bottoms stream from said acid-gas stripping column.

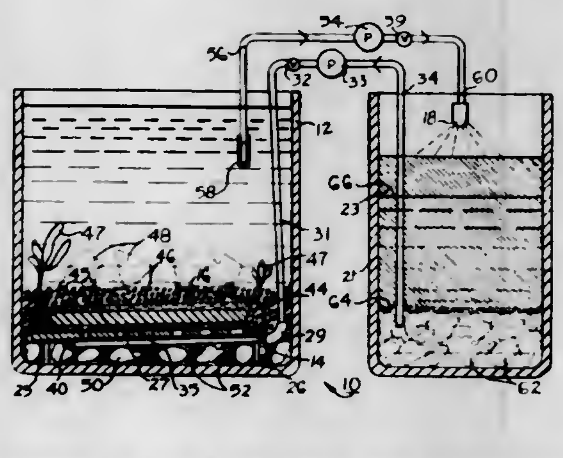
4,002,566
WATER PURIFYING SYSTEMS

John D. Smith, 5748 King Drive, Chicago, Ill. 60637

Filed Apr. 7, 1975, Ser. No. 566,004

Int. Cl.² E04H *3/20*

U.S. Cl. 210—169 **10 Claims**



1. A system for purifying water, said system comprising: a container; a perforated member within said container and spaced above the bottom thereof and extending substantially over the entire area thereof, pump means for moving water between an upper portion of said container above said member and the bottom of said container below said member to recirculate the water, means located in the path of travel of the water for aerating it; and a bacteria culture bed composed of approximately two parts sphagnum moss and approximately three and one-half parts of a mixture of gravel, diatomaceous powder, clay and bone meal; said bed being disposed above and supported by said member.

4,002,567
ULTRAFILTRATION APPARATUS

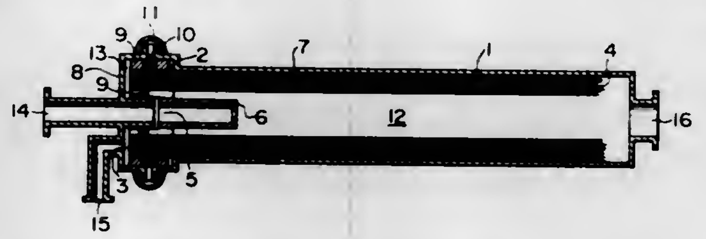
Tsugio Konno; Kohichi Matsumoto, both of Fuji; Shinichi Ohkubo, Tokyo; Yasuo Hashino, Fuji; Kaoru Maeda, Yokohama, and Giichi Sayanagi, Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1975, Ser. No. 561,913

Claims priority, application Japan, Mar. 28, 1974, 49-33988

Int. Cl.² B01D *31/00*

U.S. Cl. 210—333 R **1 Claim**



1. An ultrafiltration apparatus comprising
1. a module in which a number of polymeric hollow fibers having semipermeable walls and arranged in approximately parallel are collected orderly to form a bundle and fixed with a cast-molding material at at least one end portion thereof and opened at said end portion to form a module cartridge, said module cartridge is accommodated in a casing provided with an inlet for a liquid to be treated, an outlet for a liquid permeated through said hollow fiber walls and an outlet for a non-permeated liquid and said cast-molding material together with said hollow fiber walls work sealingly as partition between a chamber for to-be-treated liquid and a chamber for the liquid permeated through said hollow fiber walls, said module cartridge being constructed such that great numbers of polymeric hollow fibers, disposed approximately in parallel, are collected orderly to form a bundle and fixed with a cast-molding material at one end and opened at this end but not mutually fixed at the other end resulting in free ends which are not opened and said end part where fibers are collected orderly to form a bundle and are fixed, has a feed inlet for the to-be-treated feed situated at the central part of the bundle of hollow fibers and protruding towards the other end of the hollow fibers,
2. back washing means having a storage tank of permeated liquid for sending said permeated liquid to said module and
3. control means for controlling said module and said back washing means.

4,002,568
LUBRICATING OIL COMPOSITIONS

Gerald John Joseph Jayne, and Herbert Frank Askew, both of Wokingham, England, assignors to Edwin Cooper & Company Limited, Bracknell, England

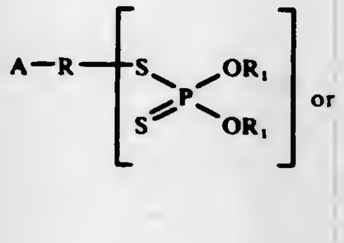
Filed Oct. 3, 1974, Ser. No. 511,920

Claims priority, application United Kingdom, Oct. 4, 1973, 46372/73

Int. Cl.² C10M *1/48, 3/42*

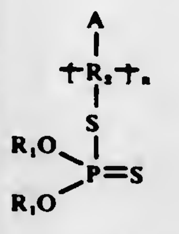
U.S. Cl. 252—46.7 **7 Claims**

1. A lubricating composition consisting essentially of a lubricating oil and a minor effective amount of a compound of the formula



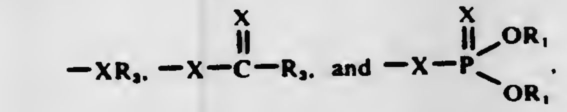
(I)

or



(II)

wherein in Formula (I) R is the residue of an intra-molecular sulphur bridged hydrocarbon ring containing 12 carbon atoms or wherein in Formula (II) $[R_2]_n$ is a polymer comprising the residue of a plurality of substantially intermolecularly sulphur-bridged hydrocarbon rings each containing 12 carbon atoms, n being the degree of polymerisation; each R_1 being independently selected from the group consisting of alkyl, alkenyl, aryl, alkaryl and aralkyl groups and each R_1 containing from 2 to 18 carbon atoms; and A is a nucleophilic group selected from the group consisting of -CN,-NCO,-NCS,



$$-XR_3,\ -X-\overset{X}{\overset{\|}{C}}-R_3,\ \text{and}\ -X-\overset{X}{\overset{\|}{P}}\genfrac{}{}{0pt}{}{\diagup OR_1}{\diagdown OR_1}.$$

wherein each R_1 is as above, X is oxygen or sulphur and R_3 is an alkyl group containing 1–12 carbon atoms or a phenyl group.

4,002,569
LUBRICATING OIL COMPOSITION CONTAINING AMINOESTER DISPERSANT

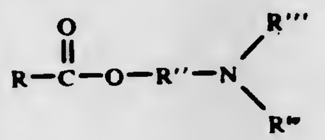
Isaac D. Rubin, Wappingers Falls; Richard F. Love, Fishkill, and Charles B. Holder, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 382,102, July 23, 1973, Pat. No. 3,890,357. This application Dec. 2, 1974, Ser. No. 528,971

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **14 Claims**

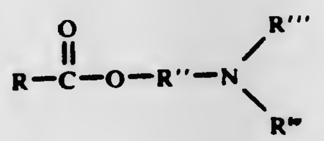
1. A lubricating oil composition comprising a major portion of a petroleum base lubricating oil of lubricating viscosity and admixed therewith a dispersing amount of an aminoester



$$R-\overset{O}{\overset{\|}{C}}-O-R''-N\genfrac{}{}{0pt}{}{\diagup R'''}{\diagdown R^{iv}}$$

wherein R, R''', and R^{iv} are saturated hydrocarbon, and R'' is divalent saturated hydrocarbon, said aminoester having been prepared by reacting an alpha nitroketone with a tertiary amino alcohol in mole ratio, of tertiary amino alcohol to nitroketone, of 1–100:1.

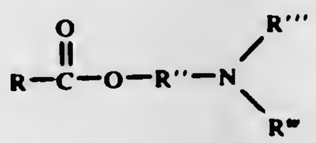
5. A concentrate containing in inert diluent-solvent an aminoester



$$R-\overset{O}{\overset{\|}{C}}-O-R''-N\genfrac{}{}{0pt}{}{\diagup R'''}{\diagdown R^{iv}}$$

wherein R, R''', and R^{iv} are saturated hydrocarbon and R'' is divalent saturated hydrocarbon, said aminoester having been prepared by reacting an alpha nitroketone with a tertiary amino alcohol in mole ratio, of tertiary amino alcohol to nitroketone of 1–100:1.

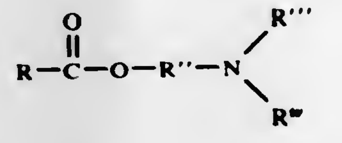
8. The method of improving the dispersancy of a petroleum base lubricating oil of lubricating viscosity which comprises
   adding to said oil a dispersing amount of 0.1–10 parts per 100 parts of lubricating oil of an aminoester



$$R-\overset{O}{\overset{\|}{C}}-O-R''-N\genfrac{}{}{0pt}{}{\diagup R'''}{\diagdown R^{iv}}$$

wherein R''' and R^{iv} are saturated hydrocarbon, R'' is divalent saturated hydrocarbon, and R is a polymer-derived moiety having a hydrocarbyl backbone, said aminoester having been prepared by reacting an alpha nitroketone with a tertiary amino alcohol in mole ratio, of tertiary amino alcohol to nitroketone, of 1–100:1.

10. The method of improving the viscosity index of a petroleum base lubricating oil of lubricating viscosity which comprises
   adding to said oil a viscosity-index improving amount of 0.5–3 parts per 100 parts of said oil of an aminoester



$$R-\overset{O}{\overset{\|}{C}}-O-R''-N\genfrac{}{}{0pt}{}{\diagup R'''}{\diagdown R^{iv}}$$

wherein R''' and R^{iv} are saturated hydrocarbon, R'' is saturated hydrocarbon, and R is a polymer-derived moiety having a hydrocarbyl backbone, said aminoester having been prepared by reacting an alpha nitroketone with a tertiary amino alcohol in mole ratio, of tertiary amino alcohol to nitroketone, of 1–100:1.

4,002,570
ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLIDENE FLUORIDE ADDITIVE

Nero R. Lindblad, Palmyra, and James M. Pearson, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,540

Int. Cl.² G03G *9/02*

U.S. Cl. 252—62.1 P **5 Claims**

1. In a developer composition for use in automatic electrophotographic machines, said composition comprising a particulate free-flowing carrier vehicle, an electroscopic toner material and a particulate polyvinylidene fluoride lubricant having an average particle size less than that of the toner material, the improvement comprising:
   said particulate polyvinylidene fluoride being cross-linked by high energy ionizing irradiation in the range of about 0.7 to 10 megarads, whereby the dimensional stability of said particulate lubricant is upgraded.

4,002,571
CLEANING COMPOSITIONS

Robert C. Anderle, and Robert F. Schwarz, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 232,940, March 8, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 510,871

Int. Cl.² A47L *7/02, 11/32;* **C11D** *7/10, 7/26*

U.S. Cl. 252—90 **24 Claims**

1. An aqueous cleaning composition having a minimum film-forming temperature of at least 30° C. consisting essentially of from about 1 to about 50 percent, by weight, of a polymer having a glass transition temperature of at least 35° C., selected from the group consisting of co-polymers of at least one acid monomer and at least one soft monomer, co-polymers of at least one acid monomer and at least one hard monomer, and co-polymers of at least one acid monomer and a mixture of hard and soft monomers, from about 0.1 to about 5 percent, by weight, of a metal salt selected from salts of zinc, cadmium, copper, nickel, cobalt, zirconium, chromium, magnesium, manganese, calcium or mixtures thereof, said composition forming a tacky film which, as a result of the drying of said composition, fractures to form a removable residue.

14. A composition as defined by claim 1 packaged in a pressurized aerosol package, said composition including an effective amount of a propellant to dispense said composition, said propellant selected from the group consisting of normally gaseous hydrocarbons, liquified halogenated hydrocarbons and inert compressible gases.

4,002,572
ALKALINE PROTEASE PRODUCED BY A BACILLUS

Bauke te Nijenhuis, Rijswijk-ZH, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Nov. 18, 1975, Ser. No. 633,026

Claims priority, application United Kingdom, Nov. 19, 1974, 50044/74

Int. Cl.² C12D *13/10*; **C11D** *7/42*

U.S. Cl. 252—99 **7 Claims**

4. An alkaline protease produced by cultivation of Bacillus nov. sp. PB 92 and characterized by the following properties:
a optimal proteolytic activity at a pH value above 12, said activity being measured against denatured hemoglobin according to the Anson method,
b. consisting of at least three proteolytically active components showing a characteristic zymogram following disc electrophoresis as shown in the accompanying figure,

c) the two main components having the following amino acid composition:

	component 1	component 2
Lysine		
Histidine	7	6
Arginine	9	8
Asparctic acid	27	28
Threonine	16	16
Serine	30	30
Glutamic acid	15	15
Proline	12	13
Glycine	31	33
Alanine	36	36
Cystine	0	0
Valine	22	22
Methionine	3	3
Isoleucine	8	9
Leucine	18	18
Tyrosine	7	6
Phenylalanine	2	2
Tryptophan	3	3

d) the two main components having the following physical properties

isolectric point	10.5	10.5
molecular weight	25,500	25,500

e. showing an improved washing action in perborate containing washing compositions.

5. A washing composition containing an effective amount of the enzyme of claim 4 having a high proteolytic activity in alkaline media.

4,002,573
AZEOTROPES OF 1,2-DICHLORO-1,1,2-TRIFLUOROETHANE

William Milton Hutchinson, deceased, late of Claremore, Okla. (by Florence M. Hutchinson, executrix), assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 396,814, Sept. 13, 1973, Pat. No. 3,940,342. This application Sept. 5, 1975, Ser. No. 610,812

Int. Cl.² C11D *7/50*

U.S. Cl. 252—171 **7 Claims**

1. A substantially constant boiling admixture of (A) 1,2-dichloro-1,1,2-trifluoroethane and (B) diethyl ether which at substantially atmospheric pressure is characterized as about 58 to 60 weight percent (A) and about 42 to 40 weight percent (B).

4,002,574
PHOTOSENSITIVE REDOX SOLUTIONS

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Division of Ser. No. 196,804, Nov. 8, 1971, which is a continuation-in-part of Ser. No. 842,716, July 12, 1969, abandoned. This application Feb. 24, 1975, Ser. No. 552,365

Int. Cl.² B01J *27/10, 31/38, 1/10*

U.S. Cl. 252—188 **6 Claims**

1. An aqueous photosensitive redox solution having a pH between about 2 and about 10 comprising essentially (1) from about 0.1 to 3 weight percent of a titanium(IV) compound and (2) from about 0.5 to 3 weight percent of an oxidizable complexing agent, the weight percent of said complexing agent being at least equal to that of said titanium(IV) compound, said titanium(IV) compound being selected from the group consisting of (a) the reaction product of substantially anhydrous trimethyl borate with substantially anhydrous titanium tetrachloride, (b) a water soluble titanium compound conforming substantially to the formula $Cl_2Ti(OR)_2$ where R is selected from the group consisting of H, CH_3, C_2H_5, C_3H_7 and C_4H_9, (c) titanyl sulfate solutions and (d) titanyl chloride solutions, said oxidizable complexing agent being selected from the group consisting of N-hydroxyethylene-diaminetriacetic acid, diethanol glycine, glucoheptanoic acid, saccharic acid, mucic acid, the sodium and ammonium salts of these acids, polyvinyl alcohol and mixtures thereof.

4,002,575
REJUVENATION OF SUPPORTED GROUP VIII METAL CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 14, 1975, Ser. No. 604,818

Int. Cl.² B01J *23/96, 29/38*; **C10G** *13/02*

U.S. Cl. 252—411 R **11 Claims**

1. A method for rejuvenating a catalyst comprising a non-zeolitic Group VIII metal supported on a siliceous zeolite base, said catalyst having been subjected to thermal and/or hydrothermal conditions resulting in a maldistribution of said Group VIII metal on said zeolite base with resultant reduction in hydrogenation activity, which comprises:
A. contacting said catalyst in an oxidized or sulfided state and at a temperature below about 300° F with water or water vapor and with ammonia to adsorb therein about 5–40 weight-percent of water containing at least about 5 weight-percent of dissolved ammonia;
B. drying and calcining the hydrated-ammoniated catalyst in a non-reducing atmosphere to effect deammoniation thereof, and dehydration to a water content of less than about 25% of its adsorptive capacity for water;
C. partially rehydrating the calcined catalyst at a temperature below about 300° F to an extent of not more than about 80% and not less than about 10% of its adsorptive capacity for water; and
D. activating the rehydrated catalyst for about 2–40 hours in a stream of essentially dry hydrogen at temperatures gradually increasing to a level between about 600° and 800° F.

6. A method for rejuvenating a catalyst comprising a non-zeolitic Group VIII metal supported on a siliceous zeolite base, said catalyst having previously been utilized at elevated temperatures in a hydrocarbon conversion process to substantial deactivation, and having been subsequently regenerated by oxidative combustion to an activity level substantially below that of the original fresh catalyst, which comprises:
A. contacting said regenerated catalyst at a temperature below about 300° F with water or water vapor and with ammonia to adsorb therein about 5–40 weight-percent of water containing at least about 5 weight-percent of dissolved ammonia;
B. drying and calcining the hydrated-ammoniated catalyst in a non-reducing atmosphere to effect deammoniation thereof, and dehydration to a water content of less than about 25% of its adsorptive capacity for water;
C. partially rehydrating the calcined catalyst at a temperature below about 300° F to an extent of not more than about 80% and not less than about 10% of its adsorptive capacity for water; and
D. activating the rehydrated catalyst for about 2–40 hours in a stream of essentially dry hydrogen at temperatures gradually increasing to a level between about 600° and 800° F.

4,002,576
ENZYME CARRIER REGENERATION

Jerry L. Gregory, and Wayne H. Pitcher, Jr., both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 18, 1975, Ser. No. 597,012

Int. Cl.² B01D *15/06*; **C12B** *1/00*; **C12K** *1/00*

U.S. Cl. 252—415 **6 Claims**

1. A method of regenerating a spent immobilized glucose isomerase composite comprising glucose isomerase adsorbed to porous particles of a $MgO\text{-}Al_2O_3$ carrier and having associated therewith carbonaceous material and contaminants resulting from use of the composite for the continuous isomerization of glucose to fructose, the method comprising the step of fluidizing the spent composite particles in a fluidized bed reactor by circulating a sodium hypochlorite solution through the composite under conditions sufficient to remove substantially all carbonaceous material and contaminants.

4,002,577
COPPER CARBONYL-CONTAINING CATALYTIC SOLUTIONS

Takashi Koyano, Tokyo; Yoshihisa Matsushima, Ohi, and Tetsuo Kitamura, Kawasaki, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 385,156, Aug. 2, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 609,538

Claims priority, application Japan, Aug. 7, 1972, 47-78401; Jan. 29, 1973, 48-11144; Feb. 27, 1973, 48-22691

Int. Cl.² B01J *27/12*

U.S. Cl. 252—433 **7 Claims**

1. A catalyst composition useful for the treatment of olefins or alcohols with carbon monoxide in the preparation of carboxylic acids which consists essentially of a solution of hydrated boron trifluoride having a ratio of not more than 3 moles of water per mole of boron trifluoride and a minor amount of copper (I) carbonyl.

4,002,578
CATALYST ACTIVATION PROCESS

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 27, 1975, Ser. No. 591,089

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **18 Claims**

1. A method of increasing the acid catalytic activity of a crystalline zeolitic aluminosilicate having at least 6-Angstrom-sized pores, containing at least one kind of alkaline earth cations, in an amount providing at least about 50% of the cationic requirement thereof, and having less than 1% of its cationic requirement furnished by hydrogen cations, which comprises a sequence of steps, including:
1. subjecting said aluminosilicate while at a temperature in the range 700° to 920° C to a reducing atmosphere comprising hydrogen gas; and
2. subjecting said aluminosilicate while at a temperature above about 315° C to an oxidizing atmosphere comprising molecular oxygen gas,

said subjectings each being for a period in the range from about 0.15 to 10 hours and said temperatures being below the temperature at which a substantial portion of the crystallinity of said aluminosilicate is destroyed.

16. A method as in claim 1 further characterized in that said cationic requirement includes ions of hydrogenation component metals selected from Groups, IV, VI and VIII, said ion having been base exchanged into said zeolite.

4,002,579
DETERGENT COMPOSITION

Hiroshi Mizutani, Yachiyo; Fumikatsu Tokiwa; Tetsuya Imamura, both of Wakayama, and Toshiro Sakurada, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 267,195, June 28, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,323

Claims priority, application Japan, July 1, 1971, 46-48287

Int. Cl.² C11D *3/26*

U.S. Cl. 252—544 **3 Claims**

1. A detergent composition consisting essentially of
A. from 5 to 50 parts by weight of surfactant component consisting essentially of
  1. from 5 – 95% by weight of water-soluble polyoxyethylene sorbitan monoester of fatty acid having 8 to 22 carbon atoms and containing from 5 to 50 oxyethylene units in the molecule,
  2. the balance being fatty acid alkylolamide selected from the group consisting of diethanolamides and polyoxyethylene monoethanolamides having 10 to 20 oxyethylene units in the molecule, of fatty acids having 8 to 22 carbon atoms, and
B. from 1 to 50 parts by weight of an organic acid salt having a chelating ability selected from the group consisting of the alkali metal and ammonium salts of gluconic acid, citric acid, malic acid, tartaric acid, and lactic acid.

4,002,580
FIRE-RETARDANT POLYURETHANE

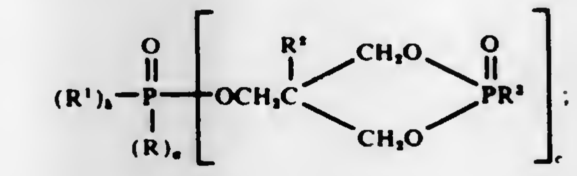
Robert Victor Russo, Brooklyn, N.Y., assignor to GAF Corporation, Wayne, N.J.

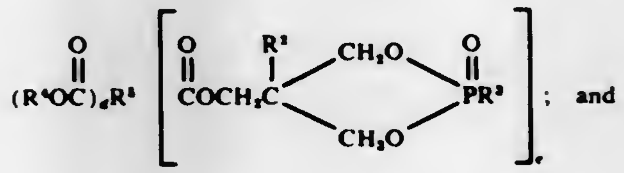
Filed Sept. 12, 1974, Ser. No. 505,359

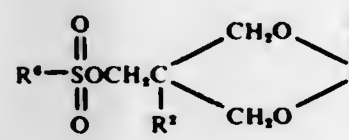
Int. Cl.² C08G *18/14, 18/30, 18/38*; **C08K** *5/53*

U.S. Cl. 260—2.5 AJ **23 Claims**

10. A polyurethane produced by reaction of an unhalogenated polyether polyol, an organic polyisocyanate, 2,3-dibromo-2-butenediol-1,4, and a phosphourus-containing compound selected from the formulea:







and mixtures thereof; wherein each of *a* and *b* has a value of 0 to 2 inclusive; *c* is an integer of from 1 to 3 and the sum of *a*, *b*, and *c* is 3; each of R and R^1 is an alkyl, alkoxy, aryloxy, alkaryl, alkaryloxy, aralkyl, arloxyalkoxy, or aralkoxy radical wherein each of said alkyl moieties is unsubstituted or hydroxy-substituted; and each of any aryl portion of said radical is an unsubstituted, or hydroxy- or chlorine-substituted aromatic hydrocarbon; R^2 is an alkyl, hydroxyalkyl, or unsubstituted aromatic hydrocarbon radical; R^3 is an alkyl or hydroxyalkyl radical; *d* has a value of from 0 to 2 inclusive; *e* is an integer of from 1 to 3 inclusive; and the sum of *d* and *e* is not in excess of 3; R^4 is an alkyl, aryl, alkaryl, aralkyl or aryloxyalkyl group, wherein any aryl portion of said group is an unsubstituted, or chlorine- or hydroxy-substituted aromatic hydrocarbon; R^5 is an alkyl, alkylene, aryl or arylene radical; and each of said aryl and arylene radicals is an unsubstituted or chlorine- or hydroxy-substituted aromatic hydrocarbon moiety; and R^6 is an alkyl, aryl, alkaryl, aralkyl or aryloxyalkyl group wherein any aryl moiety present is an unsubstituted, hydroxy-substituted or chlorine-substituted aromatic hydrocarbon moiety; and wherein said 2,3-dibromo-2-butenediol-1,4 and said phosphorus-containing compound are present in an amount sufficient to provide by weight percent of the final product a sum total of bromine (Br) and phosphorus (P), defined by the equation: $P + Br/10 \cong 0.1$ to 1.0 and wherein phosphorus (P) has a value of not less than 0.05 weight percent and bromine (Br) has a value of not less than 0.5 weight percent.

18. A polyurethane as claimed in claim **10** wherein said polyurethane is a cured, flexible, stable polyester or polyether urethane foam.

4,002,581
FOAMED THERMOPLASTIC COMPOSITIONS OF A LINEAR POLYESTER AND AN IONICALLY CROSSLINKED COPOLYMER

Thomas Joseph Dolce, Stirling, N.J., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1975, Ser. No. 638,807
Int. Cl.^{2} C08J *9/06*

U.S. Cl. 260—2.5 N **16 Claims**

1. A foamed thermoplastic composition which comprises:

a. a linear polyester resin;

b. a minor amount of polytetrafluoroethylene resin; and

c. a minor amount of a copolymer selected from the class consisting of polymers of α-olefins having the general formula $RCH = CH_2$ where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, the olefin content of said polymer being at least 50 mole percent, based on the polymer, and an α,β-ethylenically unsaturated mono- or dicarboxylic acid, the acid monomer content of said polymer being from 0.2 to 25 mole percent, based on the polymer, said mono carboxylic acid polymer containing uniformly distributed throughout the polymer a metal ion having a valence of 1 to 3 inclusive and is selected from the group consisting of Na^+, K^+, Li^+, Cs^+, Ag^+, Hg^+, Cu^+, Be^{+2}, Mg^{+2}, Ca^{+2}, Sr^{+2}, Ba^{+2}, Cu^{+2}, Cd^{+2}, Hg^{+2}, Sn^{+2}, Pb^{+2}, Ca^{+2}, Ni^{+2}, Al^{+3}, Se^{+3}, Fe^{+3} and Y^{+3} and said dicarboxylic acid polymer containing a monovalent such ion.

4,002,582
METHOD FOR THE PRODUCTION OF COATINGS

Peter Fritsche, Hiltrup, Germany, assignor to BASF Farben & Fasern Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 389,794, Aug. 20, 1973, which is a continuation of Ser. No. 149,792, June 3, 1971, abandoned.
This application Aug. 22, 1974, Ser. No. 499,609
Claims priority, application Germany, June 4, 1970, 2027428
Int. Cl.^{2} C08L *91/00, 61/10*

U.S. Cl. 260—4 R **4 Claims**

1. An aqueous coating composition for the production of electrodepositable coatings followed by air drying or baking at a temperature below 85° C consisting of an aqueous dispersion of a water-insoluble synthetic resin in a mixture dissolved or dispersed in water partly in the form of a salt with ammonia or a water-soluble organic amine, said mixture consisting essentially of:

I. about 10 to 50 percent by weight of a non-heat reactive phenolic aldehyde resin; and

II. about 50 to 90 percent by weight of a copolymer of:

A. about 50 to 85 percent by weight of an ester of acrylic or methacrylic acid with an alcohol having one to 10 carbon atoms;

B. about 5 to 20 percent by weight of at least one oil containing at least one olefinically unsaturated fatty acid;

C. about 5 to 15 percent by weight of a copolymerizable α,β-olefinically unsaturated carboxylic acid having 3 to 5 carbon atoms; and

D. about 3 to 20 percent by weight of at least one compound selected from the group consisting of acrylamide, methacrylamide, methylolacrylamide and methylolmethacrylamide and ethers of methyllolacrylamide and methylolmethacrylamide with alcohols having 1 to 8 carbon atoms; wherein

the sum of the percentages given under A to D being 100 percent, the improvement comprising said water-insoluble synthetic resin being cyclized rubber and dispersed in the aqueous solution or dispersion of said mixture from I and II, the dispersion being made by dispersing a solution of cyclized rubber in organic solvents in the aqueous solution or dispersion of said mixture from I and II, the ratio of weight between cyclized rubber and the sum of I and II being from about 40–70 percent cyclized rubber to about 0–30 percent of the sum of I and II, said cyclized rubber having a specific gravity of about 0.97–1.02, a melting point of about 135°–150° C and a viscosity of about 700–1050 seconds running time as measured in a viscosimeter at 50 percent solution of analytical benzene according to German Industrial Standard 53,211.

4,002,583
SUBSTRATE COATING COMPOSITION

Lynn J. Taylor, Toledo, Ohio, and John D. Grier, Harlysville, Pa., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 316,124, Dec. 18, 1972, Pat. No. 3,877,962. This application Feb. 3, 1975, Ser. No. 546,357
Int. Cl.^{2} C08L *1/28*

U.S. Cl. 260—17 R **5 Claims**

1. As a composition of matter, a coating system to be applied to a substrate, the system consisting of at least one particulate, solid, inorgainc substance dispersed in at least one thermally thinnable fugitive vehicle, said fugitive vehicle being a low-molecular-weight liquid polymer selected from the group consisting of polyethers, poly(alkyl methacrylates), methacrylate copolymers, polycarbonates, polyesters, polyisobutylene, polystyrene, poly(alkyl vinyl ethers), styrene/alphamethylstyrene copolymers, vinyl toluene/alphamethylstyrene copolymers, and olefin-sulfur dioxide copolymers, the vehicle being non-drying and sufficiently viscous at the temperature of the substrate application to prevent settling of said dispersed particulate solid substance and convertible to a sufficiently low viscosity liquid on heating to a higher temperature to permit controlled settling of and improved densification of said particulate solid substance and thermally removable on heating to a still higher temperature leaving said particulate solid substance.

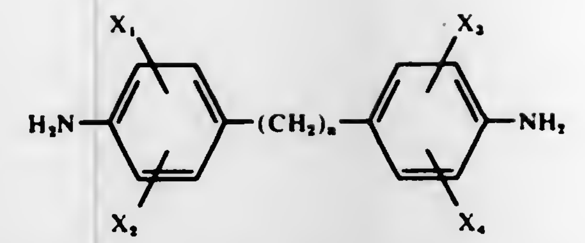
4,002,584
PROCESS FOR THE PRODUCTION OF URETHANE ELASTOMERS

Akio Takahashi, Yokohama; Hirokichi Saito, Shimizu, and Yoshijiro Oyaizu, Yaizu, all of Japan, assignors to Ihara Chemical Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1974, Ser. No. 495,097
Claims priority, application Japan, Aug. 6, 1973, 48-88235
Int. Cl.^{2} C08G *18/18, 18/32*

U.S. Cl. 260—18 TN **6 Claims**

1. A one-shot process for the production of solid urethane elastomers, characterized by reacting simultaneously a water-free mixture consisting essentially of a long-chain polyol having a molecular weight of 400–5000, an organic diisocyanate and at least one halogenated aromatic diamine



selected from the group consisting of 3,3′,5,5′-tetrachlorobenzidine, 2,2′,5,5′-tetrachlorobenzidine, 4,4′-methylene-bis(2,5-dichloroaniline) 4,4′-methylene-bis(2,3-dichloroaniline), and 4,4′-methylene-bis(2,6-dichloroaniline), said diamine being preliminarily dissolved in said polyol without reacting the same and said diisocyanate and then being added to the resultant mixture to effect said simultaneous reaction.

4,002,585
PRINTING INK BINDER RESIN

Toshio Oishi, Nishinomiya; Satoru Yoshimoto, Higashiosaka, and Hiroshi Sasaki, Nara, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1975, Ser. No. 630,030
Claims priority, application Japan, Nov. 8, 1974, 49-129430
Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—25 **15 Claims**

1. A printing ink binder resin comprising a reaction product of (a) a rosin, (b) 5 to 300 parts of an α,β-ethylenically unsaturated carboxylic acid-modified petroleum resin having an acid value of 10 to 60, a bromine value of 20 to 50 and a softening point of 85° to 170° C., (c) 20 to 80 parts of a resol-type phenol-formaldehyde pre-condensate, and (d) a polyhydric alcohol, said reaction product having an acid value of not more than 30, a softening point of not less than 140° C., a viscosity of a 33% by weight linseed oil solution of not less than Y by a Gardner-Holdt bubble viscometer at 25° C. and a tolerance of not less than 5, said (d) being present in an amount of 0.6 to 1.2 equivalents of —OH group per equivalent of —COOH group in both said (a) and (b), and said parts of (b) and (c) being parts by weight per 100 parts of (a).

4,002,586
METHOD FOR PREPARING CATIONIC LATEXES

Ritchie A. Wessling; Thomas C. Klingler, and Victor E. Meyer, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1975, Ser. No. 569,720
Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—29.2 EP **10 Claims**

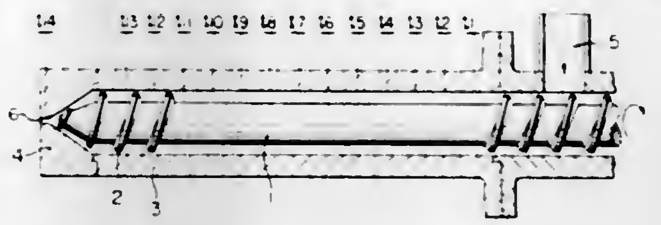
1. A method for preparing a cationic structured-paticle latex comprising the steps of reacting at a temperature from about 0° to about 80° C a water-stable, nonionic, sulfide nucleophile which is capable of diffusing through aqueous media and a low molecular weight acid which ionizes at pH values below about 10 with a latex of copolymer particles having epoxide groups bound to the copolymer at or near the particle surface; said epoxide groups being present in an amount of at least about 0.01 milliequivalent per gram of copolymer in the latex; whereby sulfonium cationic groups are chemically bound to the particles at or near the particle surface.

4,002,587
PROCESS FOR PRODUCING GRANULAR ACTIVATED CARBON

Yasuo Watanabe, Sanjo, and Toshiyuki Miyajima, Tokyo, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,244
Claims priority, application Japan, Feb. 7, 1975, 50-15282
Int. Cl.^{2} C01B *31/08*

U.S. Cl. 264—29.4 **8 Claims**



1. A process for producing granular activated carbon from scrap tire pyrolysis residue which comprises homogeneously kneading at an elevated temperature a mixture of (A) (1) the scrap tire pyrolysis residue and (A) (2) a wooden carbonaceous material with (B) a carbonaceous binder, the ratio (A) (1) / (A) (2) being from 100/30 to 100/300 and the ratio of (A) / (B) being from 50/50 to 65/35, extruding the kneaded mixture from a cylindrical screw extruder having a temperature in the range from 60° to 200° C at the inlet cylinder surface and a temperature in the range of from 140° to 250° C at the outlet, cutting the extruded composition to a selected length, and carbonizing and then activating the cut extrusion product.

4,002,588
HYDROPHILIC-HYDROPHOBIC AMPHOTERIC POLYSALT SIZING COMPOSITONS AND PAPER SIZED THEREWITH

Edward Strazdins, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 8, 1974, Ser. No. 468,113
Int. Cl.^{2} C08L *39/04, 63/00, 77/00*

U.S. Cl. 260—29.6 NR **9 Claims**

1. A polysalt of (A) a normally water-insoluble but water-dispersible anionic vinyl polymer consisting essentially of 65 to 94 mol percent of acrylamide units, 5 to 15 mol percent of styrene units, and 1 to 20 mol percent of acrylic acid units; and (B) a cationic water-soluble polyamine having a molecular weight in excess of 1,000, the ratio of the number of anionic substituents in said anionic polymer to the number of cationic substituents in said polyamine being between about 50/50 and 90/10 such when 1%–10% by weight of an aqueous solution of a polysalt-ionization suppressor complex is added to water having a pH in the range of 4 to 7, said polysalt separates as an insoluble phase consisting of discrete colloidal particles which are neutral or ionic, wherein said polysalt-ionization complex is prepared by mixing 10%–20%, by weight, aqueous solutions of (A) and (B) so as to form a supernatant layer, adding a strong water-soluble acid with a pH of less than about 3 to the mixture, such that the supernatant layer dissolves and remains soluble when the resulting solution is diluted with water to a 0.5%–1% polymer solids content.

4,002,589
PREPARATION OF WATER SOLUBLE SEGMENTED POLYMERS

David E. Farley, Pittsburgh, and Janice Elaine Morgan, Clinton, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1975, Ser. No. 540,359
Int. Cl.^{2} C08L *51/08, 53/00*

U.S. Cl. 260—29.6 WQ **9 Claims**

1. A method of preparing segmented polymers comprised of segments selected from homopolymers, copolymers and terpolymers of water-soluble vinyl monomers, and segments selected from poly(vinyl pyrrolidone) or poly(vinyl alcohol), which comprises the step of:

reacting, at a pH below 7.0, in an inverse emulsion environment which includes at least 4% by weight of the total system of one or more non-ionic surfactants having an HLB number of from about 7.0 to about 10.0, and in the presence of a cerium (IV) salt initiator, one or more water-soluble vinyl monomers and poly(vinyl pyrrolidone) or poly(vinyl alcohol).

4,002,590

COATING COMPOSITION FOR THICK COATING

Akitoshi Yoshida, Chiba; Masaharu Kosaka, Ichikawa, and Shigeki Inoue, Funabashi, all of Japan, assignors to Kikusui Kagaku Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 22, 1974, Ser. No. 526,409

Claims priority, application Japan, Nov. 27, 1973, 48-132212

Int. Cl.^{2} C08K *3/00;* C08L *25/14*

U.S. Cl. 260—29.6 S 3 Claims

1. A coating composition for thick coating in an amount of from 1 to 20 kg/m^2 comprising a coating liquid containing water, aqueous silica sol, an aqueous dispersion of butyl acrylate-methyl acrylate-styrene copolymer and an aggregate, wherein said coating liquid contains from 5 to 40% by weight as SiO_2 of colloidal silica, 3 to 40% by weight of said copolymer, a SiO_2/M_2O mole ratio, wherein M is an alkali metal atom selected from the group consisting of Na, K, and Li, of from 7 to 2000 and has a viscosity lower than 100 c.p. at 20° C when kept in a sealed state at 50° C for 10 days.

4,002,591

COLORATION OF LINEAR POLYMERS BY CO-POLYCONDENSATION WITH PIGMENTS

Philippe Yves Edouard Gangneux, Bihorel, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

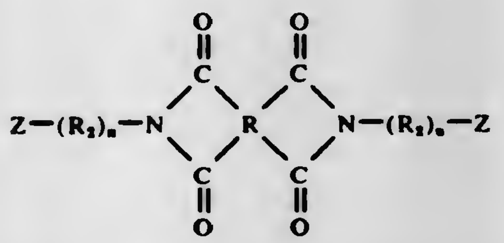
Filed Feb. 7, 1973, Ser. No. 330,332

Claims priority, application France, Feb. 7, 1972, 72.03976

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—37 N 4 Claims

1. Process for forming a colored linear polyamide which comprises effecting the polycondensation of a monomer or monomers of the polyamide in the presence of a pigment of the polycyclic dicarboximide series containing two primary amine functional groups, wherein the pigment has the formula:



(I)

wherein R represents a tetravalent residue of a substituted or unsubstituted mono- or poly-cyclic aromatic hydrocarbon or the tetravalent residue of a substituted or unsubstituted perinone; *n* represents 0 or 1; R_2 represents a $C_1 - C_{10}$ aliphatic, phenyl or diphenyl radical; and Z represents a primary amine group; wherein said pigment is in an amount of from 1 part per 1000 to 2 parts per hundred parts by weight of said monomer or monomers; and wherein said monomer or monomers are selected from the group consisting of 11-amino-undecanoic acid, Σ-caprolactam, and p-phenylenediamine, decamethylenediamine or hexamethylenediamine together with terephthalic, isophthalic, adipic or sebacic acid.

4,002,592

FRICTION MATERIALS CONTAINING SPINEL SOLID SOLUTION AS FRICTION MODIFIER

Yehuda Baskin, South Euclid, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 548,014, Feb. 7, 1975, Pat. No. 3,959,208. This application Jan. 9, 1976, Ser. No. 646,613

Int. Cl.^{2} C08J *5/14;* **C08K** *7/08*

U.S. Cl. 260—38 20 Claims

1. In friction material comprising a rigid, thermosetting, heat-resistant, organic resin and a friction modifier, the improvement comprising a crystalline mineral friction modifier of an isomorphous substitutional solid solution consisting essentially of atoms of metals and oxygen arranged as a mixed crystal in a normal spinel crystal lattice structure and corresponding to the formula:

AB_2O_4

in which A represents one or more monovalent or divalent metal atoms, B represents one or more trivalent, tetravalent, pentavalent, or hexavalent metal atoms, said metal atoms being substituted in and occupying sites in the normal spinel crystal lattice structure, there being at least three different metal atoms present and having a total valence charge of eight to maintain electrical neutrality, said normal spinel crystal lattice structure being present in an amount to impart a desired coefficient of friction to said material.

4,002,593

PROCESS FOR PRODUCING DISPERSIONS OF PIGMENTS IN CONDENSATION TYPE POLYMERS

Marlene J. Jones, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 17, 1975, Ser. No. 596,927

Int. Cl.^{2} C08K *9/04;* **C09D** *17/00*

U.S. Cl. 260—40 P 10 Claims

1. A process for producing an essentially agglomerate-free intimate pigment dispersion for use in coloring fiber and film-forming polymers, said dispersion consisting essentially of at least 10% by weight of pigment in a thermoplastic linear condensation type polymer, which process comprises the steps of

- a. forming a liquid pigment dispersion of pigment particles having a size less than 3 microns in a normally liquid aliphatic or aromatic hydrocarbon diluent which is a nonsolvent for the pigment and for said polymer and is volatile at a temperature which is at least as high as the softening point of said polymer;
- b. introducing a sufficient amount of said liquid pigment dispersion into a melt of said polymer to provide at least 10% of pigment by weight of the pigment plus polymer;
- c. mixing said liquid pigment dispersion with said polymer while it is in the molten state until the pigment has transferred from the diluent phase to the polymer phase;
- d. removing the diluent phase; and
- e. recovering the pigment polymer phase.

4,002,594

SCORCH RETARDANTS FOR RUBBER REINFORCED WITH SILICEOUS PIGMENT AND MERCAPTO-TYPE COUPLING AGENT

Miles Q. Fetterman, Seville, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

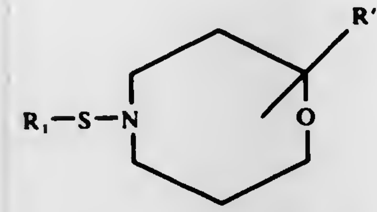
Filed July 8, 1975, Ser. No. 594,163

Int. Cl.^{2} C08K *3/34, 3/36*

U.S. Cl. 260—42.37 24 Claims

1. A sulfur vulcanizable rubber compound comprising rubber; 5 to 200 parts per 100 parts of rubber of finely divided siliceous pigment; 0.1 to 15 parts per 100 parts of rubber of a coupling agent represented by the general formula A-R-B, wherein A represents a functional group capable of bonding to the siliceous pigment, B represents a sulfur functional group

selected from the group consisting of mercapto, halomercapto, thioepoxide, and disulfide groups, and R represents a stable group which connects A and B; 0.2 to 8 parts per 100 parts of rubber of sulfur curative; and 0.1 to 15 parts per hundred parts of rubber of a thiomorpholine scorch retardant represented by the formula:



wherein R_1 is an active group that will allow the thiomorpholine group to retard scorch, each R′ independently is an inert substituent, and *i*, the number of inert substitutents, is 0, 1, 2, or 3.

4,002,595

ELECTROPLATABLE POLYPROPYLENE COMPOSITIONS

Robert L. Adelman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 428,725, Dec. 27, 1973, abandoned. This application Dec. 18, 1975, Ser. No. 641,949

Int. Cl.^{2} C08K *3/04;* **C25D** *5/56*

U.S. Cl. 260—42.47 15 Claims

1. As a new composition of matter a polyolefinic blend capable of being electroplated without first being electrolessly plated, said blend comprising about:

- a. 20 to 60 weight percent of propylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the propylene content of said copolymer being at least 92 molar percent,
- b. 4 to 20 weight percent of an ethylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the ethylene content of said copolymer being at least 88 molar percent,
- c. 1 to 15 weight percent of a low polarity rubber having a low enough polarity to result in the electrical volume resistivity of the blend being less than about 25 ohm-cm in the injection-molded condition,
- d. 12 to 45 weight percent carbon black, having an average particle size less than about 40 mμ, and a volatile content of less than about 3 weight percent, at least 15% of the total of said carbon black being a high conductivity black having a dibutyl phthalate oil absorption value of at least about 1.00 cc./gm., an iodine adsorption number greater than about 160 mg./g., and
- e. optionally up to 45 weight percent silicate mineral additive dispersed in said blend, substantially all of said additive being of a size that will pass through a screen having 44 micron opening, and at least 60% of the particles being smaller than 10 microns in cross sectional dimension,

provided that when said mineral additive is used, the combined amounts of mineral additive and carbon black are between 35 and 60% by weight of the blend.

4,002,596

HALOALKOXY DERIVATIVES OF THE CYCLOPHOSPHONITRILIC CHLORIDE-HEXAMETHYLPHOSPHORAMIDE ADDUCT

Robert M. Murch, Ashton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 436,778, Jan. 25, 1974, Pat. No. 3,927,147. This application Sept. 10, 1975, Ser. No. 612,139

Int. Cl.^{2} C08K *5/51*

U.S. Cl. 260—45.9 NP 5 Claims

1. A method for enhancing the fire retardancy characteristics of general purpose polyester resins which comprises, reacting the equimolar adduct of $(PNCl_2)_3$ and $(Me_2N)_3PO$ with an alcohol selected from the class consisting of β-chloroethanol, 3,3,3-trichloroethanol, 1,3-dichloro-2 propanol, and 2,3-dibromopropanol in an alcohol-to-adduct mole ratio of 4:1 to form an alkoxy derivative, and adding said alkoxy derivative to said polyester resin such that said alkoxy derivative is present in an amount ranging from about 5% to 20% by weight.

4,002,597

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer Douglas Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 15, 1976, Ser. No. 649,411

Int. Cl.^{2} C08K *5/28, 5/09, 3/38, 3/32, 3/22, 3/24*

U.S. Cl. 260—45.75 N 21 Claims

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCrO_4$, $NiMoO_4$, Ni_2O_3, $Ni_3(PO_4)_2$, nickel metal, nickel formate and nickel oxalate and (B) at least one vanadium compound selected from the group consisting of $LaVO_4$, Na_3VO_4, VB_2, VN, V_2O_3, and vanadium metal, said compounds (A) and (B) being compounds or hydrates thereof, and said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

4,002,598

POLYETHER UREA EPOXY CURING AGENT

Harold George Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,844

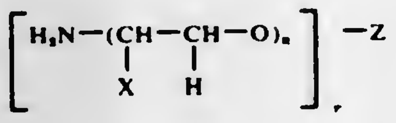
Int. Cl.^{2} C08G *30/14*

U.S. Cl. 260—47 EN 28 Claims

1. A curable epoxy resin composition consisting essentially of:

a vicinal polyepoxide; and,

an effective amount of a polyether urea curing agent having terminal primary amino groups and being formed by the reaction of a compound selected from a group consisting of urea and urea forming compounds with a polyoxyalkylenepolyamine of the formula:



$$\left[H_2N-(\underset{X}{\underset{|}{CH}}-\underset{H}{\underset{|}{CH}}-O)_n \right]_r -Z$$

wherein X is a hydrogen, a methyl radical, or an ethyl radical; Z is a hydrocarbon radical having 2 to 5 carbon atoms forming from 2 to 4 external ether linkages, *n* is a number from 1 to about 15, and *r* is a number from 2 to 4 wherein the molar ratio of said compound to said polyoxyalkylenepolyamine is about 0.50 to 0.83.

4,002,599

EPOXY RESIN COMPOSITIONS FROM GLYCIDYL DERIVATIVES OF AMINOPHENOLS CURED WITH TETRACARBOXYLIC DIANHYDRIDES

James A. Graham, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

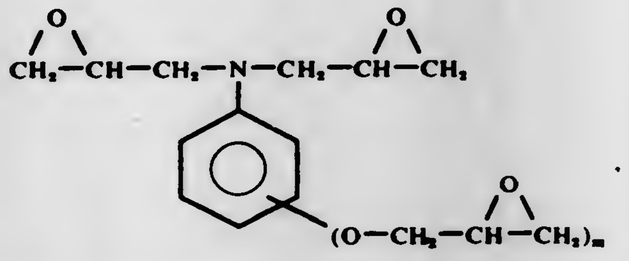
Filed Nov. 6, 1975, Ser. No. 629,342

Int. Cl.² C08G *59/32, 59/42*

U.S. Cl. 260—47 EA **40 Claims**

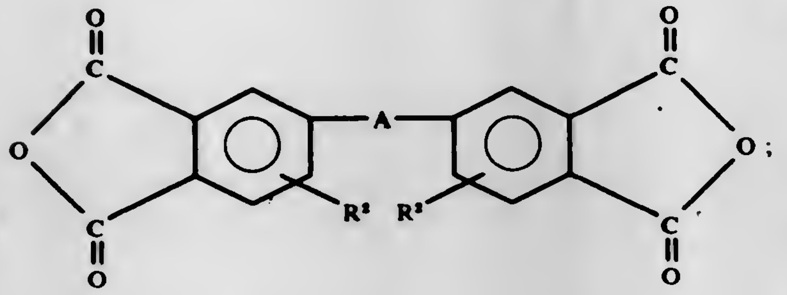
1. A room temperature stable two-pack epoxy resin system consisting essentially of

- a. a first pack comprising at least one polyglycidyl aminophenol having the structure

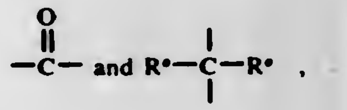


wherein *m* is 1 or 2, and

- b. a second pack comprising at least one biphenyl anhydride having the structure

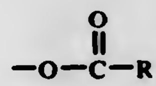


wherein A is selected from the group consisting of



$$-\overset{O}{\overset{\|}{C}}- \text{ and } R^{0}-\underset{|}{\overset{|}{C}}-R^{0} ,$$

wherein each R^0 is individually a monovalent radical selected from the group consisting of hydrogen, halogen, hydroxy, alkyl radical having from 1 to 5 carbon atoms, alkoxy radical having from 1 to 5 carbon atoms and



$$-O-\overset{O}{\overset{\|}{C}}-R^{1} ,$$

wherein R^1 is an alkyl radical having from 1 to 5 carbon atoms; and

wherein each R^2 is individually a monovalent radical selected from the group consisting of hydrogen, halogen, alkyl radical having from 1 to 5 carbon atoms, $-NO_2$. $-COOH$, $-SO_3H$, and $-NH_2$.

4,002,600

LINEAR COPOLYESTERS BASED ON TEREPHTHALIC ACID AND/OR ISOPHTHALIC ACID, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

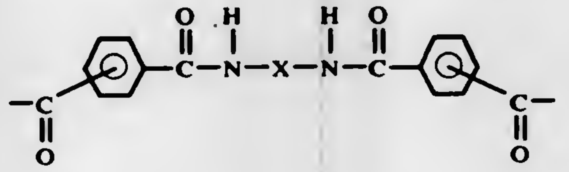
Continuation-in-part of Ser. No. 449,175, March 7, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 629,154

Claims priority, application Switzerland, Mar. 27, 1973, 04399/73

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **2 Claims**

1. A linear, thermoplastic random copolyester containing amide groups bases on polyalkylene terephthalates and/or polyalkytene isophthalates, with 2 to 6 C atoms in the alkylene, characterized in that it contains, as the cocomponent, 5–75 mole %, relative to the total molar amount of the dicarboxylic acid components, of a dicarboxylic acid diamide radical of the formula I



(I)

wherein the two carbonyl groups located on the aromatic ring are in the para-position or meta-position to one another and X is a cycloaliphatic or cycloaliphatic-aliphatic radical.

4,002,601

URETHANE OXAZOLIDINES

Manfred Hajek, Cologne, and Kuno Wagner, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

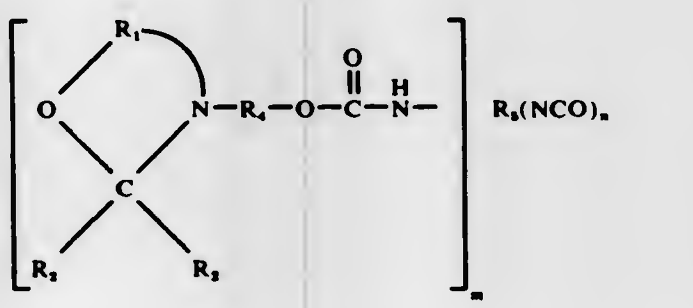
Filed Sept. 18, 1975, Ser. No. 614,470

Claims priority, application Germany, Sept. 28, 1974, 2446438

Int. Cl.² C08G *18/06;* **C07D** *265/04*

U.S. Cl. 260—77.5 AT **6 Claims**

1. Compounds corresponding to the following general formula:



wherein

m represents an integer of from 1 to 6;

n represents an integer of from 0 and 4;

R_1 represents an aliphatic hydrocarbon group containing from 2 to 6 carbon atoms;

R_2 and R_3 which may be the same or different, each represents hydrogen, an aliphatic hydrocarbon containing from 1 to 4 carbon atoms, a cycloaliphatic hydrocarbon group containing from 5 to 7 carbon atoms, or an aromatic hydrocarbon group containing from 6 to 10 carbon atoms, or when taken together with the ring carbon atom they may form a 5- or 6-membered cycloaliphatic hydrocarbon ring;

R_4 represents an aliphatic hydrocarbon group containing from 2 to 6 carbon atoms; and

R_5 represents a residue of the type which may be obtained by removal of the isocyanate groups from an organic (n + m)-valent polyisocyanate.

4,002,602

UBIQUITOUS IMMUNOPOIETIC POLYPEPTIDE (UBIP) AND METHODS

Gideon Goldstein, 4455 Douglas Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 449,686, March 11, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,844

Int. Cl.² C07C *103/52;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **12 Claims**

1. A polypeptide which has the following amino acid sequence:

H_2N-MET-GLN-ILE-PHE-VAL-LYS-THR-LEU-THR-GLY-LYS-THR-ILE-THR-LEU-GLU-VAL-GLU-PRO-SER-ASP-THR-ILE-GLU-ASN-VAL-LYS-ALA-LYS-ILE-GLN-ASP-LYS-GLU-GLY-ILE-PRO-PRO-ASP-GLN-GLN-ARG-LEU-ILE-PHE-ALA-GLY-LYS-GLN-LEU-GLU-ASP-GLY-ARG-THR-LEU-SER-ASP-TYR-ASN-ILE-GLN-LYS-GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU-ARG-COOH.

4,002,603

POLYVALENT METAL SALTS OF 7-HYDROXY-8-[p-(PHENYLAZO)PHENYLAZO]-1,3-NAPHTHALENEDISULFONIC ACID FOR DYEING FIBERGLASS

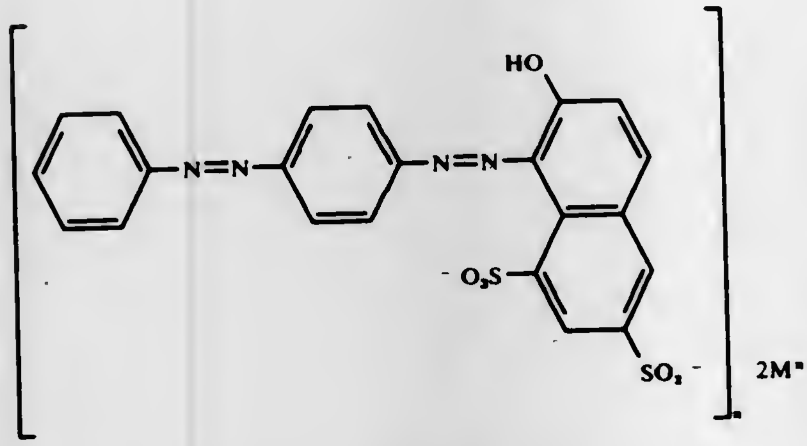
Woodrow Wilson Robbins, Bound Brook; Herbert Soffer, Fanwood, and Richard Benjamin Balsley, Lebanon, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 28, 1974, Ser. No. 501,301

Int. Cl.² C09B *45/24, 31/02;* **D06P** *3/80*

U.S. Cl. 260—148 **4 Claims**

1. A dye represented by the following formula:



wherein M is selected from the group consisting of calcium, barium, strontium, magnesium, chromium, manganese, iron, cobalt, nickel, copper and zinc and wherein *n* is an integer selected from 2 and 3.

4,002,604

AZO DYESTUFF INCLUDING A 1,3 OR 1,4-BENZODIOXAN RING STRUCTURE FUSED TO A THIAZOLE RING

David Melville Fawkes, and John Lindley Leng, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

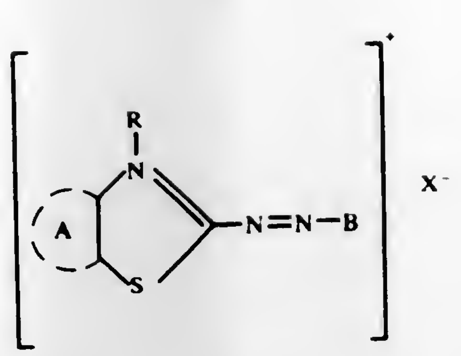
Filed Nov. 26, 1975, Ser. No. 635,423

Claims priority, application United Kingdom, Dec. 18, 1974, 54617/74

Int. Cl.² C09B *29/36*

U.S. Cl. 260—155 **14 Claims**

1. An azo dyestuff devoid of carboxylic acid and sulphonic acid groups and of the formula I



(I)

wherein A is a 1,3 or 1,4-benzodioxan ring structure fused to the thiazole ring via the benzene ring, B is the radical of a para-coupling amine or an indole, R is an optionally substituted alkyl, alkenyl, cycloalkyl or aralkyl radical and X is an anion.

4,002,605

CALCIUM AND MAGNESIUM SALTS OF 4-(2-HYDROXY-1-NAPHTHYLAZO)-1-NAPHTHALENESULFONIC ACID FOR DYEING FIBERGLASS

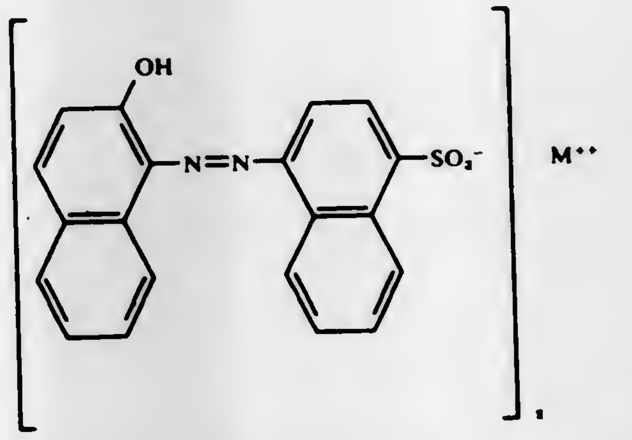
Richard Benjamin Balsley, Lebanon; Herbert Soffer, Fanwood, and Woodrow Wilson Robbins, Bound Brook, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 28, 1974, Ser. No. 501,302

Int. Cl.² C09B *29/16;* **D06P** *3/80;* **C03C** *13/00*

U.S. Cl. 260—195 **3 Claims**

1. A dye represented by the formula:



where M is selected from the group consisting of calcium and magnesium; provided that where M is calcium, said dye is characterized by an X-ray diffraction pattern with lines at interplanar spacings in Angstroms of 17.4, 8.66, 7.62 and 3.54 and relative intensities of 45, 10, 100 and 10, respectively.

4,002,606

WATER-SOLUBLE PHENYL-AZO-NAPHTHYL COMPOUNDS

Ludwig Schläfer, Fischbach, Taunus, and Ernst Hoyer, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

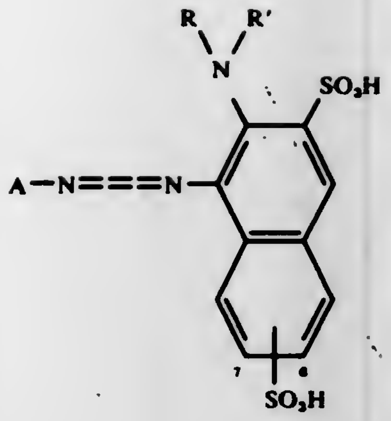
Filed Sept. 3, 1974, Ser. No. 502,501

Claims priority, application Germany, Sept. 3, 1973, 2344333

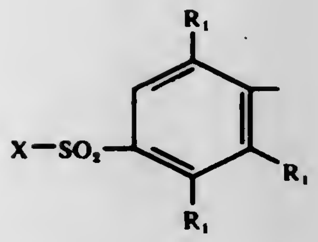
Int. Cl.² C09B *29/06;* **D06P** *3/10, 3/24, 3/66*

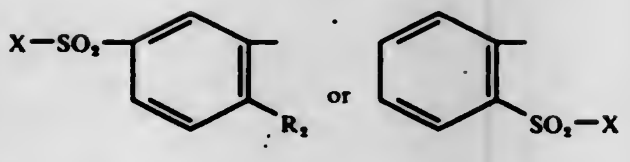
U.S. Cl. 260—196 **9 Claims**

1. Water-soluble monoazo compound which, in the form of the free acid, corresponds to the formula



wherein A is





wherein

- R_1 are identical or different, and each is hydrogen, chorine, alkyl with 1 to 4 carbon atoms, or alkoxy with 1 to 4 carbon atoms,
- R_2 is hydrogen, chlorine, bromine, sulfo, sulfonic acid amide or alkoxy of 1 to 4 carbon atoms, X is vinyl or —CH_2-CH_2-Z, in which Z is an inorganic or organic radical capable of being split off by an alkaline agent selected from the group consisting of hydroxy, chlorine, bromine, alkylsulphonyloxy or alkylsulfonylamino, each having 1 to 5 carbon atoms, arylsulfonyloxy, arylsulfonylamino, alkanyloxy having 1 to 4 carbon atoms, trialkylammonium having 1 to 4 carbon atoms in each of the alkyl groups, thiosulfato or its metal salts, phosphato or its metal salts and sulfato, or its metal salts, R is hydrogen or alkyl with 1 to 4 carbon atoms, R′ is hydrogen, alkyl with 1 to 4 carbon atoms, phenyl, or phenyl substituted by methyl, ethyl, methoxy or ethoxy and the sulfonic acid in the naphthyl radical is in 6- or 7-position.

4,002,607

AZO DYES HAVING AN AMINO GROUP PARA TO THE AZO LINKAGE

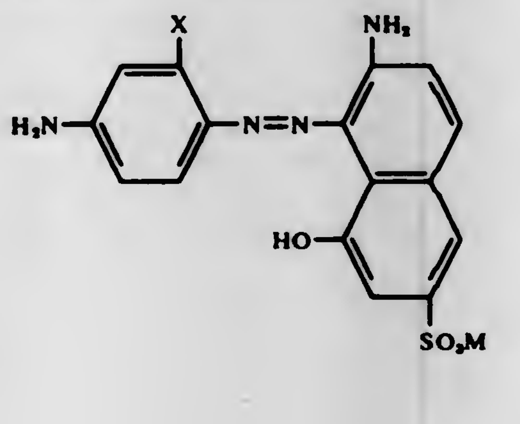
John H. McLeod, Tonawanda, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 25, 1974, Ser. No. 517,979

Int. Cl.² C09B *43/08*

U.S. Cl. 260—198 **3 Claims**

1. A monoazo dyestuff having the formula



wherein X is Cl, Br or CN and M is an alkali metal or hydrogen.

4,002,608

1-N-ALKYL-AMINOGLYCOSIDE-XK-88 DERIVATIVES AND METHODS FOR THEIR MANUFACTURE

John J. Wright; Peter J. L. Daniels, both of Cedar Grove; Alan K. Mallams, West Orange, and Tattanahalli L. Nagabhushan, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Nov. 4, 1975, Ser. No. 628,638

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **8 Claims**

1. A 1-N-X-4,6-di-O-(aminoglycosyl)-2-deoxystreptamine selected from the group consisting of 1-N-X-Aminoglycoside-XK-88-1, 1-N-X-Aminoglycoside-XK-88-3, and 1-N-X-Aminoglycoside-XK-88-5;

wherein X is an alkyl substituent selected from the group consisting of alkyl, alkenyl, aralkyl, hydroxyalkyl, cycloalkylalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl, and alkylaminohydroxyalkyl, said alkyl substituent having up to 8 carbon atoms, the carbon in said alkyl substituent adjacent to the aminoglycoside nitrogen being unsubstituted, and when said alkyl substituent is substituted by both hydroxyl and amino functions, only one of said functions can be attached at any one carbon atom;

and the pharmaceutically acceptable acid addition salts thereof.

4,002,609

SUCROSE DERIVATIVES

Riaz Ahmed Khan, Sonning, England, assignor to Tate & Lyle Limited, London, England

Filed Feb. 24, 1975, Ser. No. 552,205

Claims priority, application United Kingdom, Mar. 5, 1974, 9867/74

Int. Cl.² C08B *37/00*

U.S. Cl. 536—119 **9 Claims**

1. A process for preparing 1′,2,3,3′,4,4′,6-hepta-O-acetylsucrose and 1′,2,3,3′,4′,6,6′-hepta-O-acetylsucrose, which comprises the successive steps of: tritylating sucrose, whereby there is obtained a mixture of 6- and 6′-mono-O-tritylsucroses; acetylating said mixture of monotritylsucroses, without first separating them from each other, whereby there is obtained a mixture of 6- and 6′-mono-O-tritylsucrose hepta-acetates; and detritylating said mixture of monotritylsucrose hepta-acetates with hydrobromic acid in acetic acid solution.

4,002,610

2-AMINOBENZODIAZEPINE-5-ONES

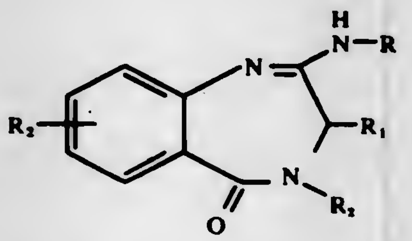
Richard J. Mohrbacher, Maple Glen, and Philip P. Grous, Philadelphia, both of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Sept. 22, 1975, Ser. No. 615,667

Int. Cl.² C07D *243/20*

U.S. Cl. 260—239.3 D **13 Claims**

1. A compound selected from the group consisting of a 2-aminobenzodiazepine-5-one of the formula:



and the therapeutically active non-toxic acid addition salts thereof, wherein:

- R is a member selected from the group consisting of hydrogen, arylloweralkyl, indolylloweralkyl, diloweralkylaminoloweralkyl and aryl;
- R_1 is a member selected from the group consisting of hydrogen and aryl;
- R_2 is loweralkyl; and
- R_3 is a member selected from the group consisting of hydrogen, halo, nitro, loweralkoxy and loweralkyl;

provided, that, when R is hydrogen, then said R_1 is aryl; the aforementioned term aryl in each occurrence being a member selected from the group consisting of phenyl, trifluoromethylphenyl and phenyl substituted with from 1 to 3 members selected from the group consisting of halo, loweralkyl, hydroxy, and loweralkoxy.

4,002,611

PREPARATION OF BENZODIAZEPINES

Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Tadashi Okamoto, Ashiya; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo; Michihiro Yamamoto, Takarazuka; Isamu Maruyama, Minoo; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

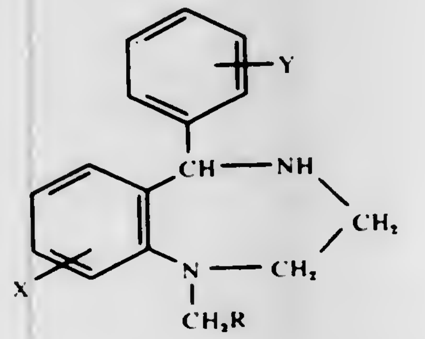
Filed Feb. 7, 1969, Ser. No. 797,663

Claims priority, application Japan, Feb. 13, 1968, 43-8951; Mar. 5, 1968, 43-14449; Mar. 6, 1968, 43-14830; Mar. 12, 1968, 43-16332; May 8, 1968, 43-31142

Int. Cl.² C07D *243/16*

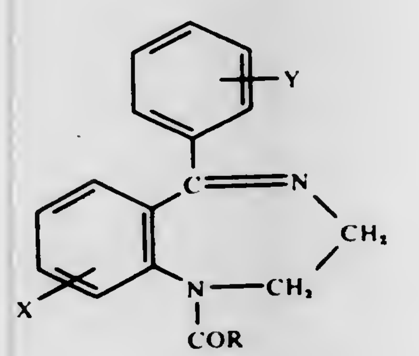
U.S. Cl. 260—239 BD **4 Claims**

1. A process for preparing 1-alkyl-1,2,4,5-tetrahydro-3H-1,4-benzodiazepine derivatives, and acid-addition salts thereof, represented by the formula,



(I)

wherein R signifies a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, and X and Y signify respectively a hydrogen atom, a halogen atom or a trifluoromethyl group; comprising contacting a 1-(C_1–C_4 alkanoyl)-2,3-dihydro-1H-1,4-benzodiazepine derivative, or an acid-addition salt thereof, represented by the formula,



(II)

wherein R, X and Y are as defined above, with a lithium aluminum hydride.

4,002,612

1-(3,4-DICHLOROBENZYL)HEXAHYDRO-1,3-DIAZEPIN-2(1H)-ONE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,374

Int. Cl.² C07D *243/04*

U.S. Cl. 260—239.3 R **1 Claim**

1. 1-(3,4-Dichlorobenzyl)hexahydro-1,3-diazepin-2(1H)-one.

4,002,613

10-(3,4-DICHLOROBENZYL)DIBENZ[B,F][1,4]OXAZEPIN-11-ONE

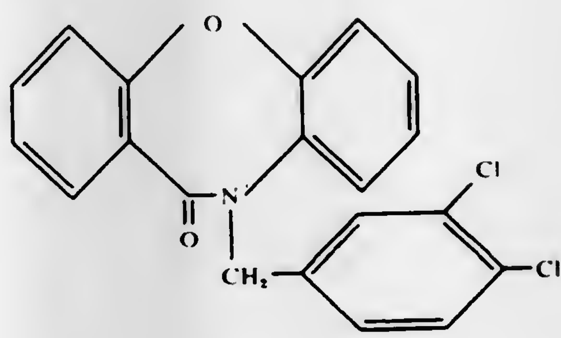
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,225

Int. Cl.² C07D *267/20*

U.S. Cl. 260—239.3 T **1 Claim**

1. The compound of the formula:



4,002,614

HALOGENATED 19-NORSTEROIDS

Georg Anner, Basel, and Peter Wieland, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

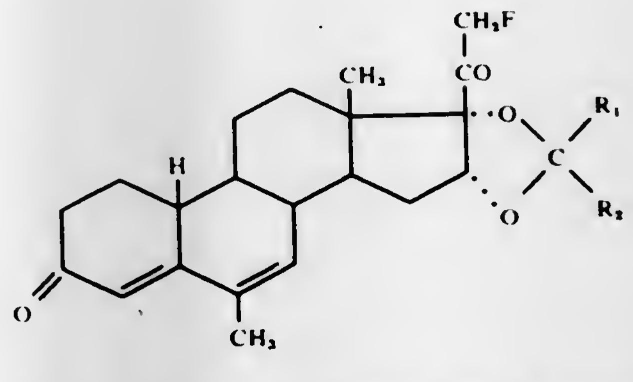
Continuation of Ser. No. 442,931, Feb. 15, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,518

Claims priority, application Switzerland, Feb. 28, 1973, 2950/73; Dec. 20, 1973, 17898/73

Int. Cl.² C07J *21/00*

U.S. Cl. 260—239.55 D **4 Claims**

1. A 21-fluoro-19-norpregnadiene compound of the general formula



wherein R_1 and R_2 each individually denote a lower alkyl, lower cycloalkyl, phenyl or benzyl radical or together with the adjacent carbon atom form the cyclopentane or the cyclohexane ring.

4,002,615

TERPENOID COMPOUNDS OF SUBSTITUTED HYDROXYALKYL-PYRIDINES HAVING JUVENILE HORMONE ACTIVITY

Hauk Solli, Harboor; Per Dausell Klemmensen, Lemvig; Preben Lindholm Holst, Harboor, and Hans Berg Madsen, Bovlingbjerg, all of Denmark, assignors to A/S Cheminova, Lemvig, Denmark

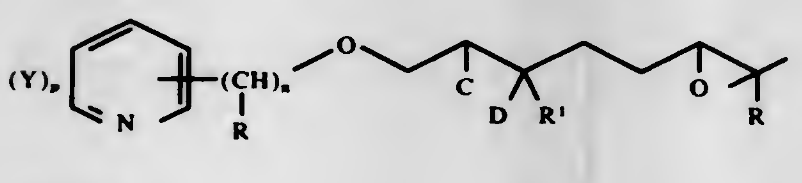
Filed July 25, 1974, Ser. No. 491,970

Claims priority, application United Kingdom, Mar. 13, 1974, 11201/74

Int. Cl.² C07D *405/12*

U.S. Cl. 260—240 H **9 Claims**

1. A novel chemical compound of the general formula (I):



wherein

C is hydrogen,

D is hydrogen,

C and D when taken together form a further single bond between the adjacent carbon atoms,

R is methyl or ethyl,

R_1 is methyl or ethyl

n is an integer from 1 to 3,

R_2 is alkyl or hydrogen and when *n* is 2 or 3 may be the same or different,

p is an integer from 0 to 3 and

Y is NO_2, halogen, OH, CF_3, alkyl, alkoxy, COOH or COOalkyl and when *p* is 2 or 3 or may be the same or different.

4,002,616

DISPERSE BISANIL DYES DERIVED FROM DIAMINOMALEONITRILE AND THEIR PREPARATION

John Fred Neumer, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 430,416, Jan. 3, 1974, Pat. No. 3,927,065. This application June 30, 1975, Ser. No. 592,205

Int. Cl.² C07D *333/04, 209/14*

U.S. Cl. 260—240 G **21 Claims**

1. Bisanil dye of the formula

Ar_1-CH=N-C(CN)=C(CN)-N=CH-Ar_2

wherein each of Ar_1 and Ar_2 is independently selected from

1. benzo(5- and 6-membered)heterocyclic groups containing 0–4 methyl substituents and
2. phenyl, naphthyl, 5-membered heterocyclic and 6-membered heterocyclic groups containing 0–3 substituents selected from NO_2, halogen, CN, C_{1-4} alkyl, C_{1-4} alkoxy, OCH_2-phenyl, phenyl, CF_3, OH, OC_{1-4} alkylene-N(C_{1-4} alkyl)$_2$, C_{2-4} alkylene-Cl, $NHCONH_2$, NHCOA, $NHSO_2A$, SR_8, SO_2R_8, NHR_1, $NHCOC_{1-4}$ alkylene-B and -NR_1R_2 wherein:
   - a. R_1 is C_{1-4} alkyl or C_{2-4} alkylene-R_3;
   - b. R_2 is C_{1-4} alkyl, C_{2-4} alkylene-R_4 or, if Ar_1 or Ar_2 is phenyl, C_3 alkylene attached to a phenyl position which is ortho to the position to which the nitrogen is attached;
   - c. R_3 is CN, halogen, OH, phenyl, C_{1-4} alkoxy, OC_{1-4} alkylene-CN, CO_2A, OCOA, OCONHA or CO_2C_{1-4} alkylene-OCOA;
   - d. R_4 is CN, halogen, OH, phenyl, OC_{1-4} alkylene-CN, CO_2A, OCOA, CO_2C_{1-4} alkylene-OCOA, SO_2A, phthalimido, succinimido, glutarimido, $OCOCH=CH_2$, CH_2-CH(OCOA)CH_2OA or CH_2CH(OCONHA)C-H_2OA;
   - e. A is C_{1-4} alkyl or R_5;
   - f. B is halogen, C_{1-4} alkoxy or R_5;
   - g. R_5 is phenyl containing 0–2 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halogen, NO_2, CN, C_{1-4} alkyl-CONH and NR_6R_7 wherein each of R_6 and R_7 is independently selected from H and C_{1-4} alkyl, with at least one of R_6 and R_7 being C_{1-4} alkyl; and
   - h. R_8 is C_{1-4} alkyl, C_2H_4OH, C_{3-6} cycloalkyl or R_5; with at least one of Ar_1 and Ar_2 being a heterocyclic group selected from (1) and (2).

4,002,617

HYDRODIPYRANO-PHTHALAZINE COMPOUNDS

Fritz Eiden, and Claus Schmiz, both of Munich, Germany, assignors to Chem. Pharmaz. Fabrik Dr. Herman Thiemann G.m.b.H., Lunen, Germany

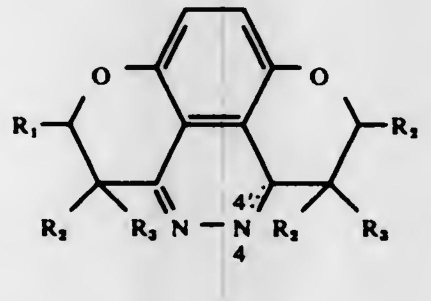
Filed Nov. 5, 1975, Ser. No. 628,963

Claims priority, application Germany, Nov. 4, 1974, 2452491

Int. Cl.² C07D *237/26*

U.S. Cl. 260—240 F **2 Claims**

1. A hydrodipyrano-phthalazine compound of the formula:



wherein

R_1 = hydrogen or lower alkyl,

R_2 = hydrogen, chlorine or bromine,

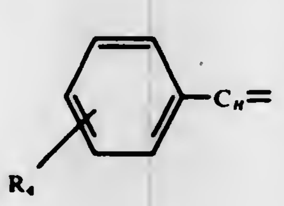
R_3 = hydrogen, chlorine, bromine, an alkoxy or aralkyl group, with the proviso that:

R_3 = hydrogen or aralkyl if R_2 = hydrogen,

R_3 = bromine or alkoxy if R_2 = bromine,

R_3 = chlorine or alkoxy if R_2 = chlorine, or

R_2 and R_3 form together the substituent



wherein

R_4 = hydrogen, halogen, trifluoromethyl, alkyl, alkoxyl, alkylenedioxy, a possibly substituted amino group, or a nitro group.

the 4,4'-bond is saturated or unsaturated, and acid-addition salts of these compounds.

4,002,618

2,2-DIPHENYL-5-(4-SUBSTITUTED-PIPERIDINO)-3-TRANS-PENTENENITRILES

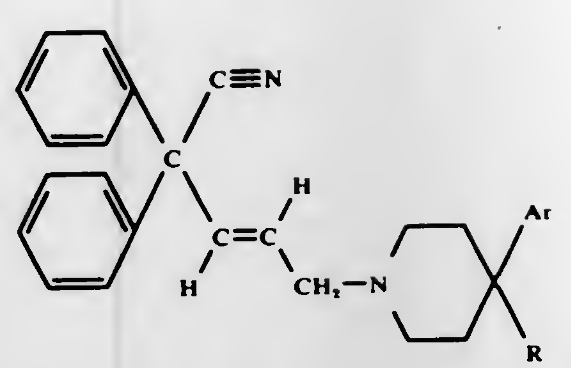
Chung H. Yen, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,205

Int. Cl.² C07D *211/06*

U.S. Cl. 260—240 R **5 Claims**

1. A compound of the formula



(I)

wherein Ar is selected from the group consisting of phenyl, monosubstituted lower alkylphenyl wherein the alkyl portion contains 1 to 6 carbon atoms, and monosubstituted halophenyl; and R is selected from the group consisting of hydrogen, hydroxy, cyano, lower alkoxycarbonyl containing 2 to 7 carbon atoms, and carboxy.

4,002,619

COUMARINE DYESTUFFS OF THE DISPERSION SERIES

Siegfried Dengler, Choex; Peter Loew, Munchenstein; Christian Zickendraht, Binningen, and Hansrudolf Schwander, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

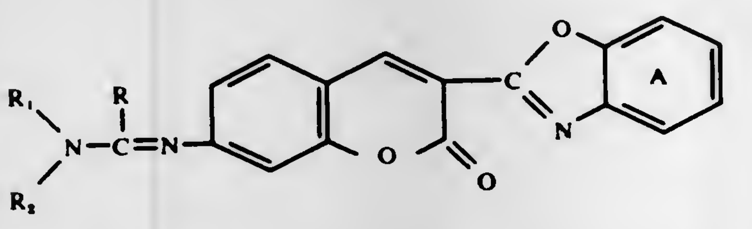
Filed June 17, 1974, Ser. No. 479,919

Claims priority, application Switzerland, June 29, 1973, 9504/73

Int. Cl.² C07D *405/00, 413/00*

U.S. Cl. 260—240 G **3 Claims**

1. A dyestuff of the formula



wherein

R, R_1 and R_2 are individually alkyl of 1 to 4 carbon atoms, unsubstituted or substituted by chloro, hydroxy, cyano, methoxy, acetoxy, butyryloxy, methoxycarbonyl, ethoxycarbonyl or phenyl; or are phenyl or phenyl substituted by methyl, ethyl, propyl, methoxy, ethoxy, cyano, chloro, bromo, nitro or acetylamino; and

R and R_1 additionally represents hydrogen, or R_1 and R_2 together additionally represent, together with the nitrogen to which they are attached, the piperidine ring;

and the benzene ring A is unsubstituted or substituted by chloro; bromo; lower alkyl; lower alkoxy; acetyl; lower alkylsulphonyl; nitro or thiocyano.

4,002,620

2-ANILINO-4H-3,1-BENZOTHIAZINES

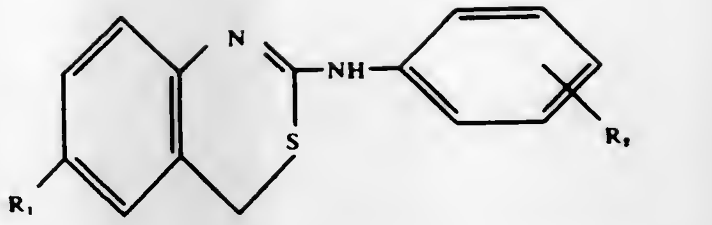
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,228

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **7 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen and R_2 represents 4-dimethylamino, 5-chloro-2,4-dimethoxy or 3,4-dichloro; and R_1 is chloro and R_2 represents 4-acetyl or 3-chloro.

4,002,621

6-CHLORO-2-(3,4-DICHLOROANILINO)-4H-3,1-BENZOTHIAZINE

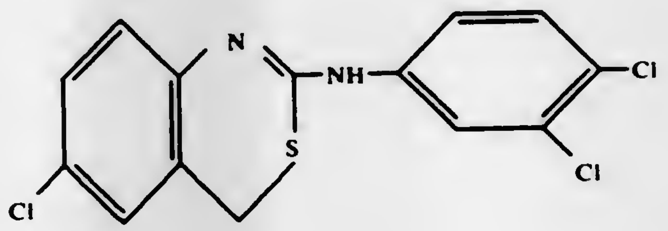
Stanford Salvatore Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,227

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **1 Claim**

1. The compound 6-chloro-2-(3,4-dichloroanilino)-4H-3,1-benzothiazine of the formula:



4,002,622

2-(3-CHLOROANILINO)-4H-3,1-BENZOTHIAZINE

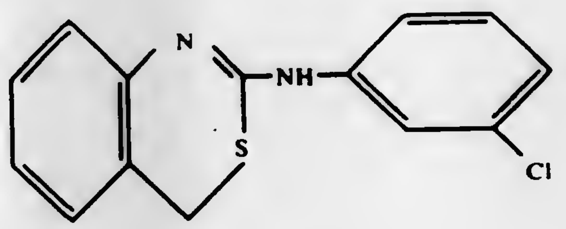
Stanford Salvatore Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,226

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **1 Claim**

1. The compound 2-(3-chloroanilino)-4H-3,1-benzothiazine of the formula:



4,002,623

ANTI-INFLAMMATORY 1-[3-(DIALKYLAMINO)PROPYL]-2-ACYLAMINOBENZIMIDAZOLES AND 2-ACYLAMINO-3-[3-(DIALKYLAMINO)-PROPYL-]IMIDAZO[4,5-b]PYRIDINES

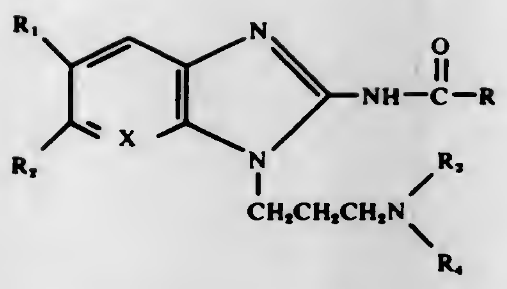
Saul Bernard Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,375

Int. Cl.² C07D *295/00*

U.S. Cl. 260—247.2 A **20 Claims**

1. A compound having the formula:



and pharmaceutically acceptable acid addition salts thereof wherein R is styryl, chlorostyryl, phenyl, or mono- or di-substituted phenyl wherein each substituent is chloro, bromo, fluoro, trifluoromethyl, phenyl, alkoxy or alkyl said alkoxy or alkyl having from 1 to 4 carbon atoms; R_1 and R_2 are each hydrogen, chloro, bromo, fluoro, trifluoromethyl, methoxy or methyl; X is carbon; and R_3 and R_4 when taken separately are each alkyl having from 1 to 4 carbon atoms and when taken together with the nitrogen to which they are attached form a piperidino, pyrrolidino, morpholino, piperazino, 4-benzylpiperazino or 4-alkylpiperazino ring said alkyl having from 1 to 4 carbon atoms.

4,002,624
SUBSTITUTED-3-THIO-1,2,4-TRIAZINES

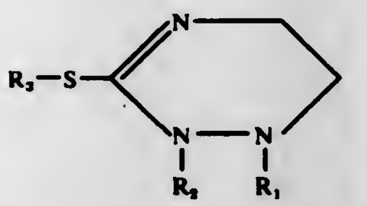
Donald L. Trepanier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1976, Ser. No. 652,606

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **5 Claims**

1. A compound of the formula



wherein

R_1 represents hydrogen or a lower alkyl group of from 1 to about 3 carbon atoms,

R_2 and R_3 independently represent benzyl, para-chlorobenzyl, diphenylmethyl, and 10,11-dihydro-5H-dibenzo(a,d)-cyclohepten-5-yl and the addition salts thereof.

4,002,625
SUBSTITUTED 1,2,4-TRIAZINE-3-METHANAMINES

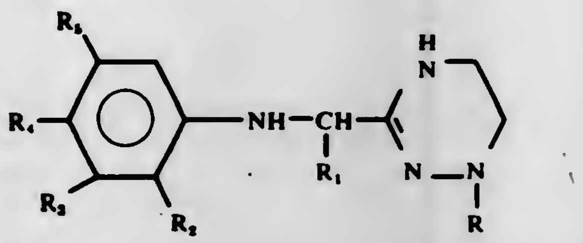
Donald L. Trepanier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1976, Ser. No. 652,607

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **4 Claims**

1. A compound of the formula



and the addition salts thereof, wherein R and R_1 independently represent hydrogen or a lower alkyl of from 1 to 3 carbon atoms and R_2, R_3, R_4, and R_5 independently represent hydrogen, methyl, trihalomethyl, or a halogen.

4,002,626
1-(2-NAPHTHYLMETHYL)-3,4,5,6-TETRAHYDRO-2(1H)PYRIMIDONE

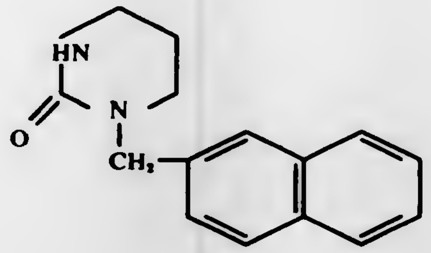
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,754

Int. Cl.² C07D *239/04*

U.S. Cl. 260—251 R **1 Claim**

1. A compound of the formula:



4,002,627
1-BENZYL-3-METHYL-3,4,5,6-TETRAHYDRO-2(1H) PYRIMIDONE

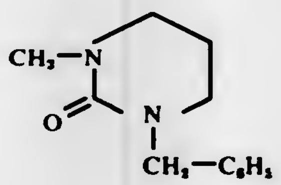
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,651

Int. Cl.² C07D *239/04*

U.S. Cl. 260—251 R **1 Claim**

1. A compound of the formula:



4,002,628
NOVEL FLUOROALKOXYPHENYL-SUBSTITUTED NITROGEN

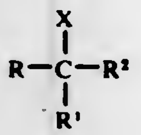
Robert Lee Benefiel, Manila, and Eriks Viktor KrumRalns, Indianapolis, both of Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 371,106, June 18, 1973, Pat. No. 3,967,949. This application Dec. 17, 1975, Ser. No. 641,403

Int. Cl.² C07D *239/26*

U.S. Cl. 260—251 R **4 Claims**

1. A compound of the formula



$$R-\overset{\displaystyle X}{\underset{\displaystyle R^1}{C}}-R^2$$

wherein

R is 5-pyrimidyl;

R^1 is phenyl, pyridyl, C_1–C_{12} alkyl or C_3–C_8 cycloalkyl;

R^2 is trifluoromethoxyphenyl, tetrafluoroethoxyphenyl, pentafluoroethoxyphenyl, or 2,2,4,4-tetrafluoro-1,3-benzodioxanyl;

X is hydrogen, hydroxy, lower alkoxy, lower alkylthio, or lower alkanoyloxy;

and the nonphytotoxic acid addition salts thereof.

4,002,629
CERTAIN PYRIDINE CARBOXAMIDE DERIVATIVES

Jacques E. Delarge, Dolembreux; Leopold N. Thunus, Liege; Charles-Leon Lapiere, Tongeren, and Andre H. Georges, Ottignies, all of Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

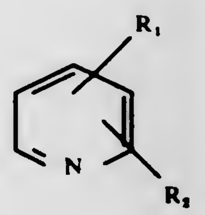
Continuation-in-part of Ser. No. 459,987, April 11, 1974, which is a continuation-in-part of Ser. No. 197,139, Nov. 9, 1971, abandoned. This application Sept. 26, 1975, Ser. No. 617,127

Claims priority, application United Kingdom, Nov. 11, 1970, 53675/70

Int. Cl.² C07D *401/04*

U.S. Cl. 260—268 H **3 Claims**

1. Compounds of the formula:



wherein R_1 in the 3- or 5-position of the pyridine nucleus represents carboxamido, lower alkyl carboxamido or di-lower alkyl carboxamido group; and R_2 in the 2-position represents the N-metyl-piperazinyl group, and the pharmaceutically acceptable salts of the compounds of formula I.

4,002,630
NOVEL AROMATIC O-HYDROXYALDEHYDES, A PROCESS FOR THEIR PREPARATION AND THEIR UTILIZATION

Theodor Papenfuhs, Frankfurt am Main, and Helmut Troster, Schneidhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

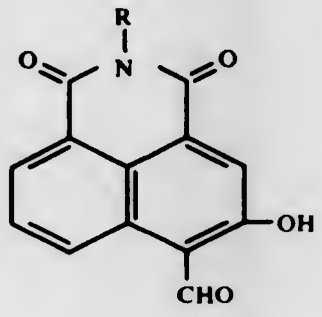
Filed July 22, 1975, Ser. No. 598,070

Claims priority, application Germany, July 26, 1974, 2436032

Int. Cl.² C07D *217/24*

U.S. Cl. 260—281 Q **5 Claims**

1. A compound of the formula



in which R is alkyl of 1 – 4 carbon atoms, or alkyl of 1 to 4 carbon atoms substituted by hydroxy or alkoxy of 1 to 4 carbon atoms, or is cyclopentyl, cyclohexyl, benzyl or phenethyl.

4,002,631
TETRAHYDROQUINOLINE OR JUJOLIDINE DERIVATIVE OF A LACTONE COMPOUND OF PYRIDINE-CARBOXYLIC ACID

Yoshihide Miyazawa; Minoru Ozutsumi, and Satoshi Ogawa, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

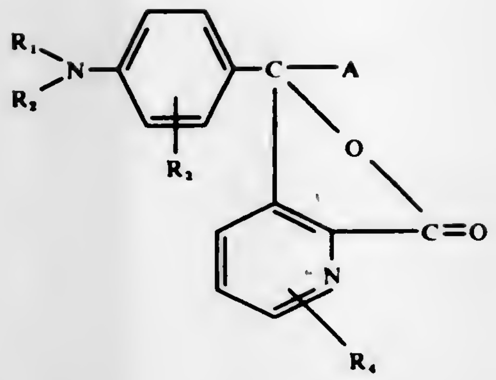
Filed July 24, 1974, Ser. No. 491,435

Claims priority, application Japan, July 24, 1973, 48-82649

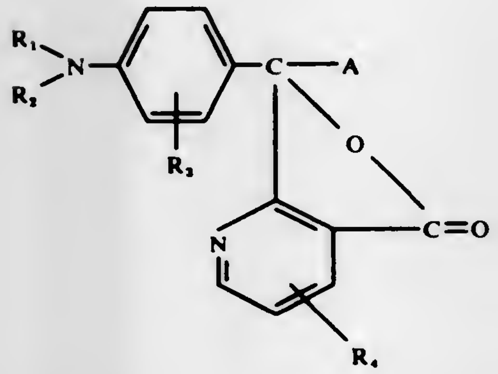
Int. Cl.² C07D *405/14, 471/06*

U.S. Cl. 260—287 T **3 Claims**

1. A lactone compound of a pyridine-carboxylic acid represented by the formula



or



or a mixture thereof, wherein R_1 and R_2 each represents a hydrogen atom, an acetyl group, a lower alkyl group which may be substituted with a halogen atom, a cyano, hydroxyl, lower alkoxy, lower alkylamino, acetyl or phenoxy group, or a benzyl or phenyl group which may be substituted with a lower alkyl group, a halogen atom, a lower alkoxy, nitro, amino or lower alkylamino group, or R_1 and R_2 may combine to form a hetereocyclic ring selected from the group consisting of morpholine, piperazine, piperidine and pyrrolidin-(1); R_3 represents a hydrogen or halogen atom, a nitro, amino, lower alkylamino group or a lower alkyl group which may be substituted with a halogen atom or a lower alkoxy group, a lower alkoxy group which may be substituted with a halogen atom, or a benzyl, benzyloxy or phenoxy group which may be substituted with a halogen atom, a lower alkyl, alkoxy or lower alkylamino group; R_4 represents a hydrogen or halogen atom, a lower alkyl group or a phenyl group; and A represents a julolidinyl or tetrahydroquinolyl group which may be substituted with a lower alkyl, lower alkylamino, acyl or nitro group; the alkyl moiety in said lower alkyl, lower alkoxy or lower alkylamino group having 1 to 5 carbon atoms.

4,002,632
TETRACYCLIC PIPERIDINO DERIVATIVES

Willem Jacob van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

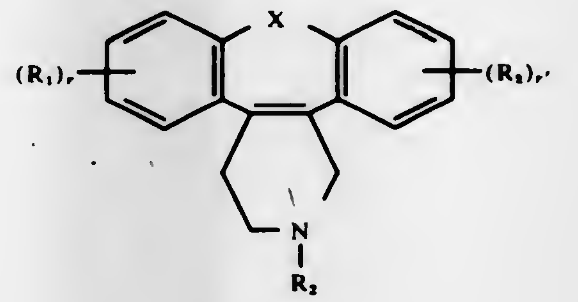
Filed Jan. 22, 1975, Ser. No. 543,199

Claims priority, application Netherlands, Jan. 31, 1974, 7401324

Int. Cl.² C07D *221/18, 471/22, 491/22, 495/22*

U.S. Cl. 260—290 H **5 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt or nitrogen oxide thereof, in which

R_1 and R_2 represent hydroxy, halogen, alkyl (1–6 C), alkoxy (1–6 C), alkylthio (1–6 C) or trifluoromethyl,
R_3 stands for hydrogen, alkyl (1–6 C) or aralkyl (7–10 C),
X represents oxygen, sulphur, the group $>NR_4$ or methylene (CH_2),
R_4 stands for hydrogen or alkyl (1–4 C) and
r and r' represent the number 0, 1 or 2.

4,002,633
NOVEL COMPOUNDS: N-DISUBSTITUTED AMINO-ETHYL ESTERS OF RAUBASINE OF THE GENERAL FORMULA

Jean Alfred Alphonse Joseph Hannart, Brussels, Belgium, assignor to Omnium Chimique Societe Anonyme, Brussels, Belgium

Filed July 10, 1975, Ser. No. 594,875
Claims priority, application Belgium, July 26, 1974, 818145
Int. Cl.² C07D *471/04*
U.S. Cl. 260—293.53 **3 Claims**

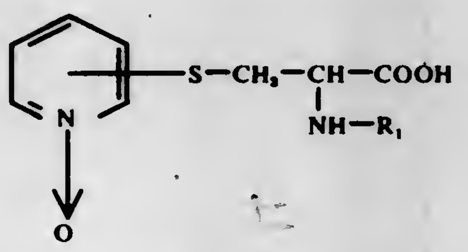
1. N-β-ethylpiperidine raubasinate.

4,002,634
N-OXYPYRIDYL SUBSTITUTED CYSTEINE OR CYSTEINE DERIVATIVE THEREOF

Gregoire Kalopissis, Neuilly-sur-Seine, and Claude Bouillon, Eaubonne, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 458,444, April 5, 1974, Pat. No. 3,917,815, which is a continuation-in-part of Ser. No. 69,936, Sept. 4, 1970, abandoned. This application Sept. 15, 1975, Ser. No. 613,563
Claims priority, application Luxembourg, Sept. 4, 1969, 59405; Feb. 20, 1970, 60384
Int. Cl.² C07D *213/28*
U.S. Cl. 260—294.8 F **4 Claims**

1. N-oxypyridyl derivative having the formula



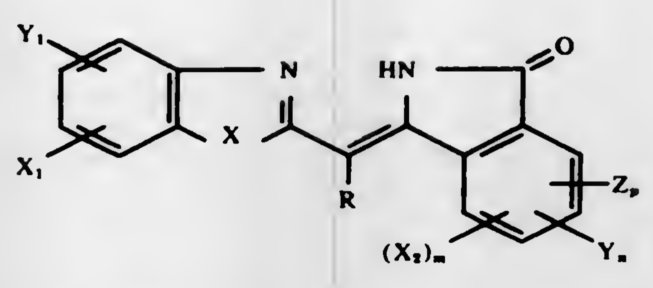
wherein the sulfur atom is attached to the N-oxypyridyl nucleus in a position ortho or para to the NO group, and R_1 represents a member selected from the group consisting of hydrogen, COR_2 and SO_2R_2 wherein R_2 is selected from the group consisting of alkyl having 1–4 carbon atoms, phenyl and tolyl.

4,002,635
ISOINDOLINONE COMPOUNDS USEFUL IN PREPARING HEAVY METAL CONTAINING PIGMENTS

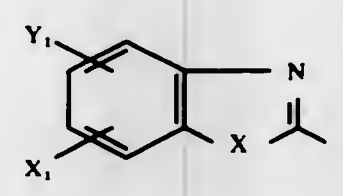
Christoph Frey, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 417,849, Nov. 21, 1973, Pat. No. 3,897,439. This application May 8, 1975, Ser. No. 575,672
Claims priority, application Switzerland, Dec. 4, 1972, 17625/72
Int. Cl.² C07D *417/00, 413/00, 403/00*
U.S. Cl. 260—304 R **1 Claim**

1. An isoindolinone of the formula



wherein R denotes alkyl containing 1 to 4 carbon atoms, phenyl, cyano, alkoxycarbonyl containing 1 to 5 carbon atoms, phenoxycarbonyl, carbamoyl or a group of the formula



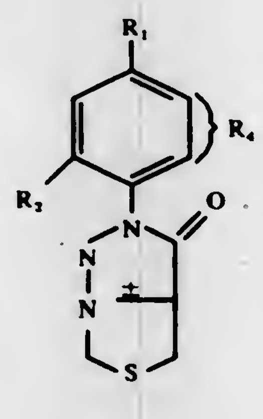
X denotes O, S or imino, X_1 and Y_1 denote H, halogen, alkyl containing 1 to 6 carbon atoms, alkoxy containing from 1 to 6 carbon atoms, alkoxycarbonyl containing from 1 to 6 carbon atoms, alkylsulphonyl containing from 1 to 6 carbon atoms, alkylcarbamoyl containing 1 to 6 carbon atoms, nitro, carbamoyl or phenylcarbamoyl, or the radicals X_1 and Y_1 form a fused benzene ring, X_2 denotes H, Y denotes halogen and Z denotes nitro, carbamoyl or phenylcarbamoyl selected from the group consisting of parachlorophenylcarbamoyl, phenylcarbamoyl, and para-methylphenylcarbamoyl, or a group of the formula R_1Y_2-, wherein R_1 representsH, alkyl represents H, from 1 to 6 carbon atoms, cycloalkyl containing 1 to 6 carbon atoms or phenyl and Y_2 represents O or S, m denotes 0-4, p denotes 0-3 and the sum of $m+n+p$ must be 4.

4,002,636
CERTAIN NOVEL SUBSTITUTED TETRAHYDRO-OXOTHIAZOLO-TRIAZOLIUM COMPOUNDS USEFUL AS HERBICIDES

Marwan J. Abu-El-Haj, Groton, and James W. McFarland, Lyme, both of Conn., assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 395,713, Sept. 10, 1973, Pat. No. 3,894,036, which is a continuation-in-part of Ser. No. 170,996, Aug. 11, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,497
Int. Cl.² C07D *513/04*
U.S. Cl. 260—306.7 T **1 Claim**

1. A compound of the formula



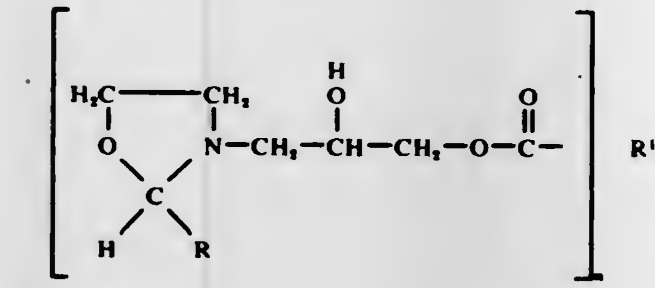
wherein
R_1 is halogen; and
R_2 and R_4 are each hydrogen or halogen.

4,002,637
OXAZOLIDINE, OXAZOLIDINE-CONTAINING CONDENSATION AND ADDITION POLYMERS AND METHODS OF PRODUCING THEM

Sheldon N. Lewis, Zurich, Switzerland; Jerome F. Levy, Dresher, and Napoleon L. Horton, Philadelphia, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 377,375, July 9, 1973, abandoned, and Ser. No. 377,377, July 9, 1973, Pat. No. 3,937,716. This application Jan. 10, 1975, Ser. No. 540,021
Int. Cl.² C07D *263/02*
U.S. Cl. 260—307 FA **12 Claims**

1. A compound of the formula:



(III)

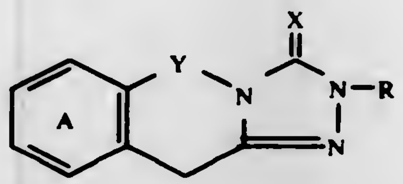
wherein,
R is a member selected from hydrogen, alkyl having 1 to 8 carbon atoms, and benzyl
n is an integer having a value of 1, 2, or more,
R^1, when n is 1, is phenyl, benzyl, or alkyl or alkenyl of 2 to 10 carbon atoms,
R^1, when n is 2, is a covalent bond, an alkylene chain of 2 to 10 carbon atoms, an alkenylene chain of 2 to 10 carbon atoms, or phenylene, and
R^1, when n is more than 2, is a residue of a polycarboxylic acid selected from the group consisting of aconitic, trimesic, tricarballylic and citric acids.

4,002,638
BENZAZEPINE DERIVATIVES

Yutaka Kuwada, Ashiya; Hiroyuki Tawada, Osaka, and Kanji Meguro, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 11, 1974, Ser. No. 505,088
Claims priority, application Japan, Sept. 14, 1973, 48-104256; Feb. 26, 1974, 49-023062; Jan. 10, 1974, 49-006173
Int. Cl.² C07D *249/12*
U.S. Cl. 260—308 C **32 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein ring A is unsubstituted or substituted by at least one of halogen, nitro, alkyl of 1–4 carbon atoms, alkoxy of 1–4carbon atoms and trifluoromethyl,

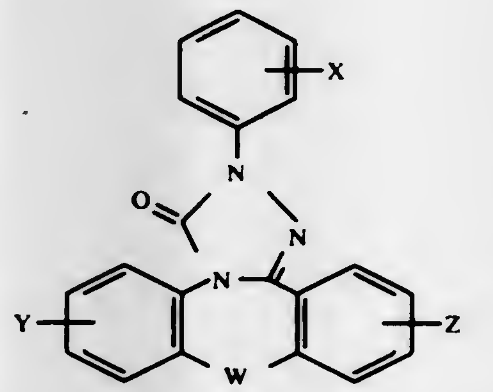
R is hydrogen, alkyl of 1–6 carbon atoms, cyclopentyl or cyclohexyl, said alkyl, cyclopentyl and cyclohexyl groups designated by R being unsubstituted or substituted by at least one of (1) hydroxy, (2) alkoxy of 1–4 carbon atoms, (3) monoalkylamino of 1–3 carbon atoms, (4) dialkylamino of 1–3 carbon atoms in each alkyl group, (5) mercapto, (6) mercapto substituted by alkyl of 1–4 carbon atoms, (7) phenyl, (8) phenyl substituted by at least one of halogen and alkoxy of 1–4 carbon atoms, (9) cyclopropyl, (10) cyclopentyl, (11) cyclohexyl, (12) unsubstituted 1-pyrrolidinyl, (13) unsubstituted morpholino, (14) unsubstituted piperidino, (15) unsubstituted piperazinyl, (16) 4-methylpiperazinyl and (17) 4-hydroxyethylpiperazinyl,
X is oxygen or sulfur, and
Y is $-CH_2-CH_2-$ or $-CH{=}CH-$,
and pharmaceutically acceptable salts thereof.

4,002,639
2-(SUBSTITUTED PHENYL)-DIBENZ[b,f][1,2,4]TRIAZOLO-[4,3-d][1,4]OXAZEPIN OR THIAZEPIN-3(2H)-ONES

Berthold Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 31, 1975, Ser. No. 563,769
Int. Cl.² C07D *498/04, 513/14*
U.S. Cl. 260—308 C **6 Claims**

1. A compound of the formula:



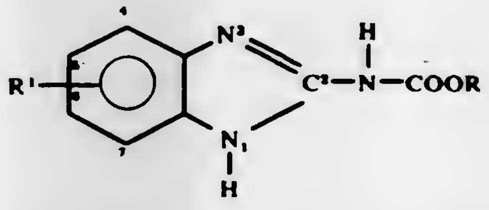
wherein W is O or S; and X, Y and Z are independently selected from the group consisting of hydrogen, bromine, chlorine, fluorine, lower alkyl of 1 to 3 carbon atoms, lower alkoxy of 1 to 3 carbon atoms, and trifluoromethyl.

4,002,640
5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

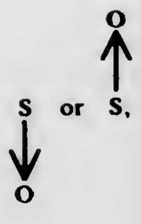
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 417,963, Nov. 21, 1973, Pat. No. 3,929,821, which is a continuation-in-part of Ser. No. 319,299, Dec. 29, 1972, abandoned. This application Nov. 3, 1975, Ser. No. 628,434
The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.
Int. Cl.² C07D *235/32*
U.S. Cl. 260—309.2 **15 Claims**

1. A compound represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is $-SOR^2$, $-SO_2R^2$, -SCN, $-SR^3$, $-OR^3$, or $M'(CH_2)_nMR^7$ where M and M'are independently O, S,



$$\underset{\underset{O}{\downarrow}}{S} \text{ or } \overset{\overset{O}{\uparrow}}{S},$$

R^7 is lower alkyl having 1 to 4 carbon atoms, phenyl or naphthyl, and *n* is 1–4; R^2 is lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, lower alkenyl or lower alkynyl having 3 to 6 carbon atoms, benzyl, phenethyl, phenyl or naphthyl; and R^3 is lower alkenyl, lower alkynyl, or benzyl or phenethyl; the R^1 substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

4,002,641

PYRAZOLE DERIVATIVES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

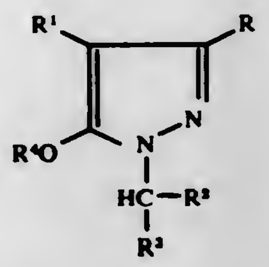
Filed Dec. 13, 1974, Ser. No. 532,311

Claims priority, application Germany, Dec. 20, 1973, 2363511

Int. Cl.² C07D *231/22*

U.S. Cl. 260—310 R **14 Claims**

1. A compound of the formula



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen or alkyl of 1 to 4 carbon atoms;

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 is alkyl of 1 to 4 carbon atoms;

R^3 is napthyl; or phenyl substituted by

- a. one or two of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and alkoxy of 1 to 4 carbon atoms;
- b. one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro; or
- c. one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro, and one or two of the same or different substituents selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen and trifluoromethyl; and

R^4 is R^5CO wherein R^5 is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by one, two or three halogen moieties.

4,002,642

PROCESS FOR THE PREPARATION OF POLYHALO COPPER PHTHALOCYANINES

Friedrich Ische, Naurod, Taunus, and Ernst Spietschka, Oberauroff, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 15, 1975, Ser. No. 605,060

Claims priority, application Germany, Aug. 17, 1974, 2439600

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **11 Claims**

1. In a process for the preparation of a polyhalo copper phthalocyanine from a halophthalic acid or a derivative thereof containing no available nitrogen and urea or a derivative of said halophthalic acid containing available nitrogen, a copper salt and a titanium halide, the improvement comprising reacting as a titanium halide an addition compound of a titanium tetrahalide and a compound capable of forming an addition compound with said titanium tetrahalide or, instead of said addition compound, a mixture of its components, said compound capable of forming an addition compound with titanium tetrahalide being selected from the group consisting of thionyl chloride, sulfuryl chloride, phosphorus trichloride, phosphorus oxychloride, phosphorus pentachloride and mixtures thereof.

4,002,643

PREPARATION OF β-ACYL PYRROLES

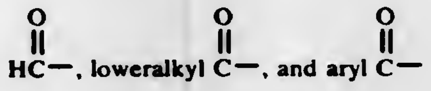
McNeil Laboratories, Incorporated, Norristown, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Filed June 27, 1975, Ser. No. 590,996

Int. Cl.² C07D *207/32*

U.S. Cl. 260—326.5 J **12 Claims**

1. A process for transforming an α-acyl pyrrole having at least one hydrogen atom in the β- position into a β-acyl pyrrole which comprises reacting said α-acyl pyrrole with a strong, anhydrous, non-oxidizing acid, said "acyl" being a member selected from the group consisting of



$$\overset{O}{\overset{\|}{HC}}-,\ \text{loweralkyl}\ \overset{O}{\overset{\|}{C}}-,\ \text{and aryl}\ \overset{O}{\overset{\|}{C}}-$$

and said "aryl" being a member selected from the group consisting of phenyl, trifluoromethylphenyl, nitrophenyl and phenyl substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo, said lower alkyl and lower alkoxy groups having 1 to 5 carbon atoms.

4,002,644

BIS-(1,4-DIHYDRONAPHTHO)[2,3-C; 2,3-F]1,2,5-TRITHIEPANE

David J. Fenoglio, Carol Stream, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 432,996, Jan. 14, 1975, Pat. No. 3,923,753. This application May 19, 1975, Ser. No. 578,620

Int. Cl.² C07D *341/00*

U.S. Cl. 260—327 B **1 Claim**

1. Bis-(1,4-dihydronaphtho)[2,3-c; 2,3-f] 1,2,5-trithiepane.

4,002,645

BIS AROMATIC ANHYDRIDES

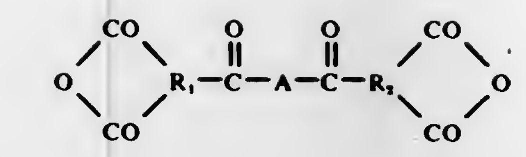
Joseph Sonnenberg, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 123,036, March 10, 1971, abandoned. This application May 31, 1974, Ser. No. 475,050

Int. Cl.² C07D *307/89*

U.S. Cl. 260—345.2 **24 Claims**

1. A compound of the formula



wherein R_1 and R_2 are trivalent aromatic radicals having vicinal carbon atoms from which stem the valence bonds to which the anhydride moieties are attached and selected from the group consisting of phenyl and naphthyl and A is a divalent polynuclear aromatic selected from the group consisting of naphthalene anthracene, diphenyl-Z, dinaphthyl-Z, dibenzofuran, fluorene, carbazole, and dibenzothiophene wherein Z is O, S, C_1 to C_3 alkylidene or a single valence bond, the point of attachment to said trivalent aromatic radicals of the carbonyl bridges between said trivalent and divalent aromatic radicals being other than ortho to said vicinal carbon atoms.

4,002,646

PROCESS FOR MAKING TETRAHYDROFURANS

Ivan Maxwell Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

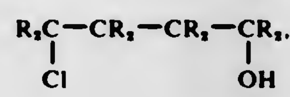
Filed July 17, 1975, Ser. No. 596,647

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 R **9 Claims**

1. A process for making a tetrahydrofuran comprising:

- a. contacting gamma-chloroalkanol with a dilute aqueous protonic solution in the liquid phase at a temperature of 50°–200° C by which the alkanol is cyclized to form a tetrahydrofuran and HCl is evolved and absorbed into the protonic solution, the alkanol corresponding to the structure



$$R_2\underset{\underset{Cl}{|}}{C}-CR_2-CR_2-\underset{\underset{OH}{|}}{C}R_2.$$

  wherein the R groups are independently selected from the group consisting of hydrogen and alkyl, the sum of carbon atoms in the R groups being no more than 16; and
- b. separating the tetrahydrofuran from the reaction mixture.

4,002,647

NOVEL BENZOFURANYL PEST RETARDANTS

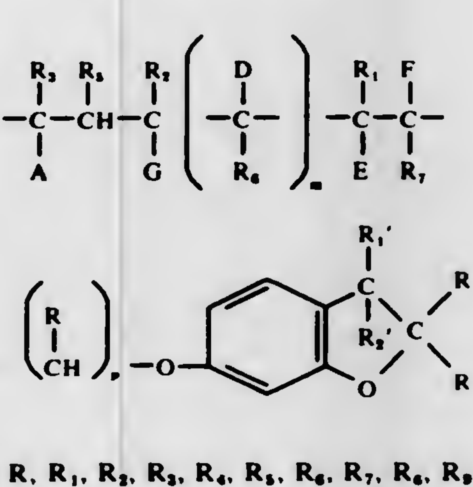
Madhukar Subraya Chodnekar, Seltisberg; Peter Loeliger, Munchenstein; Albert Pfiffner, Bulach; Ulrich Schwieter, Reinach; Milos Suchy, and Rene Zurfluh, both of Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 351,215, April 16, 1973, Pat. No. 3,910,897. This application May 21, 1975, Ser. No. 579,358

Int. Cl.² C07D *307/83*

U.S. Cl. 260—346.2 R **41 Claims**

1. A compound of the formula



wherein R, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_1' and r_2' are hydrogen or lower alkyl; A is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, or lower alkynyloxy; G and D are individually hydrogen or taken together form a carbon to carbon bond; E and F are individually hydrogen or taken together form a carbon to carbon bond; *m* is an integer of from 0 to 1; and *p* is an integer from 1 to 2.

4,002,648

CATALYZED TRANS-ACIDOLYSIS REACTION OF TRIMELLITIC ACID, TRIMELLITIC ANHYDRIDE AND 2-NAPHTHOIC ACID

Imre Puskas, Glen Ellyn, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 379,202, July 16, 1973, abandoned, Division of Ser. No. 63,622, Aug. 13, 1970, Pat. No. 3,784,573. This application Sept. 8, 1975, Ser. No. 611,534

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.3 **4 Claims**

1. In the method of reacting a lower alkanoic monoester of an alcohol selected from the group consisting of n-butyl alcohol, isobutyl alcohol, sec-butyl alcohol, higher monoalkanols up to n-stearyl alcohol, the corresponding alkenols and the corresponding thiols or a lower alkanoic polyester of a polyalcohol having the formula

$R-(Y)_n$

where Y is -OH or -SH, n is 2 to 4, and R is a phenylene radical, a fused carbocyclis with 4 rings or less, a biphenyl, a terphenyl, a bisphenylene or a straight chain aliphatic radical with an organic acid selected from the group consisting of trimellitic acid, trimellitic anhydride and 2-naphthoic acid, as the reaction mixture in a trans-acidolysis reaction, the improvement comprising conducting the reaction in the presence of an effective amount of a basic metal carboxylate catalyst, in the liquid melt phase and in the absence of solvent, said catalyst being a carboxylate of a metal selected from the group consisting of sodium, potassium, calcium and magnesium, the said carboxylate having a K_a less than 10^{-4} and said carboxylate being added to the reaction mixture from an external source.

4,002,649

2-FURALDOXIMINYL ALLOPHANATES

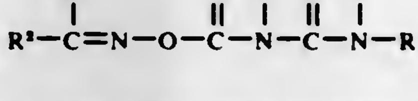
Peter A. Bukowick, Louisiana, Mo., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 350,218, April 11, 1973, Pat. No. 3,957,867. This application Nov. 4, 1975, Ser. No. 628,630

Int. Cl.² C07D *307/54*

U.S. Cl. 260—347.3 **2 Claims**

1. A compound having the following structural formula:



$$R^2-\overset{\overset{R^1}{|}}{C}=N-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{R^3}{|}}{N}-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{N}-R^4$$

in which when R^1 and R^2 are taken separately, R^1 is selected independently from the group consisting of hydrogen and C_1–C_7 alkyl and R^2 is 2-furanyl; R^3 is selected from the group consisting of C_1–C_7 alkyl, allyl, phenyl, 3-halophenyl and 3,4-dihalophenyl; and R^4 is selected from the group consisting of C_1–C_7 alkyl, allyl, cyclohexyl, phenyl, halophenyl, tolyl, anisolyl, nitrophenyl, 3,4-dihalophenyl, 1-naphthyl, p-toluene sulfonyl, trihalomethylphenyl and 2,6-dinitro-4-trihalomethylphenyl.

4,002,650

PREPARATION OF MALEIC ANHYDRIDE FROM n-BUTANE

Noel J. Bremer, Stow; Ernest C. Milberger, Solon, and Serge R. Dolhyj, Parma, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Dec. 10, 1973, Ser. No. 423,032

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 A **1 Claim**

1. In the process for the production of maleic anhydride by the oxidation of n-butane with molecular oxygen in the vapor phase at a reaction temperature of 350°–600° C. in the presence of a catalyst of the formula

$V_a P_b U_c O_x$

wherein

a and *b* are 0.5 to 3;

c is 0.1 to 0.5; and

x is the number of oxygens to satisfy the valence requirements of the other elements present.

4,002,651

AZIDO-SILANE COMPOSITIONS

James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 26, 1974, Ser. No. 483,367

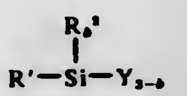
Int. Cl.² C07C *11/7*

U.S. Cl. 260—349 **11 Claims**

1. A solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a solvent (a) an azido-containing compound selected from the group consisting of carboxylic acids of the formula

$(N_3X)_a—Ar—(R)_n—COOH$

and the ammonium salts of said acids, wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, *a* is an integer of from 1 to 2, Ar is an aryl or hydroxy-substituted aryl radical, R is an alkylene radical and *n* has a value of 0 or 1; and (b) an amino-containing silane having the formula



$$R'—\overset{R^2_b}{\overset{|}{Si}}—Y_{3-b}$$

wherein R² is a monovalent hydrocarbon radical, *b* has a value of from 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals, and R′ is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

4,002,652

2-SUBSTITUTED-5,6-DIMETHOXYINDAZOLES

Thomas J. Schwan; Charles S. Davis, both of Norwich, and Leroy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No. 3,966,760. This application Feb. 25, 1976, Ser. No. 661,339

Int. Cl.² C07C *117/00*

U.S. Cl. 260—349 **1 Claim**

1. The compound 6-azidoveratraldehyde.

4,002,653

MANUFACTURE OF ANTHRAQUINONE

Peter Reuter, Bad Durkheim; Heinz Eilingsfeld, Frankenthal, and Manfred Patsch, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

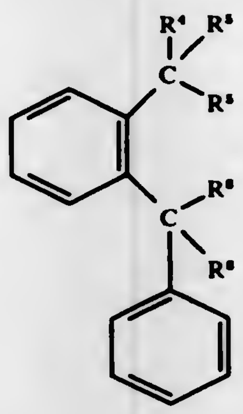
Filed May 22, 1975, Ser. No. 579,886

Claims priority, application Germany, June 26, 1974, 2430567

Int. Cl.² C09B *1/00*

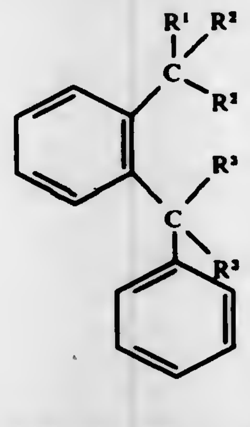
U.S. Cl. 260—369 **14 Claims**

1. In a process for the manufacture of anthraquinone by oxidation of diphenylmethane derivatives of the formula



Ia

where the individual radicals R⁴, R⁵ and R⁶ are identical or different and each is hydrogen or an aliphatic radical, or the two R⁵s together and/or the two R⁶s together are oxo, and/or R⁴ and one R⁶ are together an aliphatic radical which is substituted methylene or has at least 2 carbon atoms or, if the R⁵s and one R⁶, or one R⁵ and the two R⁶s, or the two R⁵s and the two R⁶s can, in each case together, be an aliphatic radical, by means of oxygen in the gas phase in the presence of vanadium(V) compounds as catalysts, at elevated temperature, the improvement comprising: oxidizing a diphenylmethane compound of the formula



I

in which the individual radicals R¹, R² and R³ are identical or different and each is hydrogen or an aliphatic radical, in the presence of a catalyst which contains titanium dioxide and vanadium pentoxide in a weight ratio vanadium pentoxide: titanium dioxide of from 0.004:1 to 0.35:1.

4,002,654

PROCESS FOR THE PREPARATION OF DIHYDROXYANTHRAQUINONES

Andreas Huppertz, Cologne-Mulheim; Peter Schultz, Leverkusen, and Dieter Maertens, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 19, 1975, Ser. No. 615,101

Claims priority, application Germany, Sept. 21, 1974, 2445221

Int. Cl.² C07C *49/75*

U.S. Cl. 260—383 **13 Claims**

1. In a lime melt process for the preparation of 1,5-dihydroxyanthraquinone and 1,8-dihydroxyanthraquinone and mixtures thereof from alkali metal or alkaline earth metal salts of the corresponding anthraquinone disulfonic acids wherein said salts are treated in an aqueous medium under pressure and at elevated temperatures with lime and buffer substances to form a lime melt reaction mixture, the improvement comprising carrying out said lime melt process at temperatures from about 290° C to about 370° C and at pressures from about 50 to about 200 bars and subsequently continuously acidifying said reaction mixture with mineral acid to precipitate said dihydroxyanthraquinones.

4,002,655

GLYCYRRHETINIC ACID DERIVATIVES

David William Hawkins, Pinner, England, assignor to Biorex Laboratories, Limited, London, England

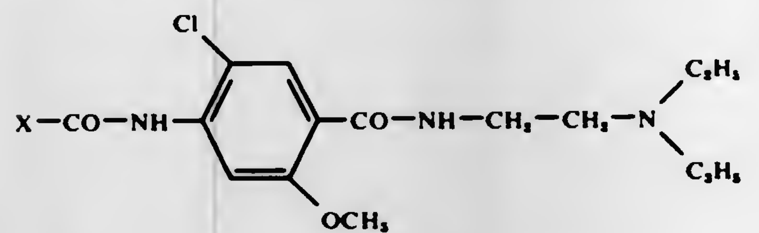
Filed Feb. 10, 1975, Ser. No. 548,767

Claims priority, application United Kingdom, Feb. 8, 1974, 5817/74

Int. Cl.² C07C *103/28*

U.S. Cl. 260—404.5 **6 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein X is the acyl residue of 18α- or 18β-glycyrrhetinic acid, the 3-hydroxyl group of which is optionally acylated with a monobasic fatty acid containing up to 20 carbon atoms or succinic acid and the metoclopramide salt of said compound wherein the 3-hydroxy group is acylated with succinic acid.

4,002,656

PROCESS FOR THE SELECTIVE OXIDATION OF PARAFFINIC HYDROCARBONS

Jacques Daniel Victor Hanotier, Uccle, and Philippe Jean Andre Charles Camerman, Wesembeek-Oppem, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

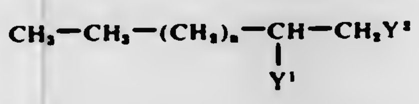
Continuation-in-part of Ser. No. 141,987, May 10, 1971, abandoned. This application May 16, 1975, Ser. No. 578,361

Claims priority, application United Kingdom, May 18, 1970, 23897/70

Int. Cl.² C07C *121/14, 121/30;* **C09F** *7/02*

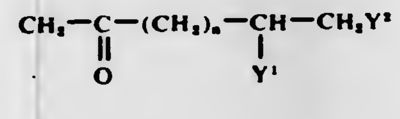
U.S. Cl. 260—406 **17 Claims**

1. A process for the oxidation of aliphatic compounds of the formula:



$$CH_3—CH_2—(CH_2)_n—\underset{\underset{Y^1}{|}}{CH}—CH_2Y^2$$

wherein *n* is an integer from 1 to 16 inclusive, wherein Y¹ is hydrogen or a substituent selected from the group consisting of X, CN, COOR and OCOR, wherein X is a halogen and R is an alkyl radical containing from 1 to 6 carbon atoms inclusive, wherein Y² is selected from the group consisting of Y¹, CHX_2 and CX_3 and wherein Y¹ is hydrogen or X when Y² is CX_3 and Y¹ is X when Y² is CHX_2, to produce selective formation of monoketones having the same number of carbon atoms as the starting compound and being of the formula:



$$CH_3—\underset{\underset{O}{\|}}{C}—(CH_2)_n—\underset{\underset{Y^1}{|}}{CH}—CH_2Y^2$$

wherein *n*, Y¹ and Y² are as defined above, the process comprising contacting a feed consisting essentially of said aliphatic compounds in the liquid phase with a catalyst wherein the active agent in said catalyst consists essentially of a mixture of divalent and trivalent cobalt ions having a combined concentration of from 0.05 mole per liter of reaction mixture to the saturation level of the reaction mixture, at a temperature between 30° and 100° C., in the presence of molecular oxygen and in the absence of an activator, said mixture of divalent and trivalent cobalt ions having a Co(III)/Co(III) + Co(II) ratio of between 0.8 and 1.0.

4,002,657

PERFLUOROALKYLALKYLCARBOXYLIC ACIDS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,953

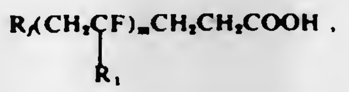
Claims priority, application Switzerland, Mar. 5, 1973, 3184/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C *53/34;* **D06M** *13/20*

U.S. Cl. 260—408 **6 Claims**

1. A perfluoroalkylalkylcarboxylic acid of the formula



$$R_f(CH_2\underset{\underset{R_1}{|}}{C}F)_mCH_2CH_2COOH\ ,$$

wherein R_f is an unbranched or branched perfluoroalkyl radical with 3 to 18 carbon atoms, R_1 is hydrogen or fluorine, and *m* is a whole number from 1 to 3.

4,002,658

METHANATION CATALYST AND PROCESS OF USING THE SAME

Ralph A. Della Betta, Dearborn; Ann G. Piken, West Bloomfield, and Mordecai Shelef, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 1, 1975, Ser. No. 573,716

Int. Cl.² C07C *1/04;* **B01J** *23/74*

U.S. Cl. 260—449 M **2 Claims**

1. A method of methanating a synthesis gas stream including a sulfur bearing component in a concentration in a range from 10 ppm to 100 ppm which comprises: passing said synthesis gas stream over a nickel catalyst formed on a catalyst substrate principally of zirconium oxide.

4,002,659

ETHYL 2′,5′-DICHLORO-4′-THIOCYANATOFUMARANILATE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,584

Int. Cl.² C07C *161/02*

U.S. Cl. 260—454 **1 Claim**

1. The compound ethyl 2′,5′-dichloro-4′-thiocyanatofumaranilate.

4,002,660

S-(4-CHLOROPHENYL)-3-ARYL-3-HYDROXYPROPANETHIOATES

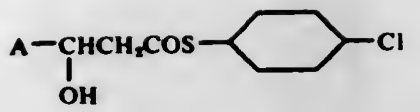
Harry R. Snyder, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,868

Int. Cl.² C07C *153/07*

U.S. Cl. 260—455 R **8 Claims**

1. A compound of the formula:



wherein A is phenyl, 4-methylphenyl, 4-ethylphenyl, 4-chlorophenyl, 2,4-dichlorophenyl, 3,4-dichlorophenyl or 3-chloro-4-methylphenyl.

4,002,661
PERFLUOROALKANESULFONATE ESTERS

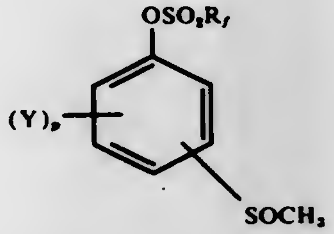
Tomas L. Fridinger, Village of Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 575,648, May 8, 1975, Pat. No. 3,954,828, which is a division of Ser. No. 336,956, March 1, 1973, Pat. No. 3,907,853, which is a continuation-in-part of Ser. No. 27,998, April 13, 1970, abandoned. This application Jan. 26, 1976, Ser. No. 652,403

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 R **3 Claims**

1. The compound of the formula:



wherein R_f is CF_3 or C_2F_5, each Y independently is chlorine or an alkyl group having 1 or 2 carbon atoms and *p* is an integer from zero, 1 or 2.

4,002,662
2-NITRO-5-(CYANO-TRIFLUOROMETHYL-PHENOXY)-BENZOIC ACIDS AND ESTERS

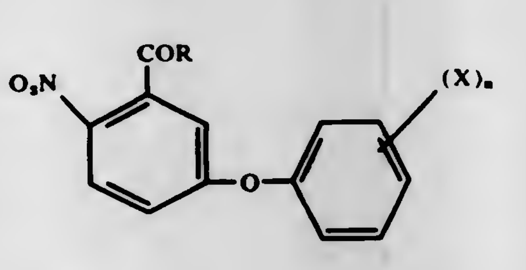
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 398,610, Sept. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, April 25, 1969, Pat. No. 3,652,645. This application Jan. 29, 1975, Ser. No. 545,232

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 D **2 Claims**

1. A compound having the formula:



wherein R is hydroxy or alkoxy of 1 to 5 carbon atoms, *n* is an integer of 2, and in which compound one X is trifluoromethyl and one other X is cyano.

4,002,663
DEUTERATED PROSTAGLANDIN ANALOGS

Masateru Miyano, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 3, 1975, Ser. No. 554,965

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **3 Claims**

2. A compound which is 9β,15β-bisdeuterio-9α,11α,15α-trihydroxy-5-cis,13-trans-prostadienoic acid.

3. A compound which is 15β-deuterio-9β,11α,15α-trihydroxy-5-cis,13-trans-prostadienoic acid.

4,002,664
MANUFACTURE OF DIMETHYLAMINOBENZENECARBOXYLIC ACID ESTERS

Hans-Juergen Quadbeck-Seeger, and Helmut Hoch, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 5, 1974, Ser. No. 476,394

Claims priority, application Germany, June 9, 1973, 2329553; Feb. 15, 1974, 2407160

Int. Cl.² C07C *99/00*

U.S. Cl. 260—471 R **14 Claims**

1. A process for the manufacture of a dimethylaminobenzenecarboxylic acid ester by reaction of a nitrobenzenecarboxylic acid ester with formaldehyde and hydrogen in the presence of a hydrogenation catalyst, which comprises reacting a nitrobenzenecarboxylic acid ester with hydrogen and formaldehyde at a ratio of 2 to 8 moles of formaldehyde per mol of said ester in the presence of a hydrogenation catalyst which contains one or more metals of atomic numbers from 24 to 29, and in the presence of a weak organic acid, at a temperature in the range of 35° to 150° C and at a pressure of at least 40 atmospheres.

4,002,665
PROCESS FOR SUBSTITUTED CYCLOHEXENES AND ITS PRODUCTS

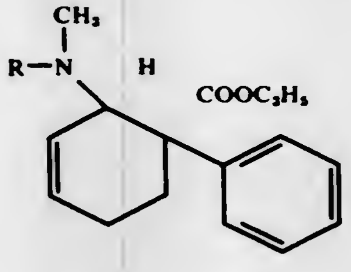
Gerhard Satzinger, Gundelfingen, and Gustav Hechtfischer, Freiburg-Landwasser, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 117,142, Feb. 19, 1971, Pat. No. 3,792,080. This application Aug. 14, 1973, Ser. No. 388,285

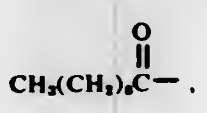
Int. Cl.² C07C *101/14*

U.S. Cl. 260—471 A **11 Claims**

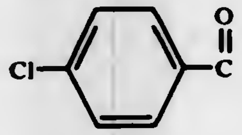
1. A compound of the formula:

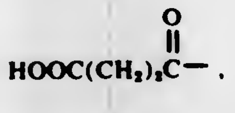


wherein R is selected from the group consisting of



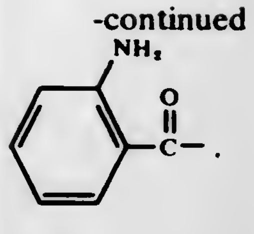
$CH_3(CH_2)_6\overset{\overset{O}{\|}}{C}-$,

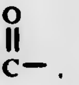




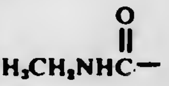
$HOOC(CH_2)_2\overset{\overset{O}{\|}}{C}-$,

-continued

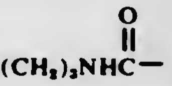




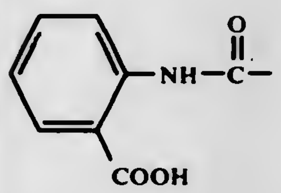
$H_2N\overset{\overset{O}{\|}}{C}-$,



$CH_3CH_2NH\overset{\overset{O}{\|}}{C}-$,



$CH_3(CH_2)_3NH\overset{\overset{O}{\|}}{C}-$, and



4,002,666
PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE p-HYDROXYPHENYLGLYCINE

Tadashi Shirai, Musashino; Yasuhisa Tashiro, Yokohama, and Shigeru Aoki, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

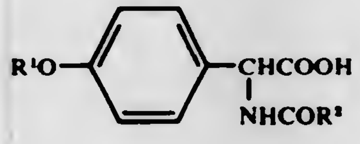
Filed Oct. 22, 1974, Ser. No. 516,963

Claims priority, application Japan, Oct. 23, 1973, 48-118542

Int. Cl.² C07C *19/00, 103/46, 103/84, 125/06*

U.S. Cl. 260—471 C **10 Claims**

1. A process for the preparation of optically active p-hydroxyphenylglycine, which comprises reacting a racemic compound of a p-hydroxyphenylglycine derivative represented by the following general formula



(wherein R^1 represents a hydrogen atom, a lower alkyl group or an acyl group and R^2 represents a hydrogen atom, a lower alkyl group, a phenyl group or a benzyloxy group) with optically active α-phenylethylamine in a solvent to form a corresponding salt, subjecting said salt to fractional crystallization for optical resolution to obtain two kinds of optically active salts, decomposing at least one of said two kinds of optically active salts by means of an acid or an alkali to obtain the respective optically active p-hydroxyphenylglycine derivative, and hydrolyzing said derivative with an acid selected from the group consisting of hydrochloric acid, sulfuric acid, hydrobromic acid and hydroidic acid.

4,002,667
BIS-(2-HYDROXYETHYL)-TEREPHTHALATE

John Martin Thompson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 17, 1975, Ser. No. 558,694

Claims priority, application United Kingdom, Mar. 26, 1974, 13277/74

Int. Cl.² C07C *69/82*

U.S. Cl. 260—475 P **7 Claims**

1. A process for the manufacture of bis-(2-hydroxyethyl)-terephthalate, which comprises heating together dimethyl terephthalate and ethylene glycol, the molar ratio of ethylene glycol to dimethyl terephthalate being at least 8:1, under distillation conditions at a pressure of from 15 mm to 100 mms Hg in the presence of a basic catalyst, said basic catalyst being an alkali or alkaline earth metal or an oxide, hydroxide, stable bicarbonate, carbonate or alcoholate thereof or a quaternary ammonium hydroxide or a dialkali hydrogen phosphate, in excess over that required to neutralize any acidity in the dimethyl terephthalate or ethylene glycol.

4,002,668
METHOD OF PRODUCING ANHYDROUS CRYSTALLINE REACTION PRODUCTS OF FORMALDEHYDE AND METHYL-, ETHYL CARBAMATE

Norton A. Cashen, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 16, 1975, Ser. No. 578,298

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **2 Claims**

1. A process for preparing in the crystalline state, dimethylol methyl carbamate, the process which comprises:

a. admixing an aqueous reaction mixture of paraformaldehyde and methyl carbamate in a molar ratio to 2.2 to 1.0, to give a total solids content of 25–50%, and sufficient basic catalyst to maintain a pH of 10.1;

b. allowing the solution from (a) to stand for 30 minutes to 24 hours at temperatures varying from ambient to 65° C;

c. adjusting the solution from (b) to a pH of 5.5 with a mineral acid;

d. adjusting the solution from (c) with water to a solids concentration no greater than ten weight percent;

e. lyophilizing the frozen solution from (d) for about twenty-four hours;

f. diluting the lyophilized product from (e) with water to ten percent solids, and lyophilizing the diluted product;

g. reducing the temperature of the partially crystalline residue of (f) to about 18° C.

4,002,669
HYDROXY GROUP CONTAINING DIESTERS OF ACRYLIC ACID

Albert Gross, Frankfurt am Main, and Roland Schaefer, Friedrichsdorf, Taunus, both of Germany, assignors to Kulzer & Co. GmbH, Bad Homberg vor der Hohe, Germany

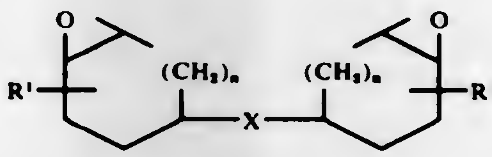
Filed Jan. 27, 1975, Ser. No. 544,532

Claims priority, application Germany, Feb. 12, 1974, 2406557

Int. Cl.² C07C *69/54*

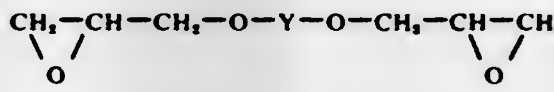
U.S. Cl. 260—486 B **8 Claims**

1. Polymerizable hydroxy-group-containing diesters of acrylic acids prepared by the reacting 3-(3,4-epoxycyclohexyl)-8,9-epoxy-2,4-dioxaspiro(5,5)undecane or a bis-epoxide of formula (A)



(A)

or a bis-epoxide of formula (B)



(B)

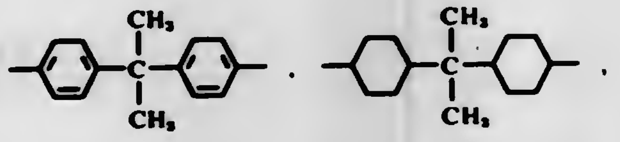
with a hydroxyalkylacrylate or hydroxyalkylmethacrylate containing 2 to 10 carbon atoms in the alkyl portion, *n* being 0 or 1 in formula (A) with the proviso that if

n is 0,

X is —O— and

R^1 is —H; and that if

n is 1,
X is selected from the group of alkylene with 1 to 10 carbon atoms, C_{1-3}-alkyl substituted alkylene with 1 to 10 carbon atoms, $-O-(CH_2)_m-O-$ where *m* is 1 to 10, $-CH_2-OCO-(CH_2)_p-COO-CH_2$ where *p* is 1 to 6, and $-CH_2-OCO-$, and
R^1 is $-H$ or $-CH_3$,
and in formula (B)

Y is 

or tricyclo-[5.2.1.$0^{2,6}$]-decylene.

4,002,670
NEMATIC COMPOUNDS AND MIXTURES

Ralf Steinstrasser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

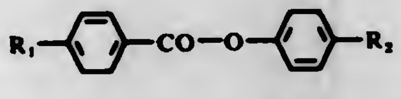
Filed Aug. 3, 1972, Ser. No. 277,502

Claims priority, application Germany, Aug. 7, 1971, 2139628

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 R **16 Claims**

1. A compound of the formula



wherein R_1 is straight chain alkyl and R_2 is straight chain alkoxy, or vice versa, and selected from the group consisting of 4′-pentoxyphenyl ester of 4-propylbenzoic acid, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-butylbenzoic acid, 4′-pentoxyphenyl ester of 4-pentylbenzoic acid, 4′-butoxyphenyl, 4′-pentoxyphenyl, 4′-hexoxyphenyl and 4′-heptoxyphenyl esters of 4-hexylbenzoic acid, 4′-pentylphenyl ester of anisic acid, 4′-butylphenyl and 4′-pentylphenyl esters of 4-pentoxybenzoic acid, and 4′-propylphenyl, 4′-butylphenyl, 4′-pentylphenyl and 4′-hexylphenyl esters of 4-hexoxybenzoic acid.

4,002,671
SUBSTITUTED ALKYL, ARYL, ARALKYL THIO ALKANAMINE ADDITION SALTS

Gregoire Kalopissis, Paris, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 203,038, Nov. 29, 1971, Pat. No. 3,879,560, which is a continuation-in-part of Ser. No. 801,840, Feb. 24, 1969, abandoned. This application Dec. 20, 1974, Ser. No. 534,804

Claims priority, application Luxembourg, Feb. 23, 1968, 55553; Dec. 22, 1965, 50125; Apr. 19, 1968, 55935; Feb. 19, 1969, 58042; May 12, 1969, 58634; Oct. 28, 1971, 64174

Int. Cl.² C07C *149/243*

U.S. Cl. 260—501.12 **2 Claims**

1. A compound selected from the group consisting of:
5-amino-3-thia hexanedioate of 2-benzylthio-ethylammonium,
5-acetamido-3-thia-hexanedioate of di-(2-benzyl-thioethylammonium),
5-amino-3-thia hexanedioate of 2-(3-alanylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-methylthioethylammonium,
5-amino-3-thia hexanedioate of 3-benzylthiopropylammonium,
2-amino-4-thia heptanedioate of 2-benzylthioethylammonium,
5-amino-3-thia hexanedioate of 2-(2,2-dimethoxyethylthio)-ethylammonium,
2-acetamido-3-benzylthio-propionate of 2-methylthioethylammonium,
5-benzamido-3-thia-hexanedioate of di-(2-benzylthioethylammonium),
5-p-toluenesulfonamido-3-thia-hexanedioate of di-(2-benzylthioethylammonium),
5-p-acetamidobenzenesulfonamido-3-thia-hexanedioate of di-(2-benzylthioethylammonium),
5-p-acetamidobenzamido-3-thia-hexanedioate of di-(2-benzylthioethylammonium),
2-acetamido-4-thia-heptanedioate of di-(2-methylthioethylammonium),
2-amino-4-thia decanedioate of 2-benzylthioethylammonium,
5-amino-3-thia hexanedioate of 2-benzylthiopropylammonium,
5-amino-3-thia hexanedioate of 2-benzylthio-2-methylpropylammonium,
5-amino-3-thia hexanedioate of 2-phenylthioethylammonium,
5-amino-3-thia hexanedioate of 2-t-butylthioethylammonium,
5-amino-3-thia hexanedioate of 2-tritylthioethylammonium,
5-amino-3-thia hexanedioate of 2-(2-butenylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(2-hydroxyethylthio)-ethylammonium,
5-amino-3-thia hexanedioate of 2-(2,3-dihydroxypropylthio) ethylammonium,
3-benzylthio-2-phenylacetamido propionate of 2-methylthioethylammonium,
2-acetamido-3-tritylthiopropionate of 2-methylthioethylammonium,
2-acetamido-3-benzhydrylthio propionate of 2-methylthioethylammonium,
5-amino-3-thia hexanedioate of 6-methanesulfonamido-6-ethoxy carbonyl-4-thia hexylammonium,
2-acetamido-4-thia-nonanedioate of 2,2′-thio bis (ethylammonium),
di-(β-benzylthioethylammonium) 5-p-acetamido-3-thia-hexanedioate,
5-amino-3-thia acid hexandedioate of 2-octadecylthio ethylammonium,
2-amino-4-thia heptanedioate of 2-undecenylthio ethylammonium,
2-amino-4-thia nonanedioate of 2-(3-hydroxypropylthio) ethylammonium.
di-(5-amino-3-thia hexanedioate) of 3-thia-1,6-hexanediammonium,
2-amino-4-thia octanedioate of 2-(β-ureido ethylthio)-ethylammonium,
5-amino-3-thia hexanedioate of 2-(3-methanesulfonamido propylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(p-phenylbenzylthio) ethylammonium,
5-tetradecanamido-3-thia hexanedioate of di(2-β-hydroxyethyl thio ethylammonium),
2-crotonamido-4-thia heptanedioate of di(2-tertiobutylthio ethylammonium),
2-butanesulfonamido-4-thia octanedioate of 2,2′-(2,3-dihydroxy-1,4-butanediyl dithio) diethylammonium,
2-formamido-3-(propyn-2-ylthio) propionate of 3-(1-naphthyl thio) propylammonium,
3-methylthio-2-trifluoroacetamido propionate of 2-oleylthio ethylammonium,
2-o-chlorobenzylthiomethyl-3-aza-4-oxo heptanedioate of 5,5′-sulfonyl bis (3-thia pentylammonium),
2-acetamido-3-p-methylthiophenylthio propionate of 2-(2,4,6-trimethyl benzylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(3,4-dichlorobenzylthio) ethylammonium,
2-butyramido-3-isopropylthio propionate of 2-(2,6-dichloro benzylthio) ethylammonium,
2-acetamido-3-(3-alanylthio) propionate of 2-m-fluorobenzylthio ethylammonium,
6-amino-3-thia heptanedioate of 2-p-dimethylaminobenzylthio ethylammonium,
2-hexanamido-di-(p-methoxyphenyl)-3-methylthio propionate of 2-(2,3-dihydroxy propylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(o-chlorobenzylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(p-bromobenzylthio) ethylammonium,
5-acetamido-3-thia hexanedioate of di-2-(2,4-dichlorobenzylthio) ethylammonium, and
2-acetamido-3-p-fluorobenzylthio propionate of 2-hexadecylthio ethylammonium.

4,002,672
PROCESS FOR PRODUCING N-PHOSPHONOMETHYL GLYCINE

Lowell R. Smith, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 22, 1972, Ser. No. 236,769

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.5 **14 Claims**

1. A process for the production of N-phosphonomethyl glycine which comprises forming an admixture consisting essentially of N-phosphonomethylimino diacetic acid and an acid selected from the group consisting of from 60% sulfuric acid to 20% fuming sulfuric acid, 47% hydrobromic acid, concentrated hydrochloric acid and hydriodic acid and heating said admixture to a temperature of from about 70° to about 200° C. whereby said N-phosphonomethylimino diacetic acid is decomposed to produce said N-phosphonomethyl glycine.

4,002,673
PROCESS FOR THE PREPARATION OF UNSATURATED AMINO COMPOUNDS

Rudolf Braden, Odenthal-Scheuren; Hans Knupfer, Schlidgen, and Sigurd Hartung, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 12, 1974, Ser. No. 532,184

Claims priority, application Germany, May 28, 1974, 2425811

Int. Cl.² C07C *143/56, 85/11*

U.S. Cl. 260—510 **7 Claims**

1. Process for the preparation of an aromatic amine which contains an olefinic double bond which comprises hydrogenating an aromatic nitro compound containing an olefinic double bond in the presence of a catalyst consisting essentially of a metal sulphide of the formula

MeS_x

in which
x is a number from 1 to 4 and
Me is iron, nickel, ruthenium, rhodium, palladium, rhenium, osmium, iridium or platinum at 20° to 140° C and at 5 to 150 bars hydrogen pressure.

4,002,674
4-HOMOISOTWISTANE-3-CARBOXYLIC ACID

Yoshiaki Inamoto; Hiroshi Ikeda; Naotake Takaishi, all of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,556

Claims priority, application Japan, July 16, 1974, 49-81535

Int. Cl.² C07C *61/12*

U.S. Cl. 260—514 G **1 Claim**

1. 4-homoisotwistane-3-carboxylic acid.

4,002,675
MANUFACTURE OF 2-HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACID

Hans-Juergen Quadbeck-Seeger, Ludwigshafen, and Helmut Hoch, Wachenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

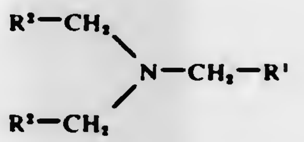
Filed Feb. 6, 1975, Ser. No. 547,641

Claims priority, application Germany, Feb. 15, 1974, 2407114

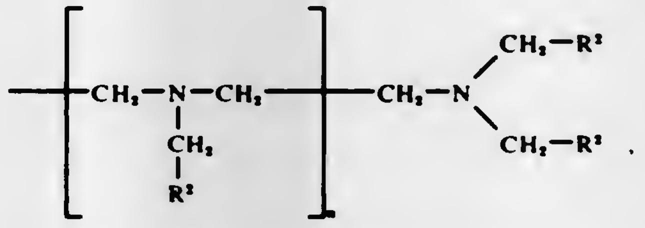
Int. Cl.² C07C *51/15*

U.S. Cl. 260—520 A **7 Claims**

1. A process for the manufacture of 2-hydroxy-naphthalene-3-carboxylic acid by reaction sodium β-naphtholate with carbon dioxide at elevated temperatures, which comprises heating sodium β-naphtholate or a mixture of sodium β-naphtolate and potassium β-naphtholate in a first stage, in the presence of a catalytic amount of inhibitor selected from the group consisting of nitrogen compounds of the formula


I

and polyphosphates containing at least 3 phosphorus atoms per molecule, wherein R^1 is carboxyl, metal carboxylate or the radical



the radicals R^2 are identical or different and each is carboxyl, metal carboxylate or the radical $-CH_2OH$, *n* is 0, 1 or 2, to a temperature of at least 180° C and reacting, in a second stage, said first stage reaction mixture with carbon dioxide at the above temperature, and the resulting salt of 2-hydroxy-naphthalene-3-carboxylic acid is then converted to 2-hydroxy-naphthalene-3-carboxylic acid by addition of an acid.

4,002,676
HYDROXYETHERCARBOXYLIC ACIDS

Gerhard Borggrefe, Dusseldorf, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Jan. 28, 1972, Ser. No. 221,816

Claims priority, application Germany, Aug. 23, 1971, 2142207

Int. Cl.² C07C *59/14, 59/12*

U.S. Cl. 260—535 P **8 Claims**

1. A hydroxyethercarboxylic acid compound selected from the group consisting of (1) a compound selected from the group consisting of 1,2-bis-O-carboxymethyl glycerine, mono-O-carboxymethyl glyceric acid, mono-O-carboxymethyl tartaric acid, mono-O-carboxymethyl erythric acid, mono-O-carboxymethyl-1,2,3-trihydroxyglutaric acid, and 1,2-bis-O-carboxymethyl-1,2,3-trihydroxyglutaric acid; and (2) a salt of said compound selected from the group consisting of alkali metal salts, ammonium salts, lower alkylamine salts, and lower akylolamine salts.

4,002,677

PROCESS FOR PREPARING CARBOXYLIC ACID ANHYDRIDES

Anthony N. Naglieri, Pine Brook, and Nabil Rizkalla, River Vale, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,813

Int. Cl.² C07C *51/54, 51/56*

U.S. Cl. 260—549 **4 Claims**

1. A process for the preparation of an anhydride of a monocarboxylic acid which comprises reacting carbon monoxide and an alkyl or aryl carboxylic acid ester or an alkyl or aryl ether under substantially anhydrous conditions at elevated temperature and superatmospheric pressure in the presence of a halide which is an iodide or a bromide and a catalyst comprising nickel and chromium and in the presence of a tin promoter.

4,002,678

PREPARATION OF CARBOXYLIC ACID ANHYDRIDES

Anthony N. Naglieri, Pine Brook, and Nabil Rizkalla, River Vale, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,208

Int. Cl.² C07C *51/54, 51/56*

U.S. Cl. 260—549 **6 Claims**

1. A process for the preparation of an anhydride of a monocarboxylic acid which comprises reacting carbon monoxide and an alkyl or aryl carboxylic acid ester or an alkyl or aryl ether under substantially anhydrous conditions at elevated temperature and atmospheric pressure in the presence of a halide which is an iodide or a bromide and a catalyst comprising nickel and chromium in the presence of a promoter comprising an organo-trivalent nitrogen compound or a phosphine.

4,002,679

PREPARATION OF POLYBENZIMIDAZOLES

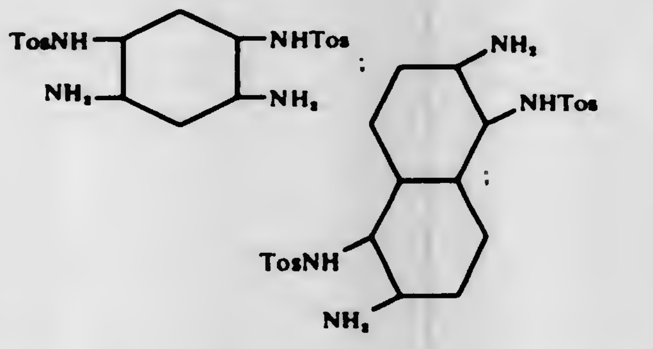
Fred E. Arnold, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 495,452, Aug. 7, 1974, Pat. No. 3,901,855. This application Mar. 27, 1975, Ser. No. 563,007

Int. Cl.² C07C *143/75, 143/77, 143/79*

U.S. Cl. 260—556 A **3 Claims**

1. As a new composition of matter, a compound selected from the group of compounds having the following formulas:



where Tos represents RSO_2, with R being phenyl, tolyl, xylyl, naphthyl, diphenyl, methylnaphthyl, benzyl, chlorophenyl, chlorodiphenyl, methyl, ethyl, propyl, amyl, octyl, decyl, dodecyl, octadecyl, cyclohexyl, cycloheptyl, methylcyclohexyl, or ethylcycloheptyl.

4,002,680

PROCESS FOR THE MANUFACTURE OF ACYLHYDRAZINES

Heimo Brunetti; Andreas Schmidt, both of Reinach, and Siegfried Rosenberger, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 17, 1973, Ser. No. 361,352

Claims priority, application Switzerland, May 31, 1972, 8031/72

Int. Cl.² C07C *103/20*

U.S. Cl. 260—559 H **13 Claims**

1. A process for the manufacture of 1,2-diacylhydrzaines of the formula I*a*

$$R_1{-}CO{-}NH{-}NH{-}CO{-}R_3 \qquad (Ia)$$

wherein R_1 and R_3 independently of one another are an aliphatic, cycloaliphatic, araliphatic, or aromatic radical, in which process 1 equivalent of an acyl hydrazide of the formula II

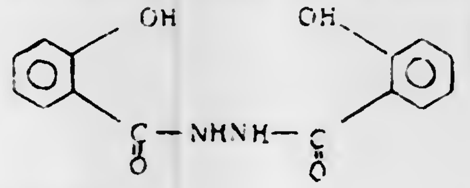
$$R_1{-}CO{-}NH{-}NH_2 \qquad II$$

and approximately one equivalent of a carboxylic acid of the formula III

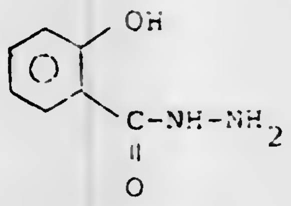
$$R_3 - COOH \qquad (III)$$

are reacted with approximately one equivalent of thionyl chloride at a temperature of 50° to 180° C and in the presence of a catalyst selected from pyridine and dimethylformamide, provided that said catalyst may be omitted if the reaction is carried out in the solvent dimethylacetamide.

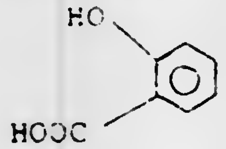
7. Process according to Claim 1 for the manufacture of



wherein 1 equivalent of



and approximately one equivalent of



are reacted with approximately one equivalent of thionyl chloride, *in chlorobenzene and in the presence of a catalyst selected from pyridine and dimethylformamide.*

8. A process for the manufacture of 1,2-diacylhydrazines of the formula Ic

$$R_1{-}CO{-}NHNH{-}Y{-}NHNH{-}CO{-}R_1 \qquad (Ic)$$

wherein R_1 is an aliphatic, cycloaliphatic, araliphatic, or aromatic radical, and Y is the diacyl radical of a divalent aliphatic, araliphatic, aromatic or heterocyclic dicarboxylic acid, in which process two equivalents of an acyl hydrazide of the formula II

$$R_1{-}CO{-}NH{-}NH_2 \qquad (II)$$

and approximately one equivalent of a compound of the formula VI,'

$$HO{-}Y{-}OH \qquad (VI)$$

are reacted with approximately two equivalents of thionyl chloride at a temperature of 50° to 180° C and in the presence of a catalyst selected from pyridine and dimethylformamide, provided that said catalyst may be omitted if the reaction is carried out in the solvent dimethylacetamide.

4,002,681

BIS-GUANIDINIUM DECAHYDRODECABORATE AND A PROCESS FOR ITS PREPARATION

Terrence P. Goddard, Aptos, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Filed June 10, 1976, Ser. No. 694,627

Int. Cl.² C07C *129/00*

U.S. Cl. 260—564 D **1 Claim**

1. The bis-guanidinium salt of decahydrodecaboric acid, having the formula $(C(NH_2)_3)_2B_{10}H_{10}$.

4,002,682

AROMATIC ENAMINOSULFOXIDE DERIVATIVES

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

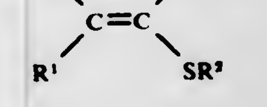
Division of Ser. No. 396,366, Sept. 12, 1973, Pat. No. 3,898,785. This application Mar. 6, 1975, Ser. No. 555,993

Claims priority, application Japan, Sept. 12, 1972, 47-90948; Sept. 12, 1972, 47-90949; Sept. 12, 1972, 47-90952; Oct. 18, 1972, 47-103606

Int. Cl.² C07C *149/42, 149/24*

U.S. Cl. 260—570.5 S **10 Claims**

1. An enaminosulfoxide of the formula,



(I)

in which R^1 is alkyl, dialkoxyalkyl, phenylalkyl, phenyl, chlorophenyl, alkylphenyl, alkoxyphenyl or dialkoxyphenyl, said alkyl and alkoxy each containing 1 to 4 carbon atoms, and each R^2 is independently alkyl of 1 to 4 carbon atoms, phenyl, tolyl or chlorophenyl, wherein at least one of the R^1 and R^2 is aromatic.

4,002,683

PROCESS FOR ISOMERIZING ALPHA ACIDS TO ISO-ALPHA ACIDS

Paul H. Todd, Jr., Kalamazoo, Mich., assignor to Kalsec, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 139,849, May 3, 1971, abandoned. This application Jan. 10, 1972, Ser. No. 216,757

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 D **21 Claims**

1. In a process for transforming an alpha acid into an isoalpha acid involving contact of the alpha acid with an aqueous solution of a metal salt, the improvement which comprises employing a water-immiscible organic solvent, employing sufficient metal salt to drive or maintain the alpha acid into or in the water-immiscible organic solvent, the pH being maintained at 13 or below, and effecting the desired isomerization in the water-immiscible organic solvent.

4,002,684

MANUFACTURE OF γ,δ-UNSATURATED KETONES

Karl von Fraunberg, Bobenheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

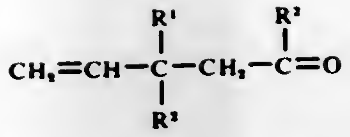
Filed June 26, 1975, Ser. No. 590,405

Claims priority, application Germany, July 5, 1974, 2432232

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R **8 Claims**

1. A process for the manufacture of γ,δ-unsaturated ketones of the general formula II

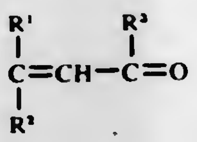


$$CH_2{=}CH{-}\underset{R^2}{\overset{R^1}{C}}{-}CH_2{-}\overset{R^3}{C}{=}O \qquad (II),$$

in which R^1 and R^2 are alkyl of from 1 to 4 carbon atoms and R^3 is an aliphatic or cycloaliphatic hydrocarbon radical which contains up to 8 carbon atoms and which may contain one or more C—C double bonds in other than the α,β-position to the carbonyl group which comprises reacting a vinylmagnesium halide of formula IV

$$CH_2{=}CH{-}Mg{-}X \qquad (IV),$$

in which X is Cl, Br or I, at −80° C to 0° C in an aprotic solvent with ketone of the general formula III



$$\underset{R^2}{\overset{R^1}{C}}{=}CH{-}\overset{R^3}{C}{=}O \qquad (III),$$

in which R^1, R^2 and R^3 have the meanings stated above, in the presence of a catalytic amount of a copper compound selected from the group consisting of CuCl, CuBr, CuI, CuCN, Cu_2O, CuSCN, CU_2SO_4, $CuCl_2$ $CuBr_2$, $CuSO_4$, $Cu(OCOCH_3)_2$, $Cu(NO_3)_2$, $Cu(OH)_2$, CuO, $Cu(CNS)_2$, copper acetonyl acetonate, $(CuCOX_2)_2$ and $(CuXPR_3)_4$, in which X denotes Cl, Br or I and R is alkyl, aryl or alkoxy.

4,002,685

PROCESS FOR THE OXIDATION OF SECONDARY ALCOHOLS INTO KETONES

Philippe Jean Andre Charles Camerman, Wesembeek-Oppem, and Jacques Daniel Victor Hanotier, Uccle, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed May 10, 1971, Ser. No. 141,988

Claims priority, application Belgium, Jan. 27, 1971, 95993

Int. Cl.² C07C *45/16*

U.S. Cl. 260—593 R **10 Claims**

1. A process for the oxidation of 2-hydroxyalkane present in a mixture of aliphatic secondary alcohols having no tertiary hydrogen on a carbon atom in alpha position relative to the carbon atom linked to the hydroxyl group, to produce a reaction product containing at least about 80 mole % of ketones having the same number of carbon atoms and having a higher proportion of methyl ketone than the proportion of 2-hydroxyalkane in said mixture, said process comprising contacting said mixture of alcohols in the liquid phase with a cobalt salt of a lower fatty acid having a trivalent cobalt to total cobalt ratio of between 0.5 and 1, the concentration of said cobalt salt being at least 0.05 mole per liter of reaction mixture, at a temperature between 20° and 120° C. and limiting the conversion of said alcohols to at most 50%.

4,002,686

METHOD OF PREPARING PRIMARY ALIPHATIC MERCAPTANS

Kirk Emerson Davis, Euclid, and Emil Thomas Wierber, Mayfield Village, both of Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Filed Aug. 5, 1975, Ser. No. 602,037

Int. Cl.² C07C *149/08, 148/00*

U.S. Cl. 260—609 R **13 Claims**

1. A method for preparing mercaptans of the formula RSH which comprises heating a composition consisting essentially of at least one of (1) a mixture of a phosphorodithioic acid having the formula $(RO)_2PSSH$, wherein each R is individually an aliphatic radical with at least one R being a primary radical, and a basic nitrogen compound, and (2) a salt of said basic nitrogen compound and said phosphorodithioic acid, at a temperature sufficient to result in formation of said mercaptan.

4,002,687
PROCESS FOR THE HYDROPEROXIDATION OF BRANCHED ALKANES IN A PLURALITY OF STAGES, COMPRISING WASHINGS BETWEEN THE SAID STAGES

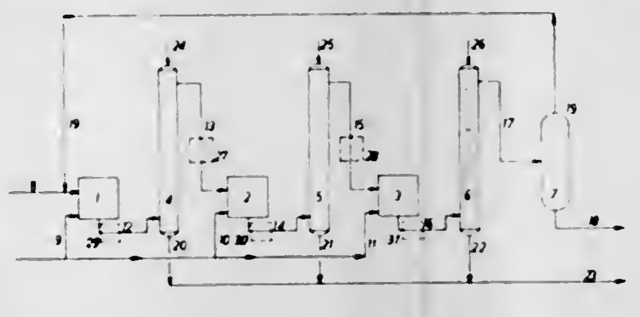
Jean Merle D'Aubigne, Paris; Jean Maurin, Montivilliers, and Joseph Edouard Weisang, Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Continuation of Ser. No. 407,475, Oct. 18, 1973, abandoned. This application July 2, 1975, Ser. No. 592,770

Claims priority, application France, Oct. 19, 1972, 72.37140

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 B **8 Claims**



1. In a process for the hydroperoxidation is isopentane or isobutane, which comprises oxidizing with oxygen said isopentane or isobutane in the liquid state, at a temperature of 100° C to 200° C under a pressure of 5 to 80 bars, by successive passes in successive reactors arranged in series, the improvement comprising the step of washing the oxidation products at a temperature of between 15° C to 100° C, under a pressure of 1 to 80 bars, between at least two oxidizing reactions, by an extraction agent chosen from the group consisting of water and an aqueous solution presaturated with the oxidation products from said process from which the acetic acid reaction product has been substantially removed.

4,002,688
PROCESS FOR CRYSTALLIZING 2,2-BIS[3,5-DIBROMO-4-(2-HYDROXYETHOXY)PHENYL] PROPANE

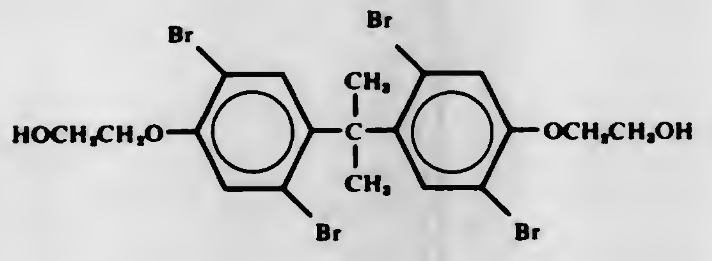
Barry L. Loeb, and Kenneth J. Witsken, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohic

Filed Mar. 28, 1975, Ser. No. 563,254

Int. Cl.² C07C *41/12*

U.S. Cl. 260—613 R **6 Claims**

1. A process for crystallizing 2,2-bis[3,5-dibromo-4-(2-hydroxyethoxy)phenyl] propane containing at least 85% by weight of the diethoxylated product of the formula



and less than 1% by weight solvent and water impurities which comprises applying a shear force of 25,000 and 60,000 joules per kilogram to a 105° to 120° C melt of said product for a period of at least 0.5 minute while lowering the temperature of the melt 15 to 30° C.

4,002,689
MODIFIED, FIRE RETARDANT POLYTETRAMETHYLENE ETHER GLYCOL

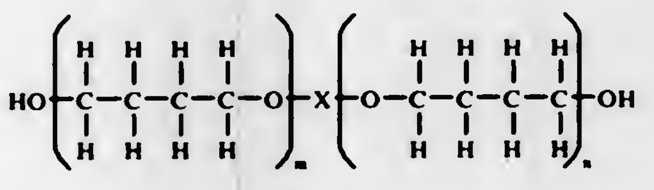
Hideo Tomomatsu, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 505,535, Sept. 13, 1974, Pat. No. 3,936,425. This application Apr. 28, 1975, Ser. No. 572,071

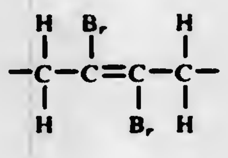
Int. Cl.² C07C *43/17*

U.S. Cl. 260—615 R **2 Claims**

1. A glycol composition having the following structural formula:



wherein *m* and *n* are integers including zero, and wherein both *m* and *n* are not zero at the same time, and wherein X is a structure having the formula:



wherein *m* and *n* are such that the number average molecular weight of the composition is in the range of 400–5000, inclusive.

4,002,690
4-HOMOISOTWIST-3-YL-CARBINOL

Yoshiaki Inamoto; Hiroshi Ikeda; Naotake Takaishi, all of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,557

Claims priority, application Japan, July 16, 1974, 49-81534

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **1 Claim**

1. 4-Homoisotwist-3-yl-carbinol.

4,002,691
POLYCYCLIC COMPOUNDS

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 401,210, Sept. 27, 1973, which is a continuation-in-part of Ser. No. 291,647, Sept. 25, 1972, Pat. No. 3,810,949, which is a continuation-in-part of Ser. No. 888,071, Dec. 24, 1969, abandoned. This application Aug. 22, 1975, Ser. No. 606,762

Int. Cl.² C07C *35/00*

U.S. Cl. 260—617 F **1 Claim**

1. Tricyclo[4.2.1.0^{2,5}]non-7-en-3-yl-methanol.

4,002,692
PROCESS FOR THE REACTIVATION OF NICKEL CATALYSTS USED IN THE HYDROGENATION OF POLYMERIC PEROXIDES

Shunsuke Mabuchi; Kenji Tsuzuki, and Hideaki Matsunaga, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Oct. 3, 1975, Ser. No. 619,227

Claims priority, application Japan, Oct. 15, 1974, 49-117694

Int. Cl.² C07C *29/00*; **B01J** *37/00*

U.S. Cl. 260—617 R **5 Claims**

1. In a process for the hydrogenation of an organopolymeric peroxide in the presence of a nickel catalyst with hydrogen in an organic solvent, the improvement comprising:

reactivating said nickel catalyst by contacting it with a reactivating medium consisting essentially of hydrogen and an oxygen-containing polar organic solvent at a temperature of 140°–250° C;

said oxygen-containing polar solvent being stable under conditions of the reactivation; and

recycling the reactivated nickel catalyst to said hydrogenation.

4,002,693
PROCESS FOR THE PRODUCTION OF O-PHENYLPHENOL

Ian Robert King, Warrington, and Anthony MacDonald Hildon, Linslade, Leighton Buzzard, both of England, assignors to Laporte Industries Limited, London, England

Filed Feb. 18, 1975, Ser. No. 550,768

Claims priority, application United Kingdom, Feb. 28, 1974, 9130/74

Int. Cl.² C07C *45/00, 37/06*

U.S. Cl. 260—620 **9 Claims**

1. In a method of preparing an O-phenyl phenol from a cyclohexanone which comprises the steps of

a. condensing the cyclohexanone in the presence of a condensation catalyst other than a naphthenate to form a reaction mixture containing an O-cyclohexenyl cyclohexanone,

b. removing the O-cyclohexenyl cyclohexanone from the reaction mixture, and

c. dehydrogenating the O-cyclohexenyl cyclohexanone from step (b) by contacting it with a noble metal dehydrogenation catalyst, selected from the group consisting of ruthenium, rhodium, osmium, iridium, platinum and palladium,

the improvement wherein the dehydrogenation step is conducted in the presence of sulphur in the form of elemental sulphur or organo-sulphides or thiols, the sulphur/dehydrogenation catalyst metal weight ratio being from about 1/60 to 1/12, to improve the selectivity of the said dehydrogenation catalyst with respect to the formation of O-phenyl phenol.

4,002,694
ETHYNYLATION CATALYST AND PROCESS FOR PRODUCING ALKYNOLS

Eugene V. Hort, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 246,607, April 24, 1972, Pat. No. 3,900,759. This application Aug. 11, 1975, Ser. No. 603,642

Int. Cl.² C07C *29/00, 33/04*

U.S. Cl. 260—635 Y **18 Claims**

1. In a process for preparing an acetylenic alcohol by reacting a lower alkanol with acetylene at about 60° C to about 120° C., the improvement which comprises effecting reaction with acetylene at less than about 2 atmospheres partial pressure of acetylene in the presence of an ethynylation catalyst comprising a water-soluble cuprous acetylide complex and a stable transitional alumina powder carrier therefor having a H_2O/Al_2O_3 mole ratio of about 0.02 to about 0.5 and a surface area of at least about 10 m^2/g, said cuprous acetylide complex being present in a concentration sufficient to catalyze the reaction of said aldehyde and said acetylene to said acetylenic alcohol.

4,002,695
PROCESS FOR MAKING TETRACHLOROETHYLENE

Earl M. Gorton, and Robert E. McGreevy, both of Sulphur, La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 6, 1976, Ser. No. 655,930

Int. Cl.² C07C *21/00*

U.S. Cl. 260—654 D **3 Claims**

1. A method of making tetrachloroethylene which comprises contacting a reaction mixture of carbon tetrachloride vapor and elemental hydrogen with a barium chloride catalyst at a temperature of at least 500° C. and thereafter recovering tetrachloroethylene from the reaction product.

4,002,696
OXIDATIVE DEHYDROGENATION OF OLEFINS OVER A HIGH ACTIVITY COBALT-MOLYBDATE CATALYST

Frederic H. Hoppstock, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 30, 1975, Ser. No. 591,264

Int. Cl.² C07C *15/10, 11/12*

U.S. Cl. 260—669 R **10 Claims**

1. In the process of oxidative dehydrogenation of at least one hydrocarbon selected from the group consisting of butene-1, butene-2, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene, n-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 4-methyl-2-pentene, 3-methyl-1-pentene and 3-methyl-2-pentene, 2-ethyl-1-butene, under oxidative dehydrogenation conditions while in the presence of a catalyst consisting of cobalt-molybdate or cobalt-molybdate treated with potassium hydroxide in amounts from about 0.5 to about 2 percent by weight of the cobalt-molybdate in the presence of an oxidant in an amount to provide an oxygen/hydrocarbon mole ratio ranging from about 0.5/1 to about 5/1 at a temperature ranging from about 350° C to about 650° C and an LHSV of from about 0.5 to about 10, the improvement which comprises calcining the cobalt-molybdate or cobalt-molybdate treated with potassium hydroxide at temperatures between about 750° C and about 1100° C for at least one hour prior to use.

7. In the process of oxidative dehydrogenation of at least one hydrocarbon selected from the group consisting of ethyl benzene and isopropyl benzene under oxidative dehydrogenation conditions while in the presence of a catalyst consisting of cobalt-molybdate or cobalt-molybdate treated with potassium hydroxide in amounts from about 0.5 to about 2 percent by weight of the cobalt-molybdate in the presence of an oxidant in an amount to provide an oxygen/hydrocarbon mole ratio ranging from about 0.5/1 to about 5/1 at a temperature ranging from about 350° C. to about 650° C. and an LHSV of from about 0.5 to about 10, the improvement which comprises calcining the cobalt-molybdate or cobalt-molybdate treated with potassium hydroxide at temperatures between about 750° C. and about 1100° C. for at least one hour prior to use.

4,002,697
SELECTIVE PRODUCTION OF PARA-XYLENE

Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 421,459, Dec. 3, 1973, abandoned. This application Sept. 25, 1974, Ser. No. 509,188

Int. Cl.² C07C *3/52*

U.S. Cl. 260—671 M **15 Claims**

1. In a process for manufacture of xylene by reacting toluene with a methylating agent in the presence of a crystalline aluminosilicate catalyst, the improvement resulting in a proportion of p-xylene greater than the thermo dynamic equilibrium proportion of total xylenes which comprises conducting the reaction in the presence of catalyst particles of ZSM-5, ZSM-11 or ZSM-21 of average crystal size greater than 0.5 micron, said catalyst particles having been surface deactivated by reaction with a compound of nitrogen or silicon of a size sufficiently large as to be unable to penetrate the pore structure of said crystalline aluminosilicate.

4,002,698

METHYLATION OF TOLUENE IN THE PRESENCE OF A PHOSPHORUS-MODIFIED ACTIVATED CRYSTALLINE ALUMINOSILICATE CATALYST

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 19, 1975, Ser. No. 605,968

Int. Cl.^{2} C07C *13/52, 15/08*

U.S. Cl. 260—671 M **18 Claims**

1. A process for the methylation of toluene to selectively yield para-xylene which comprises contacting toluene with a methylating agent under methylation conditions in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having been modified by the addition thereto of phosphorus in an amount of at least 0.5 percent by weight and activated by vapor phase treatment with a mixture of methanol and water at a temperature between about 400° C. and about 650° C. for a period of at least about 1 hour.

11. A method of activating a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having been modified by the addition thereto of phosphorus in an amount of at least 0.5 percent by weight which comprises subjecting said catalyst to vapor phase treatment with a mixture of methanol and water at a temperature between about 400° C. and about 650° C. for a period of at least about 1 hour.

4,002,699

POWDER COATING COMPOSITION WITH HYDROXY FUNCTIONAL COPOLYMER AND AMINO FUNCTIONAL CROSSLINKING AGENT

Santokh S. Labana, Dearborn Heights, and Yun Feng Chang, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 407,128, Oct. 17, 1973, abandoned, which is a continuation of Ser. No. 172,223, Aug. 16, 1971, abandoned. This application Nov. 25, 1974, Ser. No. 526,546

Int. Cl.^{2} C08L *33/04, 61/20*

U.S. Cl. 260—851 **8 Claims**

1. A powder coating composition which, exclusive of pigments and other nonreactive components, comprises a coreactive mixture of: (A) a copolymer of about 5 to about 20 weight percent of a hydroxy functional monoethylenically unsaturated monomer selected from the group consisting of hydroxyl bearing aliphatic alcohol esters of acrylic and methacrylic acid and about 95 to about 80 weight percent of other monomers containing alpha-beta olefinic unsaturation, said copolymer having a glass transition temperature in the range of about 40° C to about 90° C and a molecular weight ($\overline{M}_n$) in the range of 2,000 to 10,000; (B) an amino functional crosslinking agent of condensation products of formaldehyde and an amine of melamine, substituted melamines, urea, benzoguanamine or substituted benzoguanamines in an amount of between about 0.8 and about 1.1 crosslinkable functional groups for each hydroxy group in the copolymer; and (C) from about 0.05 to about 4.0 weight percent based on the total weight of said coating composition of a polymeric flow control agent having a number average molecular weight of at least 1,000, a surface tension which is lower than the surface tension of said copolymer at the baking temperature of said composition and a glass transition temperature which is at least 50° C below the glass transition temperature of said copolymer and which consists essentially of an acrylic polymer prepared by polymerization of acrylate or methacrylate monomers.

4,002,700

PROCESS FOR PREPARING A LIQUID RESINOUS COMPOSITION AND THE COMPOSITION

Hiroshi Fukuzaki; Masao Niki; Yukinaga Yokota, and Jun-ichi Furukawa, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1975, Ser. No. 630,136

Claims priority, application Japan, Nov. 15, 1974, 49-131662

Int. Cl.^{2} C08L *67/06;* **C08G** *63/76*

U.S. Cl. 260—872 **9 Claims**

1. A process for the preparation of liquid resinous compositions characterized by reacting a dibasic acid component containing at least one α,β-unsaturated basic acid with a glycol component to form an unsaturated polyester having an acid value of at least 10 and a molecular weight ranging from 1,000 to 10,000, mixing the so formed unsaturated polyester with water containing at least one basic component or a water-lower alcohol mixture containing at least one basic component to neutralize unreacted carboxyl groups in the unsaturated polyester by salt-forming reaction, and then subjecting the resulting water-solubilized unsaturated polyester composition to addition reaction with at least on monovinyl compound selected from the group consisting of (I) acrylic acid, methacrylic acid and alkali metal and ammonium salts thereof, (II) hydroxyalkyl ($C_1 - C_3$) esters of acrylic acid, aminoalkyl ($C_1 - C_3$) esters of acrylic acid, hydroxyalkyl ($C_1 - C_3$) esters of methacrylic acid and aminoalkyl ($C_1 - C_2$) esters of methacrylic acid, (III) acrylamide, methacrylamide and vinylpyrrolidone, (IV) N-methylolated compounds of acrylamide, alkyl ($C_1 - C_3$) etherified N-methylolated compounds of acrylamide, N-methylolated compounds of methacrylamide and alkyl ($C_1 - C_3$) etherified N-methylolated compounds of methacrylamide, and (V) methyl acrylate, ethyl acrylate, methyl methacrylate and ethyl methacrylate, the amount of said monovinyl compound being within a range of $0.1<M_2/M_1<5$ in which M_1 indicates the mole number of the unsaturated dibasic acid contained in the polyester and M_2 denotes the mole number of the monovinyl compound to be added.

4,002,701

POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING AN N-ALKANOYL-P-AMINOPHENOL STABILIZER

Arthur Katchman, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 25, 1974, Ser. No. 527,138

Int. Cl.^{2} C08L *23/00, 25/00*

U.S. Cl. 260—874 **18 Claims**

1. A thermoplastic molding composition having improved resistance to thermal aging in the presence of air which comprises:

a. a polyphenylene ether resin;
b. a vinyl aromatic resin; and
c. an amount of an N-alkanoyl-p-aminophenol sufficient to improve the resistance of said composition to thermal aging.

4,002,702

NOVEL METHOD FOR MANUFACTURING PLASTISOL RESINS

Leroy B. Kuhn, Easton, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 403,363, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,456, Nov. 26, 1971, abandoned. This application Sept. 18, 1974, Ser. No. 506,131

Int. Cl.^{2} C08L *27/06*

U.S. Cl. 260—899 **14 Claims**

1. A process for preparing blends of emulsion and nucleating resins suitable for use in preparing plastisols and organosols, said process comprising the steps of:

a. admixing an aqueous latex comprising a continuous aqueous phase in which there are dispersed a plurality of particles of a vinyl chloride emulsion resin having an average diameter in the range of from about 0.1 to about 3.0 microns and a relative viscosity of from about 1.5 to about 3.5, as determined at 25° C. with a 1.0%, by weight, solution of the resin in cyclohexanone, with a plurality of particles of a vinyl chloride nucleating resin, said vinyl chloride nucleating resin particles having an average unit particle diameter in the range of from about 5 to about 60 microns, said nucleating resin particles being admixed with said emulsion resin particles while said nucleating resin particles have a moisture content of from about substantially zero to about 50%, by weight; the wet blend resulting from step (a) having a total resin solids content in the range of from about 30 to about 75%, by weight, of which from about 30 to about 99%, by weight, is emulsion resin particles and from about 70 to about 1%, by weight, is nucleating resin particles; and
b. spray drying the wet blend of dispersion and extender resin particles resulting from step (a) under non-coagulating conditions at a temperature sufficiently low that the particles are not permanently bound when added to a plasticizer, to obtain said blend in the form of a dry powder.

4,002,703

GRAFT COPOLYMERS BASED ON METHYL METHACRYLATE POLYMERS

Gerhard Fahrbach, Schwetzingen; Erhard Seiler, Ludwigshafen, and Dieter Stein, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen(Rhine), Germany

Division of Ser. No. 409,257, Oct. 24, 1973, Pat. No. 3,933,943. This application Aug. 12, 1975, Ser. No. 603,857

Claims priority, application Germany, Oct. 26, 1972, 2252508

Int. Cl.^{2} C08L *33/04*

U.S. Cl. 260—901 **1 Claim**

1. A process for the manufacture of grafting living polyalkylene oxide on methyl methacrylate polymers, wherein a polymer of methyl methacrylate (A) containing at least 10% by weight of polymerized units of methyl methacrylate is reacted with a high molecular weight organic compound (B) consisting essentially of polyalkylene oxide with at least one alkylene oxide unit having an alkali metal alcoholate end group, said reaction being carried out in an anhydrous inert organic solvent by mixing solutions of components A and B at from −50° to +100° C.

4,002,704

CARBURETOR

Bernard R. Laprade; Xavier J. Laprade, both of Arudy, and Pierre J. Gele, Laloubere, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Tour Aquitaine Paris la Defense and Les Usines Laprade, Arudy, both of, France

Filed June 12, 1974, Ser. No. 478,600

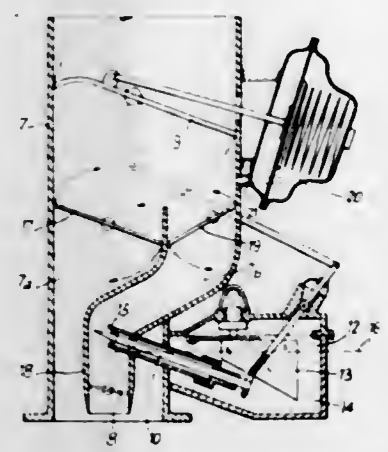
Claims priority, application France, June 29, 1973, 73.23919

Int. Cl.^{2} F02M *11/02*

U.S. Cl. 261—23 A **7 Claims**

1. A carburetor of the constant vacuum type comprising:

a body defining an air passage, first means carried by said body and defining a main air passageway of predetermined cross-sectional area and forming part of said air passage at a predetermined location therealong, second means carried by said body and defining an auxiliary air passageway of predetermined cross-sectional area and forming the remaining part of said air passage at said predetermined location therealong, an auxiliary throttle in said air passage upstream of both said main air passageway and said auxiliary air passageway, means defining a chamber for containing petrol, a petrol metering element in communication with said petrol chamber and having an adjustable aperture located in said auxiliary air passageway for discharging petrol from said petrol chamber into said auxiliary air passageway, said adjustable aperture being located substantially coincident with the centroid of the predetermined cross-sectional area of the auxiliary passageway for discharging petrol substantially centrally of the air stream flowing through said auxiliary passageway, a first main throttle element carried by said body in said main air passageway, a second main throttle element carried by said body in said auxiliary passageway and downstream of said adjustable aperture, means coupling said auxiliary throttle in said air passage and said petrol metering element for adjusting the petrol flow through said aperture in accordance with the flow of air through said air passage past said auxiliary throttle element, said main air passageway and at least a downstream portion of said auxiliary passageway containing said adjustable aperture being substantially coaxial one with the other with said downstream portion of said auxiliary passageway lying within said first means, said adjustable aperture being located substantially coincident with the substantially common axes of said main air passageway and the downstream portion of the auxiliary passageway.



4,002,705

FLUID-FLUID CONTACT APPARATUS

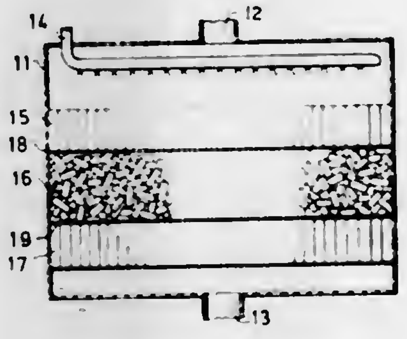
Kevin Joseph McKeown, Windermere, England, assignor to Mass Transfer Limited, Kendal, England

Continuation of Ser. No. 336,209, Feb. 27, 1973, abandoned. This application June 10, 1975, Ser. No. 585,702

Claims priority, application United Kingdom, Mar. 1, 1972, 9650/72; Apr. 12, 1972, 16971/72

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—98 **4 Claims**



1. Gas-liquid contact apparatus comprising a packed bed formed of at least two superimposed layers of fabricated packings in which the bed comprises an upper layer of randomly dumped packing members having a surface area per unit volume of 25–45 square feet per cubic feet and comprising tubular elements having a diameter to width ratio greater than 1.5:1, a plurality of ribs extending inwardly from said tubular

elements, said randomly dumped packing members being superimposed on a lower layer of stacked packing having a surface area per unit volume of 45–60 square feet per cubic feet; and means for introducing a gas and a liquid into the bed for contact therein.

4,002,706

WAX AND WAX BLENDS

Dirk Jacobus Pretorius, 3 Vanderbijl St., Sasolburg 9570, South Africa

Continuation of Ser. No. 445,079, Feb. 25, 1974, abandoned. This application Feb. 20, 1975, Ser. No. 551,302

Int. Cl.^{2} B22D *23/08*; **C08L** *91/08*

U.S. Cl. 264—13 **30 Claims**

1. Process for producing a particulate wax composition improved in respect of at least one of the properties: free flowing ability and particle hardness, as compared with conventional blends of the same over-all composition, which comprises:

a. preparing a melt essentially composed of a substantial content of low melting point, soft wax having a congealing point between about 20° C. and 80° C. and a penetration greater than 80 measured at 25° C., 10^{-1} mm, and another wax superior thereto in respect of at least one of the properties: melting point and hardness;
b. converting the melt into droplets, having a size corresponding to the particle size of the particulate wax composition being produced;
c. suspending the droplets in a cooling medium;
d. whilst thus suspended, over a period of between about 7 and 20 seconds, causing said droplets to solidify progressively from the outside inwardly by the chilling action of the cooling medium; and
e. collecting as said particulate wax composition a free flowing powdered product consisting of the said droplets in externally solidified form, the wax superoir in respect of melting point and/or hardness being concentrated in the outer region of the droplets.

4,002,707

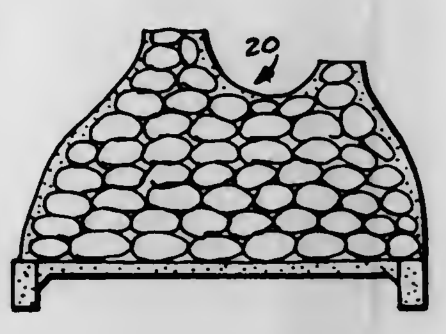
METHOD AND APPARATUS FOR THE CONSTRUCTION OF CONCRETE SHELLS

Michael Allen Oram, 1022 Nell Ave., Columbus, Ohio 43201

Filed June 23, 1975, Ser. No. 589,459

Int. Cl.^{2} E04B *1/16*

U.S. Cl. 264—31 **1 Claim**



1. The method of forming concrete shell structures utilizing waterfilled bladders comprised of the following steps:

a. position a plurality of empty bladders of predetermined size and shape to define a first layer generally conforming to the plan of the intended structure
b. fill the first layer of bladders with water to form a first layer of inflated bladders;
c. position a second layer of unfilled bladders on top of the inflated preceeding layer in an overlapping manner;
d. fill the second layer of bladders so that the weight of the water and the pattern in which the bladders are arranged tend to stabilize the arrangement of said bladders and minimize the effect of liquid distortion;
e. repeat the above procedure utilizing successive layers of bladders to form a mold with the desired configuration, the surface of the mold so formed consisting solely of the layered, inflated bladders;
f. cover the mold with a layer of wire mesh reinforcing and cast a thin walled concrete shell utilizing commonly accepted construction practice;
g. allow the concrete shell to harden, then successively drain and remove the deflated bladders through preformed openings in the contemplated shell.

4,002,708

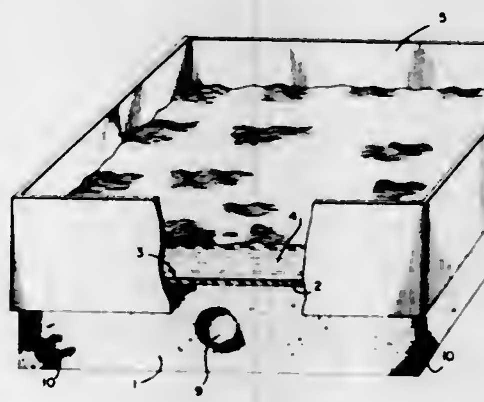
METHOD FOR PRODUCING POLYMER IMPREGNATED FOAMED MASONARY ELEMENTS

James L. Lott, Champaign, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1971, Ser. No. 193,495

Int. Cl.^{2} B29H *7/20*

U.S. Cl. 264—42 **3 Claims**



1. A method for producing polymer impregnated foamed masonry elements comprising:

a. blending a preformed foam lather and a mixture of cement, sand and water to produce a paste having foam voids ranging from 50–65 per cent of the paste volume;
b. casting and curing said paste in a predetermined form;
c. surrounding one surface of said cured, cast form with a liquid tight enclosure;
d. removing any latent paste cement film from said one surface and covering said one surface with a layer of an impregnating polymerizable liquid of relatively high viscosity;
e. covering said polymerizable liquid layer with a water impervious sheet;
f. covering said water impervious sheet with water to a depth sufficient to cause impregnation to a predetermined depth and in a predetermined time of said one surface by said polymerizable liquid throughout the dispersed void system within a region of said foamed masonry cast form adjacent said one surface;
g. polymerizing said impregnated liquid in situ;
h. removing said water, water impervious sheet, remaining polymerizable liquid and said liquid tight enclosure.

4,002,709

CONTROLLED AIR IN POLYESTER TUBE EXTRUSION FOR CLEAR SEALABLE PARISON

Larry P. Mozer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1975, Ser. No. 616,533

Int. Cl.^{2} B29C *17/07*; **B29D** *23/04*

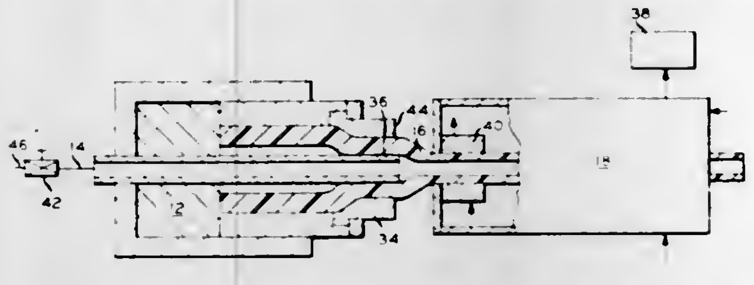
U.S. Cl. 264—90 **10 Claims**

1. A process for producing a clear, easily sealed, saturated thermoplastic polyester tube comprising: heating a saturated thermoplastic polyester to a molten state;

forcing said molten polyester through an annular die to form a tube;

passing said thus formed tube to and through an external sizing sleeve maintained under a vacuum and bringing said tube out into conformity with said external sizing sleeve by means of said vacuum;

maintaining free communication between a downstream end of said tube and ambient air with no internal restriction on air movement within said tube downstream of a face of said die, said tube being periodically severed so that said downstream end thereof is separated from said die face by distance equal to 50 to 800 times the internal diameter thereof; and



wherein the sole communication with any fluid through said die is with ambient air introduced through a conduit having an effective internal diameter of 0 to 50 percent of the internal diameter of said tube.

4,002,710

PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES OF PLASTIC MATERIAL COMPOSED OF CHEMICALLY MODIFIED PROTEIN

Klaus-Dieter Hammer, Mainz; Walter Busch, and Wolfgang Klendauer, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

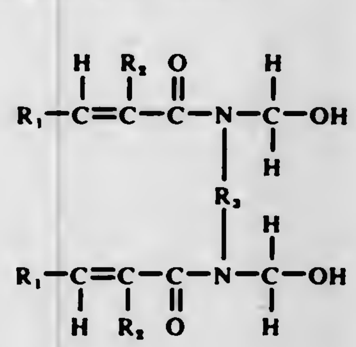
Filed Oct. 3, 1975, Ser. No. 619,223

Claims priority, application Germany, Oct. 7, 1974, 2447680

Int. Cl.^{2} C08L *89/00*

U.S. Cl. 264—183 **31 Claims**

1. A process for the production of a shaped article of a plastic material of chemically modified protein, which comprises mixing an alkaline aqueous protein solution with an aqueous solution of an organic tetrafunctional, unsaturated compound of the general formula



$$\mathrm{R_1-CH=C(R_2)-C(=O)-N(CH_2OH)-R_3-N(CH_2OH)-C(=O)-C(R_2)=CH-R_1}$$

in which

R_1 and R_2 are hydrogen or an alkyl group with 1 to 6 carbon atoms, and
R_3 is the group $-(CH_2)_n-$, n being an integer from 1 to 8, or the group

$$-\overset{|}{\mathrm{C}}\mathrm{H}-\mathrm{R}_4,$$

in which R_4 is an alkyl group with 1 to 18 carbon atoms, spinning the resulting viscous liquid ready for spinning by means of a shaping die into a precipitating liquid, washing the shaped article with a washing liquid, causing an aqueous solution of an organic, saturated, at least bifunctional compound to act on the article, heating the article, optionally causing plasticizer liquid to act on it, and drying.

4,002,711

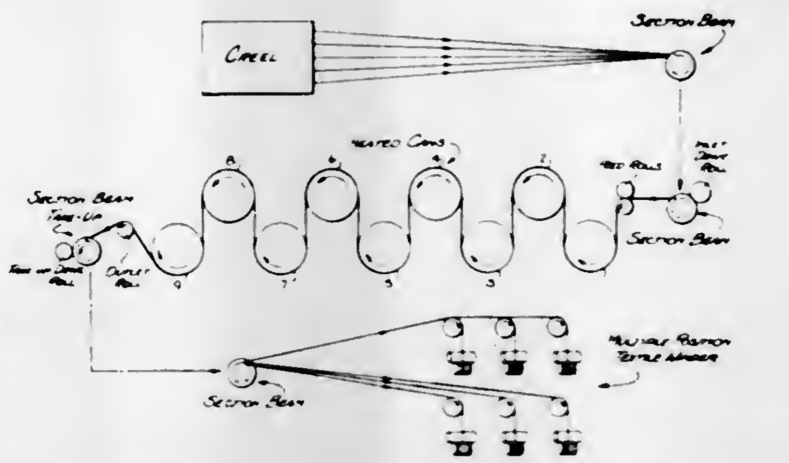
METHOD FOR DRAWING POLYURETHANE FILAMENTS

Timothy V. Peters, Rte. 3, Box 193, Lebanon, N.J. 08833

Continuation of Ser. No. 126,129, March 19, 1971, abandoned. This application May 22, 1974, Ser. No. 472,185

Int. Cl.^{2} D01D *5/06, 5/12*

U.S. Cl. 264—184 **7 Claims**



1. The method of reducing the denier of a dry, finished filament formed from a substantially linear polyurethane, said polyurethane being produced by chain extension of a prepolymer with a chain extender selected from the class of hydrazine and diamines, without substantially affecting the other physical properties of the filament, comprising elongating the filament a number of times its original length and heating it to a temperature above its "fiber stick temperature" for a sufficient time so that the filament substantially permanently retains that elongation and does not recover any substantial amount of the length to which it has been elongated.

4,002,712

PROCESS FOR THE PRODUCTION OF A PLASTICIZED SHAPED BODY FROM A CELLULOSE DERIVATIVE

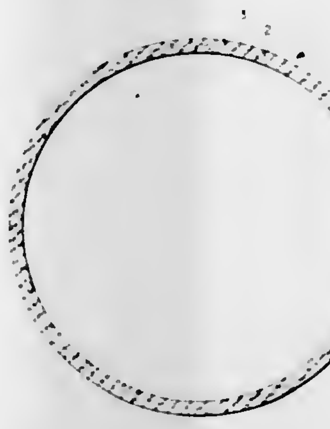
Klaus Dieter Hammer, Finthen, and Wolfgang Klendauer, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 16, 1974, Ser. No. 533,452

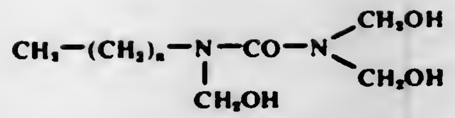
Claims priority, application Germany, Dec. 17, 1973, 2362551; Dec. 17, 1973, 2362770; Dec. 17, 1973, 2362606; Apr. 6, 1974, 2416891; Apr. 6, 1974, 2416892

Int. Cl.^{2} D01F *2/08*

U.S. Cl. 264—194 **43 Claims**

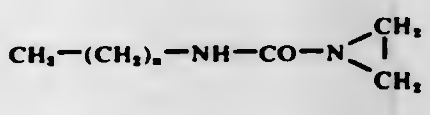


1. A process for the production of a shaped body from a cellulose derivative which comprises extruding a viscose solution through a shaping die into a precipitation bath and passing the shaped body thus formed through regenerating and washing baths, then treating the body with an acid aqueous solution of a chemical plasticizer for regenerated cellulose, drying it by heating, and finally moistening it with water after drying, said viscose solution being mixed with a liquid containing alkyl-trimethylol-urea of the following general formula

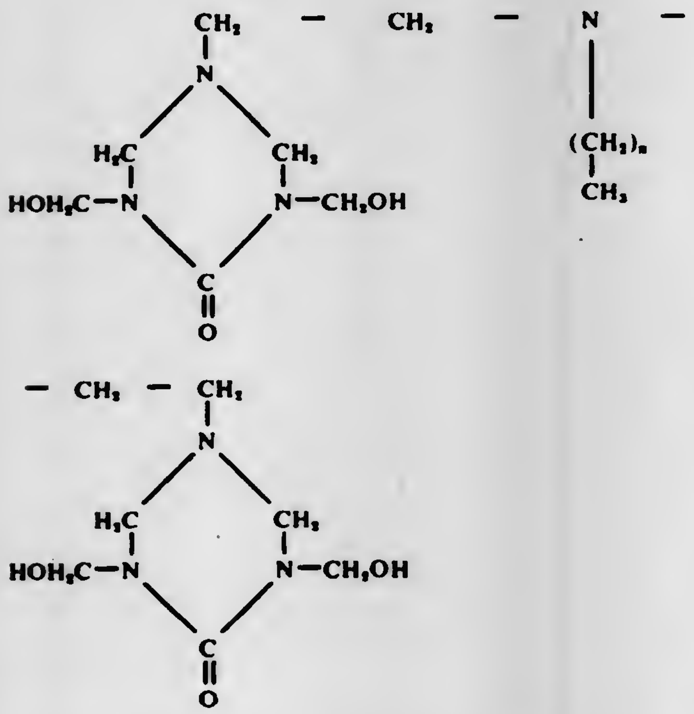


$$CH_3-(CH_2)_n-\underset{\underset{\displaystyle CH_2OH}{|}}{N}-CO-N<\begin{array}{l}CH_2OH\\ CH_2OH\end{array}$$

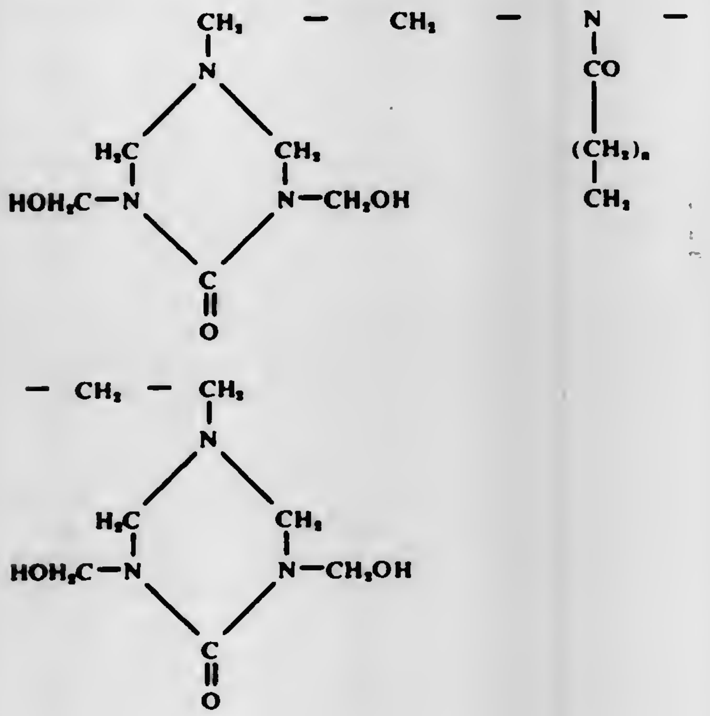
wherein *n* is a whole number between 9 and 24, preferably between 14 and 19, and especially the number 17, and/or with a liquid containing alkyl-ethylene-urea of the following general formula



wherein *n* is a whole number between 11 and 19, preferably between 15 and 18, and especially the number 17, or with a liquid containing alkylamine-bis-dimethylene-triazinonetetramethylol of the following general formula



wherein *n* is a whole number between 9 and 24, preferably between 14 and 19, and especially the number 17, or with a liquid containing alkylamide-bis-dimethylene-triazinonetetramethylol of the following general formula



wherein *n* is a whole number between 9 and 24, preferably between 14 and 19, and especially the number 17.

4,002,713

CEMENTING COMPOSITIONS AND CONCRETES AND MORTARS DERIVED THEREFROM

Frederic James Duncan, and Ronald George Chappell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 343,169, March 20, 1973, Pat. No. 3,850,651. This application Oct. 7, 1974, Ser. No. 512,979

Claims priority, application United Kingdom, Apr. 13, 1972, 17069/72

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² B29C *25/00*

U.S. Cl. 264—234 16 Claims

1. A method of preparation of a pre-cast shaped concrete article which comprises casting and curing a cementing composition initially including an inorganic cement, and an aqueous emulsion or dispersion of a water-insoluble polymer or copolymer derived from one or more alkyl methacrylates having from 1 to 8 carbon atoms in the alkyl group, the said polymer or copolymer having a glass transition temperature of at least 10° C. and the curing being effected, after initial setting, at an elevated temperature of at least 40° C.

4,002,714

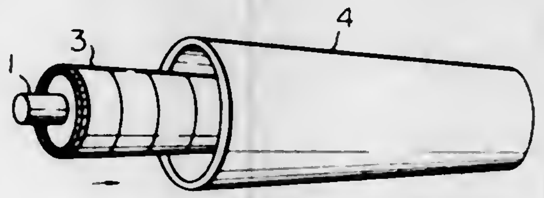
METHOD FOR PRODUCING A TAPERED PIPE OF REINFORCED SYNTHETIC RESIN

Fumio Usui, No. 441, Shimo Asao, Tama, Kawasaki, Kanagawa, Japan

Division of Ser. No. 280,209, Aug. 14, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 538,774

Int. Cl.² B29C *5/04*; **B29D** *3/02, 23/00*

U.S. Cl. 264—250 2 Claims



2. A method of manufacturing a tapered bent pipe of reinforced synthetic resin material with a base plate integrally attached to the larger end thereof, said method comprising:

providing a tapered core bar having a first larger diameter end and a second smaller diameter end;

mounting a flanged base frame on said first end of said core bar, thereby forming a core bar assembly;

spirally winding glass fiber reinforcing material in plural layers over said core bar and said base frame, thereby forming a body of reinforcing material of predetermined shape;

inserting said core bar assembly with said body of reinforcing material thereon into a flexible one-piece mold having an interior configuration in the form of a tapered portion and, at the larger end thereof, an enlarged portion for receiving said base frame;

extracting said core bar from said mold while leaving said body of reinforcing material and said base frame in said mold;

bending a portion of said body of reinforcing material to cover an outer bottom portion of said base frame;

inserting said flexible mold having said body of reinforcing material and said base frame therein within a body of rotation;

pouring a predetermined amount of liquid thermosetting synthetic resin material into said mold;

inclining said mold and body of rotation from the horizontal position by a predetermined angle so that the larger end of said mold is higher than the smaller end;

rotating said mold and body of rotation at a predetermined rate of rotation while so positioned, thereby causing said resin material to permeate said body of reinforcing material, and causing said resin material to partially harden in said body of reinforcing material, thereby forming a tapered pipe having a base plate integral with the larger diameter end thereof;

removing said flexible mold and said tapered pipe from said body of rotation before said thermosetting synthetic resin material has completely hardened;

positioning said flexible mold and tapered pipe in a jig and bending said tapered pipe to a predetermined shape;

causing said thermosetting synthetic resin material to completely harden in said jig, thereby forming a tapered bent pipe having a base plate integral with the larger diameter end thereof; and

extracting said thus formed tapered bent pipe from said flexible mold.

4,002,715

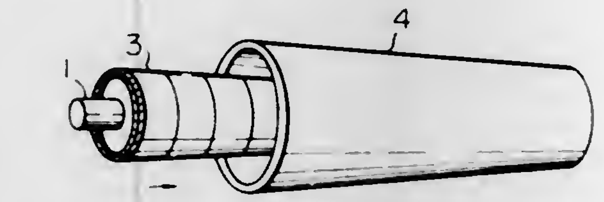
METHOD FOR PRODUCING A TAPERED PIPE OF REINFORCED SYNTHETIC RESIN

Fumio Usui, No. 441, Shimo Asao, Tama, Kawasaki, Kanagawa, Japan

Continuation of Ser. No. 280,209, Aug. 14, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 538,773

Int. Cl.² B29C *5/04*; **B29D** *3/02, 23/00*

U.S. Cl. 264—250 1 Claim



1. A method of manufacturing a tapered pipe of reinforced synthetic resin material with a base plate integrally attached to the larger end thereof, said method comprising:

providing a tapered core bar having a first larger diameter end and a second smaller diameter end;

mounting a flanged base frame on said first end of said core bar, thereby forming a core bar assembly;

spirally winding glass fiber reinforcing material in plural layers over said core bar and said base frame, thereby forming a body of reinforcing material of predetermined shape;

inserting said core bar assembly with said body of reinforcing material thereon into a rigid one-piece mold having an interior configuration in the form of a tapered portion and, at the larger end thereof, an enlarged portion for receiving said base frame;

extracting said core bar from said mold while leaving said body of reinforcing material and said base frame in said mold;

bending a portion of said body of reinforcing material to cover an outer bottom portion of said base frame;

inserting said mold having said body of reinforcing material and said base frame therein within a body of rotation;

pouring a predetermined amount of liquid thermosetting synthetic resin material into said mold;

inclining said mold and body of rotation from the horizontal position by a predetermined angle so that the larger end of the mold is higher than the smaller end;

rotating said mold and body of rotation at a predetermined rate of rotation while so positioned, thereby causing said resin material to permeate said body of reinforcing material, and causing said resin material to harden in said body of reinforcing material, thereby forming a tapered pipe having a base plate integral with the larger diameter end thereof; and

axially removing said tapered pipe and integral base plate from said mold.

4,002,716

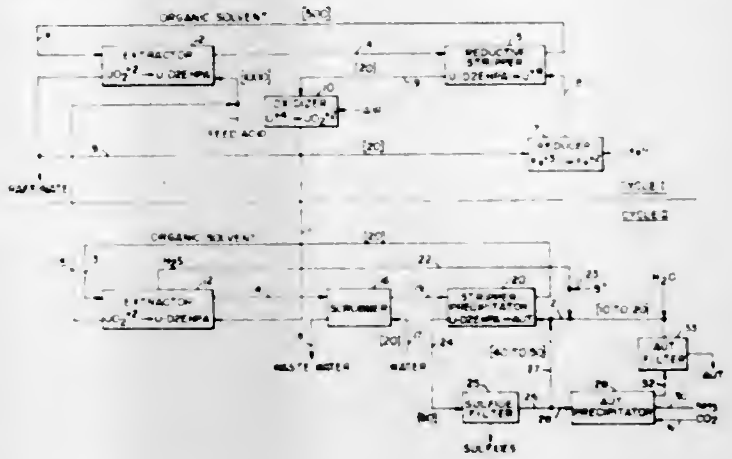
SULFIDE PRECIPITATION METHOD OF SEPARATING URANIUM FROM GROUP II AND GROUP III METAL IONS

Parameshwaran S. Sundar, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1973, Ser. No. 390,997

Int. Cl.² C01G *43/00*

U.S. Cl. 423—10 21 Claims



1. A method of separating uranium from iron in an acidic aqueous liquor containing uranyl ion comprising:

1. extracting the uranium from said liquor with a non-interfering, water-immiscible, organic solvent containing a reagent which reacts with said uranyl ion to form a complex soluble in said solvent, said solvent moving in a closed loop;
2. in either order
   - a. mixing with said solvent an aqueous solution containing about 0.5 to about 1 mole per liter of ions selected from the group consisting of $(NH_4)_2CO_3$, NH_4HCO_3, and mixtures thereof, ½ to 4/5 of said aqueous solution being recycled in a closed loop, and
   - b. contacting said recycled aqueous solution with sufficient sulfide ion to precipitate said metal ions as sulfides, said uranium remaining in solution;
3. permitting said solvent and said aqueous solution to separate;
4. separating said precipitated sulfides from said recycled aqueous solution;
5. adding to the 1/5 to ½ of said aqueous solution which was not recycled sufficient ions selected from the group consisting of $(NH_4)_2CO_3$, NH_4HCO_3, and mixtures thereof to bring said ion concentration in said non-recycled aqueous solution to about 1.5 to about 2.5 moles per liter, causing said uranium to precipitate as ammonium-uranyl-tricarbonate;
6. filtering said uranium precipitate from said aqueous solution; and
7. calcining said filtered uranium precipitate.

4,002,717

REFINING OF MANGANESE OXIDE ORES

Richard G. Sandberg, Gloucester; William S. Kane, Wicomico, and Paul H. Cardwell, Zanoni, all of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

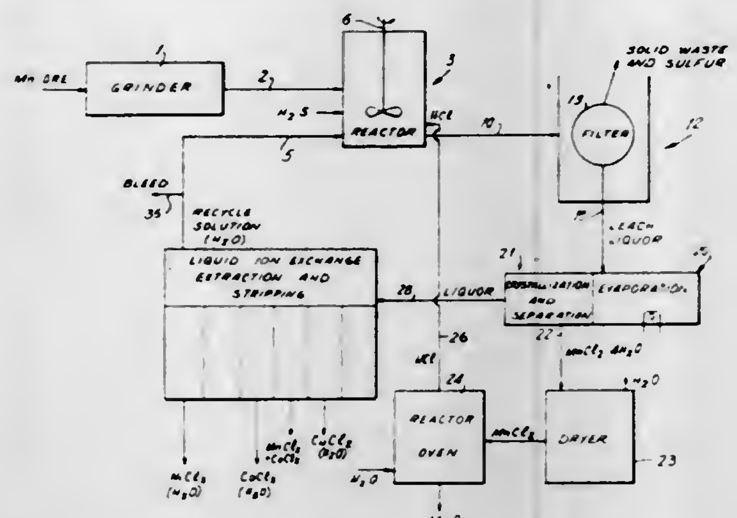
Filed Jan. 9, 1975, Ser. No. 539,872

Int. Cl.² B01D *11/04*; **B01F** *1/00*

U.S. Cl. 423—24 34 Claims

1. A method for treating manganese oxide ores including manganese having a valence greater than two, the method comprising contacting the manganese oxide ore in an aqueous slurry with an acid of a hydrogen halide and a sulfide compound selected from the group consisting of hydrogen sulfide

and metal sulfides, the sulfide compound being present in at least the stoichiometric amount to react with any acid and manganese`oxide being reacted, so as to form sulfur and an aqueous leach solution comprising dissolved manganese salt.



4,002,718
GELATIN-ENCAPSULATED DIGOXIN SOLUTIONS AND METHOD OF PREPARING THE SAME

Libero A. Gardella, Libertyville, and Helen Kesler, Barrington, both of Ill., assignors to Arnar-Stone Laboratories, Inc., Mount Prospect, Ill.

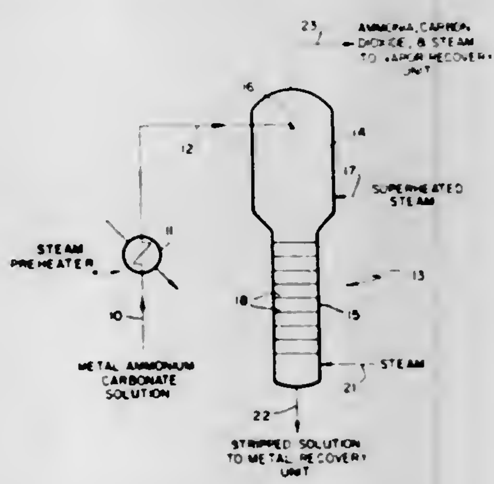
Filed Oct. 16, 1974, Ser. No. 515,087
Int. Cl.² A61J *3/07;* **A61K** *9/48, 31/705*
U.S. Cl. 424—37 **21 Claims**

1. A method for preparing digoxin in encapsulated therapeutic dosage form, comprising the steps of reducing the size of digoxin particles to an average size no larger than about 10 microns, then mixing the micronized particles of digoxin with a solvent essentially alcohol-free and consisting predominantly of polyethylene glycol of a molecular weight no greater than about 1000, and heating the mixture at a temperature below the decomposition temperature of the drug until at least 0.5 milligrams of digoxin is dissolved in each milliliter of solvent, and then encapsulating therapeutic doses of the dissolved digoxin in gelatin capsules soluble in water but insoluble in said solvent.

4,002,719
RECOVERY OF NICKEL AND COBALT CARBONATES FROM AMMONIACAL LEACH SOLUTIONS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Sept. 22, 1975, Ser. No. 615,801
Int. Cl.² C01G *51/06*
U.S. Cl. 423—144 **6 Claims**


AMMONIA, CARBON DIOXIDE, & STEAM TO VAPOR RECOVERY UNIT
SUPERHEATED STEAM
STEAM PREHEATER
STEAM
METAL AMMONIUM CARBONATE SOLUTION
STRIPPED SOLUTION TO METAL RECOVERY UNIT
10
11
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22
23

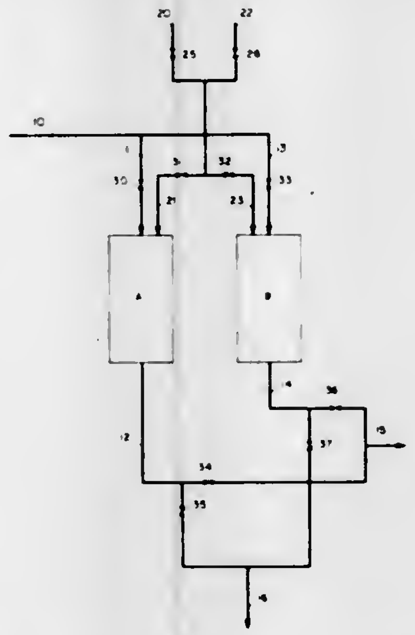
1. In a process for recovering a member selected from the group consisting of nickel, cobalt and mixtures thereof dissolved in an ammonium carbonate solution by stripping ammonia from the solution in a stripping column to precipitate the carbonate of said member, the improvement comprising:

- spraying said solution into a flash chamber in an upper portion of the stripping column to flash a portion of the ammonia therefrom and precipitate a portion of said metal carbonate as a fine precipitate in solution droplets formed in said spraying; and
- stripping said solution containing the fine precipitate of metal carbonate in the lower portion of the stripping column wherein further ammonia is stripped from the solution to precipitate further amounts of said metal carbonate, said fine precipitate functioning as nuclei for the precipitated further amounts to reduce deposition of precipitate on column surfaces.

4,002,720
GAS DESULFURIZATION

Kenneth S. Wheelock, and Geoffrey R. Say, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 24, 1974, Ser. No. 536,164
Int. Cl.² B01D *53/34*
U.S. Cl. 423—230 **17 Claims**



1. A process for removing by sorption at least a portion of acidic gases selected from the group consisting of hydrogen sulfide, carbonyl sulfide and mixtures thereof from a gaseous mixture containing the same, which process comprises: contacting said gaseous mixture with a sorbent comprising (i) a pre-steamed inorganic oxide support selected from the group consisting of alumina, silica-alumina, zirconia, magnesia, boria and vanadia and (ii) a rare earth metal component.

4,002,721
PROCESS IMPROVEMENT IN THE ABSORPTION OF ACID GAS FROM A FEED GAS

Joseph C. Guffy, El Cerrito; Robert A. Winkler, Berkeley, and Marvin H. Paulson, El Cerrito, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

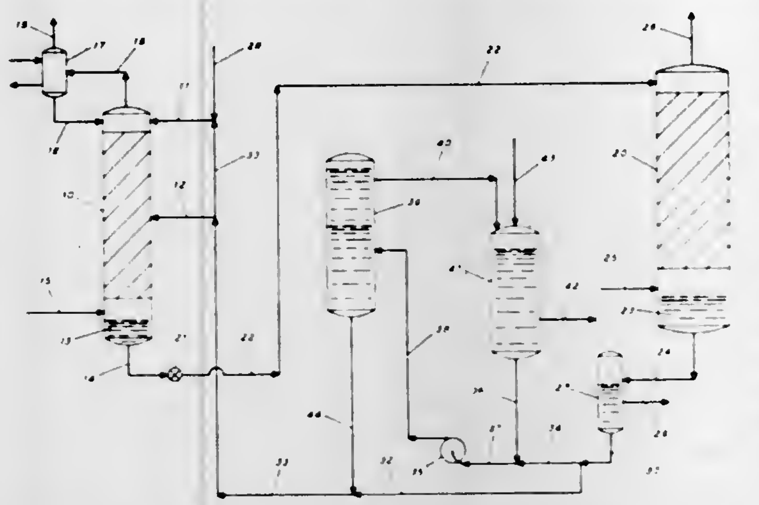
Filed Sept. 26, 1974, Ser. No. 509,507
Int. Cl.² B01D *53/34*
U.S. Cl. 423—232 **13 Claims**

1. In a cyclic process for absorbing acid gas from a normally gaseous feed comprising said acid gas by contacting the feed with a regenerable alkaline scrubbing solution comprising an aqueous solution containing at least one alkaline acid-gas absorbing agent in a first contact zone under gasliquid absorption process conditions, including:

1. an excessive foaming of the aqueous solution;

2. withdrawing at least a portion of said contacted solution from the first contact zone; and
3. recycling of the withdrawn solution to the first contact zone,

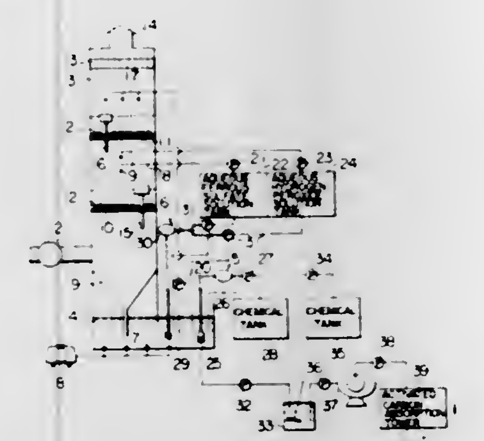
the improvement which comprises substantially reducing said foaming by contacting in a second contact zone at least a portion of said withdrawn solution with a hydrocarbon solvent under liquid-liquid extracting conditions, said solvent comprising at least one normally liquid hydrocarbon containing at least 7 carbon atoms and said solvent containing an effective amount of a hydrocarbon-soluble extraction adjuvant, said amount, based on 100 parts by weight of the hydrocarbon solvent, being in the range from about 2 to 50 parts and said adjuvant being at least one organic compound composed of carbon, hydrogen and oxygen, having an oxygen-to-carbon atomic ratio which is not greater than about 1 to 4 and having a carbon atom content in the range from 4 to about 18.



4,002,722
PROCESS AND APPARATUS FOR WET TREATMENT OF VENT GAS

Hiroshi Suzuki, Kariya; Shigeru Ito, Toyokawa; Kazuyuki Nishikawa, Hoi, and Tutomu Shibata, Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Mar. 12, 1975, Ser. No. 557,451
Claims priority, application Japan, Mar. 16, 1974, 49-30215
Int. Cl.² B01D *53/34*
U.S. Cl. 423—238 **8 Claims**



1. A process for wet treatment of vent gas containing at least one disagreeable odor component selected from the group consisting of phenols, formaldehydes and ammonia, which comprises adding a ferrous salt and hydrogen peroxide to an aqueous absorbent solution in an absorption tower provided with an aqueous absorbent solution tank and filter layers for absorption of the disagreeable odor components, thereby making the ferrous ion concentration at least one-seventh of the hydrogen peroxide concentration in the aqueous absorbent solution, and adjusting an oxidation-reduction potential of the thus added absorbent solution at least to a value of (540 − 60 × pH value) mV, said pH value being 5 or less and contacting said vent gas with said aqueous absorbent solution.

4,002,723
METHOD OF REMOVAL OF NITROGEN OXIDES

Hideya Inaba; Shigenori Onizuka, and Yasumi Kamino, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Continuation of Ser. No. 471,292, May 20, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,262
Claims priority, application Japan, Sept. 29, 1973, 48-109774
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 **7 Claims**

1. The method of selectively reducing nitrogen oxides from an exhaust gas containing oxygen, moisture and sulphur dioxide by employing ammonia in said exhaust gas as a reductant, the theoretical ratio of the amount of said reductant to the amount of nitrogen oxides being at least equal to 1.0, wherein said exhaust gas and ammonia are contacted at a reaction temperature of 240°–460° C with a catalyst consisting essentially of rhodium, copper, magnesium and alumina.

4,002,724
SULFUR DIOXIDE COLLECTION

R. Thomas McKie, 1411 Ranch Road, Boise, Idaho 83700

Continuation-in-part of Ser. No. 405,313, Oct. 11, 1973, abandoned. This application Nov. 21, 1975, Ser. No. 633,968
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **11 Claims**

1. A method for cleansing SO_2-containing flue gas utilizing associated alkali-containing flyash comprising the steps of:

- a. scrubbing flue gas containing SO_2 and associated alkali-containing flyash with an aqueous scrubbing agent, using the said alkali-containing flyash as the primary SO_2 neutralizing agent;
- b. classifying the scrubber discharge into an oversize fraction characterized by flyash particles greater than about 325 Tyler mesh size, and an undersize fraction characterized by flyash particles less than about 325 Tyler mesh size;
- c. removing said undersize fraction to a settling pond;
- d. clarifying the undersize scrubber discharge fraction into liquid and solid portions;
- e. recycling the liquid portion of the clarified undersize scrubber discharge fraction for use as a liquid scrubbing agent in said scrubbing step, while separating the solid portion of the clarified undersize scrubber discharge fraction;
- f. reducing the particle size of the oversize scrubber discharge fraction; and
- g. recycling the reduced oversize fraction back in said scrubbing step for further reaction with sulfur dioxide, followed by subsequent clarifying, recycling and separating in accordance with steps (d) and (e) above whereby clarification of said undersize fraction is achieved without attendant slime and gook problems.

4,002,725
PROCESS FOR GROWING ACICULA OF RARE EARTH PENTAPHOSPHATES

Paul Michael Bridenbaugh, Whitehouse Station; Paul Foo-Hung Liao, Middletown, both of N.J.; Bruce Cedric Tofield, Abingdon, England, and Heinz Paul Weber, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

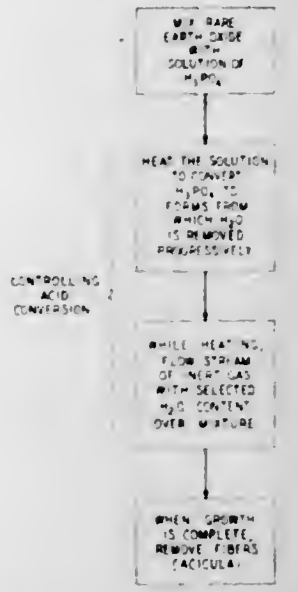
Filed July 9, 1975, Ser. No. 594,193
Int. Cl.² C01F *17/00*
U.S. Cl. 423—263 **2 Claims**

1. A process for producing acicular of rare earth pentaphosphates with ratios of length to diameter of greater than about 25 to 1 comprising the steps of

mixing oxides of selected rare earths with a solution of H_3PO_4,

heating said solution to cause conversion of the H_3PO_4 to metaphosphoric acids and then heating to a temperature of approximately 550° C to develop more highly condensed poly acid forms, and

controlling the acid conversion during said heating by


MIX RARE EARTH OXIDE WITH SOLUTION OF H_3PO_4
HEAT THE SOLUTION TO CONVERT H_3PO_4 TO FORMS FROM WHICH H_2O IS REMOVED PROGRESSIVELY
CONTROLLING ACID CONVERSION
2
WHILE HEATING, FLOW STREAM OF INERT GAS WITH SELECTED H_2O CONTENT OVER MIXTURE
WHEN GROWTH IS COMPLETE, REMOVE FIBERS (ACICULA)

flowing a stream of gas over said mixture, said gas stream containing an inert gas and water vapor in the range between approximately 14 grams per cubic meter and approximately 290 grams per cubic meter, whereby acicula of rare earth pentaphosphates are obtained in said mixture, and

removing said acicula from said mixture.

4,002,726
METHOD OF RECYCLING LITHIUM BORATE TO LITHIUM BOROHYDRIDE THROUGH METHYL BORATE

Evan E. Filby, Rigby, Idaho, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 16, 1975, Ser. No. 596,550
Int. Cl.^{2} C01B *6/21*

U.S. Cl. 423—287 **8 Claims**

1. A process for the recovery of lithium borohydride from lithium borate formed as a by-product in the generation of hydrogen by the reaction of lithium borohydride with water comprising:

a. reacting the lithium borate with hydrogen chloride and water to produce boric acid and lithium chloride;
b. converting the boric acid to methyl borate;
c. reacting said methyl borate with sodium hydride to produce sodium borohydride; and
d. reacting the lithium chloride of step (a) with said sodium borohydride to produce lithium borohydride.

4,002,727
DESULFURIZATION PROCESS FOR HYDROGEN SULFIDE-CONTAINING GASES

Takezo Sonoda, Himeji; Masao Nakano, Hyogo; Michito Okane, and Hideo Suzuki, both of Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd, Osaka, Japan

Filed Dec. 16, 1974, Ser. No. 532,856
Claims priority, application Japan, Dec. 18, 1973, 48-14028
Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—573 R **15 Claims**

1. In a process for the desulfurization of hydrogen sulfide-containing gases by contacting the hydrogen sulfide-containing gas with an aqueous alkali solution containing ammonium naphthoquinonesulfonate to cause absorption of hydrogen sulfide by said absorption solution and catalytically oxidizing by means of a molecular oxygen-containing gas the absorption solution thus obtained to separate out elementary sulfur, the improvement which comprises (a) carrying out the contact of the hydrogen sulfidecontaining gas using an absorption solution adjusted to its pH to 8 to 10 by ammonia and containing as catalyst components 10 to 2000 ppm ammonium naphthoquinonesulfonate and 0.01 to 1000 ppm of a variable valent metal compound, (b) carrying out the catalytic oxidation of the absorption solution containing absorbed therein hydrogen sulfide using a molecular oxygen-containing gas to lower the hydrosulfide ion concentration in the absorption solution after the treatment to 70 ppm or less and (c) recirculating the absorption solution to the contact with the hydrogen sulfidecontaining gas.

4,002,728
HYDROGEN SULFIDE REMOVAL FROM CONTAMINATED SULFUR

George B. DeMay, Newberg, Oreg., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 6, 1975, Ser. No. 538,844
Int. Cl.^{2} C01B *17/14*

U.S. Cl. 423—578 R **10 Claims**

1. A process for reducing the hydrogen sulfide content of hydrogen-sulfide-contaminated elemental sulfur, said sulfur containing at least an appreciable amount of said contaminant, which comprises extracting hydrogen sulfide from the sulfur by contacting the sulfur in the liquid phase with water, said contacting being effected using from 2 to about 10 extraction stages, being at a pressure sufficient to maintain the water in the liquid phase and at a temperature in the range from about the melting point of said sulfur to about 165° C.

4,002,729
METHOD FOR THERMOCHEMICAL DECOMPOSITION OF WATER

Bernard M. Abraham, Oak Park, and Felix Schreiner, Mokena, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 6, 1976, Ser. No. 674,199
Int. Cl.^{2} C01B *13/02, 1/02*

U.S. Cl. 423—579 **7 Claims**

1. A method for decomposing water chemically comprising: (a) reacting KI, NH_3, CO_2 and H_2O to form $KHCO_3$ and NH_4I, (b) separating the $KHCO_3$ and NH_4I_2 from the H_2O and from each other, (c) decomposing the $KHCO_3$ to K_2CO_3, H_2O and CO_2, (d) reacting the NH_4I with vaporous metallic mercury to form HgI_2, NH_3 and hydrogen, (e) reacting the vaporous HgI_2 just formed with the K_2CO_3 formed in the previous reaction to produce Hg, KI, CO_2 and ½ O_2 and recycling all compounds produced in this series of reactions except hydrogen and oxygen, the net effect of the total process thus comprising the decomposition of water.

4,002,730
RADIONUCLIDE CARRIERS

Frederick Anthony Hartman; Herbert Charles Kretschmar, and Andrew John Tofe, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 13, 1975, Ser. No. 540,488
Int. Cl.^{2} A61K *29/00, 43/00;* G01T *1/161*

U.S. Cl. 424—1 **11 Claims**

1. A physiologically acceptable, substantially water-insoluble particulate radionuclide carrier comprising an anionic starch derivative comprising from about 1% to about 20% by weight anionic substituents, wherein an average of from about 0.1% to about 1.5%, by weight, of a reducing agent is bound to said starch derivative.

4,002,731
DIAGNOSTIC PROCESS USING SODIUM TYROPANOATE

Thomas W. Skulan, Valatie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed June 17, 1974, Ser. No. 479,634
Int. Cl.^{2} A61K *29/02, 9/22*

U.S. Cl. 424—5 **3 Claims**

1. A process which comprises administering orally to a mammal possessing a gallbladder, single undivided dose in a sustained or controlled release formulation or intermittently over a period of between about four and about ten hours, an amount of sodium tyropanoate of between about 25 and 100 milligrams per kilogram of body weight of the mammal, whereby a concentration of iodine in the gallbladder sufficient to provide adequate X-ray visualization of the gallbladder is obtained, while maintaining the maximum iodine concentration in the blood significantly lower than the maximum iodine concentration in the blood obtained by oral administration of an initial single dose of the same total amount of sodium tyropanoate.

4,002,732
SPECKLE PARTICLE FOR DENTIFRICE

Ian Ray Gault, Lymm, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 385,296, Aug. 3, 1973, Pat. No. 3,928,555.
This application Sept. 15, 1975, Ser. No. 612,878
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.^{2} A61K *7/16*

U.S. Cl. 424—49 **9 Claims**

1. An opaque, transparent of translucent toothpaste dentifrice preparation comprising a toothpaste dentifrice base containing about 10–75% by weight of the preparation of a dentally acceptable water-insoluble polishing agent and about 0.15–50% by weight of the preparation of finely divided visible functional particles, which alleviate periodontal sensitivity and bleeding upon application to teeth and gums, having macroscopic size of 100 to 1000 microns, comprising a matrix of meltable binding material which binding material is a C_{12}–C_{22} saturated fatty acid di- or tri-ester of glycercol or ethylene glycol and about 5–10% by weight of anit-irritant compound selected from the group consisting of allantoin, aluminum dihydroxy allantoinate and aluminum chlorohydroxy allantoinate, said meltable binding material having a melting or softening point lower than the decomposition point of said anit-irritant compound, the total amount of said anti-irritant compound being about 0.1–5% by weight of the preparation.

4,002,733
SUNSCREENING COMPOSITIONS

Peter John Degen, Woodbury Township, Washington County, and Anthony James Lucas, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

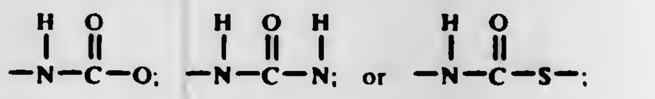
Filed July 26, 1974, Ser. No. 492,180
Int. Cl.^{2} A61K *7/42*

U.S. Cl. 424—59 **20 Claims**

1. In a sunscreening composition comprising a pharmaceutical extending medium and an effective sunscreening amount of a dermally non-irritating, ultraviolet light-absorbing compound, the improvement wherein the dermally non-irritating, ultraviolet light-absorbing compound is a substantive compound of the formula

$(XE)_n-R-(AY)_n$one

wherein R is the aliphatic portion of polymerized 18 carbon fatty acids and contains 36, 54, 72, 90 or 108 carbon atoms; A and E are independently



$$-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-O;\quad -\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{N}};\quad \text{or}\quad -\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-S-;$$

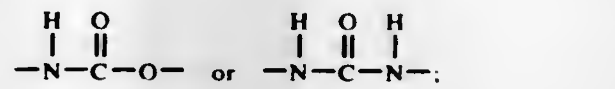
X and Y are aromatic, ultraviolet light absorbing moieties characterized by ultraviolet light absorption maxima in the range of 280 nm to about 360 nm, and when $n + n^1$ is greater than 2, Y may be hydrogen or an alkyl radical containing 1 to 6 carbon atoms; n and n^1 are independently integers from 1 to 6 designating different or the same (XE) and (AY) respectively, except $n + n^1$ must equal 2 - 6.

13. An ultraviolet light-absorbing compound of the formula

$(XE)_n-R-(AY)_n$one

wherein R is the aliphatic portion of polymerized 18 carbon fatty acids and contains 36, 54, 72, 90 or 108 carbon atoms;

A and E are independently



$$-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-O-\quad \text{or}\quad -\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{N}}-;$$

X and Y are aromatic, ultraviolet light absorbing moieties characterized by ultraviolet light absorption maxima in the range of 280 nm to about 360 nm, and when $n + n^1$ is greater than 2, Y may be hydrogen or an alkyl radical containing 1 to 6 carbon atoms; n and n^1 are independently integers from 1 to 6 designating the same or different (XE) and (AY) respectively, except $n + n^1$ must equal 2–6.

4,002,734
EMOLLIENT HAIR GROOMING COMPOSITION

Melcina H. Pickford, 614 W. Broadway, Minneapolis, Minn. 55411

Continuation-in-part of Ser. No. 410,631, Oct. 29, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,663
Int. Cl.^{2} A61K *7/06*

U.S. Cl. 424—74 **4 Claims**

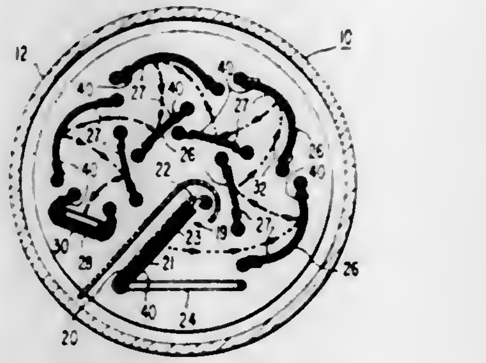
1. An emollient hair grooming composition comprising a blended mixture of about 16 to 20 parts by weight of (A) a mixture consisting essentially of about 6.71% rectified tar oil, 2.43% sulfur, 1% lanolin, 1.53% inerts and 0.32% captan in 88.01% petroleum; about 15 to 19 parts by weight of (B) a mixture consisting essentially of about 10 to 35% by weight of mineral oil, about 5 to 20% each of mineral wax, isopropyl palmitate and beeswax, about 3 to 5% of sulfur, and about 0.1 to 3% each of oxyquinoline and pine oil in 40% to 75% of petroleum jelly containing about 0.1% phenol, to make 100%; and about 14 to 18 parts of (C) castor oil; all blended into about 280 to 400 parts by weight of (D) petroleum jelly.

4,002,735
METHOD OF SENSITIZING ELECTRON EMISSIVE SURFACES OF ANTIMONY BASE LAYERS WITH ALKALI METAL VAPORS

Arthur Frederick McDonie, Lancaster, Pa., and Charles Michael Tomasetti, Turnersville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 4, 1975, Ser. No. 583,746
Int. Cl.^{2} H01J *9/22;* B05D *5/12*

U.S. Cl. 427—78 **6 Claims**



1. A method of making an electron emissive electrode including a supporting base layer of antimony sensitized with

the vapors of a plurality of alkali metals comprising the steps of:

a. sensitizing the base layer by exposing a surface portion thereof to the vapors of at least two alkali metals at a pressure level of less than 10^{-4} torr and at an initial temperature of less than about 120° C.; then,
b. continuing said exposure of step (a) while gradually increasing said temperature to a final temperature of about 200° C. at an average rate of less than about 10° C. per minute; then,
c. baking the electrode at said final temperature until substantially maximum photosensitivity is achieved.

4,002,736
PORCINE BACTERIN

Duane C. Paukratz, c/o Grand Laboratories, Freeman, S. Dak. 57029

Filed Dec. 16, 1974, Ser. No. 532,771
Int. Cl.^{2} A61K *39/02*

U.S. Cl. 424—92 **16 Claims**

1. A bacterin for prophylactic treatment of the pathologic effects of the bacterium *Streptococcus equisimilus* in swine, which bacterin consists essentially of killed *Streptococcus equisimilus* bacteria suspended in an injectable aqueous medium.

4,002,737
PREVENTION AND/OR TREATMENT OF POISON IVY DERMATITIS

David P. Borris, Oxford, Miss., assignor to Research Corporation, New York, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,520
Int. Cl.^{2} A61K *37/48*

U.S. Cl. 424—94 **10 Claims**

1. A method of treating or preventing poison ivy dermatitis which comprises applying to the skin surface susceptible to or evidencing poison ivy dermatitis an effective amount of enzyme selected from the group consisting of catechol 1,2-oxygenase and catechol 2,3-oxygenase.

4,002,738
TREATMENT OF SPECIFIED NEOPLASIAS

Edwin Samuel Johnson, Antioch, and John Hunter Seely, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 30, 1975, Ser. No. 582,319
Int. Cl.^{2} A61K *37/02*

U.S. Cl. 424—177 **7 Claims**

1. The method of reducing the size of a mammary or DMBA-inducible tumor in a warm-blooded animal by administering to said animal an effective daily amount to reduce the size of said tumor of a nonapeptide of the formula

L-pGlu-L-His-L-Trp-L-Ser-L-Tyr-X-L-Leu-L-Arg-L-Pro-NH-R

wherein X denotes the optically active D-form of an aminoacid of the formula —NH—CHR′—CO— with R′ being a linear or branched carbon chain of 1 – 4 carbon atoms and wherein R is lower alkyl.

4,002,739
SOLUBLE COLLAGEN

James E. Turner, Madison, and James R. Butler, Parsippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 18, 1975, Ser. No. 550,790
Int. Cl.^{2} A61K *37/00*; C08H *1/00*

U.S. Cl. 424—177 **13 Claims**

1. A composition of matter for use in measuring blood platelet aggregation comprising a solution of acidic collagen and bovine serum albumin said composition having a pH of between about 3.0 to about 4.5.

4,002,740
THYMOPOIETIN II AND THERAPEUTIC USE THEREOF

Gideon Goldstein, 4421 Douglas Ave., Riverdale, N.Y. 10471, and David H. Schlesinger, c/o Mass. Gen. Hospital, Boston, Mass. 02114

Filed Aug. 21, 1975, Ser. No. 606,654
Int. Cl.^{2} A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **6 Claims**

1. A polypeptide of the following sequence:

H_2N—Gly—Glu—Gln—Arg—Lys—Asp—Val—Tyr—Val—Gln—Leu—Tyr—Leu—COOH.

4. A therapeutic composition of matter comprising a therapeutically effective amount of the composition of claim 1 in a pharmaceutically acceptable carrier.

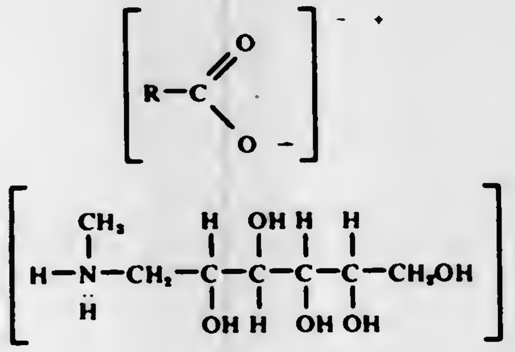
4,002,741
MEGLUMINE COMPLEX FUNGICIDAL POLYENE MACROLIDE ANTIBIOTIC COMPOSITIONS AND TREATMENT METHOD

Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, korpus 1, kv. 85; Tatyana Mikhailovna Kokushina, prospekt Metallistov, 16, kv. 66; Irina Kondratievna Lagert, Moskovskoe shosse, 16, kv. 163; Georgy Avxentievich Mikhailets, ulitsa Lanskaya, 10, kv. 100; Galina Vasilievna Kholodova, ulitsa B. Pushkinskaya, 40, kv. 9; Oleg Nikolaevich Ekzemplyarov, Suvorovsky prospekt, 22b, kv. 14; Ruvim Bentsionovich Zelmanov, ulitsa Chaikovskogo, 13, kv. 20; Leonid Borisovich Sokolov, ulitsa Novorossiskaya, 22, kv. 45; Evgeny Davidovich Etingov, ulitsa Zvezdnaya, 8, kv. 43, and Irina Mikhailovna Lushitskaya, ulitsa Belgradskaya, 42, korpus 2, kv. 26, all of Leningrad, U.S.S.R.

Division of Ser. No. 463,843, April 24, 1974. This application Dec. 4, 1975, Ser. No. 637,827
Int. Cl.^{2} A61K *31/70*

U.S. Cl. 424—180 **26 Claims**

1. A medicinal composition comprising as an active ingredient, a meglumine complex of a fungicidal polyene macrolide antibiotic of the formula:



wherein R is the remainder of a fungicidal polyene macrolide antibiotic having no carboxyl groups.

4,002,742
1-N-ALKYL-4,6-DI-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOS, METHODS FOR THEIR MANUFACTURE, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS, AND COMPOSITIONS USEFUL THEREFOR

John J. Wright, Orange; Peter J. L. Daniels, Cedar Grove; Alan K. Mallams, West Orange, and Tattanahalli L. Nagabhushan, East Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 452,600, March 19, 1974, abandoned. This application July 30, 1974, Ser. No. 492,998
Int. Cl.^{2} A61K *31/70*

U.S. Cl. 424—180 **47 Claims**

1. A compound selected from the group consisting of a 1-N-X-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol selected from the group consisting of 1-N-X-gentamicin A, 1-N-X-gentamicin B, 1-X-gentamicin B_1, 1-N-X-gentamicin C_1, 1-N-X-gentamicin C_{1a}, 1-N-X-gentamicin C_2, 1-N-X-gentamicin C_{2a}, 1-N-X-gentamicin C_{2b}, 1-N-X-gentamicin X_2, 1-N-X-sisomicin, 1-N-X-verdamicin, 1-N-X-tobramycin, 1-N-X-Antibiotic G-418, 1-N-X-Antibiotic 66-40B, 1-N-X-Antibiotic 66–40D, 1-N-X-Antibiotic JI-20A, 1-N-X-Antibiotic JI-20B, 1-N-X-Antibiotic G-52, 1-N-X-mutamicin 1, 1-N-X-mutamicin 2, 1-N-X-mutamicin 4, 1-N-X-mutamicin 5, and 1-N-X-mutamicin 6;

wherein X is an alkyl substituent selected from the group consisting of alkyl, cycloalkylalkyl, alkenyl, aralkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl, and alkylaminohydroxyalkyl, said alkyl substituent having up to 8 carbon atoms, the carbon in said alkyl substituent adjacent to the aminoglycoside nitrogen being unsubstituted, and when said alkyl substituent is substituted by both hydroxyl and amino functions, only one of said functions can be attached at any one carbon atom;

and the pharmaceutically acceptable acid addition salts thereof.

4,002,743
MONO- AND DITHIOPHOSPHONIC ACID ESTERS AND THEIR USE AS PESTICIDES

Gerhard Stähler, Frankfurt am Main; Ludwig Emmel, Bergen-Enkheim, and Werner Bonin, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

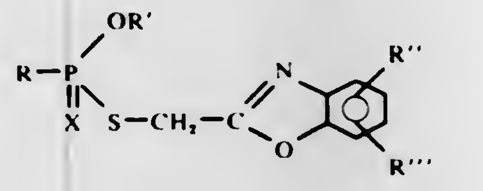
Filed Mar. 18, 1975, Ser. No. 559,643

Claims priority, application Germany, Mar. 18, 1974, 2413008

Int. Cl.^{2} C07D *263/56*

U.S. Cl. 424—200 **16 Claims**

1. A mono- or dithiophosphonic acid ester of the formula



wherein

R is alkyl of from 1 to 4 carbon atoms optionally substituted by halogen, alkoxy of from 1 to 4 carbon atoms, alkylmercapto of from 1 to 4 carbon atoms or phenyl; cycloalkyl of 5 or 6 carbon atoms; phenyl; halophenyl; methylphenyl or methoxyphenyl;

R′ is alkyl of from 1 to 12 carbon atoms optionally substituted by halogen, alkoxy of from 1 to 4 carbon atoms, alkylmercapto of from 1 to 4 carbon atoms or phenyl; alkenyl of from 3 to 5 carbon atoms or cycloalkyl of from 3 to 5 carbon atoms;

R″ and R‴, which are identical or different, are hydrogen, halogen, methyl, methoxy, nitro or trifluoromethyl; and

X is oxygen or sulfur.

2. A composition for combating a parasitic insect, mite or tick, which comprises 1 to 95% by weight of a compound defined in claim 1 and a solid or liquid inert carrier substance, an adhesive, a wetting agent, a dispersing agent or a grinding auxiliary.

3. A method for combating a parasitic insect or mite infesting a crop plant or a parasitic insect, mite or tick living on a livestock animal, which comprises contacting with the surface of said crop plant, to effect deposition on said surface or absorption into said plant, or administering cutaneously to said livestock animal an effective amount of a compound defined in claim 18 introduced in a composition comprising 1 to 95% by weight of said compound and a solid or liquid inert carrier substance, an adhesive, a wetting agent, a dispersing agent or a grinding auxiliary.

4,002,744
0-ETHYL-0-ISO-BUTYL-0-(2,2-DICHLOROVINYL)-THIONO-PHOSPHORIC ACID ESTER

Wilhelm Sirrenberg, Sprockhovel, and Bernhard Homeyer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

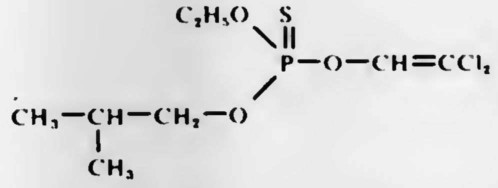
Filed Apr. 9, 1975, Ser. No. 566,647

Claims priority, application Germany, Apr. 24, 1974, 2419624

Int. Cl.^{2} A01N *9/36*; C07F *9/165*

U.S. Cl. 424—219 **3 Claims**

1. O-Etyl-O-iso-butyl-O-(2,2-dichlorovinyl)-thiono-phosphoric acid ester of the formula



2. An insecticidal composition containing as active ingredient an insecticidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,002,745
COMPLEMENT INHIBITORS

Seymour Bernstein; Milton David Heller, both of New City, N.Y., and Joseph Peter Joseph, Cliffside Park, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 18, 1975, Ser. No. 632,932
Int. Cl.^{2} A61K *31/61, 31/60*

U.S. Cl. 424—230 **15 Claims**

1. A method of inhibiting the complement system in a warm-blooded animal in need of such therapy which comprises internally administering to said animal an effective complement inhibiting amount of a pharmaceutically acceptable compound selected from the group consisting of formaurin dicarboxylic acid, C_1–C_5 acylate thereof, C_1–C_5 alkyl ether thereof, C_1–C_5 alkyl ester thereof, C_1–C_5 acylate of the C_1–C_5 alkyl ester thereof, C_1–C_5 alkyl ether of the C_1–C_5 alkyl ester thereof and salts thereof.

4,002,746

SYNTHESIS OF GON-4-ENES

Gordon Alan Hughes, and Herchel Smith, both of Wayne, Pa., assignors to Herchel Smith, Bryn Mawr, Pa.

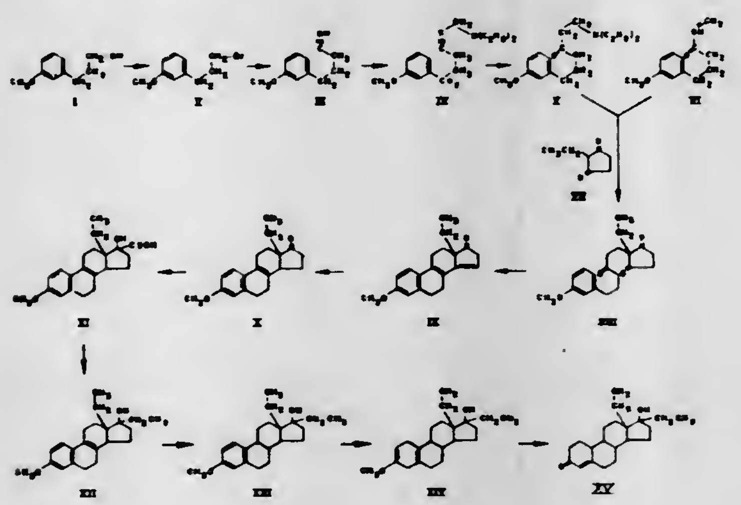
Continuation-in-part of Ser. No. 228,384, Oct. 4, 1962, Pat. No. 3,850,911, which is a continuation-in-part of Ser. Nos. 57,904, Sept. 23, 1960, abandoned, and Ser. No. 91,341, Feb. 24, 1961, abandoned, and Ser. No. 137,535, Sept. 12, 1961, abandoned, and Ser. No. 195,000, May 15, 1962, abandoned, and Ser. No. 196,557, May 16, 1962, abandoned. This application Jan. 15, 1964, Ser. No. 337,823

Claims priority, application United Kingdom, Sept. 25, 1959, 32619/59

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07J *71/00*

U.S. Cl. 424—243 **5 Claims**



1. A therapeutic composition having progestational activity comprising as active ingredient a 17-aliphatic carboxylic acid ester of 17α-ethynyl-18-methyl-19-nortestosterone and a pharmaceutical carrier for said compound.

4,002,747

NOVEL ESTER OF 19-NOR-TESTOSTERONE

Johannes van der Vies, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

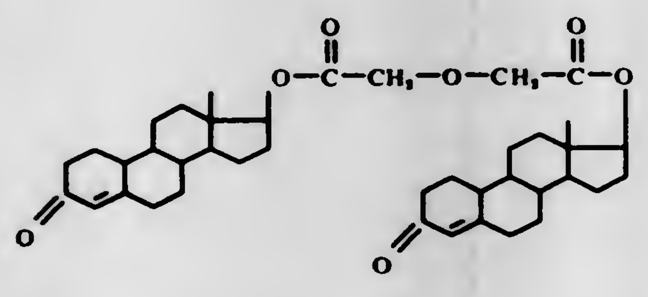
Filed Nov. 24, 1975, Ser. No. 634,391

Claims priority, application Netherlands, Dec. 2, 1974, 7415669

Int. Cl.² C07J *1/00*

U.S. Cl. 424—243 **2 Claims**

1. The compound, having the formula:



2. A pharmaceutical composition adapted for parenteral administration comprising the compound of claim 1 in a concentration from about 10 to about 50 mg per cc. in a pharmaceutically acceptable liquid carrier.

4,002,748

METHOD OF PREPARING STERILE ESSENTIALLY AMORPHOUS CEFAZOLIN FOR RECONSTITUTION FOR PARENTERAL ADMINISTRATION

Michael Bornstein, and Sandra M. Carone, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 19, 1976, Ser. No. 650,210

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **2 Claims**

1. A method of preparing a sterile, essentially amorphous cefazolin sodium for reconstitution for parenteral administration comprising the steps of:

a. dissolving said cefazolin sodium in water in a concentration of from about 10 to about 25 percent (W/V);

b. filtering the solution from a) through a sterilizing filter into a previously sterilized container;

c. exposing the preparation from b) to an environment wherein the temperature is from about minus 50° C. to about minus 55° C.;

d. cooling the preparation in the environment of c) to a temperature of minus 48° C. or below and stabilizing for about 30 minutes at such temperature;

e. reducing the pressure of the environment in which the preparation from (d) is maintained to a maximum of 100 microns Hg absolute, and stabilizing such pressure for about 30 minutes;

f. raising the temperature of the environment in which the preparation from (e) is maintained to about 10° C. and holding such temperature until the temperature of such preparation reaches about 5° C., avoiding the melting of such preparation; and

g. raising the temperature of the environment in which the preparation from (f) is maintained to about 35° C. sublimng the water from such preparation until the resulting amorphous cefazolin sodium has a moisture content of no more than 6 percent.

4,002,749

SUBSTITUTED INDOLINONES

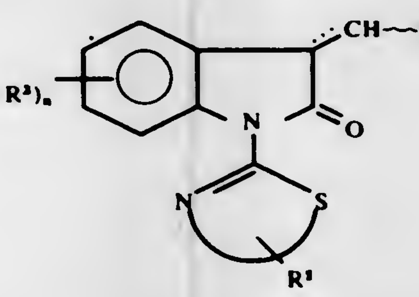
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 12, 1975, Ser. No. 604,000

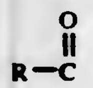
Int. Cl.² C07D *417/02*

U.S. Cl. 424—246 **25 Claims**

1. A compound of the formula

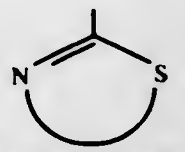


wherein R¹ is selected from the group consisting of phenyl, naphthyl, thienyl, furyl, chlorofuryl, dichlorofuryl, pyrryl, pyridyl, coumarinyl, thiacoumarinyl, thiazolyl, isothiazolyl, imidazolyl, or phenyl or naphthyl substituted with one or more substituents selected from the group consisting of halogen, hydroxy, lower alkyl, nitro, CF_3 and lower alkoxy; R² is selected from the group consisting of hydrogen, lower alkyl, phenyl, naphthyl, lower alkylphenyl, or lower alkylnaphthyl; R³ is selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, halo, lower alkoxy, nitro, cyano, amino, dilower alkylamino or

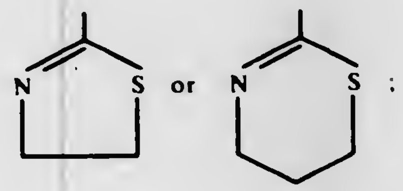


$$R-\overset{\overset{\displaystyle O}{\|}}{C}$$

wherein R is selected from the groups consisting of lower alkyl, lower alkenyl, phenyl, phenyl-lower alkyl, cycloalkyl, cycloalkenyl, cycloalkyl-lower alkyl, and cycloalkyl-lower alkenyl;



represents a 5- or 6-membered ring selected from the group consisting of



n is 1 or 2; the dotted line - - - - represents an optional bond; and pharmaceutically acceptable acid-addition salts thereof.

16. A method for treating inflammation in mammalian species, which comprises administering to the mammalian host a therapeutic amount of a compound as defined in claim 1.

4,002,750

PYRAZINE 4-OXIDE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Vittorio Ambrogi; Willy Logemann; Marc Antonio Parenti, and Raffaele Tommasini, all of Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

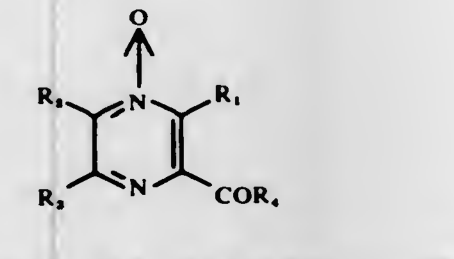
Continuation of Ser. No. 354,909, April 26, 1973, abandoned. This application May 19, 1975, Ser. No. 578,820

Claims priority, application Italy, Apr. 28, 1972, 23663/72

Int. Cl.² C07D *241/24*

U.S. Cl. 424—250 **17 Claims**

1. A compound of formula (I)



(I)

wherein at least one of R¹, R² and R³ is C_{1-4} alkyl and the others are hydrogen atoms; R⁴ is hydroxy or C_{1-4} alkoxy, or a salt of the compound wherein R⁴ is hydroxy with a pharmaceutically acceptable base.

4,002,751

5-HYDRAZINOPYRIDAZIN-3(2H)-ONES

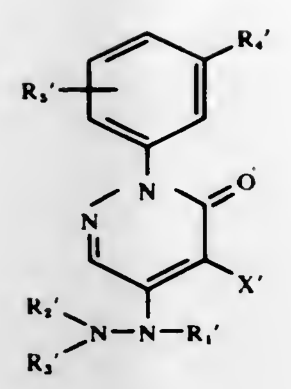
Jerome Linder, Westfield, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 442,748, Feb. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 409,921, Oct. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 343,889, March 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,760, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 227,269, Feb. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 197,401, Nov. 10, 1971, abandoned. This application May 2, 1975, Ser. No. 574,049

Int. Cl.² C07D *237/14;* **A61K** *31/50*

U.S. Cl. 424—250 **12 Claims**

1. A compound of the formula:



where X' is chloro;
R₁' is lower alkyl having 1 to 4 carbon atoms;
R₂' and R₃' are both hydrogen;
R₄' is fluoro, chloro, or trifluoromethyl, and
R₅' is hydrogen fluoro, chloro, or trifluoromethyl;
provided that when R₄' is fluoro or chloro, R₅' is also independently fluoro or chloro and in the position on the ring para to R₄' and that when R₄' and R₅' are both trifluoromethyl, they are on other than an adjacent carbon atom, or a pharmaceutically acceptable acid addition salt thereof.

12. A method of inducing sleep which comprises administering 37.5 to 2000 milligrams of a compound according to claim 1.

4,002,752

PIPERAZINYLIMINO RIFAMYCINS

Renato Cricchio, Varese, and Vittorio Arioli, Como, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

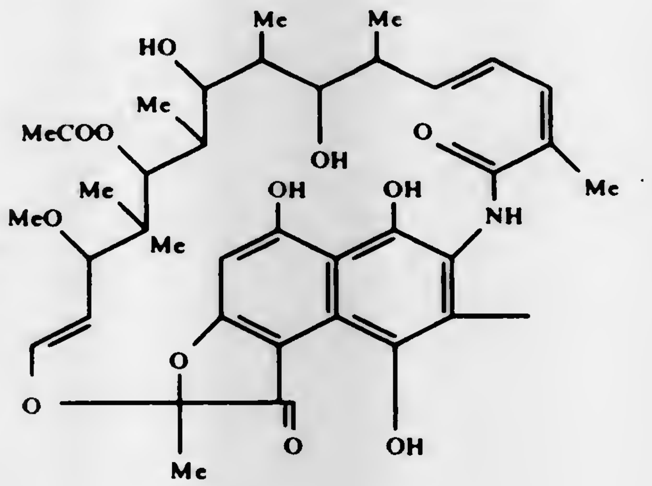
Filed Feb. 26, 1976, Ser. No. 661,587

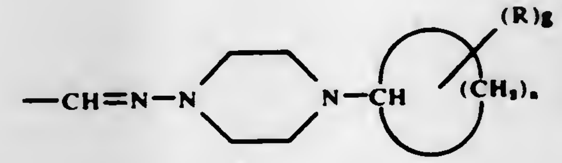
Claims priority, application United Kingdom, Mar. 25, 1975, 10020/75

Int. Cl.² C07D *491/08*

U.S. Cl. 424—250 **8 Claims**

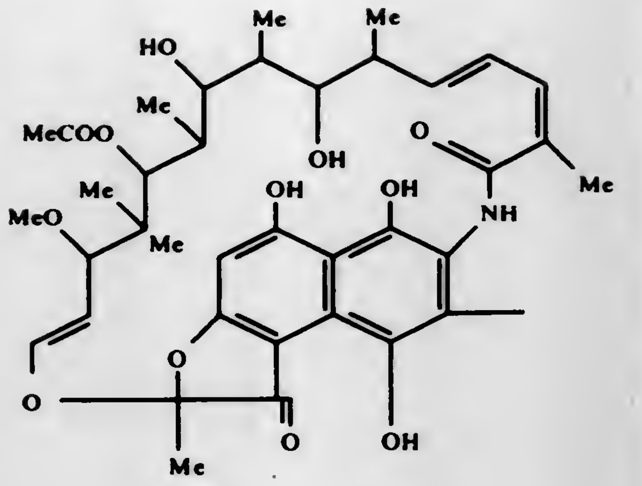
1. A rifamycin compound of the formula

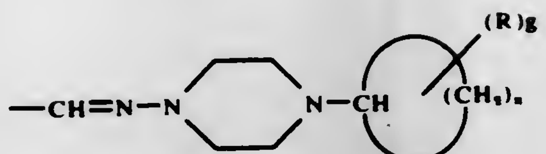




wherein Me represents a methyl group; *n* represents the integer 3, 4, 5 or 6; *g* represents the integer 0, 1 or 2; and each R represents a lower alkyl group selected from methyl or ethyl substituting for a hydrogen atom of a —CH₂— group.

8. A pharmaceutical composition for combatting microbial infections containing an antimicrobially effective amount of a compound of the formula





wherein Me represents a methyl group; *n* represents the integer 3, 4, 5 or 6; *g* represents the integer 0, 1 or 2; and each R represents a lower alkyl group selected from methyl or ethyl substituting for a hydrogen atom of a $—CH_2—$ group admixed with a pharmaceutical carrier.

4,002,753
6-SUBSTITUTED 3-CARBETHOXYHYDRAZINOPYRIDAZINES

Carlo Carpi, S.Polo d'EnZa (Reggio Emilia); Luciano Dorigotti, and Giorgio Pifferi, both of Milan, all of Italy, assignors to I.S.F. S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 447,523, March 4, 1974, Pat. No. 3,925,381. This application Sept. 16, 1975, Ser. No. 613,865

Claims priority, application Italy, Mar. 7, 1973, 21297/73

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.² C07D *237/20;* **A61K** *31/50*

U.S. Cl. 424—250 **2 Claims**

1. 3-(2-Carbethoxyhydrazino)-6-[N-(2-hydroxypropyl)ethylamino]-pyridazine and its pharmaceutically acceptable salts.

2. Pharmaceutical composition comprising an antihypertensively effective amount of the compound according to claim 1 and an inert pharmaceutical carrier.

4,002,754
SUBSTITUTED PIPERAZINYLIMINORIFAMYCINS

Renato Cricchio, Varese, and Vittorio Arioli, Como, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

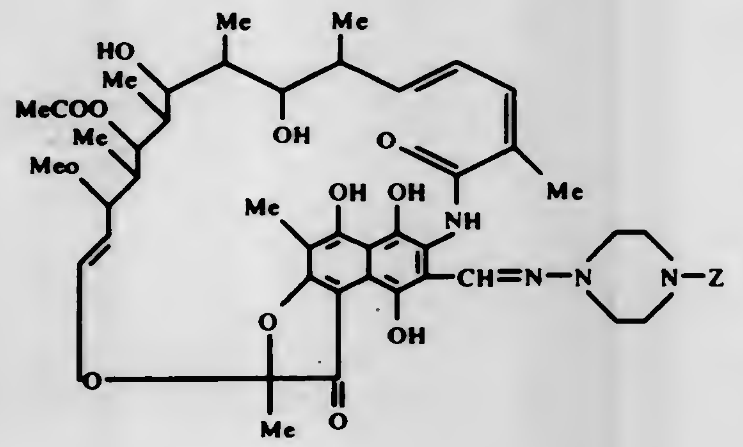
Filed Feb. 26, 1976, Ser. No. 661,586

Claims priority, application United Kingdom, Mar. 5, 1975, 9058/75

Int. Cl.² C07D *491/08*

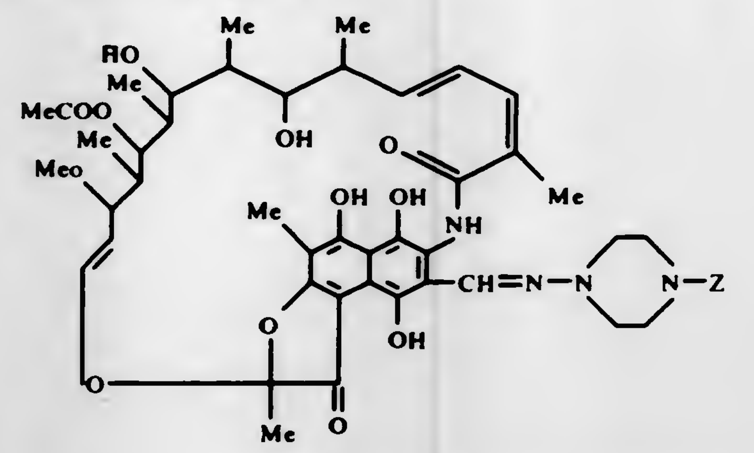
U.S. Cl. 424—250 **9 Claims**

1. A rifamycin compound of the formula



wherein Me represents a methyl group and Z represents alkenyl of 3 to 5 carbon atoms, alkynyl of 3 to 5 carbon atoms, 5- to 7-membered cycloalkenyl, cycloalkyl-$(C_1–C_2)$alkyl wherein the cycloalkyl moiety is a 3- to 7-membered ring or cycloalkenyl-$(C_1–C_2)$alkyl wherein the cycloalkenyl moiety is a 5- to 7-membered ring.

9. A pharmaceutical composition for combatting microbial infections containing an antimicrobially effective amount of a compound of the formula



wherein Me represents a methyl group and Z represents alkenyl of 3 to 5 carbon atoms, alkynyl of 3 to 5 carbon atoms, 5- to 7-membered cycloalkenyl, cycloalkyl-$(3_1–C_2)$alkyl wherein the cycloalkyl moiety is a 3- to 7-membered ring or cycloalkenyl-$(C_1–C_2)$alkyl wherein the cycloalkenyl moiety is a 5- to 7-membered ring, admixed with a pharmaceutical carrier.

4,002,755
TRIAZOLOQUINAZOLINES

Michihiro Yamamoto; Shigeaki Morooka; Masao Koshiba, all of Nishinomiya; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

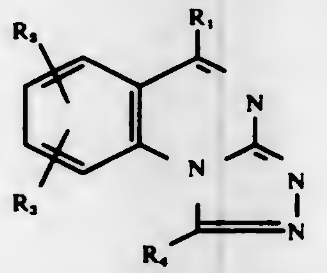
Filed Feb. 25, 1975, Ser. No. 552,889

Claims priority, application Japan, Feb. 27, 1974, 49-24621

Int. Cl.² C07D *487/04*

U.S. Cl. 424—251 **6 Claims**

1. An s-triazolo[4,3-a]quinazoline of the formula



wherein R_1 is $C_1–C_4$ alkyl, phenyl, halophenyl, $C_1–C_4$ alkylphenyl or $C_1–C_4$ alkoxyphenyl; R_2 and R_3 are independently hydrogen, halogen, trifluoromethyl, nitro, $C_1–C_4$ alkyl or $C_1–C_4$ alkoxy, or R_2 and R_3 together may form methylenedioxy; and R_4 is hydrogen, $C_1–C_4$ alkyl, benzyl, phenethyl or halobenzyl; and pharmaceutically acceptable acid addition salts thereof.

4,002,756
USEFUL PRO-DRUG FORMS OF THEOPHYLLINE

Takeru Higuchi; Nicolae S. Bodor, and Yu-Neng Kuo, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

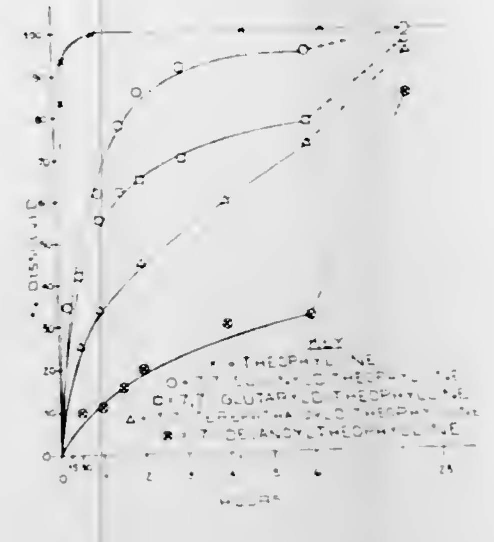
Division of Ser. No. 463,092, April 22, 1974, Pat. No. 3,935,196. This application Sept. 26, 1975, Ser. No. 617,030

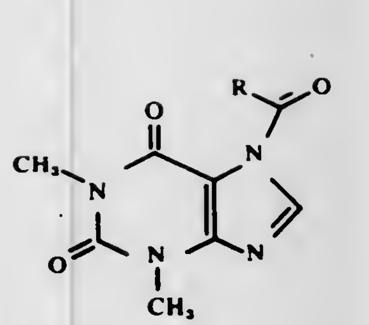
Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **4 Claims**

1. A method for inducing a non-toxic, sustained therapeutically effective release of theophylline in the bloodstream of a warm-blooded animal which comprises:

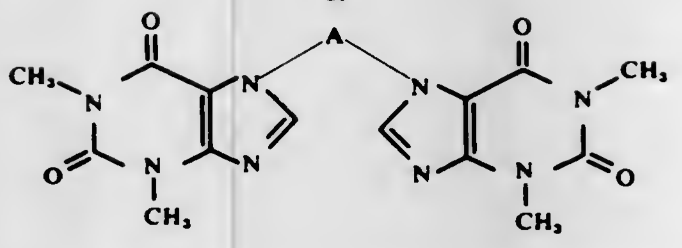
administering thereto, a bronchodilating amount of a prodrug of theophylline of the formula





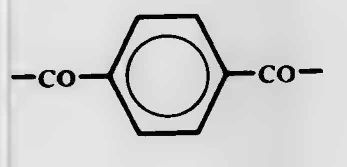
(I)

or

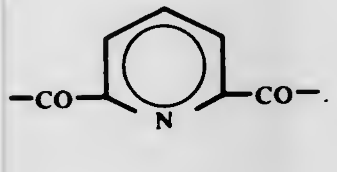


(II)

wherein R represents a member selected from the group consisting of straight or branched $C_4–C_{20}$ alkyl, straight or branched $C_4–C_{20}$ alkenyl, substituted phenyl or a substituted or unsubstituted naphthyl whose substituents are selected from the group consisting of hydroxy, $C_1–C_4$ alkyl, $C_1–C_4$ alkoxy, acyloxy derived from an alkanoic acid of up to 4 carbon atoms, chlorine, bromine, and iodine, 2,3,4 pyridyl or quinoline, and wherein A represents a member selected from the group consisting of —CO—, $—CO—(CH_2)_n—CO—$ wherein *n* represents an integer of from 1 - 16, —CO—CH=λ CH—CO—(cis or trans),



and



4,002,757
N-(1-SUBSTITUTED-3-PYRROLIDINYL)-4-QUINOLINECARBOXAMIDES

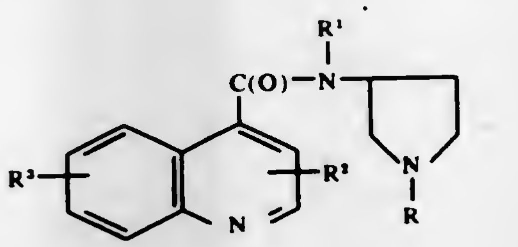
Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 26, 1974, Ser. No. 536,514

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **10 Claims**

1. A therapeutic composition suitable for control of emesis comprising (1) an anti-emetic effective amount of between 1.0 and 100 mg. of an anti-emetic compound having the formula:



wherein;

R is lower cycloalkyl,

R^1 is selected from the group consisting of hydrogen, lower-alkyl, phenyl and substituted phenyl wherein the substituents are halogen atoms of atomic weight less than 80, nitro, lower-alkyl, lower-alkoxy or trifluoromethyl,

R^2 is selected from the group consisting of hydrogen, lower-alkyl, halogen of atomic weight less than 80, lower-alkoxy, amino and nitro,

R^3 is selected from the group consisting of hydrogen, lower-alkyl, lower-alkoxy, halogen atom of atomic weight less than 80, amino and nitro, or

pharmaceutically acceptable acid addition salts thereof, and (2) a pharmaceutically acceptable carrier therefor.

4,002,758
MEDICAMENT WHICH IS UTILIZABLE IN OPHTHALMOLOGY

Alphonse Bigóu, Paris, France, assignor to Societe B.F.B., Champigny, France

Continuation of Ser. No. 403,172, Oct. 3, 1973, abandoned. This application July 2, 1975, Ser. No. 592,513

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **2 Claims**

1. A method of treating ophthalmological disorders of the cornea in which there is lysis of collagen by the action of collagenase which comprises the oral administration to a patient in need thereof from one to four times a day of a composition comprising:

a. from 200 to 1,000 mg of a compound selected from the group consisting of cystine and cysteine

b. from 50 to 300 mg of pyridoxine in the form of a base or a salt.

4,002,759
PYRIDYLBUTYLAMINO ETHYLENE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote; Charon Robin Ganellin, Welwyn Garden City, and Hunter Douglas Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

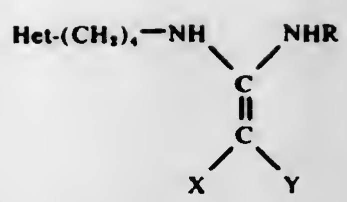
Continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Nov. 5, 1975, Ser. No. 629,193

Claims priority, application United Kingdom, May 17, 1973, 23568/73

Int. Cl.² C07D *213/36;* **A61K** *31/44*

U.S. Cl. 424—263 **9 Claims**

1. A compound of the formula:



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; Het is a pyridine ring which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; R is hydrogen or lower alkyl; Z is —S— or methylene; *m* is 0, 1 or 2 and *n* is 2 or 3 provided that the sum of *m* and *n* is 3 or 4; and Ar is phenyl optionally substituted by halogen, methyl or amino, or a pharmaceutically acceptable acid addition salt thereof.

9. A method of inhibiting H-2 histamine receptors which comprises administering orally or parenterally to an animal, in an effective amount to inhibit said receptors, a compound of claim 1.

4,002,760

TREATMENT OF HUMANS WITH CHOLINESTERASE REACTIVATORS

Albert W. Cook, Centre Island Road, Centre Island, N.Y. 11771

Continuation-in-part of Ser. No. 482,061, June 24, 1974, Pat. No. 3,928,594. This application Nov. 24, 1975, Ser. No. 634,794

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 2 Claims

1. Method of alleviating the pain of tic douloureux comprising administering to a person suffering therefrom a dose of 2-formyl-1-methylpyridium oxime or a physiologically acceptable salt thereof effective to alleviate said pain of tic douloureux.

4,002,761

2,3-BIS-(3-LOWER ALKANOYL-2-THIOUREIDO)-PYRIDINES

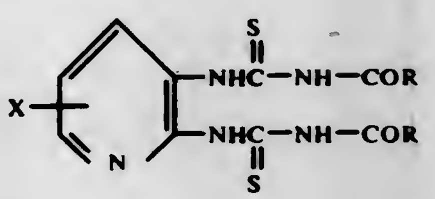
Roger C. Parish, King of Prussia, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 565,026, April 3, 1975, Pat. No. 3,961,063. This application Feb. 10, 1976, Ser. No. 657,016

Int. Cl.^{2} A61K *31/395;* **C07D** *213/53*

U.S. Cl. 424—263 6 Claims

1. A compound of the formula:



in which R is lower alkyl; and X is hydrogen, lower alkyl, trifluoromethyl, halo, lower alkoxy, benzoyl, lower alkylthio, lower alkylsulfonyl, phenyloxy or phenylthio.

6. An anthelmintic composition comprising an anthelmintically effective but nontoxic quantity of a compound as claimed in claim 1, dispersed uniformly throughout an inert carier in amounts selected from the range of 1 to 300 mg./kg. per dosage unit.

4,002,762

2-AMINO-3,4-DIHYDROPYRIDINES USED TO EFFECT CORONARY VESSEL DILATION AND TREAT HYPERTENSION

Horst Meyer; Friedrich Bossert; Wulf Vater, all of Wuppertal, and Kurt Stoepel, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

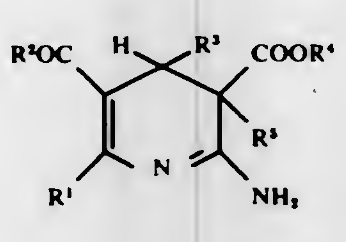
Division of Ser. No. 445,166, Feb. 25, 1974. This application Jan. 28, 1975, Ser. No. 544,934

Claims priority, application Germany, Mar. 3, 1973, 2310747

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 34 Claims

1. A pharmaceutical composition useful for effecting coronary vessel dilation in humans and other animals and for treating hypertension in humans and other animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



wherein

R^1 is hydrogen, straight or branched chain lower alkyl, or amino;

R^2 is straight or branched chain lower alkyl or OR′ wherein R′ is straight or branched chain lower alkyl, lower alkenyl, lower alkynyl or alkoxyalkyl of 2 to 4 carbon atoms;

R^3 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or unsubstituted or substituted phenyl or naphthyl which when substituted bears 1, 2 or 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, azido, cyano, phenyl, nitro, trifluoromethyl, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and SO_n-alkyl of 1 to 4 carbon atoms in the alkyl moiety wherein *n* is 0, 1 or 2;

$R^4$is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, or straight or branched chain alkynyl of 2 to 6 carbon atoms; and

R^5 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, straight or branched chain alkynyl of 2 to 6 carbon atoms, or benzyl,

in combination with a pharmaceutical acceptable nontoxic inert carrier.

4,002,763

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

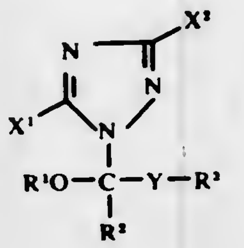
Division of Ser. No. 396,202, Sept. 11, 1973. This application Dec. 12, 1974, Ser. No. 532,191

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—269 18 Claims

9. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is alkyl of 1 to 6 carbon atoms;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 is alkyl of 1 to 6 carbon atoms; and

Y is CO;

in combination with a pharmaceutically acceptable, nontoxic, inert diluent or carrier.

4,002,764

DIAZEPINE DERIVATIVES IN THE TREATMENT OF TENSION, AGITATION AND EPILEPSY

Hans Allgeier, Haagen, Germany, and Andre Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

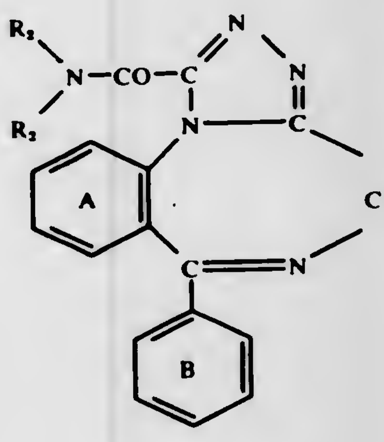
Division of Ser. No. 418,137, Nov. 21, 1973, Pat. No. 3,948,931. This application Nov. 24, 1975, Ser. No. 634,808

Claims priority, application Switzerland, Nov. 28, 1972, 17300/72

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—269 4 Claims

1. A pharmaceutical preparation useful in the treatment of states of tension, agitation and epilepsy which comprises a diazepine derivative of the general formula I



(I)

wherein R_1 represents hydrogen, R_2 and R_3 each independently represent hydrogen or alkyl having 1 to 6 carbon atoms, ring A is unsubstituted, or substituted in the 8-position by halogen up to atomic number 35, or trifluoromethyl or nitro, and ring B is unsubstituted, or substituted in one o-position by halogen up to atomic number 35, or by trifluoromethyl or a nitro group, or the 5-oxide or a pharmaceutically acceptable acid addition salt of a compound of the formula I, together with an inert pharmaceutical carrier.

4,002,765

2-(NITROMETHYLENE)-1,3-DIAZACYCLOALKANE INSECT CONTROL AGENTS

Charles H. Tieman; Willy D. Kollmeyer, and Steven A. Roman, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

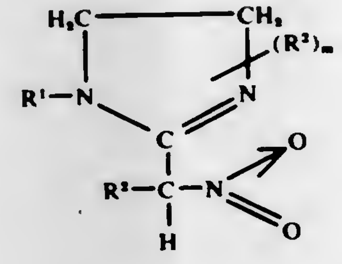
Division of Ser. No. 510,100, Sept. 27, 1974, Pat. No. 3,948,934, which is a continuation-in-part of Ser. No. 412,373, Nov. 1, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 630,068

Int. Cl.^{2} A01N *9/22*

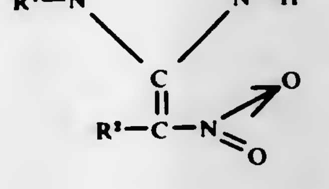
U.S. Cl. 424—273 7 Claims

1. An insecticidal composition comprising

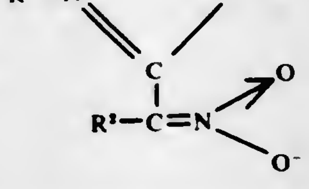
a. as active ingredient, an insecticidally effective amount of a compound of the group consisting of compounds of the formula:



derivatives thereof wherein the alpha hydrogen is replaced by middle halogen and resonance hybrids represented by the formulae:



and



wherein R^1 contains up to eight carbon atoms and is straight-chain alkyl, haloalkyl, alkenyl (middle halo)alkenyl or alkynyl; R^2 is hydrogen, middle halogen or phenylthio optionally substituted by one to two of middle halogen, nitro or alkyl or alkoxy of from 1 to 3 carbon atoms; R^3 is alkyl of 1 to 8 carbon atoms, and *m* is 0 or 1, with the proviso that in said resonance hybrids the R^3 substituent may only replace a hydrogen on a carbon atom in the ring, and (b) an adjuvant therefore.

4,002,766

ANTIARRHYTHMIA METHODS

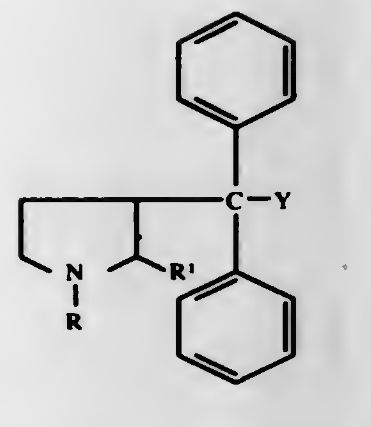
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 26, 1974, Ser. No. 536,708

Int. Cl.^{2} A61K *31/40*

U.S. Cl. 424—274 5 Claims

1. A method of controlling cardiac arrhythmias in a mammal suffering therewith which comprises administering to said mammal an antiarrhythmic effective amount of a compound of the formula:



wherein;

- R is a member selected from the group consisting of hydrogen, lower alkyl, lower cycloalkyl and phenyllower alkyl,
- R′ is a member selected from the group consisting of hydrogen and lower alkyl,
- Y is a member selected from the group consisting of carbamoyl, cyano and hydrogen, and

pharmaceutically acceptable acid addition salts thereof.

4,002,767
1-TERTIARY-ALKYL-3-(SUBSTITUTED CYCLOHEXENYL)UREAS AS ANTIHYPERTENSIVE AGENTS

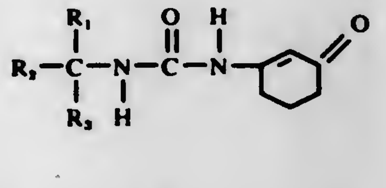
Paul E. Aldrich, Wilmington, Del.; Gilbert H. Berezin, West Chester, Pa., and Bruce I. Dittmar, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 525,445, Nov. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 461,697, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,308

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **15 Claims**

1. A compound of the formula



where

R_1, R_2, and R_3 = C_1–C_3 alkyl, C_2–C_3 alkenyl, or two of R_1, R_2, and R_3 may be joined to form a cycloalkyl or cycloalkenyl group; and its suitable pharmaceutical salts;

provided that the total number of carbon atoms of $R_1 + R_2 + R_3$ does not exceed 5.

4,002,768
PHENYLALKINYL ETHERS

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

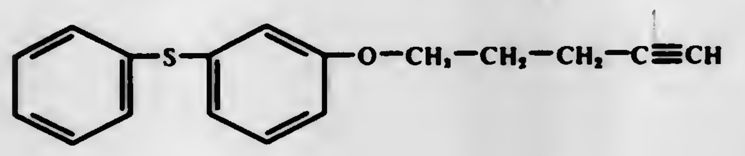
Filed June 27, 1975, Ser. No. 590,761

Claims priority, application Switzerland, July 3, 1974, 9133/74; June 4, 1975, 7215/75

Int. Cl.² C07C *149/32*

U.S. Cl. 424—337 **3 Claims**

1. The compound of the formula



3. A method for combatting insects and acarids which comprises applying thereto or to the locus thereof an insecticidally and acaricidally effective amount of a compound of the formula of claim 1.

4,002,769
INSECT MATURATION INHIBITORS

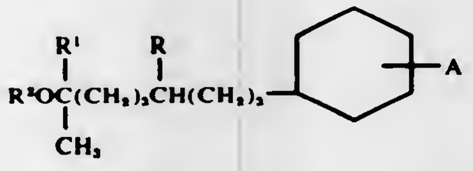
Meyer Schwarz, Kensington; Richard W. Miller, Bowie, both of Md., and James E. Wright, Bryan, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 498,165, Aug. 16, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 599,731

Int. Cl.² A01N *9/24;* **C07C** *43/00*

U.S. Cl. 424—339 **16 Claims**

1. A method of inhibiting the eclosion of fly pupae comprising adding to the natural growth media of said pupae from about 0.1 to about 10.0 ppm of a compound of the general formula:



in which A is alkyl having 1 to 5 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, or nitro; R and R^1 are independently methyl or ethyl; and, R^2 is alkyl having 1 to 4 carbon atoms.

4,002,770
MAKING BEVERAGE MIXES AND THE PRODUCT THEREOF

Bartley Norman Wankier, Ontario, Oreg., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 383,352, July 27, 1973, Pat. No. 3,908,024. This application June 30, 1975, Ser. No. 591,688

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² A23L *1/27*

U.S. Cl. 426—72 **10 Claims**

6. The process of preparing an acidified beverage mix contains primarily crystalline sucrose said mix intended to be viewed and having an enhanced coloration which comprises forming a dispersion of finely divided tricalcium phosphate in an aqueous solution of coloring solutes, drying the dispersion to a moisture content less than 0.5%, said dried dispersion being in the form of a frangible, easily broken matrix of coloring solutes having the tricalcium phosphate discretely distributed throughout, and then mixing from 0.05–5.0% by weight of the mix of the dried colored phosphate dispersion with sucrose particles to a free-flowing form of uniform coloration and causing the coloring solutes originally plated on the tricalcium phosphate to be transferred to and adhere on the surfaces of the sucrose particles by continued intermixing of the ingredients.

4,002,771
PROCESS FOR PREPARING A DRY, FLOWABLE SUGAR/FAT COMPONENT AND WHIPPABLE DESSERT COMPOSITION

Gary Arthur Henderson, Cobourg, and Clifford Arthur Allen Dunlop, Richmond, both of Canada, assignors to General Foods Limited, Toronto, Canada

Filed Feb. 6, 1974, Ser. No. 440,109

Int. Cl.² A23L *1/04;* **A23G** *3/00*

U.S. Cl. 426—103 **9 Claims**

1. A process for preparing a dry, flowable sugar/fat component comprising coating said sugar by applying said fat in a melted state onto said sugar whose temperature is maintained at a temperature less than about 25° F while applying the fat onto said sugar and blending the sugar/fat mixture.

4,002,772
METHOD OF INCREASING THE PERMEABILITY OF CELLULAR MATERIALS

Gerhard J. Haas, Woodcliff Lake, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 565,370, July 15, 1966, Pat. No. 3,535,126. This application June 22, 1970, Ser. No. 48,560

The portion of the term of this patent subsequent to Oct. 20, 1987, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² A23L *1/31;* **A23C** *3/00*

U.S. Cl. 426—281 **11 Claims**

1. A method of increasing the permeability of cellular food material, without substantially disrupting the cell structure, comprising the steps of:

- a. placing the cellular foodstuff in a pressure vessel,
- b. raising the pressure in the vessel to greater than about 50 p.s.i.g. with a gas selected from the group consisting of methane, carbon monoxide, nitrogen, dichlorodifluoromethane and air, the pressure being sufficient to permeate the cellular material with the gas.
- c. completely freezing said pressurized cellular material at about −20°C. to −25°C., and then
- d. releasing the pressure on the completely frozen cellular material.

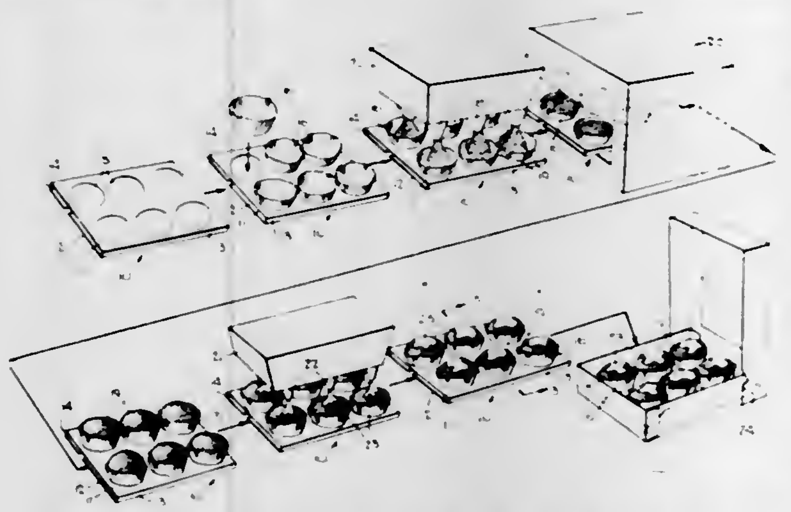
4,002,773
BAKING AND PACKAGING SYSTEM

Charles E. Entenmann, Bayshore, N.Y., assignor to Entenmann's Bakery, Inc., Bayshore, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,958

Int. Cl.² B65B *25/16*

U.S. Cl. 426—302 **5 Claims**



1. A method of cooking and packaging baked goods comprising the steps of:

- providing a shallow tray made primarily of heat resistant nonmetallic material, the tray having an upper level and a lower level spaced below the upper level, the upper level of the tray having a number of spaced openings, and the lower level extending in a plane beneath the openings;
- positioning paper baking liners in the openings in the tray so that the bottoms of the liners are supported by the lower level of the tray, and the sides of the liners are supported circumferentially by the edges of the corresponding openings in the upper level of the tray;
- pouring a predetermined amount of batter into each liner;
- transporting the tray of batter-filled liners to an oven for baking at predetermined temperature conditions for a predetermined time sufficient to fully cook the batter;
- removing the tray of baked goods in the liners from the oven; and
- enclosing the tray of baked goods within a protective delivery and display package, without removing or disturbing the liners in the tray, whereby the individual liners are continuously supported in predetermined spaced relation through the complete process of filling, cooking, and packaging the baked goods, and the cost of reusable metal baking pans is eliminated.

4,002,774
METHOD FOR REMOVING SEEDS FROM PAPAYAS

Harvey T. Chan, Jr., Honolulu, Hawaii, assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 605,983

Int. Cl.² A23P *1/00;* **A23N** *4/24*

U.S. Cl. 426—484 **4 Claims**

1. A method for removing the seeds from a papaya, which consists of

- a. cutting off the blossom end of the papaya to expose the blossom end of the seed cavity.
- b. cutting off the stem end of the papaya to expose the stem end of the seed cavity,
- c. applying a jet of fluid to the stem end of the seed cavity, the jet having sufficient force to create a pressure in the seed cavity effective to cause the seeds within the cavity to be blown out the blossom end of the seed cavity.

4,002,775
FATTY ACIDS AND DERIVATIVES AS ANTIMICROBIAL AGENTS

Jon J. Kabara, 2088 Riverwood, Okemos, Mich. 48864

Continuation-in-part of Ser. No. 377,187, July 9, 1973, abandoned. This application May 21, 1975, Ser. No. 579,687

Int. Cl.² A23L *3/34;* **A61K** *31/23, 31/22*

U.S. Cl. 426—532 **4 Claims**

1. A microbicidal of microbiostatic food-grade composition comprising a food subject to microbial spoilage and therefore in need of preservation and containing in an effective amount of up to 30% by weight of a primary food-grade microbicide consisting essentially of a 1 or 2 -mono-laurin polyol ester as the sole active microbicide in the composition.

4,002,776
IMAGING PROCESS EMPLOYING TONER PARTICLES CONTAINING ARYLSULPHONAMIDE FORMALDEHYDE ADDUCT

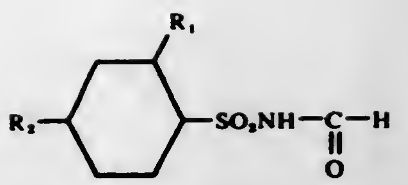
Robert A. Braun, and Robert Mermelstein, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 336,158, Feb. 26, 1973, Pat. No. 3,893,934. This application Jan. 21, 1975, Ser. No. 542,744

Int. Cl.² G03G *9/02*

U.S. Cl. 427—19 **10 Claims**

1. An electrostatographic imaging process comprising the steps of forming an electrostatic latent image on a surface and developing said electrostatic latent image by contacting said electrostatic latent image with an electrostatographic developer material comprising particles, said particles including finely-divided toner material having a particle size of up to about 30 microns, a melting point of at least about 110° F, a melt viscosity of less than about 2.5×10^{-4} poise at temperatures up to about 450° F, said toner material comprising a colorant selected from the group consisting of pigments, dyes, and mixtures thereof, a thermoplastic resin consisting essentially of a vinyl polymer having a melting point of at least about 110° F, and from about 5 percent to about 55 percent by weight, based on the weight of said vinyl polymer, of an arylsulfonamide formaldehyde adduct having a melting point between about 50° F and about 250° F and having the general structure



wherein R_1 and R_2 are either hydrogen or methyl provided that where R_1 or R_2 is methyl, the other is hydrogen, wherein said adduct reduces the melt viscosity of said toner material but does not reduce its glass transition temperature nor its blocking temperature, whereby at least a portion of said particles are attracted to and held on said surface in conformance to said electrostatic latent image.

4,002,777
METHOD OF DEPOSITING ELECTROSTATICALLY CHARGED LIQUID COATING MATERIAL

James W. Juvinall, Sylvania Township, Lucas County, and Erhard Kock, Toledo, both of Ohio, assignors to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 677,981, Oct. 25, 1967, abandoned, which is a continuation-in-part of Ser. No. 624,400, March 20, 1967, abandoned. This application Sept. 2, 1969, Ser. No. 849,526

Int. Cl.² B05D *1/06*

U.S. Cl. 427—27 **13 Claims**

1. In a method of depositing liquid coating material on an article in a system in which coating material particles are formed from a thin stream of a liquid body by mechanical force derived from a stream of atomizing air, and in which the liquid body is electrically charged, the improvement comprising the step of adjusting the resistivity of the coating material to be between 0.3 and 300 megohm-centimeters and charging the liquid body to such voltage that at least 95 percent of the current carried to the article is borne by the charged coating material particles and not more than 5 percent of the current is air-borne.

4,002,778
CHEMICAL PLATING PROCESS

Harold E. Bellis, and Donald E. Booker, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 388,648, Aug. 15, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,134

Int. Cl.² C23C *3/02*

U.S. Cl. 427—98 **20 Claims**

1. A process for plating nickel or cobalt by chemical reduction of a plating bath onto the surface of an electrically conducting material which is normally non-catalytic to the plating bath, said material selected from the group (measured by weight) consisting of

copper and copper-based alloys containing at least 50% copper,

iron-based alloys containing at least about 50% iron and 12% chromium,

an iron-based alloy containing about 29% nickel, 17% cobalt, and the balance essentially iron,

silver,

a sintered, fritted composition of oxide powders and at least one metal selected from the group consisting of gold, silver, platinum, and alloys containing at least 50% of one or more of such metals,

tin oxide compositions containing a small but effective amount of antimony oxide compositions to increase electrical conductivity, and

a composition consisting essentially of molybdenum, manganese and oxygen,

which process consists essentially of contacting the surface prior to said plating with a pretreating solution consisting essentially of water and a reducing agent selected from the group consisting of alkali metal borohydrides, alkali metal cyanoborohydrides, and amine boranes, said solution containing at least about 0.5 grams per liter of said reducing agent, and then contacting the surface with the plating bath to cause the chemical reduction of nickel or cobalt onto the surface, provided that when the reducing agent in the pretreating solution is an alkali metal borohydride, an alkali metal borohydride is also used as reducing agent in the plating bath.

4,002,779
PROCESS FOR THE MANUFACTURE OF ELECTROCONDUCTIVE NON-WOVEN FABRICS

Ehrenfried Nischwitz, Oberreifenberg, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 23, 1975, Ser. No. 580,162

Claims priority, application Germany, May 24, 1974, 2425196

Int. Cl.² B05D *5/12;* **C23C** *3/02*

U.S. Cl. 427—124 **3 Claims**

1. A process for the manufacture of electroconductive, non-woven fabrics which comprises the steps of (a) cleaning a non-woven fabric with a polar organic solvent, (b) sensitizing the fiber surfaces of the fabric with an aqueous hydrochloric acid solution of tin-II chloride, (c) rinsing the fabric with water, (d) activating the fiber surfaces with an aqueous hydrochloric acid solution of palladium chloride, (e) again rinsing the fabric with water, and (f) treating the sensitized and activated fiber surfaces of the non-woven fabric with a mixture of an aqueous tenside-free dispersion of an organic polymeric binder and a metastable aqueous metal salt solution to deposit said metal on said fiber surfaces.

4,002,780
METHOD AND DEVICE FOR COATING PLASTICS FILM

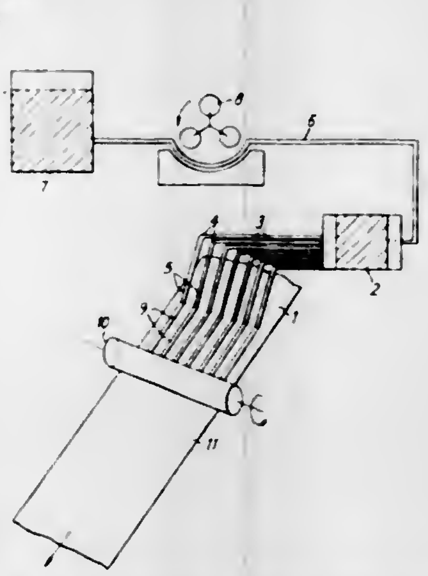
Grahame Melvin Reade, Wheathampstead, and Alan Charles Viney, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 235,718, March 17, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,544

Claims priority, application United Kingdom, Mar. 26, 1971, 7910/71

Int. Cl.² B05D *1/40*

U.S. Cl. 427—209 **10 Claims**



1. A method of coating tubular plastics film in lay-flat form comprising depositing on each side of the external surface of the tubular film a plurality of lines of a flowable material capable of forming a coating, passing each side of the external surface with the deposited material over a roller rotating contrary to the direction of travel of the film, and applying sufficient pressure between the roller and the said side of the film surface to spread and merge the material to cover the said side, and subsequently causing or allowing the resulting coating to form a solid coating.

4,002,781
PROCESS FOR MAKING CARRIER SHEETS CONTAINING HARDENABLE POLYESTER RESINS

Jurgen Fock, Essen-Bredeney, and Ulrich Holtschmidt, Essen, both of Germany, assignors to Th. Goldschmidt AG, Germany

Filed Dec. 28, 1971, Ser. No. 213,225

Claims priority, application Germany, Jan. 7, 1971, 2100376; Nov. 26, 1971, 2158679

Int. Cl.² B05D *3/10*

U.S. Cl. 427—340 **14 Claims**

1. A process for making carrier sheets containing hardenable polyester resins by treating the carrier sheets with solutions or emulsions of polyester resins, which comprises

a. impregnating the carrier sheet with an aqueous solution of a hardenable water-soluble polyester resin,

b. substantially drying the carrier sheet containing the aqueous solution of the hardenable polyester resin,

c. applying a polymerizable unsaturated compound as a cross-linking agent onto the resin-containing carrier sheet in a quantity sufficient for subsequent cross-linking,

d. coating the treated resin-containing carrier sheet with a solution or an aqueous dispersion of a water-insoluble hardenable polyester resin containing a cross-linking agent, and

e. substantially drying the resultant product of the process.

12. A process for making carrier sheets containing hardenable polyester resins by treating the carrier sheets with solutions or emulsions of polyester resins,

which comprises

a. impregnating the carrier sheet with an aqueous solution of a hardenable water-soluble polyester resin containing at least one unetherified melamine-formaldehyde precondensate in a weight ratio of 0.5 – 1.5 to 1.5 – 0.15,

b. substantially drying the carrier sheet containing the aqueous solution of the hardenable polyester resin,

c. coating the treated resin-containing carrier sheet with a solution or an aqueous dispersion of a water-insoluble hardenable polyester resin containing a cross-linking agent, and

d. substantially drying the resultant product of the process.

4,002,782
PROCESS FOR DEPOSITING PROTECTIVE REFRACTORY METAL COATINGS

Joshua B. Warner, Spartanburg, and James S. Wolf, Clemson, both of S.C., assignors to Warner-London, Greensboro, N.C.

Filed Nov. 1, 1974, Ser. No. 520,422

Int. Cl.² C23C *17/00*

U.S. Cl. 427—345 **30 Claims**

1. A process for depositing upon a relatively low wear resistant base metal a refractory metal comprising;

providing an electrolyte material capable of dissociation into ions, and having a conductance ratio of between 0.13 and 0.93 calculated at a 0.1 normal solution,

providing a particulate refractory metal to be deposited within the near-surface region of said base material, said refractory metal having a melting point of at least 1490° C,

admixing 99 to 50% by weight of said refractory metal and 1 to 50% by weight of said electrolyte for a sufficient time to form a nascent surface on at least a portion of each said refractory metal particles to be deposited and at least partially surrounding said refractory metal particles with said electrolyte,

maintaining a moisture content in said mixture sufficient to maintain a resistivity of said electrolyte of less than about 10^6 ohm-centimeters of said admixture, forming a refractory metal ion concentration of 1–20,000 mg. per liter of solution,

contacting and at least partially coating the surface of said base material with said refractory metal in particulate form and said electrolyte admixture,

reacting said admixture with said base material at temperatures between 0° C and 200° C, and

depositing said refractory metal within the near-surface region of said base material in the form of discrete particles, whereby to provide a protective surface for said base material.

4,002,783
PROCESS FOR THE PRODUCTION OF TEXTILE MATERIAL LENGTHS CONTAINING BONDING AGENTS

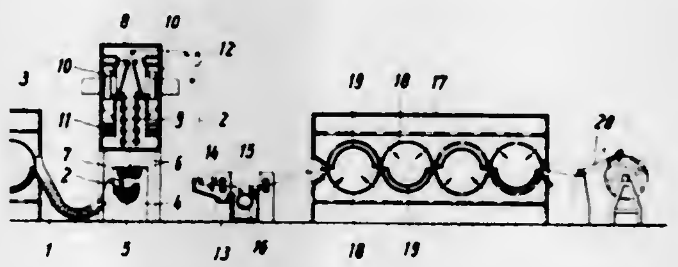
Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Continuation of Ser. No. 287,831, Sept. 11, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,949

Claims priority, application Germany, Feb. 6, 1970, 1905746

Int. Cl.² B05D *3/00, 3/04, 3/02*

U.S. Cl. 427—335 **11 Claims**



1. A process for the production of a textile material length containing latex bonding agents for the production of synthetic leather which comprises impregnating the textile material with a thermo-sensibilized latex bonding agent, heating said textile material impregnated with said bonding agent contact-free to a temperature at which the bonding agent coagulates, said latex bonding agent coagulating before drying of said impregnated textile material takes place, washing said textile material impregnated with said bonding agent to remove excess thermo-sensibilizing agent therefrom, subsequently mechanically removing a substantial portion of water from the textile material containing the coagulated latex bonding agent, and thereafter drying and curing the bonding agent within the textile material by drawing a heated gas through said textile material, the passage of said gas through said textile material also increasing the airpermeability of said impregnated textile material.

4,002,784
COATING METHOD FOR GRAPHITE

John G. Banker, Kingston, and Cressie E. Holcombe, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,245

Int. Cl.² B05D *7/22;* **B22C** *3/00*

U.S. Cl. 427—385 R **3 Claims**

1. A method of limiting adverse carbon contamination in metals from graphite ware used in melting said metals, comprising coating said graphite ware with a suspension comprising Y_2O_3 in a suspending solution consisting of water and an effective suspending amount of sodium carboxymethylcellulose.

4,002,785
ORGANIC COMPOUND

Marcel Grossmann, Reinach, and Richard Hochreuter, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

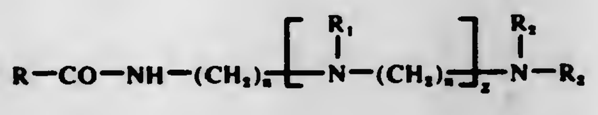
Continuation-in-part of Ser. No. 446,055, Feb. 26, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,929

Claims priority, application Switzerland, Feb. 27, 1973, 2812/73

Int. Cl.² B05D *3/02;* **B32B** *27/06*

U.S. Cl. 427—389 **16 Claims**

1. A method of producing a non-woven fabric which comprises impregnating a non-woven fibrous web with a migration inhibitor of the formula:

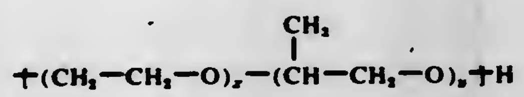


$$R-CO-NH-(CH_2)_n\left[-\overset{\overset{R_1}{|}}{N}-(CH_2)_n-\right]_z-\overset{\overset{R_2}{|}}{N}-R_3$$

wherein

R is alkyl (C_5–C_{21}), alkenyl (C_5–C_{21}) or alkyl (C_5–C_{21}) or alkenyl (C_5–C_{21}) substituted by hydroxy or containing an oxo group,

R_1, R_2 and R_3 are each, independently, hydrogen, alkyl (C_1–C_3) or a radical



$$+(CH_2-CH_2-O)_x-(\overset{\overset{CH_3}{|}}{C}H-CH_2-O)_y+H$$

wherein each of *x* and *y* are independently zero or an integer 1 to 60, the sum of each of the integers *x* and *y* in the molecular of the compound of formula I being an integer 1 to 60,

n is an integer 2 or 3 and

Z is zero or an integer 1 to 3, in free base, acid addition salt or quaternary ammonium salt form, and with an aqueous dispersion of a synthetic resin binder, and heating the impregnated web to cause coagulation of the binding agent and to effect drying.

4,002,786
METHOD FOR ELECTROLESS COPPER PLATING

Hyogo Hirohata, Neyagawa; Masahiro Oita, Kashiwara, and Katsuhiko Honjo, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 314,549, Dec. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,106, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 767,502, Oct. 14, 1968, abandoned. This application Apr. 18, 1975, Ser. No. 569,176

Claims priority, application Japan, Oct. 16, 1967, 42-67082; Oct. 27, 1967, 42-69769

Int. Cl.² C23C *3/02*

U.S. Cl. 427—430 A **6 Claims**

1. A method for electroless copper plating comprising providing an electroless copper plating bath which comprises

0.005 to 0.3 mole per liter of a water soluble copper salt,

0.005 to 0.6 mole per liter of ethylenediaminetetraacetate as a complexing agent for cupric ions,

0.02 to 3.0 mole per liter of formaldehyde,

0.05 to 1000 milligrams per liter of 2,2′-dipyridyl and an alkaline compound to maintain the pH of said aqueous solution to between 10.5 and 14 and immersing a material having catalytic action at the surface into said electroless copper plating bath composition maintained at a temperature of 70° to 90° C whereby a copper film having a high mechanical strength is deposited on said material.

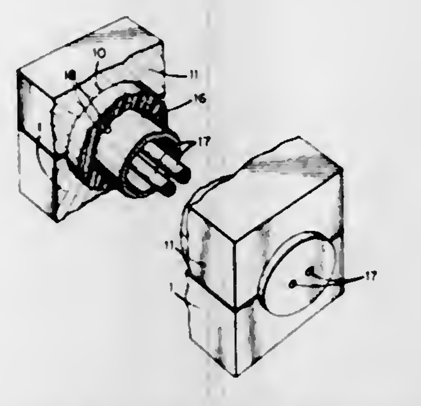
4,002,787
FOAMED POLYMERIC ARTICLE AND METHOD FOR MAKING THE SAME

Richard L. Bailly, Beechwood Circle, Boxford, Mass. 02132

Filed June 24, 1974, Ser. No. 482,340

Int. Cl.² B29C *27/02;* **B29D** *23/00, 27/00;* **B65D** *9/10*

U.S. Cl. 428—35 **12 Claims**



1. Article of manufacture of a desired shape comprising a sheet of foamed polymeric thermoplastic material having at least a pair of edges in abutting engagement, said article having a surface layer having a density greater than the density of the interior of said foamed material, said surface layer being fused at said pair of abutting edges to form a bond therebetween, said abutting edges being unbonded inwardly from said surface layer.

4,002,788
TWO-PHASE MATERIAL OF CONCRETE AND POLYMER AND ITS METHOD OF PREPARATION

James L. Lott, Champaign, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 193,495, Oct. 28, 1971. This application Oct. 7, 1975, Ser. No. 620,474

Int. Cl.² B32B *3/02*

U.S. Cl. 428—70 **4 Claims**

3. A two-phase material having thermal insulating and structural stress bearing capabilities comprising:

a. a foamed masonry material having opposed surfaces and a dispersed foam void volume of 50–65 per cent of the volume of said material;

b. a region adjacent each of said opposed surfaces including polymer impregnated interconnected foam voids; and

c. a core region of unimpregnated foam voids and masonry material between said regions adjacent each of said opposed surfaces.

4. A structure as recited in claim 3 including reinforcing means in the regions defined by the polymer impregnated interconnected foam voids.

4,002,789
ENDLESS REINFORCEMENT

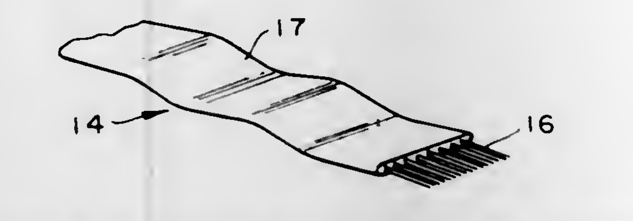
Norman E. Klein, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 10, 1974, Ser. No. 432,162

Int. Cl.² B32B *5/12;* **B60C** *9/12;* **B29H** *17/02*

U.S. Cl. 428—108 **6 Claims**

1. An endless reinforcement comprising at least one unitary strip positioned across the width of the reinforcement from one side to the other at an angle to the edges of the reinforcement in a zigzag pattern, said unitary strip including a multiplicity of continuous filaments surrounded and separated by rubber and disposed in contiguous transversely undulating relationship in the major plane of said strip and throughout said strip, said strip being between one-half inch and two inches in width with at least one-half an undulation per inch throughout the length of said strip.



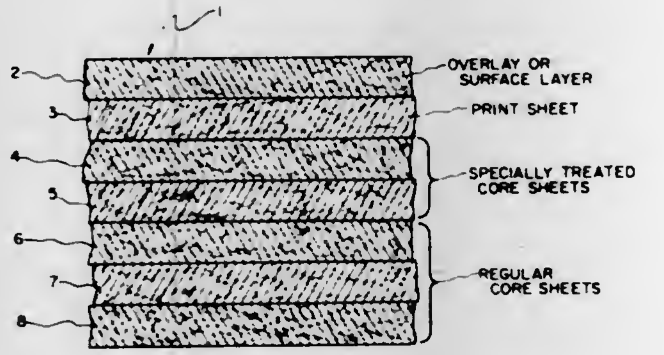
4,002,790
POSTFORMABLE LAMINATE

Carl E. Trewiler, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 294,682, Oct. 3, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,822

Int. Cl.² B32B *7/02;* **B29D** *9/06*

U.S. Cl. 428—212 **5 Claims**



1. A decorative plastic laminate, characterized by improved postformability render heat, comprising a plurality of paper core sheets, all of said core sheets being resin-impregnated, and an overlying print sheet, at least one of said core sheets next to the print sheet of said laminate, but not all of said core sheets, being specially resin-impregnated to a greater resin content than the other resin-impregnated core sheets to render the fibers in said specially resin-impregnated core sheets less yielding to postforming stresses relative to those of the other resin-impregnated core sheets to reduce failure of the surface of said laminate when said laminate is postformed.

5. The process of providing readily heat postformable decorative plastic laminates comprising a plurality of resin-impregnated paper core sheets all of which are resin-impregnated and a superimposed print sheet thereon which comprises resin-impregnating at least one of the core sheets next to the print sheet, but not all of said core sheets, to a greater resin content than the other resin-impregnated core sheets to render said specially resin-impregnated core sheet less yielding than the other core sheets when said laminate is postformed.

4,002,791
BELT COATED WITH POLYURETHANE COMPOSITION CONTAINING CELLULOSIC PARTICLES

John M. Sawyer, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 17, 1976, Ser. No. 658,433

Int. Cl.² B32B *5/16, 27/04, 27/40;* **B64F** *1/02*

U.S. Cl. 428—260 **3 Claims**

1. A woven fabric belt having a coating of polyurethane on each face and extending through interstices of the fabric, the polyurethane comprising the reaction product of a polypropylene ether glycol, 4,4′-methylene di(cyclohexylene isocyanate) cured with p,p′-methylene dianiline and at least one face of said belt contains said polyurethane having walnut shell powder incorporated therein.

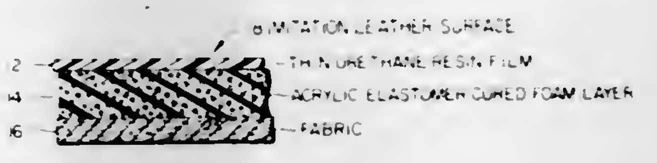
4,002,792
IMITATION LEATHER MATERIAL AND METHOD OF PREPARING SUCH MATERIAL

Richard E. Petersen, Concord, Mass., and Jitendra J. Modi, North Bergen, N.J., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Filed Dec. 11, 1974, Ser. No. 531,464

Int. Cl.² D06N *3/08;* **B32B** *3/26*

U.S. Cl. 428—310 **18 Claims**


8 IMITATION LEATHER SURFACE
2
14
16
THIN URETHANE RESIN FILM
ACRYLIC ELASTOMER CURED FOAM LAYER
FABRIC

1. A sheet laminate material suitable for use as a shoe-upper material, which laminate material comprises:

a. a thin, flexible, organic, polymer, top skin layer;

b. a flexible supporting fabric material; and

c. a foam layer intervening between and bonded to the top skin layer and the fabric layer, which foam layer comprises a resilient, flexible, substantially open-cell, polymeric foam layer having a thickness of from about 5 to about 30 mils, and which foam layer has been derived from a latex composition which consists essentially of

   i. a film-forming, organic, cross-linkable, carboxylated polymer,

   ii. a water-soluble, long-chain, free, acidcontaining, partially neutralized, acrylate polymer in a thickening amount of from about 2 to 10 phr,

   iii. a methylol cross-linking agent in an amount sufficient to cross-link the organic film-forming carboxylated polymer and the acidic acrylate polymer, and

   iv. the latex composition having an acidic pH and a foamable viscosity.

4,002,793
7-METHYL-2-BENZOFURAN CARBOXALDEHYDE

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantre, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,695, June 24, 1974, Pat. No. 3,917,871, which is a division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 6, 1975, Ser. No. 584,688

Int. Cl.² C07D *307/80*

U.S. Cl. 260—346.2 R **1 Claim**

1. The compound 7-methyl-benzofuran-2-aldehyde.

4,002,794
ADHESIVE MATERIAL AND ARTICLES INCORPORATING SAME

Andor Schwarcz, Niskayuna, N.Y., assignor to Nashua Corporation, Nashua, N.H.

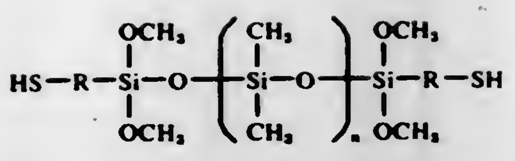
Filed July 18, 1975, Ser. No. 597,080

Int. Cl.² B32B *9/00*

U.S. Cl. 428—352 **15 Claims**

1. Release agent comprising the reaction product of a composition comprising in admixture:

a. a di (omega-organofunctional) dimethylsiloxane oligomer represented by the formula:



$$HS-R-\underset{OCH_3}{\overset{OCH_3}{Si}}-O-\left(\underset{CH_3}{\overset{CH_3}{Si}}-O\right)_n-\underset{OCH_3}{\overset{OCH_3}{Si}}-R-SH$$

wherein R is an olefin hydrocarbon radical having at least two carbon atoms and n is an integer from 5 to 100;

- b. a difunctional organic compound capable of reacting with the active hydrogen of the terminal groups of the dimethylsiloxane oligomer selected from the group consisting of aromatic and aliphatic diisocyanates and diisocyanate prepolymers resulting from the reaction of a difunctional organic compound containing active hydrogen groups with a large excess of diisocyanate; and
- c. when said difunctional organic compound is selected from the group of aromatic and aliphatic diisocyanates, a second difunctional organic compound containing active hydrogen groups.

4,002,795

CRIMPED YARNS AND METHOD FOR MAKING THEM

Gerard Barbe, St Didier au Mont d'Or; Robert Habault, Lyon, and Jean-Louis Tamet, Besancon, all of France, assignors to Rhone-Poulenc-Textile, France

Continuation of Ser. No. 454,285, March 25, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,978

Claims priority, application France, Mar. 26, 1974, 74.11046

Int. Cl.^{2} D02G *3/00, 3/02*

U.S. Cl. 428—370 **3 Claims**

1. A crimped yarn having a substantially cylindrical appearance and comprising bi-component organic polymer filaments, each filament possessing an elongated cross-section, the position of the interface between the components in the cross-section varying from one filament to the other but remaining substantially the same throughout the length of the filament, whereby the yarn is formed from at least two filament types, one of said filament types having an interface which is substantially disposed along or parallel to the smaller axis and another of said filament types having an interface which is disposed along or parallel to the larger axis of the cross-section of the filament.

4,002,796

CONDITIONING OF POLYOLEFINIC FIBERS FOR USE IN THE MANUFACTURE OF SYNTHETIC PAPER

Luciano Baldi, Turin, and Emilio Martini, Bologna, both of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Jan. 10, 1975, Ser. No. 540,164

Claims priority, application Italy, Jan. 11, 1974, 19329/74

Int. Cl.^{2} D06M *15/08*

U.S. Cl. 428—375 **7 Claims**

1. In the process of rendering polyolefin fibers having a surface area greater than 1 m^2/g dispersible in water which comprises treating said polyolefin fibers with an aqueous solution of a hydrophilic polymer, the improvement characterized in that the hydrophilic polymer is a condensation product of polyvinyl alcohol with an aliphatic aldehyde having from 1 to 6 carbon atoms which condensation product contains, in the macromolecule, from 2 to 8 aldehyde residues per 100 vinyl monomeric units.

4,002,797

LUBRICANT FOR WIRES WITH ENAMELED OR LACQUERED INSULATION

Heinz Hacker, Nurnberg, and Ernst Helwig, Bad Neustadt, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1975, Ser. No. 553,125

Claims priority, application Germany, Mar. 1, 1974, 2409979; Jan. 31, 1975, 2504044

Int. Cl.^{2} D02G *3/00;* **B32B** *15/00*

U.S. Cl. 428—378 **9 Claims**

1. A lacquered wire having a lubricant film thereon; said lubricant having an ointment or soap-like consistency at room temperature and having a melting point between about 35° and 65° C comprising a compound of the formula A-C-B wherein A is a chemical grouping, having at least one ethylenically unsaturated group or having at least one reactive hydrogen atom which permit chemical incorporation into a polymerizable impregnating resin system; B is a saturated or unsaturated aliphatic hydrocarbon radical having from 8–24 carbons, and C is a binding member in the form of a divalent radical containing an element selected from the group consisting of carbon, nitrogen, oxygen and sulfur.

4,002,798

CURABLE POLYENE-POLYTHIOL COMPOSITIONS

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

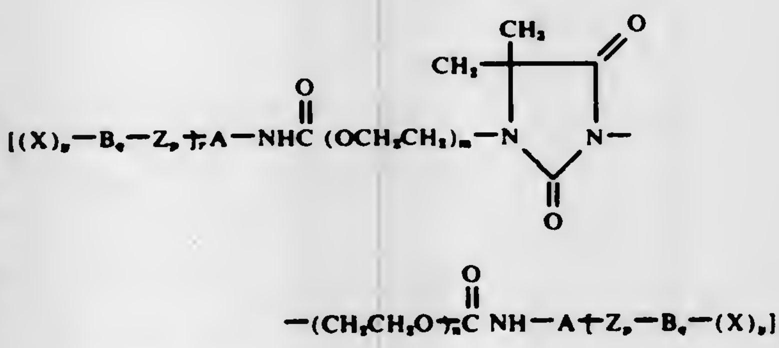
Division of Ser. No. 461,207, April 15, 1974, Pat. No. 3,945,982. This application Sept. 18, 1975, Ser. No. 614,575

Int. Cl.^{2} B32B *27/06;* **B05D** *3/06*

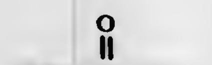
U.S. Cl. 428—419 **2 Claims**

1. An article comprising two substrates having therebetween a curable composition which on curing becomes a solid crosslinked polythioether adhesive comprising

1. A polyene of the formula:



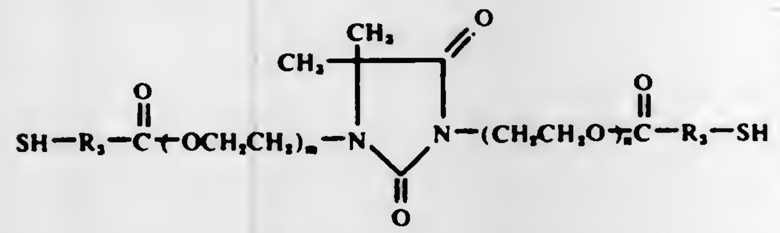
wherein A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be connected by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chemically compatible linkage selected from the group consisting of



$$-NH-\overset{O}{\overset{\|}{C}}-O-.$$

—O— and —S—; X is a member selected from the group consisting of (a) $-(CH_2)_d-CR'=CHR$, (b) $-O-(CH_2)_d-CR'=CHR$, (c) $-S-(CH_2)_d-CR'=CHR$, (d) $-(CH_2)_d-C \quad CR$, (e) $-O-(CH_2)_d-C \quad CR$, (f) $-S-(CH_2)_d-C \quad CR$; and mixtures thereof; where R and R' each are independently selected from the group consisting of hydrogen and methyl radicals; *d*, *p* and *q* are each integers from 0 to 1; *m* and *n* are each integers of at least 1; with $m + n$ from 2 to 22 and *r* at least 1, and *y* from 1 to 10; and

2. A polythiol of the formula:



wherein *m* and *n* are each at least 1 and $m + n$ is 2 to 22 and R_2 is a polyvalent organic radical member free of reactive carbon-to-carbon unsaturation and is selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (a) the reactive carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4.

4,002,799

GLASS SEALED PRODUCTS

Maurice E. Dumesnil, Palo Alto, and Ulrich Schreier, San Mateo, both of Calif., assignors to Technology Glass Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 418,247, Nov. 23, 1973, Pat. No. 3,963,505. This application Feb. 17, 1976, Ser. No. 658,660

Int. Cl.^{2} B32B *17/06;* **C03C** *27/00, 3/14, 3/10*

U.S. Cl. 428—428 **7 Claims**

4. A glass, metal or ceramic body having its surface covered by a hermetic sealing coat formed by covering its surface with a mixture comprised of a finely divided solder glass selected from the group consisting of lead-boron glasses and zinc-lead-boron glasses in which the zinc oxide:lead oxide mol ratio is below 1:2 and a finely divided oxygen containing zinc material selected from the group consisting of zinc silicate, zinc zirconium silicate, zinc oxide, zinc aluminate, zinc zirconate, zinc stannate, zinc zirconium aluminum silicate and mixtures thereof, the zinc material being present in an amount in the range 3 to 30% by weight of the total mixture, heating the thus covered body to a temperature at which the covering mixture softens and wets the body surface, holding the body at such temperature for several minutes and then cooling it to ambient temperature.

4,002,800

IMPREGNATION OF MASONRY HAVING A NEUTRALLY OR ACIDLY REACTION SURFACE

Heinz Nestler, Niederkassel-Ranzel; Jürgen Amort, Troisdorf, and Leo Hans Plankl, Recklinghausen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 418,627, Nov. 23, 1973, Pat. No. 3,879,206. This application Apr. 5, 1974, Ser. No. 458,488

Claims priority, application Germany, Dec. 1, 1972, 2258901

Int. Cl.^{2} B32B *9/04*

U.S. Cl. 428—447 **14 Claims**

1. In a process of contacting masonry with an alcoholic or hydrocarbonaceous solution of an alkyltrialkoxysilane or a partial condensation product thereof, the improvement which comprises including in said solution as an additive a composition selected from the group consisting of an organofunctional silane having a basic organo group and an alcoholate of silicon, a metal of the First Main Group of the Periodic System, a metal of the Second Main Group of the Periodic System, a metal of the Fourth Sub-Group of the Periodic System or a metal of the Fifth Sub-Group of the Periodic System.

4,002,801

HEAT SEALABLE ARTICLES TREATED WITH VINYL HALIDE POLYMER LATICES

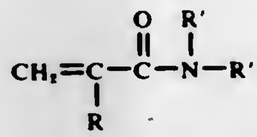
Donald P. Knechtges, Grafton, and Bela K. Mikofalvy, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 341,996, March 16, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,133

Int. Cl.^{2} B32B *27/06, 27/34*

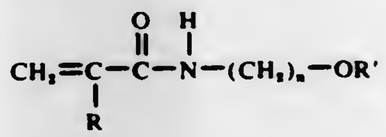
U.S. Cl. 428—474 **8 Claims**

1. A heat-sealable article comprising a substrate coated or impregnated with an overpolymer latex containing (1) from about 10% to about 90% by weight of the overpolymer latex of a core polymer of polyvinyl chloride, and (2) from about 90% to about 10% by weight of the overpolymer latex of a shell on said core polymer, said shell being overpolymerized on said core polymer and containing, in polymerized form, one or more polymerizable monomers selected from the group consisting of (a) α,β-olefinically unsaturated carboxylic acids containing from 2 to 12 carbon atoms; (b) amides having the formula



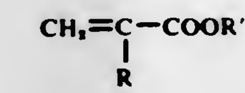
$$CH_2=\underset{R}{C}-\overset{O}{\overset{\|}{C}}-\overset{R'}{N}-R''$$

wherein R is hydrogen or an alkyl group containing from 1 to 4 carbon atoms and R' and R'' are hydrogen or an alkyl group containing from 1 to 8 carbon atoms; (c) N-alkylol and N-alkoxyalkyl amides having the formula



$$CH_2=\underset{R}{C}-\overset{O}{\overset{\|}{C}}-\overset{H}{N}-(CH_2)_n-OR'$$

wherein R is hydrogen or an alkyl group containing from 1 to 4 carbon atoms, R' is hydrogen or a hydrocarbon radical containing from 1 to 12 carbon atoms, and n is an integer from 1 to 4; and (d) esters of acrylic acid and methacrylic acid having the formula



$$CH_2=\underset{R}{C}-COOR'$$

wherein R is hydrogen or a methyl group and R' is an alkyl radical containing from 1 to 12 carbon atoms and wherein said shell contains at least one monomer selected from (c), said heat-sealable article being curable at temperatures substantially below 300° F. without the use of curing agents and being substantially free of discoloration.

4,002,802

PHOTOGRAPHIC SUBBING COMPOSITION HAVING IMPROVED ANCHORAGE

John H. Bayless, Kendall Park, and Harold Carl Arvidson, Princeton Junction, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,729

Int. Cl.^{2} B05D *3/00;* **B32B** *27/08, 27/30, 27/36*

U.S. Cl. 428—483 **10 Claims**

1. A process of coating a dimensionally stable, hydrophobic, biaxially oriented thermoplastic resin film with an aqueous

emulsion of a polymer containing from 35 to 96 weight percent vinylidene chloride, from 3.5 to 64.5 weight percent of an alkyl acrylate wherein the alkyl group contains from 1 to 10 carbon atoms, an alkyl methacrylate wherein the alkyl group contains from 1 to 10 carbon atoms, acrylonitrile, methacrylonitrile, vinyl chloride, or combinations thereof and from 0.5 to 25 weight percent of a carboxylic acid containing from 3 to 10 carbon atoms and having one carbon - carbon ethylenically unsaturated double bond wherein said dispersion has an initial pH of from about 2 to about 5 and which process comprises treating said dispersion with an anionic exchange resin sufficiently to raise the pH of the dispersion to above about 7.5, applying the thus treated dispersion to the film and drying the coated dispersion.

4,002,803

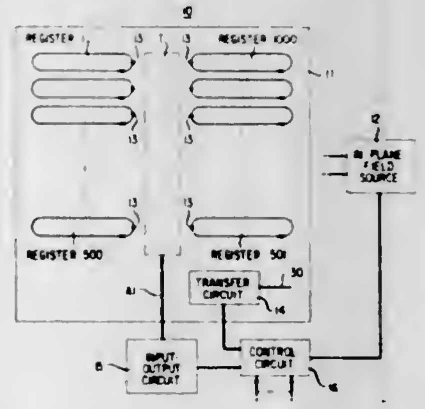
MAGNETIC BUBBLE DEVICES WITH CONTROLLED TEMPERATURE CHARACTERISTICS

Stuart Lawrence Blank, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,379

Int. Cl.^{2} G11C *11/14*; G11B *5/00*

U.S. Cl. 428—539 **8 Claims**



1. A magnetic bubble device comprising
- a. a substrate supporting at least a first layer of an iron containing garnet possessing an uniaxial magnetic anisotropy perpendicular to the layer, which layer is capable of supporting magnetic bubbles which are stable and of a characteristic diameter in a temperature varying bias field over a temperature range, which anisotropy is predominantly a growth induced anisotropy produced by dodecahedral site substitution, which bias field is produced by a magnet adapted for maintaining the layer in the bias field throughout the temperature range, which bias field is less than a bubble collapse field at each temperature within the temperature range, and which bias field varies throughout the temperature range at an average rate, Δ;
- b. generating means for generating the bubbles; and
- c. propagating means for moving the bubbles in order to produce information processing characterized in that the iron garnet contains at least one member of the group consisting Lu, Yb, or Tm in octahedral sites, in a total relative molar concentration of from 0.01 to 0.2 per formula unit, such that the bubble collapse field of the garnet varies with temperature throughout the temperature range at an average rate of approximately Δ.

4,002,804

MAGNETIC RECORDING MATERIAL

Goro Akashi; Masaaki Fujiyama; Nobutaka Yamaguchi; Satoru Takayama, and Koji Sasazawa, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed July 31, 1975, Ser. No. 600,689

Claims priority, application Japan, July 31, 1974, 49-88416

Int. Cl.^{2} B23B *15/00*

U.S. Cl. 428—539 **13 Claims**

1. A magnetic recording material which comprises a support having thereon a magnetic recording layer consisting essentially of a ferromagnetic material and a binder, wherein the ferromagnetic material is a mixture of (1) a Berthollide iron oxide having a particle size of about 0.5 μ or larger and a degree of oxidation represented by the value of x in FeO_x of $1.33 < x \leqq 1.45$ and (2) a Berthollide iron oxide having a particle size of about 0.4 μ or smaller and a degree of oxidation represented by the value of x in FeO_x of $1.43 \leqq x < 1.50$, where the weight ratio of Berthollide iron oxide (1) to Berthollide iron oxide (2) ranges from about 1:4 to 4:1.

4,002,805

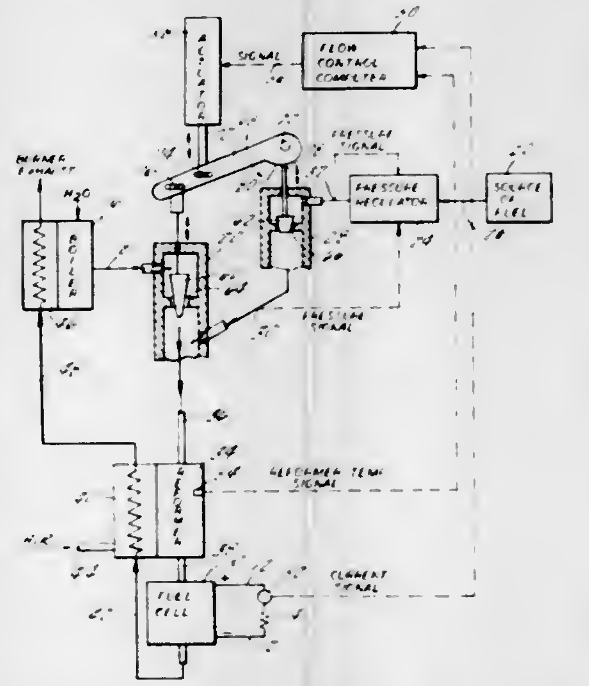
METHOD AND APPARATUS FOR CONTROLLING THE FUEL FLOW TO A STEAM REFORMER IN A FUEL CELL SYSTEM

Elliot I. Waldman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1975, Ser. No. 633,992

Int. Cl.^{2} H01M *8/06*

U.S. Cl. 429—17 **8 Claims**



1. In the method of regulating the feed flow of steam and fuel to reforming apparatus in a fuel cell system including a variable area ejector having a metering orifice as a part thereof, fuel supply means in communication with said ejector for supplying a gaseous fuel to said ejector, said fuel supply means including a fuel flow control valve, said valve having a metering orifice as a part thereof, said fuel reforming apparatus being downstream of said ejector, said apparatus including a steam reformer, and a fuel cell downstream of said apparatus for receiving reformed fuel from said apparatus, the steps of:
- introducing steam into the ejector as the primary flow thereof including controlling the rate of steam flow into said ejector by varying the area of said metering orifice of said ejector;
- introducing a gaseous fuel into said ejector as the secondary flow thereof for mixing with the steam therein including controlling the rate of fuel flow into the ejector by (1) passing said fuel through said valve, (2) maintaining a constant pressure drop across said valve, and (3) varying, in response to the fuel requirements of said fuel cell, the area of said metering orifice of said valve simultaneously with the step of varying the area of said metering orifice of said ejector and in a manner which provides the desired ratio of fuel to steam for all steam flow rates; and
- conveying the mixture of fuel and steam from said ejector into the fuel reforming apparatus.

4,002,806

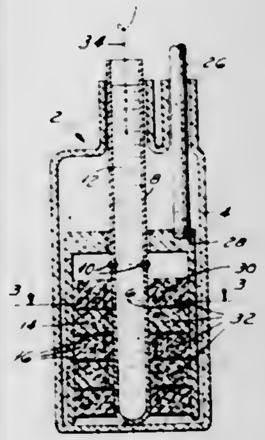
SECONDARY BATTERY OR CELL

Nirmal K. Gupta, Plymouth, and Frank A. Ludwig, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1975, Ser. No. 605,943

Int. Cl.^{2} H01M *43/00*

U.S. Cl. 429—104 **13 Claims**



1. In a secondary battery or cell comprising:
- A. one or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;
- B. one or more cathodic reaction zones containing (i) a cathodic reactant which, when the battery or cell is at least partially discharged, is selected from the group consisting of (a) single phase composition comprising a molten polysulfide salt of said anodic reactant and (b) a two phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (ii) an electrode of porous conductive material which is at least partially immersed in said cathodic reactant, and
- C. a cation - permeable baarrier to mass liquid transfer interposed between and in contact with said anodic and cathodic and cathodic reaction zones, said porous conductive material being in electrical contact with both said cation -permeable barrier and an external circuit,

wherein the improvment comprises increasing the charge/discharge capacity of said battery or cell by including in said cathodic reactant between about 0.001 and about 10 weight percent based on the total weight of the cathodic reactant of and additive selected from the group consisting of:
- i. metals selected from the group consisting of
  - a. metals from Groups I, II and III of the Periodic Table of Elements, (b) Transition Series Metals, and (c) antimony, lead, tin and bismuth;
- ii. alloys comprising metals of (i);
- iii. salts of metals of (i);
- iv. oxides of metals of (i);
- v. phosphides, arsenides, antimonides, carbides and nitrides of the metals of (i); and
- vi. mixtures of (i) through (v).

4,002,807

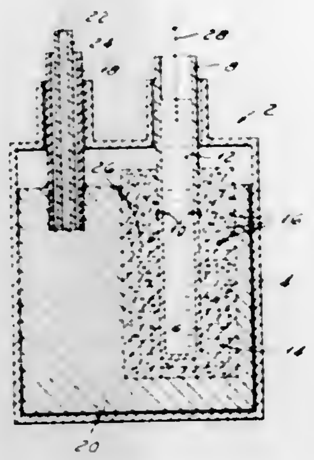
ALKALI METAL, SULFUR BATTERY OR CELL WITH SINGLE PHASE SULFUR ELECTRODE

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 30, 1975, Ser. No. 618,171

Int. Cl.^{2} H01M *43/00*

U.S. Cl. 429—104 **7 Claims**



1. In a secondary battery or cell comprising:
- A. One or more anodic reaction zones containing a molten sodium reactant-anode in electrical contact with an external circuit;
- B. one or more cathodic reaction zones containing (i) a cathodic reactant which, when the battery or cell is at least partially discharged, is selected from the group consisting of (a) a molten sodium polysulfide salt and (b) a composition comprising molten sulfur and molten sulfur saturated sodium polysulfide salts and (ii) an electrode of porous conductive material which is at least partially immersed in said cathode reactant, and
- C. a solid electrolyte which is a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said porous conductive material being in electrical contact with both said cation-permeable barrier and an external circuit,

wherein the improvement comprises increasing the charge/-discharge capacity of said battery or cell by dissolving in said cathodic reactant an additive selected from the group consisting of: (1) arsenic and phosphorus; (2) polysulfide salts of arsenic and phosphorus; and (3) mixtures of (1) and (2), said additive being dissolved in such an amount that said cathodic reactant contains between about 5 and about 25 atom percent of arsenic and/or phosphorus based on the total atoms of said additive element or elements and sulfur in said reactant.

4,002,808

ELECTROCHEMICAL CELL

Jean Fafa, Paris, France, assignor to Compagnie Industrielle des Piles Electriques "Cipel", Levallois Perret, France

Filed Feb. 18, 1975, Ser. No. 550,748

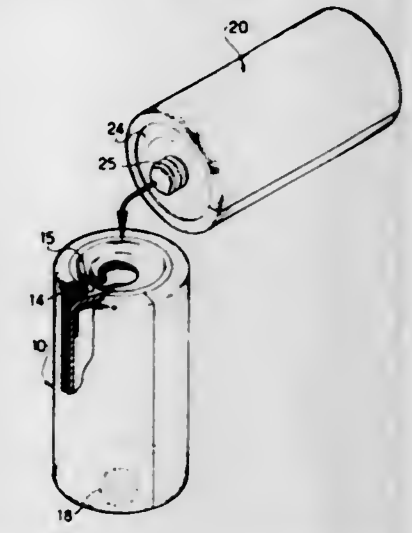
Claims priority, application France, Feb. 26, 1974, 74.06468

Int. Cl.^{2} H01M *6/42*

U.S. Cl. 429—157 **15 Claims**

1. Electrochemical cell comprising a casing having two opposite ends, a metal electrode cup constituting one of the electrodes of said cell and having a closed bottom located inwardly of an end of said casing, a terminal of first polarity for another electrode of said cell projecting ouwardly from the other end of said casing and a second terminal of opposite polarity comprising socket means fixed to the closed end of said electrode cup externally thereof, and thus being isolated from the interior of said electrode cup, said socket means comprising a deformable disc including a portion that will receive and cooperatively engages with the pin-like member of another cell like said cell so and to connect said two cells electrically and also fix them to each other, said second terminal having a substantially plane surface constituting a portion of the first-named end of said casing of said cell with no part

of said disc protruding outwardly from said plane surface until said disc is tightly engaged and deformed outwardly by the pin



member of another cell, whereby said cell maybe stood on said plane surface at said first named end prior to being connected to said another cell.

4,002,809
METHOD OF MANUFACTURING ACRYLIC FIBERS

Ko Kozuka, Takasago; Shunichiro Kurioka, Kobe; Taizo Yasumoto; Shigeru Kobayashi, both of Akashi; Atsuo Kubota, Takasago, and Nobumasa Otoshi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 169,474, Aug. 5, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 348,917

Claims priority, application Japan, Dec. 2, 1970, 45-107307; Dec. 7, 1970, 45-107602; Dec. 7, 1970, 45-107603

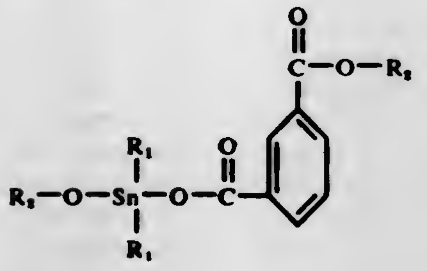
Int. Cl.² C08K *5/00*; **D01F** *6/18*

U.S. Cl. 526—4 **6 Claims**

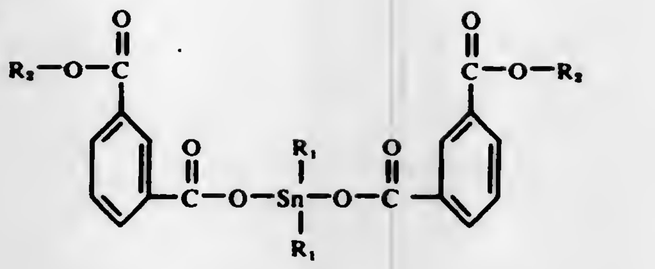
1. Method of manufacturing acrylic fibers comprising the steps of

A. dissolving in an organic solvent one of the following resins
  1. a copolymer consisting essentially of
    a. 30 to 80 weight percent acrylonitrile, and
    b. 70 to 20 weight percent vinyl chloride or vinylidene chloride, or
  2. a tripolymer consisting essentially of
    a. 30 to 80 weight percent acrylonitrile,
    b. 70 to 20 weight percent vinyl chloride or vinylidene chloride, and
    c. 3 weight percent or less ethylenically unsaturated monomer having a hydrophilic group;
  3. adding one or more compounds from the group consisting of
  1. a tin compound represented by the following formulas (I) or (II)

(I)



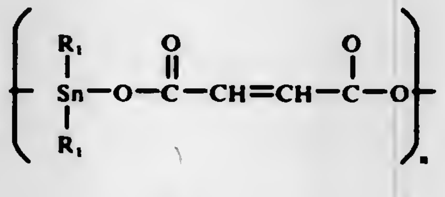
(II)



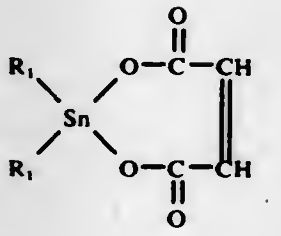
(wherein R_1 represents alkyl group having 2 to 8 carbon atoms and R_2 represents alkyl group having 1 to 12 carbon atoms), and

2. a tin compound represented by the following formulas: (III), (IV) or (V)

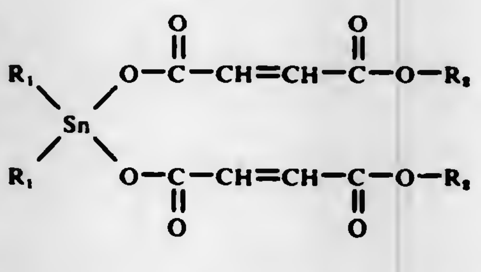
(III)



(IV)



(V)



(Wherein R_1 represents alkyl group having 2 to 8 carbon atoms and R_2 represents alkyl group having 1 to 12 carbon atoms, and *n* denotes a positive integer); and

C. spinning the resulting spinning solution in first and second baths comprising one or more solvents in concentrations of less than 60 weight percent and 61 to 85 weight percent, respectively.

4,002,810
PROCESS FOR INSERTION OF HEXAFLUOROPROPENE AT THE ALIPHATIC CARBON-HYDROGEN BOND OF A POLYOLEFIN

Robert Neville Haszeldine, Disley, and Ronald Rowland, Warrington, both of England, assignors to Pennwalt Corporation, Philadelphia, Pa.

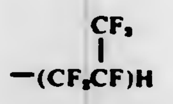
Division of Ser. No. 321,161, Jan. 5, 1973, Pat. No. 3,917,725. This application Jan. 2, 1975, Ser. No. 537,977

Claims priority, application United Kingdom, Jan. 14, 1972, 1988/72

Int. Cl.² C08F *8/18*

U.S. Cl. 526—22 **8 Claims**

1. A polymer product comprising a fluorinated, substantially non cross-linked polyolefin selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene and ethylene-propylene copolymers, said polyolefin having from about 0.1 to about 60%, based on the weight of said polymer product, of pendant groups having the following formula:



$$-(CF_2\overset{\overset{\displaystyle CF_3}{|}}{C}F)H$$

4,002,811
PRODUCTION OF UNIFORM COPOLYMER OF ACRYLONITRILE AND AROMATIC OLEFINES

Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1974, Ser. No. 532,687

Claims priority, application United Kingdom, Dec. 20, 1973, 59054/73

Int. Cl.² C08F *2/20, 212/10*

U.S. Cl. 526—59 **5 Claims**

1. A suspension polymerization process for the batchwise production of a uniform copolymer of acrylonitrile and at least one conjugated aromatic olefine having a faster reaction rate selected from the group consisting of styrene, α-methyl styrene and mixtures thereof containing 50 to 95% molar of acrylonitrile units which method comprises polymerising the monomers in aqueous suspension and feeding a portion of at least the faster reacting aromatic olefine to the reaction mixture so as to produce said uniform copolymer wherein polyvinyl pyrrolidone having a Fikentscher K value of at least 60 is employed as suspension agent.

4,002,812
PRODUCTION OF UNIFORM COPOLYMER OF ACRYLONITRILE AND AROMATIC OLEFINES

Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1974, Ser. No. 532,688

Claims priority, application United Kingdom, Dec. 20, 1973, 59053/73

Int. Cl.² C08F *2/20, 212/10*

U.S. Cl. 526—59 **4 Claims**

1. A suspension polymerization process for the batchwise production of a uniform copolymer of acrylonitrile and at least one conjugated aromatic olefine having a faster reaction rate selected from the group consisting of styrene and α-methyl styrene, said copolymer containing 50 to 95% molar of acrylonitrile units, which method comprises polymerising the monomers in aqueous suspension and feeding a portion of at least the faster-reacting aromatic olefine to the reaction mixture so as to produce said uniform copolymer wherein the suspension agent employed is hydroxyethyl cellulose which has M.S. of 1.5 to 3.5, D.S. of 1.0 to 3.0, and Brookfield viscosity (measured on a 1% by weight aqueous solution at 25° C) of 500 to 5000 cps and wherein M.S. is the average number of moles of ethylene oxide incorporated into each anhydroglucose unit and D.S. is the average number of groups per anhydroglucose unit which are substituted.

4,002,813
INJECTION OF CATALYSTS INTO A POLYMERIZATION AUTOCLAVE

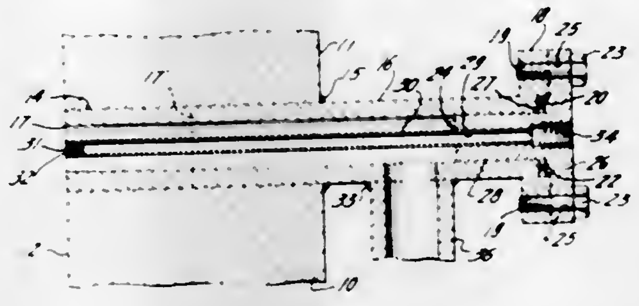
Robert Bruce Steinert, Staten Island, N.Y., and William Arthur Schuessler, Rivervale, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 16, 1974, Ser. No. 497,977

Int. Cl.² C08F *2/00, 10/02*

U.S. Cl. 526—61 **7 Claims**

1. In a continuous process for conducting polymerization reactions under high pressure with the aid of a free-radical generating catalyst in an enclosed reaction space, the improvement which comprises releasing a highly pressurized fine liquid jet of catalyst internally into a separate compressed stream of monomer just as said stream of monomer discharges into said enclosed reaction space from its entry port through the enclosure wall surrounding said reaction space.



4,002,814
POLYMERIZATION PROCESS

Eric Jones; John Christopher Padget, and Geoffrey Alan Cole, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 11, 1975, Ser. No. 557,378

Claims priority, application United Kingdom, Mar. 11, 1974, 10686/74

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—154 **11 Claims**

1. A process for the copolymerization of ethylene with one or more other mono α-olefins in which the monomers are contacted with an initiator composition which is the product of reacting an organo-metallic compound of general formula R_mMX_p with finely divided alumina which is free from adsorbed water, where M is a metal of Group IVA, R is a hydrocarbyl group, and X, when present, is a singly charged anionic ligand or a monodentate neutral ligand and *m* and *p* are integers, *m* having a value from 2 to 4 and *n* having a value from 0 to 2 the sum of *m* and *p* being not more than 4, is characterised in that the said organo-metallic compound has a purity ratio of at least 500/1, wherein said organometallic is prepared by reaction of a Group IV A metal halide with a Group I-III metal hydrocarbyl compound; wherein said purity ratio is defined as the molar ratio of the Group IV A metal to Group I to III metal in the Group IVA organometallic.

4,002,815
CYCLOPENTENE-DICYCLOPENTADIENE COPOLYMERS AND METHOD OF MAKING SAME

Robert J. Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 412,956, Nov. 5, 1973, which is a continuation-in-part of Ser. No. 337,392, March 2, 1973, Pat. No. 3,853,830. This application Apr. 3, 1975, Ser. No. 564,774

Int. Cl.² C08F *210/00, 212/00*

U.S. Cl. 526—283 **4 Claims**

1. A copolymer comprising cyclopentene, dicyclopentadiene and from about 0.01 to about 0.3 mole of at least one nonconjugated acyclic olefin polymerized therewith per mole of total cyclopentene and dicyclopentadiene monomer, said nonconjugated acyclic olefin having at least one hydrogen on each double-bonded carbon atom and 2 to 12 carbon atoms, and said dicyclopentadiene being present in an amount from about 55% to about 98% by weight of the total weight of copolymer.

4,002,816

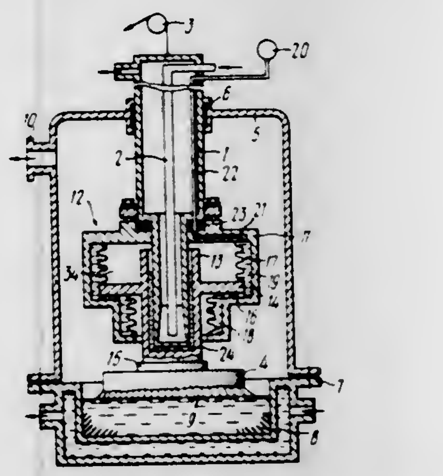
DEVICE FOR MEASURING MASS OF CONSUMABLE ELECTRODES BEING REMELTED IN ELECTRIC FURNACES

Anatoly Dmitrievich Zhupakhin, ulitsa Teatralnaya, 4, kv. 45; Gennady Ivanovich Prokoshev, Shosse Metallurgov, 53a, kv. 206, both of Chelyabinsk; Boris Konstantinovich Karavashkin, ulitsa Nevezhina, 15, kv. 25, Kurgan; Felix Iosifovich Shved, ulitsa B. Khmelnitskogo, 18, kv. 21, Chelyabinsk; Rashat Faskheevich Maksutov, prospekt Lenina, 77, kv. 38, Chelyabinsk; Evgeny Fedorovich Gavrilin, Shoose Metallurgov, 53a, kv. 217, Chelyabinsk; Vasily Andreevich Mushenkov, Trudovaya ulitsa, 17a, kv. 35, Chelyabinsk; Anatoly Borisovich Sergeev, Teatralnaya ulitsa, 4a, kv. 26, Chelyabinsk; Alexandr Fedorovich Shkapa, Elektrostalskaya ulitsa, 47, kv. 71, Chelyabinsk, and Lev Alexandrovich Zhivichkin, ulitsa 3 Sputnika, 3a, kv. 56, Chelyabinsk, all of U.S.S.R.

Filed Aug. 4, 1975, Ser. No. 601,703

Int. Cl.^{2} H05B *7/148;* **F27D** *11/10*

U.S. Cl. 13—12 **16 Claims**



1. A device for measuring the mass of electrodes being remelted in electric furnaces, comprising: a hollow cooled rod; a mass transmitter for the consumable electrode secured on said rod; a casing of said mass transmitter; a bar with an annular projection acting as a movable element of said mass transmitter and arranged in said casing; two bellows of different diameter disposed in said casing one above the other along the axis of said bar and functioning as a sensitive element of said mass transmitting; opposing near ends of said bellows being secured on the projection of said bar; remote ends of said bellows being secured on said casing; said annular projection having a working surface by means of which it interacts with said bellows; the spaces of said bellows defined by the bellows proper, by said casing and said annular projection being in communication with one another; a liquid filling said spaces of said bellows, variations in the pressure thereof being indicative of the mass of said consumable electrode; a recess provided on the end face of said bar and accommodating an end face of said rod; a current-conducting liquid medium filling said recess; and a holder of said consumable electrode rigidly associated with the other end face of said bar.

4,002,817

GAS CABLE WITH COMPRESSION TYPE PULLING ASSEMBLY

Costabile DeGrado, Elmwood Park, N.J., assignor to The Okonite Company, Ramsey, N.J.

Filed Dec. 31, 1975, Ser. No. 645,532

Int. Cl.^{2} H02G *1/00, 15/22*

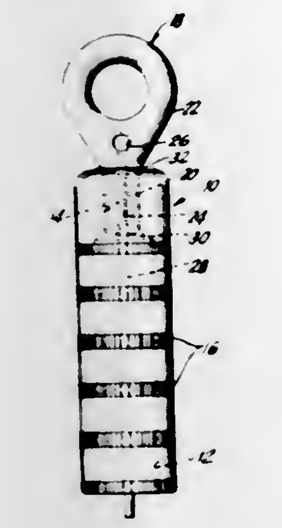
U.S. Cl. 174—10 **5 Claims**

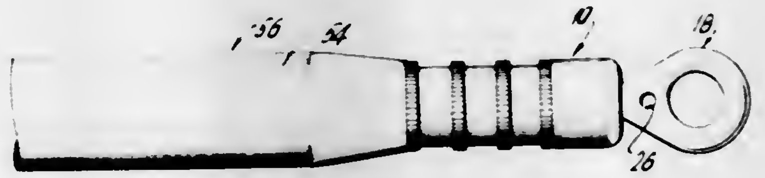
1. A multiconductor, gas-filled cable wherein a compression type pulling assembly is attached to the end of the cable, wherein the improvement comprises:

a. a pulling eye having gas passageway means extending generally longitudinally therethrough;

b. a shell member having a first terminal end connected with said pulling eye and having a second terminal end receiving said multiconductor, gas-filled cable; and

c. a tube connected to said gas passageway means of the pulling eye, extending longitudinally through the interior





of said shell, and entering said multiconductor cable, for communicating gas from said gas passageway means to the interior of said multiconductor, gas-filled cable.

4,002,818

LIPPED CABLE ENTRY SEAL FOR PRESSURIZED SLEEVE

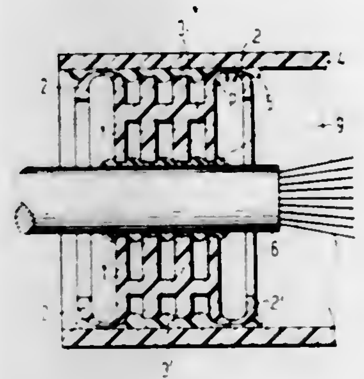
Dieter Kunze, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 25, 1975, Ser. No. 599,307

Claims priority, application Germany, July 25, 1974, 7425454

Int. Cl.^{2} H02G *15/24, 15/18*

U.S. Cl. 174—21 R **6 Claims**



1. A cable sleeve entry seal adapted to position and seal at least one cable passing therethrough and to contain pressurized gas about said cable and within a cable sleeve thereabout comprising:

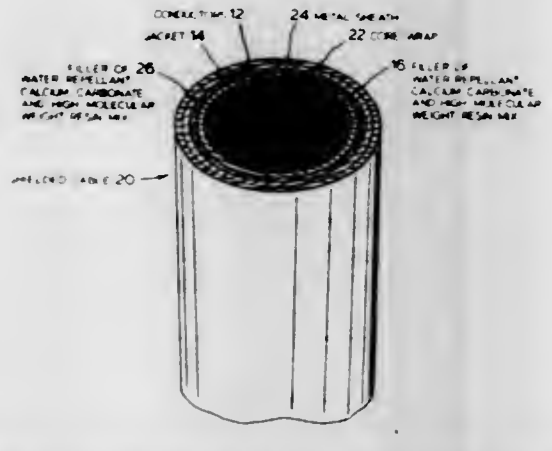
a lip member extending radially outwardly and longitudinally inwardly from a longitudinally inward radial sealing surface of said entry seal and engageable with an inner surface of said sleeve, the lip being sealed against said sleeve surface by gas pressure thereon from within said sleeve and inwardly of said seal;

a coating of plastic sealing compound applied to an inner surface of said sleeve and to an outer surface of said cable; and

at least two longitudinally-spaced, radially inwardlyextending sealing elements engaging said cable surface via said sealing compound coated on said cable surface.

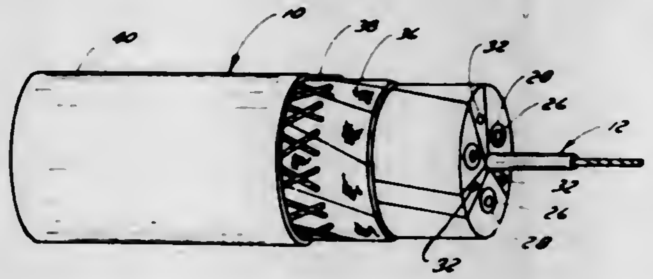
4. A pressurized cable sleeve seal having a cable extending therethrough, the seal being divided longitudinally and fitting tightly on said cable and having a seal means extending generally radially from said cable to an inner wall of said cable sleeve, said seal means having a peripheral lip extending into a pressurized interior portion of said cable sleeve in juxtaposition to said inner wall of said cable sleeve whereby the pressure within said cable sleeve forces said peripheral lip into tight-fitting engagement with the inner wall of said cable sleeve, and the tight fit of said seal on said cable is effected by tensioning band circumferentially about said seal.

4,002,819
WATER BLOCKED ELECTRIC CABLES
Leo Victor Woytiuk, Pointe-Claire, Canada, assignor to Northern Electric Company Limited, Montreal, Canada
Filed June 14, 1976, Ser. No. 695,845
Int. Cl.² H01B *7/28*
U.S. Cl. 174—23 C **10 Claims**


CONDUCTORS 12
JACKET 14
24 METAL SHEATH
22 CORE WRAP
FILLER OF 26 WATER REPELLANT CALCIUM CARBONATE AND HIGH MOLECULAR WEIGHT RESIN MIX
16 FILLER OF WATER REPELLANT CALCIUM CARBONATE AND HIGH MOLECULAR WEIGHT RESIN MIX
SHIELDED CABLE 20

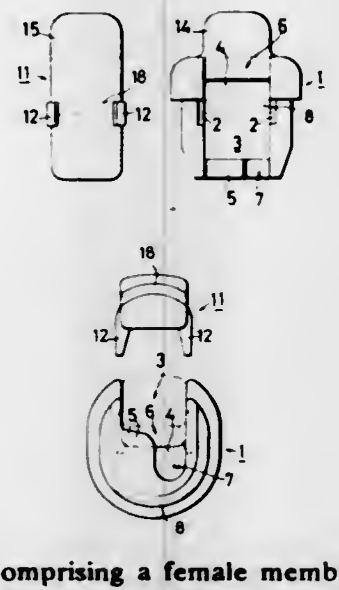
1. An electric cable having a core of a plurality of insulated conductors and a jacket, the interstices between the conductors and within the jacket being at least partially filled with a mixture of water repellant treated calcium carbonate and at least one high molecular weight resin rapidly hydratable to form a viscous solution.

4,002,820
POWER CABLE HAVING AN EXTENSIBLE GROUND CHECK CONDUCTOR
Zvi Paniri, Scarborough, and Walter Shakotko, Toronto, both of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada
Filed Apr. 16, 1975, Ser. No. 568,529
Claims priority, application Canada, May 3, 1974, 198848
Int. Cl.² H01B *9/00*
U.S. Cl. 174—115 **19 Claims**



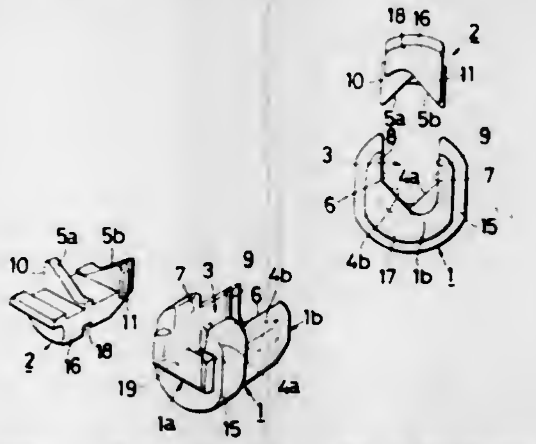
1. A power cable comprising three insulated power conductors helically stranded together, at least two grounding conductors located in the interstices between the power conductors and an extensible ground check conductor also located in the interstices between the power conductors, said ground check conductor including:
- a. a plurality of metallic wire strands helically wound together in a short lay and in the same direction of lay; and
- b. extensible non-metallic material separating said metallic wire strands for substantially eliminating direct friction between the metallic wire strands during flexing and twisting of the cable.

4,002,821
STRAIN RELIEF GROMMET
Sei'ichi Satoh, and Kazuo Sekiguchi, both of Yokohama, Japan, assignors to Nifco Inc., Tokyo, Japan
Filed June 24, 1976, Ser. No. 699,814
Claims priority, application Japan, June 27, 1975, 50-89946
Int. Cl.² H01B *17/26;* **H01R** *13/58;* **F16L** *5/00*
U.S. Cl. 174—153 G **3 Claims**



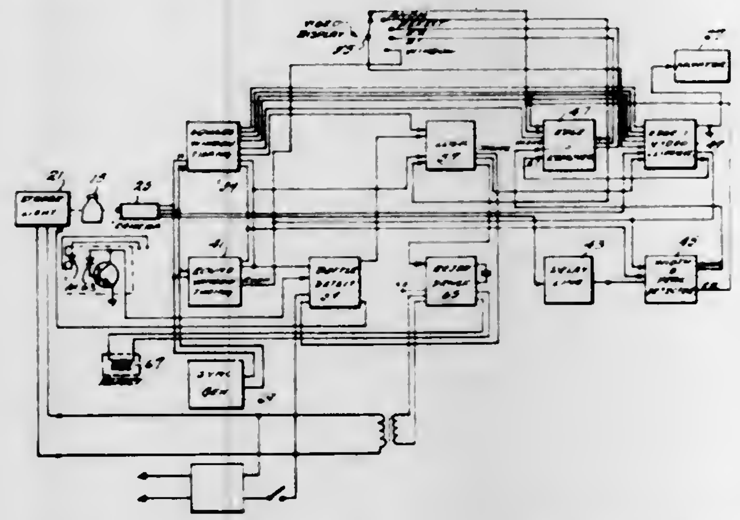
1. A grommet, comprising a female member having a U-shaped end face and possessing a U groove adapted to pass a cord and provided at one extremity thereof with an elevating wall rising from the bottom of said groove and at the other extremity thereof with a projecting wall extending inwardly from one side wall and a male member adapted to be brought into engagement with said female member downwardly from above said U groove, whereby the engagement of said male and female members creates a laterally elongate opening at the extremity containing said elevated wall and a longitudinally elongated opening at the extremity containing the projecting wall.

4,002,822
STRAIN RELIEF GROMMET
Mutsuo Kurosaki, Moriguchi, Japan, assignor to Nifco Inc., Tokyo, Japan
Filed July 22, 1976, Ser. No. 707,808
Claims priority, application Japan, July 24, 1975, 50-101711
Int. Cl.² H01B *17/26;* **H01R** *13/58;* **F16L** *5/00*
U.S. Cl. 174—153 G **1 Claim**



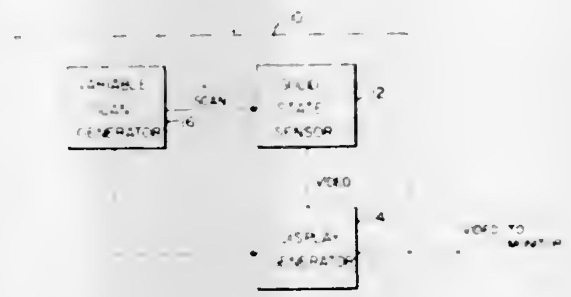
1. A grommet, which comprises a pair of members, one of said pair of members being possessed of a U groove and provided at the bottom of said groove with a pair of inclined protrusions of which the directions of the inclined edges, when observed in front elevation, cross each other substantially perpendicularly and the other member being adapted to be coupled into fitting engagement with said U groove and provided with a pair of inclined protrusions of which the directions of the inclined edges, when observed in front elevation, cross each other substantially perpendicularly in such a way that, when the latter member is inserted into the fitting engagement with said U groove, said inclined protrusions confront the pair of inclined protrusions formed on the bottom of the former member, whereby a cord interposed between said two members is gripped fast in a twisted state because of the crossed relationship of the inclined edges of the pairs of inclined protrusions when the two members are pressed against each other into fitting engagement.

4,002,823
METHOD AND APPARATUS FOR VIDEO INSPECTION OF ARTICLES OF MANUFACTURE
Jack T. Van Oosterhout, Conklin, N.Y., assignor to Ball Corporation, Muncie, Ind.
Filed Nov. 1, 1974, Ser. No. 520,227
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² H04N *7/18*
U.S. Cl. 358—106 **18 Claims**



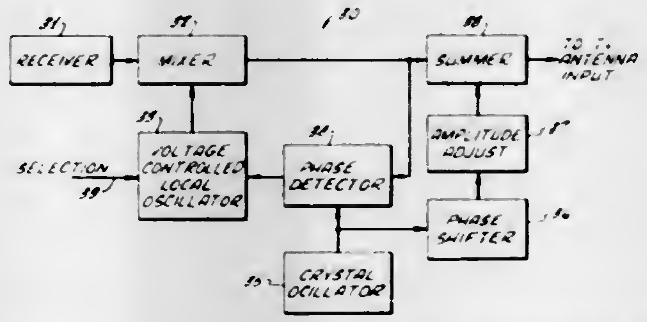
1. An apparatus for video inspection of articles of manufacture comprising:
- a light source for providing light rays to illuminate a sample article,
- a video camera means for scanning said illuminated sample and for producing for each scan line a video signal corresponding to the difference in refraction characteristics of the portion of the sample scanned, and
- means connected to said camera for processing the output signal thereof to produce a defect output signal in response to a scanned defect in said sample, said processing means including
  - means for suppressing a predetermined portion of the video signal received from said camera means during each of said scan lines, and
  - means for continuously discriminating between the video signals corresponding to desired changes in the refraction characteristics of said sample as said camera scans across said sample and the refraction characteristic produced by defects in said sample.

4,002,824
SELECTIVE ZOOM CAMERA AND DISPLAY
Edward A. Petrocelli, Sunrise, Fla., and Anthony C. H. Louie, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 28, 1976, Ser. No. 652,919
Int. Cl.² H04N *7/00*
U.S. Cl. 358—180 **6 Claims**



1. An electronic control system for selectively controlling the scanning rate of a solid state sensor to display a picture with a portion being magnified while the remainder remains constant comprising:
- a. solid state sensor means for providing video output signals in response to being electronically scanned,
- b. variable scan generator means coupled to said solid state sensor for providing selectively controlled clock signals to drive said solid state sensor,
- c. display generator circuit means coupled to said solid state sensor and to said variable scan generator means for providing an output video signal that when displayed will display a picture with a portion being magnified while the remainder remains constant.

4,002,825
SYSTEM FOR ENCODING AND DECODING AMPLITUDE MODULATED SIGNALS
Donald W. Lewis, Stanton, Calif., assignor to Summit Systems, Inc., Placentia, Calif.
Filed July 25, 1973, Ser. No. 382,574
Int. Cl.² H04N *1/44*
U.S. Cl. 325—32 **4 Claims**



3. A system for encoding and decoding an amplitude modulated signal having a carrier component and at least one set of side-bands comprising:
- means for shifting the phase of said carrier component relative to the phase of said side bands by an amount sufficient to significantly distort the modulation envelope;
- means for transmitting said phase-shifted carrier component and said set of side-bands;
- means for receiving said transmitted signal;
- means for generating a reference signal having a highly stable frequency;
- means for converting the frequency and phase of said received signal to those of said reference signal;
- means for shifting the phase and adjusting the amplitude of said reference signal to produce a corrective signal having a frequency, amplitude, and phase which restores the

original, un-phase-shifted amplitude and phase of said carrier component so as to render intelligible said modulation envelope; and

means for summing said frequency and phase converted received signal with said corrective signal.

4,002,826

PLAYBACK APPARATUS, IN PARTICULAR, VIDEO PLAYER, FOR PLAYING ROUND RECORDS PROVIDED WITH INFORMATION TRACKS

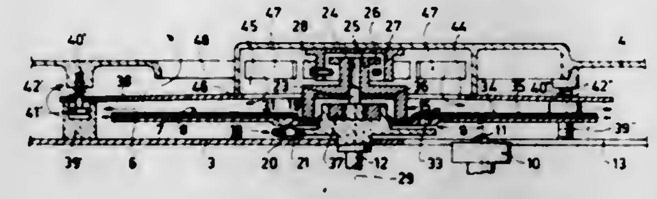
Johannes Andreas Iemenschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 583,989

Claims priority, application Netherlands, Mar. 12, 1975, 7502914

Int. Cl.² G11B *3/60, 5/016;* **H04N** *7/00*

U.S. Cl. 358—128 **6 Claims**



1. A playing apparatus in particular a video player, for playing round records which are provided with information tracks and comprising:

a housing with a substantially flat covering plate,

a motor driven spindle which extends from the housing for rotating a record parallel to the covering plate,

a cover hinged to the housing and in the closed condition covering the covering plate and drive spindle, and

a stabilizing plate resiliently connected to the cover and extends substantially perpendicularly to the axis of the drive spindle when the cover is closed, for stabilizing a record during playing in its plane of rotation, while the cover is closed, a number of supports on the covering plate abutting said stabilizing plate when the cover is closed and being spaced therefrom when the cover is open, whereby the position of the stabilizing plate relative to the covering plate is determined by said supports.

4,002,827

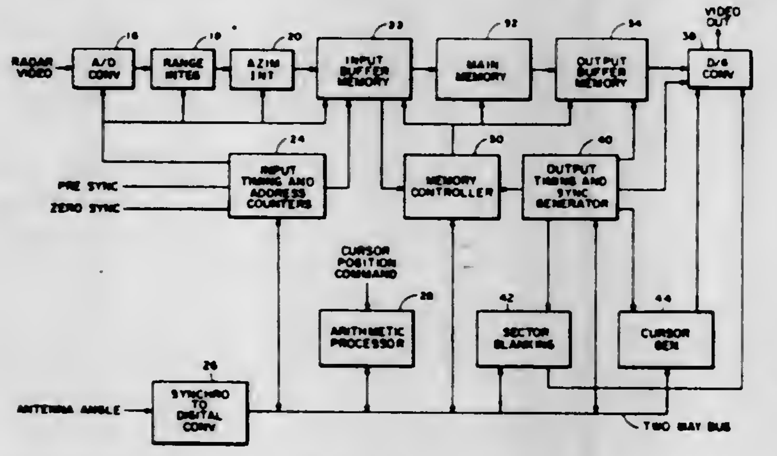
POLAR COORDINATE FORMAT TO A CARTESIAN COORDINATE FORMAT SCAN CONVERTER

Robert Leland Nevin, New Hartford; John Joseph O'Leary, Utica, both of N.Y., and Leonard Joseph Cikotte, Norristown, Pa., assignors to General Electric Company, Utica, N.Y.

Filed May 15, 1975, Ser. No. 577,971

Int. Cl.² H04N *5/02*

U.S. Cl. 343—5 SC **4 Claims**



1. In a radar system including an angularly scanned antenna and an associated receiver system,

a scan converter for converting pulse-generated radar data received via said antenna — receiver system in polar coordinate scan format to an *x-y* cartesian coordinate format comprising, in combination:

means for generating a cosine signal representative of the cosine of the antenna angle, said angle being defined by the angle between the polar coordinate radius along with said radar data is generated and a predetermined reference radius;

means operating in response to said cosine signal for generating a train of clock pulses for each radar pulse, the repetition rate of said pulses being a function of the cosine of said angle;

sampling means for generating a data signal representative of said radar in response to each of said clock pulses;

memory means having storage locations addressible in accordance with said x-y cartesian coordinate format;

means for loading said data signals into said memory means including a Y-address counter and means for incrementing said counter synchronism with said clock pulses, and

means for reading said data signals out of said memory in a sequence compatible with said cartesian coordinate format.

4,002,828

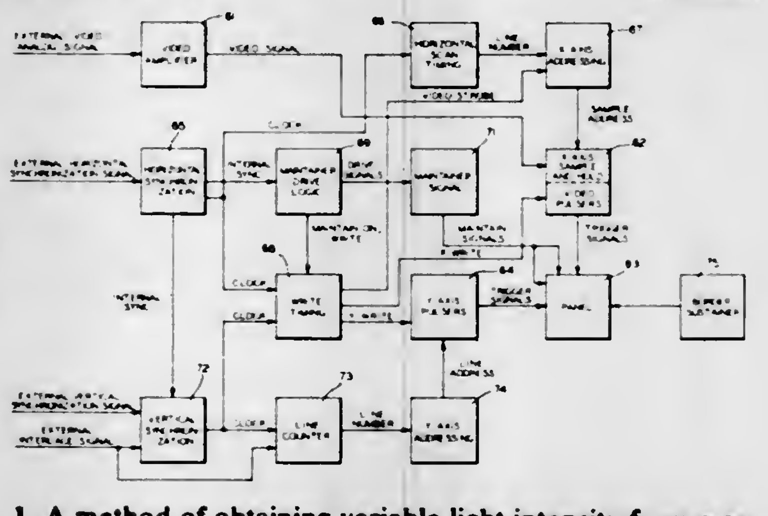
METHOD AND CIRCUIT FOR GENERATING GRAY SCALE IN GASEOUS DISCHARGE PANELS

James F. Nolan, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1975, Ser. No. 635,801

Int. Cl.² H04N *5/66, 3/10*

U.S. Cl. 358—240 **36 Claims**



1. A method of obtaining variable light intensity from a gas discharge display/memory cell, said method comprising the steps of:

applying a trigger voltage signal across the cell having at least one dimension selected to cause a gas discharge proportional to the light intensity desired; and

applying an alternating current maintain voltage signal to the cell of a magnitude insufficient to initiate a gas discharge or to maintain a sequence of gas discharges of relatively constant intensity for an indefinite length of time, the maintain voltage magnitude being sufficient to maintain a sequence of gas discharges for a number of cycles of the maintain voltage signal proportional to the selected dimension of the trigger voltage signal.

4,002,829

AUTOSYNCHRONOUS OPTICAL SCANNING AND RECORDING LASER SYSTEM WITH FIBER OPTIC LIGHT DETECTION

John Grear Hutchison, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,638

Int. Cl.² H04N *1/02*

U.S. Cl. 358—286 **39 Claims**

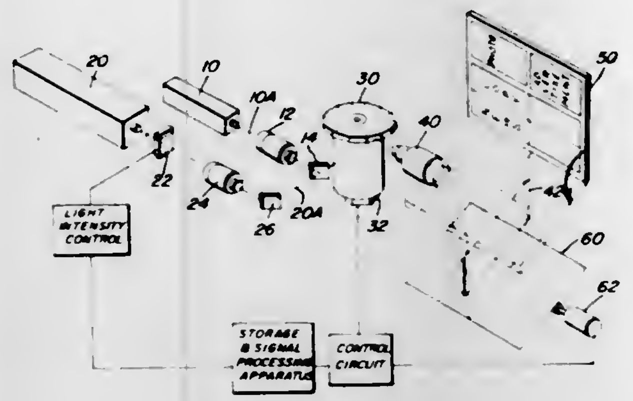
1. In a scanning and recording device for making an image of an object including;

means for simultaneously linearly advancing the object and a photosensitive recording surface disposed in parallel spaced apart facing arrangement on opposite sides of a rectilinear scan deflector means;

means for providing a first modulatable beam of coherent laser radiation;

means for providing a second beam of focusable radiation;

optical scanning means for receiving said first and second beams and for causing said beams to be directed along narrowly divergent paths toward said rectilinear deflector means and then directing said first beam toward said photosensitive surface while simultaneously directing said second beam toward said object in cooperation with said advancing means to form a simultaneous rectilinear scanning raster pattern of said beams across said surface and said object respectively;



said optical scanning means further comprising flat field lens means to simultaneously focus both beams;

photodetector means for receiving radiation from the object and for generating an electrical signal representative of said radiation;

means responsive to said electrical signal for modulating said first beam; and

a fiber optic line-to-spot converter having a plurality of internally-reflecting light-transmitting fibers arranged in a linear array adjacent the rectilinear scan deflector means to transmit radiation from the object to the photodetector means.

4,002,830

APPARATUS FOR COMPENSATING FOR OPTICAL ERROR IN A ROTATIVE MIRROR

John Buchanan Brown, Lincoln, and Frank J. Gardiner, Weston, both of Mass., assignors to Laser Graphic Systems Corporation, Sudbury, Mass.

Filed Jan. 22, 1975, Ser. No. 543,082

Int. Cl.² G02D *17/00;* **H04M** *5/84*

U.S. Cl. 358—293 **9 Claims**

1. An optical scanning apparatus comprising:

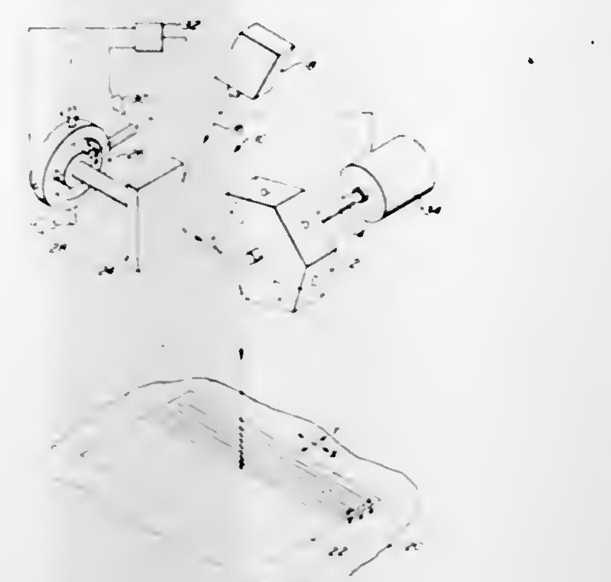
a polygonal radiation deflecting device for scanning radiation across a surface and means mounting said device for rotation about an axis substantially parallel to a plurality of radiation deflecting facets on said device, said plurality of facets being substantially congruent and the angles between each pair of adjacent facets being substantially equal;

means for compensating for optical errors in the angular relationship of said facets;

said compensating means comprising radiation deflecting means positioned intermediate a source of radiation and said surface for deflecting the radiation to be deflected by said facets, at least part of said deflecting means being movable in a first direction such that movement in said first direction would cause said radiation to move along said surface in a direction parallel to the direction of scan;

wherein at least part of said deflecting means is movable in a second direction such that movement in said second direction would cause said radiation to move along said surface in a direction perpendicular to the direction of scan and wherein each of at least some of said signals in said set is proportional to the error in the angle between a facet and said axis of said device;

electro-mechanical transducer means operatively associated with said deflecting means for moving said deflecting means in response to electrical signals applied to said transducer means; and



means for generating a set of signals synchronized to the rotation of said polygonal deflecting device, each of at least some of said signals said set being proportional to the error in the angle between a pair of facets.

4,002,831

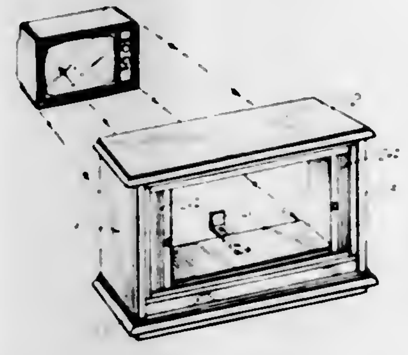
CONSOLE CABINET FOR PORTABLE TELEVISION RECEIVER

Eugene Aeschliman, Jackson, Miss., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 29, 1976, Ser. No. 671,291

Int. Cl.² H04M *5/64*

U.S. Cl. 358—254 **10 Claims**



1. A console cabinet for a portable television receiver, said cabinet comprising, in combination:

a. a base, a top, open front and rear sides, and a pair of sidewalls attached to said base and terminating at said top;

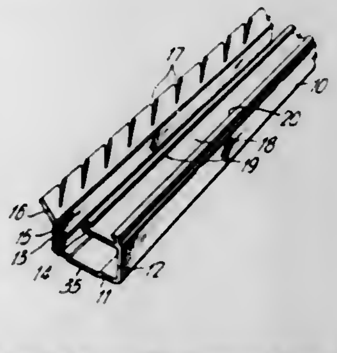
b. supporting means disposed in a lower portion of said cabinet positioned for holding in a generally horizontal position vertical adjustment receiver support means disposed above said base wherein the entirety of said adjustment means overlies said base, and the upper side of said adjustment means receives said receiver; and,

c. open front closure means disposed over said base and between said sidewalls and top adjustment strip means permitting partial closure of said open front whereby when the receiver is inserted in said cabinet on said adjustment means, and adjusted upwards or downwards in said cabinet, and said closure means frames said receiver, a floor console model is obtained.

4,002,832
LOADING COIL ASSEMBLIES FOR COMMUNICATIONS CABLES

George Debortoli, and Peter McGivery Chase, both of Ottawa, Canada, assignors to Northern Electric Company Limited. Montreal, Canada

Filed Sept. 22, 1975, Ser. No. 615,547
Int. Cl.² H01F *17/08*
U.S. Cl. 178—46 **12 Claims**

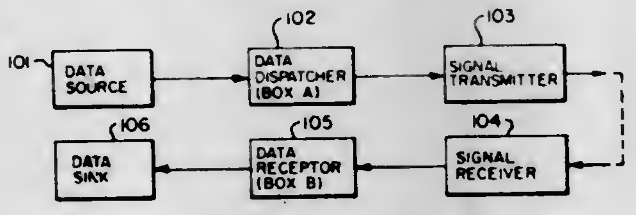


1. A loading coil assembly comprising:
a body member of a length of preformed electrically insulated material open at each end and having a channel shaped cross-section including a substantially flat base web and two spaced apart side webs extending substantially normal to said base web, and a top web on an upper part of one of said side webs, said top web extending inwardly over and spaced from said base web, said side webs spaced a distance equal to the diameter of a coil and said top web spaced from said base web at least the thickness of a coil, said base web, said side webs and said top web defining a substantially rectangular cross-section corresponding to the cross-section of a coil viewed in a direction normal to the axis of a coil;
a terminal strip on said top web and including terminals thereon;
a plurality of loading coils positioned side by side in said body member, the axes of said coils spaced apart along said body member parallel to each other and normal to the plane of said base web, each end of the winding of a coil attached to a related terminal, said top web, and said terminal strip on said top web, extending part-way over said coils; and
separate electrically insualting means positioned between each of said coils.

4,002,833
RATE INDEPENDENT SIGNALLING MEANS

Joseph J. Eachus, Cambridge, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 20, 1974, Ser. No. 534,972
Int. Cl.² H04L *27/00*
U.S. Cl. 178—66 R **11 Claims**

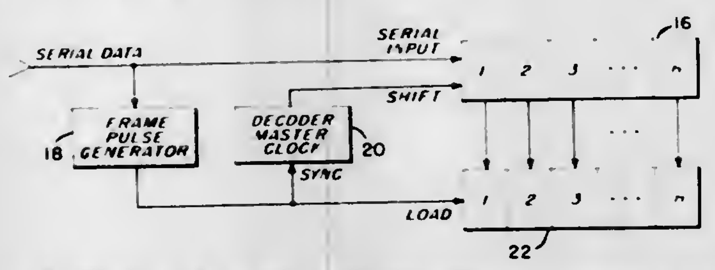


1. An apparatus for serially conveying in a rate-independent fashion at least three different discrete units of information by changing the signal states of two bi-level signals, said apparatus comprising:
means for changing the signal state of the first bi-level signal to represent a first discrete unit of information;
means for changing the signal state of the second bi-level signal to represent a second discrete unit of information; and
means for changing the signal states of both the first bi-level signal and the second bi-level signal to represent a third discrete unit of information.

4,002,834
PCM SYNCHRONIZATION AND MULTIPLEXING SYSTEM

James Alfred Cocci, Leominster, Mass., and Maurice L. Schiff, Fort Wayne, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,794
Int. Cl.² G06F *11/12*; G08C *25/00*
U.S. Cl. 178—69.1 **17 Claims**

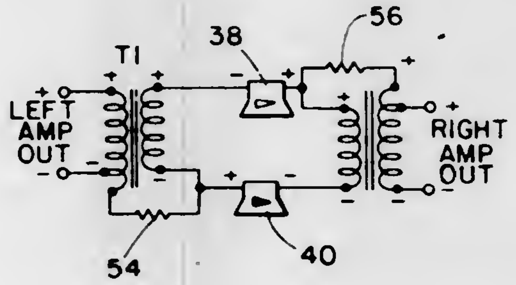


1. A method of pulse code modulation communication comprising the steps of
a. transmitting a plurality of discrete binary 1's;
b. serially transmitting a group of *n* data bits representative of a quantized, pulse code modulated signal after each discrete 1 of said plurality of binary 1's;
c. serially transmitting $n + 1$ binary 0's after each said group of *n* data bits;
d. generating a decoder frame pulse in response to receipt of a binary 1;
e. generating a decoder clock in response to the leading edge of said frame pulse;
f. pulsing a decoder shift register with said decoder clock to enter each of said groups of n data bits in said decoder shift register;
g. triggering a buffer register in response to the trailing edge of said frame pulse to load said buffer register with said n data bits from said decoder shift register;
whereby the maximum time where loss of synchronization between transmission and reception occurs is $2(n + 1)T$, where T is the time between data bits.

4,002,835
MULTI-CHANNEL DECODING CIRCUIT FOR TWO-CHANNEL AUDIO SYSTEMS

Roger L. Bumber, 740 S. Ridgeland Ave., Oak Park, Ill. 60304

Filed June 6, 1975, Ser. No. 584,589
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **7 Claims**



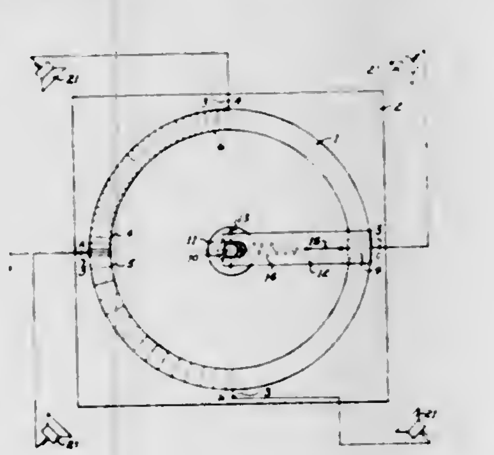
1. A passive bridging circuit for producing additional powered channels of audio information from the speaker outputs of the left and right channels of a stereo amplifier comprising:
a. a pair of loudspeakers each having a positive and negative terminal for connecting to an audio source;

b. left and right channel transformers having primaries and secondaries, the primaries being connected to the said stereo amplifiers's left and right speaker position and negative outputs respectively, the loudspeakers coupling the secondaries of the two transformers, one loudspeaker between the two plus terminals of the secondaries and the other loudspeaker between the two minus terminals, and
c. resistive means connecting the primaries of said transformers to one of said speaker terminals for coupling in-phase information to said speakers to obtain back separation,
whereby said loudspeakers are coupled across the left and right channels of said amplifier to reproduce sound corresponding to the difference between the left and right signals from the amplifier.

4,002,836
AUDIO SIGNAL DISTRIBUTOR

Gilbert MacLean Gardner, 58 Brighton Ave., San Francisco, Calif. 94112

Filed July 24, 1975, Ser. No. 598,836
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **6 Claims**



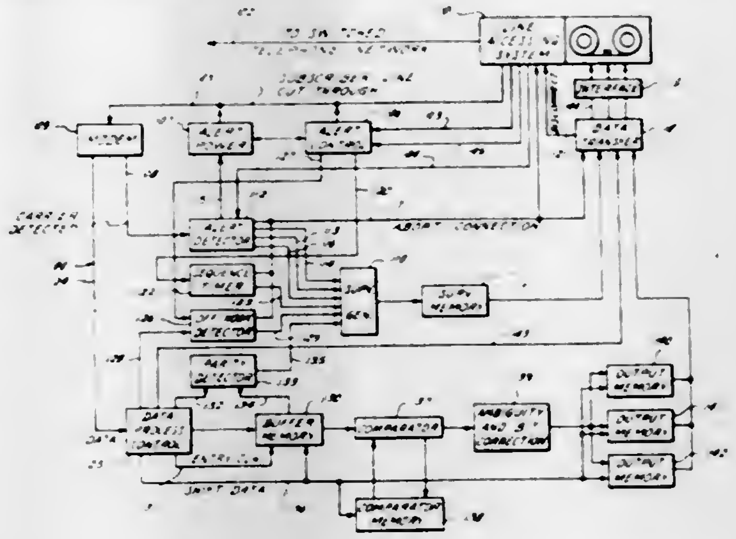
1. An audio sound producing system comprising:
a. a plurality of speakers arranged in a preselected pattern about a listening area;
b. a source of audio signals capable of actuating said speakers;
c. an audio signal distributing device for distributing said source of audio signals through said speakers, said audio signal distributing device including an annular dielectric form;
d. a plurality of tie-points, mounted an equal distance apart, on said form, the number of said tie-points corresponding to the number of said speakers;
e. a shaft adapted to be rotated at the center of said dielectric form, said shaft having a wiper arm thereon, said wiper arm passing over said form;
f. a pair of conductive windings for each tiepoint, each winding of the pair being wound in opposite directions around the form up to the next adjacent tie-point, but being insulated from the adjacent tie-point.

4,002,837
TRANSCEIVER

Theran L. Ebner, and Donald W. Hawkins, both of Houston, Tex., assignors to Houston Natural Gas Corporation, Houston, Tex.

Filed Sept. 17, 1975, Ser. No. 614,035
Int. Cl.² H04Q *9/00*
U.S. Cl. 179—2 AM **15 Claims**

1. A data transceiver for transmitting interrogating signals to sequentially activate and poll a plurality of data transponders connected to a common telephone communication path and receiving and processing data from an activated transponder transmitting data, comprising,
an input having means to transmit interrogating signals and operating power for the transponders through the communication path,
temporary storage means connected to the input means to store the received data from the transponders,
parity means connected to the temporary storage means to check parity of the received data,
a comparator and a comparator memory connected to the temporary storage means for correcting ambiguities in the position of the errors in the received data,
an output memory receiving the corrected data from the comparator,
a data control connected to the input for controlling the data processing,

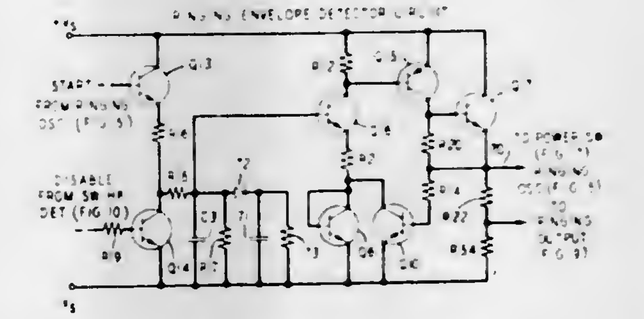


means connected to the input to detect when a telephone connected to the path is activated by lifting its receiver "off hook" while signals and data are being transmitted,
a supervisory information character generator connected to the input for providing identifying data corresponding to various operating conditions occurring in the operating sequence of said transceiver,
a supervisory output memory connected to the supervisory character generator to store the identifying data,
a common data output for receiving data from said output memories, and
a data transfer circuit to multiplex the outputs of the output memories to the common data output.

4,002,838
TELEPHONE RINGING CONTROL CIRCUITS

Barry Sheldon Bosik, Parsippany, and Dale Eugene Stone, Cedar Knolls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 5, 1975, Ser. No. 638,163
Int. Cl.² H04H *1/08*
U.S. Cl. 179—2.5 R **8 Claims**



1. A delay circuit having a hysteresis delay characteristic comprising
an integrating detector,
a threshold responsive means connected to said detector and including threshold establishing means, and
feedback means from said threshold responsive means for altering said threshold establishing means.

4,002,839
METHOD AND APPARATUS FOR THE MUTUAL SYNCHRONIZATION OF THE EXCHANGE CLOCK PULSE OSCILLATORS IN SWITCHING SYSTEMS OF A PCM TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

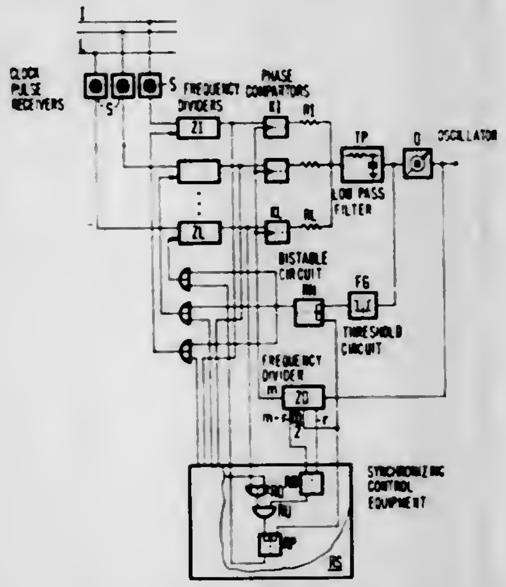
Otto Karl, Forstenrieder Allee 78/III, and Reiner Binz, Rohrauerstrasse 58, both of, 8000 Munich 71, Germany

Filed May 27, 1975, Ser. No. 581,376

Claims priority, application Germany, May 27, 1974, 2425604

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **10 Claims**



1. In a time division multiplex (TDM) telecommunication network wherein each exchange installation therein includes a clock oscillator, a method for synchronizing that clock oscillator with clock oscillator signals received on incoming trunks from other exchanges in the network, comprising the steps of:

dividing the output frequency of said clock oscillator,

dividing the frequencies received on said incoming trunks producing an output phase displaced from said divided clock oscillator output by 180° using reference phase regeneration,

initiating said reference phase regeneration when said clock oscillator frequency drifts from the no-load frequency by an amount exceeding a predetermined limit value which is attainable with the minimum number of phase comparators used in any said exchange installation, which limit value is independent of the total number of phase comparators used in any said exchange installation,

comparing the phase of said clock oscillator signal individually with the phase of each said clock oscillator signal on said incoming trunks by means of phase discriminators, one of which is assigned to each incoming trunk,

producing a control signal which corresponds to one of the sum or mean value of the outputs of said phase discriminators and

adjusting the frequency of said clock signal in accordance with the value of said control signal.

4,002,840
ANGLE-MODULATED SIGNAL TRANSMISSION SYSTEM

Tadashi Abe, Hirakata, and Yukinobu Ishigaki, Yamato, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Victor Company of Japan, Limited, Yokohama, both of, Japan

Filed June 24, 1975, Ser. No. 589,750

Claims priority, application Japan, June 25, 1974, 49-71879; Jan. 30, 1975, 50-13061

Int. Cl.² H04R *5/00*

U.S. Cl. 179—15 BT **9 Claims**

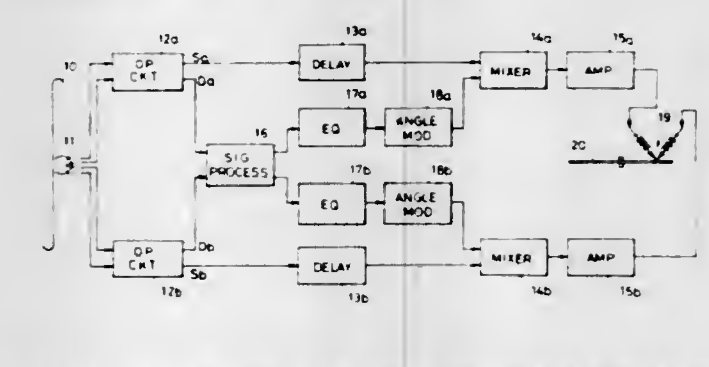
1. An angle-modulated signal transmission system comprising:

a plurality of transmission path means for respectively transmitting angle-modulated signals;

means for supplying to said transmission path means at least first and second modulation signals;

first filtering means for filtering, from the first and second modulation signals, predetermined signal components in a band of predetermined frequencies which are conducive to a generation of interference distortion during transmission and thereafter during demodulation, the interference being caused by crosstalk between the angle-modulated signals;

second filtering means for filtering, from the first and second modulation signals, signal components in a band of frequencies which are other than said predetermined frequencies;



means for mixing with each other, and with a specific mixing ratio, the predetermined signal components of the first and second modulation signals thus filtered by the filtering means;

means for adding the predetermined signal components of the first and second modulation signals thus processed by the mixing means, with the signal components of the first and second modulation signals thus filtered by the second filtering means; and

means for respectively angle modulating carriers responsive to the first and second modulation signals thus processed by the mixing means and adding means, and for supplying the resulting angle-modulated output signals to the respective transmission path means.

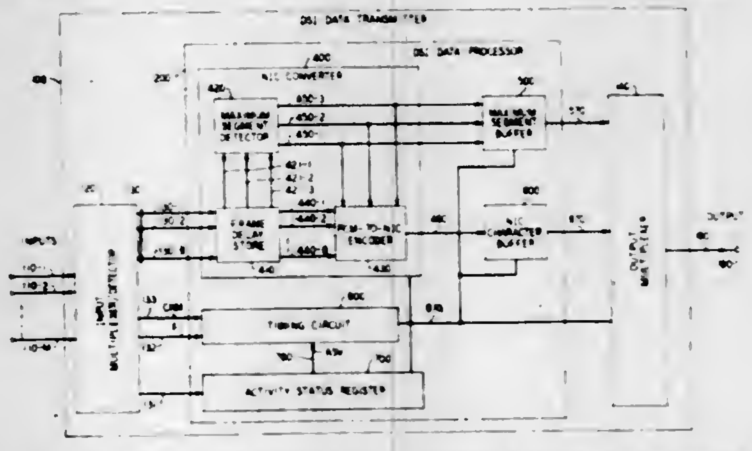
4,002,841
DATA COMPRESSION USING NEARLY INSTANTANEOUS COMPANDING IN A DIGITAL SPEECH INTERPOLATION SYSTEM

Yau-Chau Ching, Morganville; Allan Michael Hofmann, Jackson, and David Gavin Messerschmitt, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1976, Ser. No. 650,936

Int. Cl.² H04J *6/02*

U.S. Cl. 179—15 AS **12 Claims**



1. In a digital communication system for communicating digitized message samples between a transmitting station and a receiving station over a first plurality of trunks through a second plurality of channels; said system including activity status means for determining whether each trunk is active or inactive; buffer means for forming multibit output frames, each frame including an activity status field and a data field; and overload mitigating means operative upon said digitized message samples; and CHARACTERIZED IN THAT said system further comprises:

means for applying nearly instantaneous companding to said digitized message samples to form second digitized message samples; and

means responsive to said buffer means and to said applying means for forming a multiframe, said multiframe including a plurality of frames, each frame including predetermined ones of said second digitized message samples in said data field thereof.

4,002,842
TIME MULTIPLEX LOOP TELECOMMUNICATION SYSTEM

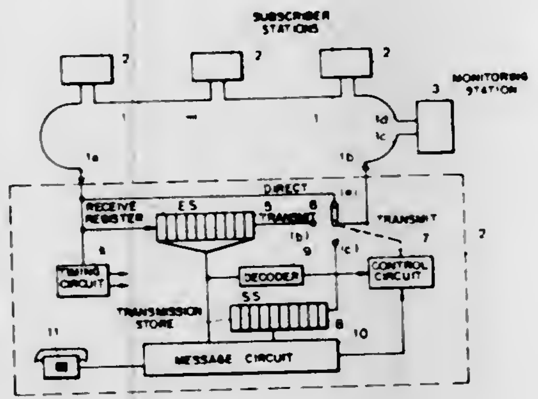
Heini Meyr, Hinterkappelen; Hansjurg Mey, Kehrsatz; Zdenek Nenadal, Bern; Markus Tschanz, Koniz; Eberhard W. Vogel, Bern, and Emanuel Hafner, Wohlen, all of Switzerland, assignors to Hasler AG, Bern, Switzerland

Continuation-in-part of Ser. No. 376,233, July 3, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,604

Claims priority, application Switzerland, July 4, 1972, 9903/72; June 8, 1973, 8425/73

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 AL **3 Claims**



1. In combination

a closed unidirectional transmission loop (1)

plural stations (2) for transmitting information signals and signalling codes in form of addressed telegrams or byte groups each provided with an address and having the same number bytes, among such stations and having each an input (1*a*) and an output (1*b*), the input of each station being connected to the output of another of said stations by a section of said loop;

each said station (2) being operable in a first, a second and a third mode of operation respectively, said first mode of operation corresponding to the idle state of the station;

means (3) generating a continuous byte stream circulating in said transmission loop (1);

each said station (2) comprising

a subscriber set (11);

a message circuit (10) connected to said subscriber set (11) and including first storing means for storing at least one address and means for forming addressed byte groups by adding one of the stored addresses to every information which is ready for transmission in the station;

second storing means (5) having a serial input connected to the input (1*a*) of the station (2), a parallel output connected to said message circuit (10) and a serial output, and storing for a byte group period the bytes appearing at its input providing a delay equal to the time required for transmission of one byte group to the loop;

switching means (6) connecting in said first mode of operation the input (1*a*) of the station (2) to the output (1*b*) thereof, connecting in said second mode of operation the serial output of said second storing means (5) to the output (1*b*) of the station (2) thus connecting the delay in circuit with the loop, and transmitting in said third mode of operation one of said addressed byte groups to the output (1*b*) of the station (2);

detecting means (9) delivering first control signals at the end of every byte group appearing at the input of the station and delivering a second control signal when detecting at the input of the station a byte group addressed to the station, and a third control signal when detecting at the input of the station one of said addressed byte groups formed and transmitted by the station itself;

control means (7) connected to be actuated by said message circuit (10) and said detecting means (9) and connected for switching said switching means (6) from said first to said third mode of operation connecting the delay into the loop for inserting the byte group ready for transmission into the space resulting from the introduction of the delay when receiving a first control signal from said detecting means (9) after one of said addressed byte groups has been formed in said message circuit (10), and switching said switching means (6) from said third to said second mode of operation after one of said addressed byte groups have been transmitted to the output (1*b*) of the station (2), and responsive on said second and third control signals respectively for switching said switching means (6) from said second to said first mode of operation if no further addressed byte group is formed in said message circuit (10), and from said second to said third mode of operation if a further addressed byte group is formed in said circuit means (10).

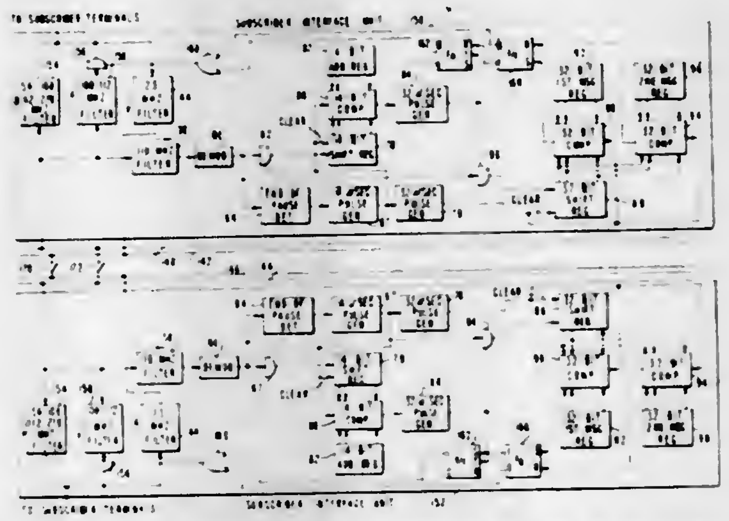
4,002,843
TAMPER-PROOF TWO-WAY CABLE SYSTEM

Michael I. Rackman, 1710 Glenwood Road, Brooklyn, N.Y. 11230

Continuation of Ser. No. 424,925, Dec. 17, 1973, abandoned, which is a continuation of Ser. No. 290,857, Sept. 21, 1972, abandoned. This application Aug. 4, 1975, Ser. No. 601,544

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 AL **2 Claims**



2. In a two-way cable television system having cable means, a central control connected to said cable means for transmitting downstream address and message signals, and a plurality of subscriber terminals coupled in parallel to said cable means each of which receives signals from and transmits message signals to said cable means, said subscriber terminals being situated on the different residential premises of respective subscribers, the improvement comprising a plurality of interface units situated off the premises of said subscribers and out of their reach and control, each for coupling at least one subscriber terminal to said cable means, each of said interface units including means for recognizing the downstream transmission of the address of the respective at least one subscriber terminal, means for recognizing the downstream transmission of predetermined messages following the recognition of the downstream transmission of the address of the respective at

least one subscriber terminal, and means responsive to the recognition of said predetermined messages for controlling thereafter respective modes of transmission of signals between said cable means and said at least one subscriber terminal, and wherein each of said interface units couples a respective plurality of subscriber terminals to said cable means, all of the subscriber terminals coupled to said cable means by the same interface unit having respective addresses with a portion thereof in common, and said address recognizing means is operative to recognize the downstream transmission of said common address portion for operating said controlling means.

4,002,844

DEVICE FOR MULTIPLEXING N ASYNCHRONOUS DIGITAL TRAINS

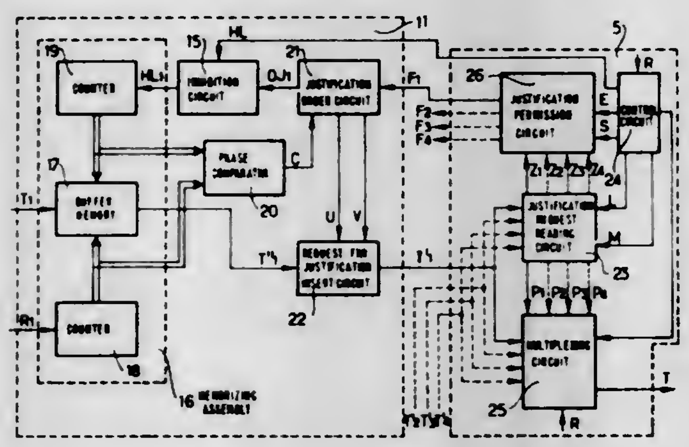
Pierre Doussoux, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 19, 1975, Ser. No. 560,010

Claims priority, application France, Apr. 25, 1974, 74.14460

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 AF **2 Claims**



1. Device for multiplexing n incident quasisynchronous digital trains T*l* to T*n* having individual pulse rates R*l* to R*n* respectively into a more rapid digital train sent out at a pulse rate R and articulated in successive frames each including, at determined locations, at the most one justification bit per incident train, and systematic filling bits comprising an identification character and at least one set of *n* justification indicator bits for the n incident trains respectively, comprising:

n channel elements for receiving the *n* incident trains respectively, and

a multiplexing element including

a multiplexing circuit for sending out the rapid train, and

first means for generating, from the said pulse rate R, a clock signal HL sent out at a pulse rate R′ equal to R/*n* and having "holes" at the locations corresponding to the systematic filling bits, a frame synchronizing signal S formed by pulses occuring within the time intervals corresponding to the locations of said identification characters in said successive frames, and a justification location signal defining the locations allocated in said successive frames for the justification bits,

each of said channel elements, which receives an incident train T*i* ($i = 1, \ldots, n$), including

second means connected to receive the clock signal HL and generating, under the control of a control signal applied thereto, additional "holes" in said clock signal HL, in the locations corresponding to the justifications bits, said circuit sending out a clock signal HLi,

buffer means receiving said train T*i*, controlled for load by a clock signal having the pulse rate R*i* and for unload by said clock signal HL*i*, and sending out a digital train T″*i*,

a phase comparator for comparing the phase of said clock signal HL*i* and the phase of said clock signal at the pulse rate R*i*,

third means connected to the output of said phase comparator and connected to receive said signal S, for generating a signal representing the result of the phase comparison at each pulse of said signal S,

fourth means controlled by said third means for inserting in the outgoing train T″*i* of said buffer means, within the duration of each pulse of said signal S, a justification request signal which is a function of said signal representing the result of the phase comparison, the digital train emerging from the said fourth means being sent to the multiplexing circuit,

said multiplexing element further including

fifth means for reading each of the *n* justification request signals, the fifth means controlling the said multiplexing circuit for the inserting of the justification indicator bits in the rapid train, and

sixth means for generating from the said justification location signal and as a function of the result of the said reading, *n* justification permission signals for the said *n* incident trains respectively, each of said *n* justification permission signals being sent to the corresponding channel element wherein this justification permission signal is applied for controlling said second means.

4,002,845

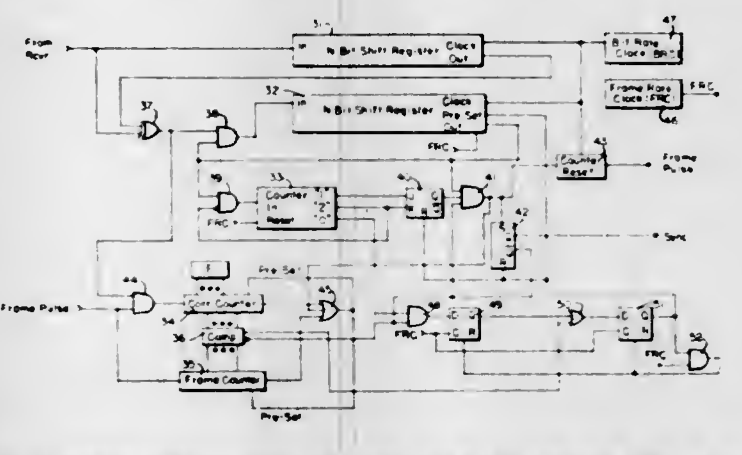
FRAME SYNCHRONIZER

Pradman P. Kaul, Gaithersburg, and Pradeep Kaul, Rockville, both of Md., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed Mar. 26, 1975, Ser. No. 562,366

Int. Cl.² H04J *3/06;* **H04L** *7/08*

U.S. Cl. 179—15 BS **17 Claims**



1. A frame synchronizer for searching for framing bits of an N bit frame in a stream of binary signals occurring at a bit rate and wherein said frames repeat at a rate equal to said bit rate divided by N, comprising;

first means for comparing each bit of said stream with the corresponding bit in a previous frame and for producing a distinctive signal if said bits are different,

an N bit shift register clocked at said bit rate and providing an output,

second means providing a distinctive input to said register if and only if, said first means produces said distinctive signal contemporaneous with a distinctive output of said shift register,

counting means connected to the output of said shift register for counting distinctive outputs of said shift register,

memory means operated by said counting means to a predetermined condition if, and only if, said counting means counts a single distinctive output in a period corresponding to a single frame,

third means for identifying said framing bit and producing an output if, and only if, said shift register produces a distinctive output when said memory means is in said pre-determined condition,

timing means for producing frame pulses at said framing rate, said timing means being connected to and reset by said third means output, and,

an out-of-sync detector including a second and third counting means, said second counting means connected to and counting the output of said timing means,

said third counting means counting contemporaneous outputs of said timing means and said first means, and

comparator means connected to outputs of said second and third counting means for producing an out-of-sync signal when the output of said second counting means exceeds the output of said third counting means.

4,002,846

MULTIPLEXED DIGITAL TRANSMISSION SYSTEM WITH MEANS FOR CHANNEL INSERTION AND EXTRACTION

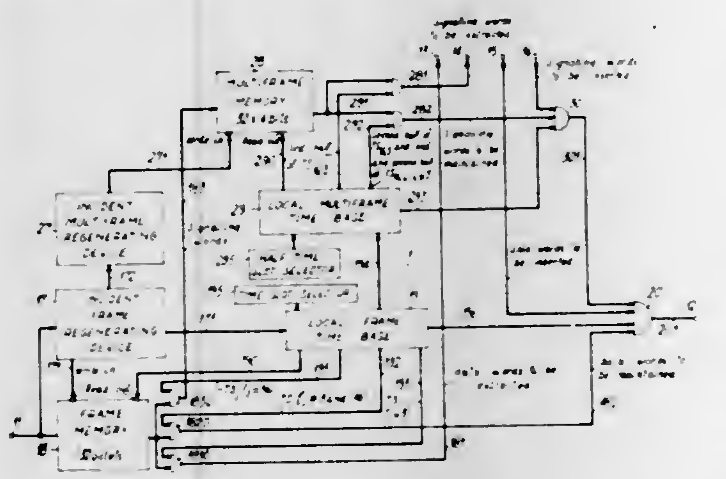
Xavier N. Barbier, Plessis Trevise, France, assignor to Societe Anonyme de Telecommunications, Paris Cedex, France

Filed Dec. 22, 1975, Ser. No. 643,001

Claims priority, application France, Dec. 31, 1974, 74.43511

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 BD **3 Claims**



1. A multiplex digital transmission system comprising:

a multiplex channel comprising a plurality of digital component channels;

each of said component channels conveying data information and signalling information;

the data information of said digital component channels being time multiplexed in time slots containing data words and forming a frame;

the signalling information of said component channels being time multiplexed in time slot parts containing signalling words and forming a multiframe;

a plurality of component channel extraction and insertion stations located along the transmission path of the system channels;

each of said extraction and insertion stations having an input, an output, a particular insertion input and a particular extraction output;

means in each of said stations for reconstituting the frame of the incoming multiplex digital channel connected to said input of said extraction and insertion station;

means driven by said frame reconstituting means for reconstituting the multiframe of the incoming multiplex channel;

a data and signalling word store, a write addressing means for the data word and a signalling word store all controlled by said frame reconstituting means;

a signalling word store and a write addressing means controlled by said multiframe reconstituting means;

a self driven local frame time base synchronized by said frame reconstituting means;

means controlled by said local frame time base to selectively direct the words stored in said data word and signalling word store to said signalling word store;

a multiframe time base driven by said self driven local frame time base;

means for selectively directing parts of the signalling words stored in said signalling word store to the output of said multiplex channel and to the particular extraction output of the corresponding component channel; and,

means for inserting in the output of the multiplex channel data words and signalling words applied to the input of the particular insertion means of the digital component channels.

4,002,847

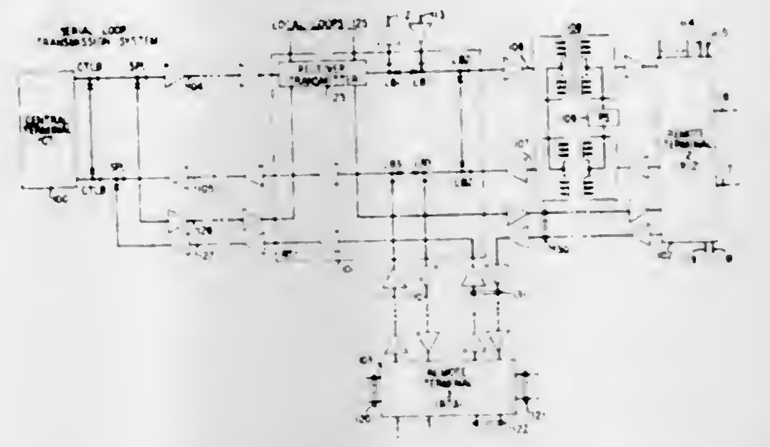
FAULT ISOLATION IN A SERIAL-LOOPED TRANSMISSION SYSTEM

James Edward Dail, Budd Lake, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1975, Ser. No. 645,022

Int. Cl.² H04J *3/14*

U.S. Cl. 179—15 AL **10 Claims**



9. In a serial data loop transmission system including a central station and a plurality of remote stations, a loop sectionalizing system comprising:

a sectionalizing switch at each of said remote stations,

signaling means at each central station for selectively controlling said sectionalizing switches, and

delay means at each of said remote stations for selectively delaying the operation of said sectionalizing switches at each of said remote stations not currently selectively controlled by said signaling.

4,002,848

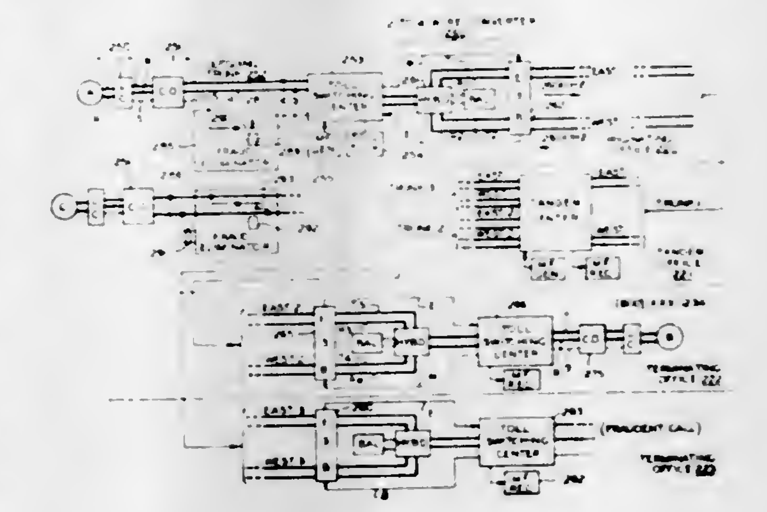
TOLL FRAUD ELIMINATOR FOR TELEPHONE SYSTEMS

Richard P. Stein, Monrovia, Calif., assignor to Reliable Electric Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 523,566, Nov. 14, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,188

Int. Cl.² H04M *1/66*

U.S. Cl. 179—18 DA **13 Claims**



1. A system including a single frequency toll fraud eliminator, said system comprising a telephone exchange having a

plurality of lines connected to one side and trunks connected to the other side, at least one of said trunks comprising a d.c. to single frequency converter means connected to originate and terminate ends of said one trunk; said toll fraud eliminator comprising single frequency tone detecting means connected to said one trunk on the d.c. side of said d.c. to single frequency converter means at the end of said one trunk where said call originated, whereby said tone detector is connected into said trunk at a point where an apparently valid control tone signal of said single frequency cannot legitimately appear, said single frequency tone detecting means operating responsive to signals having said single frequency and call barring means operated responsive to said single frequency tone detecting means for interrupting any call connection from said exchange which is then using said telecommunication channel.

11. A toll fraud eliminator for use on a toll path including at least one telecommunication channel, comprising a d.c. to single frequency converter means connected to originate and terminate ends of said telecommunication channel; said toll fraud eliminator comprising means for connecting said eliminator to said toll path on the d.c. side of said d.c. to single frequency converter means at the originating end of said telecommunication channel, means responsive to signals appearing on said connecting means for precluding a continuation of a call or an attempted call in progress when said signals so appear, said call continuation precluding means comprising means for detecting upper and lower threshold frequencies on opposite sides of said single frequency connected in a series circuit including a relay, said threshold detecting means passing substantially only said single frequency, means responsive to the output of said threshold detecting means for operating said relay, and contacts on said relay for causing said preclusion of the continuation of said telephone call.

4,002,849

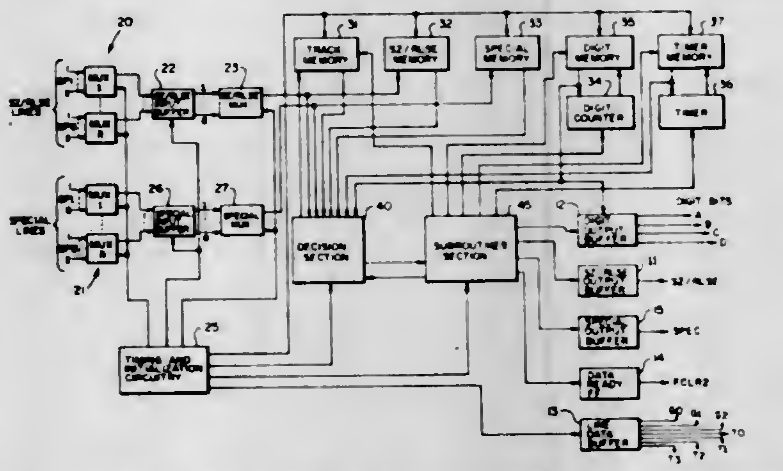
SCANNING APPARATUS FOR DETECTING AND ANALYZING SUPERVISORY AND SIGNALING INFORMATION

Frederick Kotler, Needham, Mass., and David A. Zlotek, Nashua, N.H., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 621,771

Int. Cl.² H04M *3/22*

U.S. Cl. 179—18 EB **14 Claims**



1. Apparatus for receiving and counting pulses comprising means for receiving an incoming signal with portions of a first level and with pulses of a second level;

sampling means for periodically sampling an incoming signal and determining whether each sample is at the first or the second level;

sample memory means for storing the most recent sample;

digit counting means for recording a count in response to the presence of a sample at the second level when the most recent sample stored in the sample memory means is at the first level;

timing means for accumulating a count of samples at the first level;

means for clearing the timing means of the accumulated count therein in response to the presence of a sample at the first level when the most recent sample stored in the sample memory means is at the second level;

readout means for reading out the accumulated count in the digit counting means when a predetermined accumulated count is present in the timing means; and

means for clearing the digit counting means of the accumulated count therein subsequent to reading out of the accumulated count by the readout means;

whereby the readout means produces a count of the number of pulses at the second level occurring prior to a period at the first level sufficiently long for the timing means to accumulate a count equal to said predetermined count.

4,002,850

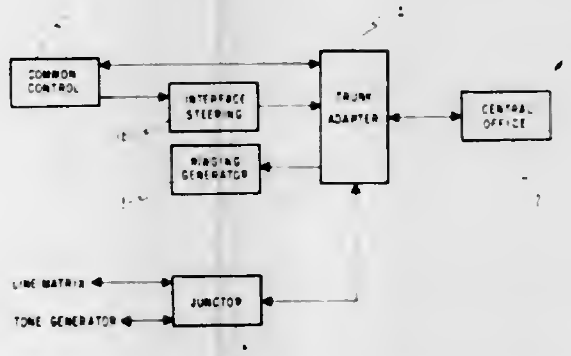
TRUNK ADAPTER

Glenn L. Richards, Caledonia, and Uwe A. Pommerening, Webster, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,871

Int. Cl.² H04Q *3/58*

U.S. Cl. 179—18 AH **13 Claims**



1. In a common control private automatic branch exchange telephone system having trunks and associated junctor circuits for connecting said system with a central office and being associated with said system on a time-shared basis,

the improvement comprising a trunk adapter, interconnected with the junctor circuits of said system and with said central office, for carrying out a purality of different trunk functions which are continuosly monitored by said common control, to thereby effect the coupling of said system to said central office.

4,002,851

TELECOMMUNICATION SYSTEM CONTROLLED BY STORED PROGRAM INSTRUCTIONS

Lars-Ake Evert Larsson, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 19, 1975, Ser. No. 578,734

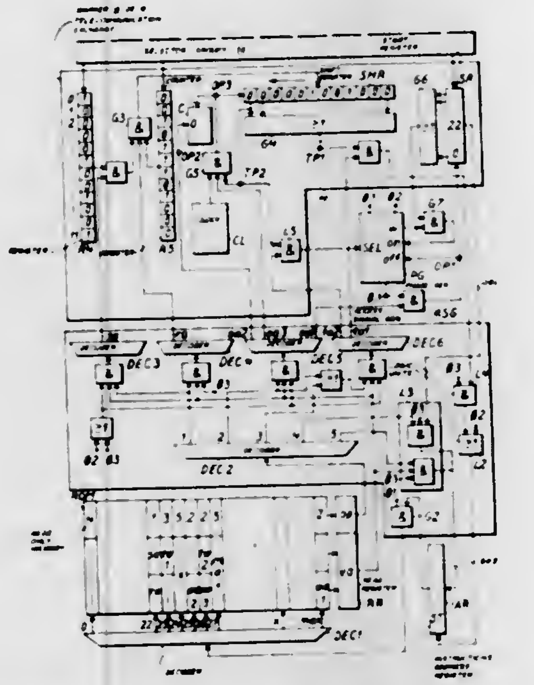
Claims priority, application Sweden, June 6, 1974, 7407431

Int. Cl.² H04Q *3/54*

U.S. Cl. 179—18 ES **6 Claims**

1. In a stored program controlled telecommunication system operating in processing cycles and having test points accessible for testing their binary state by means of test access signals, operating points accessible for activation by means of operating access signals, and data storage registers accessible for sending and receiving, respectively, data by means of data transfer access signals, control apparatus comprising: a phase signal generator means for generating series of differently phased timing signals for dividing each processing cycle into a set of different phases; an instruction address register for storing instruction addresses, said instruction address register having means for incrementing a stored instruction address in response to an incrementing control signal; instruction register means having a plurality of addressed storage registers each having an instruction address assigned thereto and each

storing a control instruction; data transfer connecting means interconnecting at least some of said registers including said data storage registers; and access signal generating means connected to said phase signal generator means, to said instruction address register, to said addressed storage registers, to said test points, to said operating points and to at least some of said data storage registers and including means for generating test access signals for transfer to said test points upon receipt of test control instructions from said addressed storage registers, for generating operating access signals for transfer to said operating points upon receipt of operating control instructions from said addressed storage registers and for generating transfer signals upon receipt of transfer control instructions from said addressed storage registers, said access signal generating means further comprising a first logic means operative during at least one of the phases of the processing cycle for controlling the transfer to said means for generating the access signals of the contents of the addressed storage register whose instruction address is stored in said instruction address register, a second logic means for transmitting said incrementing control signal to said incrementing means of said instruction address register during another of the phases of the processing cycle, and third logic means operative in response to one of the control instructions for controlling the transfer of the address of one of the addressed storage registers stored in one of said registers to said instruction address register during a further phase of the processing cycle.



4,002,852

ELECTRONIC TELEPHONE NETWORK

Kenneth Watt Martin, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 8, 1975, Ser. No. 594,026

Int. Cl.² H04M *1/00, 1/60*

U.S. Cl. 179—81 B **17 Claims**

1. An electronic telephone network for receiving and transmitting signals over a two-wire telephone line the impedance of which may vary over a given range, said network comprising in combination:

a preamplifier,

means for applying telephone input signals to said preamplifier;

a line-driver amplifier having an input coupled to said preamplifier and an output coupled to said line and being responsive to said preamplifier for amplifying the output signals of said preamplifier and wherein the gain of said line-driver amplifier varies in accordance with its output impedance relative to the impedance of said line;

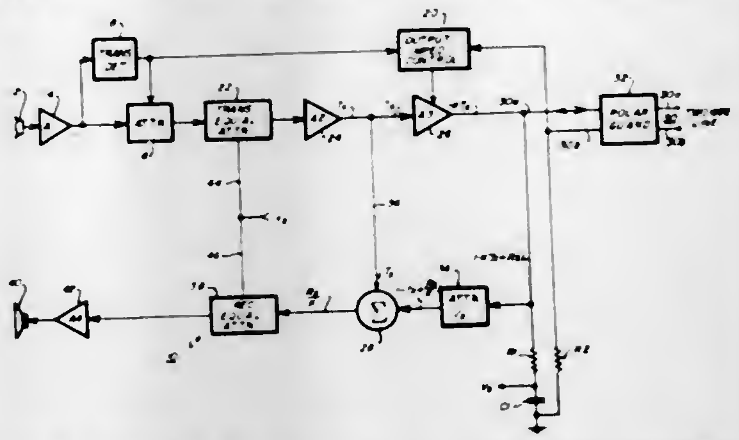
means coupled across said line-driver amplifier for substantially separating received signals from said telephone line and for providing the separated signals at an output thereof, said separating means including an attenuator wherein an attenuated portion of the signals at said output of said line-driver amplifier is combined with a portion of the signals at its input to provide said separated signals;

a receive amplifier coupled to said output of said separating means for increasing the level of said separated signals;

means for deriving operating potential for said network from said line;

means coupled between said preamplifier and said line-driver amplifier and responsive to said telephone input signals for providing a control signal when the level of said telephone input signals exceeds a predetermined value; and,

means coupled to said line-driver amplifier and responsive to said control signal for decreasing the AC output impedance of said line-driver amplifier from a first given level to a second given level when the level of said telephone input signals exceeds said predetermined value, thereby to reduce the gain variations of said line-driver amplifier with respect to variations in the impedance of said line over said given range.



4,002,853

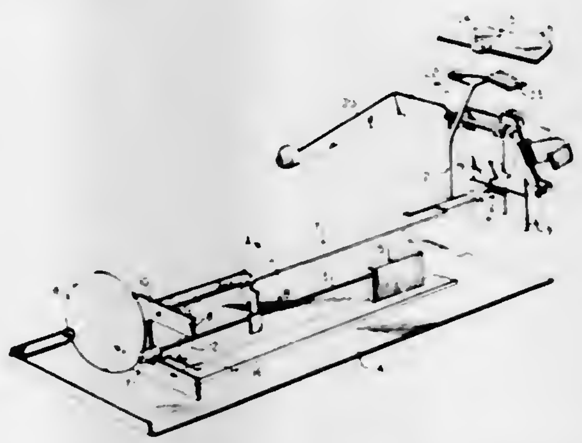
VISUAL RING INDICATOR

Hans George Mattes, Ocean Township, Monmouth County, and Daniel Edward Oates, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 13, 1975, Ser. No. 604,162

Int. Cl.² H04M *1/21*

U.S. Cl. 179—84 L **7 Claims**



1. A telephone station set having a visual ring indicator for informing a user that said station set has been rung, where said station set includes a switchhook and a ringing system comprising a clapper which vibrates in response to an incoming call, said apparatus comprising: an indicator element having at least an on and off position, said indicator element comprising: a mechanical link responsive to physical impact of said vibrating clapper for placing said indicator element in said on position; means for resetting said indicator element to said off

position in response to operation of said switchhook; and means for viewing said on and off positions of said indicator element.

4,002,854
LOUDSPEAKING TELEPHONE INSTRUMENTS

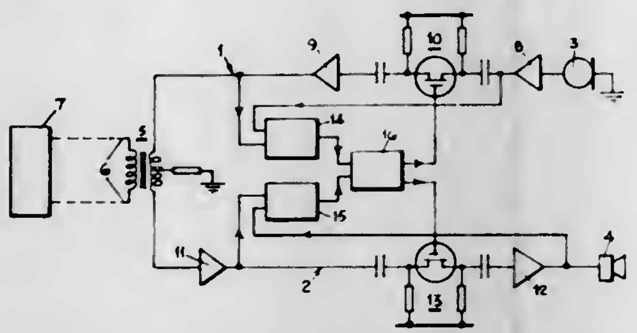
David John Pearose, Darlington, England, assignor to The General Electric Company Limited, London, England

Filed Sept. 22, 1975, Ser. No. 615,504

Claims priority, application United Kingdom, Sept. 27, 1974, 42099/74

Int. Cl.² H04M *9/08*

U.S. Cl. 179—81 B **7 Claims**



1. A loudspeaking telephone instrument including a voice switching arrangement by means of which in operation signals on a send path or a receive path selectively are substantially attenuated in dependence upon the relative amplitudes of the voice frequency signals appearing on said paths, the voice switching arrangement comprising a voltage comparator and respective rectifier circuit means to derive from said signals appearing on said send and receive paths unidirectional voltage signals for application to respective inputs of said comparator, wherein at least one of said rectifier circuit means comprises means to derive from the respective unidirectional voltage signal a voltage proportional to the mean level of that unidirectional voltage signal, and rectifier means to derive said respective unidirectional voltage signal from the voice frequency signals on the respective path and from said voltage proportional to said mean level, such that the effects of a continuing background noise on the level of said respective unidirectional voltage signal are reduced.

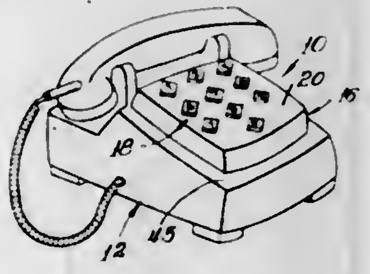
4,002,855
PUSH-BUTTON TELEPHONE ATTACHMENT

Jerome D. Schiffman, 116 Woodbine, Wilmette, Ill. 60091, and Bernard L. Kleinke, 934 Willson Drive, Des Plaines, Ill. 60016

Filed Sept. 24, 1974, Ser. No. 508,768

Int. Cl.² H04M *1/23*

U.S. Cl. 179—90 K **10 Claims**



1. An attachment adapted to be used with a push button telephone having an array of telephone push buttons, said attachment comprising:

a cup-shaped housing having an opened mouth adapted to fit over the array of push buttons of the telephone and to be secured in place thereover, said housing having a plate, said plate including an array of apertures extending therethrough, said plate having inner and outer faces;

an array of finger discs corresponding to at least some of the telephone push buttons for actuating them and bearing indicia on the front faces of said discs, said discs normally at least partially extending outwardly from the outer face of said plate, said discs having rear faces on the opposite side of said front faces; and

a series of elongated legs fixedly connected to said rear faces and slidably extending through said apertures to the telephone push buttons for actuating them selectively when depressed and alternatively maintaining said discs normally at least partially extending outwardly from the outer face of said plate, at least one of said legs having an axially-extending front portion disposed in axial alignment with its aperture in said plate and having a laterally extending intermediate portion connected at its forward end to said front portion and terminating in a foot portion adapted to engage one of the telephone push buttons.

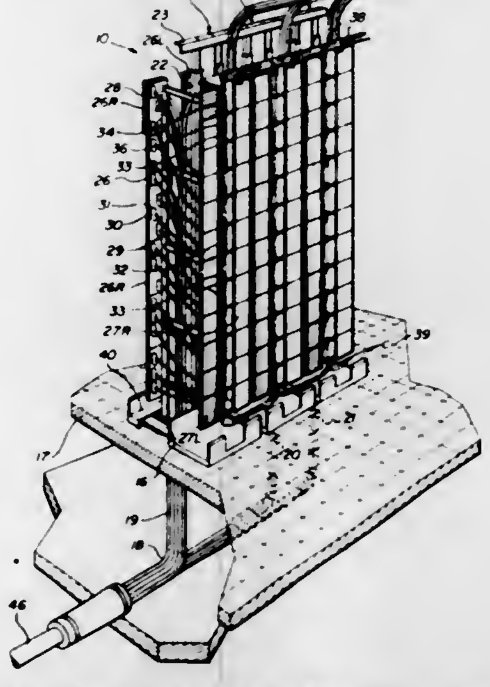
4,002,856
MODULAR DISTRIBUTION FRAME ASSEMBLY

William S. Sedlacek, Chicago; Edward S. Paluch, Elmwood Park, and William Andrew Brey, Schaumburg, all of Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed June 27, 1975, Ser. No. 591,037

Int. Cl.² H04Q *1/14*

U.S. Cl. 179—98 **10 Claims**



1. A modular distribution frame assembly comprising a vertically upstanding frame, a base structure, and a top structure, said base and top structures having means for securement to a subjacent and overhead supports, respectively, at least one of said structures being vertically extensible to accommodate varying spacings between said subjacent and overhead supports, a vertical array of protector blocks attached to one side of said frame, said protector blocks adapted for electrically conductive connection to subscriber lines, first and second vertical arrays of terminal blocks on the other side of said frame, said first terminal blocks having terminals thereon for electrical connection to said protector blocks, said second terminal block having terminals thereon for electrical connection to said central office equipment, means on said frame forming a main open vertical column between said protector blocks and said first and second terminal blocks, and interconnecting generally vertical jumper wires joining terminals of said first terminal block with the terminals of said second terminal block, said jumper wires being housed in said vertical column.

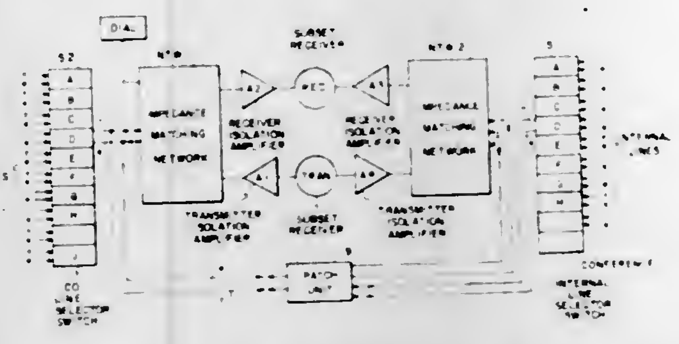
4,002,857
TELEPHONE CIRCUIT TO ELIMINATE USE OF A HOLD BUTTON

Richard Eugene Herlacher, Camp Hill, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 16, 1975, Ser. No. 641,201

Int. Cl.² H04M *1/72, 3/56*

U.S. Cl. 179—99 **11 Claims**


DIAL
SUBSET RECEIVER
IMPEDANCE MATCHING NETWORK
RECEIVER ISOLATION AMPLIFIER
TRANSMITTER ISOLATION AMPLIFIER
SUBSET TRANSMITTER
IMPEDANCE MATCHING NETWORK
TRANSMITTER ISOLATION AMPLIFIER
INTERNAL LINES
C.O. LINES

1. A telephone circuit to eliminate use of a hold button comprising:

a subset having a receiver and a transmitter for use by one party;

a plurality of central office lines connected to outside parties;

a plurality of internal lines connected to internal parties;

first means to couple said receiver and said transmitter to a selected one of said central office lines to enable a first two-way conversation between said one party and a selected one of said outside parties, said first means including a first network coupled between said transmitter and said receiver to reduce sidetones in said receiver;

second means to couple said receiver and said transmitter to a selected one of said internal lines to enable a second two-way conversation between said one party and a selected one of said internal parties, said second means including a second network coupled between said transmitter and said receiver to reduce sidetones in said receiver; and

third means coupled between said first means and said second means, said third means having a first state to enable said first and second conversations to be carried on simultaneously and to prevent said selected one of said outside parties and said selected one of said internal parties from hearing each other and a second state to selectively enable said one party, said selected one of said outside parties and said selected one of said internal parties to be placed in a two-way conference.

4,002,858
AUDIO PROGRAM SWITCHING APPARATUS

Edwin G. Giese, 1008 E. Fairy Chasm Road, Milwaukee, Wis. 53217

Filed Dec. 19, 1974, Ser. No. 534,163

Int. Cl.² G11B *31/00*

U.S. Cl. 179—100.1 C **4 Claims**

1. An electrical control apparatus, comprising a transducer converting electrical audio signals to audio sound waves, a primary source connected through a connecting circuit to said transducer and supplying a primary output including a continuous primary audio program, a secondary source connected to said transducer and selectively supplying a secondary output including a secondary audio program of a predetermined time duration followed by a control signal outside of the audio frequency range, an amplifying transistor connected in common emitter configuration and having a base circuit connected to receive said secondary output and a collector circuit operatively connected to a power source, a feedback coupling said collector and base circuits and including a first feedback path having a first resistor and a first circuit portion connected to a system ground potential through a first capacitor and a second feedback path having a second capacitor and a second circuit portion connected to said ground potential through a second resistor, said amplifying transistor resonating in response to said control signal to provide a resonating output at said collector circuit, a controlled rectifier having a gating circuit operatively connected to said collector circuit and an anode circuit providing an output in response to said resonating output, a timing circuit including a selectively variable impedance operatively connected to said power source and to a timing capacitor through a junction circuit connected to said anode output circuit, said timing circuit responding to said controlled rectifier and initiating a timing sequence of a predetermined time in response to said resonating output, a first switching circuit connected to said junction circuit and providing an output connected to said connecting circuit and operatively supplying said primary program to said transducer in response to said timing sequence initiation and operatively attenuating said primary program in response to the expiration of said predetermined time, and a second switching circuit connected to said first switching output and to said secondary source and operatively supplying said secondary output to said transducer and to said amplifying transistor in response to the expiration of said predetermined time.

4,002,859
MULTI-MODE ELECTROSTATIC MICROPHONE CONSTRUCTION

Karl Schoeps, Karlsruhe, and Joerg Wuttke, Pfinztal, Berghausen, both of Germany, assignors to Schalltechnik Dr. Schoeps, Karlsruhe, Germany

Filed Nov. 5, 1974, Ser. No. 521,150

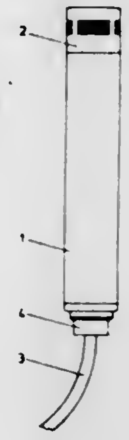
Claims priority, application Germany, Nov. 8, 1973, 2355778

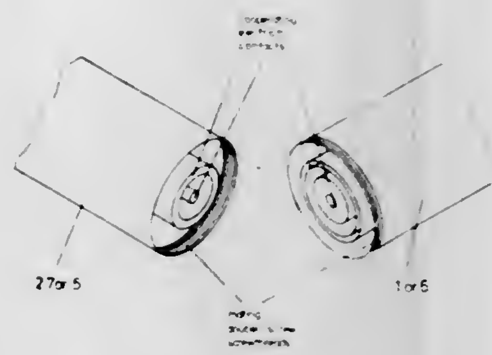
Int. Cl. H04r *1/00*

U.S. Cl. 179—146 R **16 Claims**

1. A set of components connectable together to form different microphone constructions, comprising, in combination, a first unit containing a microphone amplifier having an electrical input provided with electrical input contact means, said first unit having a first connecting portion; a second unit containing an electrostatic microphone transducer having an electrical output provided with electrical output contact means, said second unit having a second connecting portion, said first and second connecting portions being so configured as to be detachably connectable to each other, with said electrical output contact means of said transducer and said electrical input contact means of said microphone amplifier being so disposed relative to said first and second connecting portions, respectively, that when the latter are connected to each other said electrical output contact means of said transducer becomes electrically connected to said electrical input contact means of said microphone amplifier; a third unit containing an impedance converter circuit having a high-impedance electrical input adapted for electrical connection to a microphone transducer and a low-impedance electrical output provided

with electrical output contact means, said third unit having a respective third connecting portion, said first and third connecting portions being so configured as to be detachably connectable to each other, with said electrical output contact means of said impedance converter circuit and said electrical



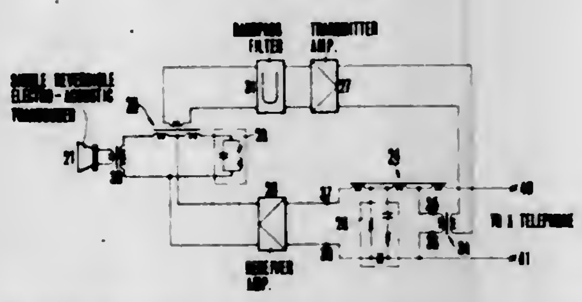


input contact means of said microphone amplifier being so disposed relative to said first and third connecting portions, respectively, that when the latter are connected to each other said electrical output contact means of said impedance converter circuit becomes electrically connected to said electrical input contact means of said microphone amplifier.

4,002,860
TRANSMITTING AND RECEIVING APPARATUS

Masaaki Terai; Kazuhiko Kakehi, both Tokyo; Ryoichi Matsuda, Musashino, and Giichi Ito, Koganei, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Apr. 2, 1975, Ser. No. 564,544
Claims priority, application Japan, Apr. 4, 1974, 49-37326
Int. Cl.² H04B *1/52, 3/36*
U.S. Cl. 179—170 R **9 Claims**

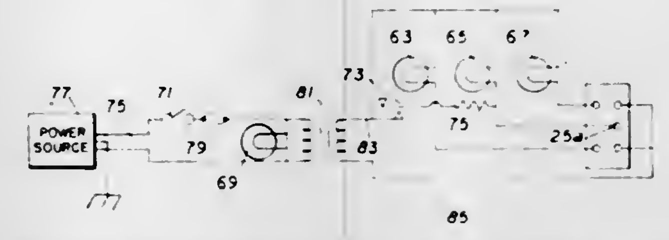


1. Transmitting and receiving apparatus comprising a single reversible electro-acoustic converter acting as a transmitter and a receiver, and first and second 2-wire to 4-wire converters, the 2-wire side terminal pair of said first 2-wire to 4-wire converter being connected to said reversible electro-acoustic converter, the first terminal pair of the 4-wire side terminal pairs of said first 2-wire to 4-wire converter being connected to the first terminal of the 4-wire side terminal pairs of said second 2-wire to 4-wire converter through an amplifier for constituting a transmitting system, the second terminal pair of said 4-wire side terminal pairs of said first 2-wire to 4-wire converter being connected to the second terminal pair of the 4-wire side terminal pairs of said second 2-wire to 4-wire converter for constituting a receiving system, and the 2-wire side terminal pair of said second 2-wire to 4-wire converter being connected to a communication line.

4,002,861
PROTECTOR MODULE TEST SET

Dan W. Putt, 206 Avalon Road, Sebring, Fla. 33870

Filed Oct. 6, 1975, Ser. No. 619,949
Int. Cl.² H04M *3/22*
U.S. Cl. 179—175 **2 Claims**



1. A test set for a telephone connector protector (17) module used in a telephone connector (11) for cable terminations, said telephone connector (11) having a multiplicity of five prong protective modules (17) plugged therein, each of said modules having a tip and a ring circuit (29, 31) with a tip, ring, and ground, long prong (21, 23, 25), and a tip and ring short prong (27, 28), one heat coil (33, 35) and a shunt switch (37, 39) coupled to the tip and ring circuits and the ground prong, said test set comprising in combination;

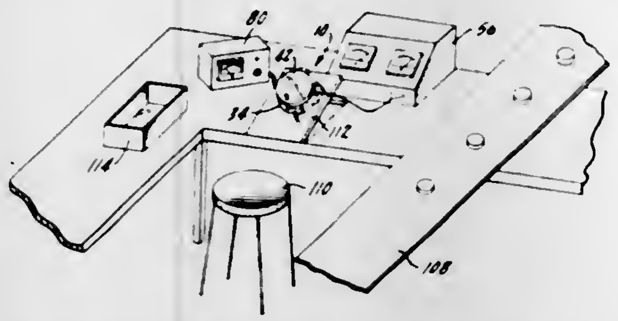
- a. a rectangular box-like housing (55), with a front panel (59);
- b. a receptacle (61) in the center of said panel for receiving a five prong module having tip ring and ground long plugs (21, 23, 25) and tip and ring short plugs (27, 28);
- c. tip, alarm, and ring lamp sockets and lamps (63, 65, 67) in line in said panel above said receptacle (61), a clear switch (73), pilot lamp (69), power switch (71), in line in said panel below said receptacle;
- d. a power line (75) connected to said housing (55) with a plug in unit (77);
- e. a power line circuit connected to said plug-in unit including said power switch (71), a transformer primary and secondary (81), a pilot lamp (69) in parallel with said transformer primary and a fuse (79);
- f. first and second side lines (85, 83) connected to said secondary, said first side (85) terminating in tip and ring short plugs of said receptacle (61);
- g. a tip circuit connected between said second side (83) and said tip long plug having said tip lamp (63) in series therein;
- h. a ring circuit connected between said second side (83) and said ring long plug having said ring lamp (67) in series therein;
- i. an alarm circuit connected between said second side and said ground long plug having said alarm lamp (65) and a junction in series therein; and,
- j. a clear circuit connecting said second side and said junction having said clear switch (73) and a high value resistor therein,

whereby, when a module to be tested is placed in said receptacle and the power switch is closed, the ring and tip lamps will light up if the module is in good order, the alarm light will not light up if there is no short, and if the clear switch is pressed the circuit closing should clear carbon dust in the modules, while if the tip or ring lamps fail to light or if the alarm lamp remains lit, the module is defective.

4,002,862
SOUND AUDIT STATION AND METHOD OF TESTING ELECTRIC HORNS

Juris Turlais, Marion, Ind., assignor to United Filtration Corporation, Marion, Ind.

Filed Sept. 18, 1975, Ser. No. 614,496
Int. Cl.² H04R *29/00*
U.S. Cl. 179—175.1 A **4 Claims**

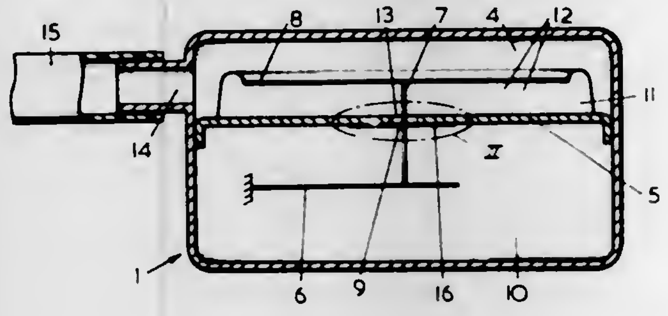


1. A sound audit station for testing electric horns, comprising a sound-detecting fixture including an elongated progressive wave tube, a mass of sound-absorptive material within the progressive wave tube spaced from one end and substantially filling a partial length of the tube, and sound-detecting means interposed within the progressive wave tube between said one end and the mass of sound-absorptive material, a horn mounting associated with said one end of the progressive wave tube for positioning a horn being tested relative to said one end, said horn mounting including sound-absorptive material for substantially containing sound from a horn being tested within the progressive wave tube and horn mounting, a source of electric power, electrical connecting means between the source of electric power and the sound-detecting fixture, including means for operatively connecting the electrical connecting means to a horn being tested to actuate the horn, a display indicator associated with the sound-detecting means for presenting a direct readout of the correlated sound level of a horn being tested, a sound level amplifier operatively connected between the sound-detecting means and display indicator to adjust signals from the former for presentation by the latter, and an an annular electromagnetic noise interference shield disposed within the horn mounting around the sound-absorptive material for reducing electromagnetic interference during the testing of D.C. horns.

4,002,863
TRANSDUCER AND METHOD OF MAKING SAME

Harmen Broersma, Stoombootweg 9, Amsterdam-N., Netherlands

Filed Dec. 2, 1974, Ser. No. 528,803
Int. Cl.² H04R *1/28, 31/00*
U.S. Cl. 179—180 **2 Claims**

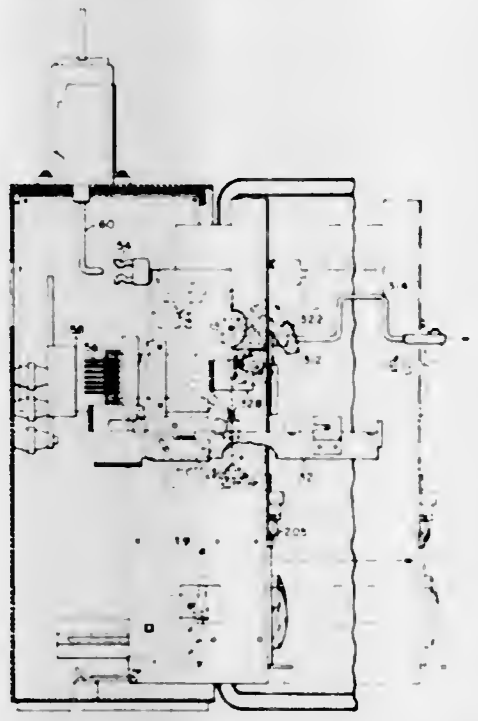


1. A method of making a hearing aid comprising a miniature transducer having a housing, an electromechanical motor in said housing, a partition subdividing said housing and having associated therewith a foil with a passage therethrough, and a linkage pin extending through said passage, which includes the steps of placing said linkage pin into said opening with clamping fit, and selecting the material of the linkage pin and said foil so that after initiating the operation of said electromechanical motor the outer surface of said linkage pin and the edges of said opening will wear each other out until they are just free of play.

4,002,864
ENCLOSED CIRCUIT INTERRUPTER WITH INTERLOCKED SAFETY BARRIER

Edmund W. Kuhn, Pittsburgh; William P. Matty, Jr., Bethel Park, and Alan G. McGuffie, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1975, Ser. No. 564,575
Int. Cl.² H01H *9/20*
U.S. Cl. 200—50 AA **3 Claims**



1. A drawout type circuit interrupter, comprising:
an enclosure;
load terminals connected to an electrical load;
line terminals connected to a source of electrical energy at high potential;
a drawout unit movably mounted within said enclosure and comprising a levering mechanism for moving said interrupter unit between connected and disconnected positions, said drawout unit comprising separable contacts bridging said load and line terminals and placing high potential upon components of said drawout unit when said drawout unit is in a connected position;
a vertical upstanding protective barrier of conductive material removably attached to said drawout unit; said barrier, when attached; being at ground potential and preventing all access to components at high potential; and
interlock means comprising catch means attached to said barrier and engaging means attached to said levering means, said engaging means mechanically capturing said catch means when said drawout unit is in any position other than a fully disconnected position, thereby preventing removal of said barrier when said drawout unit is in any position other than a fully disconnected position.

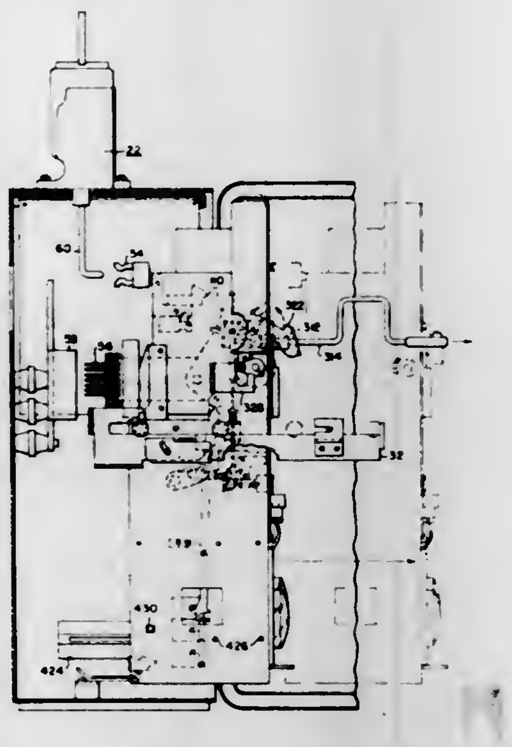
4,002,865
DRAWOUT TYPE CIRCUIT INTERRUPTER WITH INTERLOCKED LEVERING MECHANISM

Edmund W. Kuhn, and Alan G. McGuffie, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1975, Ser. No. 564,577

Int. Cl.^{2} H01H *9/22*

U.S. Cl. 200—50 AA **8 Claims**



1. A drawout type circuit interrupter, comprising:
an enclosure;
a circuit interrupter unit mounted within said enclosure and movable between connected and disconnected positions;
drawout means for moving said circuit interrupter unit between connected and disconnected positions;
means removably attached to said drawout means for operating said drawout means; and
interlock means permitting insertion and removal of said operating means when said circuit interrupter unit is in either a connected or a disconnected position, said interlock means preventing insertion and removal of said operating means when said circuit interrupter unit is in any position intermediate a connected and disconnected position, said interlock means comprising a shutter pivotally attached to said drawout means and movable between raised and lowered positions, said shutter comprising means for engaging said operating means to prevent insertion or removal of said operating means when said shutter is in a lowered position.

4,002,866
ELECTRIC SWITCHES

William E. Ward, Clanfield, England, assignor to Illinois Tool Works Inc., Chicago, Ill.

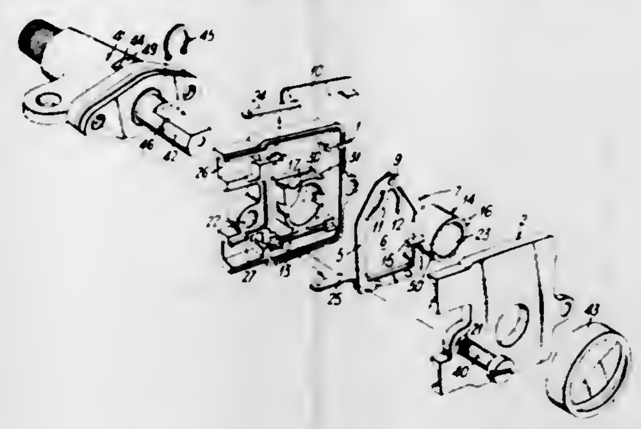
Filed Apr. 18, 1975, Ser. No. 569,528

Claims priority, application United Kingdom, Apr. 19, 1974, 17338/74

Int. Cl.^{2} H01H *13/36*

U.S. Cl. 200—67 D **11 Claims**

1. An electrical switch for a gas valve having a shaft for opening the valve by rotation of the shaft comprising a housing having a generally cylindrically-shaped hollow boss integrally formed thereon; a first contact member which is of resilient flexible material and includes a frame defining a central window, the frame lying generally in a plane and consisting of a base, two opposite sides, and a tip, the base being fixed in the housing and the remainder of the frame being movable; a fulcrum formed on said boss and aligned with the window and fixed in the housing; a second contact member, fixed in the housing adjacent to the tip of the first contact member; a stop fixed in the housing adjacent to the tip; and a hollow cylindrically-shaped actuating member having a central bore, the axis of which is transverse to the general plane of the frame, and the cross-section of which is aligned with the window; a control member adjacent said actuating member which may be reciprocated and rotated simultaneously, the actuating member being able to reciprocate in said boss and to be guided by said boss relatively to the housing in the direction of the axis of the bore, when said actuating member is contacted by said control member, and the actuating member having a pair of diametrically opposed pins aligned with each other and extending in opposite directions from said actuating member cooperating with the sides of the frame; said boss being formed with a pair of parallel slots on opposite sides of said boss which receive said pins therein and which guide said pins so as to restrain the actuating member from rotating during actuation and deactuation of the switch, but which will allow for rotation of said shaft of said gas valve when said shaft is rotated by said control member; the first contact member including a tongue projecting into the window from adjacent to the tip of the frame, and terminating in an end which is in compressive engagement with the fulcrum, and the proportions of the switch being such that a predetermined stroke of the actuating member will cause the first contact member to snap from a first extreme position to a second extreme position, and release of the actuating member will enable the first contact member to snap back to the first extreme position, the tip making firm engagement with the second contact member when in one of the said extreme positions, and being spaced from the second contact member and in engagement with the stop when in the other of said extreme positions.



4,002,867
VACUUM-TYPE CIRCUIT INTERRUPTERS WITH CONDENSING SHIELD AT A FIXED POTENTIAL RELATIVE TO THE CONTACTS

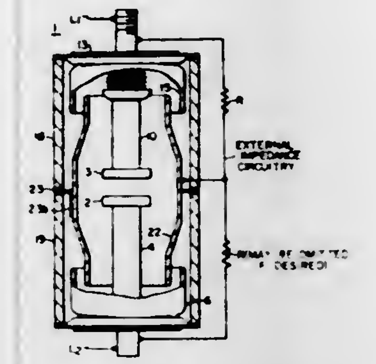
Sidney J. Cherry, Elmira, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,952, Nov. 1, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,373

Int. Cl.^{2} H01H *33/66*

U.S. Cl. 200—144 B **7 Claims**

1. An alternating current circuit interrupter of the vacuum type, including in combination:
a. a generally cylindrical insulating casing defining a highly-evacuated envelope;
b. a pair of relatively movable conductive contact posts sealingly extending through opposed ends of the envelope along the longitudinal axis of the cylindrical insulating casing;
c. arc contact members disposed at the ends of the respective contact posts within the space defined by the cylindrical insulating casing;
d. a single centrally disposed metallic condensing shield supported from the cylindrical insulating casing and centrally disposed within the space defined by the cylindrical insulating casing about the arc contacts and the gap between the contacts when they are spaced apart to shield the insulating casing from vaporized metal from the contacts;
e. a resistive coating disposed on the interior or exterior surface of the insulating casing and electrically contacting the centrally disposed metallic condensing shield, which resistive coating extends to and serially electrically connects the condensing shield to at least one of the contact posts whereby the potential on the condensing shield may be quickly dissipated through the resistive coating.



4,002,868
MECHANICALLY OPERATED ELECTRIC SWITCH, PARTICULARLY BREAKER CONTACT FOR AUTOMOTIVE IGNITION SYSTEMS

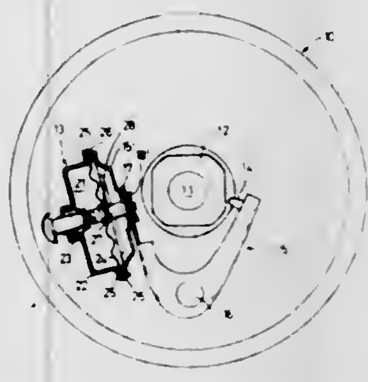
Helmut Jooss, Ditzingen; Hartmut Brammer, Stuttgart, and Helmut Funke, Munchingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 2, 1975, Ser. No. 609,448

Claims priority, application Germany, Sept. 14, 1974, 2444039

Int. Cl.^{2} H01H *19/62*

U.S. Cl. 200—30 A **10 Claims**



1. Sealed electrical switch adapted for cooperation with an operating means (11, 12) located adjacent to, but spaced from the switch comprising
a housing structure (13) having rigid walls and including a movable membrane (24) forming another wall of said structure and defining a gas-tight chamber therein;
a fixed electrical contact (19) extending into and sealed through the fixed walls of the housing structure;
a carrier bolt (18) extending through and sealed to the membrane (24) and movable transversely to the major plane of the membrane;
a movable contact (20) carried by the carrier bolt (18) at the portion thereof within the gas-tight chamber;
and motion-transmitting means (15, 16, 17) coupled to the bolt and engageable by the operating means (11, 12) to move the bolt and guide it in contact opening and closing reciprocating movement comprising
a double-arm lever of approximately V shape pivoted approximately at the apex of the V, laterally with respect to the operating means (11, 12), and including the operating means in the angle between the arms of the V, one lever arm being shaped for cooperation with said operating means (11, 12), and the other lever arm acting without play on the carrier bolt (18), movement transferred to the carrier bolt being in a direction towards the operating means when movement of the bolt tends to open the contacts.

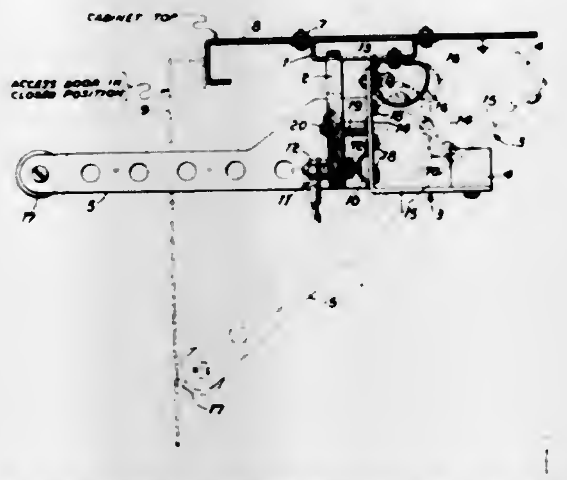
4,002,869
AUTOMATIC HIGH VOLTAGE GROUNDING DEVICE FOR PERSONNEL SAFETY

Philip Anthony Taccetta, Lanham, and Robert Michael Novak, Baltimore, both of Md., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 8, 1975, Ser. No. 575,681

Int. Cl.^{2} H01H *3/16*

U.S. Cl. 200—61.7 **11 Claims**



1. An automatic high voltage grounding device to short high voltages within a cabinet to cabinet ground when a cabinet access door having a latch side is opened comprising:
a base plate secured to said cabinet adjacent said access door;
a high voltage terminal board secured to said base plate, said terminal board having a plurality of high voltage terminals extending therethrough;
a grounding plate pivotably secured to said base plate;
a plurality of spring finger contacts secured to said grounding plate, each of said plurality of spring finger contacts contacting a different one of said plurality of terminals when said access door is fully open;
an actuating lever having one end secured to said grounding plate and the other end engaging the inner surface of said access door to control the movement of said grounding plate to ground said plurality of terminals when said access door is fully opened and to remove ground from said plurality of terminals when said access door is closed, said lever losing contact with said access door when said access door is fully opened to ground said plurality of terminals; and
a counter weight secured to said grounding plate and providing a positive movement of said grounding plate and a positive grounding contact between said plurality of terminals and said plurality of spring finger contacts when said access door is fully opened to protect personnel from said high voltages on said plurality of terminals.

4,002,870
ARCING CONTACT FOR A HIGH CURRENT SWITCH

Bernard L. Phillips, Norwood, Mass., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed July 18, 1974, Ser. No. 489,753

Int. Cl.^{2} H01H *33/12*

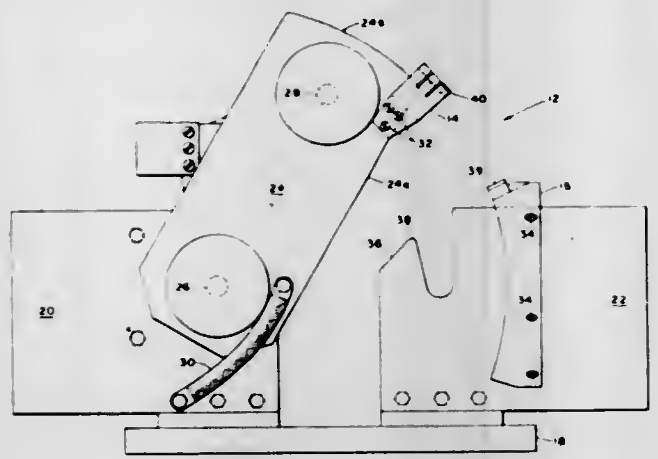
U.S. Cl. 200—146 R **14 Claims**

1. An arcing contact for a high current switch having a pair of relatively movable switch members that move in a sliding face-to-face engagement to close and open the switch, comprising

a set of resilient laminations in adjacent, face-to-face contact, each having a fixed end portion, a body portion and a free end portion that is bent at an angle substantially perpendicular to the body portion,

said fixed end portion being mounted on a face of a first switch member of said pair so that the end surfaces of the free end portions of each lamination are in electrical connection with a contact face of a second switch member of said pair to shunt the switch members when the switch makes on closing and breaks on opening, and

said second switch member deflecting each of said laminations as they move into said electrical connection thereby developing a spring force that urges said end surfaces against the contact face of said second member, said deflection being in a direction substantially normal to the direction of movement of said switch members and said laminations.



4,002,871

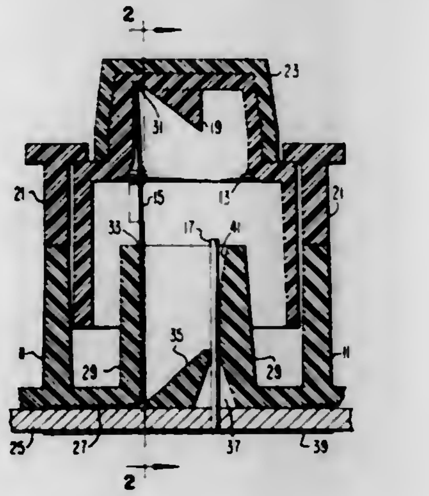
COLUMN LEAF SPRING PUSH-BUTTON SWITCH FOR USE IN A KEYBOARD

Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 20, 1974, Ser. No. 534,825

Int. Cl.² H01H *3/12*

U.S. Cl. 200—159 A **15 Claims**



1. A switching apparatus comprising:

resiliently deformable electrically conductive columnar means for resiliently deflecting into a bowed configuration upon actuation, said columnar means being capable of deflecting only in a lateral direction with respect to its undeflected configuration;

actuating means for causing said columnar means to be selectively and forcibly deflected into a bowed configuration;

elongated, resilient contact means parallely disposed with respect to said columnar means for engagement by said columnar means when said columnar means is forcibly actuated into a bowed configuration and for cooperating with said columnar means to complete a switching action; and

elongated damping means substantially parallely disposed and adjacent to said elongated contact means to cooperate with said contact means when said contact means is forcibly engaged by said columnar means.

4,002,872

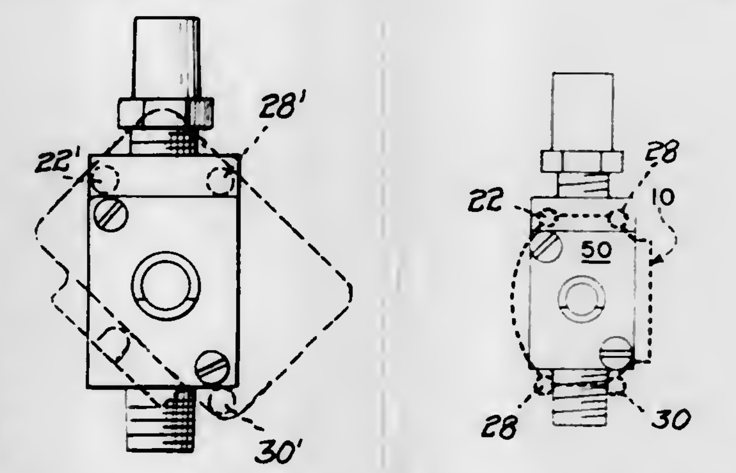
ELECTRICAL SWITCH HOUSING DETACHABLY MOUNTABLE ON A GAS VALVE STRUCTURE

Frank B. Desio, Melrose Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 18, 1975, Ser. No. 588,126

Int. Cl.² H01H *9/02*

U.S. Cl. 200—294 **6 Claims**



1. In an electrical switch assembly including a housing having an outside surface and an aperture therethrough and an operating member rotatably mounted in said aperture of said housing for receiving a control shaft the improvement comprising a pair of mounting posts of electrically insulating material that extend in a substantially normal direction from said outside surface of said housing with said posts of said pair of posts being positioned substantially equidistant from the center of the said aperture along first and second radial lines, each of which pass substantially through the center of one of said posts and the center of said aperture wherein said radial lines make an angle of approximately 135° therebetween the chordal length of a line running between the posts of each pair of posts is approximately one and one-quarter inches.

4,002,873

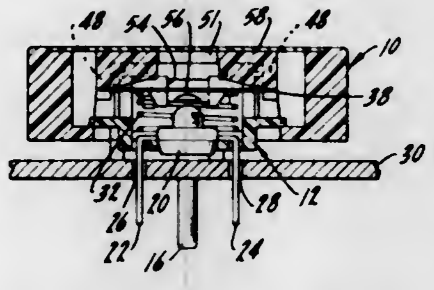
ILLUMINATED PUSHBUTTON SWITCH

Raymond F. Lewandowski, Mount Prospect, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Feb. 6, 1975, Ser. No. 547,436

Int. Cl.² H01H *9/00*

U.S. Cl. 200—314 **1 Claim**



1. A pushbutton switch including a base and a button telescopically mounted on the base, at least a portion of said button being light transmissive, spaced terminals extending outwardly from the base and having portions positioned within the base, spring means normally biasing the button away from the base,

a contact having a plurality of outwardly extending substantially co-planar arms positioned between the base and button, certain of said arms being disposed for contact with said terminal portions, the remaining arms being disposed for contact by said button, means on the button for contacting said remaining arms to move said certain arms into contact with said terminal portions,

said substantially co-planar arms being joined together in a central area, an opening generally in the center of said central area, a light emitting diode positioned within said base and on the side of said contact away from said button, said light emitting diode being positioned in direct alignment with said contact opening and said light transmissive button portion.

4,002,874

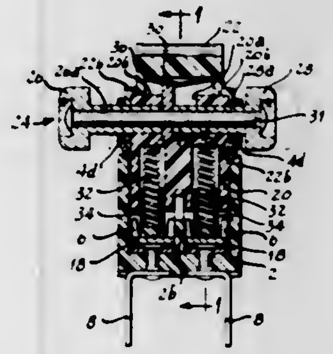
DOUBLE-THROW ROCKER SWITCH WITH SELECTIVE LOCKOUT MEANS

Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 19, 1975, Ser. No. 559,673

Int. Cl.² H01H *21/50*

U.S. Cl. 200—321 **10 Claims**



1. A double-throw rocker switch with selective lockout means comprising:

a switch housing having an opening at the top;

stationary contacts within said housing connected to terminals outside said housing;

movable contact means in said housing operable to be moved into engagement with selected stationary contacts;

a switch operator comprising a double-throw rocker portion outside said housing adapted to be actuated from a center position in one or another direction by the user, a contact actuator portion coupled for double-throw rocking movement with said rocker portion and extending through said opening into said housing for moving said movable contact means, and pivoting means pivotally supporting both of said portions for double-throw rocking movement on said housing;

and selective lockout means including mounting means therefor rendering the same shiftable into one or another selective position for limiting rocking movement of said rocker portion to said one or said other direction as determined by the selective position of said lockout means.

4,002,875

HIGH FREQUENCY HEATING APPARATUS

Mitsuyuki Kiuchi, Toyonaka; Shigeru Kusunoki, Yamato Koriyama; Hiroshi Fujieda, Nara; Keizo Amagami, Takatsuki, and Tadao Toyooka, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

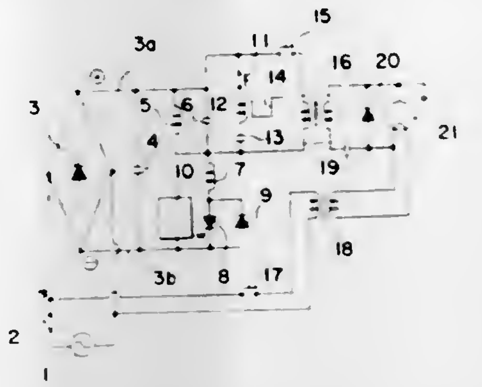
Filed Oct. 10, 1975, Ser. No. 621,620

Claims priority, application Japan, Oct. 18, 1974, 49-120757; Oct. 18, 1974, 49-120758

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **16 Claims**

1. A high frequency heating apparatus which comprises a unidirectional power source for converting input from an A.C. power source to D.C. voltage, an inverter for converting output from said unidirectional power source into high frequency power, a control circuit for said inverter, an induction heating coil for heating through electrical induction by high frequency magnetic flux, a high frequency oscillator which is energized by high voltage for radiating microwave energy, and a heating cavity in which the microwave energy from said high frequency oscillator is confined for effecting the dielectric heating, said inverter including at least one thyristor connected to a series-resonance circuit which has at least a commutation capacitor and a commutation inductor, said commutation capacitor being connected in parallel to a filter capacitor and said induction coil which are connected in series, with a step-up transformer for a high frequency oscillator being further connected in parallel to said commutation capacitor, thereby enabling said inverter to serve as a high voltage power source for applying the high voltage to said high frequency oscillator and also a high frequency power source for energizing said induction heating coil.



4,002,876

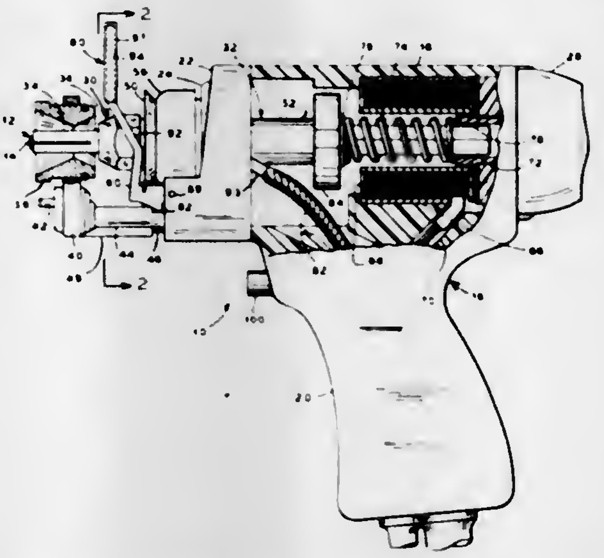
STUD WELDING TOOL WITH RETRACTION MECHANISM

Howard N. Wieland, Jr., Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,755

Int. Cl.² B23K *9/20*

U.S. Cl. 219—98 **7 Claims**



1. In a tool for welding a stud to a workpiece, a tool body, a chuck leg supported for longitudinal movement with respect to said body, a chuck, means connecting said chuck to an end of said chuck leg with said chuck extending beyond a forward end of said tool body, resilient means in said tool body for urging said chuck leg toward a forward position, means in said tool body for holding said chuck leg and said chuck leg in a retracted position, a lever located in front of said tool body and engageable with a portion of said chuck leg for moving said chuck leg and said chuck from a forward position to the retracted position, said lever having an opening therein through which said chuck leg extends, means pivotally supporting said

lever at one side of said opening by said tool body, and said lever having a handle extending to the side of said opening opposite said pivot means.

4,002,877

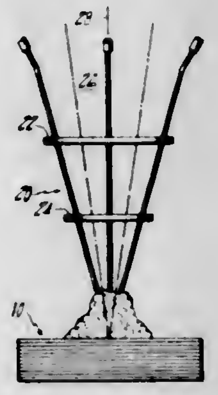
METHOD OF CUTTING WITH LASER RADIATION AND LIQUID COOLANT

Conrad M. Banas, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1974, Ser. No. 532,566

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 LM **5 Claims**



1. The method of cutting a multilayer stack of sheet material along a desired pattern including the steps of:
  - providing a low mode beam of laser radiation having a symmetric intensity profile across its axis of propagation;
  - focusing the beam to a focus point on the multilayer stack to produce an energy intensity distribution with an inner region having an energy intensity sufficient to vaporize the sheet material in its path and an outer region having an energy intensity insufficient to vaporize the sheet material in its path;
  - directing a continuous stream of solid liquid coolant onto the stack at the focus point in a direction approximating the direction of propagation of the beam to absorb energy from the outer region of the beam and avoid interlayer fusion to the sheet material along the edges of the cut pattern; and
  - causing relative motion between the stack and the focused beam along a path that corresponds to the desired pattern.

4,002,878

GAS TUNGSTEN ARC WELDING ELECTRODE

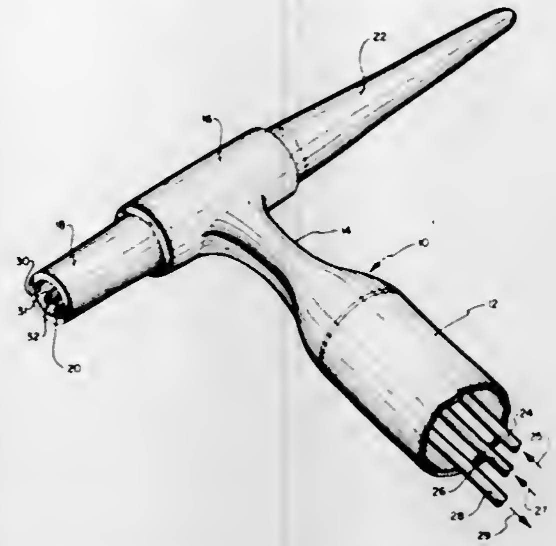
John A. Disney, Orem, Utah, assignor to Utah State University Foundation, Logan, Utah

Filed July 25, 1975, Ser. No. 599,216

Int. Cl.² B23K *9/24*

U.S. Cl. 219—121 P **11 Claims**

9. An improved working tip for a nonconsumable electrode comprising a narrow annular ring on the face of the working tip, the ring being formed adjacent the circle of intersection of a taper with the face, the narrow annular ring having an area less than the area of electron emission at the current limitation of the electrode thereby forcing the area of electron emission to include electrode surface area on the working tip adjacent the narrow annular ring.



4,002,879

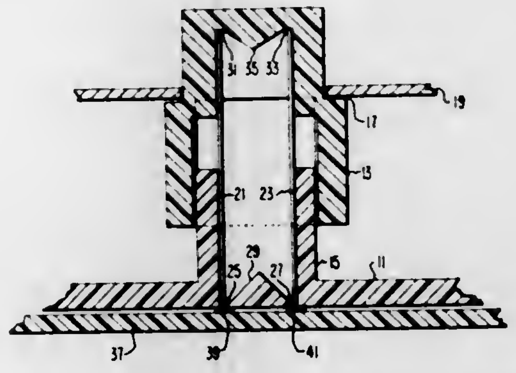
DOUBLE COLUMN LEAF SPRING PUSH-BUTTON SWITCH

Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 26, 1975, Ser. No. 607,894

Int. Cl.² H01H *13/52*

U.S. Cl. 200—159 A **15 Claims**



1. An electrical switch assembly for tactile manipulation comprising:
  - a rigid planar member;
  - conducting means on said rigid planar member;
  - a plurality of electrical contacts comprising resilient columnar biasing means each having an upper end and a lower end and a medial portion, said columnar biasing means each being mounted on said rigid planar member with respective lower ends of said columnar biasing means engaging said conducting means, said columnar biasing means resiliently bowing toward each other into contacting engagement at their respective medial portions when actuated while maintaining constant distances between their respective upper and lower ends, said contacting medial portions completing an electrical conductive path when engaged;
  - means acting on the upper ends of said columnar biasing means when tactile pressure is applied thereto for downward movement to actuate said opposing columnar biasing means to bow towards each other; and
  - limiting means in juxtaposition with said actuating means for insuring that said columnar biasing means bow only toward each other when actuated by said actuating means, said resilient columnar biasing means restoring said actuating means when pressure is removed therefrom.

4,002,880

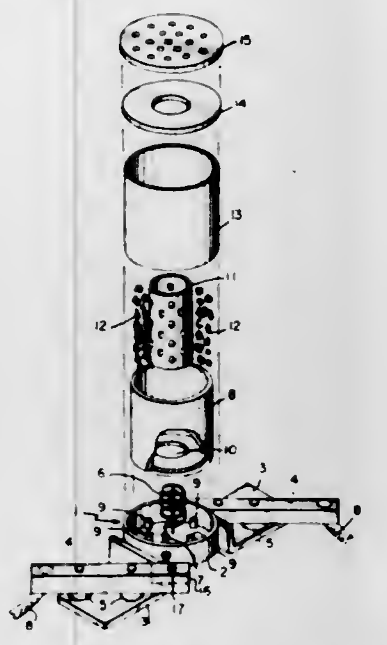
EVAPORATION SOURCE

Ernest A. Davey, Peabody, Mass.; Norman A. Mathieu, Exeter, N.H., and Edward D. Parent, Hamilton, Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Aug. 13, 1975, Ser. No. 604,507

Int. Cl.² A61L *3/00*

U.S. Cl. 219—275 **2 Claims**



1. An evaporation source for the vacuum deposition of sublimating material comprising: a furnace base assembly including two bus bars and a cup holder; an upright coiled tungsten wire heater disposed in said cup holder and having two legs, each leg horizontally extending through a clearance hole in said cup holder and being connected to a bus bar; a cylindrical cup supported on said assembly slightly above the horizontally extending portions of the heater legs and surrounding said heater; and sublimating material disposed in said cup surrounding, and spaced from, said heater.

4,002,881

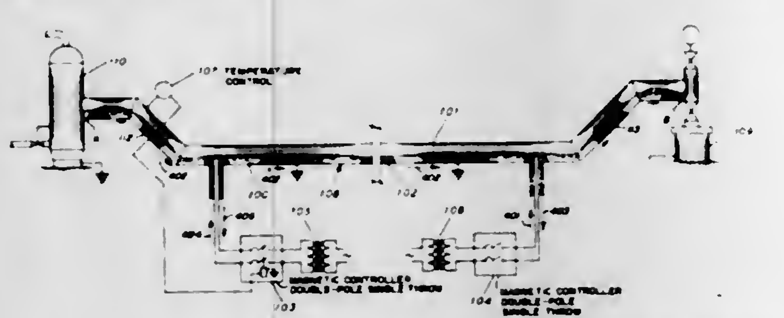
SYSTEM FOR CONTROLLING ELECTICAL POWER IN AN INTERNAL WIRE IMPEDANCE HEATING SYSTEM

James M. West, Englewood, Colo., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 13, 1974, Ser. No. 479,000

Int. Cl.² H05B *1/02;* **F24H** *1/10;* **F16L** *53/00*

U.S. Cl. 219—301 **12 Claims**


110
107 TEMPERATURE CONTROL
101
100
106
102
105
108
103 MAGNETIC CONTROLLER DOUBLE-POLE SINGLE THROW
104 MAGNETIC CONTROLLER DOUBLE-POLE SINGLE THROW

1. In combination with an apparatus for electrically heating a fluid in a pipe of the type wherein a ferromagnetic pipe for the fluid has an insulated wire means for conducting alternating current extending within, along, adjacent and electrically in series with a predetermined length of said pipe; the improvement comprising:
  - a plurality of voltage transformers each having at least a primary and secondary winding;
  - each of said secondary windings being connectable in said series circuit with each other and said ferromagnetic pipe by predetermined lengths of said insulated wire means;
  - means for connecting said primary windings to an alternating current source of power, and
  - regulating means responsive to the temperature of the fluid in the pipe for regulating power output to said series circuit from selected ones of said transformers to selectively control current flow in said series circuit in response to the temperature of the fluid in said pipe.

4,002,882

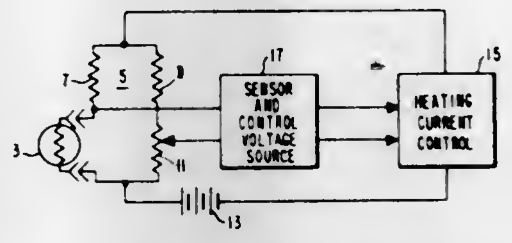
HEATING CIRCUIT

Charles W. McCutchen, 5213 Acacia Ave., Bethesda, Md. 20014

Filed Mar. 5, 1975, Ser. No. 555,642

Int. Cl.² H05B *1/02*

U.S. Cl. 219—499 **11 Claims**



8. A device of the character described in claim 4 in which said device is connected to said glowplug by removable leads and in which the direct current for powering said device is derived from the charge in a large capacitor which is coupled to said direct current source through said glowplug, said removable leads and a diode, so that the device draws no standby current when said removable leads have been disconnected from said glowplug.

4,002,883

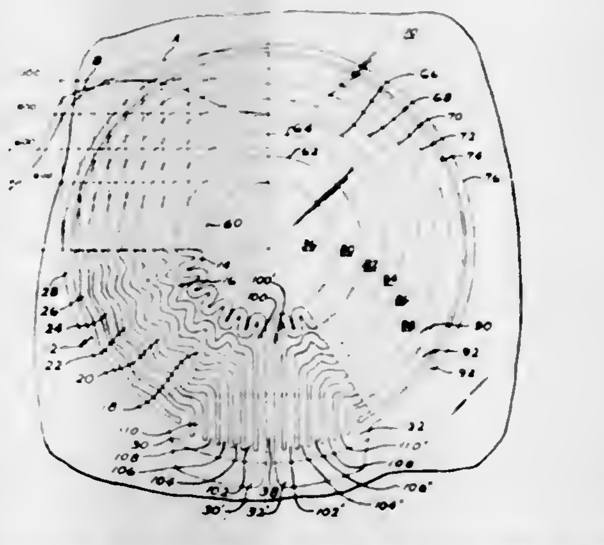
GLASS-CERAMIC PLATE WITH MULTIPLE COIL FILM HEATERS

Bohdan Hurko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 23, 1975, Ser. No. 598,243

Int. Cl.² H05B *3/16*

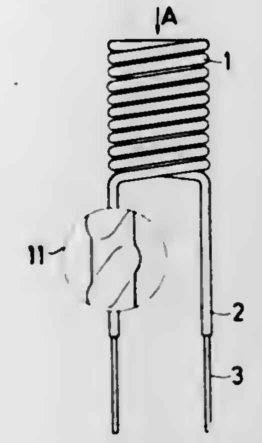
U.S. Cl. 219—543 **12 Claims**

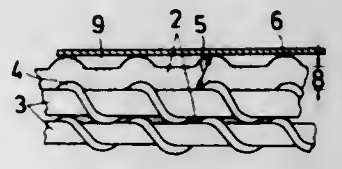


1. An electrical heating unit comprising a thin plate of high electrical resistivity and high dielectric strength and relatively good thermal conductivity, a plurality of electrical resistance thin film conductors of less than 0.001 inch thickness in physical contact with a surface of said plate, said conductors being of generally symmetrical looped configuration to form a relatively small unheated central area and a relatively large heated area, one terminal end of each loop being joined to a first common terminal strip and the other teminal end of each loop being joined to a second common terminal strip, the length of each conductor being of substantially equal length and of the same resistivity per ohm square and hence of equal watts density in order to obtain a generally uniform temperature distribution over the heating unit.

4,002,884
HEATER ELEMENT FOR AN INDIRECTLY HEATED CATHODE

Eberhard Weiss, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Jan. 24, 1975, Ser. No. 543,724
Claims priority, application Germany, Jan. 30, 1974, 2404362
Int. Cl.² H05B ***3/10***
U.S. Cl. 219—552 2 Claims



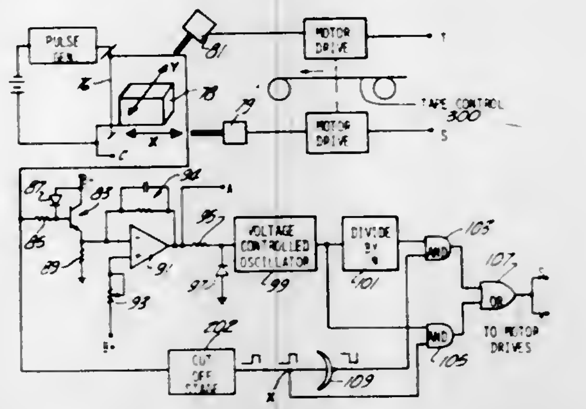


1. A heating element for an indirectly heated cathode comprising:
- a heating wire having a plurality of closely wound turns and a spacer wire wound around said heating wire having a thickness providing a spacing between adjacent turns of said heating wire which is equal to the thickness of the spacing wire;
- a layer of thermally conductive and electrically insulating material directly coated on said heater and spacer wires and sealing thereof,
- said spacer wire being of a material which is capable of being removed subsequent to the application of said insulating material, while said insulating material retains the added thickness of said spacer wire, the pitch of the winding of said spacer wire being a multiple of the thickness of the spacer wire, and
- said heating and spacer wires being disposed so that the spacer wires of two adjacent turns of said heating wire do not contact one another.

4,002,885
SERVO FEED SYSTEM FOR A WIRE ELECTRODE TYPE ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Mooresville, and Randall C. Gilleland, Statesville, both of N.C., assignors to Colt Industries Operating Corporation, New York, N.Y.
Filed Feb. 21, 1975, Ser. No. 551,957
Int. Cl.² B23P ***1/08***
U.S. Cl. 219—69 G 20 Claims

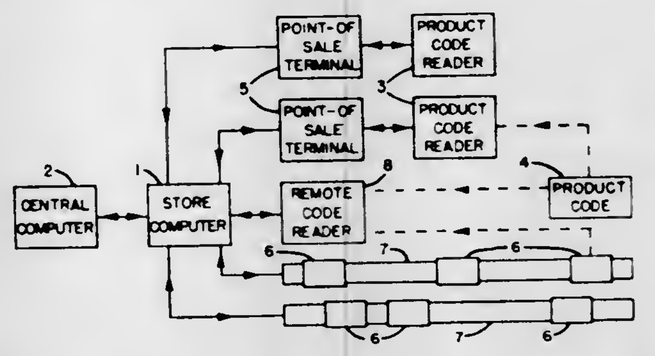
1. A servo feed system for an electrical discharge machining apparatus having a wire electrode and a workpiece whose relative movement is controlled by at least one electrically operated stepping motor, wherein the improvement comprises:
- a voltage controlled oscillator having an input voltage from the gap representative of gap voltage and having connected to said motor a pulse output whose frequency is a function of the input voltage;
- a divide-by-N stage operably connected between the output of said oscillator and the motor for predetermining a reduced frequency of pulses from said pulse output to be provided to said motor; and



- a network operably connected to said gap for enabling the divide-by-N stage to connect its reduced frequency of pulses to said motor responsive to gap short circuit condition.

4,002,886
ELECTRONIC PRICE DISPLAY UNIT

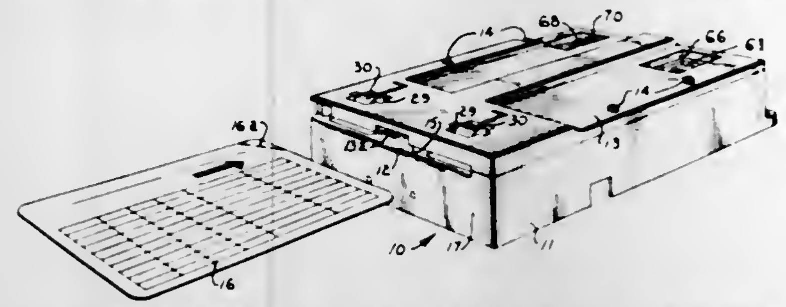
Ronald Murl Sundelin, 5 Sunset West, Ithaca, N.Y. 14850
Filed June 20, 1975, Ser. No. 588,866
Int. Cl.² G06K ***7/14;*** **G09F** ***3/20;*** **B65G** ***1/02;*** **H04Q** ***5/16***
U.S. Cl. 235—61.7 R 12 Claims



8. In a sales establishment having a plurality of types of items to be sold stored at a plurality of locations, a point-of-sale terminal, and a memory means, said terminal including means for sensing a respective product code carried on each item of each type of said plurality of types of items, interrogating said memory means to obtain data stored in said memory means for each sensed product code, and means for totalizing data obtained from the sensing of a plurality of said product codes, the combination of: a plurality of display units located at respective ones of said locations to be associated with respective ones of said types of items; a signal bus means extending from said memory means to each of said display units; each of said display units carrying coded externally-sensible indicia identifying said display unit and its fixed internal address; and a portable reader means for sensing the coded indicia of each display unit and the product code of the type of such items associated with said display unit and transmitting signals representing said coded indicia and product code to said memory means.

4,002,887
DIGITAL AREA NAVIGATION SYSTEM AND COMBINED MAGNETIC CARD READER AND ENCODER

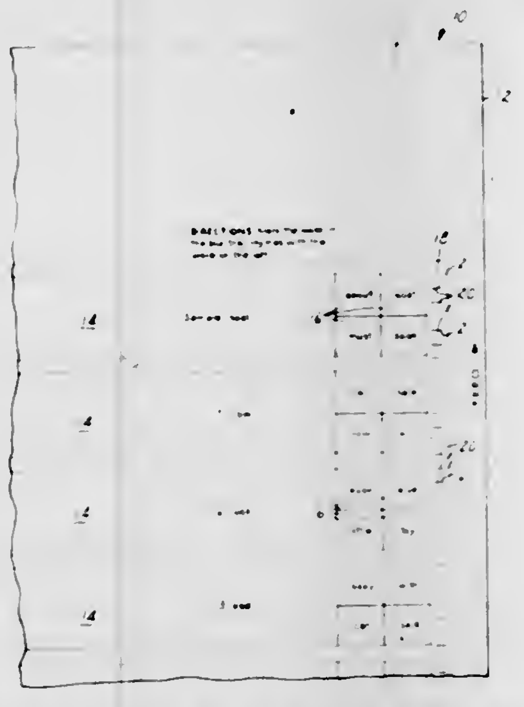
Blaine N. Ouimette, Independence, Mo., assignor to King Radio Corporation, Olathe, Kans.
Filed Apr. 18, 1975, Ser. No. 569,573
Int. Cl.² G06K ***7/08;*** **G11B** ***15/00***
U.S. Cl. 235—61.11 D 41 Claims



1. An apparatus for use in an avionics system, said apparatus mounted within a pilot operated aircraft for processing data on a card, said apparatus comprising:
- a read-write head, and
- means interconnecting said read-write head within said system to permit a pilot to program data on said card, using said apparatus while in said aircraft.

4,002,888
TEST FORM FOR USE WITH A TEST SCORING APPARATUS

Richard E. Jahnke, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 17, 1975, Ser. No. 569,311
Int. Cl.² G06K ***19/00;*** **G09B** ***7/06***
U.S. Cl. 235—61.12 N 8 Claims

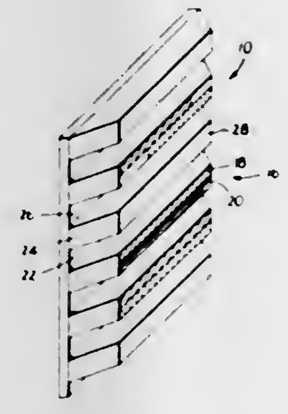


1. A test form for use with a test scoring apparatus of the type for sensing the presence of indicia in answer indication areas on the test sheet, said test form comprising:
- a. a generally rectangular shaped sheet of paper or like material having longitudinal and transverse axes, and at least one generally straight edge parallel with one of said axes, said straight edge providing a reference edge for guiding the movement of the paper through said sensing apparatus;
- b. a series of question locations indicated on said sheet of paper with each question location having a number of answer indication areas indicated on said sheet in which indicia can be entered, said number of answer indication areas of each question location being spaced to form transverse rows generally perpendicular to said straight edge of the sheet and/or being spaced to form longitudinal columns generally parallel with the straight edge of the sheet, and said series of question locations being spaced with answer indication areas therein being aligned with similar answer indication areas of other question locations to form longitudinal columns generally parallel with said straight edge of the sheet; and
- c. a timing mark column generally parallel to said straight edge of the sheet containing a given number of timing marks which is greater than the number of rows of answer indication areas, with one of the timing marks being positioned in relation to each row of answer indication areas to time the sensing of each answer indication area;

wherein the improvement comprises
- the spacing of the timing marks in relation to the longitudinal dimensions of the answer indication areas being such that for at least one said answer indication area, more than one timing mark is positioned to time the sensing of more than one region within said answer indication area; wherein
- a number of said timing marks corresponding to the number of rows of answer indication areas are positioned in relation to each said row to time the sensing of the longitudinal center of each answer indication area.

4,002,889
SELF-CLEANING LABEL FOR AUTOMATIC OBJECT IDENTIFICATION SYSTEM

Sigurd Hoyer-Ellefsen, Locus Valley, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.
Filed Dec. 8, 1975, Ser. No. 638,560
Int. Cl.² G06K ***19/06, 9/00***
U.S. Cl. 235—61.12 N 6 Claims

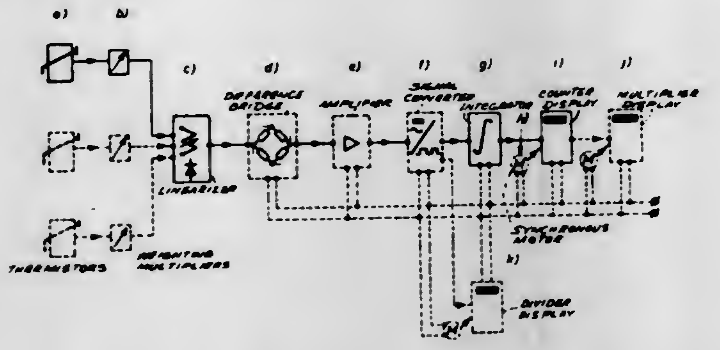


1. In an automatic object identification system of the type comprising a label made up of a backing member and a plurality of stripes of reflective material secured to said member, means for directing a beam of light on said stripes, and means for scanning the label to receive energy reflected from the individual stripes and generate an electrical system in response thereto the improvement comprising: a plurality of spaced apart protuding fins extending across said backing member, each of said fins having a rear surface directed toward said backing member and a front surface directed away from said backing member, said stripes of reflective material being affixed to said fins whereby the flow of air past said fins serves to prevent the settling of particulate matter on said stripes.

4,002,890

METHOD OF CHARGING FUEL COSTS AMONG THE VARIOUS APARTMENTS IN AN APARTMENT HOUSE OR THE LIKE AND SUITABLE DEVICES IN THIS CONNECTION

Karl Filip Einar Welin, Lidingo, Sweden, assignor to Einar Welins Patenter Kommanditbolag, Lidingo, Sweden
Filed July 30, 1975, Ser. No. 600,231
Claims priority, application Sweden, Aug. 1, 1974, 7407284
Int. Cl.² G06G *7/56*
U.S. Cl. 235—151.3 **18 Claims**



6. A device for an equitable allocation of heating costs in an apartment building or the like equipped with a central heating plant common to a number of individual consumers (apartments), characterized in that the allocation of said costs is made dependent on the heat comfort really enjoyed by the consumers concerned by being based upon a representative instantaneous value of the air temperature (average temperature) in the apartment in question, comprising:

a certain number of temperature sensors placed in the individual apartments to establish a representative instantaneous air temperature (the average apartment temperature measured at one or several representative points),

weighting means connected to each of said temperature sensors, said weighting means comprising electrical resistors having values chosen to regulate the effect each individual temperature sensor with respect to the area it represents in producing a signal representing the total value measured for each apartment,

a signal converter for each individual apartment connected to receive the signals representing the measured values,

an electric integrating device for each individual apartment connected to integrate the output of said signal converter, and

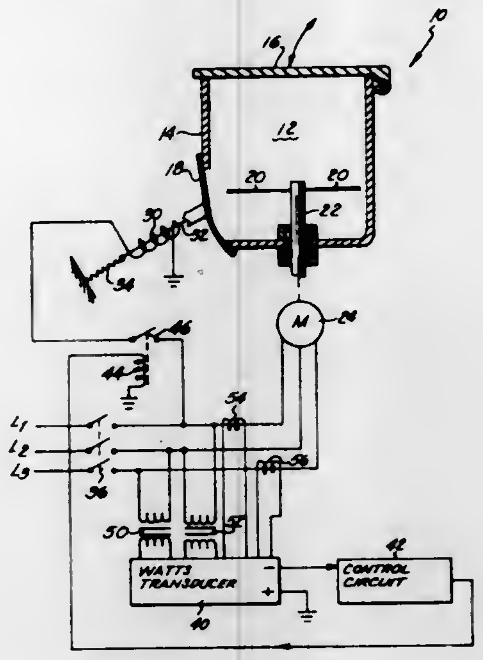
coupling means for automatically switching on said device simultaneously with the electrical equipment of the central heating plant.

4,002,891

MIXER CONTROL SYSTEM

John Paul Porter, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Aug. 13, 1975, Ser. No. 604,241
Int. Cl.² B29B *1/04;* **B29H** *1/10*
U.S. Cl. 235—151.12 **13 Claims**

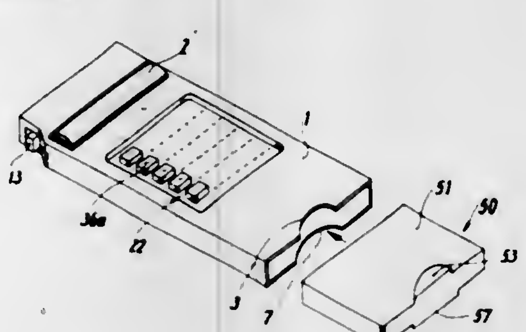
1. Apparatus for use with a fluidizing mixer having means for mechanically working material and electrically energized drive means for driving said working means such that electrical energy is expended as work is performed on said material, means for sensing the electrical energy expended as work is performed during a work cycle of operation on said material and providing an electrical energy signal having a value in accordance therewith, and means for terminating a said work cycle of operation when the amount of energy expended to work said material decreases by a given amount.



4,002,892

PORTABLE CALCULATOR

Adolf H. Zielinski, Haidgraben 101, 8012 Ottobrunn, Germany
Filed Sept. 16, 1974, Ser. No. 506,196
Claims priority, application Germany, Sept. 15, 1973, 7333551[U]; Feb. 2, 1974, 2405062
Int. Cl.² G06F *15/02*
U.S. Cl. 235—156 **3 Claims**

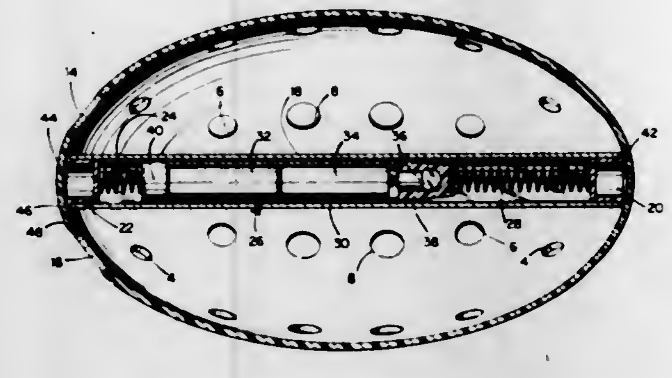


1. A portable electronic calculator comprising a housing of substantially rectangular outline having a length greater than its width and being of shallow height relative to its width, said housing having an end opening receptacle at one end thereof surrounded by top, bottom and side walls, a first printed circuit board retained in said housing inwardly of said receptacle and having connected thereto a keyboard, an electronic arithmetic unit, and a multi-digit display unit, said housing having appropriate areas for visual access to said display unit and for manual access to said keyboard, a second printed circuit board, and electrical supply unit on said second printed circuit board, said electrical supply unit and said second printed circuit board being movable into and out of said receptacle and positioned thereon by said walls, and plug- and-socket connection means between said first and second printed circuit boards and automatically engaging and disengaging upon insertion and withdrawal of said second printed circuit board and electrical supply unit said second printed circuit board and said electrical supply unit being housed in a rectangular block fitting within said receptacle.

4,002,893

ILLUMINATED PLAYBALL

Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of Mirror Lake, N.H. 03853
Filed Oct. 6, 1975, Ser. No. 620,011
Int. Cl.² F21V *33/00;* **A63H** *33/26*
U.S. Cl. 240—6.4 R **10 Claims**



1. A hollow ball having a self-supporting wall made of translucent plastic,

first and second diametrically oppositely disposed sockets in the said ball,

a light transmitting self-supporting tube containing a light source and having its ends in said sockets,

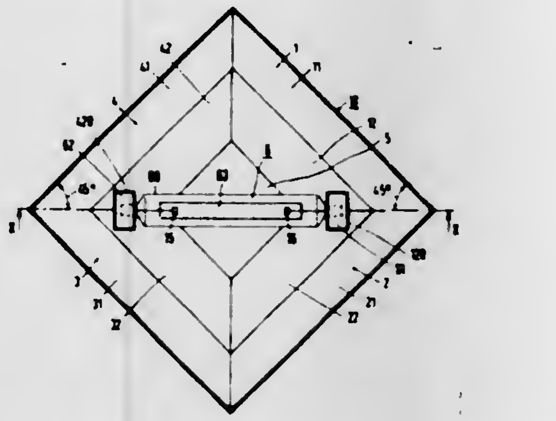
a first hole in said wall closely adjacent the first of said sockets and large enough to permit passage of said tube therethrough,

said wall and said tube together capable of sufficient distortion to permit the moving of one end of said tube from its position in said first socket to a position in said first hole whereby said tube and light source may be withdrawn from said ball.

4,002,894

LIGHTING FIXTURE WITH A DIAGONALLY ARRANGED LAMP

Harry Kintz, Traunreut, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 7, 1975, Ser. No. 565,955
Claims priority, application Germany, Apr. 8, 1974, 2417100; Feb. 27, 1975, 2508580
Int. Cl.² F21L *7/00;* **F21Y** *7/00*
U.S. Cl. 240—11.2 A **7 Claims**

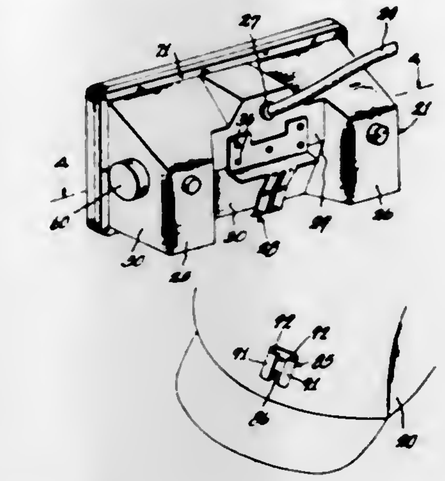


1. In a lighting fixture for discharge lamp of high brightness, said lamp being of the type having a linear inner bulb containing a burning arc, with a reflector in the form of a truncated pyramid with a rectangular light egress opening, the improvement comprising means for supporting the discharge lamp within the reflector so that the principal radiation directions of the lamp which are perpendicular to the longitudinal axis of the inner bulb point toward two diametrically opposed corners of the reflector.

4,002,895

ILLUMINATING APPARATUS

Albert E. Ketler, Indiana; Ronald P. Campbell, Latrobe, and George Shacreaw, Blairsville, all of Pa., assignors to Ocean Energy, Inc., Blairsville, Pa.
Division of Ser. No. 462,886, April 22, 1974, Pat. No. 3,953,725. This application June 6, 1975, Ser. No. 584,621
Int. Cl.² F21L *3/00, 15/08*
U.S. Cl. 240—60 **5 Claims**



1. In combination:

a hard hat of the type worn by workers in hazardous occupations, said hat having a transversely curved front portion,

an oblong housing formed of light weight material,

a fluorescent tube lamp mounted within said housing to extend parallel with the longer axis thereof,

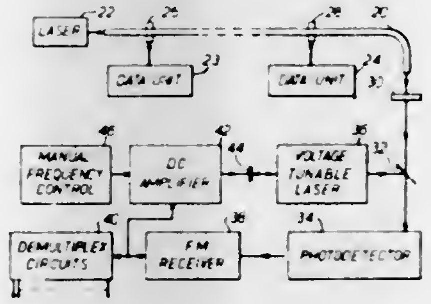
said housing having an elongated opening in its front wall aligned with said tube lamp to pass light rays, and said housing having its rear wall inwardly recessed to receive the transversely curved front portion of said hard hat, and

means connecting said housing to said hard hat with said longer axis extending generally horizontally when said hat is worn in normal manner by a worker.

4,002,896

TELECOMMUNICATION SYSTEM

David Evan Naunton Davies, 1 Copper Beach Close, Boxmoor, Hemel, Hempstead, Hertfordshire, and Stuart Alexander Kingsley, 43, Rostrevor Avenue, London, both of England
Filed Jan. 21, 1975, Ser. No. 543,224
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **7 Claims**



3. A telecommunications system comprising a highway formed from an optical fibre, a source of coherent electromagnetic radiation of optical frequency at one end of the highway, a modulator comprising a source of acoustic energy and a body of material having a high acoustic impedence adapted to focus acoustic waves on to the surface of the fibre at an intermediate position on the highway, and demodulating means connected to the other end of the highway.

4,002,897

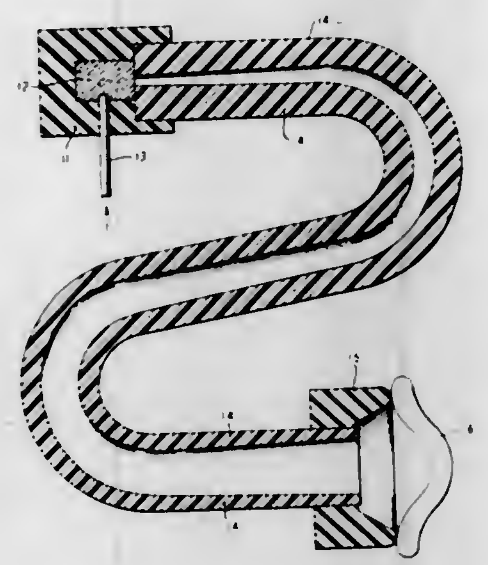
OPTO-ACOUSTIC TELEPHONE RECEIVER

David Allmond Kleinman, Lebanon, and Donald Frederick Nelson, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1975, Ser. No. 612,761

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **13 Claims**



1. Apparatus which comprises

a. a hollow chamber of the order of 0.001 cm³ in volume,

b. a first aperture in said chamber for the entry of light signals;

c. light absorbing means for absorbing the light located in said chamber; and

d. a second aperture in said chamber for the exit of acoustic signals into a hollow tube in accordance with the light signals, said acoustic signals having been generated in the chamber and said hollow tube adapted for acoustically transmitting said acoustic signals from a relatively narrow input end to a relatively wide output end.

4,002,898

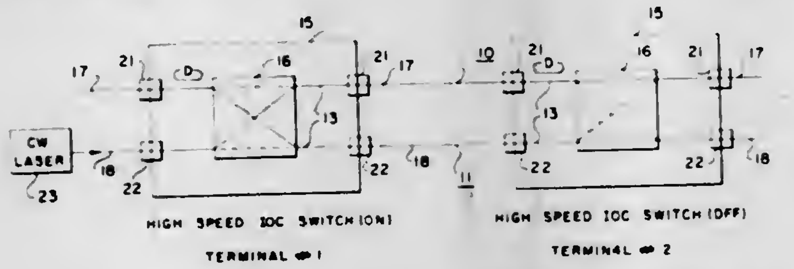
SINGLE MODE LASER MULTITERMINAL OPTICAL DATA COMMUNICATION SYSTEM

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,253

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **3 Claims**



1. An optical communication system which includes in combination:

a plurality of terminals optically connected with each other by a single fiber communication line and a single fiber distribution line;

each of said terminals including a communication channel optical waveguide and a distribution channel optical waveguide with said distribution channel optical waveguide optically connected with said single fiber distribution line and said communication channel optical waveguide optically connected with said single fiber communication line;

a continuous wave laser for producing a light beam;

a single mode optical fiber interconnecting said laser light output with said distribution channel of one terminal; and

a light detector at each terminal for detecting light on said communication channel thereby receiving any information on the communication channel.

4,002,899

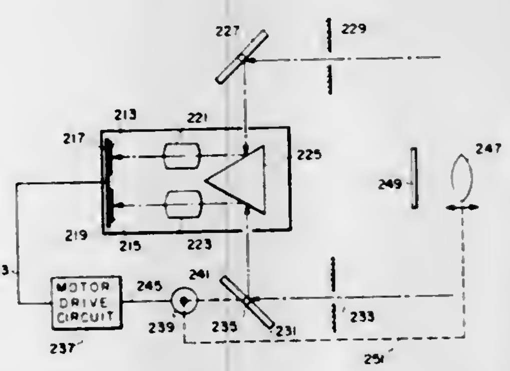
FOCUS DETECTING APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 529,573, Dec. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 377,809, July 9, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,607

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **44 Claims**



1. Apparatus for providing a measure of the distance between the apparatus and an object, comprising

a plurality of radiation responsive elements formed on a single planar substrate and divided into two similar coplanar detector arrays lying immediately adjacent each other, all of the elements in each of said arrays being closely spaced along a line thereof, each of said elements being arranged to provide an electrical signal representative of the intensity of radiation impinging thereon,

first auxiliary means defining a first optical path for radiation from the object and for forming a first detection image thereof on solely one of said arrays,

second auxiliary means defining a second optical path for radiation from the object and for forming a second detection image thereof on solely the other of said arrays, the positions and radiation distributions of said detection images on the corresponding arrays changing with changes in the distance between the object and said arrays, and with changes in the relative positions of said auxiliary means and said arrays,

signal processing means connected to said elements for comparing the signal from each of said elements of one of said arrays with the signal from the positionally corresponding one of said elements of the other of said arrays, and for summing the results of such comparisons to provide an output signal which has a minimum value when the radiation distributions of said detection images on the corresponding arrays are substantially identical, and

control means connected to receive and to be responsive to said output signal for effecting relative movement between at least one of said detection images and the corresponding one of said arrays, along said line of the said elements thereof, to establish a condition in which the radiation distributions of said detection images on the corresponding arrays are substantially identical and said output signal reaches the minimum value therefor, to provide a measure of the distance between the object and said arrays.

4,002,900

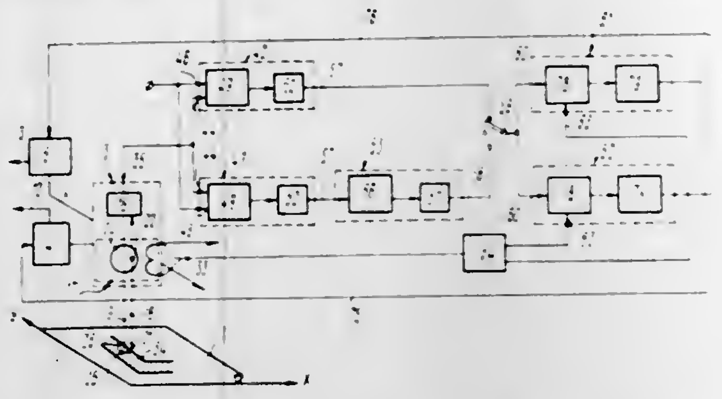
PHOTOTRACING SYSTEM

Valentin Mikhailovich Sitnichenko, ulitsa Odesskaya, 58/6, kv. 14; Alexandr Mikhailovich Zamuruev, ulitsa Tereshkovoi, 12, kv. 24, and Andrei Isakovich Kogut, ulitsa Pionerskaya, 20, kv. 12, all of Odessa, U.S.S.R.

Continuation-in-part of Ser. No. 254,467, May 18, 1972, and a continuation-in-part of Ser. No. 888,014, Dec. 24, 1969. This application May 12, 1976, Ser. No. 686,226

Int. Cl.² H01J *39/12*

U.S. Cl. 250—202 **1 Claim**



1. A phototracing system for controlling the motion of the tool of a two-coordinate machine for cutting sheet materials, comprising:

a template drawing having imaged thereon in a rectangular system of coordinates X and Y the contours of parts of arbitrary configurations, which are to be cut by said machine from a sheet material;

the contours of the parts being shown on said template drawing as a wide contrast line, one "black-to-white" edge of said wide contrast line being the outline of the contours of the parts of arbitrary configurations, to be cut from the sheet material, on said template drawing;

a tracing head having an optical axis indexed substantialy normally with respect to the plane of said template drawing;

the tracing centre of said tracing head, defined as the point of intersection by the optical axis of said tracing head of the plane of said template drawing, adapted to follow said one "black-to-white" edge of the wide line of said template drawing in a given direction; an optical tracing beam by means of which said tracing head cooperates with said template drawing;

the aperture defined by said tracing beam in the plane of said template drawing having a concentrated area of definite dimensions and determining the value of the light flux of said tracing beam;

a unit for effecting a scanning motion of said optical tracing beam of said tracing head, having a synchronizing input;

a scanning orbit defined in the plane of said template drawing, along which said aperture is adapted to be moved at a permanent speed, being a circle having for its centre said tracing centre with said tracing head being stationary;

a photoelectric transducer of said tracing head, adapted to convert the light flux of said optical tracing beam into an electric voltage at the output thereof, the value of this voltage serving as a "black" and "white" signal;

the "black" level serving as a zero point at evaluation of the voltage level at the output of said photoelectric transducer;

a signal of tracing the "black-to-white" edge of the wide line, generated at the output of said tracing head, being a cyclic alternation of said "black" and "white" levels at an angular frequency "ω" corresponding to the rotation of said aperture;

the curve representing said tracing signal having gradual increases and recesses, caused by the continuous transition of said aperture through said "black-to-white" edge from "white" to "black" and vice versa;

a first shaper of a short-duration pulse of a signal of a fixed as if instantaneous change from "white" to "black" in said tracing signal, having a first input, a second input and an output;

a second shaper of a short-duration pulse of a signal of a fixed as if instantaneous change from "black" to "white" in said tracing signal, having a first input, a second input and an output;

said first inputs, respectively, of said first and second shapers being connected with the output of said photoelectric transducer;

the fixed instant of changing from "white" to "black" being predetermined by the condition of the advance of the greater part of the area of said aperture onto "black", and the fixed instant of changing from "black" to "white" being predetermined by the condition of the advance of the smaller part of the area of said aperture upon "white";

a permanent level of voltage being preset for determining said fixed instants of the changes from "white" to "black" and vice versa by comparison thereof with the level of said tracing signal;

said permanent level of voltage being preset to be less than half of the "white" level of said tracing signal and being fed to said second respective inputs of said first and second shapers;

a comparator in each said first and second shaper, adapted to determine the algebraic sign of the difference between the compared levels of said tracing signal and said permanent preset level;

a differential circuit in each said first and second shaper, connected in series with said respective comparator to shape short-duration pulses from changes between "1" and "0" signals of said comparator, in accordance with instantaneous changes of the algebraic sign of the difference between the compared levels of said tracing signal and said permanent preset voltage level;

means for delaying each said short pulse produced by said second shaper by the time of the advance of the greater part of said aperture from "black" to "white" to the same degree as that which had initiated the production of said short pulse at the output of said first shaper at the preceding advance of said aperture from "white" upon "black";

a source of a functional cosinusoidal voltage and of a functional sinusoidal voltage, synchronous and cophasal with the angular frequency "ω" of the rotation of said aperture about said tracing centre, having two outputs, the initial phase of said sinusoidal voltage being set by the coincidence in time of the first zero levels of its sine wave with said short pulses at the output of said first shaper, under a condition that the edge of the wide line passes through said tracing centre, parallel with the X—axis of said template drawing;

a three-way switch means for three states conditionally corresponding to the three tracing modes "forward-stop-reverse";

the inputs of said first and second shapers being connected with the output of said photoelectric transducer, the output of said first shaper being connected with one "forward (reverse)" input of said three-way switch, and the output of said second shaper being serially connected through said delay means with the other "reverse (forward)" input of said three-way switch;

a first converter having a first input, a second input and an output;

a second converter similar to said first converter, having a first input, a second input and an output;

said first inputs of said first and second converters being connected with the output of said three-way shitch;

said second input of said first converter being connected to the cosinusoidal voltage output of said source of functional voltages and said second input of said second converter being connected to the sinusoidal voltage output of said source;

said first converter being adapted to convert the short pulse coming from the output of said three-way switch and the cosinusoidal voltage of said source of functional voltages into a signal representing the velocity vector of the motion of said tracing head along the X—axis, and said second converter being adapted in a similar manner to produce, with provisions for the sinusoidal voltage of said source, a similar signal with respect to the Y—axis;

the cosinusoidal and sinusoidal voltages of said source being supplied to said synchronizing input of said tracing head;

a pulse-amplitude element in each said first and second converter, having a strobing input and a functional input, the former one of said inputs forming said first input, respectively, of said first and second converters and said functional input forming said second input, respectively, of said first and second converters;

said pulse-amplitude element being adapted to produce short-duration pulses of which the amplitudes equal the instantaneous values of the voltage supplied to said functional input, in correspondence with the moments of existence of the short-duration pulses fed to said strobing input thereof;

an amplitude detector in each said first and second converter, connected with the output of the respective said pulse-amplitude element, adapted to produce at the output thereof a signal shaped as an envelope of the output signals of said element, said envelope being the signal representing the velocity vector of the motion of said tracing head along the respective coordinate axis;

a first servodrive having the input thereof connected to the output of said amplitude detector in said first converter, adapted to displace said tracing head along the X—axis of said template drawing;

a second servodrive having the input thereof connected to the output of said amplitude detector in said second converter, adapted to displace said tracing head along the Y-axis of said template drawing.

4,002,901

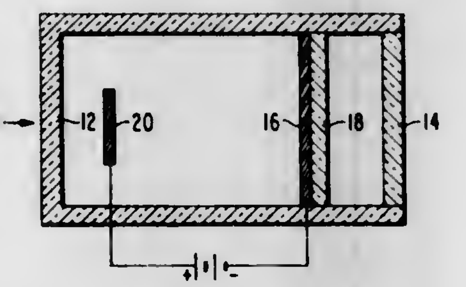
PHOTODETECTOR NON-RESPONSIVE TO CERENKOV RADIATION

Jack Caryl Coffin, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,813

Int. Cl.^{2} H01J *39/12, 31/50*

U.S. Cl. 250—211 R **6 Claims**



1. A photodetector comprising:

an evacuated envelope having a face plate, said face plate selected from a transparent material which causes internal reflection of photons generated by Cerenkov radiation in the face plate;

a transmissive type photocathode spaced apart from said face plate within said envelope; and

an anode within said envelope.

4,002,902

OPTICAL IMAGE CONVERTING RELAY HAVING AN ELECTRO-OPTICAL ELEMENT AND A PHOTOCONDUCTIVE ELEMENT

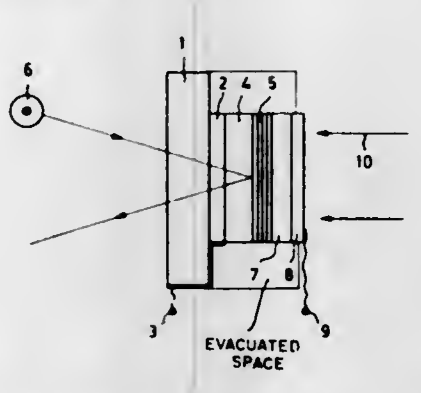
Jacques Donjon, Yerres; Michel Grenot, Brunoy, and Jean-Pierre Hazan, Saint-Maur, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 382,397, July 25, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,060

Claims priority, application France, Aug. 2, 1972, 72.27915

Int. Cl.^{2} H01J *31/50*

U.S. Cl. 250—213 R **2 Claims**



1. An optical image converting relay device of the type comprising a first source of a first radiation in the portion of the spectrum including infrared, visable and ultraviolet radiation, termed display radiation, a second source of a second light radiation, termed reading light, an optical image relay constituted by an evacuated enclosure having at least one window which is transparent to the said radiations, a photoconductive layer which is sensitive to the said first radiation aligned with said window in said relay, a plate in said relay having an electro-optical effect brought at the temperature of its Curie point and having a double refraction which is variable in accordance with an electrical potential difference existing between its faces, a first electrode which is electrically conductive and optically transparent to the said second light radiation on said plate, a second electrode on the opposite side of said plate, the improvement wherein the Curie temperature of the plate and the operating temperature of the relay are substantially that of the maximum sensitivity of the photoconductive larger in the band of the spectrum of the display light, whereby an image of an object projected on to said photoconductive larger with said second radiation is converted into phase modulated radiation in the portion of the spectrum of the first radiation, the modulation corresponding to the image.

4,002,903

SIMULTANEOUS THERMAL NEUTRON DECAY TIME AND SHALE COMPENSATED CHLORINE LOG SYSTEM

Robert W. Pitts, Jr., and Hubert D. Scott, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,513

Int. Cl.^{2} G01V *5/00*

U.S. Cl. 250—267 **19 Claims**

1. A method of radioactivity well logging to investigate subsurface earth formations in the vicinity of a well borehole, comprising the steps of:

a. repetitively emitting discrete time interval bursts of high energy neutrons from a logging instrument having a pulsed neutron source and a gamma ray detection portion in the borehole during a measurement portion of an operating cycle having a measurement portion and a background portion to bombard the earth formations and produce a succession of thermal neutron populations in the borehole and formations;

b. detecting gamma radiation in an energy range including the capture gamma ray spectrum of substantially all elements during first and second discrete detection time intervals occurring at different times after each of the repetitive irradiation time intervals during the measurement portion of the operating cycle;

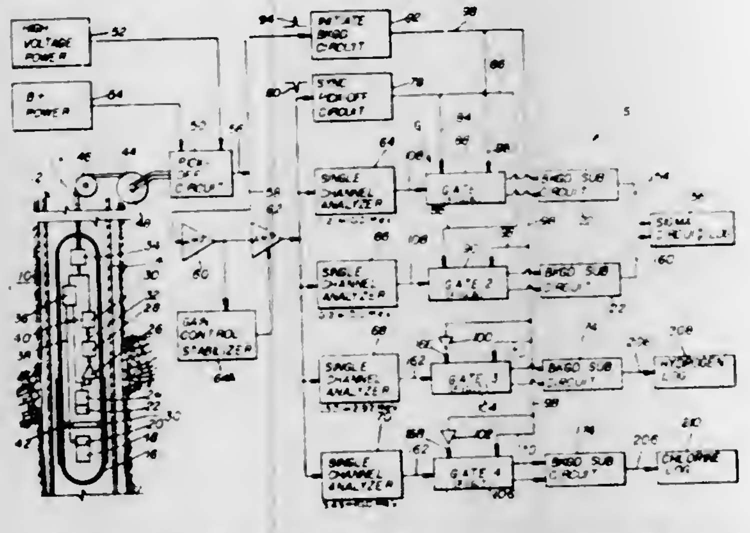
c. detecting gamma radiation in a first energy sub-range including a significant part of the capture gamma ray spectrum of hydrogen during substantially all of the measurement portion of the operating cycle;

d. detecting gamma radiation in a second energy sub-range including a significant part of the neutron capture gamma ray spectrum of chlorine which is distinct from that of hydrogen during substantially all of the measurement portion of the operating cycle;

e. deriving from the gamma radiation detected during the first and second discrete detection time intervals occurring after each of the repetitive irradiation time intervals an indication of the macroscopic thermal neutron capture cross section of the formation;

f. simultaneously deriving from the gamma radiation detected in said first and second energy sub-ranges, a measure of the relative presence of hydrogen and chlorine in the formation; and

g. shielding the detector portion of the logging instrument with a material having the characteristic of emission of thermal neutron capture gamma radiation predominantly within said first energy subrange and substantially outside said second energy sub-range.



4,002,904

SIMULTANEOUS THERMAL NEUTRON LIFETIME AND BORON CONTENT WELL LOG

Harry D. Smith, Jr.; Ward E. Schultz, and Dan M. Arnold, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,987

Int. Cl.^{2} G01V *5/00*

U.S. Cl. 250—270 **9 Claims**

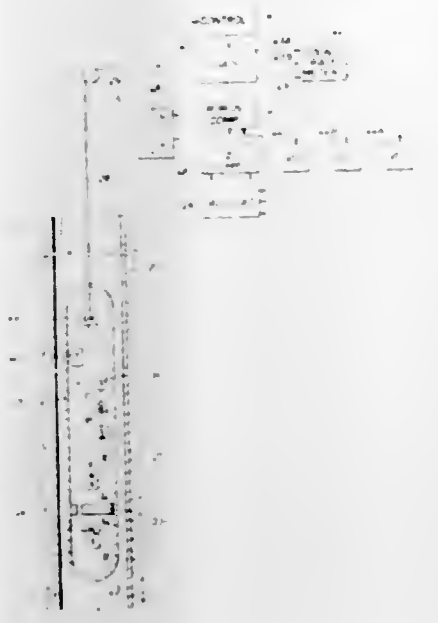
1. A method for logging earth formations traversed by a well bore comprising the steps of:

repetitively irradiating earth formations known to be substantially free of boron content with high energy neutrons and developing values of thermal neutron capture gamma ray count rates for defining the function $f(\Sigma)$ (where Σ is the macroscopic capture cross-section for thermal neutrons) for values of Σ and the thermal neutron capture gamma ray count rates;

for another section of the borehole, repetitively irradiating the earth formations over the length of such section with high energy neutrons and developing values from the thermal neutron capture gamma ray count rate of Σ and corresponding thermal neutron capture gamma ray count rates, where said gamma ray count rates include all gamma ray energies in excess of 0.8 MEV;

comparing, for discrete locations along such section the relative values of developed gamma ray count rates for selected Σ values to said function $f(\Sigma)$; and

producing indications whenever the measured values of count rates and count rates derived from said function $f(\Sigma)$ differ as an indication of the presence of boron.



4,002,905

PENETRANT FLAW INSPECTION METHOD

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 23, 1976, Ser. No. 660,594

Int. Cl.^{2} G01N *19/08, 21/16;* **C09K** *11/06*

U.S. Cl. 250—302 **15 Claims**

1. A method for detecting cracks and flaws in the surface of an object, which comprises applying to said surface a water washable biodegradable liquid dye penetrant composition which comprises (1) a major amount of a combination of biodegradable nonionic surfactants consisting of ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being alkyl chains containing in the range from 11 to 15 carbon atoms, one of said biodegradable surfactants containing an average of 5 moles of ethylene oxide and another of said biodegradable surfactants containing an average of 9 moles of ethylene oxide, and (2) a small amount of a dye soluble in said combination of biodegradable surfactants, removing said dye penetrant composition from said surface without removing said dye penetrant composition from said cracks and flaws in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

4,002,906

APPARATUS AND METHOD FOR THE RECORDING AND REPRODUCTION OF X-RAY PICTURES

Dietlind Pekau, Taufkirchen, and Eckhard Storck, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 23, 1975, Ser. No. 598,284

Claims priority, application Germany, July 31, 1974, 2436894

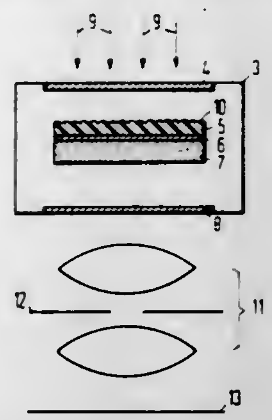
Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—315 A **11 Claims**

1. A process for recording X-ray pictures on a thermoplastic layer mounted on a transparent layer in a housing between a transparent inlet window and a transparent outlet, the housing filled with an inert gas at a pressure of at least 10 atmospheres, comprising the steps of:

creating an electric field in the area of the thermoplastic layer between the inlet window and the transparent layer;

irradiating the thermoplastic layer through the inlet window with X-rays from an X-rayed object causing ionization of the gas and movement of ions toward the thermoplastic layer, under the influence of the electric field, to produce



a charge distribution on a surface of the thermosplastic layer corresponding to the object X-rays;

heating the thermoplastic layer to produce a surface relief corresponding to the charge distribution; and

cooling the thermoplastic layer to fix the relief.

4,002,907
ARRANGEMENT FOR TREATING SHEET-MATERIAL WEBS BY CORONA DISCHARGE

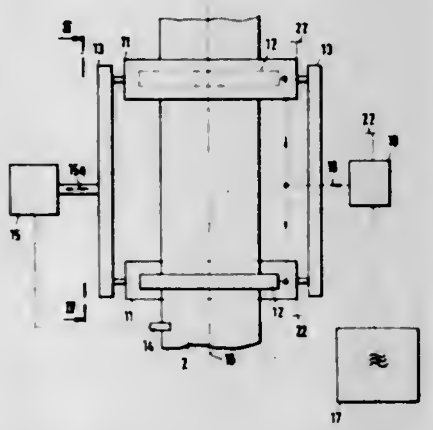
Klaus Kalwar, Alte Landwehr 10, 4803 Amshausen, Germany

Filed Oct. 15, 1975, Ser. No. 622,682

Claims priority, application Germany, Oct. 18, 1974, 2449625

Int. Cl.^{2} H01T *19/04*

U.S. Cl. 250—325 **16 Claims**



1. In an arrangement for treating sheet-material webs by corona discharge, a combination comprising means for advancing a sheet-material web in a path; corona discharge producing means, including at least one electrode roller and at least one cooperating counter roller between which said web is compelled to pass; and edge position control means for controlling the position of the edge of said web, including portions of said electrode roller which serve as guides for the edges of said web, sensing means for sensing deviations in the position of said edge from said path, and adjusting means for adjusting the position of said electrode roller in direction transverse to said path so as to compensate for the sensed deviations.

4,002,908
PROGRAM SELECTION, PARTICULARLY FOR LIQUID SCINTILLATION SPECTROMETERS

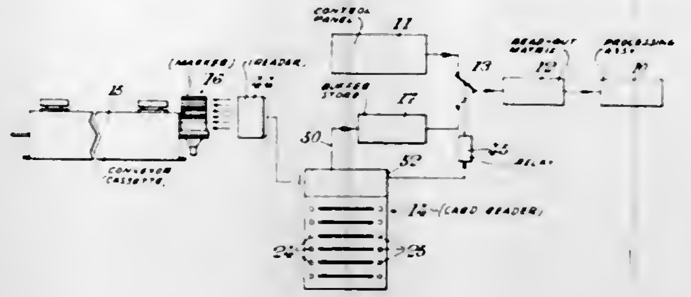
Yves Coutarel, Montrouge, France, assignor to Intertechnique S.A., Plaisir, France

Filed July 7, 1975, Ser. No. 593,563

Claims priority, application France, July 5, 1974, 74.23515

Int. Cl.^{2} G01T *1/00*

U.S. Cl. 250—328 **8 Claims**



1. A device for selecting a program to be carried out by an apparatus on a group of samples disposed in successive sample receiving locations of a conveyor of the apparatus, said conveyor being constructed to bring said locations to a working station in seriatim order, wherein said device comprises a plurality of markers each adapted to be removably located in said conveyor for movement by said conveyor along with said samples, and each provided with a different address code; auxiliary stores in the form of cards each bearing one of said programs; read out means having a plurality of addressable card receiving locations and means for reading the card located at an addressed location; means for reading the address code of each marker as it is moved toward the working position for causing said read out means to read the card at the location having the address read by said reading means and for transferring the program read out from the card to storage means controlling the process carried out by said system.

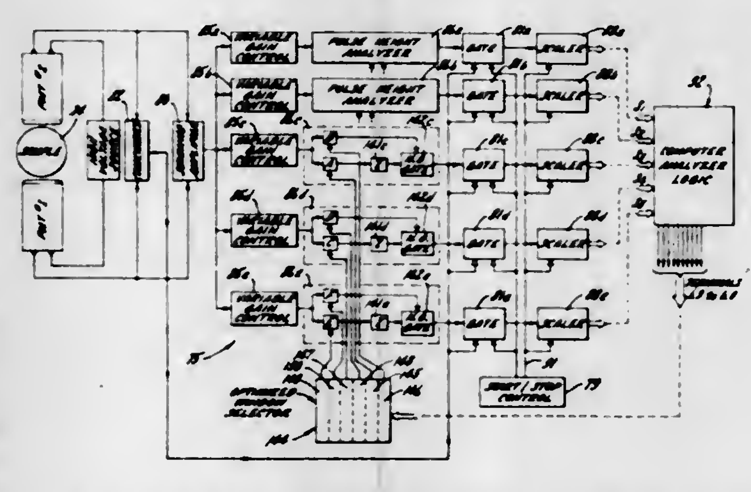
4,002,909
DATA ANALYZING SYSTEM HAVING PROVISION FOR OPTIMIZING COUNTING CONDITIONS AND THUS IMPROVING STATISTICAL COUNTING VALIDITY FOR ENABLING ACCURATE COMPUTATION OF SAMPLE ACTIVITY LEVELS IN LIQUID SCINTILLATION SPECTROMETRY

Lyle E. Packard, Hinsdale; Edward F. Polic, Lyle, and Robert E. Cavanaugh, Jr., La Grange Park, all of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Sept. 28, 1967, Ser. No. 674,083

Int. Cl.^{2} G01T *7/08*

U.S. Cl. 250—328 **28 Claims**



1. Apparatus for optimizing counting conditions in test samples containing *n* radioactive isotopes disposed in a liquid scintillator with each isotope being of the type that produces an observable energy spectrum, said apparatus comprising a light transducer, means for positioning a sample adjacent said transducer in light transmissive relationship therewith, means for measuring a selected quench indicating parameter indicative of the quench level of the sample, *n* pulse height analyzers for analyzing pulses emanating from said transducer, said *n* pulse height analyzers each including means for discriminating pulses on the basis of pulse heights, and means responsive to the value of said measured quench indicating parameter for automatically adjusting said discriminating means relative to the observed spectrum for each isotope, said adjusting means being characterized by its ability to adjust said discriminating means relative to the observed spectrum for each isotope by one of *m* predetermined, preset, amounts selected in response to the value of said measured parameter and corresponding to preselected quench levels at which counting efficiencies are accurately known.

4,002,910
RADIOLOGY

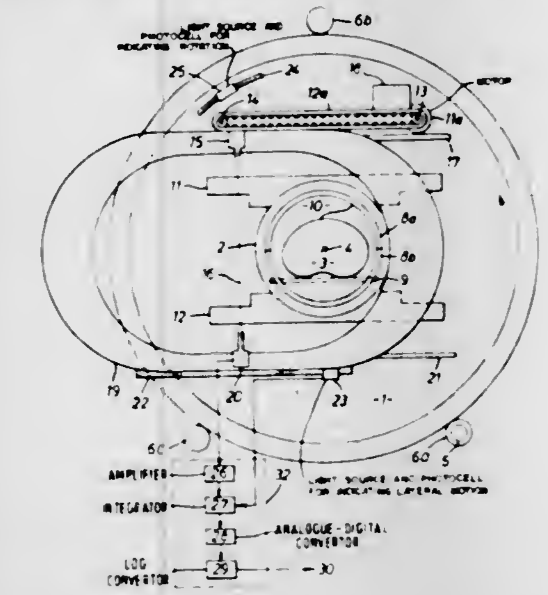
Christopher Archibald Gordon LeMay, Osterley, England, assignor to E M I Limited, Hayes, England

Filed July 17, 1975, Ser. No. 596,623

Claims priority, application United Kingdom, July 20, 1974, 32257/74

Int. Cl.^{2} G01M *23/00*

U.S. Cl. 250—360 **5 Claims**


LIGHT SOURCE AND PHOTOCELL FOR INDICATING POSITION
60
25
24
16
13
12a
14
11a
11
10
2
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19
22
20
23
21
60
AMPLIFIER
INTEGRATOR
ANALOGUE-DIGITAL CONVERTOR
LOG CONVERTOR
30

1. A method of constructing a representation of the distribution of absorption in a planar region of a body including the steps of providing data signals representing the absorption of the radiation along a plurality of substantially parallel paths in the plane of the said region, interpolating between the said data signals to provide further data signals representing the absorption of the radiation along an increased number of such paths and allocating, to each of a plurality of predetermined points in a field notionally delineated in the said region, the data signal or further data signal associated with the path whose centreline passes closest to that point, wherein the interpolation is achieved by forming signals representing difference of said data extending to order *m*, where *m* is at least two, subdividing some of said difference signals and combining the subdivided differences by running addition.

4,002,911
DATA ACQUISITION IN TOMOGRAPHY

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 471,658, May. 20, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,204

Int. Cl.^{2} G01N *21/34, 23/00*

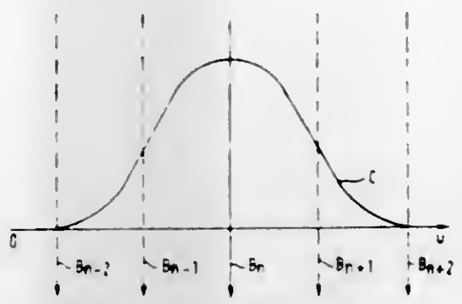
U.S. Cl. 250—360 **5 Claims**

1. Apparatus for examining a body by means of penetrating radiation such as X—or Y—radiation, comprising,

a. means for projecting the radiation through a planar section of the body,

b. means for detecting the radiation emerging from the body to provide output signals, related to the detected radiation.

c. means for scanning the means for projecting and means for detecting relative to the body so that said output signals relate to the transmission of the radiation along a plurality of sets of substantially parallel beam paths, for which the centre lines of adjacent beam paths of each



such parallel set are separated by a distance *a*, to allow the reconstruction from the output signals of an image of the variable absorption or transmission coefficient of the section, and

d. means for imposing an intensity distribution on the radiation across each of the beam paths in a direction at right angles to the beam path, said distribution being such as to limit the output signals to a spatial frequency band of which the practical upper limit is in the vicinity of or below the frequency $1/2a$.

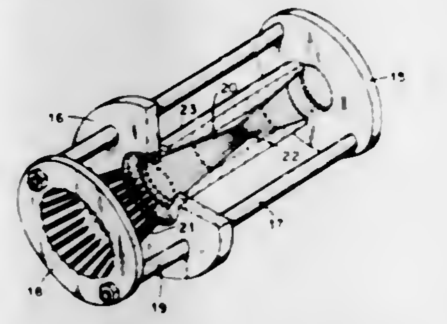
4,002,912
ELECTROSTATIC LENS TO FOCUS AN ION BEAM TO UNIFORM DENSITY

Cleland H. Johnson, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 30, 1975, Ser. No. 645,169

Int. Cl.^{2} H01J *37/12*

U.S. Cl. 250—396 R **7 Claims**



1. An electrostatic focusing lens for focusing a point source ion beam of gaussian cross sectional distribution to a uniform cross sectional distribution at a given distance from the lens, comprising a grounded inner semi-transparent grid which is axi-symmetric with said ion beam, said grid having a minimum axial aperture that matches a central cone portion of said beam, said grid being a double conical grid including a plurality of equally spaced metallic wires with a high melting point and a low expansion coefficient and a grid ring encompassing said grid wires and defining said axial aperture and provided with a desired radius with said grid wires being threaded therethrough to thus form said double conical grid, said lens further including a first grid support ring, a second support ring, a first pair of spacer rods mounted between and to said first and second rings for providing a desired spacing therebetween, a third spring support ring, a second pair of spacer rods mounted between and to said second ring and to said third ring, and a plurality of springs equal in number to said grid

wires, said grid wires being attached at first respective ends thereof to the inner edge of said first support ring with the other respective ends of said grid wires extending through said second support ring and fastened to first respective ends of said springs and the other respective ends of said springs being affixed to the inner edge of said third spring support ring, and an insulated outer anode encompassing and spaced from said double conical grid within said desired spacing between said first and second support rings, said first, second and third support rings as well as said grid being at ground potential, said anode adapted to be connected to a voltage source, said anode shaped such that said voltage applied thereto provides an electrostatic field between said anode and said grid, said grid, anode and support rings adapted to be mounted within an evacuated housing, whereby a portion of the ions from said ion beam that pass through the inside of said grid are undeflected by the zero field that exists within said grid, and the remaining portion of the ions from said ion beam that are outside of said central cone defined by said grid are deflected by said electrostatic field toward the axis of said grid an amount proportional to their minimum radial distance from said central cone such that the deflected and undeflected portions of said ion beam merge to produce said uniform distribution at said given distance from said lens.

4,002,913
RADIOLOGY

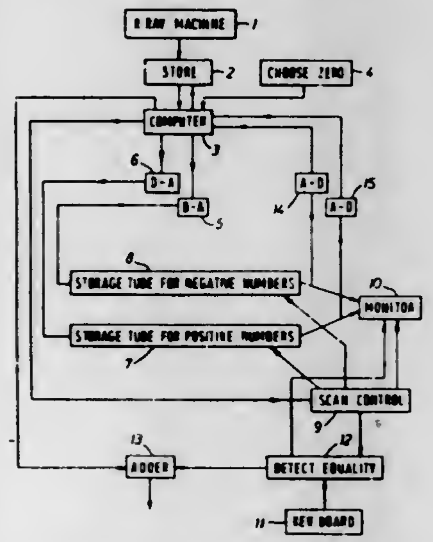
Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Filed May 8, 1975, Ser. No. 575,581

Claims priority, application United Kingdom, May 9, 1974, 20479/74

Int. Cl.² G01T *1/16*

U.S. Cl. 250—445 T **1 Claim**



1. A medical radiology diagnostic device for examining a body by penetrating X-radiation including: means for deriving, from a planar region of the body, electrical signals indicative of the absorption suffered by penetrating X-radiation traversing a plurality of sets of linear paths disposed at different positions in the plane of said planar region of the body, means for transforming said electrical signals in accordance with a convolution function to derive corresponding transformed signals, a storage tube having a target surface, means for storing on the target surface of the storage tube lines of charge each determined by the transformed electrical signal for a corresponding linear path of the X-radiation through the body and oriented on the target surface at an angle corresponding to the angle in said planar region of said corresponding linear path, a cathode ray tube having a display surface, and means for displaying on said display surface a visible brightness distribution corresponding to the charge distribution on the target surface of the storage tube.

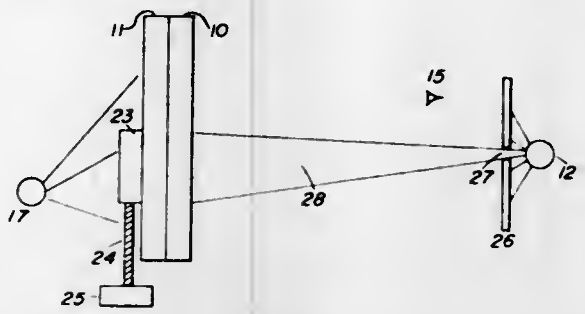
4,002,914
TRANSPARENCY CONTRAST ENHANCEMENT SYSTEM

Albert Macovski, Palo Alto, Calif., assignor to Maxim Diagnostic Imaging, Palo Alto, Calif.

Continuation-in-part of Ser. No. 538,017, Jan. 2, 1975, abandoned. This application Feb. 27, 1976, Ser. No. 661,959

Int. Cl.² G01N *21/38*; G02B *1/24, 5/30, 27/28*

U.S. Cl. 250—461 R **22 Claims**



1. Apparatus for viewing a transparency having a viewing side and a non-viewing side comprising:

a front illuminator for illuminating the transparency from the viewing side with a first illuminant which is substantially invisible to the viewer;

a converter structure positioned adjacent to the non-viewing side of the transparency which converts the first illuminant after it passes through the transparency to a second illuminant which is visible to the viewer; and

means for back illuminating the converter structure so that said back illumination illuminates the non-viewing side of the transparency with visible light.

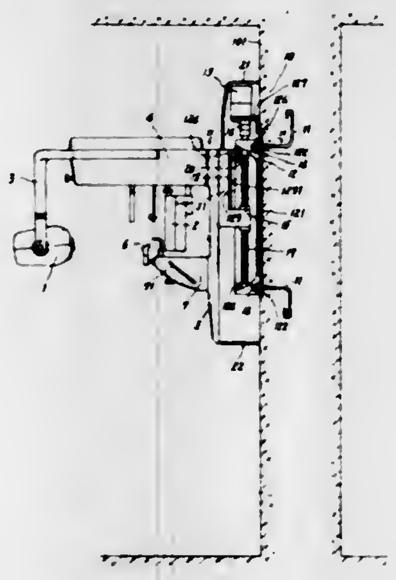
4,002,915
ASSEMBLY FOR TAKING A CONTINUOUS X-RAY PICTURE OF THE DENTAL ARCH

Charles M. Weiss, New York, N.Y., and Sadayasu Ota, Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Japan

Filed Dec. 9, 1974, Ser. No. 531,071

Int. Cl.² H01J *35/00*

U.S. Cl. 250—490 **6 Claims**



1. In an apparatus for taking a continuous X-ray picture of the dental arch, comprising a support base carrying an X-ray source, a film holder, means for supporting the patient's jaw, and means for simultaneously moving the X-ray source and the film holder about the patient's jaw, the improvement which comprises the combination of a vertically extending support base; a vertical wall construction; means for mounting said vertical support base on said vertical wall construction out of contact with the floor, said mounting means and said vertical wall construction providing the sole vertical and horizontal support for said vertical support base; means for raising and lowering said support base, comprising a housing fixed to said mounting means, a vertical threaded rod in said housing, motor means for rotating said rod, and a sleeve nut means on said support base threadely engaging said rod and operable to raise or lower the support base upon rotation of said rod; and means for preventing transverse vibrations during elevation of the support base, comprising a vertically extending U-shaped channel member on said support base and disposed around said rod, opposed vertically extending rails mounted on said housing adjacent each leg of the channel member, each rail having three roller-engaging surfaces each parallel to the longitudinal axis of the rod, the first and second surfaces being parallel to the wall construction and the third surface being perpendicular to the wall construction, a pair of rollers mounted on each leg of said channel member and engaging said first and second surfaces of the adjacent rail and a pair of rollers mounted on the base of the U-shaped channel member and engaging the third surface of the adjacent rail.

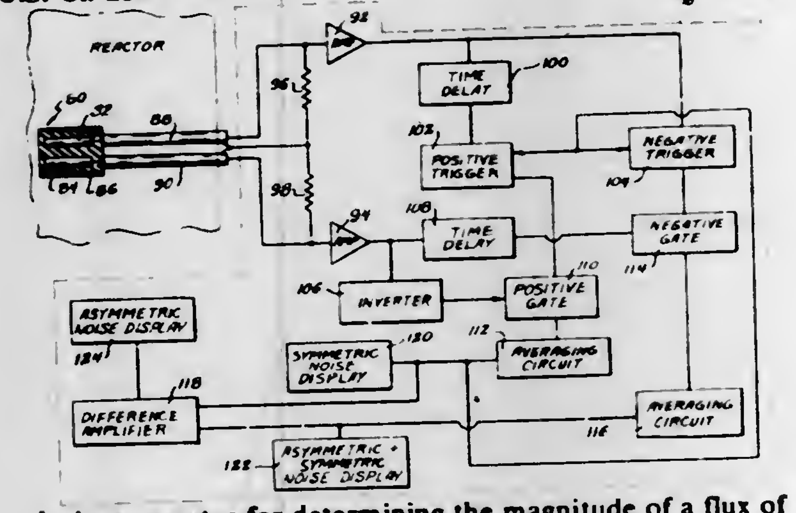
4,002,916
APPARATUS FOR MEASURING A FLUX OF NEUTRONS

James L. Stringer, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,758

Int. Cl.² G01T *3/00*

U.S. Cl. 250—392 **3 Claims**



1. An apparatus for determining the magnitude of a flux of neutrons at a measuring location which location is surrounded by an unwanted flux of neutrons generating noise, the system comprising:

a first conductor disposed at the measuring location and connected electrically through a first coaxial cable to a remote location;

a second conductor disposed in physical proximity to said first conductor but insulated electrically therefrom, said conductor connected by a second coaxial cable paralleling said first coaxial cable to said measuring location;

a first amplifier connected to the first coaxial cable and responsive to electrical signals therein to generate a first amplifier signal;

a second amplifier connected electrically to the second coaxial cable and responsive thereto to generate a second amplified signal;

a negative trigger connected electrically to the output of the first amplifier to generate therefrom a negative trigger signal;

a first time delay connected to the output of the first amplifier to generate therefrom a delayed first amplifier signal;

a positive trigger connected to the first time delay and responsive thereto to generate a positive trigger signal;

an inverter connected to the output of said second amplifier to generate therefrom an inverted second amplifier signal;

a positive gate connected electrically to the positive trigger and to the inverter to generate therefrom a positive gate signal upon coincidence of a positive trigger signal and an inverted second amplifier signal;

a second time delay connected to the output of the second amplifier to generate a delayed second amplifier signal;

a negative gate connected electrically to the negative trigger and to the second time delay to generate therefrom a negative gate signal upon coincidence of a negative trigger signal and a time delayed second amplifier signal;

averaging means connected to the positive gate and the negative gate and responsive to the positive gate signal and the positive gate signal to generate averaged signals therefrom; and

display means for displaying the averaged signals, which displayed signal is proportional to the statistically correlated portions of the inputs to the first and second amplifiers and hence to the neutron flux at the remote location.

4,002,917
SOURCES OF X-RADIATION

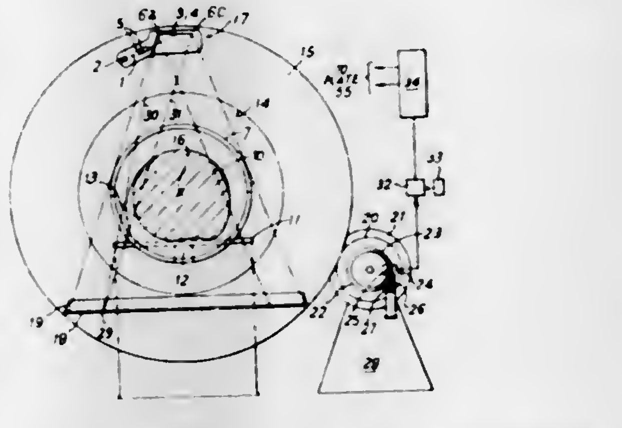
Bernard Joseph Mayo, Beaconsfield, England, assignor to EMI Limited, Hayes, England

Filed Aug. 27, 1975, Ser. No. 608,276

Claims priority, application United Kingdom, Aug. 28, 1974, 37563/74

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **5 Claims**



1. Radiological apparatus comprising means defining a patient position, a source of X-radiation, a scanning frame supporting said source, so that the X-radiation projects through a substantially planar region of said patient position, drive means for causing said scanning frame, and with it said source, to execute an angular movement around the patient position, about an axis intersecting said region, so that the radiation projects through said region from a plurality of different directions, and detector means disposed to receive the radiation emergent from said patient position and to provide output signals indicative of the amount of radiation transmitted through said patient position along each of a plurality of paths in said region; the source comprising an X-ray emissive target which is elongated in a direction substantially parallel to said axis, a source of an electron beam, and deflecting means for deflecting said electron beam relative to said anode; means being provided for energising said deflecting means during the angular movement of said scanning frame so as to shift the region of impact of said electron beam along said anode and cause said radiation to be shifted so as to project through at least one further substantially planar region of said patient position; the detector means being adapted to accommodate the shift of said radiation and the drive means being adapted to cause said scanning frame to continue its angular movement with the electron beam in its deflected position.

4,002,918
APPARATUS FOR THE IRRADIATION OF FLUIDS

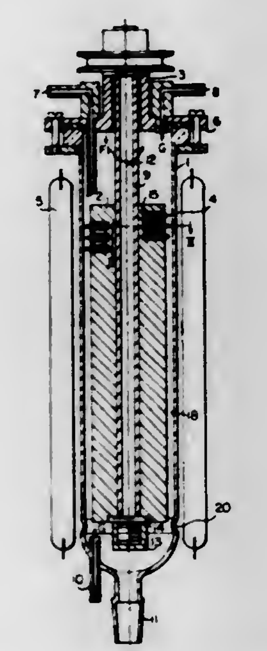
Alfred Graentzel, Durmersheimer Str. 98, 75 Karlsruhe 21, Germany

Filed Apr. 8, 1976, Ser. No. 675,142

Claims priority, application Germany, Apr. 10, 1975, 2515604

Int. Cl.² G01M *21/24*

U.S. Cl. 250—431 **7 Claims**



1. Apparatus for the irradiation of fluids to initiate chemical reactions resulting in the formation of chemical compounds, said apparatus comprising: an axially symmetrical container consisting of a material which is permeable for the radiation to which the fluid is to be exposed; at least one radiation source so arranged relative to said container as to irradiate said container; means for conducting said fluid through said container to subject it to the radiation from said radiation source; a rotor centrally supported in said container for rotation therein; and means for rotating said rotor, said rotor consisting of a body having a plurlity of bores formed therein in an essentially radial orientation and pins slidably received in said bores and adapted, upon rotation of said rotor, to abut the inner surface of said container thereby to wipe any deposits therefrom.

4,002,919
SCANNING APPARATUS FOR MEASURING THE DIMENSION OF AN OBJECT

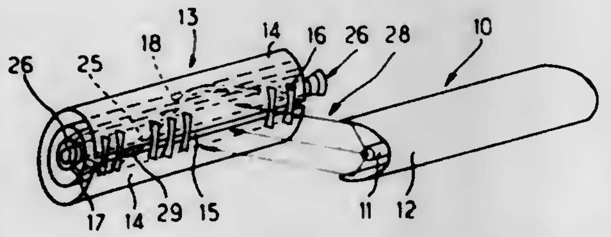
Robert Linard, 22 Bis rue de Serre, 54000 Nancy, France

Filed July 9, 1975, Ser. No. 594,234

Claims priority, application France, Nov. 4, 1974, 74.40629

Int. Cl.² G01N *21/30*

U.S. Cl. 250—560 **10 Claims**



1. Apparatus for measuring the length of elongate products such as rolled steel shapes, comprising; an elongate light emitter for directing light onto an elongate product to produce a shadow up to an end of a length dimension of the product

light receiver means for measuring said length dimension, comprising, a cylindrical stationary element and a cylindrical rotatable element, both extending along the light emitter, one inside the other, and both having apertures for forming, by an interplay of the apertures incident to a rotation of the rotatable element, a resulting aperture which has at least a portion thereof movable along the light emitter; and

photo-electric transducer means comprising light-conducting rod means inside the elements of the light receiver means, for exposure of the rod to said shadow, through said resulting aperture, and photo-sensitive means at an end of the rod means.

4,002,920
UNDERGROUND ELECTRICAL RETICULATION SYSTEMS AND TRANSFORMERS THEREFOR

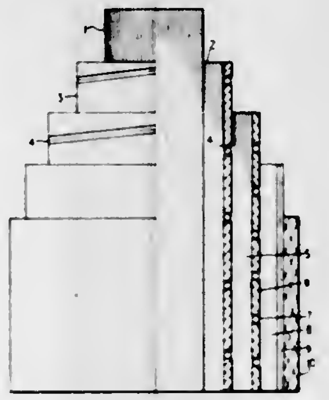
Hans Robert Jansen, 10/16 Prince St., Randwick, New South Wales 2031, Australia

Filed Dec. 20, 1974, Ser. No. 534,946

Claims priority, application Australia, Dec. 20, 1973, 6070/73

Int. Cl.² H02J *3/02*

U.S. Cl. 307—17 **2 Claims**



1. An underground residential electrical distribution system comprising a high voltage source, a transformer constructed as a cable having a magnetic core, a high voltage multi-turn primary winding extending substantially over the full length of the cable, and a number of low voltage multiturn secondary windings which together extend over substantially the full length of the cable, the cable being laid underground for substantially its length adjacent the residences to be serviced and with the ends of the cable adjacent to complete the magnetic circuit, and the system also comprising connections from the high voltage source to the ends of the primary winding, and outlets to the residences outlets being connected to the ends of the secondary windings respectively.

4,002,921
HIGH FREQUENCY POWER SUPPLY

Frank Eugene Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 456,396, March 29, 1974, abandoned, and Ser. No. 509,016, Sept. 25, 1974, abandoned. This application Dec. 19, 1974, Ser. No. 534,190

Int. Cl.² H02J *1/10*; H02M *7/515*

U.S. Cl. 307—43 **5 Claims**

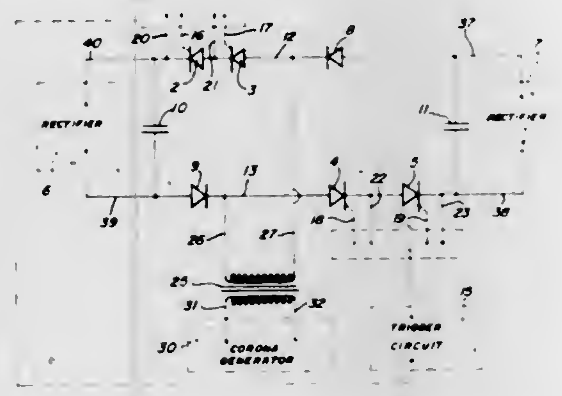
1. A power supply for converting high voltage DC power into high voltage AC power at frequencies of up to 10,000 Hz comprising:

a first circuit means including a first source of DC power connected in series circuit relationship with a first diode means and first SCR means, said first SCR means including at least two series connected SCR devices;

a second circuit means including a second source of DC power connected in series circuit relationship with a second diode means and second SCR means, said second SCR means including at least two series connected SCR devices;

a power transformer having a primary and secondary winding with said primary winding connected in common across said first and second circuit means and interconnecting said first and second circuit means in a series circuit relationship such that the conductive polarity of the first circuit means through said primary winding is opposite to the conductive polarity of said second circuit means through said primary winding, said secondary winding being connected in series with a corona discharge type load;

trigger means connected to said first and second SCR means for alternately triggering the control gates of the SCR devices of said first SCR means and then the control gates of the SCR devices of said second SCR means at the desired high frequency;



first unequalization means connected in parallel across said first SCR means and comprising a separate predetermined impedance means for each of said series SCR devices in said first SCR means with each separate predetermined impedance means being unequal in magnitude and varying from each other by at least about ten percent; and

second unequalization means connected in parallel across said second SCR means and comprising other separate predetermined impedence means for each of said series SCR devices in said second SCR means with each of said other separate predetermined impedance means being unequal in magnitude and varying from each other by at least about ten percent.

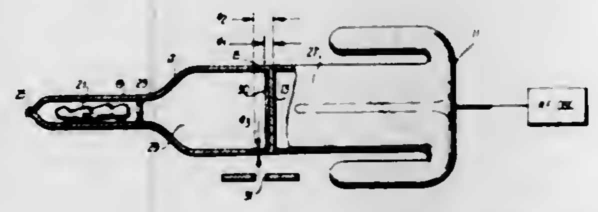
4,002,922
VACUUM ULTRAVIOLET CONTINUUM LAMPS

Robert A. Young, R.R. No. 2, Loretto, Canada

Filed June 12, 1975, Ser. No. 586,273

Int. Cl.² H03F *7/04*

U.S. Cl. 307—88.3 **14 Claims**



1. A conversion device for converting a gas resonance photon into a photon characteristic of a gas molecule comprising in combination:

a resonance lamp filled with a first gas and providing resonance radiation at a first frequency characteristic of said first gas;

a window in said resonance lamp having a lip extending outwardly about its periphery;

a conversion cell, one wall of which is said window;

a mixture of said first gas at at least one other gas filling said conversion cell, with radiation from said lamp directed through said window into said cell forming molecules of said first gas,

which molecules decompose into atoms emitting continuum radiation at frequencies lower than said first frequency; and

a getter within said conversion cell.

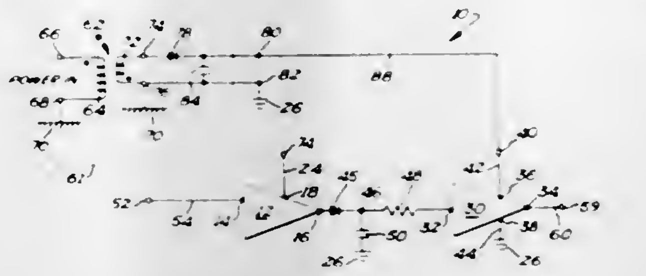
4,002,923
TOUCH ACTUATED ELECTRONIC SWITCH

Willis A. Larson, Mequon, Wis., and David E. Colglazier, Minneapolis, Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Continuation of Ser. No. 284,043, Aug. 28, 1972. This application Aug. 26, 1974, Ser. No. 500,501

Int. Cl.² H01H *35/00*

U.S. Cl. 307—116 **23 Claims**



1. A switching circuit actuated by the touch of a human, comprising in combination: means for supplying alternating voltage power to the switching circuit including a first output for providing a reference coupled to earth ground and including a second output for providing a source of alternating voltage; first amplification means having input means for receiving a signal to be amplified and having output means; second amplification means having input means for receiving a signal to be amplified and having output means for providing a switched output, with the switched output having a first state for approximating an electrical short circuit and a second state for approximating an electrical open circuit; storage means; a touch plate isolated from earth ground; first means for providing an electrical connection between the first amplification means and the second output of the means for supplying power to the switching circuit; second means for providing an electrical connection between the output means of the first amplification means and the storage means; third means for providing an electrical connection between the storage means and the input to the second amplification means; fourth means for providing an electrical connection between the input means of the first amplification means and the touch plate to allow the capacitance of the human to provide an earth reference to the first amplification means and cause the output of the second amplification means to change between the first and second states.

4,002,924
DEVICE FOR MEASUREMENT AND/OR CONTROL OF TEMPERATURE

Dieter K. Busch, Wollstadt, Germany, assignor to VDO Adolf Schindling AG, Frankfurt, Germany

Filed Oct. 11, 1974, Ser. No. 514,103

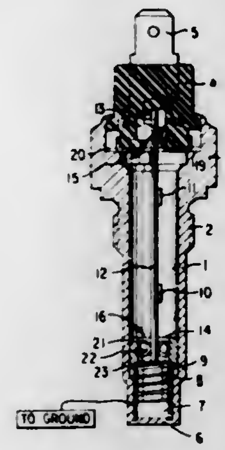
Claims priority, application Germany, Oct. 17, 1973, 2352073

Int. Cl.² H01H *35/00, 83/00*

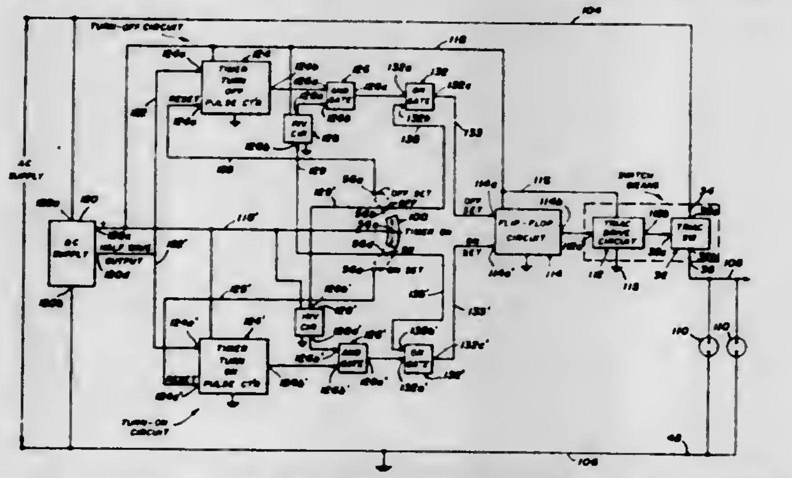
U.S. Cl. 307—117 **4 Claims**

1. A unitary temperature sensing and control device comprising, an elongated tubular metallic casing having a central longitudinal axis and an integral closure sealing its first end, a first dielectric sleeve fitting said casing and disposed contiguous to said first end, a solid state temperature sensing element fitting said first sleeve and making electrical contact with said closure, a plug closing the otherwise open second end of said casing and having an internal recess on said axis and an embedded external contact having a portion disposed in said recess, an elongated substrate body in said casing extending along said axis and having its first end adjacent said first sleeve and its second end in said recess in contact with the contact portion of said plug, an electronic integrated control circuit fixed with and extending along said substrate body from one end thereof to the other, and an electrically conductive spring in said first sleeve in contact at its respective ends with (a) said

temperature sensing element and (b) said first end of said substrate and the contiguous end of said control circuit, said spring acting to urge said element into contact with the integral closure of said casing, and said substrate into limiting axial position in said recess for making electrical connection between said element and circuit.

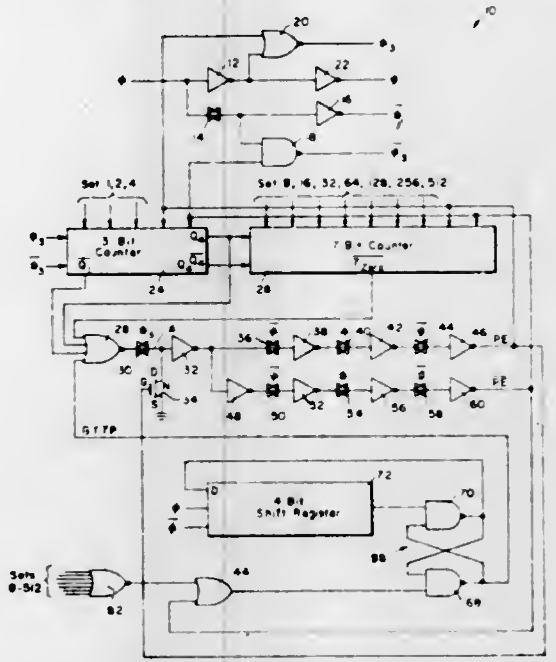


4,002,925
WALL-MOUNTED AUTOMATIC TIMER AND MANUAL ON-OFF LIGHT SWITCH
Brian J. Monahan, 7318 Norfolk Drive, Wichita, Kans. 67206
Filed July 3, 1975, Ser. No. 592,990
Int. Cl.² H01H *7/00*
U.S. Cl. 307—141 **18 Claims**



1. A combination timer and manual on-off switch comprising: manually operable means to five different conditions, one condition being a power turn-on condition, another being a power turn-off condition, another being a timer on setting condition, another being a timer off setting condition, and another being a timer turn-on condition; a pair of power line input terminals and an outlet conductor terminal; switch means coupled between one of said power input terminals and said outlet conductor terminal for coupling and uncoupling said one power line input terminal to and from said outlet conductor terminal; and control means responsive to the different conditions of said manually operable means for closing said switch means when the manually operable means is in said turn-on condition and for opening said switch means when the manually operable means is in said turn-off condition; the control means also including timer turn-on signal generating means responsive to the particular moment when said manually operable means is moved momentarily to said timer on setting condition for generating a switch closing signal every 24 hours from the moment said manually operable means is momentarily moved to said timer on setting condition, timer turn-off signal generating means responsive to the particular moment when said manually operable means is moved momentarily to said timer off setting condition for generating a switch opening signal every 24 hours from the moment said manually operable means is momentarily moved to said timer off setting condition, and signal responsive means responsive to the generating of said switch closing and switch opening signals when said manually operable means is in said timer turn-on condition for respectively closing and opening said switch means when said signals are respectively generated.

4,002,926
HIGH SPEED DIVIDE-BY-N CIRCUIT
Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Oct. 2, 1975, Ser. No. 619,097
Int. Cl.² H03K *21/36*
U.S. Cl. 307—225 C **10 Claims**

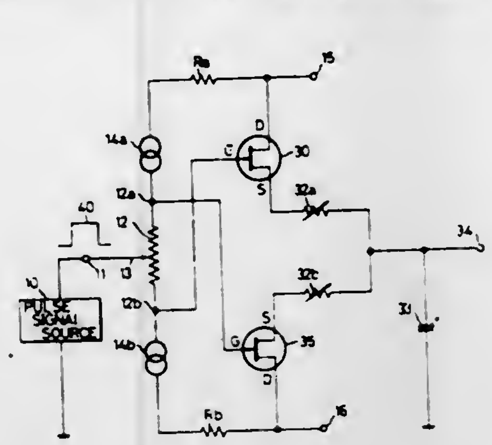


1. A divide-by-N circuit comprising:
an input clock;
a synchronous down-counter for providing a high speed decode of a particular counter state;
said synchronous down-counter having an output;
a ripple down-counter, which is connected to and clocked by said output of said synchronous down-counter, for providing a counter of predetermined length, which is not required to quickly decode;
a plurality of gates which provide a gated clock;
said input clock being fed into said gates; and
said gated clock being inputed into said synchronous counter.

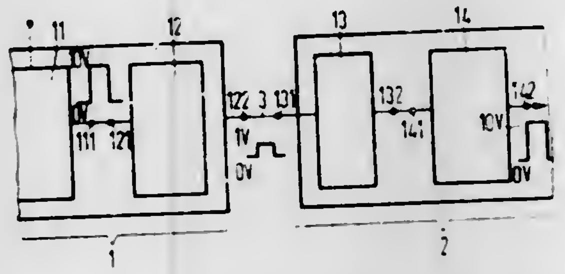
4,002,927
COMPLEMENTARY FET PULSE CONTROL CIRCUIT
Hideo Nakamura, Komae, and Akira Iga, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 22, 1975, Ser. No. 579,813
Claims priority, application Japan, May 27, 1974, 49-59452
Int. Cl.² H03K *17/00*
U.S. Cl. 307—246 **12 Claims**

1. A pulse control circuit comprising:
an input terminal supplied with a pulse signal;
a first FET put into the conductive state in response to said pulse signal;
a first time constant circuit charged when said first FET is put in the conductive state;
a second FET put into the conductive state with the charging voltage of said first time constant circuit;
a second time constant circuit discharging the charged electricity in said first time constant circuit when said second FET is put in the conductive state;
an output terminal to deliver an output signal having a wave form in accordance with the time constants of said first and second time constant circuits including first and

second DC power sources of different polarity, said first and second FETs connected in series with said first and second DC power sources and said first and second time constant circuits being connected between said first and second FETs, wherein said first and second FETs have drains, sources and gates, said sources being connected to said first and second time constant circuits respectively, and said gates being connected to a biasing circuit including a constant current circuit connected between said first and second DC power sources and a resistor connected in series with said constant current circuit.

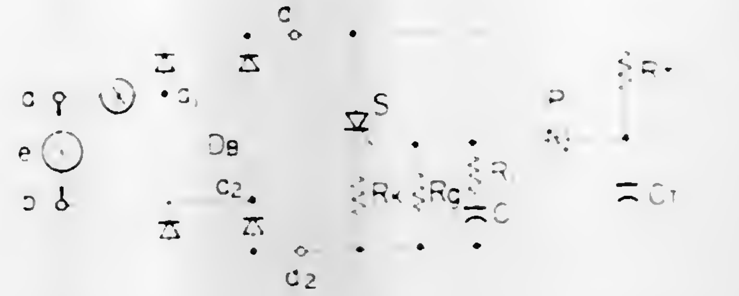


4,002,928
PROCESS FOR TRANSMITTING SIGNALS BETWEEN TWO CHIPS WITH HIGH-SPEED COMPLEMENTARY MOS CIRCUITS
Karl Goser, Munich, and Michael Pomper, Schliersee, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Sept. 17, 1974, Ser. No. 506,840
Claims priority, application Germany, Sept. 18, 1973, 2346966
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² H03K *17/60, 19/08*
U.S. Cl. 307—251 **10 Claims**



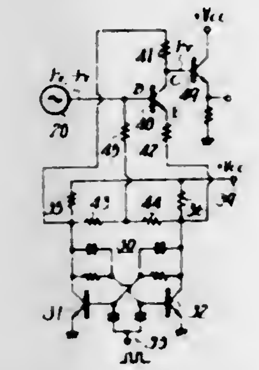
1. A process for transmitting signals between first and second semiconductor chips each having high-speed complementary MOS circuits, comprising the steps of providing an output stage on the first chip for transforming the voltage level of a signal from a connected MOS circuit to a relatively low level voltage, providing a connection line for transmitting the relatively low level voltage to the second chip, whereby the connection line is connected with the output stage on the first chip, and providing an input stage on a second chip for amplifying the low level voltage to the original voltage level, whereby said input stage is connected with the connection line and the signal is restored to its original level for connection to a subsequent MOS circuit on the second chip.

4,002,929
A.C. TYPE TIMER CIRCUIT
Hideo Suemasa, Hirakata; Kazuyoshi Honda, Kadoma; Katsuhiko Fukutake, Matsusaka, and Kenichi Yoda, Moriguchi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed June 23, 1975, Ser. No. 589,704
Claims priority, application Japan, June 28, 1974, 49-74573
Int. Cl.² H03K *17/72*
U.S. Cl. 307—252 W **3 Claims**



1. An alternating current type timer circuit comprising a load inserted between an alternating current source and a full-wave rectifying circuit, a first series circuit of a thyristor and a first resistance inserted between output terminals of said full-wave rectifying circuit, said first resistance being connected between the cathode of said thyristor and the negative side of said output terminals of the full-wave rectifying circuit, a time-limiting circuit of a series connected time-limiting resistance and time-limiting condenser connected with the output terminals of the full-wave rectifying circuit, a pulse applying means connected with the gate of the thyristor and said time-limiting circuit, said pulse applying means being caused by the time-limiting circuit to generate pulses at a desired time after an alternating current is applied from said source, a second series circuit of a second resistance and a first condenser inserted between the gate of the thyristor and the negative side of the output terminals of the full-wave rectifying circuit, and a transistor connected at its base with the junction of said second resistance and first condenser through a third resistance and at the emitter with the junction of the first condenser and the negative side of the output terminals of the full-wave rectifying circuit, said time-limiting condenser being inserted between the collector and emitter of said transistor.

4,002,930
PHASE SWITCHING CIRCUIT
Hideki Miura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 25, 1975, Ser. No. 571,750
Claims priority, application Japan, July 23, 1974, 49-87515
Int. Cl.² H03K *17/60, 3/286*
U.S. Cl. 307—262 **6 Claims**

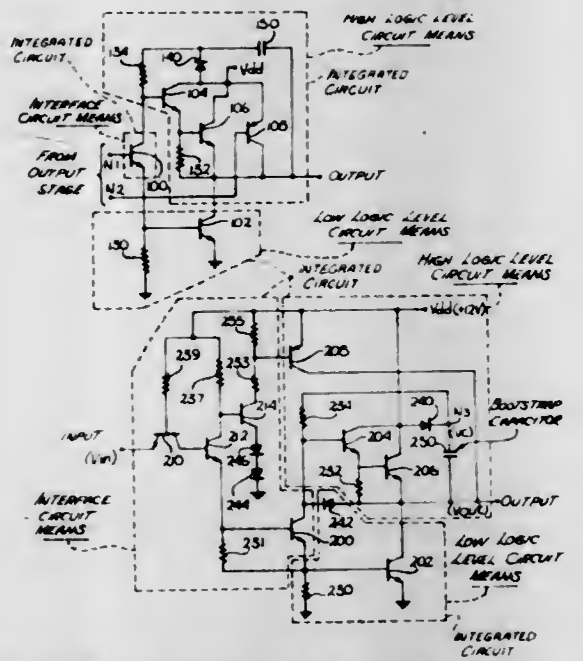


1. A phase switching circuit comprising:
a bidirectional transistor having first, second and third terminals;

a first circuit path connected to said first terminal;
a second circuit path connected to said third terminal;
an output means connected to said first circuit path;
a power source having a relatively high voltage;
first switching means for switching the first and third terminals of said bidirectional transistor between said power source and a low voltage circuit point for operation as an emitter follower;
said first switching means being connected between a low voltage point and a point on the first circuit path;
second swiching means for switching the first and third terminals of said bidirectional transistor between said power source and low voltage circuit point for operation as a collector follower;
said second switching means being connected between a low voltage point and a point on the second circuit path;
means for applying a time varying signal to said second terminal; and
means for applying a signal means to control the sequence of said first and second switching means.

4,002,931
INTEGRATED CIRCUIT BIPOLAR BOOTSTRAP DRIVER

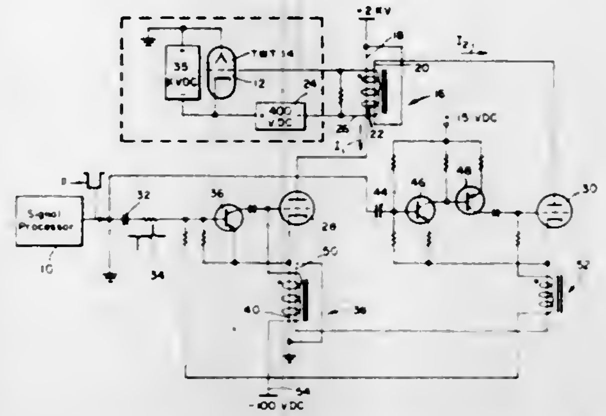
Frederick Tsang, Saratoga, and H. T. Chua, Cupertino, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.
Filed June 27, 1975, Ser. No. 590,922
Int. Cl.² H03K *1/14*
U.S. Cl. 307—264 **14 Claims**



1. In an integrated circuit having a single power supply, a bipolar bootstrap driver said driver comprising:
A. high logic level circuit means coupled to an output node for providing a fast, boot-strapped high logic level output voltage and fast high current in response to a first input voltage, said high logic level circuit means comprising:
   1. a bipolar, biased Darlington transistor pair;
   2. a bipolar transistor of a complementary type to said Darlington transistor pair, said bipolar transistor coupled in parallel to said Darlington transistor pair; and
   3. a resistor and capacitor forming a series RC network in circuit across said Darlington transistor pair;
B. low logic level circuit means coupled to said output node for providing a fast low logic level output voltage in response to a second input voltage; and
C. an interface circuit means for selectively activating said high and low logic level circuit means in response to said first and second input voltages, said interface circuit means coupled to said high and low logic level circuit means and an input node.

4,002,932
PULSE MODULATOR GATING CIRCUIT WITH TRAILING EDGE CONTROL

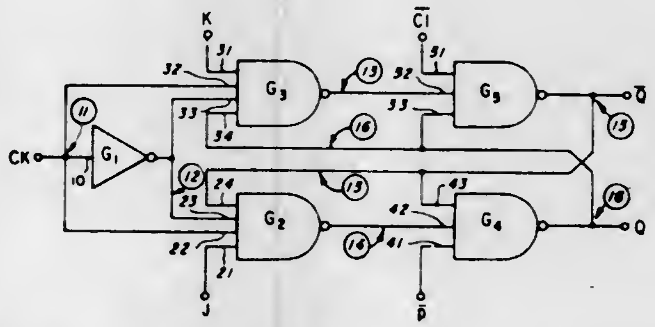
Harold Zaslav, Anaheim, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Oct. 2, 1975, Ser. No. 620,478
Int. Cl.² H03K *17/00*
U.S. Cl. 307—265 **10 Claims**



1. A pulse modulator for applying a pulse of energy to a load circuit during the duration of an applied control signal pulse, said pulse modulator comprising:
a transformer having a secondary winding adapted for being coupled across said load circuit, and first and second primary elements;
first means for applying a first current through the first primary element of said transformer during the duration of said control signal pulse;
second means for applying a second current through the second primary element of said transformer so as to produce a flux which is in opposition to the flux resulting from the current through said first primary element and such that said second current through the second primary winding commences with the trailing edge of said control signal pulse; and
wherein said first means includes a circuit arrangement having current gating means for responding to the leading edge of said control signal pulse for commencing the application of said first current, positive feedback means responsive to the said first current for increasing the value thereof, and negative feedback means responsive to said second current for terminating the flow of said first current;
whereby an output pulse is produced across the secondary winding during the duration of said control pulse signal.

4,002,933
FIVE GATE FLIP-FLOP

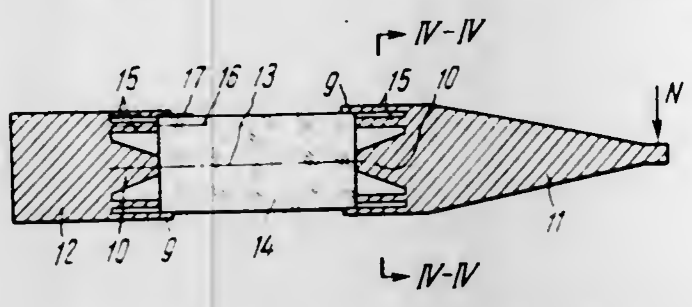
Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 18, 1975, Ser. No. 550,249
Int. Cl.² H03K *3/286*
U.S. Cl. 307—291 **18 Claims**



1. A flip-flop circuit comprising:
a. four multiple-input inverting gate circuits all of said gate circuits having known and essentially equal propagation delay periods, each of said gates being operative to produce an output signal of a first logic level in response to the simultaneous application of all of said multiple inputs of said gate of signals of a second logic level and operative to produce an output signal of said second logic level in response to the simultaneous application to said multiple inputs of said gate of any combination of signals other than all of said second logic level;
b. one pair of said gate circuits interconnected to form a latch circuit in that the output signal of each gate of said one pair is connected to a first one of said multiple inputs of the other gate of said one pair and the output of one of said pair is connected to said at least one output;
c. the second pair of said gates forming a steering circuit in that each of said second pair of gates has its output connected to a second one of said multiple inputs of a corresponding gate of said one pair, a first one of said multiple inputs of each of said second pair of gates connected to the output of a noncorresponding gate of said one pair, and the second one of said multiple inputs of each of said second pair of gates being connected to receive clock signals applied to said clock signal input; and
d. further comprising an interter gate having its input connected to said clock signal input and its output connected to a third one of said multiple inputs of each of said second pair of gates.

4,002,934
SENSITIVE ELEMENT OF PIEZOOPTIC MEASURING CONVERTER

Isaak Isaevich Slezinger, ulitsa Kirova 40-a, kv. 41; Georgy Mironovich Belitsky, Pervomaiskaya ulitsa, 74, kv. 101; Vladimir Alexandrovich Shiryaev, ulitsa "Iskra", 7, kv. 34, and Jury Vasilievich Mironov, Nagornay ulitsa, 68, korpus 14, kv. 34, all of Moscow, U.S.S.R.
Filed May 29, 1975, Ser. No. 581,923
Int. Cl.² H01L *41/04*
U.S. Cl. 310—8 **8 Claims**

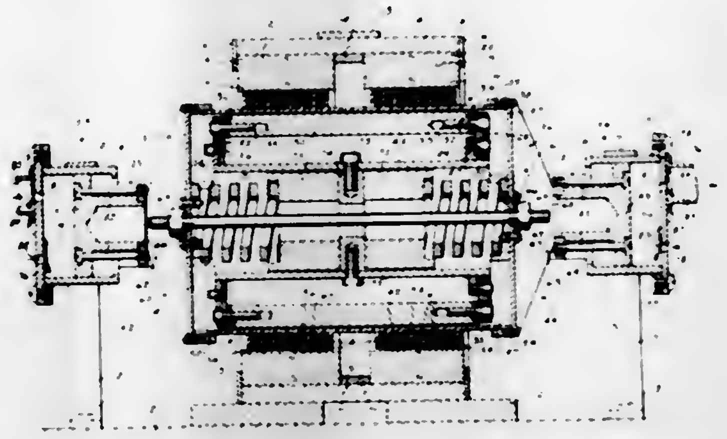


1. A sensitive element of a piezooptic measuring converter, comprising: a foot whose end portion is made as a plurality of pins having longitudinal axes; an insert of a piezooptic material, having a longitudinal axis and a first and a second end face surfaces, the first of said end face surfaces being rigidly attached to said pins of said foot; a base whose end portion is constructed as a plurality of pins having longitudinal axes and rigidly attached to the second end face surface of said insert.

4,002,935
RECIPROCATING LINEAR MOTOR

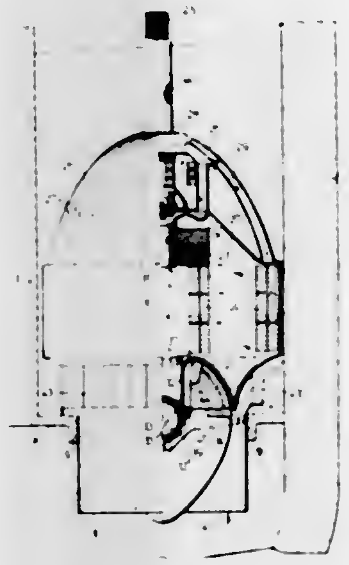
John Robert Brauer, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed May 15, 1975, Ser. No. 577,639
Int. Cl.² H02K *33/18*
U.S. Cl. 310—27 **6 Claims**

1. A linear motor, comprising permanent magnetic means including a first annular permanent magnet providing a first annular pole of a first magnetic polarity and a second annular permanent magnet providing a second annular pole of a second magnetic polarity opposed to said first polarity and axially spaced from said first pole, supporting means fixedly supporting said magnetic means and providing a magnetic circuit between said first and second magnets, coil means movably supported by said supporting means and radially spaced from said magnetic means and providing a first coil portion magnetically coupled with said first pole and a second coil portion magnetically coupled with said second pole, said coil means including a cylindrical electrical insulating member and a first plurality of spaced arc-shaped magnetically conductive members providing at least a first channel confining said first coil portion and a second plurality of spaced arc-shaped magnetically conductive members providing at least a second channel confining said second coil portion, input means selectively electrically connecting said coil means to an alternating current source, and output means operatively connected to said coil means and providing an oscillatory output in response to the energization of said coil means by said alternating current source.



4,002,936
ELECTRIC SUBMERSIBLE PUMP

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany
Continuation-in-part of Ser. Nos. 293,103, Sept. 28, 1972, abandoned, and Ser. No. 293,105, Sept. 28, 1972, abandoned.
This application June 11, 1974, Ser. No. 478,385
Claims priority, application Austria, Oct. 7, 1971, 8658/71
Int. Cl.² H02K *17/00*
U.S. Cl. 310—166 **6 Claims**



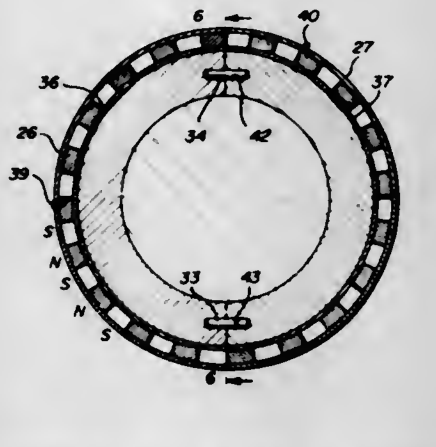
1. An electric submersible pump having an electric motor forming a unit with a pump impeller and where said motor has a rotor connected to the pump impeller, a stator comprising a plurality of pole teeth circumferentially positioned about the axis of said stator, and a plurality of coil groups where each said group has a plurality of individual coils of varying circumferential widths symmetrically positioned within each said coil group and wherein the coils of a coil group overlie pole teeth with the coils of greater circumferential width overlying a greater number of pole teeth than coils of smaller circumfer-

ential width: the improvement comprising in that all the coils of a single coil group are electrically connected at one of their ends to a common star point, in that the common star point of all said coil groups are electrically interconnected, and in that a lead is connected to the other end of each coil of a single coil group with said lead being connectable with a single phase of a multi-phase variable voltage source such that a single phase voltage is applied to all coils of a single coil group and where the leads connected to coils of greater circumferential width are subjected to a higher voltage than leads connected to coils of a smaller circumferential width to induce substantially the same amount of current flow through all of the coils of all of the coil groups to prevent short circuiting between adjacent coils.

4,002,937
MAGNETIC SENSING DEVICE

James H. Anson, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed July 3, 1975, Ser. No. 593,028
Int. Cl.^{2} H02K *21/14*
U.S. Cl. 310—168 **7 Claims**



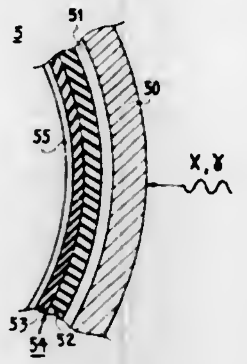
1. A magnetic unit for use for monitoring rotation of a rotatable member comprising annular magnetic means, mounting means supporting said magnetic means and mountable for rotation with said member to be monitored, said annular magnetic means comprising a flexible permanently magnetized material strip having an arcuate portion and a plurality of integral pole elements projecting axially from said arcuate portion and disposed with spaces therebetween, said pole elements presenting like magnetic poles at first sides thereof facing radially in a first direction and opposite magnetic poles at second sides thereof facing radially in an opposite direction, and backup magnetic means of a nonpermanently magnetizable material adjacent said second radially facing side and traversing said spaces and presenting said opposite magnetic poles substantially traversing said spaces and facing radially in said first direction.

4,002,938
X-RAY OR RAY IMAGE TUBE

Jean Pierre Péhé, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 8, 1975, Ser. No. 593,926
Claims priority, application France, July 12, 1974, 74.24637
Int. Cl.^{2} H01J *39/18, 39/06*
U.S. Cl. 313—101 **2 Claims**

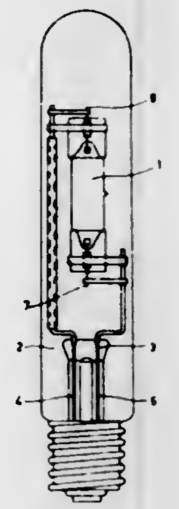
1. An X-ray or γ ray image tube comprising an input screen receiving the incident radiation from the object, and a luminescent output screen, the two being separated by an evacuated space in which the electrons emitted in operation by said input screen under the effect of said radiation, are accelerated, their impact on said luminescent screen producing a visible image constituting the image of said object, said screen comprising a scintillator constituted by an alkaline halide, and a photocathode constituted by an alkaline antimonide, applied to either side of a barrier layer, characterised in that said barrier layer is constituted by two sub-layers applied one on top of the other, that applied to said scintillator and known as the first sub-layer, being constituted by alumina Al_2O_3 and having a thickness ranging between 50 and 150 angstrom units, and that in contact with the photocathode, and known as the second sub-layer, being constituted by silicon sesquixoide Si_2O_3.



4,002,939
ELECTRIC LAMP

Johannes Maria Van Bragt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,487
Claims priority, application Netherlands, Apr. 1, 1975, 7503829
Int. Cl.^{2} H01J *61/06*
U.S. Cl. 313—217 **3 Claims**



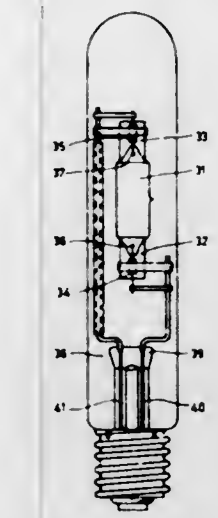
1. An electric lamp having a quartz glass lamp vessel with gas filling and pinched seal, in which seal a molybdenum foil is incorporated to which an outer current conductor and an inner current conductor are welded, characterized in that the inner current conductor, at least at the area of the welded joint at the molybdenum foil, consists of a molybdenum part which is butt welded to a part which mainly consists of tungsten and extends further in the lamp vessel.

4,002,940
ELECTRODE FOR A DISCHARGE LAMP

Tjepke Hendrik Ekkelboom, and Antonius Johannes Alberta van Stratum, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 6, 1975, Ser. No. 584,614
Claims priority, application Netherlands, June 12, 1974, 7407813
Int. Cl.^{2} H01J *1/14, 19/06*
U.S. Cl. 313—346 R **15 Claims**

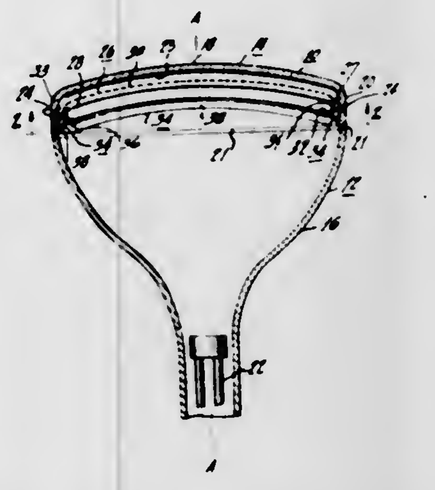
1. A discharge lamp which comprises: an envelope and at least two electrodes, each electrode including a bead and a supporting pin, said head being at least a semispherical fused body 20–80% by weight of tungsten, 80–20% by weight of a metal carbide chosen from the group consisting of tantalum carbide, hafnium carbide and zirconium carbide, and 0–5% of a third substance, the quantity of said third substance being determined by weight in relation to the total weight of said tungsten and said metal carbide, said third substance being chosen from the group consisting of elementary thorium, elementary uranium, and the borides, carbides and oxides of thorium and uranium.



4,002,941
SHADOW MASK CATHODE RAY TUBE SHIELD

Robert C. Demmy, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 590,093, Oct. 27, 1966, which is a continuation of Ser. No. 374,754, June 12, 1964, abandoned. This application July 1, 1968, Ser. No. 763,996
Int. Cl.^{2} H01J *29/07, 31/20*
U.S. Cl. 313—402 **20 Claims**

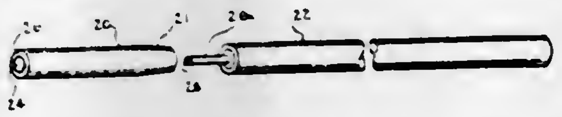


1. A cathode ray tube including an envelope panel comprising a faceplate and a peripheral side wall, a mask electrode including a multi-apertured masking portion and a peripheral reinforcing and supporting portion, said mask electrode being disposed within said panel and surrounded by said side wall with a continuous spacing gap between said side wall and said peripheral portion, means for projecting electrons toward said electrode, and an electron shield extending between said electrode and said side wall and completely blocking the passage of electrons through said spacing gap; said shield comprising a strip of metal foil and extending entirely around said gap and having a pair of flanges extending along the length thereof, one of said flanges extending along and secured to said electrode, the other flange extending along and conforming closely to said side wall, said peripheral portion of said mask electrode comprising a plurality of mounting members located within said spacing gap and supporting said electrode in said panel, said mounting members being completely shielded from said electrons by said electron shield.

4,002,942
PROCESS FOR JOINING ELECTRODES AND PRODUCT RESULTING THEREFROM

Ronald F. Gaboury, 3360 Belvedere St., Brossard, Quebec, Canada

Filed July 7, 1975, Ser. No. 593,837
Int. Cl.^{2} H05B *7/14*
U.S. Cl. 314—60 **5 Claims**

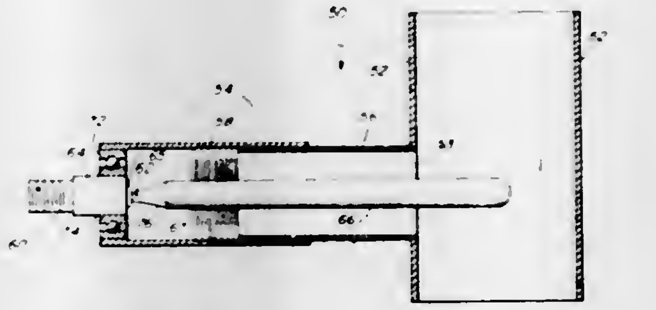


1. A process for joining two principal carbon electrodes for forming a positive electrode of an arc in the illumination of a cinematographic projector, the said principal electrodes each consisting of a core and of sleeve surrounding and adhering to said core, the said process comprising the following steps:
   a. perforating an axial smooth wall blind hole at one end of each of the two principal electrodes solely in the core thereof;
   b. joining the said two principal electrodes end to end by introducing a smooth surface secondary electrode into the two blind holes of the said two principal electrodes until the ends of said two principal electrodes directly contact each other, the said secondary electrode being constituted of a material similar to that of the said principal electrodes, the said secondary electrode having a diameter to tightly fit into the said blind holes to maintain a retention of the said three electrodes together.

4,002,943
TUNABLE MICROWAVE CAVITY

Robert J. Regan, Needam, and Paul O. Haugsjaa, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 22, 1975, Ser. No. 598,089
Int. Cl.^{2} H01J *7/46, 19/80*
U.S. Cl. 315—39 **7 Claims**



1. A tunable microwave cavity including
a. a main cavity having an aperture formed in the wall thereof, and
b. an adjustable coupling probe assembly for coupling microwave power to the main cavity and for accurately adjusting the penetration of the probe within the aperture of the cavity wall, the assembly having
   i. a first conductive tube being rigidly affixed to the cavity wall so as to surround the aperture so that a channel is formed from the interior of the tube to the interior of the cavity,
   ii. a second conductive tube in movable telescoping relationship with the first conductive tube, the conductive tubes have mutually engaging threads so that the telescoping action occurs in response to rotating the second tube with respect to the first tube, the second tube having inner dimensions which are larger than the outer dimensions of the first tube so that the second tube is disposed

over the outer end of the first tube and wherein the first and second tubes have external and internal mutually engaging threads respectively,

iii. a microwave power coupling assembly having inner and outer conductors which are fixed with respect to each other, the outer conductor being mounted within the outer end of the second tube so as to conductively contact the second tube,

iv. a coupling probe affixed to the end of the inner conductor and having a length such that the end of the probe may penetrate the main cavity in response to the telescoping effect of the conductive tubes and

v. means for inhibiting a rotation of the power coupling assembly in response to a rotation of the second conductive tube and for maintaining electrical contact between the outer conductor of the power coupling assembly and the second conductive tube, the rotation inhibiting means including a bearing assembly disposed between the outer conductor and the second tube to permit rotation of the second tube without a corresponding rotation of the power coupling assembly.

4,002,944

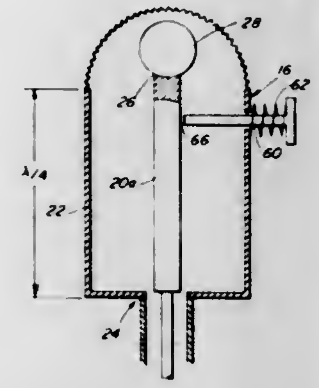
INTERNAL MATCH STARTER FOR TERMINATION FIXTURE LAMPS

William H. McNeill, Carlisle; Paul O. Haugsjaa, Acton; Joseph M. Lech, Westford, and Robert J. Regan, Newton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 570,109, April 21, 1975, Pat. No. 3,943,403. This application Nov. 17, 1975, Ser. No. 632,439

Int. Cl.² H01J *61/56*

U.S. Cl. 315—39 **3 Claims**



1. A light source comprising:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting substance and a volatile fill material which emits light upon excitation and breakdown,

c. a termination fixture for the lamp having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end coupled to the source and the inner conductor having a second end coupled to the lamp, and

d. the termination fixture further having an adjustable tuning device capable of making the fixture resonant at the operating frequency so as to create an intense electric field in the fixture for starting the lamp thereby to couple more incident power into the lamp, the lamp impedance at starting being complex having a capacitive reactance component, the tuning device having tuning means for introducing a component of impedance effective to compensate for the capacitive reactance component of the lamp impedance, the tuning means further having means for introducing an inductive reactance impedance component in parallel across the inner and outer conductors substantially at the second end of the conductors.

4,002,945

PICTURE DISPLAY DEVICE HAVING A MATRIX OF DIRECT CURRENT GAS DISCHARGE CELLS

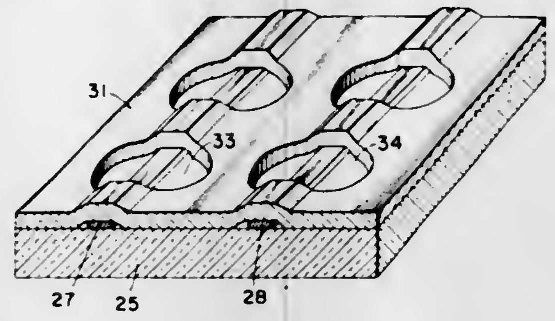
Sjouke Van Houten, and Thijs Johannes De Boer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 243,784, April 13, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,858

Claims priority, application Netherlands, Apr. 21, 1971, 7105349

Int. Cl.² H01J *17/34, 61/067, 61/30*

U.S. Cl. 315—58 **5 Claims**



1. A picture display device having a matrix of direct current gas discharge cells, comprising a flat panel type envelope containing an ionizable gas and including a substantially flat transparent front plate, a substantially flat rear plate parallel and sealed to the front plate, a first set of conductors on the inner surface of the front plate and a second set of conductors on the inner surface of the rear plate facing and orthognal to the first set of conductors, and means to form the matrix of direct current gas discharge cells between the sets of conductors comprising a single insulating foil secured directly on each plate on the side facing the other plate folded over and partly covering the conductors on said plate, said foils having aligned apertures forming a matrix of holes which form the cells.

4,002,946

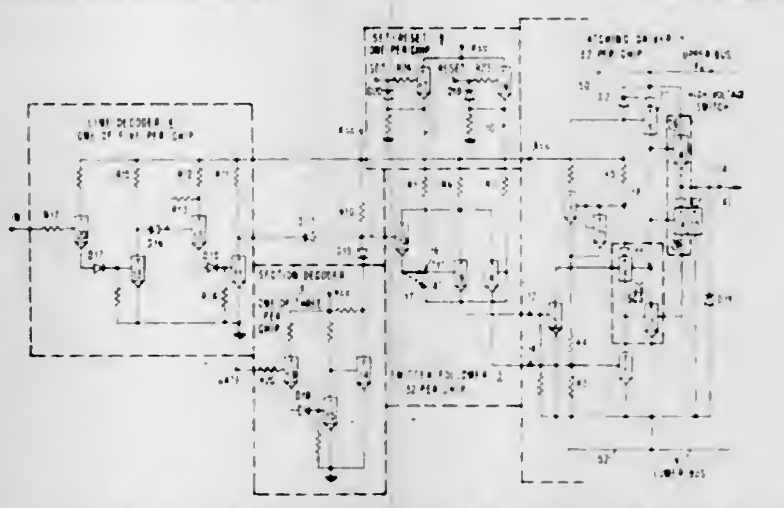
LATCHING DRIVER CIRCUIT FOR A GAS PANEL DISPLAY

Robert Chao-Chuin Liang, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 523,773, Nov. 14, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,631

Int. Cl.² H05B *41/36;* H03K *17/60*

U.S. Cl. 315—169 TV **30 Claims**



1. In an electrical circuit system for supplying sustaining voltages and discharge controlling pulse voltages to one group of row conductors and one group of column conductors in a gas discharge panel device to enter and remove information on said panel, at least a pair of monolithic semiconductor bodies forming integrated circuits, one for each said group of conductors and each including a plurality of functionally identical high voltage transistor switching circuits connected by conductors in circuit configurations which comprise;

a high voltage switch having a first NPN transistor with a collector connected to the high reference potential and its emitter connected to the emitter of a first PNP transistor having its collector connected to a low reference potential;

said emitters constituting an output node connected to one of said group of conductors;

a silicon controlled switch having a second NPN transistor having its collector connected through a load to said high reference potential and its collector connected to the base of said first NPN transistor and to the base of said first PNP transistor and having its emitter connected to said lower reference potential;

said silicon controlled switch further having a second PNP transistor having its emitter connected to a current source, its base common with the collector of said second NPN transistor and its collector common with the base of said second NPN transistor;

said silicon controlled switch controlling the alternate conduction of said first NPN transistor and said first PNP transistor and latching the state of conductivity of said transistors, in response to an input control signal;

whereby said conductor can be driven to enter or remove information on said gas discharge panel.

4,002,947

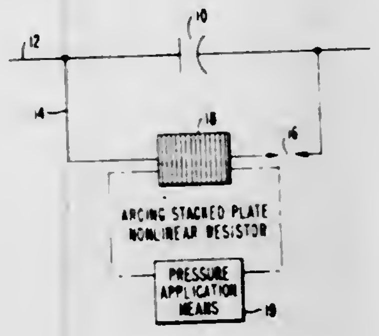
ARCING STACKED PLATE NONLINEAR RESISTOR FOR VOLTAGE LIMITER APPLICATIONS SUCH AS SERIES CAPACITOR PROTECTION

Barry L. Holtzman, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,728

Int. Cl.² H02H *7/16*

U.S. Cl. 317—12 A **8 Claims**



12
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16
ARCING STACKED PLATE NONLINEAR RESISTOR
PRESSURE APPLICATION MEANS
19

1. A series capacitor installation having a capacitor adapted to be connected in series in an alternating current transmission line, a circuit branch in parallel with said capacitor containing a spark gap device responsive to a predetermined voltage level for bypassing said capacitor under predetermined conditions and a nonlinear resistor connected in series with said spark gap device and characterized by exhibiting increasing voltage drop with increasing current up to a predetermined voltage level at which the current can increase further at least an order of magnitude without appreciable increase in voltage drop.

4,002,948

LONG DELAY ACCELERATION MODULE FOR AN OVERLOAD RELAY SYSTEM

Wardell Gary, and Glenn R. Taylor, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 2, 1975, Ser. No. 583,323

Int. Cl.² H02H *7/08*

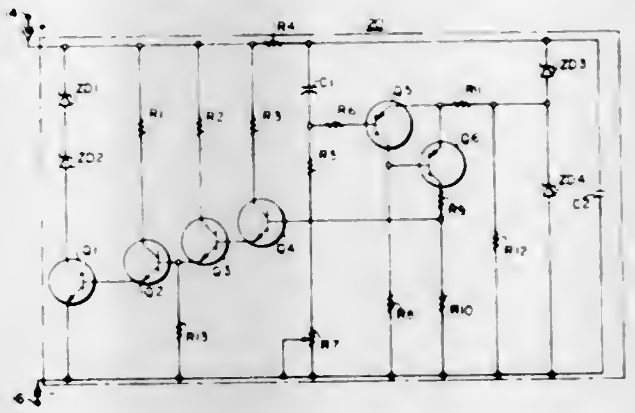
U.S. Cl. 317—13 A **4 Claims**

1. An electrical circuit protecting device, comprising:

sensor means for sensing circuit current in an electrical circuit and for providing an ouput voltage which is related to said circuit current, said electrical circuit being capable of providing electrical current to an electrical load which has the characteristic of drawing a relatively high value of said current when initially interconnected to said circuit, said current becoming significantly lower in value after said load has been interconnected to said circuit for a predetermined period of start-up time;

circuit interrupter trip means having separable main contacts connected in circuit relationship with said electrical circuit for interrupting electrical current therein;

inverse time overload means connected in circuit relationship with said sensor means for responding to said output voltage and for providing a trip signal to said circuit interrupter drive means, said latter signal being provided



at a time which is iversely proportional to the magnitude of said electrical circuit current after said electrical circuit current is sensed and provided said magnitude of said electrical current persists; and

long acceleration override means connected in circuit relationship with said sensor means and said overload means, said override means comprising zener diode means for providing a fixed voltage to said overload means regardless of said high value of current flowing in said electrical circuit for a time span extending from the time said load is interconnected to said circuit until after said predetermined period of start-up time has expired, override timer means, said override time means initiating and terminating said time span by controlling said zener diode means.

4,002,949

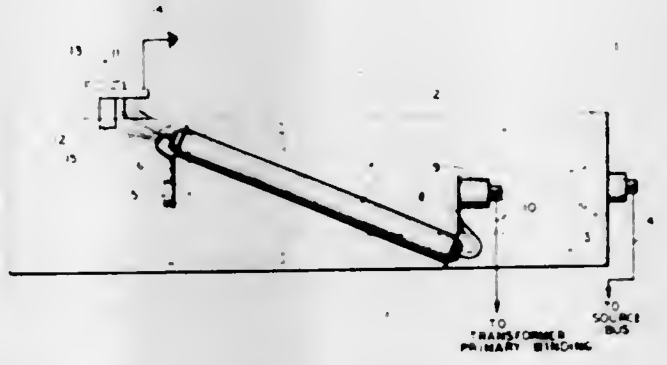
TRANSFORMER PROTECTIVE SYSTEM

Arthur C. Westrom, Stone Mountain, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Nov. 13, 1975, Ser. No. 631,437

Int. Cl.² H02H *7/04*

U.S. Cl. 317—15 **9 Claims**

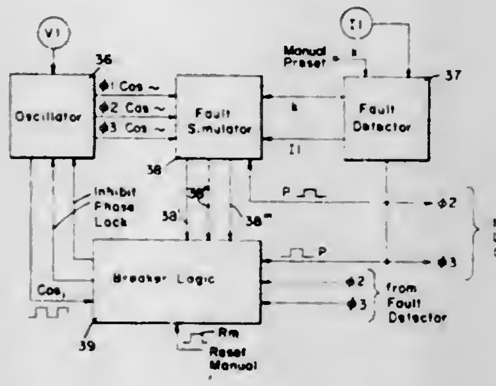


1. A transformer protective system comprising a current limiting fuse and an oil expulsion fuse connected in series with each other and with a transformer primary winding, the oil expulsion fuse being of such length that it is incapable of withstanding the recovery voltage following an interrupting operation, and a grounded element having a part disposed adjacent the end of said expulsion fuse which is connected to said current limiting fuse and arranged so that an arc drawn

upon operation of said expulsion fuse causes the products of such arc to be directed to said grounded element thereby to cause an arc to be established between said grounded element and said current limiting fuse to cause said current limiting fuse to operate and interrupt the flow of current through said primary winding, the current limiting fuse being capable of withstanding the recovery voltage following an interrupting operation.

4,002,950
POWER TRANSMISSION CONTROL SYSTEM

Arthur F. Dickerson, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 6, 1975, Ser. No. 555,770
Int. Cl.² H02H *3/20*
U.S. Cl. 317—16 **10 Claims**



1. Power transmission control system comprising in combination:

sensing means responsive to deviations in a power transmission line and having outputs indicative of a potential fault condition in the line for producing a sample signal in an output thereof corresponding th actual power transmission;

a fault simulator comprising an oscillator and a switching device;

means connected to said switching device for actuating said switching device in response to said power line sample signal when the power line sample signal is indicative of a potential fault condition, said fault simulator producing an output which varies in time as the variation in power transmission under an actual fault condition and is in quadrature with the power line voltage;

said fault simulator further comprising a differential amplifier having input circuits connected in parallel to said varying oscillator output in the absence of a fault condition and having one of said differential amplifier inputs disconnected by said switching device from said oscillator and with said input clamped at the potential of the oscillator at the time of disconnection; and

circuit means responsive to line and reference signals for comparing said reference and line sample signals, and for producing a fault signal in response to deviation of the line sample signal beyond the reference signal.

4,002,951
ELECTRICAL RECEPTACLE MOUNTED GROUND FAULT INTERRUPTER WITH AUTOMATIC INSERTION TESTING

Werner B. Halbeck, Mequon, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Sept. 22, 1975, Ser. No. 615,698
Int. Cl.² H02H *3/26*
U.S. Cl. 317—18 D **10 Claims**

1. In an electrical receptacle apparatus for mounting in a wall outlet box or the like, the combination comprising:

socket means having terminals for receiving complementally formed prongs of an electrical connector plug;

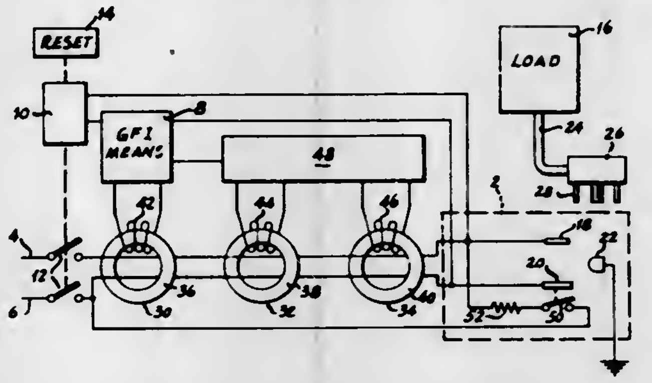
switch means for connecting terminals of said socket means to line and neutral sides of an A.C. power source and including movable contact means for completing and interrupting current between said terminals and the respective sides of said power source;

a member for releasably holding said contact means in circuit completing position;

means normally biasing said member and said contact means to move to circuit interrupting positions;

releaseable latch means normally holding said member and contact means in circuit completing positions;

electroresponsive means energizable to trip said latch means to release said member and effect circuit interrupting opening of said contact means by said biasing means;

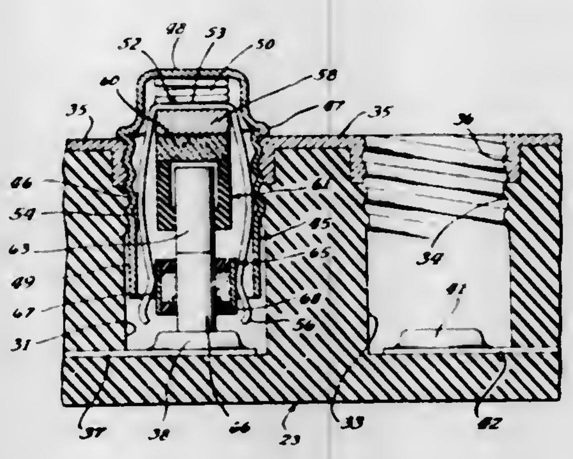


ground fault sensing means for monitoring the flow of current through the terminals of said socket means and responsive to ground faults occuring in circuit branches connected with such terminals to energize said electroresponsive means; and

means including a member adjacent a terminal opening in said socket means and responding to a predetermined depth of insertion of a prong of a connector plug in said socket means to cause said sensing means to momentarily respond to a simulated ground fault for testing the operability of said ground fault sensing means and the other means responsive thereto each time a connector plug is inserted in said socket means.

4,002,952
ELECTRIC OVERVOLTAGE ARRESTER WITH CARBON AIR GAP AND GAS TUBE

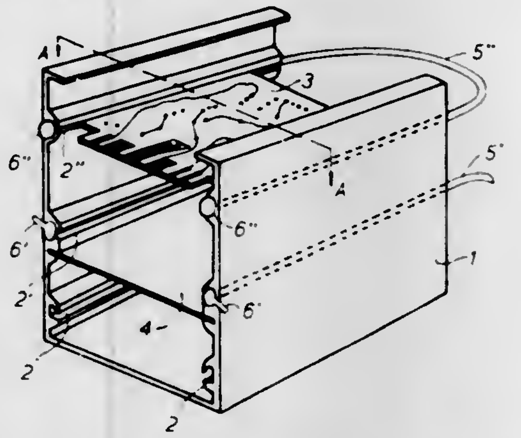
Gysbert L. Menninga, Highland Park, Ill., assignor to CEAC of Illinois, Inc., Rosemont, Ill.
Filed Apr. 25, 1975, Ser. No. 571,580
Int. Cl.² H02H *9/06*
U.S. Cl. 317—66 **10 Claims**



1. In an electrical overvoltage arrester of the character described, in combination wih a metal housing of cylindrical shape and having a closed top and an open bottom, of a metal shorting basket within the housing disposed substantially axially thereof, a carbon air gap device and a surge voltage gas tube in an operative combination and having an aligned relation within the shorting basket, the surge voltage gas tube discharging radially to an outer peripheral electrode and then to the shorting basket having contact therewith, whereby the conductive path for said discharges is parallel to the conductive path for discharges taking place through the carbon air gap device, both said conductive paths including the shorting basket.

4,002,953
DEVICE FOR FIXING A PRINTED CIRCUIT BOARD TO A CASKET-LIKE SUPPORT

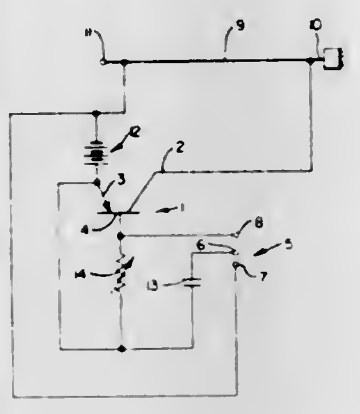
Per Tetlie, Horten, Norway, assignor to Aksjeselskapet Mikro-Elektronik, Horten, Norway
Filed May 8, 1975, Ser. No. 575,559
Claims priority, application Norway, May 15, 1974, 1771/74
Int. Cl.² H02B *1/02*
U.S. Cl. 317—101 DH **3 Claims**



1. A device for fixing a printed circuit board to a casket-like support equipped with a pair of parallel inside channels for guiding movement of the circuit board when it is inserted into and removed from the support, comprising at least one elongated element of elastic material extending along the channels and which in a normal, relaxed condition partly occupies the volume of the channels, said element being longitudinally stretchable with such longitudinal stretching being accompanied by a corresponding reduction in the cross section of the element, whereby the element in extended condition along the channel direction allows said movement because of its reduced cross section, and in relaxed condition fixes the circuit board to the support.

4,002,954
TRIGGER CIRCUIT

Carl Orlando, New Shrewsbury, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 11, 1975, Ser. No. 639,940
Int. Cl.² H02N *7/00*
U.S. Cl. 318—117 **9 Claims**



1. A trigger circuit for heating a stretched wire to the temperature at which the wire restores to its original length, said wire having a memory such that when stretched, it remains stretched but restores to its original prestretched length when heated to the critical temperature of that wire, said wire exhibiting a contractible force toward its prestretched length when restoring to its prestretched length, said trigger circuit comprising:

a transistor having a base electrode, an emitter electrode and a collector electrode;

a length of wire having said memory and having a first end and a second end;

means to couple said collector electrode to said length of wire adjacent said first end of said length of wire;

a D.C. power supply having a first terminal and a second terminal;

means to couple said first terminal of said D.C. power supply to said emitter electrode;

means to couple said second terminal of said D.C. power supply to said length of wire adjacent said second end of said length of wire;

switching means having a first stationary contact, a second stationary contact and a movable contact, said movable contact being movable from a neutral position to a first position when said movable contact is in electrical contact with said first stationary contact and to a second position when said movable contact is in electrical contact with said second stationary contact;

chargeable means coupled between said movable contact and said first terminal of said D.C. power supply;

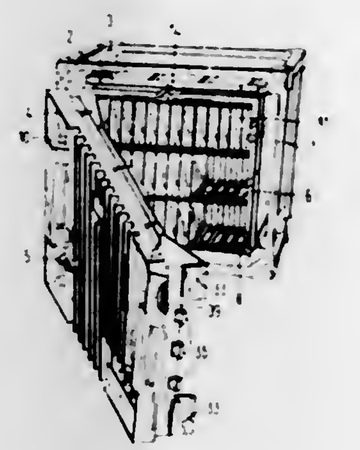
means to couple said first stationary contact of such switching means to said second terminal of said D.C. power supply;

means to couple said second stationary contact of said switching means to said base electrode; and

resistance means coupled between said second stationary contact of said switching means and to the common point of said chargeable means and said first terminal of said D.C. power supply, said chargeable means being charged by said D.C. power supply when said switching means is in said first position and said chargeable means when charged rendering said transistor conductive for a given period of time to transmit a current pulse through said length of wire when said switching means is in said second position.

4,002,955
HOUSING FOR ELECTRICAL, COMMUNICATIONS AND MEASURING DEVICES

Hans-Joachim Eggert, Karlsfeld; Georg Jungnitsch, Munich; Rudi Kuehne, Munich; Walter Wallczek, Munich, and Heinrich Zenkert, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Mar. 24, 1975, Ser. No. 561,533
Claims priority, application Germany, Mar. 28, 1974, 2415051
Int. Cl.² H02B *1/04*
U.S. Cl. 317—120 **9 Claims**



1. A housing assembly comprising: an outer housing member having one open side, a door member sealingly closing said open side and pivotally attached to a side wall of a components carrier slideably received within the housing which is removable therefrom through said open side, the door mem-

ber moveable with said components carrier with respect to said housing from a housing open side closing position when the components carrier is fully received within the housing through a door opening position when the components carrier is at an intermediate position partially removed from the housing, the door being fully openable at the intermediate position providing unobstructed access to the interior of the components carrier, a slide locking system having a portion carried by the housing interior thereof and a portion carried by the components carrier and moveable therewith, the slide locking system including means engaging both portions at said intermediate position for preventing relative movement between the components carrier and the housing locking the components carrier with respect to the housing in the intermediate position, the slide locking system being disengageable to move the components carrier to one of a fully closed position with the components carrier fully received within the housing and a fully withdrawn position with the components carrier removed from the housing, the slide locking system being disengaged in the closed and withdrawn positions.

4,002,956

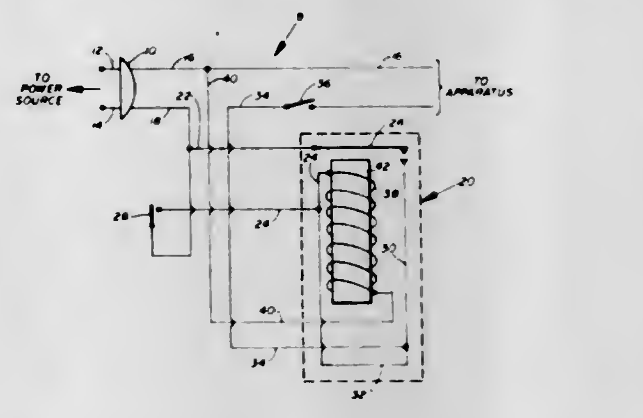
AUTOMATIC ELECTRONIC LOCK OFF SYSTEM FOR AN APPLIANCE

Ross D. Minor, and Cleta M. Minor, both of 1348 E. 11th St., Tulsa, Okla. 74120

Filed June 6, 1975, Ser. No. 584,599

Int. Cl.² H01H *47/04*

U.S. Cl. 317—154 **3 Claims**



1. An automatic electronic lock off system for an appliance comprising:

an appliance,

means for connecting the appliance to a source of electrical power,

relay means including a coil and a normally open switch, and

activator switch means,

the means for connecting the appliance to a source of electrical power, the normally open switch, and the coil are connected in series,

the means for connecting the appliance to a source of electrical power, the normally open switch, and the appliance are connected in series, and

the means for connecting the appliance to a source of electrical power, the activator switch means, and the coil are connected in series,

whereby brief closure of the activator switch means activates the relay means to close the normally open switch to permit a current flow to the appliance and to permit a current flow to the coil so that the normally open switch may be held closed.

4,002,957

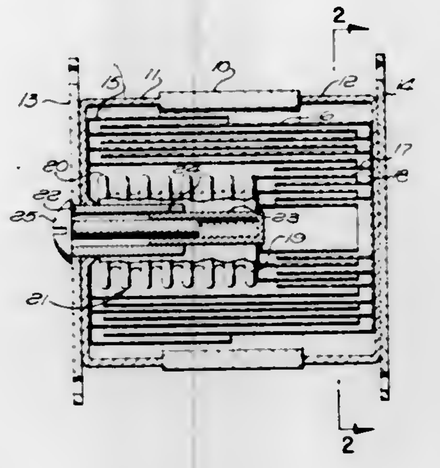
TRIMMABLE FIXED HERMETICALLY SEALED CAPACITOR

Marvin A. Weisbrod, Santa Clara, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 18, 1975, Ser. No. 587,903

Int. Cl.² H01G *5/02*

U.S. Cl. 317—245 **8 Claims**



1. A hermetically sealed capacitor assembly comprising:

a sealed housing having generally opposite end walls;

first means providing a pair of electrical terminals for said capacitor assembly through said housing;

first and second fixed interleaved capacitor plate sets each electrically connected within said housing to a corresponding one of said terminals, said first and second plate sets substantially occupying the interior of said housing except for a central core volume therein extending between said opposite end walls;

trimmer capacitor means within said central core volume, said trimmer capacitor comprising a third fixed set of capacitor plates and a movable fourth set of plates interleaved therewith;

and second means including a generally elongated axially flexible wall member attached on one end to said fourth plate set and on the other end to and forming a portion of said housing end wall adjacent to the end of said central core and opposite said third set of capacitor plates, and a mechanical thrust adjustment operatively associated with said flexible wall member, said thrust member being arranged to position said fourth plate set, said thrust adjustment thereby deflecting said flexible wall member, said trimmer being thereby effectively electrically connected in parallel with the capacitor provided by said first and second plate sets.

4,002,958

AC OUTPUT POWER CONTROL SYSTEM

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,611

Claims priority, application Japan, Dec. 28, 1973, 49-4056

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **7 Claims**

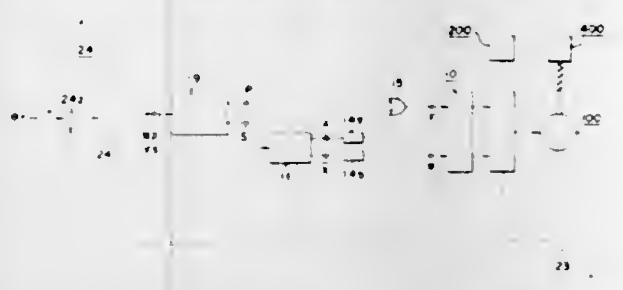
1. A power control system for providing smooth transitions in effective load current by reducing low order AC harmonics, comprising;

a plurality of electronic switch means for delivering power to a load,

allocating circuit means coupled to said plurality of electronic switch means for turning said switch means on and off in a predetermined sequential order; and,

duty cycle control means coupled to said allocating circuit means for varying the duty cycle of individual switching means of said plurality of switch means in response to the phase of said load, and

said allocating circuit means together with said duty cycle control means operating to control said plurality of electronic switch means such that one of said electronic switch means is turned on for the same variable interval during which another of said electronic switch means is turned off, whereby low order AC harmonics are reduced.



4,002,959

MOTOR CONTROL SYSTEM, PARTICULARLY TO REDUCE IDLING SPEED

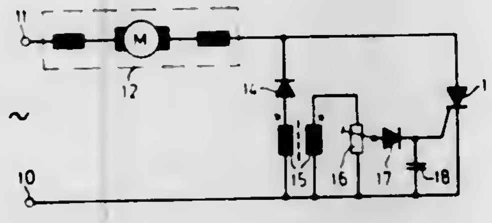
Fritz Schadlich, Stetten, and Friedrich Hornung, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 28, 1975, Ser. No. 544,692

Claims priority, application Germany, Feb. 16, 1974, 2407601

Int. Cl.² H02P *7/36*

U.S. Cl. 318—245 **12 Claims**



1. Electric motor control systems in which the no-load speed - torque characteristic of the motor is reduced with respect to the load - speed torque characteristic, comprising

a transformer (15) connected to sense the current flowing through the motor (12) and deriving a sensed signal;

and controlled switch means (13, 30) connected to and controlled by the measuring means (15) abruptly changing the effective voltage applied to the motor between a value corresponding to no-load speed - torque characteristic and load speed - torque characteristic in dependence on the value of the second signal when the sensed signal from the measuring means reaches a predetermined value.

4,002,960

TORQUE CONTROLLED TAPPING DEVICE

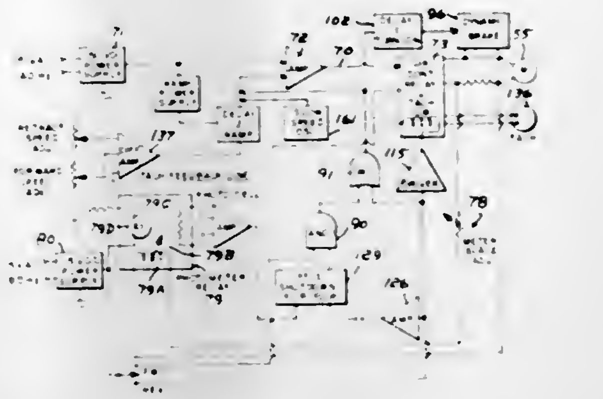
Richard A. Brookfield, Newton, Mass., and Karl R. Ritzinger, Manchester, N.H., assignors to Brookfield Engineering Laboratories, Inc., Stoughton, Mass.

Filed May 1, 1974, Ser. No. 465,748

Int. Cl.² B23Q *5/28*

U.S. Cl. 318—257 **8 Claims**

1. A device for threading or tapping work, said device comprising a shaft including means to detachably secure a threading or tapping tool thereto, a drive connected to said shaft and including a reversible D.C. motor, a tachometer driven by said motor, means connected to said shaft and operable by the operator to advance or retract said shaft relative to the work, a motor circuit including an amplifier, operator controlled circuits, each operable to effect a selected direction of shaft rotation, a speed control including a feedback from the tachometer and operable to regulate the amplifier output inversely to the motor speed thereby to maintain a substantially constant, selected motor speed, at least when the shaft is turning in a thread-cutting direction, means responsive to the motor torque and including a meter presenting measurements of the torque to the operator for his guidance in the use of the operator controlled means and operable, if the torque reaches a preselected maximum, to effect the shutdown of said amplifier, at least when the motor is operated to drive the shaft in a thread-cutting direction, and means operable to energize the motor circuit amplifier to shunt it to ground and normally maintaining said amplifier deenergized, a brake for said motor, means to operate said brake and normally maintaining said brake applied, operator controlled circuits include common means in control of said amplifier operating means and said brake operating means and operable when either is energized to effect the energization of the amplifier and the release of the brake.



4,002,961

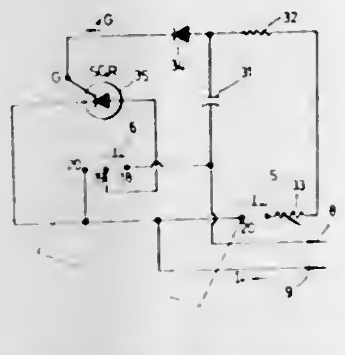
ELECTRONIC SWITCH FOR CONTROLLING THE SPEED OF A MOTOR

Ten-Hsiang Chang, P.O. Box 36-182, Taipei, China /Taiwan

Filed Sept. 5, 1975, Ser. No. 610,737

Int. Cl.² H01H *13/08*

U.S. Cl. 318—305 **1 Claim**



1. An electronic switch for variably controlling the speed of an electric motor, comprising a stationary member, a trigger member, clip means for securing said trigger member slidably relative to said stationary member, a pair of electric cords extending from the inside of said trigger member for connecting said electronic switch in circuit with an electric motor and power source, switching means and a solid-state semiconductor control device supported within said trigger member; characterized in that, said switching means comprising two sets of contacts, with one set including three electrically conductive contacts, another set including one electrically conductive contact and a resistor for providing various resistance values, disposed on said trigger member in spaced relation to each other, and two electrically conductive bridging contacts mounted on said stationary member in isolated relation to each other for contacting with respective set of contacts; while said trigger being manually actuated with respect to said stationary member, the first bridging contact is movable among a non-bridging position wherein said first bridging contact engages with the first contact of the said three contacts, a first

bridging position where said first bridging contact engages with the first and the second contacts of the said three contacts, and a second bridging position wherein said first bridging contact engages with the first and the third contacts of the said three contacts; simultaneously, the second bridging contact is movable with one end thereof slidably engaging with the contact of associated set and the other end thereof slidably engaging with said resistor for providing various resistance values in a manner to control the application of variable magnitude of electrical energy, for selectively varying the speed of said electric motor.

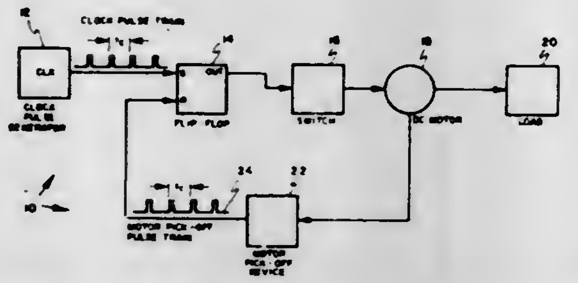
4,002,962
PHASE LOCKED SERVO LOOP CIRCUIT

Samuel A. Miller, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1973, Ser. No. 402,220

Int. Cl.² G05B *5/00;* **H02K** *27/70;* **H02P** *5/08*

U.S. Cl. 318—329 **4 Claims**



1. A phase locked servo control system loop for changing the speed of a direct current motor operating under varying load conditions to maintain a constant predetermined motor speed comprising:

reference pulse means for providing a first control signal of a series of successive pulses having a substantially fixed repetition rate in accordance with a predetermined desired operation of said motor;

speed responsive means operatively connected to sense the speed of said motor for providing a second control signal output of successive electrical pulses having a repetition rate proportional to actual rotation of said motor;

pulse responsive means electrically coupled to receive successive pulses from said reference pulse means and said speed responsive means for providing a train of output pulses of varying pulse width having a pulse width time duration dependent on the phase difference between individual successive pulses of first control signals generated by said reference pulse means and individual successive pulses of second control signals generated by said speed responsive source;

detector means operatively coupled to said pulse responsive means and to gating control means for supplying a pulsed output control signal whenever the time interval between each second control signal pulse is less than the time interval between each first control signal pulse;

coincidence means having inputs electrically coupled to receive output signals from said pulse responsive means and said detector means for producing an output in response to identical output signals;

overspeed responsive means coupled to receive signals from said coincidence means and said speed responsive means for supplying output pulse signals in response to said motor overspeed;

control logic circuit means coupled to accept output pulse signals from said overspeed responsive means for preventing said reference pulse means first control signals from being received by said pulse responsive means; and

switching means operatively connected to receive an electrical output from said pulse responsive means for supplying current to said motor in response to the time duration of the pulses for maintaining the rotation of the motor at its predetermined desired operation.

thereby causing the switching means from supplying current to the motor until such time as the motor speed decreases to cause said second control signal pulse to occur at the same time as said first control signal pulse at which time the predetermined desired operation of said motor is reached.

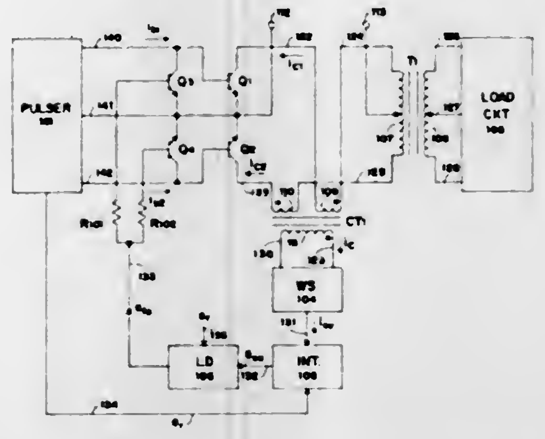
4,002,963
CONVERTER CIRCUIT AND METHOD HAVING FAST RESPONDING CURRENT BALANCE AND LIMITING

Patrick L. Hunter, Columbus, Ohio, assignor to North Electric Company, Galion, Ohio

Filed May 29, 1975, Ser. No. 581,915

Int. Cl.² H02M *1/08*

U.S. Cl. 321—18 **7 Claims**



1. In a voltage converter including inverter means, pulsing means for driving said inverter means, and an output load coupled to said inverter means, a pulse width modulation control arrangement for providing fast current limit and balance functions comprising;

a. sensing means for monitoring the instantaneous current flowing in said inverter means and for generating a first signal directly proportional to said instantaneous current;

b. waveshaping means, exhibiting a nonlinear, monotonically increasing transfer characteristic, responsive to said first signal to produce a second signal related to said first signal by said characteristic;

c. integrator means, connected to said waveshaping means and to said pulsing means, operative in response to said second signal to generate a feedback signal during each half cycle of operation of said inverter means, and operative in response to a reset signal from said pulsing means to reset said feedback signal to a predetermined reset level at the end of each half cycle of operation of said inverter means;

d. level detection means responsive to said feedback signal and operative with respect to a predetermined reference level to generate a control signal whenever said feedback signal exceeds said predetermined reference level; and

e. control means, responsive to said control signal, operative to terminate the flow of said instantaneous current for the remainder of the instant half cycle of operation of said inverter means thereby providing, within said instant half cycle of operation, inverter current balancing and limiting.

4,002,964
TEMPERATURE COMPENSATION TECHNIQUE

Bernard M. Gordon, Magnolia, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed Oct. 2, 1975, Ser. No. 618,784

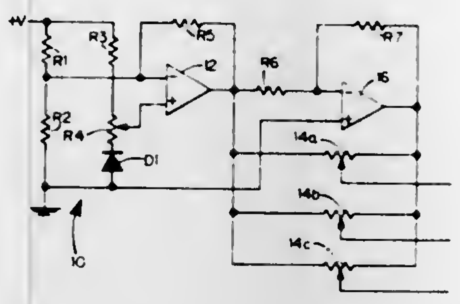
Int. Cl.² G12B *7/00*

U.S. Cl. 323—16 **9 Claims**

1. For use in apparatus in which electrical response is a function of temperature, a temperature compensation system comprising:

first means having a positive temperature characteristic for providing a first reference voltage positively increasing with temperature;

second means having a negative temperature characteristic equal and opposite to that of said first means for providing a second reference voltage negatively increasing with temperature;



said first and second reference voltages having a null value at a predetermined reference temperature; and

means for deriving at least one correction voltage from both said first and second reference voltages of a magnitude and sense to correct for particular temperature error.

4,002,965
SYNCHRONIZED AND REGULATED POWER SUPPLY

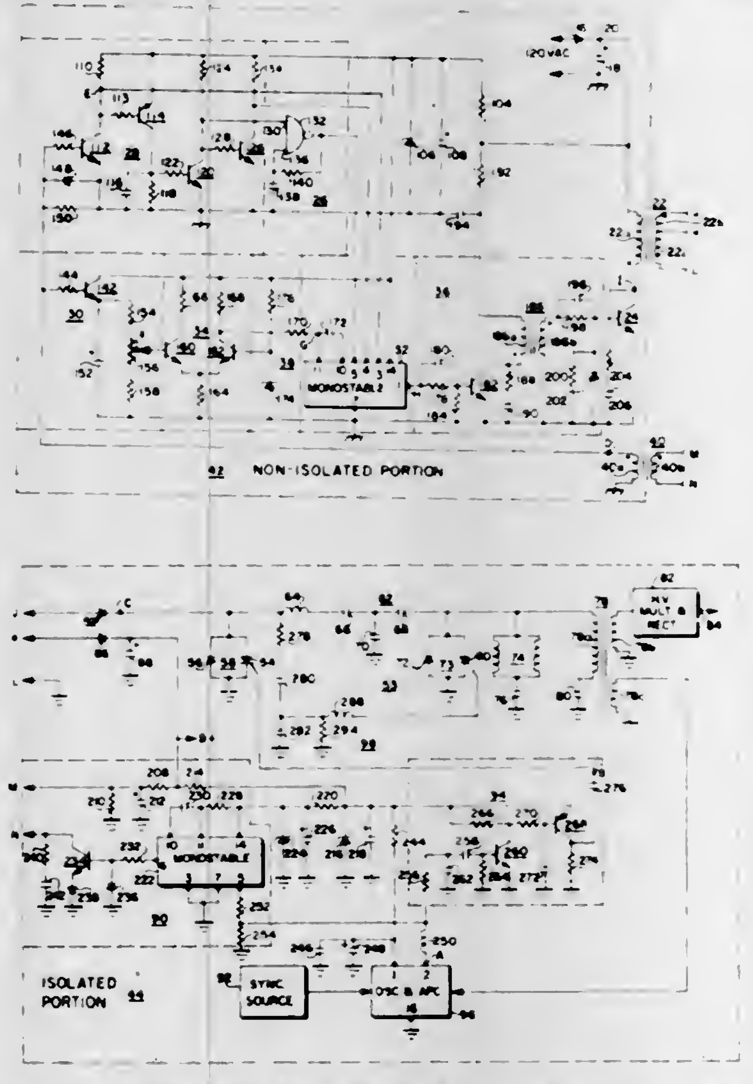
Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,512

Claims priority, application United Kingdom, June 10, 1975, 24861/75

Int. Cl.² H04N *3/18*

U.S. Cl. 323—17 **9 Claims**



1. A synchronized and regulated power supply comprising:

switching regulator means adapted to be coupled to a source of alternating current potential for producing a direct current potential having an amplitude proportional to the duration of a first drive signal condition relative to the duration of a second drive signal condition;

oscillating means adapted to be coupled to a source of synchronizing signals for producing a switching signal having a first predetermined phase offset relationship with respect to said synchronizing signals;

modulating means coupled to said switching regulator means and said oscillating means for producing a control signal having a second predetermined phase offset relationship with respect to said switching signal and having an amplitude which is proportional to the amplitude of said direct current potential; and

means including a drive signal generator coupled to said modulating means and said switching regulator means for initiating the production of said first drive signal condition in response to the initiation of said control signal and for controlling the duration of said first drive signal condition relative to the duration of said second drive signal condition in response to the amplitude of said control signal.

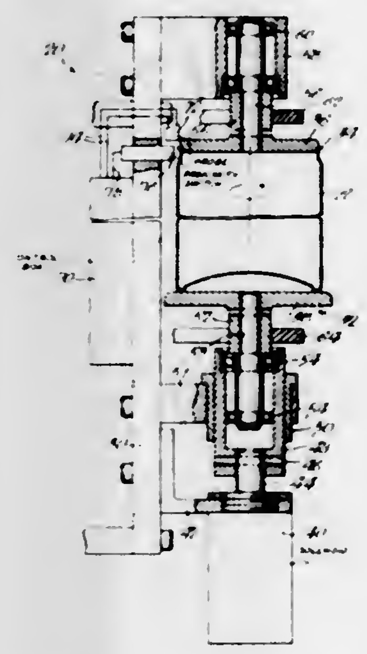
4,002,966
APPARATUS FOR DETECTING IMPERFECTIONS ON THE WALL OF CYLINDRICAL CONTAINERS

James J. Hinds, LaGrange, and Lawrence D. Stepenske, Darien, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Feb. 21, 1975, Ser. No. 551,976

Int. Cl.² G01R *33/12*

U.S. Cl. 324—37 **11 Claims**



1. Testing apparatus for detecting an imperfection in a peripheral flange of a cylindrical metal container body comprising: a hub supported for rotation about a vertical axis with said hub having a plurality of like testing stations at circumferentially spaced locations, each testing station being a removable unit including a support secured to said hub; fixed inductor means secured to said support and generating a magnetic field in response to a flow of current in said inductor means having a substantially constant rms value, holding means on each support and engaging upper and lower ends of a container body in a testing station for holding said container body in a position where said peripheral flange intersects said magnetic field generated by said inductor means, receiving means operatively connected to said inductor means for detecting variations in said rms value, switch means on each station cooperating with said holding means and connected to said receiving means for energizing said receiving means when a container body is present in said holding means in a test position; and a stationary belt means extending around the periphery of said hub and cooperating with said holding means for simultaneously rotating a plurality container bodies in respective test stations so that all portions of said flanges intersect said magnetic fields.

4,002,967

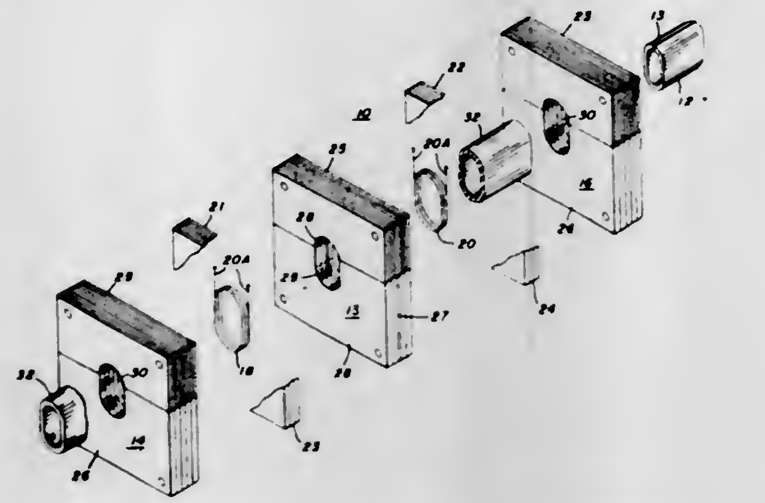
ANNULAR EDDY CURRENT TEST COIL WITH MAGNETIC LAMINATIONS ADJACENT A LIMITED CIRCUMFERENTIAL EXTENT

S. Reed Fennell, Kittanning, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,203

Int. Cl.² G01R *33/12*

U.S. Cl. 324—40 **7 Claims**



1. A magnetic pole and coil assembly for limiting and concentrating eddy currents in a peripheral arc portion of a metal product, the assembly comprising

at least one annular winding electrically connectable to a source of alternating or pulsating electrical energy, and adapted to produce magnetic flux capable of inducing eddy currents in a metal product when the winding is energized by said source, said winding being adapted to have the product pass therethrough and

laminations of a magnetic material disposed adjacent a limited circumferential portion of said winding for concentrating and limiting the magnetic flux produced by said winding in and to the area of the magnetic laminations, and thereby being effective to increase the density of the flux and eddy currents in a predetermined arc portion of a metal product when the metal product is directed past the laminations and through the winding in a rapid, continuous manner and in close proximity but spaced relation to the laminations and winding.

4,002,968

GROUND FAULT DETECTOR FOR A TWO-WIRE POWER SUPPLY

Ian Reid, Waterloo, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed June 10, 1975, Ser. No. 585,547

Int. Cl.² G01R *31/02*

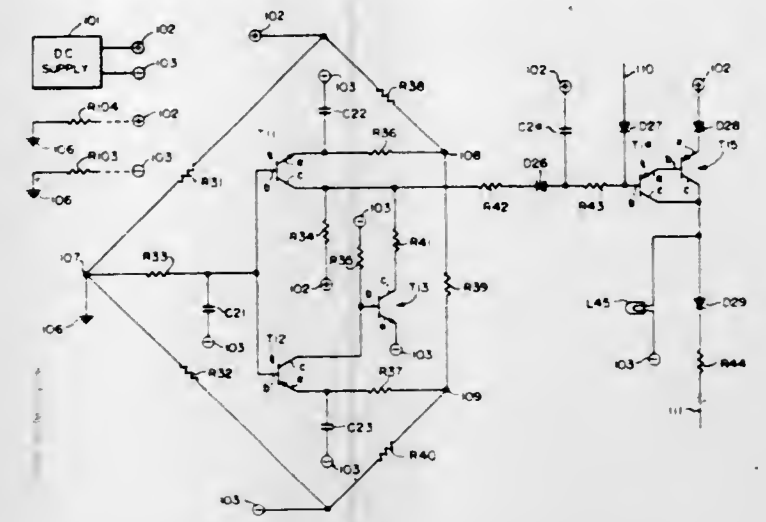
U.S. Cl. 324—51 **9 Claims**

1. Circuit means for responding to a ground fault on the first or second lead of a two wire d.c. power supply and comprising in combination:

a. a first voltage divider having first and second fixed resistive elements coupled in series and bridged between said first and second leads of said d.c. power supply and with the junction of said first and second fixed resistive elements coupled to ground;

b. a second voltage divider having third, fourth and fifth resistive elements coupled in series and bridged between said first and second leads and with the junction of said third and fourth resistive elements and said fourth and fifth resistive elements forming first and second junction points, respectively; and

c. first and second potential comparators coupled between said ground and said first and second junction, respectively, for responding to the occurrence of a potential difference, exceeding a predetermined threshold value, between said ground and said first or second junction, respectively, when a ground fault appears on said first or second lead, respectively, of said d.c. power supply.



4,002,969

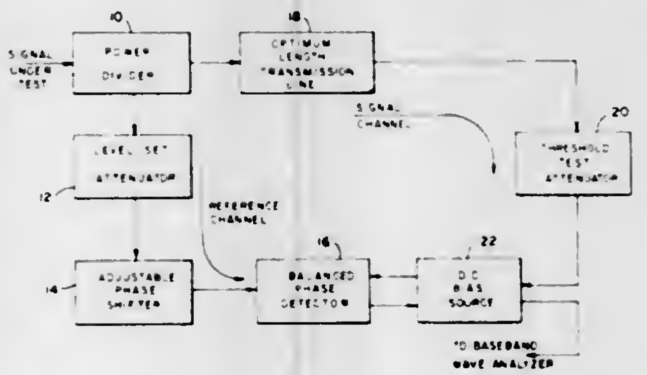
OPTIMUM LENGTH TRANSMISSION LINE DISCRIMINATOR WITH LOW NOISE DETECTOR

Thomas A. Barley; Gustaf J. Rast, Jr., both of Huntsville, Ala., and James R. Ashley, Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,445

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 N **6 Claims**



1. An optimum length transmission line discriminator with low noise detection, comprising: an optimum length transmission line having an input and an output; a power divider having an input and first and second outputs, the input being disposed to receive modulation noise input signals and the first output being coupled to the transmission line input; a balanced phase detector having first and second inputs and an output, said first input being coupled to the output of said transmission line, said second input being coupled to the second output of said power divider, and said output being disposed for supplying output measurement signals therefrom; and a direct current bias source coupled to said phase detector for enhancing amplitude modulation rejection ratios of said discriminator.

4,002,970

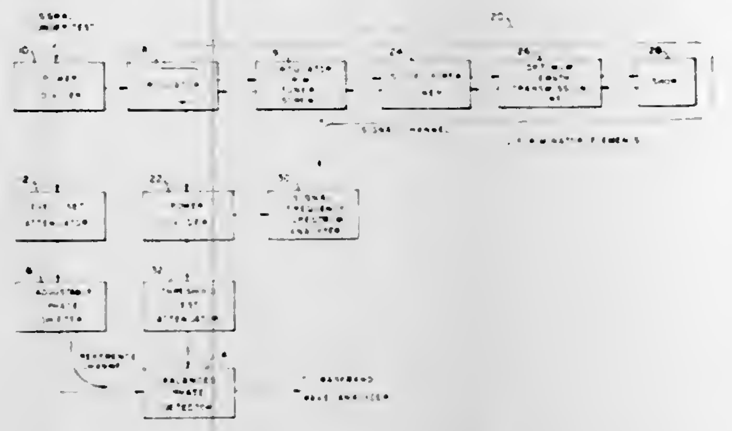
OPTIMUM THRESHOLD TRANSMISSION LINE DISCRIMINATOR

James R. Ashley, Colorado Springs, Colo.; Gustaf J. Rast, Jr., and Thomas A. Barley, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,593

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 N **10 Claims**



1. An optimum threshold transmission line discriminator circuit for measuring characteristics and frequency modulation noise on input signals comprising:

first and second power divider means, each having an input and first and second outputs, the input of said first power divider being disposed to receive said modulation noise signals;

signal circulator means having first, second, and third ports, said first port being coupled to the first output of said first power divider, said second port being coupled to the input of said second power divider;

a phase dectector having first and second inputs and an output, said first input being coupled to the first output of said second power divider and said second input being coupled to the second output of said first power divider, the output of said detector being disposed for coupling output measurement signals therefrom;

a spectrum analyzer coupled to the second output of said second power divider; and

discriminator means having an input-output port coupled to the third port of said second circulator.

4,002,971

WIDE OPERATING FREQUENCY RANGE TRANSMISSION LINE DISCRIMINATOR

Gustaf J. Rast, Jr.; Thomas A. Barley, both of Huntsville, Ala., and James R. Ashley, Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,446

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 N **9 Claims**

1. A wide operating frequency range transmission line discriminator for measuring input frequency modulation noise signals comprising:

a bandpass filter having an input and an output, the input being disposed to receive said modulation noise signals;

first and second power divider means, each having an input and first and second outputs, the input of said first power divider being coupled to the output of said filter to receive said modulation noise signals;

hybird means having an input coupled to the first output of said first divider and having first, second, and third ports;

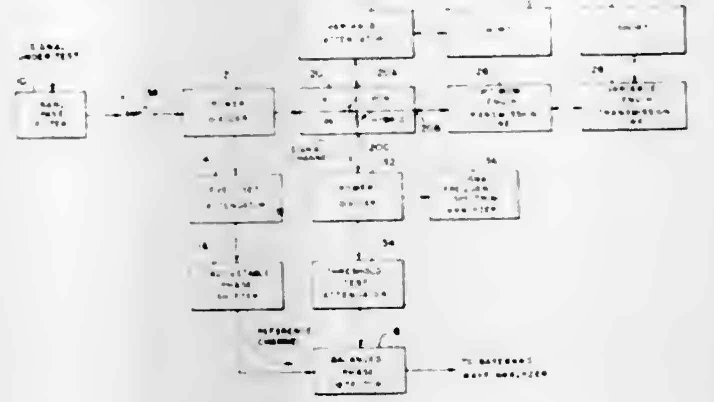
a variable attenuator and transmission line short circuit coupled in series to said first hybrid port for attenuating signals coupled thereto and directing said signals back to said hybrid;

an optimum length transmission line and a transmission line short circuit coupled in series, with said optimum length line being coupled to said second port of said hybrid;

said third hybrid port being coupled to the input of said second power divider;

quadrature detection means having first and second inputs and an output, said first input being coupled to the first output of said second power divider and said input being coupled to the second output of said first power divider, the output of said detection means being disposed for coupling output measurement signals therefrom; and

a spectrum analyzer coupled to the second output of said second power divider.



4,002,972

ELECTRIC VEHICLE CONTROL ANALYZER

Charles Edward Konrad, and Lynnie Barry Brown, both of Roanoke, Va., assignors to General Electric Company, New York, N.Y.

Filed Mar. 18, 1975, Ser. No. 559,496

Int. Cl.² G01R *15/12, 31/02*

U.S. Cl. 324—73 R **11 Claims**

1. Test apparatus adapted for connection to an electric vehicle propulsion control system of the type wherein a power control system comprising plural types of electrical components supplies regulated electric power from a traction battery to electric traction motor means, and a logic circuit is normally connected to control the operation of the power control system, said test apparatus being adapted for connection to said propulsion control system in lieu of said logic circuit for testing individual components of said power control system in situs, and comprising:

a. a plurality of output terminals adapted for simultaneous connection to said propulsion control system;

b. plural switching means adapted to be selectively actuated, in accordance to the individual one of said components to be tested;

c. a plurality of indicating means adapted to provide a discrete indication of performance of components being tested;

d. a plurality of voltage comparators, each comprising first and second inputs and an output coupled to at least one of said indicating means;

e. a first group of said output terminals being adapted for connection in circuit with said traction battery and with predetermined ones of the components of said propulsion control circuit; and

f. connection means connecting said first group of output terminals, in circuit with predetermined ones of said switching means and the inputs of said voltage comparators such that upon actuation of selected ones of said predetermined ones of said switching means a first signal produced by application of the traction battery to a circuit comprising the component under test is applied to a first input of one of said comparators and a second signal representative of the voltage of said traction battery is applied to a second input of said comparator whereby said indicating means provides a discrete indication of component performance irrespective of voltage variations of said traction battery within a predetermined range.

4,002,973

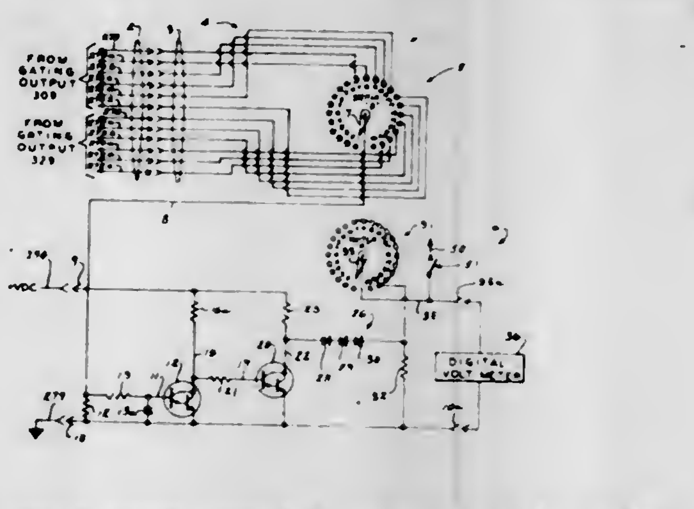
ELEVATOR TESTING SYSTEM

Theodore O. Wiesendanger, Wauwatosa, and John V. Seals, Brookfield, both of Wis., assignors to Armor Elevator Company, Louisville, Ky.

Filed Dec. 23, 1975, Ser. No. 643,684

Int. Cl.² G01R *15/12*; **B66B** *1/00*

U.S. Cl. 324—73 R **31 Claims**



1. A testing system removably connected to an elevator system having a control circuit selectively supplying gating pulses to gated rectifying means operatively supplying controlled amounts of energy from an energy source to motive means operating an elevator car, comprising input means removably connected to said control circuit and electrically sensing said gating pulses, conditioning means connected to said input means and providing a pulse having a substantially uniform magnitude in response to each of said sensed gating pulses, and means connected to said conditioning means and providing an output representing the substantial average of said uniform pulses over a predetermined period of time.

4,002,974

METHOD AND APPARATUS FOR TESTING CIRCUITS

Edward Wherry Thomas, Hanover Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1975, Ser. No. 631,731

Int. Cl.² G01R *15/12*

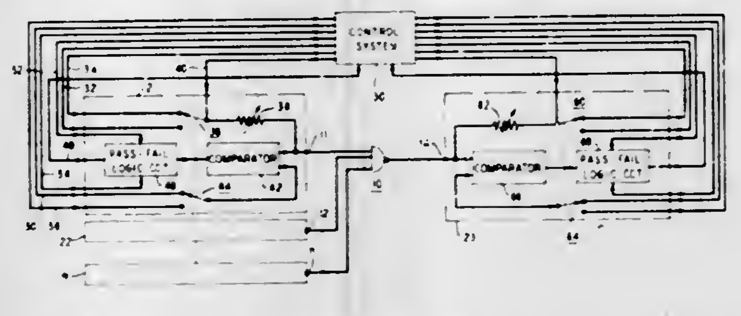
U.S. Cl. 324—73 R **7 Claims**

1. Apparatus for testing an electrical device having multiple input and output terminals, the intended functional operation of said device being represented by a logical truth table or function table, said testing being intended to assure that the prescribed functional capabilities of the device as well as specified parameters of the device conform to design standards, said apparatus comprising

plural variable loads respectively connected to the input and output terminals of said device,

means for setting said loads to values corresponding to device parameters to be tested,

means for applying successive sets of fixed input and output signals to said device via said respective variable loads in accordance with said table,



means for providing reference signals,

and means connected to the input and output terminals of said device for comparing the actual signals appearing thereat with said reference signals and for providing an error indication in the event that the relative magnitudes of any corresponding pair of actual and reference signals deviates from a prescribed relationship.

4,002,975

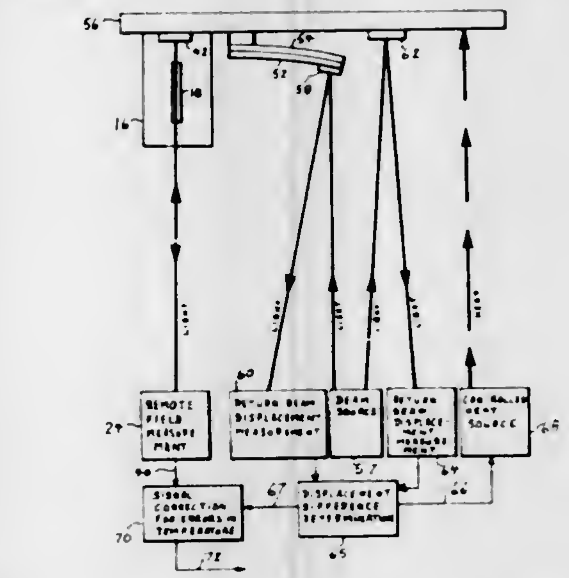
ELECTRO-OPTIC MEASUREMENT OF VOLTAGE ON HIGH-VOLTAGE POWER LINES

Dennis C. Erickson, Beaverton, and Gail A. Massey, Cornelius, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,465

Int. Cl.² G01R *31/00*

U.S. Cl. 324—96 **10 Claims**



1. In a system for measuring a field in the vicinity of a high-voltage power transmission line comprising:

A. a field-sensitive optical element located in the field,

B. light-source means for directing a polarized beam of coherent light through the optical element, and

C. direction-measurement means for measuring the direction of polarization of the beam which emerges from the optical element to derive a signal indicative of field strength,

the improvement comprising:

D. temperature-measurement means for measuring the temperature of the optical element in comparison with a predetermined temperature level to derive an error signal, and

E. correction means responsive to the error signal for eliminating errors in the field-strength signal.

10. A system for measuring transients in the field of a high-voltage power transmission line caused by faults in the line comprising:

A. a field-sensitive optical element located in the field,

B. light-source means for directing a polarized beam of coherent light through the optical element,

C. means for measuring the direction of polarization of the beam which emerges from the optical element of derive a signal indicative of field strength,

D. filter means for passing components of said signal no lower than 250 KHz and no higher than 2 MHz indicative of transients on said line, and

E. indication means responsive to the signals thus passed.

4,002,976

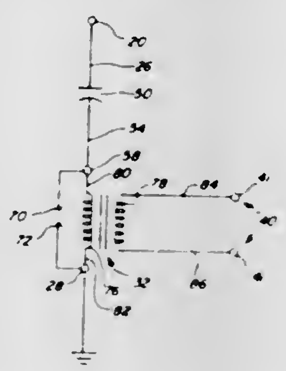
VOLTAGE SENSING DEVICE FOR USE AT HIGH VOLTAGE

John A. Zulaski, Mount Prospect, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Apr. 1, 1975, Ser. No. 564,109

Int. Cl.² G01R *1/20*; **G05F** *5/00*

U.S. Cl. 324—126 **22 Claims**



1. A voltage sensing device for providing a signal representative of the voltage between the high voltate side of a circuit and ground comprising:

a capacitor electrically connected at a first side to the high voltage side of the circuit;

a transformer having primary and secondary windings, said primary winding being serially connected between the second side of said capacitor and ground so that all of the current flowing through said capacitor also flows through said primary winding;

output terminals connected across said secondary winding;

an insulator body means formed of an electrically insulating material surrounding said capacitor and said transformer for providing line to ground insulation between the high voltage side of the circuit and ground;

whereby the signal representative of the voltage on the high voltage side of the circuit can be derived at said output terminals as well as electrical power for low-burden auxiliary apparatus.

4,002,977

MEASURING CIRCUIT

Shan C. Sun, Pittsburgh, Pa., and Anthony G. Chaprnka, Cockeysville, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 598,609

Int. Cl.² G01R *15/10*; **G06G** *7/12*

U.S. Cl. 324—132 **10 Claims**

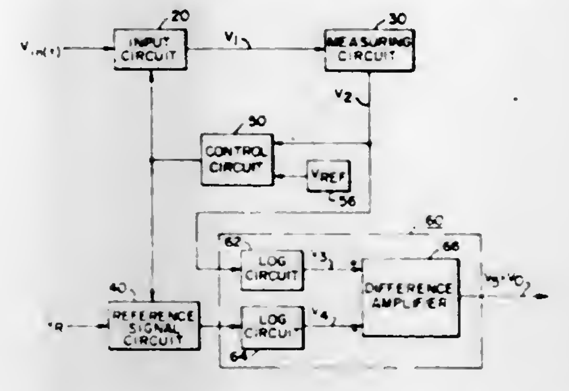
1. The combination of:

a signal measuring circuit means having an input and a output, and a defined dynamic range;

an input circuit means connected to said input of said signal measuring circuit means to adjust the magnitude of an input signal in response to a control signal to a level within said defined dynamic range and supply the resulting adjusted signal to said signal measuring circuit means, said signal measuring circuit means producing a first output signal corresponding to a predetermined characteristic of the adjusted signal;

a reference signal circuit means for adjusting the magnitude of a predetermined reference signal in response to said control signal and developing a second output signal indicative thereof;

control circuit means for developing said control signal; and



an output circuit means, including a log-ratio circuit means, for restoring the magnitude of said first output signal to a level corresponding to said input signal and restoring the magnitude of said second output signal to the level of said predetermined reference signal and producing a third output signal which is the log-ratio of the restored first and second output signals.

4,002,978

MOVING-COIL ELECTRICAL INSTRUMENTS WITH RADIALLY SPACED ANNULAR AIR-GAPS

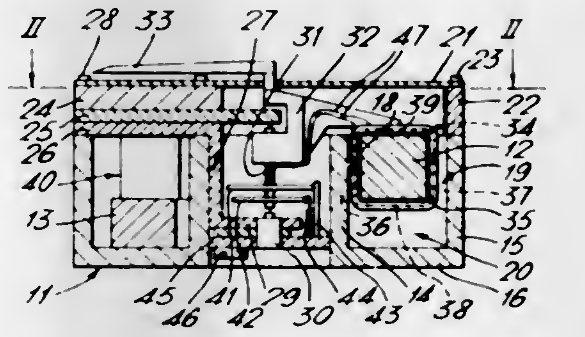
Percy Edwin Towndrow, Harrow, and James Bernard Vousden, St. Albans, both of England, assignors to Smiths Industries Limited, London, England

Filed May 27, 1975, Ser. No. 581,247

Claims priority, application United Kingdom, June 13, 1974, 26330/74; Apr. 3, 1975, 13680/75

Int. Cl.² G01R *5/08*

U.S. Cl. 324—150 **11 Claims**



1. A moving-coil electrical instrument comprising an electric coil having first and second portions, means mounting the electric coil for angular displacement about an axis, a magnetic circuit assembly comprising a housing of magnetic material having inner and outer radially-spaced, substantially annular surfaces, an annular core member of magnetic material, and means mounting the core member between the said inner and outer housing surfaces to define, between the said inner housing surface and the core member, and between the said outer housing surface and the core member, respective inner and outer radially-spaced annular air-gaps, the coil mounting means being so arranged that the coil embraces the core member with its said first and second portions extending through respective ones of the air-gaps to cause electromagnetically-induced torque to be applied to the coil about the said axis, and the nominal dimensions of said radially-spaced annular air-gaps being unequal and so related to one another that, at any angular position of the coil, a change in the com-

ponent of the said torque induced into the said first portion of the coil, arising from radial displacement of the core member, is compensated by change of opposite sense and substantially equal magnitude of the said torque induced into the said second portion of the coil.

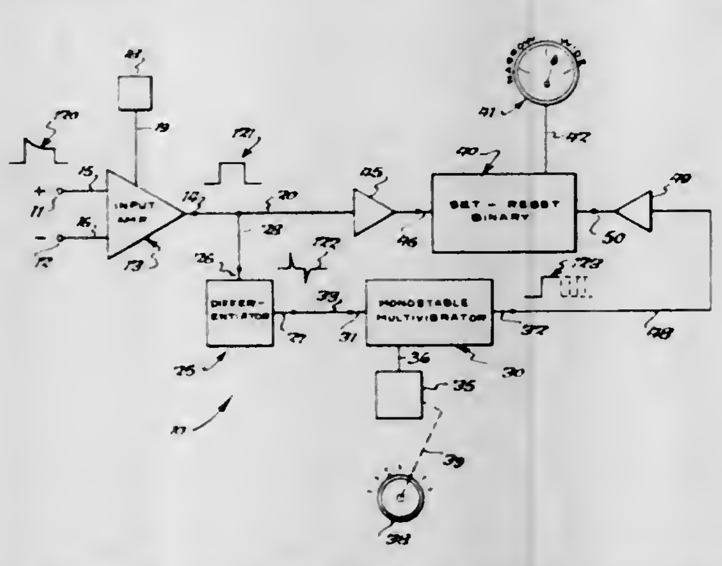
4,002,979
PULSE COMPARATOR

Francis A. Giori, Clarence, and Anthony J. DiTusa, Williamsville, both of N.Y., assignors to Electro Sciences for Medicine, Inc., Clarence, N.Y.

Division of Ser. No. 353,118, April 20, 1973, Pat. No. 3,854,472, which is a continuation-in-part of Ser. No. 84,646, Oct. 28, 1970, abandoned. This application Dec. 12, 1974, Ser. No. 532,257

Int. Cl.² G04F *8/00*

U.S. Cl. 324—181 **7 Claims**



1. Electrical pulse width measuring aparatus comprising:
- a. comparison means having first and second inputs and responsive to input pulse time duration for providing an indication of relative pulse width, said comparison means including means for maintaining said indication until another pulse arrives;
- b. means for applying an input pulse of unknown time duration to one input of said comparison means;
- c. means for producing a reference pulse of known time duration, said reference pulse producing means being coupled through circuit means to adjustable means whereby the time duration of the reference pulse is linearly proportional to the position of said adjustable means;
- d. means for applying the output of said reference pulse producing means to the other input of said comparison means; and
- e. synchronizing means coupled to said reference pulse producing means and said means applying unknown pulses for synchronizing the production of a reference pulse with the presence of an unknown pulse;
- f. whereby said comparison means provides an indication of whether the time duration of the unknown pulse is less than or greater than the duration of the reference pulse.

4,002,980
RELAY STATION IN A TELECOMMUNICATIONS TRANSMISSION SYSTEM

Rudolf Herz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

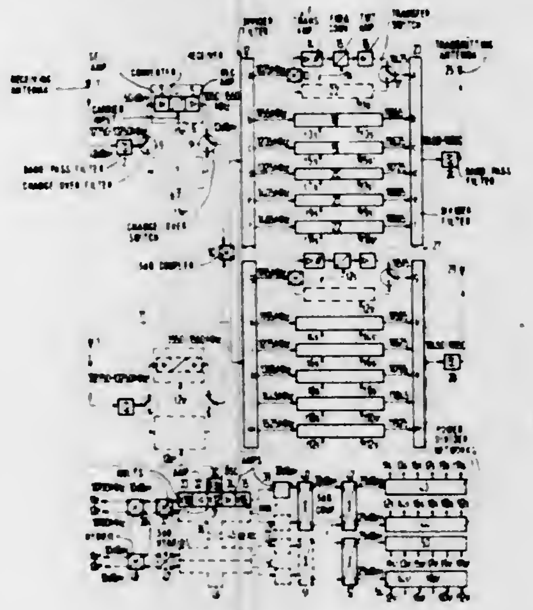
Continuation of Ser. No. 275,707, July 27, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 544,003

Claims priority, application Germany, Aug. 4, 1971, 2139049

Int. Cl.² H04B *7/14*

U.S. Cl. 325—3 **3 Claims**

1. A relay station for use in a communications transmission system, including a source of carrier and a superheterodyne receiver in which the oscillations of the received radio frequency band are converted to an intermediate frequency, said receiver connected to said source of carrier, and including a first multiplexer filter circuit connected to the output of the receiver, in which the intermediate frequency band is split into a plurality of sub-bands of separate frequencies which are disposed adjacent one another, a plurality of sub-band amplifiers, each of the intermediate frequencies sub-bands, with its own particular frequencies, being assigned to a respective sub-band amplifier, a plurality of superheterodyne transmitters requiring respective transmitter carriers and connected to the outputs of respective ones of said sub-band amplifiers, a plurality of transmitter amplifiers of the same type with respect to the individual sub-bands connected to the outputs of respective ones of said transmitters, a second multiplexer filter circuit connected to and combining the outputs of all of said transmitter amplifiers, a common carrier source comprising a stable frequency oscillator which produces the transmitter carriers at the requisite frequencies and at a low power in comparison with the total power required for the individual superheterodyne transmitters, a power divider network, and a carrier amplifier, the output of said oscillator connected to said carrier amplifier and said carrier amplifier connected to the individual superheterodyne transmitters via said power divider network, wherein said carrier amplifier is connected with the receiver carrier source and the transmitter carrier source and also amplifies the carrier for the superheterodyne receiver, and comprising a band filter divider connected to the output of said carrier amplifier, said divider operating to provide suppression of the cross-modulation products of the type $2f_2-f_1$, where f_1 and f_2 are the frequencies of the carriers for the superheterodyne transmitters and receiver, and operating to provide suppression of the noise power of the oscillator at the signal frequencies in the received frequency range.



4,002,981
DIGITAL CONVERTER FROM DELTA-MODULATED SIGNALS INTO PCM SIGNALS

Ludwig Desiré Johan Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

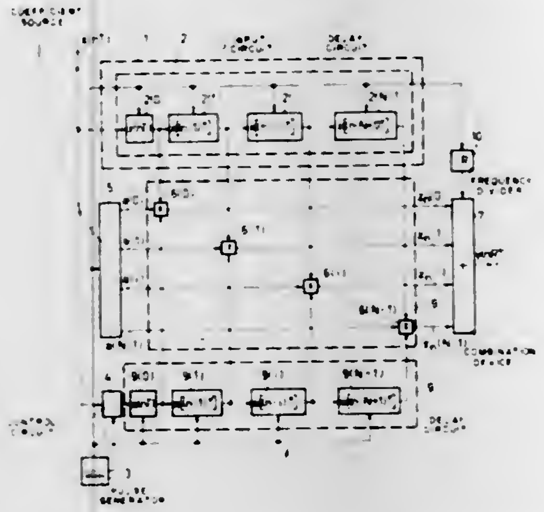
Filed Dec. 30, 1974, Ser. No. 537,316

Claims priority, application Netherlands, Jan. 21, 1974, 7400764

Int. Cl.² H04B *7/17*

U.S. Cl. 325—38 R **7 Claims**

1. An arrangement for converting a compressed delta-modulated signal into a pulse code-modulated signal, said compressed delta-modulated signal being constituted by a succession of code words occurring with a given sampling frequency and each consisting of at least one bit, comprising:
- an input circuit comprising a delay circuit comprising a cascade arrangement of N delay sections, including means in each of said sections for storing a code word of a succession of N code words of said compressed delta-modulated signal, N being a predetermined integer, to which input circuit said compressed delta-modulated signal is applied and in which a predetermined corresponding auxiliary code word is written in said delay circuit for each of said code words of said delta-modulated signal;
- a clock pulse generator for generating control pulses which are applied to said delay circuit for controlling the delay time;
- a source for a predetermined number of filter coefficients;
- a multiplier, responsive to the application of said auxiliary code words and said filter coefficients for generating a number of second code words, said number of second code words corresponding to said predetermined number of filter coefficients, each of said second code words being related to the digital product of one of said code words of said compressed delta-modulated signal and an associated filter coefficient;
- a combination device to which said second code words are applied for addition, controlled by clock pulses from said clock pulse generator; said clock pulses occurring within a period which is an integral multiple of the sampling period; and
- a step size control circuit connected to a second delay circuit having N second delay sections, in each of said sections a step size code word of a succession of N step size code words being stored.



4,002,982
MIXED ANALOG/DIGITAL TRANSMISSION SYSTEM USING RADIO LINK AND METHOD OF OPERATING SAME

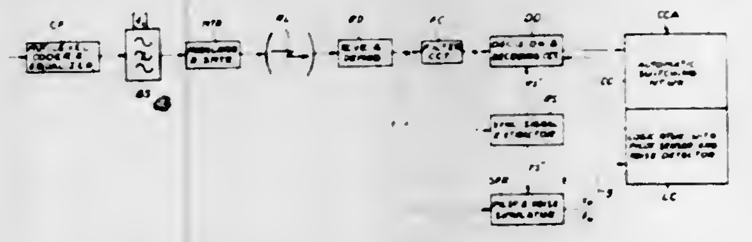
Basilio Catania, Fiano (Turin), Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Nov. 24, 1975, Ser. No. 634,526

Claims priority, application Italy, Nov. 25, 1974, 70425/74

Int. Cl.² H04B *1/00*

U.S. Cl. 325—39 **10 Claims**



1. In a receiving station for analog and digital messages transmitted from a remote station via a radio link, in combination:
- a demodulator for incoming high-frequency waves modulated with analog message signals in one mode of operation and with digital message signals in another mode of operation, said analog message signals lying outside a predetermined noise-frequency band, said digital message signals lying in a frequency range encompassing said noise-frequency band and at least part of the frequency spectrum of said analog message signals;
- a processor for message signals derived from said incoming waves by said demodulator, said processor including detector means for ascertaining the noise level in said noise-frequency band; and
- ancillary circuitry connected to the output of said demodulator and resonsive to a predetermined incoming frequency outside said frequency range for supplying a simulated noise frequency to said detector means in said other mode of operation.

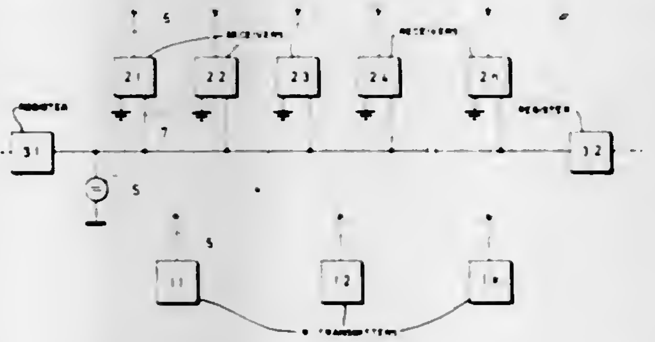
4,002,983
VEHICLE-EMERGENCY CALL SYSTEM

Jaroslav Kavalir, and Miroslav Studnicka, both of Prague, Czechoslovakia, assignors to Tesla, narodni podnik, Prague, Czechoslovakia

Filed Feb. 28, 1974, Ser. No. 446,590

Int. Cl.² H08G *1/00*

U.S. Cl. 325—54 **11 Claims**



1. An emergency call system for vehicles on public highways comprising a radio transmitter located in each of one or more vehicles, a plurality of fixed road receivers spaced at predetermined distance along the highway and at least one assistance dispatching station remotely located from said receivers, said vehicle transmitter having means for selectively providing a high frequency output of predetermined coded information indicative of one or more emergency conditions, said road receivers having an input tuned to the output frequency of the vehicle transmitter and a signal generator responsive to the receipt at said input of said predetermined coded information of said vehicle transmitter, said signal generator producing a coded output signal indicative of the given road receiver combined with the coded information indicative of the emergency condition received from said vehicle transmitter, and means for transmitting the combined coded signal, said dispatching station having means for receiving, and decoding said combined coded signal into independent indicia signifying the emergency condition and the given road receiver.

4,002,984
CIRCUIT ARRANGEMENT FOR DETERMINING THE TIME DURATION OF RECEIVED OSCILLATIONS

Wülf-Christian Streckenbach, Hemmingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Nov. 26, 1975, Ser. No. 636,223

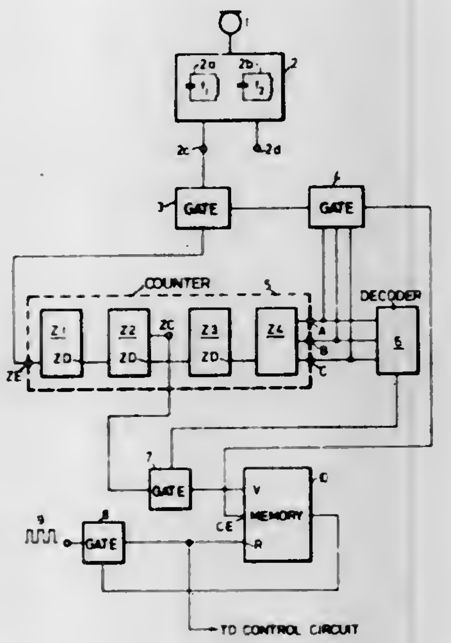
Claims priority, application Germany, Nov. 27, 1974, 2456005

Int. Cl.² H04B *1/06*

U.S. Cl. 325—392 **10 Claims**

1. In a circuit arrangement for evaluating a received signal

of a predetermined frequency, and whose maximum possible time duration is predetermined, by determining the time duration of the signal of said predetermined frequency, said circuit arrangement including a counter, means responsive to said received signal for feeding pulses of a constant frequency to the counting input of said counter to cause same to count during the time said signal of predetermined frequency is being received, and a memory means having its input connected to an output of said counter for storing a count representative of the number of counted pulses, the improvement comprising logic means, responsive to the counting state of said counter, for interrupting the feeding of said pulses to said input of said counter and for erasing the information stored in said memory whenever a counter state corresponding to said maximum permissible time duration has been exceeded due to receipt of interference signals having said predetermined frequency, whereby an erroneous evaluation is avoided.



4,002,985

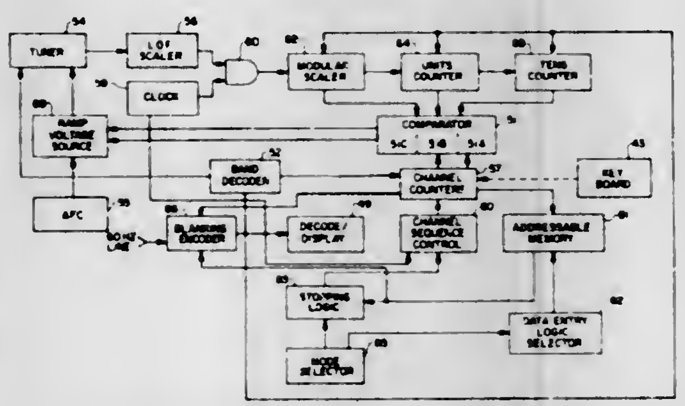
CHANNEL SELECTION INDICATOR FOR MEMORY TUNING SYSTEM

Richard G. Merrell, Darien, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,558

Int. Cl.² H04B *1/16*

U.S. Cl. 325—455 5 Claims



1. A television tuning system including:

counting means, generating sequential channel numbers for tuning all channels;

display means coupled to said counting means displaying the tens and units digits of generated channel numbers;

read/write memory means coupled to said counting means accessed by said generated channel numbers and having a plurality of addressable locations for storage and recall of signals related to selected channel numbers;

mode selection means coupled to said counting means and said memory means for establishing a program mode for storage of said signals and an operate mode for recall from said memory means of said signals to cause tuning to channels corresponding to the addresses of individual locations of said memory means;

a clock means generating timing pulses at predetermined rates;

indicator means coupled to said memory means indicating storage of said signals; and

blanking encoder means coupled between said clock means and said indicator means for causing a distinctive illumination sequence in said indicator means for distinguishing between selected and non-selected channel numbers.

4,002,986

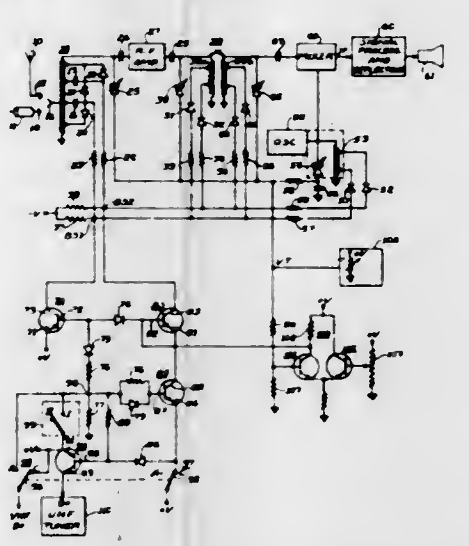
TELEVISION RECEIVER WITH TUNER CAPABLE OF RECEIVING AIR AND CATV SIGNALS

John Y. Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,534

Int. Cl.² H04B *1/16*

U.S. Cl. 325—459 16 Claims



1. A television receiver for receiving, with a single tuner, both airborne and cable television signals lying in three or more frequency bands comprising: a tuner having tunable stages each including an inductive reactance and a varactor diode exhibiting capacitance variations as a function of applied DC tuning voltage, the range of capacitance variation being insufficient, in conjunction with said inductive reactance, to enable said tuner to receive all of said television signals; means for coupling said television signals to said tuner without frequency conversion; and bandswitch means in said television receiver for adjusting the values of said inductive reactances in said tunable stages for television signals lying in different ones of said frequency bands to permit substantially the same magnitude tuning voltage to tune to more than one of said television signals.

4,002,987

CIRCUIT ARRANGEMENT FOR LIMITING THE TRANSMISSION SPEED OF DATA SIGNALS

Wolfgang Hans Kuhn, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 10, 1975, Ser. No. 585,495

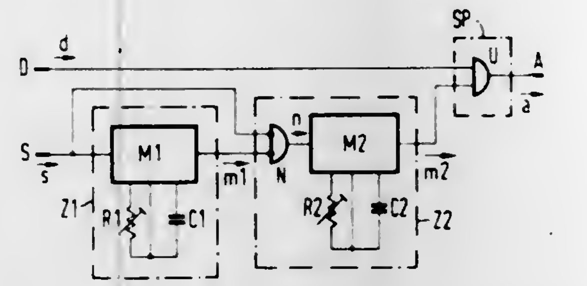
Claims priority, application Germany, June 12, 1974, 2428367

Int. Cl.² H03D *3/00*

U.S. Cl. 328—138 4 Claims

1. In apparatus for limiting the transmission speed of binary data signals wherein a first input to the apparatus is supplied with the data signals and a second input is supplied with associated element pulse trains which have a predetermined pulse duration when their repetition frequency is equal to a predetermined limit frequency and wherein binary outut signals corresponding to said data signals are emitted when said repetition frequency does not exceed said limit frequency, the improvement comprising:

a first timing means having inputs for receiving said element pulse trains and for producing a first signal having pulse durations equal to the pulse durations of said element pulse trains at said predetermined limit frequency.



second timing means having inputs for receiving said element pulse trains and said first signal for producing therefrom, if said first signal occurs between two pulses of said element pulse trains, a second signal having pulse durations greater than those of said element pulse train corresponding to said predetermined limit frequency and

gate means supplied with said data signals and said second signal for blocking the binary data signal output when said second signal occurs.

4,002,988

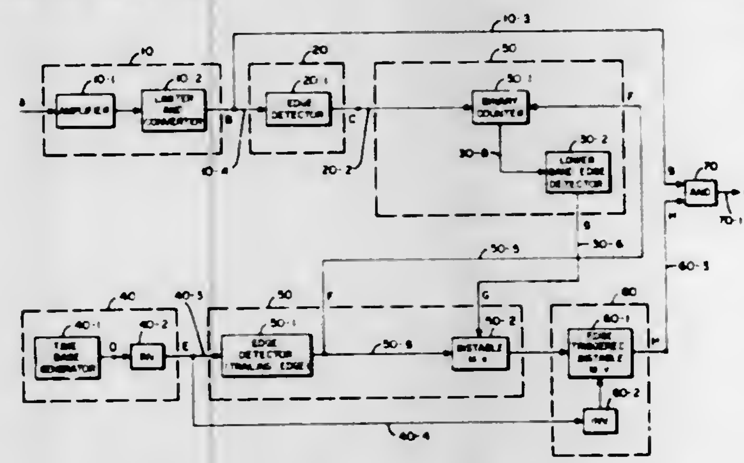
PROGRAMMABLE HIGH PASS DIGITAL FILTER OF ANALOG SIGNAL

Carlos D. Cardon, and Lawrence P. Griffone, both of Salt Lake City, Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 29, 1975, Ser. No. 600,018

Int. Cl.² H03K *9/06;* H03D *3/04*

U.S. Cl. 328—138 6 Claims



1. A programmable high pass digital filter of an analog signal, comprising:

means receiving an input analog signal of a frequency F_A for generating a binary digital signal of a frequency F_A therefrom;

counting means coupled to said receiving means for counting the number of cycles N_A of said binary digital signal during a preset sample time T_S;

comparator means coupled to said counting means for determining when said number of pulses N_A is equal to a preset low N_L number of pulses;

programming means coupled to said comparator means for setting in said comparator means said preset low N_L number of pulses that defines a preset lower limit of a preset passable high band;

first memory means responsively coupled to said comparator means for generating as the alternative output signals, an output True signal or an output False signal indicating that said counting means has counted a number of pulses N_A of said binary digital signal that is within or without respectively, said preset passable high band;

first gating means;

means coupling said binary digital signal as a first input to said first gating means;

means coupling said first memory means to said first gating means for alternatively coupling said True output signal or said False output signal as a second input to said first gating means, said True output signal or said False output signal enabling or disabling said first gating means to provide or not to provide, respectively, as an output signal therefrom said binary digital signal.

4,002,989

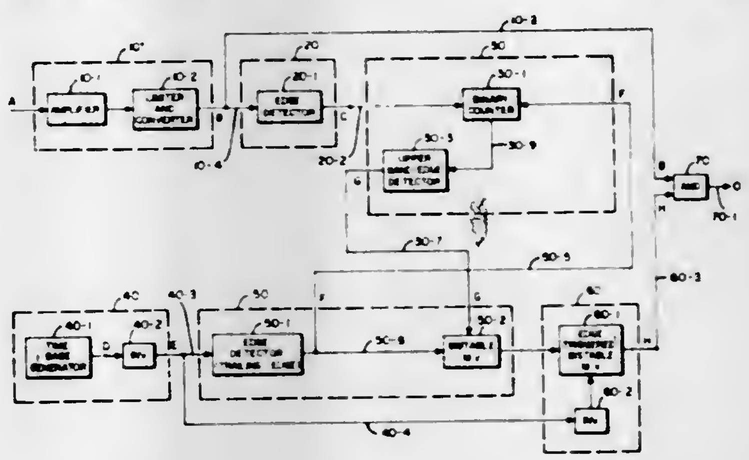
PROGRAMMABLE LOW PASS DIGITAL FILTER OF ANALOG SIGNAL

Carlos D. Cardon, and Lawrence P. Griffone, both of Salt Lake City, Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 29, 1975, Ser. No. 600,019

Int. Cl.² H03K *9/06;* H03D *3/04*

U.S. Cl. 328—138 6 Claims



1. A programmable low pass digital filter of an analog signal, comprising:

means receiving an input analog signal of a frequency F_A for generating a binary digital signal of a frequency F_A therefrom;

counting means coupled to said receiving means for counting the number of cycles N_A of said binary digital signal during a preset sample time T_S;

comparator means coupled to said counting means for determining when said number of pulses N_A is equal to a preset high N_H number of pulses;

programming means coupled to said comparator means for setting in said comparator means said preset high N_H number of pulses that defines the minimum number of pulses that exceeds the upper limit of a preset passable low band;

first memory means responsively coupled to said comparator means for generating as the alternative output signals, an output True signal or an output False signal indicating that said counting means has counted a number of pulses N_A of said binary digital signal that is within or without, respectively, said preset passable low band;

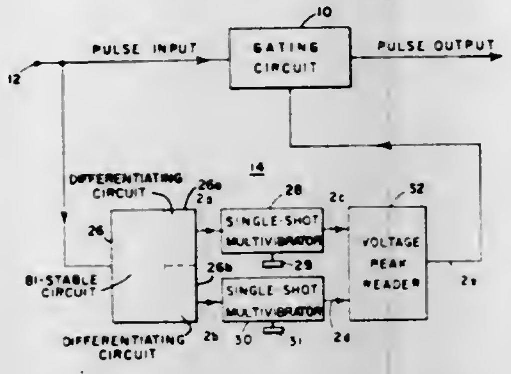
first gating means;

means coupling said binary digital signal as a first input to said first gating means;

means coupling said first memory means to said first gating means for alternatively coupling said True output signal or said False output signal as a second input to said first gating means, said True output signal or said False output signal enabling or disabling said first gating means to provide or not to provide, respectively, as an output signal therefrom said binary digital signal.

4,002,990
ELECTRONIC PULSE FILTERING SYSTEM

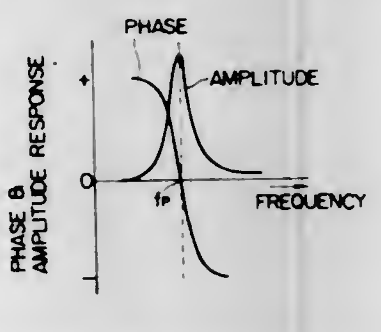
Ellis L. Roney, 171 Jardin Drive, Los Altos, Calif. 94022
Filed July 22, 1957, Ser. No. 673,472
Int. Cl.² H03K *9/06;* **H03D** *3/02*
U.S. Cl. 328—138 **3 Claims**



1. A pulse filtering system adapted to pass to an output circuit only those pulses of a train of substantially uniformly spaced input pulses whose repetition frequency exceeds a predetermined frequency, said system comprising, a normally closed gating circuit, a bi-stable circuit having first and second output terminals operative in response to a train of input pulses to produce outward pulses alternately at said first and second output terminals, means for applying a train of input pulses in parallel to said gating circuit and to said bi-stable circuit, first and second single-shot multivibrators arranged to be switched by the pulses from the first and second output terminal respectively of said bi-stable circuit, said single-shot multivibrators each being operative to produce trains of rectangular output pulses of substantially equal durations equal to the repetition period at said predetermined pulse repetition frequency, means for adding the pulses from said first and second single-shot multivibrators and operative to produce a direct current signal only when the pulse repetition frequency of said input pulses exceeds said predetermined frequency, and means for coupling said direct current signal to said gating circuit to open the same and allow the transmission of said input pulses therethrough.

4,002,991
PILOT SIGNAL EXTRACTING CIRCUITRY

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jan. 2, 1976, Ser. No. 646,049
Claims priority, application Japan, Jan. 29, 1975, 50-12432[U]; May 15, 1975, 50-63707[U]
Int. Cl.² H03B *1/00;* **H04B** *1/68;* **H03D** *3/18*
U.S. Cl. 328—139 **9 Claims**



1. A pilot signal extracting circuitry for extracting a pilot signal from a composite signal consisting of plural signals modulated by a suppressed carrier modulation system, comprising:

a synchronous signal generating circuit for receiving said composite signal and for thereby generating a synchronous signal which is synchronous with the pilot signal contained in said composite signal;

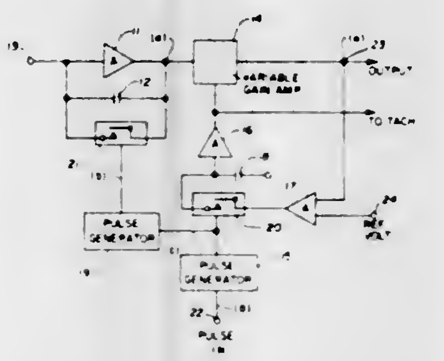
a synchronous detector circuit for receiving said synchronous signal and said composite signal and for thereby generating a DC voltage having a value proportional to the level of said pilot signal contained in said composite signal; and

a pulse-forming circuit for receiving said synchronous signal and said DC voltage and for thereby forming a pulse which is synchronous with said synchronous signal and which has a magnitude proportional to the value of said DC voltage,

said pulse formed by said pulse-forming circuit being used as an extracted pilot signal.

4,002,992
AMPLITUDE CONTROL FOR SAWTOOTH WAVE FORM

David I. Spalding, Epping, Australia, assignor to Applied Power Australia Limited, Canberra City, Australia
Filed Sept. 22, 1975, Ser. No. 616,165
Int. Cl.² H03K *4/10*
U.S. Cl. 328—181 **5 Claims**



1. A sawtooth voltage wave form generating circuit having:

a capacitor,

a charging circuit connected to said capacitor for charging the same,

switching means also connected to said capacitor for discharing the same,

an input terminal for connection to a source of pulses of variable repetition rate,

means connected to said input terminal and operatively connected to said switching means and operable each time that one of said pulses is applied to said input terminal to cause said switching means to discharge said capacitor,

an output terminal for said circuit,

a variable gain amplifier connected between said capacitor and said output terminal for variably amplifying the voltage across said capacitor and applying the same to said output terminal,

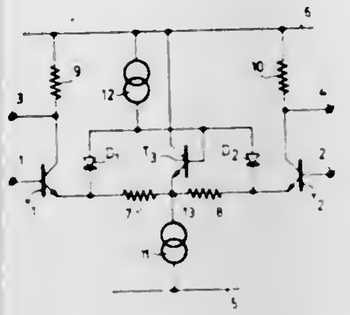
voltage responsive means connected to said output terminal for determining the magnitude of the voltage at said output terminal,

means connected to said variable gain amplifier for controlling the gain thereof,

and means connected to said voltage responsive means and said gain controlling means and effective each time that a pulse is received at said input terminal to cause said voltage responsive means to adjust said gain controlling means if the output voltage at the time of occurrence of the pulse does not have a predetermined value.

4,002,993
DIFFERENTIAL AMPLIFIER

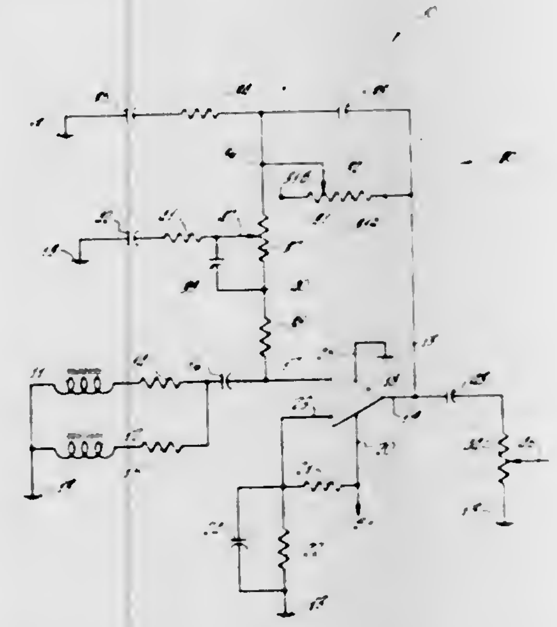
Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed June 25, 1975, Ser. No. 590,139
Claims priority, application Netherlands, July 8, 1974, 7409191
Int. Cl.² H03F *3/68*
U.S. Cl. 330—30 D **13 Claims**



6. A differential amplifier comprising first and second transistors of the same conductivity type, resistor means connecting the emitters of each of said transistors to a first common junction point, input means for applying an input signal to the base of at least one of said first and second transistors, first and second semiconductor junctions connected in series opposition between the emitters of said first and second transistors with a second common junction formed between the two semiconductor junctions, a first current source coupled to said second common junction for applying current to said semiconductor junctions, a third transistor with its emitter coupled to the first common junction, a second current source coupled to the third transistor so as to determine the quiescent current setting of the third transistor, and means for coupling the base of the third transistor to the second common junction so that the quiescent current setting of the first and second transistors varies as a function of the input signal.

4,002,994
TONE CONTROL CIRCUIT

C. Leo Fender, 2851 Rolling Hills Drive Sp. 33, Fullerton, Calif. 92635
Filed Jan. 26, 1976, Ser. No. 652,409
Int. Cl.² H03F *1/36;* **G10H** *3/00*
U.S. Cl. 330—107 **14 Claims**



1. A tone control circuit comprising:

an operational amplifier having an input and an output; and

a negative feedback circuit connected between said output and said input, said feedback circuit comprising:

a first variable resistor, a second resistor having a manually movable tap, and a third resistor connected in series between said output and said input;

a first capacitor connected across said first resistor;

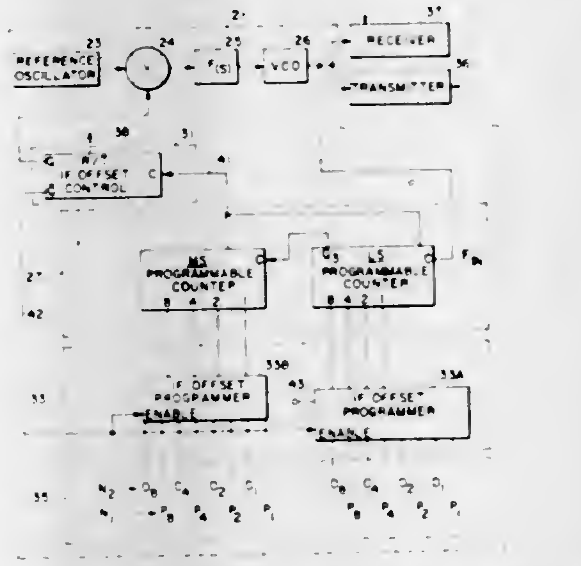
a fourth resistor connected between a first junction between said first and second resistors and ground;

a fifth resistor and a second capacitor connected in series between said manually movable tap of said second resistor and ground; and

a third capacitor connected between said manually movable tap of said second resistor and a second junction between said second and third resistors.

4,002,995
DIGITAL FREQUENCY SYNTHESIZER HAVING SELECTABLE FREQUENCY OFFSET BETWEEN TRANSMIT AND RECEIVE FREQUENCIES

L. J. Reed, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed July 7, 1975, Ser. No. 593,893
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **4 Claims**



1. In a frequency synthesizer of the type including a phase locked loop for providing a first frequency output or a second frequency output the frequency of which is set off from that of the first frequency output by an intermediate frequency, the improvement which comprises:

presetting means for enabling said synthesizer to selectively generate one of the first and the second frequency outputs; and

programmable means coupled to said presetting means for programmably setting the value of said intermediate frequency to any desired frequency within the capabilities of the frequency synthesizer.

4,002,996
LEVEL DETECTOR USING OSCILLATOR CIRCUIT WITH TWO CAPACITIVE PROBES

Leonard Klebanoff, Willowdale, and Donald Binnee, Richmond Hill, both of Canada, assignors to Elkay Electronics Ltd., Agincourt, Canada
Filed June 18, 1975, Ser. No. 587,989
Int. Cl.² A61M *5/14;* **G01F** *23/26;* **H03B** *5/12*
U.S. Cl. 331—65 **7 Claims**

1. A device for detecting a predetermined level of flowable material in a closed container by emitting an oscillation comprising

a circuit,

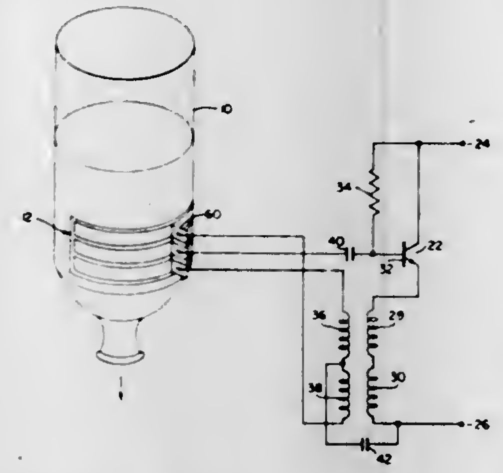
said circuit having an amplifier with a feed-back terminal,

a feed-back network including two vertically spaced apart probe condensers each having an open dielectric space,

means for connecting said feedback terminal to said feedback network,

said probe condensers each being in different feed-back paths of said feed-back network.

said probe condensers each having a similar plate configuration and said feed-back paths being similar whereby the magnitude of the current through each of said condensers is substantially the same when the open dielectric space of said two probe condensers is filled with the same dielectric material and is substantially different when the dielectric space of one probe condenser is filled with different dielectric material to the dielectric space of the other probe condenser,



means for deriving a resultant feed-back signal from the difference between the magnitudes of the currents through said probe condensers, the current through the upper condenser contributing a negative feed-back component to said resultant feed-back signal and the current through the lower condenser contributing a positive component to said resultant feed-back signal,

said circuit being responsive to a positive resultant feed-back signal to said feed-back terminal to oscillate.

4,002,997
INTEGRATED OPTICAL CIRCUIT

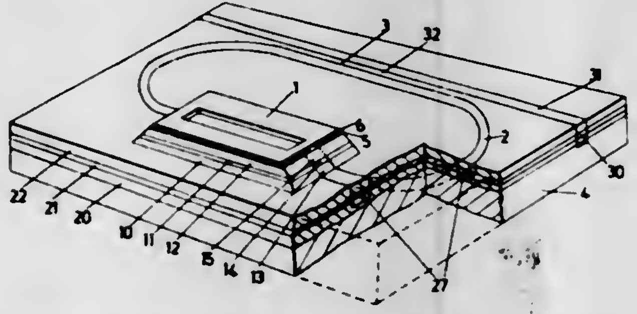
George H. B. Thompson, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,342

Claims priority, application United Kingdom, Oct. 29, 1974, 46741/74

Int. Cl.² H01S *3/19*

U.S. Cl. 331—94.5 H **6 Claims**



1. An integrated optical circuit comprising a heterostructure injection laser having an optical resonator and an active optical gain region, said optical resonator being spaced apart from said optical gain region and comprising a closed loop.

4,002,998
EXTERNALLY CONTROLLABLE MINIATURE LASERS

Esther M. Conwell, Rochester, and Dorian Kermisch, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 10, 1975, Ser. No. 621,313

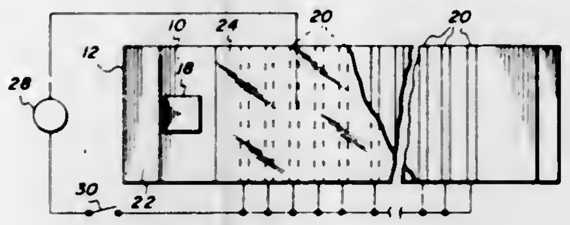
Int. Cl.² H01S *3/082*

U.S. Cl. 331—94.5 C **22 Claims**

1. A laser comprising:

an optical wave guide, said wave guide being formed of a deformable material of a given cross-section, said deformable material being a material being capable of guiding light at a predetermined wave length therethrough,

laser active material in said deformable material, a pumping light source to which the laser active material is responsive, and



deforming means for exerting a force on said deformable material while the light is being guided therethrough to physically deform said deformable material to cause a change in said given cross-section such as to produce laser feedback.

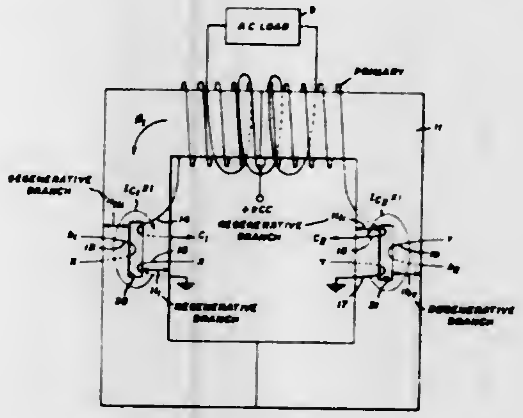
4,002,999
STATIC INVERTER WITH CONTROLLED CORE SATURATION

Joseph P. Hesler, Liverpool, and Samuel M. Korzekwa, Baldwinsville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,564

Int. Cl.² H03K *3/281*

U.S. Cl. 331—113 A **10 Claims**



1. A static inverter comprising:

a. input terminals for connection to a source of d.c. potentials,

b. a pair of semiconductor power switching devices, each semiconductor device having a pair of input electrodes and an output electrode,

c. a transformer having
   1. a core of substantially linear magnetic material having a closed magnetic path of approximately uniform cross-section with a pair of apertures in the core, each aperture partitioning the magnetic cross-sections in a localized region into two branches between which the flux may be steered with a magnetomotive force,
   2. a pair of primary power windings encircling the full core cross-section, each coupled between an output electrode of one of said semiconductor devices and said source terminals for generating an alternating flux in said core as said devices are switched,
   3. a secondary power winding encircling the full core cross-section to derive an alternating voltage output,

d. means for causing said power switching devices to conduct in alternation comprising:
   1. a first pair of regenerative feedback windings, one winding (R_1) passing through the first aperture, the other winding (R_2) passing through the second aperture, and each winding (R_1 and R_2) encircling a first branch,

   2. a second pair of degenerative feedback windings, one winding (D_1) passing through the first aperture, and the other winding (D_2) passing through the second aperture and each winding (D_1 and D_2) encircling a second branch,

   the first regenerative (R_1) and the first degenerative (D_1) winding connected in series opposition between the input electrodes of the first semiconductor device and the second regenerative winding (R_2) and the second degenerative winding (D_2) being connected in series opposition between the input electrodes of the second semiconductor device, and

   3. means to cause a differential magnetization rate higher in each first branch than in the local second branch to cause said first branch to saturate first, said saturation removing the regenerative feedback and applying unopposed degenerative feedback to said input electrodes to cause a reverse input bias in advance of full core saturation thus avoiding stresses on said switching device.

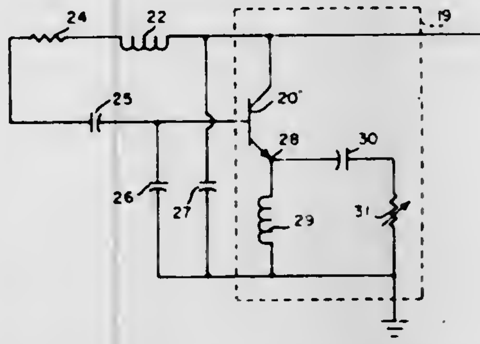
4,003,000
SINUSOIDAL OSCILLATOR WITH ELECTRONICALLY VARIABLE FREQUENCY

Frank J. Sordello, Los Gatos, and Robert L. Cloke, Santa Clara, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,091

Int. Cl.² H03B *3/04, 5/12*

U.S. Cl. 331—117 R **10 Claims**



1. A variable frequency sinusoidal oscillator comprising:

an amplifier system;

a feedback circuit for the amplifier system, said feedback circuit and said amplifier system including means for causing a phase shift of three hundred sixty degrees in signals transmitted therethrough such that the oscillaator will oscillate at a given frequency;

means to detect the oscillation frequency of the oscillator; and

reactive circuit means connecting with the transistor to vary the phase shift of the amplifier gain thereby to vary the oscillation frequency of the oscillator within a predetermined frequency range.

4,003,001
MULTI-LINE, MULTI-MODE MODULATOR USING BANDWIDTH REDUCTION FOR DIGITAL FSK AND DPSK MODULATION

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 525,699, Nov. 21, 1974, Pat. No. 3,958,191. This application Nov. 10, 1975, Ser. No. 630,246

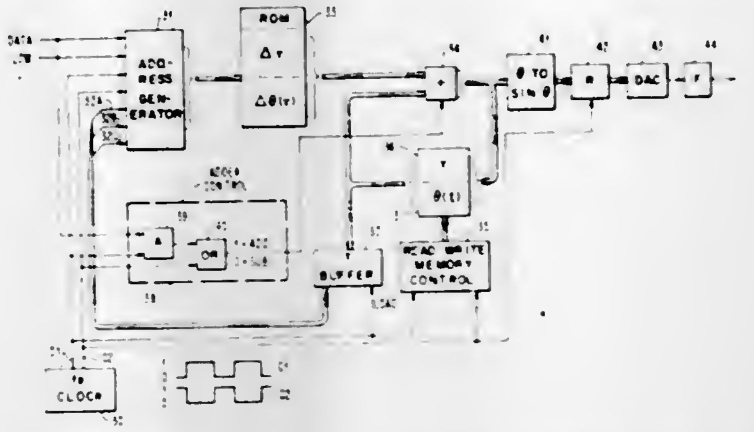
Int. Cl.² H03C *3/02;* **H04L** *27/20*

U.S. Cl. 332—1 **9 Claims**

9. A method for digitally generating narrow bandwidth FSK modulated signals comprising the steps of:

storing a predetermined trajectory for the instantaneous frequency transitions in the form of n discrete digital numerical values;

selecting within each baud time in which a frequency transition occurs each of said n discrete numerical values at least once, said selections being determined as a function of the interbaud time;



calculating the instantaneous phase in digital form based on each selected numerical value; and

converting the calculated instantaneous digital phase to an analog signal having the same instantaneous phase.

4,003,002
MODULATION AND FILTERING DEVICE

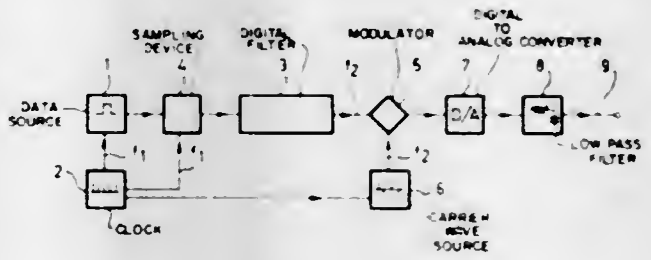
Wilfred André Maria Snijders; Nicolaas Alphonsus Maria Verhoeckx; Petrus Josephus van Gerwen, and Hendrik Arie van Essen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,392

Claims priority, application Netherlands, Sept. 12, 1974, 7412095

Int. Cl.² H03K *7/00*

U.S. Cl. 332—10 **1 Claim**



1. Modulation- and filtering device for digital signals comprising means for filtering the digital signals and means for modulating the filtered digital signals, on a modulator carrier wave characterized in that signal samples of the digital input signal, which occur at a first sampling frequency are converted in a digital filter to signal samples of a second sampling frequency, which is twice as high as the modulator carrier wave frequency and the signal samples at the second sampling frequency are modulated in the modulator with signal samples of the modulator carrier wave which occur at the same second sampling frequency the digital filter being adapted to have a band-pass filter characteristic.

4,003,003
MULTICHANNEL DIGITAL SYNTHESIZER AND MODULATOR

Ailen L. Heaberlin, 5737 Avenida Sanchez, San Diego, Calif. 92124

Filed Nov. 18, 1975, Ser. No. 633,147

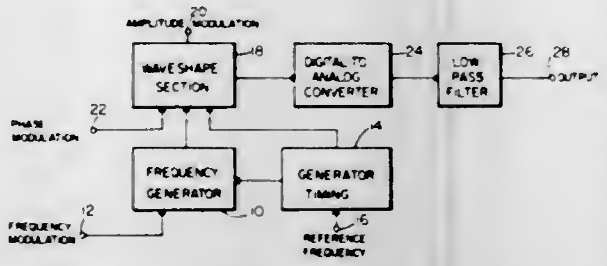
Int. Cl.² H03K *7/00*

U.S. Cl. 332—11 R **8 Claims**

1. Apparatus for generating a coherent multichannel signal comprising:

a. a reference frequency source for providing signals at a predetermined reference frequency;

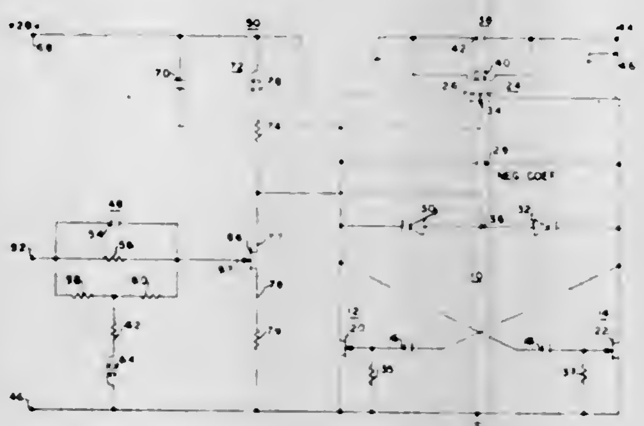
b. counter means coupled to said reference frequency source for consecutively sequencing through said reference signals;
c. increment circuit means having a first input coupled to said counter means and having a second input coupled to a frequency modulation source for generating an increment signal representing the frequency for each of the channel numbers;
d. phase information circuit means coupled to said increment circuit means for converting each of said increment signals into an output signal representing the phase information at each sampling point for each channel;



e. waveshape circuit means coupled to said phase information circuit means and being responsive to each of said output signals and its associated phase information for converting said phase information into digital amplitude information signals;
f. and digital-to-analog converter means coupled to said waveshape circuit means for converting said digital signals into an analog signal that is the sum of said predetermined number of consecutive signals.

4,003,004
FREQUENCY MODULATED OSCILLATOR

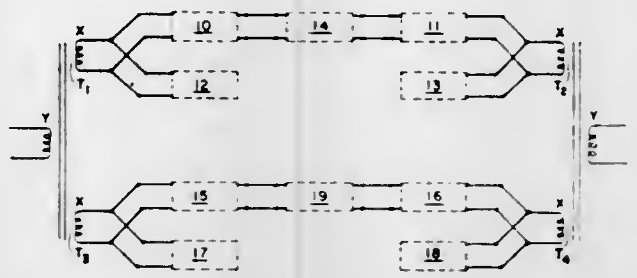
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Martial A. Honnell, Auburn, Ala.
Filed Apr. 9, 1975, Ser. No. 566,495
Int. Cl.² H03C *3/20*
U.S. Cl. 332—30 V **8 Claims**



1. A frequency modulated oscillator comprising:
a radio frequency oscillator
modulation means comprising a varactor coupled to said oscillator for varying the frequency of said oscillator non-linearly, deviating in a first direction of deviation from a linear variation with respect to a signal applied to said varactor; and
signal means comprising a field effect transistor, and responsive to an input signal applied to said field effect transistor, for applying, as an output of said field effect transistor, a signal to said varactor which varies non-linearly in amplitude with respect to said input signal due to a non-linearity of said field effect transistor, deviating in a second, opposite, direction of deviation from a linear variation when compared with a deviation from linearity effected by said varactor;
whereby the frequency of output of said oscillator varies substantially linearly with the amplitude of said input signal applied to said field effect transistor.

4,003,005
BIDIRECTIONAL CONSTANT IMPEDANCE LOW PASS/HIGH PASS FILTER CIRCUIT

Samir Mukherjee, Scottsville, N.Y., and William Ford Shepherd, Raleigh, N.C., assignors to Electro Networks, Division of Chloride, Inc. N. American Operations, Tampa, Fla.
Filed Nov. 24, 1975, Ser. No. 634,351
Int. Cl.² H03H *7/04, 7/38, 7/46*
U.S. Cl. 333—8 **10 Claims**



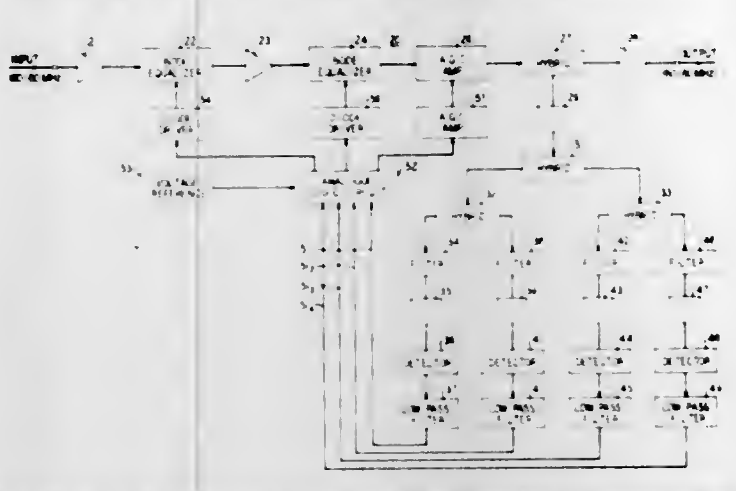
1. A bidirectional filter circuit having an input and an output and substantially constant input and output impedance characteristics over the desired frequency range, comprising:
a low-pass filter network connected between filter input and output having identical low-pass filter half sections cascaded back-to-back with a symmetrical all-pass network interposed therebetween, the all-pass network providing isolation between the low-pass filter half sections and the desired terminating impedance therefor,
first and second identical compensating networks respectively connected to the filter input and output and having reciprocal characteristic functions with respect to the low-pass filter half sections to compensate for impedance changes in the low-pass filter half sections over the desired frequency range without affecting amplitude characteristics thereof,
a high-pass filter network connected between filter input and output having identical high-pass filter half sections cascaded back-to-back with a symmetrical all-pass network interposed therebetween, the all-pass network providing isolation between the high-pass filter half sections and the desired terminating impedance therefor,
third and fourth identical compensating networks respectively connected to the filter input and output and having reciprocal characteristic functions with respect to the high-pass filter half sections to compensate for impedance changes in the high-pass filter half sections over the desired frequency range without affecting amplitude characteristics thereof.

4,003,006
PILOT TONE CONTROLLED ADAPTIVE AMPLITUDE EQUALIZER

Gordon James Mandeville, Lawrence, Mass., and Dale Irving McLean, Hampstead, N.H., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 6, 1975, Ser. No. 619,674
Int. Cl.² H04B *3/10*
U.S. Cl. 333—16 **11 Claims**

1. Apparatus for adaptively equalizing the amplitude of a communications channel, said channel having impressed thereon a message load of predetermined bandwidth, first and second pilot tones respectively positioned proximate the upper and lower edges of said band, and at least a third pilot tone positioned proximate the center of said band, said apparatus comprising, in tandem:
means for shaping the frequency characteristic of a first portion of said band;

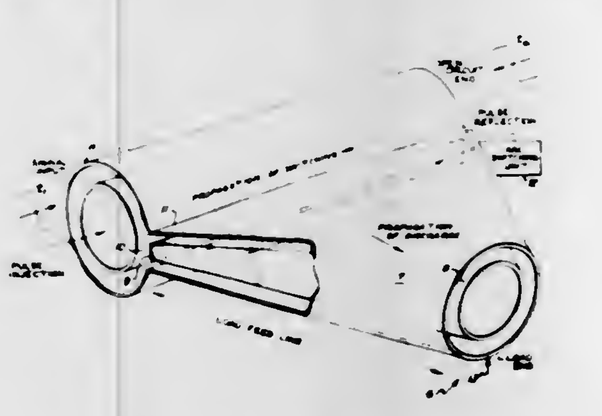
means for shaping the frequency characteristic of a second portion of said band, said first and second portion shaping means having substantially no shaping effect on that portion of the band shaped by the other; and
a variable-gain amplifier connected downstream of said first and second portion shaping means, said apparatus further comprising:
means, connected to the output of said amplifier, for filtering said first, second and third pilot tones from said message load;
means, connected to the output of said filtering means, for detecting said first, second and third pilot tones;



a source of a reference potential; and means, connected to said reference source and to said detecting means, for selectively adjusting the gain of said variable gain amplifier and/or the slope characteristic of said first and second portion shaping means, in an offsetting manner, as the levels of said first, second and third tones vary, whereby the overall amplitude characteristic of said communications channel remains substantially flat even in the presence of frequency-selective and non-frequency-selective fading in said channel.

4,003,007
HIGH POWER PULSE COMPRESSION TECHNIQUES

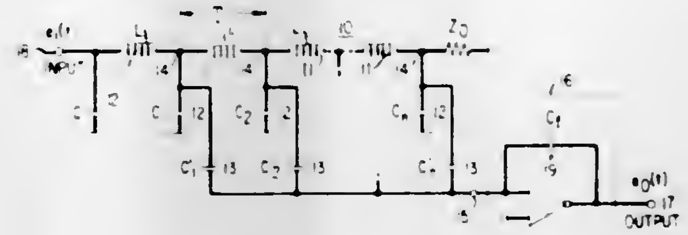
Alexander G. Stewart, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 13, 1975, Ser. No. 631,793
Int. Cl.² H01P *1/00;* **H03K** *5/04*
U.S. Cl. 333—20 **13 Claims**



1. A method of compressing a high intensity electromagnetic energy pulse comprising the steps of:
injecting the electromagnetic energy pulse into a transmission line, the pulse length being approximately at least as small as the electrical length of the transmission line but longer than the transverse dimension of the line,
activating a switching unit along the length of the transmission line causing the pulse energy to exit along the length of the line instead of out the end, and
discharging the pulse energy onto a discharge line at least over an extent and at times along the transmission line so that the pulse energy at various points along the line arrives at a load end of the discharge line at approximately the same time, thereby compressing the high intensity electromagnetic pulse.

4,003,008
ELECTROMAGNETIC SIGNAL PROCESSOR

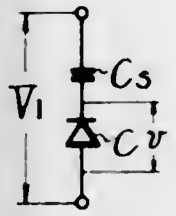
Gabriel Lorimer Miller, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 14, 1975, Ser. No. 577,289
Int. Cl.² H03H *9/26, 9/32*
U.S. Cl. 333—70 T **11 Claims**



1. A filter comprising a) an electromagnetic transmission line of time delay, T, the transmission line including series inductance and shunt capacitances to ground along its length resulting in a characteristic impedance, (b) sampling means for extracting signal information along at least a portion of the transmission line and (c) summing means for summing the extracted signal information CHARACTERIZED IN THAT the sampling means includes at least one portion of the shunt capacitance at each position along the line at which the signal information is extracted and the summing means includes at least one summing device, which summing device possesses an imput impedance to ground which is small compared to the characteristic impedance of the transmission line, which said portion of the shunt capacitance is chosen such that the transmission characteristic between the input to the transmission line and the output of the summing means possesses the desired frequency response wherein the at least one summing device includes an operational integrator.

4,003,009
RESONANT CIRCUIT USING VARIABLE CAPACITANCE DIODE

Seiichi Watanabe, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 24, 1975, Ser. No. 561,298
Claims priority, application Japan, Mar. 25, 1974, 49-33224
Int. Cl.² H03H *5/12;* **H03J** *3/06, 5/04*
U.S. Cl. 334—15 **8 Claims**



1. A resonance circuit comprising:
a. an inductive means;
b. a capacitive means having a semiconductor junction element which includes a layer of intrinsic semiconductor material adjacent the junction and which satisfies the equation

$$C\frac{d^2C}{dV^2} = \frac{4}{3}\left(\frac{dC}{dV}\right)^2$$

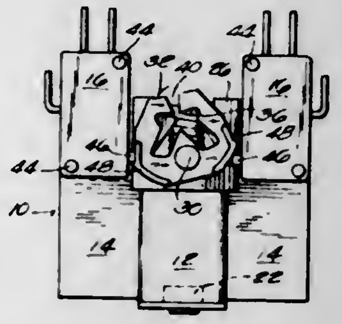
where C is the capacitance of said element when a voltage V is applied thereto and a junction of said junction element is reverse biased and C′ is a constant,

c. means for applying a signal to said element, said C′ is equal to said C, and $C = C_D (V + V_D)^{-3}$ is satisfied where C_D and V_D are constants, and said element has an impurity concentration proportional to 5/x 3, where x is the distance from said junction, and a low doping profile exists in the neighborhood of said junction.

4,003,010
LATCH RELAY

George F. Kuchuris, Bloomingdale, and Kenji Yatsushiro, Chicago, both of Ill., assignors to The Singer Company, New York, N.Y.

Filed Dec. 2, 1975, Ser. No. 637,081
Int. Cl.² H01H *3/42*
U.S. Cl. 335—190 **10 Claims**



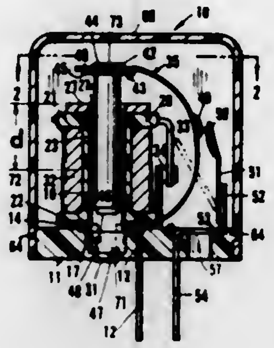
1. Apparatus comprising
- a frame,
- a relay mounted in the frame and including a coil and a plunger,
- a spring biasing the plunger out of the coil,
- a generally flat cam member pivotally mounted on the frame for rocking movement between two positions and having an external cam surface and an opening therein,
- a pin projecting from the plunger into said cam opening,
- said opening providing an outer limit stop and an impact surface for said pin on each side of the cam centerline,
- said pin engaging either of the limit stops when the coil is de-energized and moving into engagement with the impact surface on the same side of the centerline when the coil is energized to cause the cam member to rock to a new position,
- means operative upon de-energization of the coil to cause the pin to move past the cam centerline into engagement with the other limit stop,
- a device mounted on the frame adjacent the cam member and having an actuator spring loaded into engagement with the external cam surface,
- said external cam surface being contoured so the actuator acting thereagainst holds the cam member in either of said two positions in a stable manner.

4,003,011
ELECTROMECHANICAL SWITCHING DEVICE

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Sept. 4, 1975, Ser. No. 610,201
Claims priority, application Canada, June 18, 1975, 229651
Int. Cl.² H01H *1/12, 51/06*
U.S. Cl. 335—196 **12 Claims**

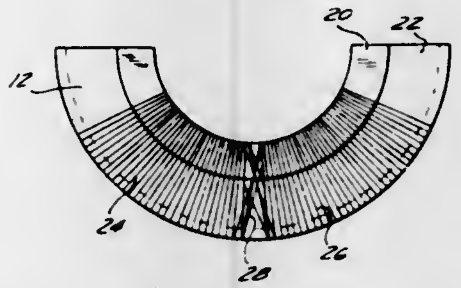
1. An electromechanical switching device comprising: an insulate base; an input terminal connected to said base; a device actuating means; device actuating means mounting means associated with said base, said mounting means supporting said device actuating means for linear reciprocating movement relative thereto; an arcuately bent armature, said armature being electrically connected to said input terminal and being in the form of a spring metal strip, one end of said armature strip being fixed to said base and the other end of said strip being connected to said device actuating means; a first contact means carried by said armature strip between said ends and relatively proximate the apex of the bend thereof; an output terminal joined to said base; and a second contact means associated with said base and electrically connected to said output terminal; said first contact means being tangentially engageable with said second contact means responsive to movement of said device actuating means relative to said mounting means.



4,003,012
VERTICAL COIL FOR A DEFLECTION YOKE

Bernard Chasens, El Paso, Tex., assignor to General Instrument Corporation, Clifton, N.J.

Filed Oct. 9, 1975, Ser. No. 620,944
Int. Cl.² H01F *5/00*
U.S. Cl. 335—213 **8 Claims**



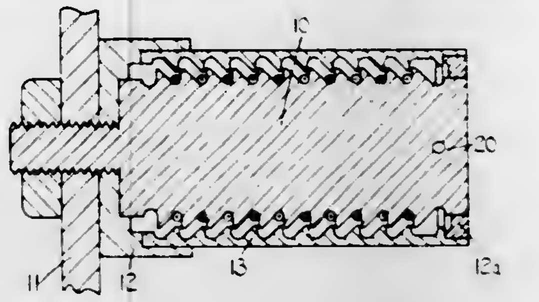
1. A deflection yoke coil of the type for use with a tri-gun in-line cathode ray tube, said yoke coil comprising a core and a winding formed of continuous wire turns, said winding comprising first and second sections and one or more crossover turns connecting said sections, said sections being spaced from each other along said core with said crossover turns extending therebetween on the outer surface of said core, said sections defining an area on the inner surface of said core extending from the interior to the exterior edge of said core which is substantially devoid of crossover turns.

4,003,013
ELECTROMAGNETIC DEVICES

Alec Harry Seilly, North Wembley, England, assignor to Simms Group Research & Development Limited, Birmingham, England

Continuation of Ser. No. 552,801, Feb. 25, 1975, abandoned.
This application Mar. 4, 1976, Ser. No. 663,829
Int. Cl.² H01F *7/08*
U.S. Cl. 335—220 **18 Claims**

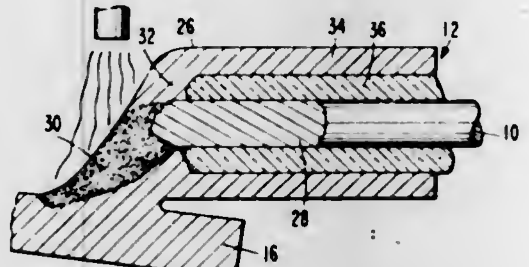
1. An electromagnetic device comprising a pair of relatively movable magnetisable members and an electrical winding means through which can be passed an electric current to produce a magnetic field to effect relative movement of the members, in which one of said members defines a plurality of slots disposed in side by side relationship on one face of the said one member, the other said member defining a plurality of projections entering into the said slots respectively and of a smaller width than the slots, at least some of said slots accommodating said electrical winding means, the connection of the winding means being such that any two slots in which the flow of current in the winding means therein is in the same direction are separated by a slot with a winding means in which the flow of current is in the opposite direction, the arrangement being such that if said members are positioned so that said projections are not centrally disposed in said slots, the members will, upon current being passed through said winding means, be urged relative to each other in an attempt to reduce the size of the smaller gap between each projection and the side faces of the associated slot.



4,003,014
REFRACTORY RESISTANCE TERMINAL

Charles D. Branson, and William D. Long, Jr., both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 25, 1975, Ser. No. 616,799
Int. Cl.² H01C *1/14*
U.S. Cl. 338—326 **12 Claims**

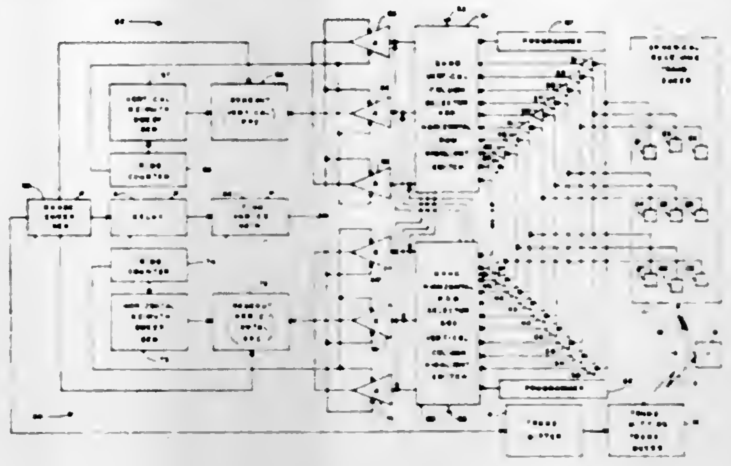


1. A resistance and terminal comprising
- an elongated resistance element made from a conductive refractory material which is weakened where subjected to a substantial temperature gradient,
- a metal supporting member extending along a segment of the element from one end of the element and at least partially surrounding the segment of the element,
- a fused portion having constituents of the supporting member metal and the refractory material joining the one end of the resistant element to the supporting member,
- said supporting member having an unfused portion along a substantial portion of the segment providing mechanical support for the element where subject to weakening, and
- a layer of solidified-from-melt material interposed between the unfused portion and the segment of the element,
- said solidified-from-melt material selected to be compatable with the refractory element and having a coefficient of linear expansion within the range of about 0.5 to 1.5 times the coefficient of linear expansion of the refractory material.

4,003,015
MULTIPATH SONAR SYSTEM

Edward L. Pipkin, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 3, 1975, Ser. No. 593,919
Int. Cl.² G01S *9/66, 7/62*
U.S. Cl. 340—3 R **18 Claims**



1. A sonar system, comprising in combination:
- first receiving means for receiving a first acoustical signal from an underwater target via a first path sector of the water encompassing said target;
- second receiving means for receiving a second acoustical signal from the aforesaid underwater target via a second path sector that is different from said first path sector of the water and which encompasses said target; and
- first and second readout means connected to the outputs of said first and second receiving means for reading out images of said target and said first and second water path sectors encompassing it, respectively, said first readout means comprising a data input, a vertical azimuth sweep input, and a range sweep input, and said second readout means comprising a data input, a horizontal azimuth sweep input, and a range sweep input;
- said first receiving means comprising a receiving transducer having a plurality of electroacoustical energy converters disposed in a predetermined number of columns and rows, a predetermined plurality of isolation amplifiers connected to the outputs of said electroacoustical energy converters, an adjustable vertical column selector switch connected to the outputs of said predetermined plurality of isolation amplifiers, a plurality of control amplifiers, each having a data input, an on-off control input, a time-varied gain control input, and an output, with the data inputs of said control amplifiers connected to respective ones of a like plurality of outputs of said adjustable vertical column selector switch, said first receiving means further comprising a vertical azimuth sawtooth sweep signal generator having an input and having an output connected to said vertical azimuth sweep input, a ring counter connected to said input of said vertical azimuth sawtooth sweep signal generator for effecting the timing thereof and to said on-off inputs of said isolation amplifiers, and an adjustable range sweep generator connected to said range sweep input.

4,003,016
DIGITAL BEAMFORMING SYSTEM

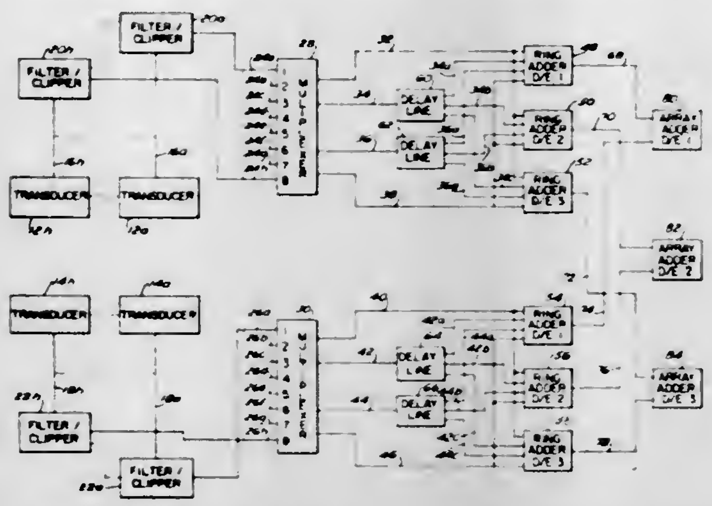
Winslow Rodeck Remley, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1975, Ser. No. 619,720
Int. Cl.² G01S *3/80*
U.S. Cl. 340—6 R **4 Claims**

1. A signal processing system comprising:
- a plurality of transducers for providing a plurality of respective output signals, said transducers arranged to form an array exhibiting ring symmetry;

a plurality of filtering and clipping means to filter and clip respective transducer output signals;

a multiplexer having a plurality of input terminals, each of said multiplexer input terminals connected to a respective member of said plurality of filtering and clipping means for receiving filtered and clipped signals, said multiplexer having a plurality of output terminals that is less in number than said input terminals, each of said output terminals adapted for sequentially providing said filtered and clipped signals simultaneously at predetermined intervals;



at least one pair of delay lines connected to respective members of a pair of selected multiplexer output terminals, said pair of delay lines adapted to delay received signals for a simultaneous predetermined period of time; and

an adder connected to said pair of delay lines for receiving the delayed signals and connected directly to a second pair of selected multiplexer output terminals.

4,003,017

CONTINUOUS BIT POSITIONING SYSTEM

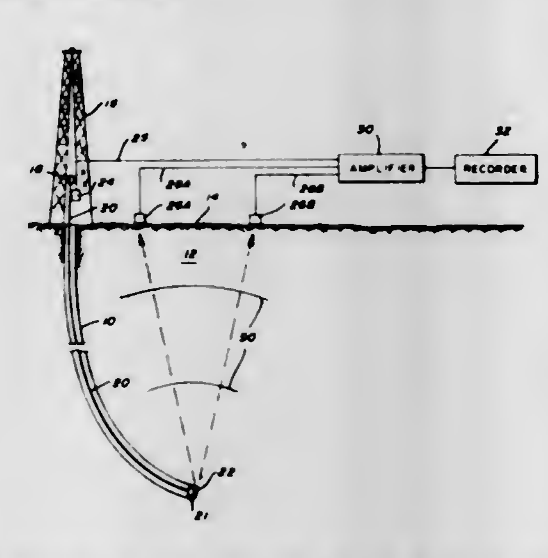
John R. Bailey, Tulsa, Okla., assignor to Senturion Sciences, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 371,142, June 18, 1973, Pat. No. 3,817,345. This application June 3, 1974, Ser. No. 475,791

The portion of the term of this patent subsequent to June 18, 1991 has been disclaimed

Int. Cl.^{2} G01V *1/00;* **E21B** *47/02*

U.S. Cl. 340—15.5 BH 19 Claims



1. The method of determining the position in the earth of the bottom of a borehole, during rotary drilling of said borehole, including a known length of drill pipe at least one drill collar, jars and bit, comprising:

a. placing a plurality of sensors in the earth in a known geometric pattern above the expected position of the bottom of the borehole, said sensors adapted to detect and transduce the vibrations in the earth to corresponding electrical signals, and amplifying said transduced signals;

b. lifting said drill pipe, drill collar, and jars a selected distance, and suddenly releasing the drill pipe, so that it falls in the borehole until the drill bit strikes the bottom of the well bore, whereby the impact of the drill bit on the bottom of the well bore will generate a first elastic wave in the earth, and the impact of the pipe on the jars will generate a second elastic wave in the earth;

c. determining the time of release of said drill pipe;

d. recording as a function of time said amplified transduced signals and determining the times of arrival of at least either said first or second elastic waves at said sensors; and

e. from the known time of release of said drill pipe and the known length of drill pipe and the times of arrival of said at least either said first or second elastic waves at said sensors, determining the positiion of said bottom of the borehole.

4,003,018

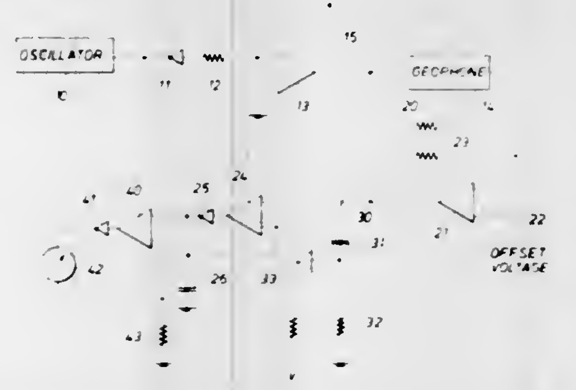
METHOD AND APPARATUS FOR TESTING A PLURALITY OF GEOPHONES

Karl McCormick, Channelview, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1976, Ser. No. 656,680

Int. Cl.^{2} G01V *1/16*

U.S. Cl. 340—15 13 Claims



1. An apparatus for testing a plurality of geophones for malfunctions comprising:

first circuit means, said circuit means being coupled to said geophones to apply a series of constant amplitude current pulses to said geophones, said pulses having a duration exceeding the normal resonant period of the geophones; and

measuring means coupled to said geophones to measure the peak voltage response of the geophones to said current pulses.

4,003,019

PARAMETER DISPLAY AND ALARM INSTALLATION FOR MOTOR-DRIVEN VEHICLES

Roger Philippe Tronel, Residence du 14 Juillet, 42300 Roanne, France

Filed Dec. 3, 1974, Ser. No. 529,059

Claims priority, application France, Dec. 3, 1973, 73.43638; Dec. 3, 1973, 73.43639; July 5, 1974, 74.24764

Int. Cl.^{2} B60Q *1/54*

U.S. Cl. 340—52 F 10 Claims

1. A parameter display and alarm installation for a motor-driven vehicle having a gear-box associated with the vehicle motor, said gear-box including a tachometric output shaft the rotational speed of which is proportional to the speed of the vehicle, said installation comprising:

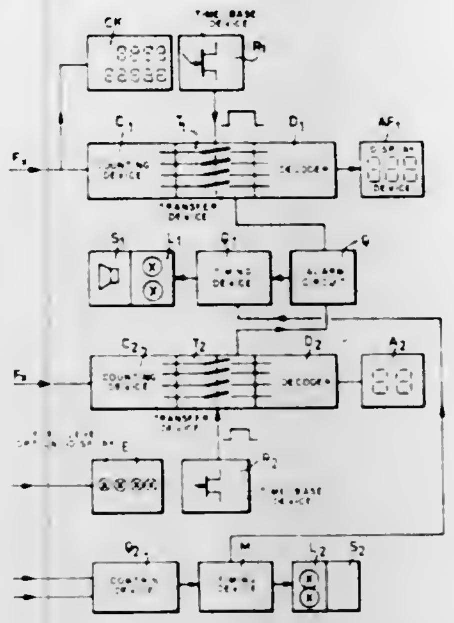
a revolution counting device and a speedometer device, a general mileage recorder and a trip recorder operatively connected to said counting device and speedometer device;

said speedometer device comprising a signal generator associated with said tachometric output shaft for producing binary signals in accordance with the rotational speed of said output shaft;

said vehicle motor including a rotating element, the rotational speed of which is proportional to the rotational speed of said motor;

said revolution-counting device comprising a second binary signal generator operatively connected to said rotating element;

an electronic transfer device connected to said first and second signal generators and having an "active" condition of predetermined duration for receiving the signals emitted by the related signal generator and for transmitting said signals to at least one decoding device for transforming said signals into a digital form and an "inactive" condition;



said installation further comprising at least one alarm circuit associated with said revolution counter and speedometer devices for indicating when the rotational speed of the motor of the vehicle exceeds a predetermined value and for indicating when the speed of the vehicle exceeds a predetermined value.

4,003,020

DIGITAL SIGNAL TRANSMISSION

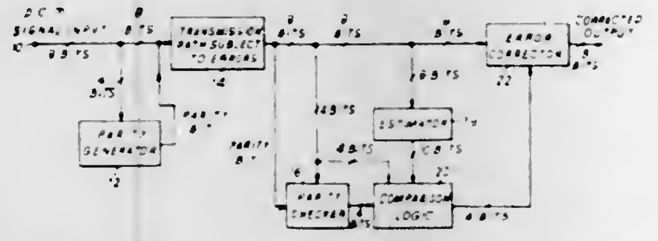
Christopher Keith Perry Clarke, Crawley, England, assignor to The Marconi Company Limited and Standard Telephones & Cables Limited, both of London, England

Filed June 30, 1975, Ser. No. 592,021

Claims priority, application United Kingdom, July 3, 1974, 29516/74

Int. Cl.^{2} G06F *11/10*

U.S. Cl. 340—146.1 AL 19 Claims



1. A method of detecting errors in a received digital signal which comprises a plurality of words each of which consists of a plurality of bits, the signal having parity bits, wherein the method comprises generating parity bits, one for each of a group of bits of the received signal, to correspond with the received parity bits, comparing the generated parity bits with the corresponding received parity bits, and when the generated and received parity bits differ in respect of a group, estimating a value for each word containing a bit from the respective group, and comparing the estimated value with the received value for the word to detect any word containing an erroneous bit.

4,003,021

LEVEL DETERMINATION FOR OPTICAL CHARACTER READER

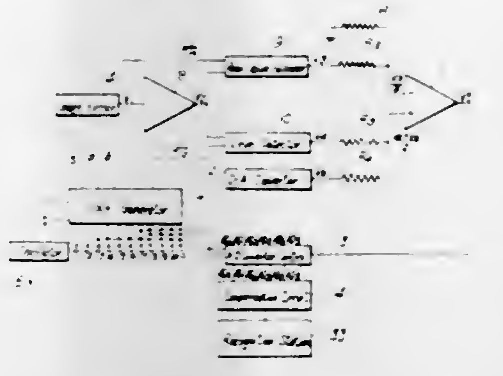
Hiromu Sasaki, Yamatokoriyama; Syoichi Yasuda, Nara, and Humikazu Nagano, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1975, Ser. No. 561,233

Claims priority, application Japan, Mar. 23, 1974, 49-34289; Mar. 23, 1974, 49-34290; Mar. 23, 1974, 49-34291

Int. Cl.^{2} G06K *9/02*

U.S. Cl. 340—146.3 AG 4 Claims



1. A level determination system providing quantized information signals for use in an optical character reader for reading information written on a card having a reference portion and an information portion, the improvement comprising:

a photosensor means for scanning said reference and information portions including N photosensitive elements providing N unique video reference signals for said reference portion of said card and N unique video information signals for said information portion of said card, the said information signals being representative of the information written on said card;

storage means having N storage sections therein and responsive to the maximum value of each said N unique video reference signals for storing same in a corresponding one of said N storage sections to thereby store a reference level signal peculiar to the operating conditions of each of said N photosensitive elements in said storage means for each and every card to be read; and

quantizing means responsive to said video signals comparing each of said N video information signals with the corresponding one of said N unique video reference signals in said storage means and providing N quantized information signals as respective functions of said comparisons.

4,003,022

SYMBOL STRING PATTERN RECOGNITION EQUIPMENT

Kousuke Takahashi, and Haruki Kohara, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 24, 1975, Ser. No. 598,958

Claims priority, application Japan, Aug. 2, 1974, 49-89278; Nov. 25, 1974, 49-135716; Dec. 23, 1974, 49-2463

Int. Cl.^{2} G06K *9/00*

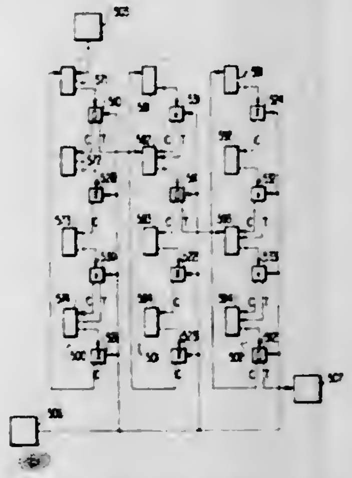
U.S. Cl. 340—146.3 MA 4 Claims

1. A symbol string pattern recognition equipment comprising:

an external signal generating circuit for generating respective input symbols constituting a symbol string pattern in the form of a string of binary-coded external signals;

at least one internal signal generating circuit for generating an internal signal in response to the symbol string pattern;

- a plurality of sequential logic circuits connected to said internal signal generating circuit and controlling travelling paths of the internal signal depending on the external signal, each of said sequential logic circuits consisting of a parallel arrangement of internal shift registers having a plurality of stages adapted to circulate or move the internal signal in either of two directions within the internal shift registers in synchronism with the external signals, and coupling elements coupled between shift registers and between selected stages of shift registers, said coupling elements having a function of shifting the internal signal or erasing the internal signal in the course of shifting or returning the internal signal to an internal shift register, when receiving one of the binary-coded external signals, and said coupling elements having another function of returning the internal signal to the first of said parallel arrangement of said internal shift registers all the time, when receiving the other of the binary-coded external signals;

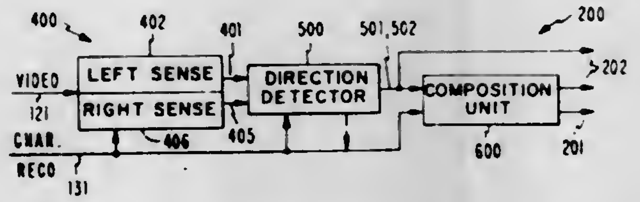


- an external shift register connected to each of the sequential logic circuits; and
- a detecting circuit for checking whether or not the internal signal has reached the external shift register, upon completion of the supply of the symbol string pattern.

4,003,023
POST-RECOGNITION SEGMENTATION FOR PATTERN-RECOGNITION MACHINES

Gary G. Benson, and Eugene R. Jones, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 9, 1975, Ser. No. 594,387
Int. Cl.^{2} G06K *9/00*
U.S. Cl. 340—146.3 SG **8 Claims**



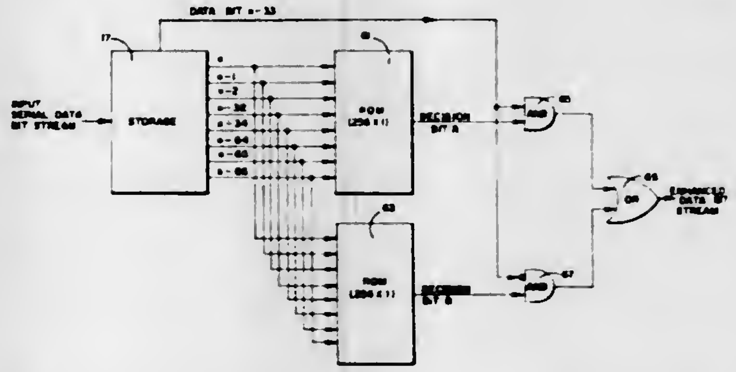
1. Apparatus for separating adjacent patterns in a system having a pattern-recognition unit responsive to pattern input signals for producing recognition codes at intervals which are substantially independent of the occurrences of said adjacent patterns, said apparatus comprising:

- first sense generator means for combining a plurality of said pattern signals so as to produce a left-sense signal indicative of the occurrence of a first side of a potential pattern;
- second sense generator means for combining a plurality of said pattern signals so as to produce a right-sense signal indicative of the occurrence of a right side of a potential pattern; and
- composition means responsive to said left-sense signal, said right-sense signal and said recognition codes for producing a single output code for each of said adjacent patterns, regardless of the number of said recognition codes produced for said patterns, said composition means including gating means responsive to a plurality of said sense signals for producing start and end signals respectively representing the beginning and the end of each of said adjacent patterns and discriminator means responsive to said start and end signals for selectively storing said recognition codes and for releasing one of said stored recognition codes as said output code, wherein said discriminator means is adapted to store a reject code when said start signal is active, and to store a current one of said recognition codes when said stored code is said reject code.

4,003,024
TWO-DIMENSIONAL BINARY DATA ENHANCEMENT SYSTEM

John P. Riganati, Yorba Linda, and Visvaldis A. Vitols, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1975, Ser. No. 621,724
Int. Cl.^{2} G06K *9/12*
U.S. Cl. 340—146.3 H **6 Claims**



1. A system for enhancing the bits in two-dimensional binary data, said system comprising:

- means for sequentially storing a data bit and bits associated therewith in preselected storage locations; and
- means for sequentially developing an output bit for each data bit, the state of the output bit being a function of the pattern of the bits stored in the preselected storage locations, said developing means comprising memory means for developing first and second decision bits as a function of the states of the bits associated with the data bit and gating means for selecting one of the first and second decision bits for the output bit as a function of the binary state of the data bit, said gating means comprising:
  - a first gate circuit for developing the output bit;
  - a second gate circuit for passing the first decision bit through said first gate circuit as the output bit when the data bit is in a first binary state; and
  - a third gate circuit for passing the second decision bit through the first gate circuit as the output bit when the data bit is in a second binary state.

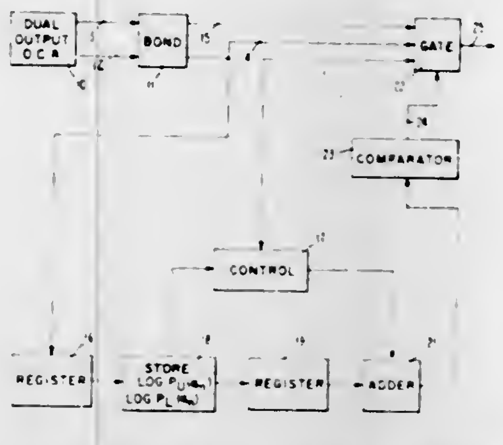
4,003,025
ALPHABETIC CHARACTER WORD UPPER/LOWER CASE PRINT CONVENTION APPARATUS AND METHOD

John Joseph Hilliard, Potomac; Philip Joseph Mullan, Rockville, and Walter Steven Rosenbaum, Silver Spring, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1975, Ser. No. 643,976
Int. Cl.^{2} G06K *9/00*
U.S. Cl. 340—146.3 S **7 Claims**

1. An apparatus for discriminating upper and lower case alphabetic character fields appearing on the output line of an optical character recognition machine (OCR) as a series of character defining electrical signals, comprising:

- a read-only store having an input and an output, said store containing respective upper and lower case $P_U(\alpha_n)$ and $P_L(\alpha_n)$ print convention probability values therein for conflict, reject and alphabetic characters outputted by the OCR and in accordance with the equations



$$P_U(\alpha_n)=\sum_{i=1}^{26} P_c\left[\alpha_n \,|\, U(i)\right] P[U(i)] \text{ and } P_L(\alpha_n)=$$

$$\sum_{i=1}^{26} P_c\left[\alpha_n \,|\, L(i)\right] P[L(i)]$$

where $P_U(\alpha_n)$ is representative of the probability tht said OCR recognition (α_n) resulted from the scan of an upper case alphabetic character; $P_L(\alpha_n)$ is representative of the probability that said OCR recognition (α_n) resulted from the scan of a lower case alphabetic character; ($U(i)$ is the 1–26 ith upper case alphabetic character; $L(i)$ is the 1–26 ith lower case alphabetic character; $P_c[\alpha_n\ U(i)]$ is the confusion probability of $U(i)$ being read as α_n; $P[U(i)]$ is the probability of $U(i)$ occurring on the document scanned by said OCR in view of the language of the field of characters inscribed on the aforesaid document; $P_c[\alpha_n\ L(i)]$ is the confusion probability of $L(i)$ being read as α_n; and $P[L(i)]$ is the probability of $L(i)$ occurring on the document scanned by said OCR in view of the language of the field of characters inscribed on the aforesaid document;

- first circuit means connected said OCR output line to the input of said store whereby a sequence of signals indicative of a field of characters outputted by said OCR, address said store serially a character at a time, to thereby make available serially at said store output, probability values corresponding to the aforesaid serially outputted character signals;
- an adder having an input and an output;
- second circuit means connecting said store output to the input of said adder, whereby probability values corresponding to the aforesaid serially outputted character signals are added algebraically;
- and last means connected to the output of said adder to detect the polarity of the print convention probability value algebraic sum following the read-out by said OCR to said store of all characters within a field, to thereby designate the upper/lower case print convention of the characters within the field.

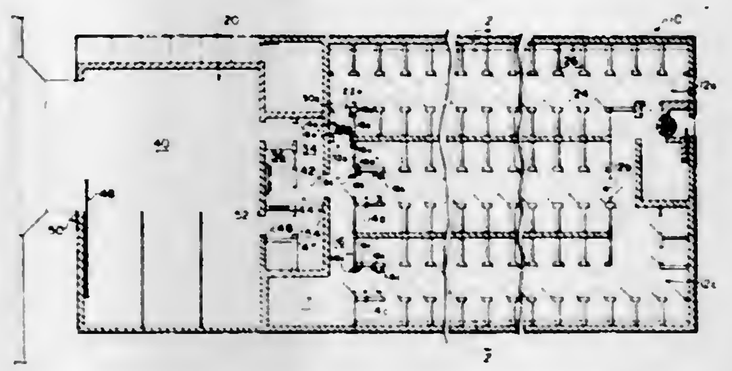
4,003,026
VAULT SECURITY SYSTEM

Herbert L. Wallerstein, Jr., 1704 Ambassador. Beverly Hills, Calif. 90210

Filed July 7, 1975, Ser. No. 593,267
Int. Cl.^{2} H04Q *3/00*
U.S. Cl. 340—149 A **7 Claims**

1. A vault security system, for the storage of valuables and the exclusion of unauthorized persons comprising:

- a plurality of corridors each with an entrance;
- a plurality of holding means, one of said holding means located at the entrance to each of said corridors for holding an unauthorized person, each of said holding means comprising a room with at least two doors, one of said doors being a corridor door openable so as to allow entry through said entrance into said corridor;
- a common hall communicating with said plurality of holding means, one of said doors of said holding means being a hall door openable so as to allow entry into said holding means from said common hall, only one of said doors of said holding means openable at any one time; and

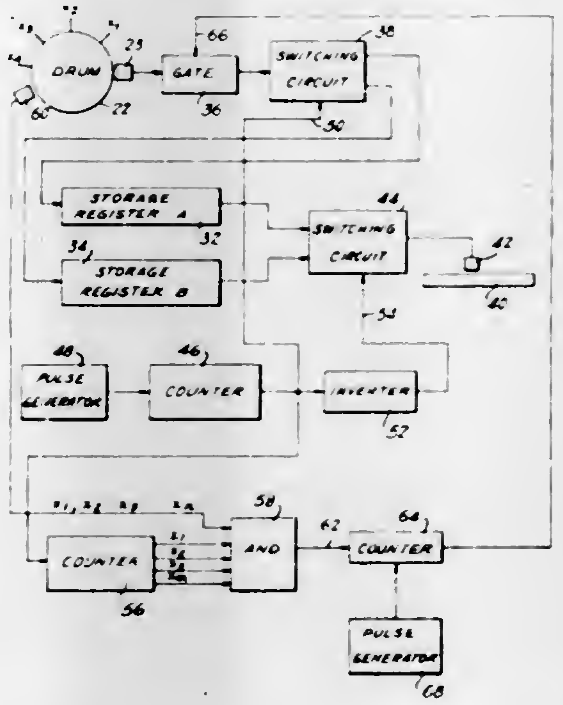


- a plurality of access means, each of said access means for opening from said common hall all of said hall doors for allowing access from inside said common hall to said plurality of holding means, each of said access means for opening, from inside only one of said plurality of holding means, said corridor door for allowing access to said corridor and said hall door for allowing access back to said common hall, said holding means for holding the unauthorized person attempting to enter any of said corridors through said holding means located at the entrance thereof with an access means that does not open said corridor door and said hall door from inside said holding means.

4,003,027
ARRANGEMENT FOR VARYING THE RATE OF RECORDING OF INFORMATION

Paul L. DiMatteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,081
Int. Cl.^{2} G06F *5/06*
U.S. Cl. 340—172.5 **17 Claims**



1. A method for changing the recording speed of a signal

from a first speed to a second speed comprising the steps of: subdividing said signal into predetermined intervals by recording values of said signal at the ends of said intervals, said values corresponding to the oridnates of the signal when said signal is graphically represented on a system of coordinate axes; recording at a first speed the values of said signal at the ends of said intervals; sensing said recorded values at a speed substantially equal to said first speed; storing in a first storage means a first portion of said sensed values; storing in at least a second storage means a second portion of said values; recording at a second speed substantially different from said first speed the first portion of said values; stored in said first storage means; and alternately recording at said second speed the second stored portion of said values stored in said second storage means; said first and second portions of said values being stored and alternately recorded separately to allow said portions to be stored at said first speed prior to when said portions may be received and recorded at said second speed when said second speed is substantially different from said first speed, one of said stored portions being recorded at said second speed while the other one of said portions is being stored at said first speed.

4,003,028

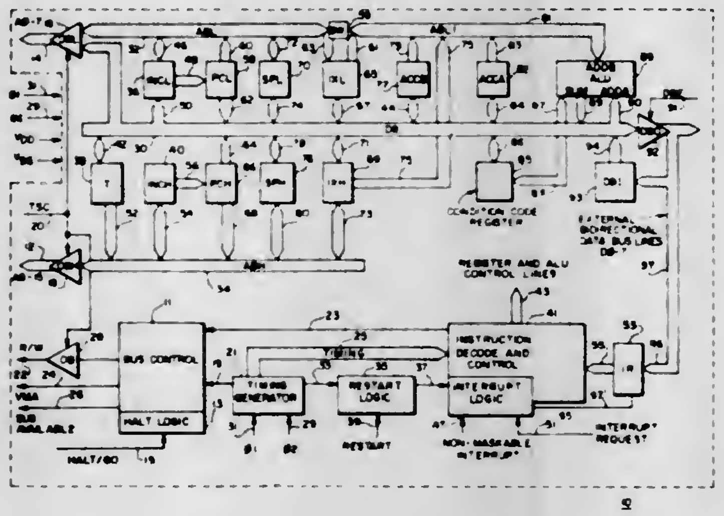
INTERRUPT CIRCUITRY FOR MICROPROCESSOR CHIP

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale, Ariz.; Charles Peddle, Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 30, 1974, Ser. No. 519,137

Int. Cl.² G06F *9/18, 9/20*

U.S. Cl. 340—172.5 **3 Claims**



1. In a microprocessor, circuitry for effecting execution of an interrupt operation of said microprocessor in response to an interrupt request signal, comprising:

data bus means for transferring digital information, said data bus means being coupled to a memory means having an interrupt routine program stored therein;

register storage means coupled to said data bus means for temporarily storing digital information in accordance with execution of various instructions by said microprocessor, including an instruction for setting an interrupt mask bit;

an interrupt request conductor for conducting said interrupt request signal;

instruction register means coupled to said data bus means for temporarily storing each instruction as it is received from said data bus means;

instruction decode means coupled to said instruction register means for controlling said register storage means and said data bus means to effect execution of the instruction stored in said instruction register means;

storage means coupled to said interrupt request conductor and said data bus means for storing said interrupt mask bit received from said data bus means in accordance with execution of said instruction for setting said interrupt mask bit;

gating means, coupled to said storage means and to said interrupt request conductor, for generating an interrupt enable signal responsive to said interrupt mask bit;

interrupt means, coupled to said gating means and to said data bus means, for inhibiting said temporary storing of the next instruction to be executed;

means responsive to said interrupt enable signal for internally generating a fixed code instruction within said instruction register means; and

circuit means in said instruction decode means for effecting transferring digital information in said register storage means to said memory means and causing said microprocessor to branch to said interrupt routine program.

4,003,029

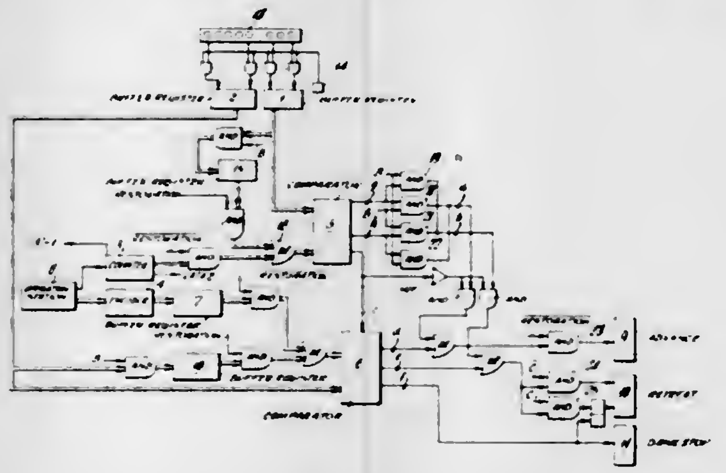
INFORMATION SEARCH SYSTEM

Masaaki Niiho, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 495,601, Aug. 9, 1974, which is a continuation of Ser. No. 312,148, Dec. 4, 1972. This application Dec. 18, 1974, Ser. No. 533,904

Int. Cl.² G06F *7/22*

U.S. Cl. 340—172.5 **3 Claims**



1. The method of operating a word data processing system for information searching comprising the steps of encoding each character of a word by assigning a character number representative of the particular character, and an order number representative of the position of each character in a word; storing the information so encoded in an information storage; sequentially entering into said system from an input word generator characters of a word to be searched; encoding each character to be searched as a first number representative of the character, and a second number representing the position of the character in the word to be searched; reading out the character and order number of a character at an output of said information storage; comparing the order number and character number of said output character with the respective first and second numbers of the character being searched; and driving said information storage to position the next adjacent word at said output until the second number is equal to the order number of the output character and the first number is equal to the character number of the output character, and repeating said comparing step for each such character comprising the word to be searched, said system comprising first and second comparator networks, and including the steps of feeding said order and second numbers to said first comparator network to produce first, second and third output signals when said order number is less than, greater than and equal to said second number respectively, driving said information storage in advance and reverse directions in response to said first and second signals respectively, feeding said character first number and third signal to said second comparator network to produce first, second and third output signals when said character number is less than, greater than or equal to said first number respectively, and driving said information storage in response to said second comparator first, second and third output signals in an advance and reverse direction and stopping said information storage drive respectively.

4,003,030

ELECTRONIC CASH REGISTER

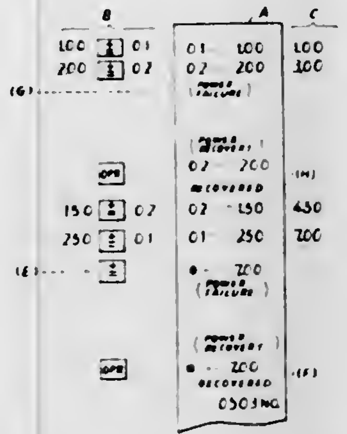
Haruo Takagi, Muko, and Reijiro Aoki, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronics Co., Japan

Filed Sept. 19, 1975, Ser. No. 614,778

Claims priority, application Japan, Sept. 25, 1974, 49-110299

Int. Cl.² G06F *1/00, 3/12, 13/00*

U.S. Cl. 340—172.5 **36 Claims**



2. An electronic cash register, comprising;

means for supplying electric power to said electronic cash register for energization thereof,

means operatively coupled to said power supply means for detecting recovery of the power supply after the occurrence of a power failure and producing a corresponding power recovery detected output signal,

means for entering information concerning commercial transactions to said electronic cash register,

storage means connected to said entering means for storing said entered information,

means responsive to said power recovery detected output signal from said power recovery detecting means for issuring a print enabling signal, and

means responsive to said print enabling signal for printing out said information stored in said storage means.

4,003,031

INFORMATION-ARRANGING DEVICE

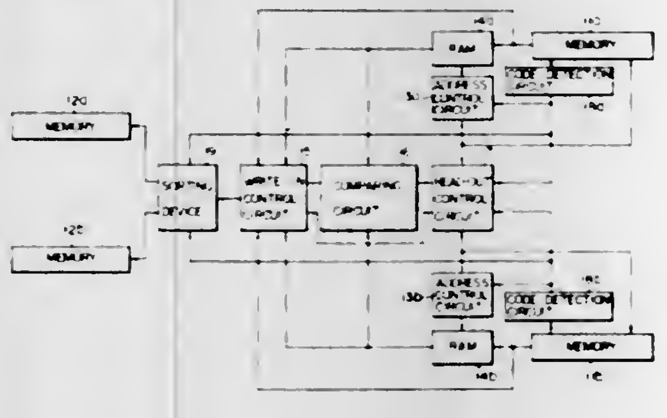
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,362

Claims priority, application Japan, Jan. 24, 1974, 49-10367

Int. Cl.² G06F *7/16, 7/36*

U.S. Cl. 340—172.5 **6 Claims**



1. An information-arranging device comprising:

two input memory means each for storing one group of records, each record comprising a plurality of words including at least one key word, said records being arranged serially with record positioning codes (BN) or different positioning codes (BK) interposed among them;

comparator means coupled to said input memory means for comparing the key words of any two records read out from said two input memory means, respectively, and generating a comparison output signal;

output memory means coupled to said input memory means and to said comparator means for storing, in response to a comparison output signal from said comparator means, one of the compared two records whose key word has priority and then the other record, together with a converted positioning code therebetween;

means for converting a record positioning code (BN) between any two records whose key words have been compared into a different positioning code (BK) before the records are stored in said output memory means;

positioning code-discriminating means coupled to said input memory means for determining whether a positioning code following each record read out from said input memory means is a record positioning code (BN) or a different positioning code (BK);

control circuit means coupled to said memory means, comparing means and positioning code-discriminating means for causing, when a record positioning code (BN) is detected by said positioning code-discriminating means, at least one record whose key word has been compared by said comparator means and has no priority to be stored in said output memory means after the record whose key word has been compared with that of said record and has priority, until a different positioning code (BK) is detected by said positioning code-discriminating means, and causing, when a different postioning code (BK) is detected by said positioning code-discriminating means, the keyword of a record following said different positioning code (BK) to be compared with the non-priority key word of said record, thereby storing in said output memory means one of the two records whose key word has priority upon receipt of a comparison output signal from said comparator means;

means for causing said comparator means to repeatedly compare the key words of two records at least one of which is different from the prior compared records; and

means coupled to said input memory means for transferring to said two input memory means the records stored in said output memory means when all of said stored records are stored in the output memory means in a sequential order determined by the key word comparison repeatedly effected by said comparator means.

4,003,032

AUTOMATIC TERMINAL AND LINE SPEED DETECTOR

Michael M. Austin, Salt Lake City, and William G. Barrett, Bountiful, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,994

Int. Cl.² G06F *3/00, 3/04*

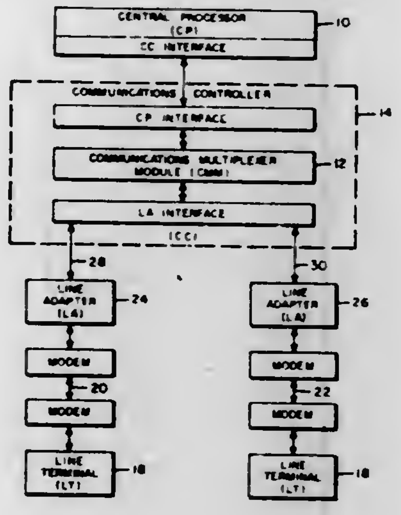
U.S. Cl. 340—172.5 **19 Claims**

6. A detector for the automatic determination of the terminal characteristics and line speeds (ATLSD) of a plurality of line terminals that are to be demultiplexed from a plurality of communication lines, comprising:

demultiplexing means for receiving bit-serially from a selected one of a plurality of communication lines a plurality of first characters, each of which first characters is the first character that is to be transmitted by an associated one of a plurality of line terminals that are of to-be-determined terminal characteristics and line speeds, each of said first characters being a multibit word having a first Start bit signal transition and a last Stop bit signal transition, said Start bit and said Stop bit being separated by a plurality of intermediate Data bit signal transitions, the signal transition that is formed by a predetermined one of said intermediate Data bits being designated by a count transition number (CTN) and the last signal transition of said first character being designated by a character transition number (KTN);

ATLSD Table means for storing a plurality of terminal identifier characters (TICs), each TIC comprising three bytes byte 1, byte 2 and byte 3, of which byte 1 includes the maximum sample count, i.e., the maximum number of sample counts that is required to count from the Start bit signal transition to the CTN of a particular Start character, and of which bytes 2 and 3 include the terminal characteristics and line speed of the line terminal that is associated with the maximum sample count of byte 1, each of said TICs being stored in an ascending order of maximum sample counts in an associated one of a plurality of ascendingly ordered addressable locations in said ATLSD Table means;

ATLSD register means coupled to said ATLSD Table means for storing the CTN and the KTN that are associated with all of the line terminals of a set of line terminals that is associated with the selected one of said communication lines and for storing the starting location address in said ATLSD Table means in which is stored the TIC having the minimum maximum sample count of the range of maximum sample counts that is associated with all of the line terminals of said set of line terminals that is associated with said selected one of said communication lines;



transition detector means coupled to said demultiplexing means for detecting the first character signal transitions and then generating a transition signal upon the detection of each first character signal transition including said Start bit signal transition;

clocking signal generator means for generating a real-time clocking signal that is comprised of a plurality of relatively short duration clocking pulses having a frequency F;

sample counter means coupled to said clocking signal generator means and to said transition detector means for counting and accumulating the current sample count beginning with the signal transition generated by said Start bit;

sample count comparator means coupled to said sample counter means and to said ATLSD Table means for comparing the current sample count that has been accumulated by said sample counter means to the current maximum sample count that is stored in the ATLSD Table addressable location that is currently being addressed and for incrementing the address of said addressable location when said current sample count equals said current maximum sample count.

4,003,033

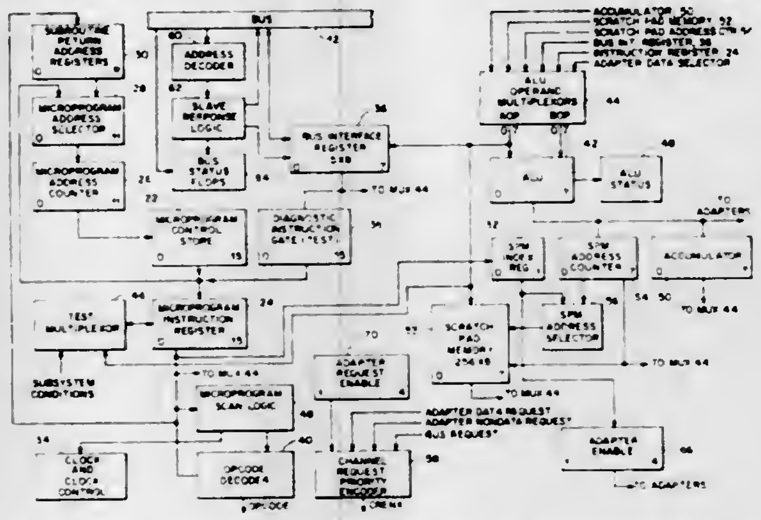
ARCHITECTURE FOR A MICROPROGRAMMED DEVICE CONTROLLER

David B. O'Keefe, Tyngsboro; Frank V. Cassarino, Jr., Weston, and Douglas L. Riikonen, Westford, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 22, 1975, Ser. No. 643,439

Int. Cl.² G06F *3/00, 15/16*

U.S. Cl. 340—172.5 **14 Claims**



1. A data processing system having a data processor, a controller, a plurality of peripheral devices, a common electrical bus coupling said processor and said controller, a plurality of paths coupling said devices and said controller, whereby said controller is interposed between said bus and said devices, said controller coupled to control the operation of said devices, said controller comprising:

A. means for storing a plurality of instructions useable in controlling the operation of said controller;

B. a memory for storing information useable in the control and operation of said devices;

C. first means for addressing said means for storing;

D. second means for addressing said memory;

E. an instruction register for receiving the addressed one of said instructions from said means for storing;

F. an arithmetic unit having an input and an output;

G. means for coupling said output of said arithmetic unit to said means for addressing said memory;

H. multiplexor means for coupling said input of said arithmetic unit to either of the following means:

  1. means responsive to said first means for addressing for receiving said instructions from said instruction register for controlling the operation of said controller,

  2. means, responsive to said second means for addressing for receiving said information from said memory for controlling the operation of said devices, and

  3. means for receiving information from said devices for enabling the control of said devices; and

I. means for coupling said multiplexor means with said memory for direct transfer of the information received by said multiplexor means to said memory for storage therein.

4,003,034

SENSE AMPLIFIER CIRCUIT FOR A RANDOM ACCESS MEMORY

Alexander C. Au, Los Gatos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 23, 1975, Ser. No. 580,256

Int. Cl.² G11C *11/44*

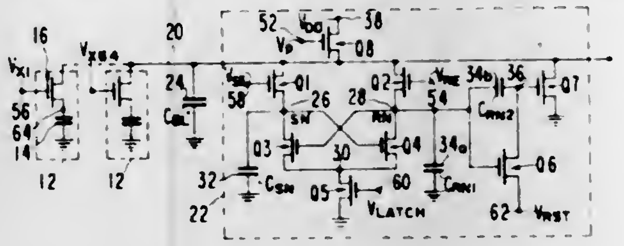
U.S. Cl. 340—173 CA **11 Claims**

1. In combination with an electronic memory of the type having a plurality of substantially identical memory cells each comprised of one transistor and a charge storage capacitor, where a plurality of such memory cells are connected to a common bit line having an inherent bit line capacitance, an improved sense amplifier comprising:

a first and second transistor each having a gate electrode, a drain and a source, said first gate electrode connected to said second drain, forming a reference node, said second gate electrode connected to said first drain forming a signal node;

a first control capacitance operatively connected between said signal node and ground;

a second control capacitance operatively connected between said reference node and ground, whereby the minimum input signal voltage required to cause said improved sense amplifier to read the binary state "1" is controlled by the magnitudes of said first and second capacitances;



charge sensitive means connected to said reference node for selectively rounding said common bit line; and,

a third and fourth transistor forming bit line connection means for selectively connecting said signal node and said reference node to said common bit line, each having a gate electrode, a drain and a source, said third and fourth drains connected to said common bit line, said third and fourth sources connected to said signal node and said reference node, respectively, and said third and fourth gate electrodes being disposed for receiving control voltages.

4,003,035

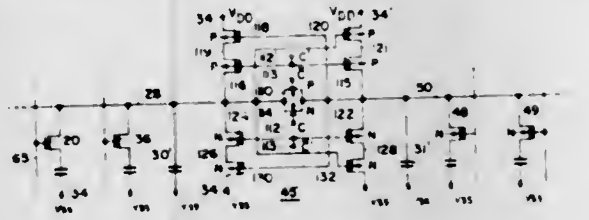
COMPLEMENTARY FIELD EFFECT TRANSISTOR SENSE AMPLIFIER FOR ONE TRANSISTOR PER BIT RAM CELL

Charles Robert Hoffman, Tempe, and William Walter Lattin, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed July 3, 1975, Ser. No. 593,072

Int. Cl.² G11C *7/06, 11/24*

U.S. Cl. 340—173 FF **14 Claims**



1. A semiconductor random access memory comprising:

a storage array including a plurality of storage cells;

a first sense-write conductor coupled to a plurality of said storage cells for receiving data from and transferring data into any one of said storage cells when said one of said storage cells is selected, all of said storage cells including only field effect transistors of the same conductivity type;

decode circuit means coupled to a plurality of said storage cells including one of said storage cells connected to said sense-write conductor for selecting storage cells coupled to said decode means by means of a first selection conductor;

sense amplifier circuit means coupled to said first sense-write conductor for amplifying a sense signal imparted to said sense-write conductor by said selected storage cell and isolating said sense-write conductor so that it is electrically floating at times other than during a read operation or a write operation, and said sense amplifier circuit means including both P-channel and N-channel field effect transistors.

4,003,036

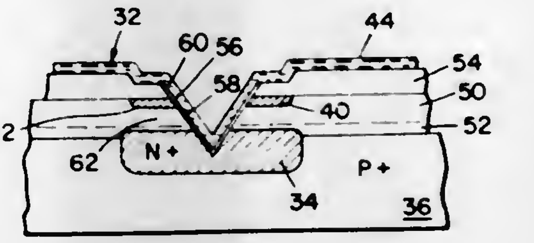
SINGLE IGFET MEMORY CELL WITH BURIED STORAGE ELEMENT

Fredrick Benjamin Jenne, Los Gatos, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Oct. 23, 1975, Ser. No. 624,868

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **17 Claims**



1. In a semiconductor memory device a single transistor cell comprising:

a substrate of low resistivity semiconductor material of a preselected polarity;

an epitaxial layer on said substrate having the same polarity as said substrate;

a first region of material buried within said substrate and having the opposite polarity therefrom;

a second region of material within said epitaxial layer having the same polarity as and spaced upwardly from said first region;

a gate means located within a recess on said device, said recess extending downwardly from its upper surface through said second region and into said first region, said gate means extending between said first and second regions; and

conductive contact means covering said gate means within said recess.

4,003,037

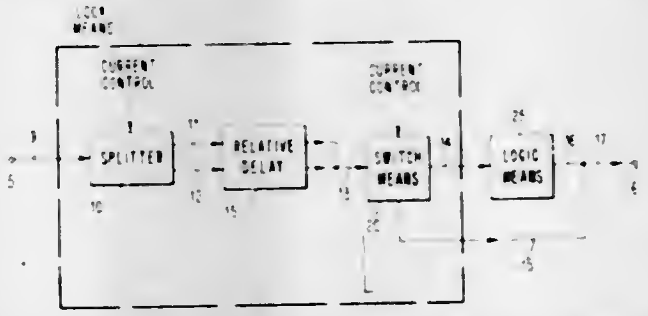
MAGNETIC BUBBLE DOMAIN PROCESSING APPARATUS AND METHOD

Hsu Chang, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,326

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **31 Claims**



1. Control means for directing a data entity to one or another path depending on a key associated with said entity comprising.,

propagation means for propagating said key and data entity in serial order,

means for duplicating said key and for propagating, in serial order a first key, a second key and said data entity,

third means connected to said last named means and responsive to one of said keys for allowing said other key and said data entity only to propagate on said one path or said other path.

4,003,038

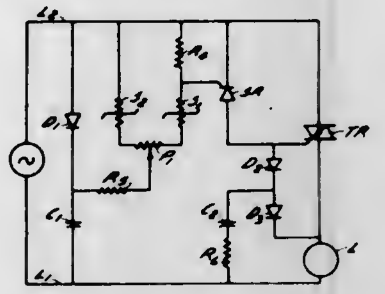
THERMAL DISCRIMINATOR FOR SENSING VARIATIONS IN THE HEAT EXCHANGE PROPERTIES OF A MEDIUM

Robert S. Meijer, Montreal, Canada, assignor to Multi-State Devices Ltd., Dorval, Canada

Filed June 9, 1975, Ser. No. 585,445

Int. Cl.² G08B *21/00*

U.S. Cl. 340—227 D **8 Claims**



1. A thermal discriminator for sensing variations in the heat exchange properties of a medium comprising:

a. a first and second switching devices having substantially indentical electrical characteristics and exhibiting regenerative switching at a power level which is dependent on the temperature sensed by said switching devices, both said switching devices being exposed to the same ambient temperature in a surrounding medium but only one of them being exposed to variations in the heat exchange properties of the surrounding medium;

b. means for applying to both switching devices sufficient power from an increasing voltage source to cause the switching devices to dissipate about the same amount of heat under certain conditions of the medium so that both switching devices would normally switch substantially simultaneously;

c. a coupling device interconnecting said first and second switching devices for inducing regenerative switching action in one of said switching devices in response to unbalance in the heat dissipated by said switching devices due to variations in the heat exchange properties of the surrounding medium from said conditions, and to inhibit the other switching device from switching; and

d. discriminating means connected to the first and second switching devices for detecting which one of said switching devices has switched as an indication that the heat exchange properties of the surrounding medium have changed.

4,003,039

OPTICAL FIRE DETECTION SYSTEM

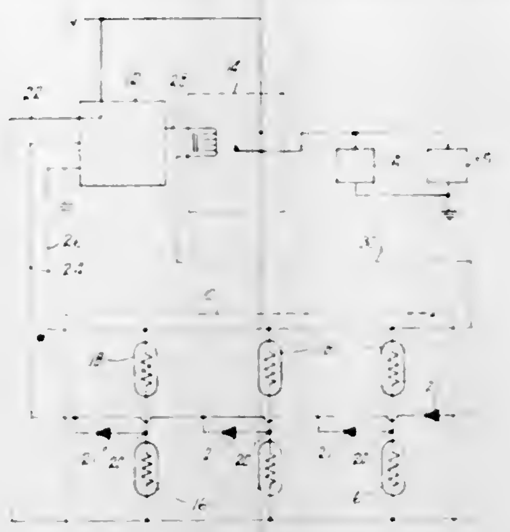
Matthew J. Dunphy, Braintree, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Filed July 19, 1973, Ser. No. 380,849

Int. Cl.² G08B *21/00*; G01N *21/58*

U.S. Cl. 340—228 R **4 Claims**

1. A condition sensing system which includes an amplifier and a remote condition sensing unit comprising a pair of impedence elements connected through a junction connected to the amplifier input across a voltage source, at least one of said impedence elements being responsive by a change in impedence to a condition to be detected, whereby a change in voltage occurs at the amplifier input, said amplifier being responsive to a predetermined change in voltage at the input to energize through a pair of circuit paths an actuating device, one of said circuit paths being by way of the full length of one of the power source leads to the condition sensing unit.



4,003,040

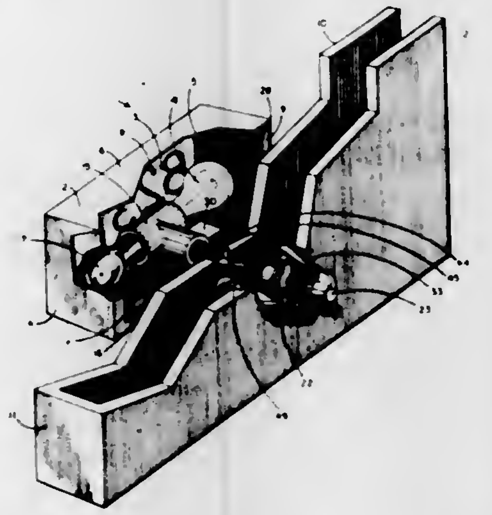
FLASHING ADDRESS-INDICATING DOOR SIGN

Cecil Carlton Browand, 5616 Reiter Ave., Las Vegas, Nev. 89108

Filed May 30, 1975, Ser. No. 582,287

Int. Cl.² G08B *5/00*

U.S. Cl. 340—332 **2 Claims**



1. An electrically illuminated sign mountable on the exterior of a residence comprising:

a housing having a front wall and side walls, said front wall being at least partially transparent, indicia indicating the house number of a residence, said indicia being carried by the front wall such that the indicia are clearly outlined when the sign is illuminated,

white light means and red light means enclosed by said housing, flasher means for rapidly turning the red and white light means on and off, switch means mountable inside the residence having a first operating position, a second operating position, and a third operating position, a source of conventional AC power,

circuit means for operatively electrically connecting said power source to said white light means when the switch means is in the first operating position and operatively electrically connecting said power source to said white light means and the flasher means when the switch is in the second operating position, and for operatively electrically connecting said power source to said red light means and the flasher means when the switch is in the third operating position, and

mounting means for attaching the housing to the exterior of the residence.

4,003,041

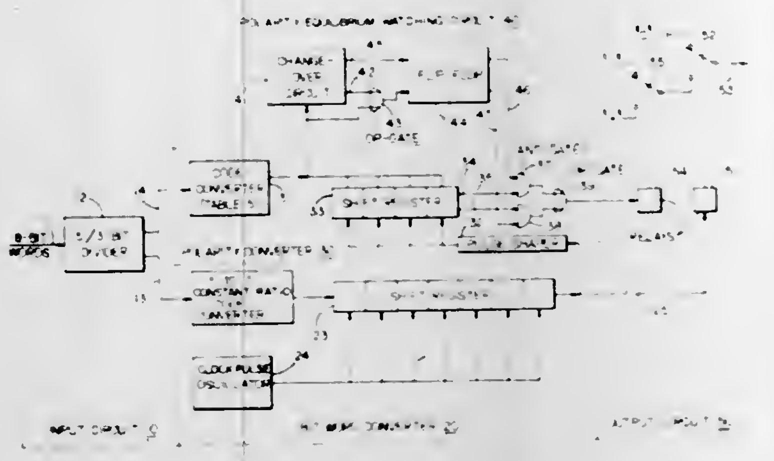
SYSTEM FOR CONVERTING BINARY SIGNALS INTO SHORTER BALANCED TERNARY CODE SIGNALS

Henrik Cornelis Anthony van Duuren, Zomerland-flat 330, Raaphorstlaan 25, Wassenaar, and Herman da Silva, Agrippinastraat 34, Voorburg, both of Netherlands

Continuation-in-part of Ser. No. 354,250, April 25, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,399

Int. Cl.² H04L *3/00*

U.S. Cl. 340—347 DD **10 Claims**



1. A system for converting n-bit binary code signals of more than three bits per signal of 1 and 0 bits into a ternary balanced code signal of $n-1$ bits of 0, + and − bits per ternary code signal, wherein each ternary signal has the same number of 0-bits, comprising:

A. means for dividing each signal of said binary code into two groups of units, the first group consisting of the first $n-3$ bits of each code signal,

B. means for converting said first group of bits into the first $n-1$ bits having a constant ratio of 0 and 1-bits per signal,

C. means for converting the 1-bits of said first group of bits into + and − bits according to the second group of the last 3-bits of each binary code signal, and

D. means for inverting the + and − bits in alternate ternary code signals having the same unevenness in the number of + and − bits, so that after a few converted ternary signals any D.C. component in said ternary signals is eliminated.

4,003,042

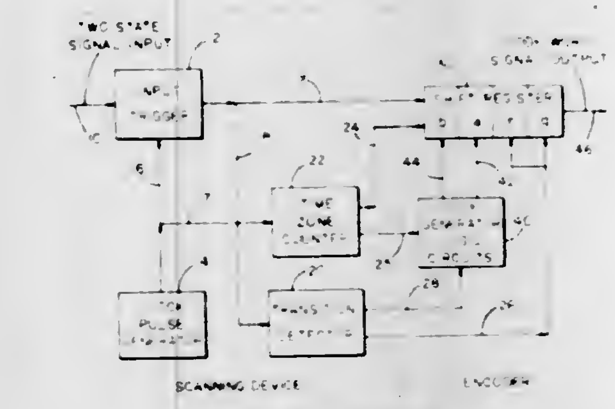
SYSTEM FOR THE TRANSFER OF TWO STATES BY MULTIPLE SCANNING

Hendrik Cornelis Anthony van Duuren, 83 Storm van's-Gravesandeweg, Wassenaar, Netherlands

Continuation-in-part of Ser. No. 354,251, April 25, 1973, abandoned. This application Jan. 29, 1975, Ser. No. 545,113

Int. Cl.² H03K *13/24*

U.S. Cl. 340—347 DD **8 Claims**



1. An apparatus for the transfer of point of time and direction of a transition between two states of an input signal comprising:

A. means for continuously scanning said input in at least three successive equal time intervals (V) for determining the position time zone (0, 1, 2, 3) of said transition in a co-incident time interval,

B. means for generating binary bits for each time interval, comprising one bit repeatedly for one continuous state and the other bit repeatedly for the other continuous state,

C. means for generating a code word comprising less than five successive binary bits, two of which bits (b, a) indicate said position time zone, and the remaining bits (r, q) indicate the direction of said transition, in accordance with Table II of this specification

D. means for transmitting said bits including said code word,

E. means for receiving said bits including said code word, and

F. means for determining from said received code word the direction of transition.

4,003,043

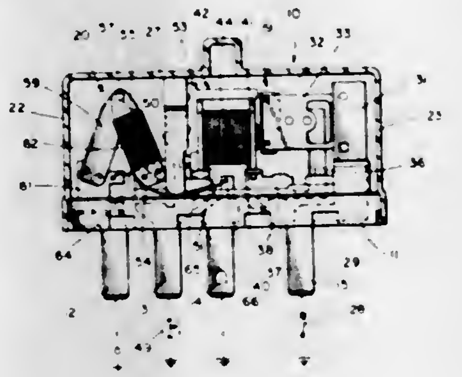
TIMED BUZZER

Arthur J. Little, Springfield, and William R. Mayer, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1976, Ser. No. 652,592

Int. Cl.² G01K *1/08*; G08B *3/00*

U.S. Cl. 340—403 **11 Claims**



1. A timed buzzer, comprising; housing means, a coil assembly mounted in said housing means, an armature supporting member, a flexible armature connected to said armature supporting member, a contact carried by said armature, a contact member supported in said housing means and being positioned to be engageable with said armature contact, said armature being positioned so that the coil, when energized, will move the armature contact out of engagement with the contact member, first terminal means connected to said armature, said contact member being connected to one end of said coil assembly, second terminal means, said second terminal means being connected to the other end of the coil assembly, said armature having sound producing means thereon, a timer assembly mounted in said housing means, said timer assembly including first and second bimetal elements, third terminal means, one of said elements being connected to said third terminal means, one of said bimetal elements having heater means thereon, another of said elements being connected to said second terminal means, to provide a circuit to energize said coil assembly when said third terminal means is positive, fourth terminal means for grounding, said heater means being connected to both said third terminal means and said fourth terminal means so that the heater means heats the bimetal elements whenever said third terminal means is positive opening said bimetal elements after a predetermined time delay terminating operation of the sound producing means.

4,003,044

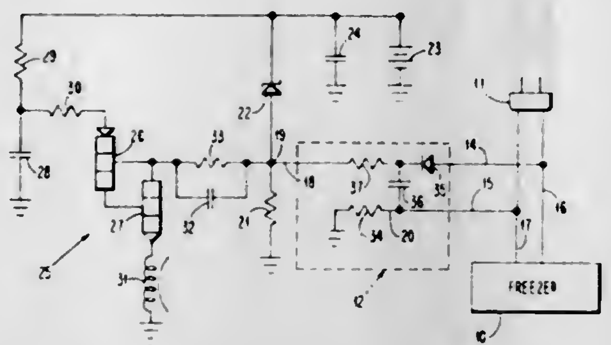
ALARM DEVICE HAVING AN OSCILLATOR

William O. Richmond, Jr., Lexington, Ky., assignor to Wolsk Associates, Ltd., Lexington, Ky.

Filed Sept. 30, 1974, Ser. No. 510,376

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 C **19 Claims**



1. An oscillator circuit comprising:

charge storage means;

a source of power;

first impedance means connecting said source of power to said charge storage means;

second impedance means and third impedance means connected in series to opposite sides of said source of power, said second impedance means having a lower impedance than said third impedance means;

responsive means connected to said source of power through said second impedance means;.

said responsive means being responsive to the voltage of said charge storage means reaching a predetermined voltage greater than a voltage supplied to said responsive means from said source of power through said second impedance means to provide a discharge path for said charge storage means when the voltage of said charge storage means reaches the predetermined voltage;

a resistor connected solely between said responsive means and the junction of said first impedance means and said charge storage means, said resistor having an impedance substantially smaller than the impedance of said first impedance means;

a capacitor and a resistor connected in parallel, one junction of the parallel combination of said capacitor and said resistor being connected to the junction of said second impedance means and said third impedance means and the other junction of the parallel combination of said capacitor and said resistor being connected to said responsive means;

and said source of power supplying a surge of current to a load when said responsive means provides the discharge path, said second impedance means having a substantially fixed voltage drop irrespective of the magnitude of current flowing therethrough to supply the surge of current from said source of power to the load when said responsive means provides the discharge path.

4,003,045

INTRUSION DETECTION SYSTEMS WITH TURBULENCE DISCRIMINATION

Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiague, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,692

Int. Cl.² G08B *13/18*

U.S. Cl. 340—258 A **8 Claims**

1. An intrusion alarm system for detecting the presence of a moving target in the presence of interfering signals, comprising:

a. means for transmitting signals into a zone under surveillance,

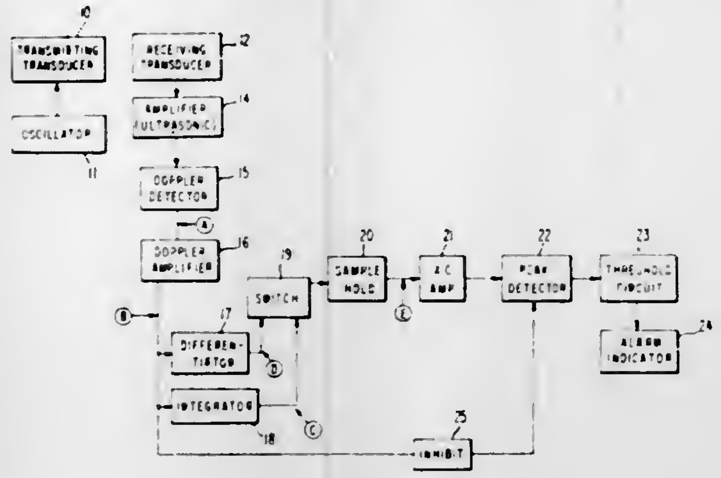
b. means for receiving signals returned from said zone,

c. processing means operative in response to said received signals to provide an output signal, indicative of said moving target and said interfering signal,

d. first means for differentiating said output signal,

e. second means for integrating said output signal,

f. detector means coupled to said first and second means and responsive to said differentiated signal to store a magnitude proportional to said integrated signal during a predetermined period



g. threshold means coupled to said detector means and operative to provide an alarm signal when said stored magnitude is relatively constant during said predetermined period.

4,003,046

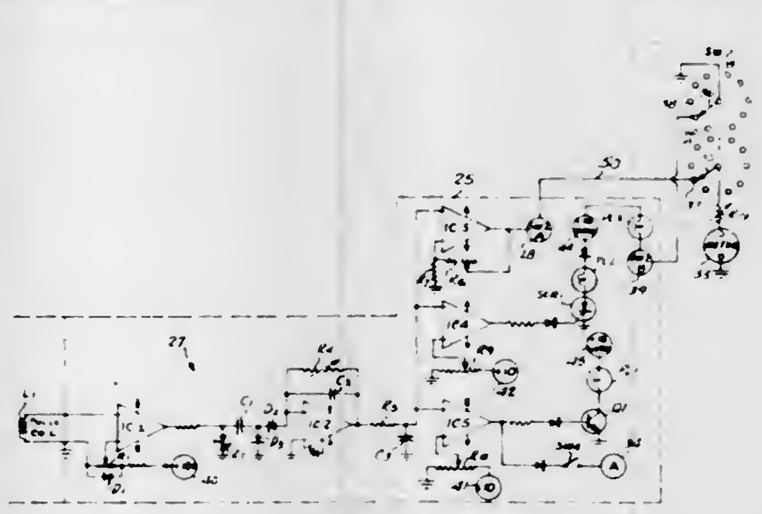
COTTON GIN MONITORING SYSTEM

Robert E. Jordan, Rte. 8, Box 1479, and Lloyd D. Miller, 4001 W. 28th, both of Pine Bluff, Ark. 71601

Filed Sept. 12, 1975, Ser. No. 612,629

Int. Cl.² G08B *21/00*

U.S. Cl. 340—271 **20 Claims**



1. Means to monitor the speed of a rotating shaft comprising pulse generating means at the shaft for generating electrical pulses at a rate in accordance with the shaft rotational speed, means to generate a voltage of a magnitude in accordance with the pulse rate, means to measure said voltage, whereby to indicate relative shaft speed, voltage-responsive first indicator means energized when said voltage decreases to a first preset warning value corresponding to a critical shaft speed, voltage-responsive second indicator means energized when said voltage decreases below said first preset warning value to a lower second preset warning value corresponding to a bottom limit shaft speed, and means to turn off the second indicator means if the shaft speed subsequently rises above said bottom limit shaft speed but to hold the first indicator means energized if the shaft speed subsequently rises above said critical shaft speed.

4,003,047

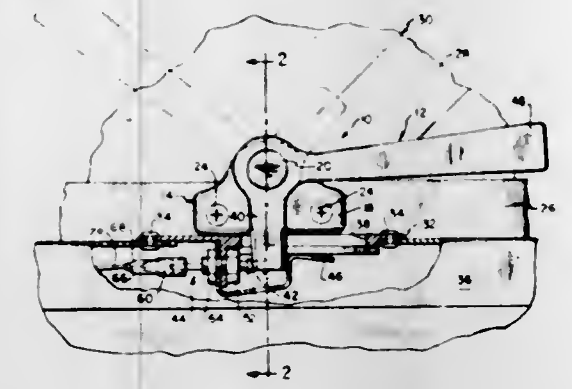
EMERGENCY EXIT LATCH

Philip C. Johnson, South Bend, Ind., assignor to Revere Copper and Brass, Incorporated, New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,737

Int. Cl.² G08B *13/08*

U.S. Cl. 340—274 R **6 Claims**



1. An emergency exit latch for selectively locking and unlocking a portal, such as a window or a door, which is mounted within a frame, and adapted for selectively operating an early warning device, which comprises:

a. a locking device comprising an elongated operator member configured to be gripped by an operator and tang means secured in angular relation thereto, said locking device being pivotally attached to said portal for rotation;

b. tang receiving means securely affixed to a frame portion adjacent said locking device when said portal is in a closed position comprising:

  i. a base section defining an opening configured to selectively receive said tang means; and

  ii. resilient locking means secured to said base section adjacent the opening thereof and positioned, dimensioned, and configured for selectively lockingly receiving at least a portion of the tang means when the locking device is rotated to a locking position, said resilient means engageably retaining said operator member and tang means in said locked position;

c. switch means mounted on the frame adjacent to said tang receiving means comprising an activating member having first and second positions, said first position providing a signal capable of deactivating said warning device and said second position providing a signal capable of activating the warning device, said switch means being positioned such that when the portal is in the closed position, rotation of the locking device to the locked position provides corresponding rotation of said tang means, and continued rotation produces engagement of said tang means with said activating member to change the position of said activating member to deactivate said warning device, and rotation of said locking device to an unlocked position causes the tang means to rotate out of engagement with the activating member to activate the warning device, said tang means and tang receiving means being respectively dimensioned and configured such that the warning device is activated prior to complete withdrawal of said tang means from said tang receiving means.

4,003,048

REMOTE ALARM SYSTEM FOR DETECTION OF FIRE EXTINGUISHER REMOVAL

George Weise, 1462 Alps Road, Wayne, N.J. 07470

Filed Feb. 23, 1976, Ser. No. 660,539

Int. Cl.² G08B *21/00*

U.S. Cl. 340—280 **6 Claims**

1. A detection device and alarm system for the detection of the removal of a fire extinguisher from its usual location within a particular zone comprising in combination:

a plurality of break-away electrically conductive wire lanyard means interposed upon a supervisory circuit;

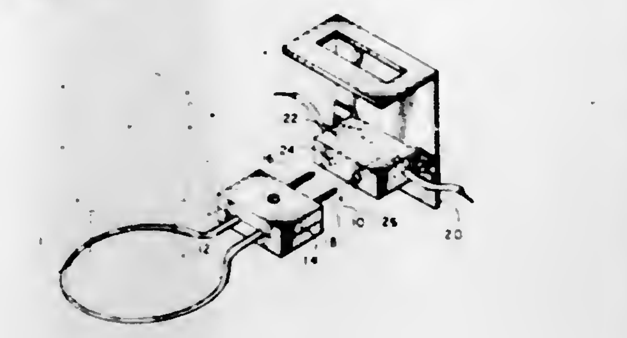
two male prong-female receptacle break-away connections to transfer supervisory current to said lanyard and a male prongfemale receptacle connection to output supervisory current from said lanyard to said supervisory circuit and the next detection device in series;

said female receptacle being stationarily secured;

an end-of-line supervisory circuit resistor to define said zones;

two batteries, one on either side of said resistor, connected in series to provice current for said supervisory circuit;

a sensitive relay connected to monitor each zone of said supervisory zoned circuit current to detect interruption of said zoned circuit;



a control alarm means having indicators corresponding to each of said supervisory circuit zones to indicate interruption of said supervisory circuit in a particular zone;

alarm circuit lines to correspond with and differentiate each zone of said supervisory circuit, connected to said alarm indicator means;

a latching relay to activate a particular alarm circuit;

a power source to supply current to said alarm circuit through said latching relay upon interruption of a particular zone of said supervisory circuit; and

switch means activated by said sensitive relay upon interruption of said supervisory circuit to in turn activate said latching relay to supply power to an alarm circuit line corresponding with the interrupted supervisory circuit zone.

4,003,049

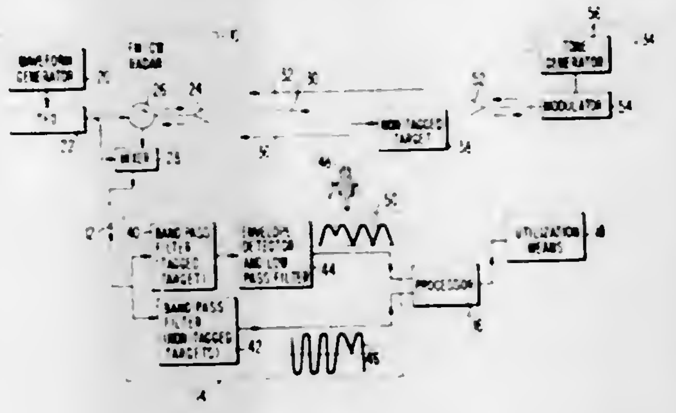
DUAL MODE AUTOMOBILE COLLISION AVOIDANCE RADAR

Fred Sterzer, Princeton, and Gerald Stanley Kaplan, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 3, 1975, Ser. No. 593,016

Int. Cl.² G01S *9/56, 9/46*

U.S. Cl. 343—6 R **6 Claims**



1. In a system for detecting the presence and range of a remote object from a probe station, said probe station transmitting modulating probe signals in a given direction, said object being of the class comprising cooperative targets hav-

ing means for receiving probe signals and radiating return signals having a characteristic indicia and non-cooperating targets serving to reflect said probe signals as return signals, said probe station comprising:

means for generating said modulated probe signals including means for generating a sample signal indicative of said probe signal;

means, receptive of said return signals and said sample signal, for generating a difference signal having distinguishable components indicative of return signals from said cooperative objects and of return signals from said non-cooperative objects; and

means, responsive to said difference signals, for generating a signal indicative of the range between said probe station and said cooperative objects, and the range between said probe station and said non-cooperative objects for all ranges not exceeding a predetermined value.

4,003,050

FULL RANGE CORRELATOR FOR USE IN A COLLISION AVOIDANCE SYSTEM

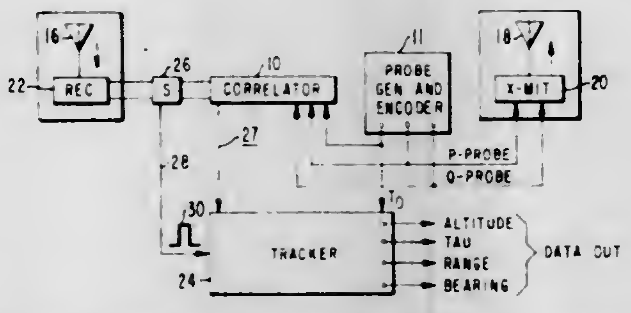
Jeffrey Ellis Miller, Dallas, Tex., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,995

Claims priority, application United Kingdom, Apr. 23, 1974, 17707/74

Int. Cl.² G01S *9/56*

U.S. Cl. 343—7.3 **6 Claims**



6. In a cooperative collision avoidance system employing two distinctive type probe signals transmitted from an interrogation station, including remote stations having means to respond to said probe signals and to generate reply signals corresponding to the type of probe signal received,

a. means responsive to said reply signals for generating a binary number representing the number of replies received during a predetermined period, said period corresponding to a range from said interrogation station to said remote stations,

b. storage means for storing a plurality of said binary numbers,

whereby the range of each reply received in response to a predetermined corresponding probe is stored in said storage means, and

c. comparator means for comparing each of said binary numbers to a predetermined reference number corresponding to a minimum critical range and generating an output signal for each reply signal from a remote station having a range less than said critical range.

4,003,051

EXPANDED RANGE GATE MOVING TARGET INDICATOR

John Henry Fitzgerald, Norwalk; Robert Anthony Guarino, Monroe, both of Conn., and Herbert Green, Elmsford, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 17, 1975, Ser. No. 632,879

Int. Cl.² G01S *9/42*

U.S. Cl. 343—7.7 **4 Claims**

1. A range gated moving target indicator radar system, comprising:

oscillator means for providing a timing signal;

signal means, including an antenna, a transmitter responsive to said oscillator means for providing to said antenna pulsed radar energy at a prescribed pulse width and pulse repetition period in dependence upon the timing signal for illuminating successive portions of a spatial sector, and a receiver for receiving, during a non-pulse portion of the pulse repetition period, return signals reflected from targets located within the spatial sector, said signal means providing video signals having a Doppler frequency spectrum representative of the return signals from moving targets within the sector;

gate signal means, responsive to said oscillator means for providing a range gate signal having a time period greater than the period of the timing signal, and greater than the pulse width of the pulsed radar energy, said gate signal means further providing a plurality of sequential, periodic video gate signals having a time period equal to the period of the range gate signal, each video gate signal time period including an enable portion having a time interval equal to the period of the timing signal;

video processing means, responsive to the video signals from said signal means and the video gate signals from said gate signal means, for expanding the signal width of the video signals to a value commensurate with the time period of the range gate signal; and

detection means, responsive to the expanded video signals from said video processing means, and including a plurality of range gated filters responsive to the range gate signal for quantizing the non-pulse portion of the pulse repetition period into a plurality of equal, contiguously sequential range intervals having a time duration equal to the range gate signal period, said plurality of range gated filters providing band-pass filtering of the expanded video signals coincident with each of the range intervals, said detection means providing a signal manifestation representative of moving targets detected within the spatial sector.

4,003,052

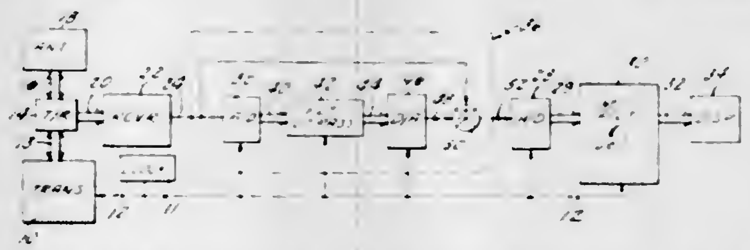
DIGITAL PREFILTER FOR CLUTTER ATTENUATION IN MTI RADARS

Stephen Adelman, Wilton, and Marshall Greenspan, Fairfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1975, Ser. No. 641,127

Int. Cl.² G01S *9/42*

U.S. Cl. 343—7.7 **9 Claims**



1. A digital moving target indicator radar system, comprising:

oscillator means for providing a timing signal;

signal means for providing pulsed radar energy for illuminating a spatial sector at a pulse repetition period in dependence on the timing signal and for receiving, during a non-pulse portion of the pulse repetition period, reflected radar energy from targets within the sector, said signal means providing in response thereto an analog video signal having a given amplitude, high frequency target signal component representative of moving targets and a larger amplitude, low frequency clutter signal component representative of relatively stationary targets, the analog video signal being characterized by a given value target-to-clutter signal ratio;

prefilter means, responsive to the analog video signal and the timing signal, for reducing the amplitude of the low frequency clutter component to provide a low clutter analog video signal with a target-to-clutter signal ratio which is substantially greater than that of said signal means video signal;

first analog-to-digital conversion means, responsive to the low clutter analog video signal and the timing signal for providing a plurality of low clutter digital video signals representative of the analog video signal amplitude coincident in a plurality of successive time intervals provided by the quantization of the pulse repetition period in dependence on the timing signal, said analog-to-digital conversion means having a resolution accuracy capable of providing amplitude discrimination between the target signal component and the reduced clutter signal component, the resolution accuracy being substantially less than that required to provide equal accuracy amplitude discrimination of the target signal component of said signal means video signal; and

filter and detection means, responsive to said analog-to-digital conversion means, for filtering the low clutter digital signal to provide detection of the high frequency target signal component, and for providing in response thereto a signal manifestation representative of a moving target.

4,003,053

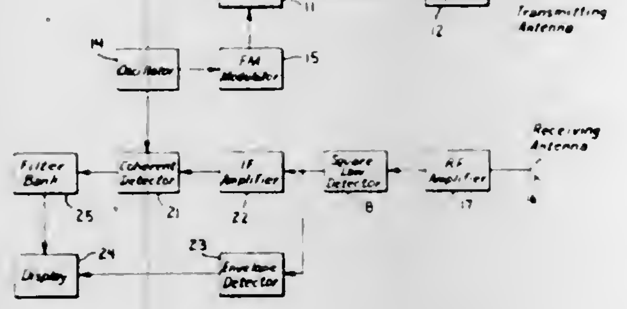
TARGET ADAPTIVE RADAR SYSTEM

Clare L. Mengel, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1966, Ser. No. 602,418

Int. Cl.² G01S *9/24*

U.S. Cl. 343—14 **3 Claims**



1. A target adaptive frequency modulated radar system utilizing a target modulated signal produced by the combining interference of a coherent target reflected wave with a transmitted incident wave for reducing the effects of sea and ground clutter comprising:

means for transmitting a signal of given carrier frequency which is transmitter modulated plus and minus a given frequency value at a given rate for reflection from a coherent target, to produce a target modulated signal indicative of said coherent target by the combining interference of the transmitted incident signal with the reflected signal from said coherent target;

means for recovering said target modulated signal indicative of said coherent target, said recovered target modulated signal being comprised of said transmitter modulated given carrier frequency and frequency modulation produced by the combining of said incident signal with said reflected signal from said coherent target;

means for separating said given carrier frequency from said recovered target modulated signal;

a narrow band video amplifier connected to said means for separating said given carrier frequency from said recovered target modulated signal, for passing and amplifying only the remaining portion of said target modulation signal;

a coherent detector and an envelope detector connected to the output of said narrow band video amplifier; and

utilization means actuated by said coherent detector and said envelope detector.

4,003,054

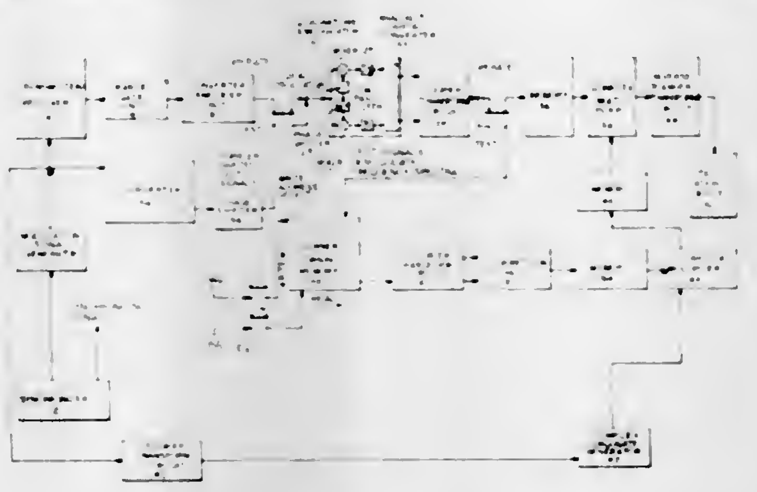
METHOD OF COMPENSATING FOR IMBALANCES IN A QUADRATURE DEMODULATOR

Bertram J. Goldstone, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 3, 1974, Ser. No. 511,553

Int. Cl.² G01S *7/40*

U.S. Cl. 343—17.7 **1 Claim**



1. A method of correcting imbalances in amplification and in phase shift in the two channels of a quadrature demodulator in a radar receiver, such method comprising the steps of:

a. impressing a sinusoidal test signal analogous to a Doppler shifted echo signal from a moving target on the two channels of a quadrature demodulator of a radar receiver to derive a pair of time varying signals, $f_{1(t)}$ and $f_{2(t)}$;

b. converting each one of the time varying signals, $F_{1(t)}$ and $f_{2(t)}$, to a set of complex digital numbers;

c. determining, as a like set of complex digital numbers, the Fourier transform of the vector sum of the sets of complex digital numbers, such transform having two complex terms, $F(\omega)$ and $F(-\omega)$, where

$$F(\omega) = a(\omega) + j\,b(\omega)$$

and

$$F(-\omega) = a(-\omega) + j\,b(-\omega),$$

indicative, respectively, of the energy at the Doppler frequency, ω, of the vector sum of the time varying signals $f_{1(t)}$, $f_{2(t)}$ and the image frequency, $-\omega$;

d. determining the complex conjugate, $f(-\omega)$, of the complex term $F(-\omega)$;

e. adding the complex terms $F(\omega)$ and $F(-\omega)$ to derive a vector $2F1(\omega)$ indicative of the amplitude and phase of the first time varying signal $f_{1(t)}$;

f. subtracting the complex terms $F(\omega)$ and $F(-\omega)$ and multiplying the difference by the square root of minus one to derive a vector $2F2(\omega)$ indicative of the amplitude and phase of the second time varying signal, $f_{2(t)}$;

g. comparing the amplitudes of the vectors $2F1(\omega)$ and

$2F2(\omega)$ to derive a first correction factor indicative of the imbalance in amplitude between the time varying signals $f_{1(t)}$ and $f_{2(t)}$;

h. comparing the difference between 90° and the sum of the phase angles of the vectors $2F1(\omega)$ and $2F2(\omega)$ to derive a second correction factor indicative of the imbalance in phase between the time varying signals $f_{1(t)}$ and $f_{2(t)}$; and

i. storing the first and second correction factor and applying such stored correction factors to the signals out of the quadrature demodulator during operation of the radar receiver.

4,003,055

RADAR FUNCTION TESTING APPARATUS

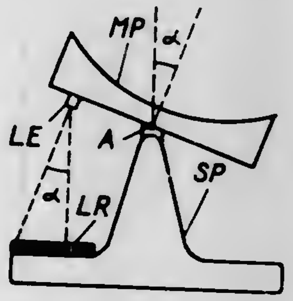
Nils Tage Eriksson, Molnlycke; Rune William Jacobsson, Goteborg, and Ingvar Georg Sundström, Molnlycke, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 20, 1975, Ser. No. 623,666

Claims priority, application Sweden, Nov. 6, 1974, 7413918

Int. Cl.² H01Q *3/02*; **G01S** *7/40*

U.S. Cl. 343—17.7 **7 Claims**



1. Apparatus for testing different functions in a radar equipment comprising:

n antenna unit having a movable part and a fixed part;

a receiver unit for said antenna unit;

a source of radiation energy and a radiation receiver;

means for providing a directed transmission of radiation energy between said parts of the antenna unit in dependence on the position of said movable part relative to the position of said fixed part;

means included in said radiation receiver for generating three different signals in dependence on the deviation of the direction of the radiant energy from a fictitious target direction corresponding to a certain target position, said signals consisting of a first signal whose amplitude varies with the received energy, a second signal which varies with the position of the radiation beam center relative to a symmetry axis, and a third signal which varies with the position of the beam center relative to another symmetry axis perpendicular to said symmetry axis;

a signal source for generating pulsed signals; and

attenuating means controlled by said first, second and third signals, for generating from said pulsed signals three different output signals which are fed to said receiver unit, said output signals corresponding to the target signals which would be obtained from a real radar target.

4,003,056

WINDSHIELD ANTENNA SYSTEM WITH RESONANT ELEMENT AND COOPERATING RESONANT CONDUCTIVE EDGE

Ross Alan Davis, 724 Ala Moana Blvd., Honolulu, Hawaii 96813

Filed May 20, 1975, Ser. No. 579,149

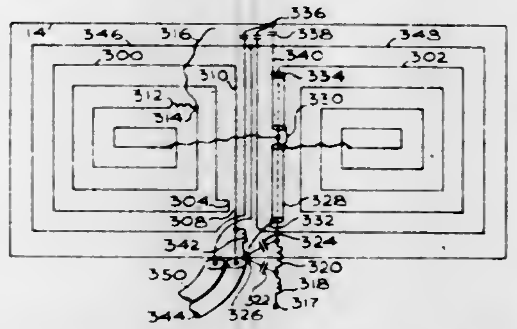
Int. Cl.² H01Q *1/02, 1/32*

U.S. Cl. 343—704 **18 Claims**

1. A conductive-body vehicle-antenna system responsive to both E-field and H-field electromagnetic signals, including:

an electrically conductive vehicle body having at least one window opening therein to form a conductive edge;

a plurality of intercoupled, electrically conductive members serially disposed on said window to form at least one loop having a total electrically effective length approximating one-half wavelength at an intended operating frequency of the system, said at least one loop being spaced from, but electrically coupled to said edge, the end conductive member having a tuning end;



tuning means coupled to said tuning end for producing electrical resonance of said at least one loop in a predetermined range of frequencies;

and, means for coupling to external circuits signals from said at least one loop.

4,003,057

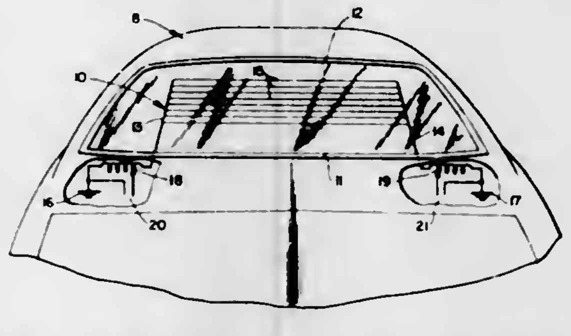
REAR WINDOW DIRECTION FINDING ANTENNA

Arthur Luedtke, Marietta, and William F. Bentley, Jr., Smyrna, both of, GA, assignors to The United States of America as represented by the Field Operations Bureau of the Federal Communications Commision, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,708

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—713 **8 Claims**



1. A rear window DF antenna mounted on a vehicle window of a vehicle having a split ground plane comprising two paralleled vertical wire spaced whip elements spaced apart and connected to separate outputs; and a plurality of parallel horizontal wire cross connecting element means forming a delay line.

4,003,058

COLOR IMAGE DATA RECORDER

Geoffrey S. Entwistle, Severna Park, Md., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 27, 1974, Ser. No. 500,990

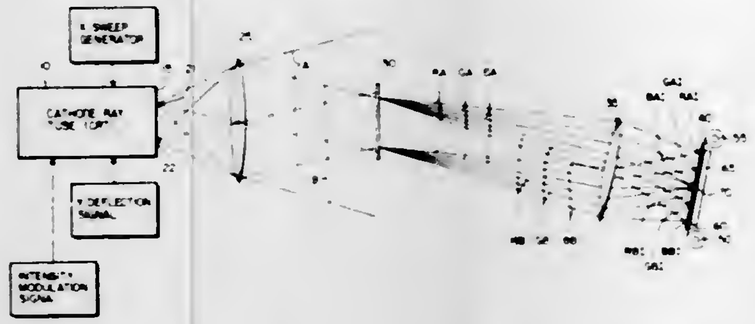
Int. Cl.² G01D *15/14*

U.S. Cl. 346—1 **13 Claims**

1. The method of producing hard-copy color recordings representative of multi-dimensional data contained in an electrical signal, one of the dimensions of the data being represented spectrally, and at least one of the other dimensions being represented spatially, comprising the steps of:

displaying, on electronic light emitting means responsive to said electrical signal, a two-dimensional primary pattern of substantially white light units, the first dimension of said primary pattern representing the spatial dimension of at least a portion of said data, and the second dimension of said primary pattern representing the spectral dimension of said portion;

spectrally decomposing the white light from said primary pattern into a secondary pattern of colored light, the chromatic content of said secondary pattern being primarily determined by the positions of said white light units in said second dimension;



generating, from said secondary pattern, a colored line representing the spatial and spectral data represented by at least part of said primary pattern; and

recording, on color-responsive photosensitive means, a color image recording of said colored line.

4,003,059

OPTICAL RECORDER HAVING FOCUS CONTROLLING MEANS

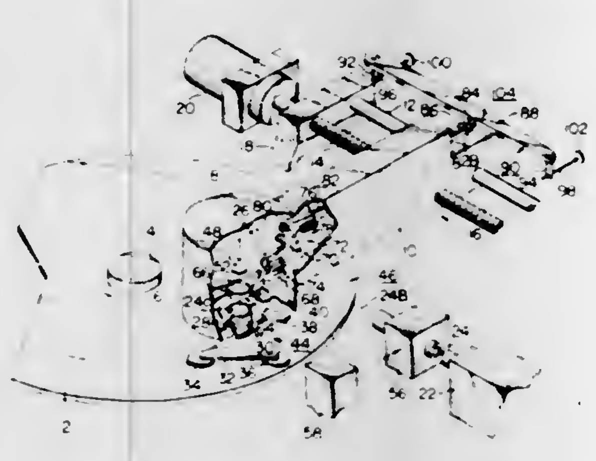
Yoshinori Sugiura; Kiyonobu Endo, both of Yokohama; Kimio Kono, Kawasaki, and Hideaki Sato, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1975, Ser. No. 545,746

Claims priority, application Japan, Feb. 7, 1974, 49-15735; Feb. 15, 1974, 49-18827

Int. Cl.² G01D *18/00*

U.S. Cl. 346—108 **14 Claims**



1. An optical device comprising:

a recording medium for recording and reproducing light beam signals;

means for producing the light beam for information recording and reproducing;

a floating member provided with at least one floating shoe having a surface adapted to face said recording medium, said floating shoe being floatable above said recording medium with a clearance determined by high pressure air produced adjacent said surface of the shoe;

an optical system for focusing the light beam on a surface of said recording medium, at least a part of said optical system being carried on said floating member and said optical system having at least three lenses, an optical path length between one of said at least three lenses and said recording medium being variable;

means for detecting the positional relationship of said floating member above said recording medium;

means for controlling, in accordance with said detecting means, said optical system to keep the focus of the light beam within a predetermined range relative to the surface of said recording medium, said controlling means changing the relative position of at least one of said at least three lenses relative to the surface of said recording medium.

4,003,060

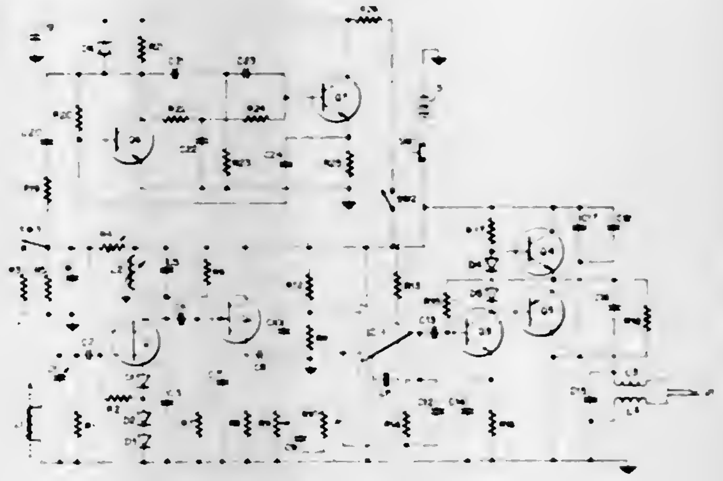
DIRECTION FINDING RECEIVER

Fred L. Broce, Doraville; William F. Bentley, Jr., Smyrna, and William L. Kilpatrick, Austell, all of Ga., assignors to The United States of America as represented by the Federal Communications Commission, Washington, D.C.

Filed Feb. 26, 1975, Ser. No. 553,313

Int. Cl.² G01S *5/02*

U.S. Cl. 343—113 PT **8 Claims**



1. In a hand held portable direction finding receiver contained in a metal rectangular housing having an affixed ferrite rod antenna in said housing coupled to receiving circuitry, the improvement in said receiving circuitry comprising a fixed and predesigned frequency tuned-input means and identically tuned-output means connected to a first dual gate protected MOS FET radio frequency amplifier having capability of operating at preselected rolloff points yielding a frequency bandwidth of at least 2% about said pre-designed frequency of said tuned-input, tuned-output means allowing simultaneous operation on more than one radio communication channel with no frequency tuning adjustments, said tuned-input means being connected to a first gate of said first FET, said tuned-output means connected to a drain of said first FET, and means for internally modulating a received signal connected to a second gate of said first FET.

4,003,061

PHOTOPLOTTER

Peter S. LaCanfora, Chelmsford, Mass., assignor to Applicon Incorporated, Burlington, Mass.

Filed Oct. 31, 1975, Ser. No. 627,675

Int. Cl.² G03B *41/00*

U.S. Cl. 354—4 **15 Claims**

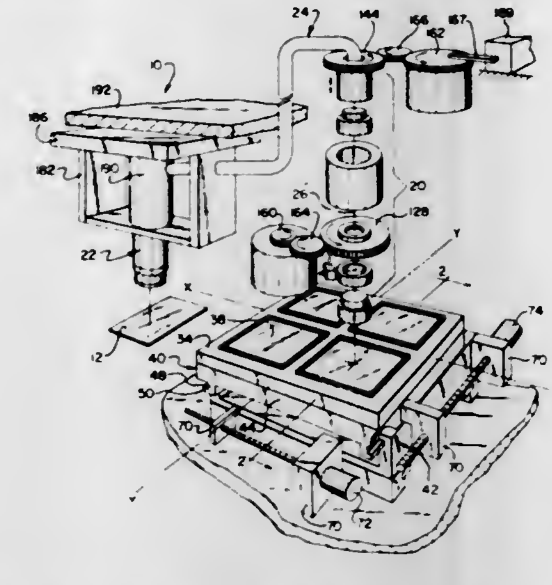
1. A device for exposing selective portions of a photosensitive surface to produce a graphic display thereon, said device comprising;

means for defining at least one aperture;

means for forming an image of said aperture in a first image plane;

a coherent fiber optic bundle for transmitting said image from said first image plane to a second image plane;

means for rotating one end of said coherent fiber optic bundle so as to rotate said image in said second image plane; and



means for moving said image in said second image plane in either one of two mutually perpendicular directions.

4,003,062

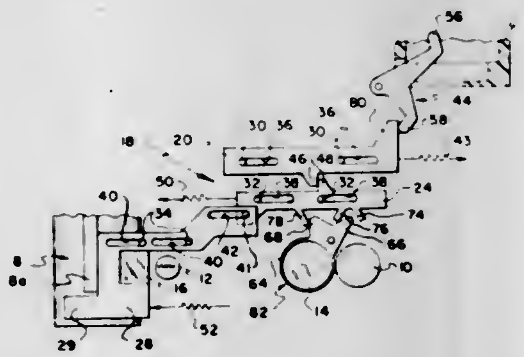
CAMERA FILTER POSITIONING APPARATUS

Floyd Malcolm Galbraith, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1975, Ser. No. 638,128

Int. Cl.² G03B *7/00, 11/00*

U.S. Cl. 354—21 **2 Claims**



1. In a camera adapted to selectively receive and expose film having different effective film speeds, under both ambient and flash illumination, said film being carried by means coded to indicate the speed of the film, said camera having a film-exposure path and means for removably mounting a flash unit thereon, the improvement comprising:

a filter selectively movable into and out of said exposure path;

means, responsive to the mounting of a flash unit on said camera, for urging said filter into said path; and

film speed code-sensing means, responsive to the presence of a relatively low-speed film in said camera, for rendering said filter urging means ineffective to move said filter into said path.

4,003,063

POWER SUPPLY REGULATOR FOR AN AUTOMATIC EXPOSURE ADJUSTING CIRCUIT FOR USE IN A CAMERA

Akira Takahashi, Tokyo, and Mikio Kobayashi, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,689

Claims priority, application Japan, Oct. 26, 1973, 48-119817

Int. Cl.² G03B *7/08*

U.S. Cl. 354—50 **6 Claims**

1. In a camera having an automatic exposure adjusting system of the type comprising:

shutter means for operating in response to a trigger signal;

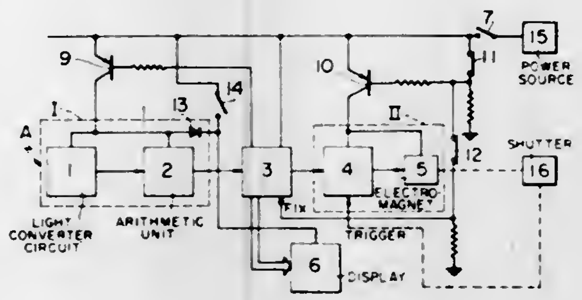
first circuit means for sensing incoming light and producing a photometry signal in response thereto;

second circuit means for storing said photometry signal until receipt of an end-of-photometry signal;

third circuit means for receiving said stored photometry signal upon receipt of said trigger signal and for producing an output signal in accordance with said stored photometry signal to end the operation of said shutter means; and

a power source for energizing said first, second and third circuit means;

the improvement comprising:



switching means connected between said power source and at least one of said first and third circuit means; and

means for controlling said switching means to cut off power from said power source to said at least one of said first and third circuit means in respective response to the occurrence of at least one of said end-of-photometry signal and the end of the operation of said shutter means; and wherein

said switching means comprises a transistor having its emitter connected to said power source, its base connected to said controlling means and its collector connected to one of said first and third circuit means.

4,003,064

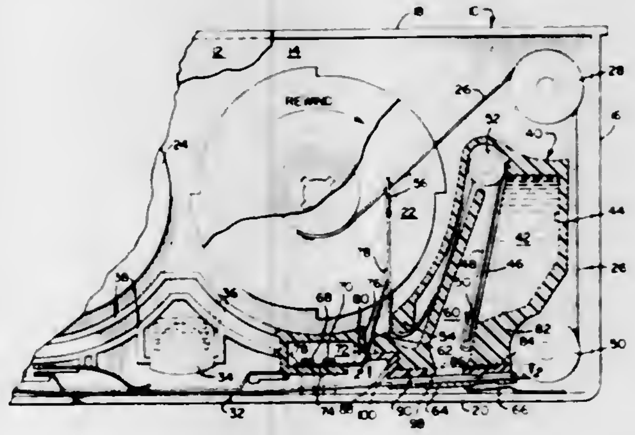
MULTI-PURPOSE FILM CASSETTE PROCESSOR HAVNG SLIDEABLE NOZZLE PLATE

Paul B. Mason, Magnolia, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,184

Int. Cl.² G03B *17/50*

U.S. Cl. 354—88 **29 Claims**



1. A photographic film cassette for use with other apparatus, said cassette configured for depositing a coating of processing fluid on a moving run of a cassette retained photographic film strip to develop images thereon, said cassette comprising:

a cassette housing;

means for cooperating with the other apparatus for advancing and guiding said film strip along a given path within said cassette housing;

means actuatable for depositing processing fluid on the advancing film strip; and

means for actuating said depositing means and for indicating to the other apparatus the processed condition of the film strip, said means for actuating and indicating including an actuating member mounted for displacement from an initial position wherein said depositing means is inoperative to another position wherein said depositing means is rendered operative, a pair of spaced apart conductive terminals, and a conductive element coupled to said actuating member and displaceable therewith between one position in bridging connection with said conductive terminals and another position wherein said conductive element is in unbridging connection thereto so as to alter the conductive condition across said terminals between a closed and an open condition in accordance with displacement of said actuating member thereby indicating to said other apparatus that said processing condition has been initiated.

4,003,065

FLASH DEVICE FOR A FOCAL PLANE SHUTTER CAMERA

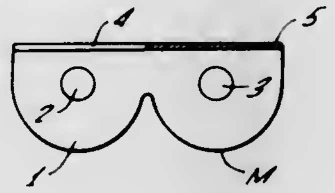
Kiyoshi Chikashige, c/o Asahi Kogaku-ryo, No. 33, 1-chome, Itabashi, Tokyo, Japan

Continuation of Ser. No. 469,439, May 13, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,228

Claims priority, application Japan, May 30, 1973, 48-64339; Nov. 19, 1973, 48-133594

Int. Cl.² G03B *15/03*

U.S. Cl. 354—132 **11 Claims**



1. A flash device for use with a focal plane shutter camera, said flash device comprising:

a plurality of light sources of equal intensity, each source having a large light increasing rate in the early period of flashing and a lower light reducing rate in the end of flashing;

means for sequentially activating said plurality of light sources in a manner such that the end of the flashing period for a first light source overlaps with the beginning of a succeeding source with the timing such that an intensity peak of undesirable height would occur at the overlapped portion if the light output of the sources were not modified, each of said light sources being fixed with respect to said camera throughout its flashing period; and

means for sequentially and individually reducing the intensity of said succeeding light source throughout its flashing period to reduce said intensity peak of said overlapped portion.

4,003,066

MIRROR OPERATING ARRANGEMENT OF SINGLE LENS REFLEX CAMERA

Tetsuji Shono, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

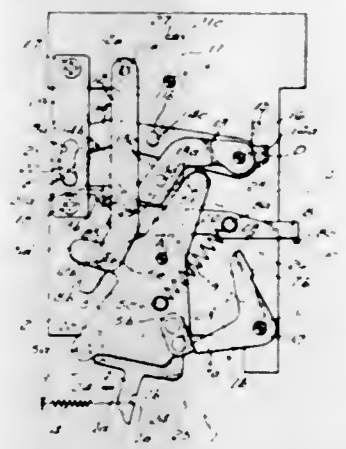
Filed Apr. 9, 1975, Ser. No. 566,204

Claims priority, application Japan, Apr. 13, 1974, 49-41871[U]

Int. Cl.² G03B *19/12*

U.S. Cl. 354—156 **8 Claims**

1. In combination, a mirror and a mirror mounting assembly for movably mounting said mirror in a single lens reflex camera with reduced shock loads upon movement of said mirror to a shutter operating position, said mirror mounting assembly comprising mounting lever means providing a generally horizontal, upwardly translatable mirror rotation axis for supporting said mirror adjacent an end of said mirror in a viewing position, said mirror being rotatable about said mirror rotation axis, in a first position of the axis, from said mirror viewing position to translate the free end of the mirror in an upward direction and thereby position the mirror at an angularly



displaced mirror-up position prior to shutter operation, said mounting lever means being adapted to be supported in a camera for rotational movement to translate said mirror rotation axis from said first axis position and said mirror from its mirror-up position further in said upward direction and to said shutter operating position.

4,003,067

AUTOMATIC PHOTOGRAPHIC SHUTTER CONTROL APPARATUS

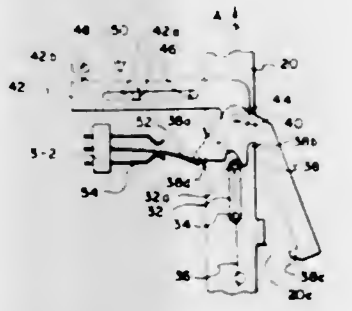
Gerhard Brauning, Stuttgart, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 3, 1975, Ser. No. 583,495

Claims priority, application Germany, June 6, 1974, 2427365

Int. Cl.² G03B *9/08*

U.S. Cl. 354—235 **7 Claims**



1. In a camera having exposure control apparatus utilizing an electronic timing circuit operably connected to an electromagnet to control drive means to move a shutter to initiate and terminate an exposure, the drive means being moved in a first direction by energization of the electromagnet to move the shutter to initiate an exposure and being moved by spring means to move the shutter to terminate the exposure upon de-energization of the electromagnet, the improvement comprising:

movable means, actuated by the drive means upon initial movement thereof to initiate an exposure interval, for de-energizing the electromagnet during a portion of the exposure interval and for holding the drive means to prevent movement of the shutter to terminate the exposure interval; and

means for momentarily re-energizing the electromagnet to move the drive means a second time in the first direction to release said movable means.

4,003,068

EXTENSION TUBE FOR USE IN CLOSE-UP PHOTOGRAPHY

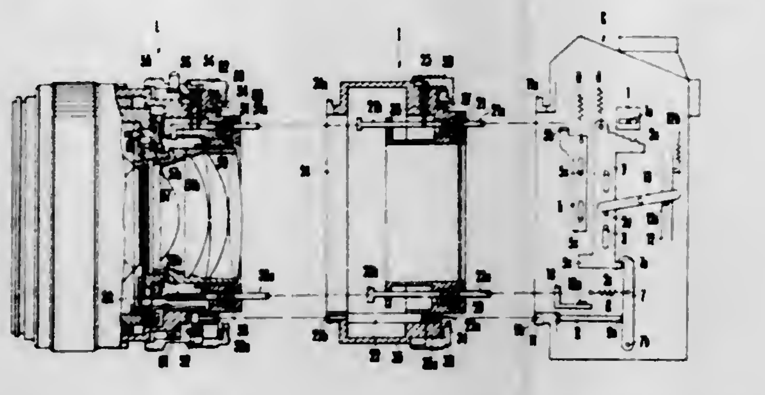
Shigeru Hashimoto, Yokohama, and Masaharu Ito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 631,129

Claims priority, application Japan, Nov. 26, 1974, 49-136525; Nov. 26, 1974, 49-136526; Nov. 26, 1974, 49-136527; Nov. 26, 1974, 49-136528

Int. Cl.² G03B *17/56*

U.S. Cl. 354—286 **6 Claims**



5. An intermediate barrel for use in close photography with a single lens reflex camera, said intermediate barrel being adapted to be insertable between the interchangeable lens mount and body of said camera, said body having automatic diaphragm control means and diaphragm drive means, and said interchangeable lens mount being provided with diaphragm means, diaphragm presetting means, manually operable means for said presetting means and means for selecting either automatic and manual diaphragm control mode, which intermediate barrel comprises;

a. position control means for securing said intermediate barrel to said camera body in predetermined angular spaced relation to each other,

b. fastening means rotatable on the outer peripheral surface of said intermediate barrel,

c. first interconnecting means for operatively interconnecting said automatic diaphragm control means and said diaphragm presetting means arranged to be rotatable about the optical axis; and

d. second interconnecting means for operatively interconnecting said diaphragm drive means and said diaphragm means.

4,003,069

METHOD AND APPARATUS FOR PRODUCING A DEVELOPER MEDIUM FOR DIAZOTYPE MATERIALS

Horst Hilgers, Bad Schwalbach-Heimbach, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 16, 1974, Ser. No. 533,191

Claims priority, application Germany, Dec. 21, 1973, 2363821

Int. Cl.² G03D *13/00*

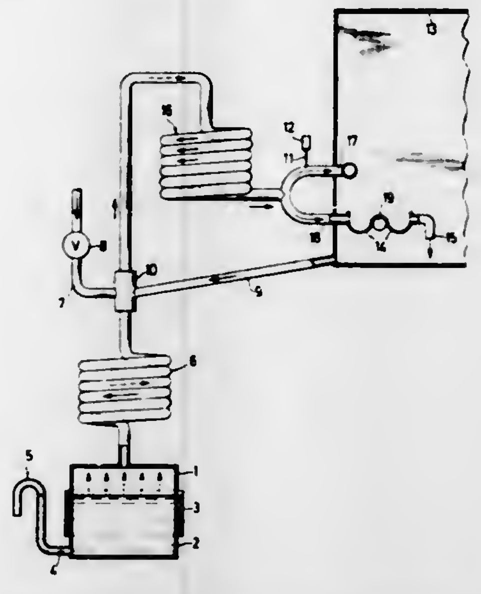
U.S. Cl. 354—299 **17 Claims**

1. An apparatus for producing a gaseous developer medium for a diazotype material from a developer solution, which apparatus comprises a vessel means, provided with a heater and an outlet for residual liquid, for generating a stream of vapor from a liquid,

conduit means in which a stream of developer solution flowing in one general direction can come into contact with a stream of vapor flowing in the other general direction, which conduit means communicates at one end with the vessel and is provided at, or in the vicinity of, the other end with an inlet for the developer solution,

condenser means which communicates with the end of the conduit remote from the vessel, the condenser means having an outlet for gaseous developer medium and an outlet for condensed developer medium,

and a vaporizing vessel means adapted to be located in a developing chamber for diazotype materials, which vaporizing vessel means communicates with the outlet for condensed developer medium.



4,003,070

APPARATUS FOR TREATING PHOTOGRAPHIC MATERIALS

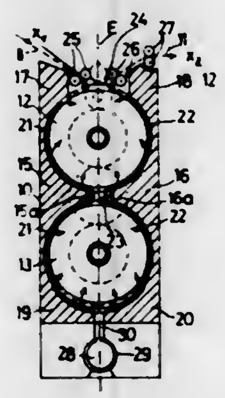
Werner Merz, Oberelchingen, and Werner Michaelis, Stuttgart, both of Germany, assignors to Merz & Co., Oberelchingen, Germany

Filed Nov. 20, 1974, Ser. No. 525,372

Claims priority, application Germany, Apr. 4, 1974, 2416393

Int. Cl.² G03D *3/08, 3/02*

U.S. Cl. 354—322 **41 Claims**



1. An apparatus for treating photographic materials, especially for developing such materials, comprising housing means forming a chamber having an inner wall; at least one drum mounted in said chamber for rotation about an axis, said drum having a circumferential wall spaced from said inner wall so as to form a channel in which photographic material may be guided about said drum; aperture means in said circumferential wall communicating the interior of said drum with the exterior thereof; annular means concentrically mounted in the interior of said drum and having a diameter slightly smaller than the diameter of said drum so as to form with an inner wall surface of said circumferential wall a narrow annular clearance which communicates with said aperture means; and circulating means communicating with said clearance for circulating a treating fluid from said chamber through said aperture means into said clearance, to thereby create a suction which draws said material towards an outer surface of said circumferential wall to be conveyed during rotation of said drum.

4,003,071

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

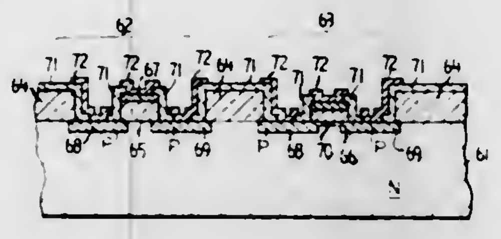
Sadaaki Takagi, Kawasaki, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 289,598, Sept. 18, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 555,040

Claims priority, application Japan, Sept. 18, 1971, 46-72900; Dec. 27, 1971, 47-1824; Dec. 28, 1971, 47-3301; June 15, 1972, 47-59746

Int. Cl.² H01L *27/02*

U.S. Cl. 357—42 **3 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type having a main surface;

first, second and third regions of a second conductivity type, opposite to said first conductivity type, within said semiconductor substrate adjacent said main surface thereof and disposed with respect to each other to form a first channel within said semiconductor substrate between said first and second regions and a second channel within said semiconductor substrate between said second and third regions;

first and second insulating films of SiO_2 disposed upon said main surface of said semiconductor substrate overlying said first and second channels thereof, respectively, wherein said first and second insulating films each have a thickness of approximately 1500A and 1000 to 1200A, respectively;

a conductivity modifying impurity of said second conductivity type diffused into each of said first and second insulating films; and

said first insulating film being of a sufficiently large thickness such that said impurity of said second conductivity type diffused therein produces a field of a strength insufficient to change the conductivity type of said first channel whereby said first channel and said first and second regions form an enhancement mode transistor, and said second film being of a lesser thickness than said first film such that such impurity of said second conductivity type diffused therein produces a field of a sufficient intensity to alter the conductivity type of said second channel whereby said second channel and said second and third regions form a depletion mode transistor.

4,003,072

SEMICONDUCTOR DEVICE WITH HIGH VOLTAGE BREAKDOWN RESISTANCE

Takeshi Matsushita, Sagamihara, and Hisao Hayashi, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 351,172, April 17, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,115

Claims priority, application Japan, Apr. 20, 1972, 47-39759

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H01L *29/34*

U.S. Cl. 357—52 **12 Claims**

1. A semiconductor device comprising:

a planar substrate of semiconductor material of one conductivity type having first and second surfaces on opposite sides thereof;

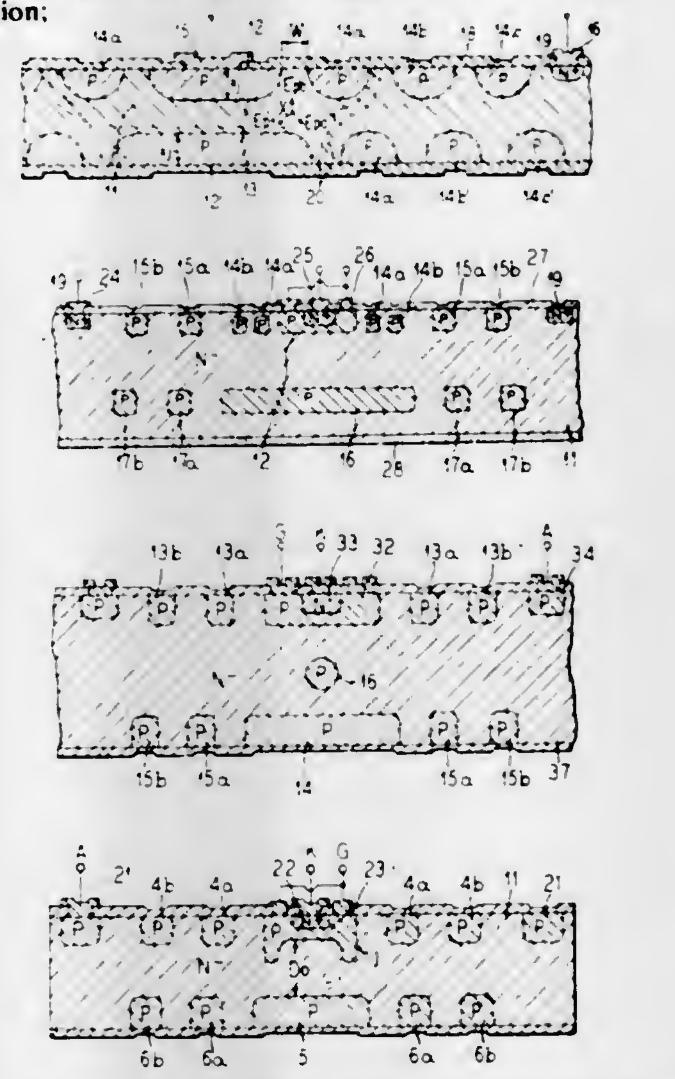
a first region of the opposite conductivity type on said first surface of said substrate forming a first pn junction therewith;

a first electrode mounted on said first region;

a second region of said opposite conductivity type on said first surface of said substrate forming a second pn junction therewith which surrounds said first pn junction in predetermined spaced relation;

a third region of said opposite conductivity type on the second surface of said substrate forming a third pn junction therewith which faces said first region in predetermined spaced relation therewith; the periphery of said third region extending beyond that of said first region;

said second and third regions being free of electrical connection;



a potential source reverse biasing said first pn junction with a potential of such magnitude such that the depletion layer will extend from said first pn junction to said second and third pn junctions;

a second electrode mounted on said substrate and disposed on a region of said one conductivity type on said first surface of said substrate, and the distance between said second electrode and said first region being larger than the distance between said first and second regions;

said potential source connected to said first and second electrodes;

said first, second and third regions being arranged so that a depletion layer extends from the vicinity of said first pn junction and surrounds said second and third regions so as to increase the breakdown voltage, and

insulating layers covering said first and second surfaces.

4,003,073

INTEGRATED CIRCUIT DEVICE EMPLOYING METAL FRAME MEANS WITH PREFORMED CONDUCTOR MEANS

Robert W. Helda, Hollywood, Fla., and Harry J. Geyer, Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

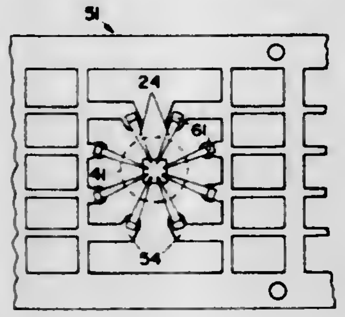
Division of Ser. No. 56,081, June 29, 1970, Pat. No. 3,698,974, which is a continuation of Ser. No. 691,040, Dec. 15, 1967, abandoned. This application Oct. 10, 1972, Ser. No. 296,186

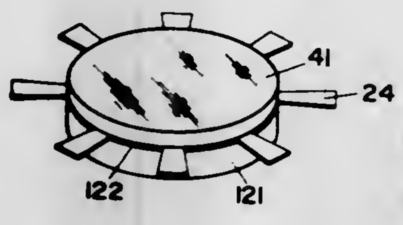
Int. Cl.² H01L *23/48, 23/28, 23/30*

U.S. Cl. 357—70 **2 Claims**

1. An integrated circuit semiconductor device adapted to be

produced with automated steps in the assembly thereof, said device including metal portions within housing means and extending outside said housing means for such device, said metal portions all having been originally a part of a substantially one piece flat metal strip including a plurality of lead frame sections in the strip and each lead frame section having a plurality of leads comprising said ultimate metal portions of the semiconductor device, each said metal portion in said device having an inner portion extending toward an originally open central area in the original frame section and an outer portion extending outwardly therefrom, said original metal strip and each integral frame section thereof being less than 4.0 mils thick and characterized by a flexibility such that the metal strip with an integrated circuit semiconductor unit bonded to the leads of each frame section thereof can be wound on a spool for handling said strip from which said strip is unwound for use as needed in the manufacture of semiconductor devices, said semiconductor device having an integrated circuit semiconductor unit positioned at said central area and bonded to said inner lead portion of each lead in a frame section by means of a single bonding step, housing means for a portion of each of said metal portions and the semiconductor unit bonded thereto, and with a portion of each original frame section being severable from the outer portions of said original leads to separate each lead from the others in a frame section, said housing means being round in configuration and with the outer portions of each metal portion in the device extending in a spaced apart circular pattern outside said housing means for connecting the semiconductor device with apparatus in which the device is to be used.





4,003,074
HERMETICALLY-SEALED INJECTION SEMICONDUCTOR LASER DEVICE

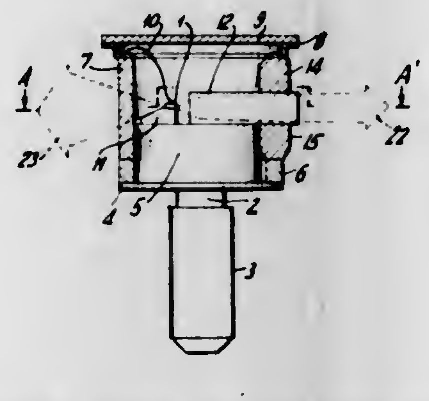
Hiroo Yonezu, and Izuo Hayashi, both of Tokyo, Japan, assignors to Nippon Selfoc Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 519,051

Claims priority, application Japan, Dec. 3, 1973, 48-139268[U]; Dec. 3, 1973, 48-139269[U]; Dec. 3, 1973, 48-139270[U]

Int. Cl.^{2} H01L *23/02, 23/12, 33/00, 33/19*

U.S. Cl. 357—74 **5 Claims**



1. A hermetically sealed injection semiconductor laser device comprising:

a pair of metal electrodes;

a hollow generally cylindrical body of transparent insulating material having said pair of metal electrodes hermetically sealed to its ends and having one of said pair of metal electrodes protruding axially into its interior;

a semiconductor laser crystal pellet having an electrode surface thermally and electrically connected to the end of said protruding metal electrode with its light-emitting ends facing the wall of said hollow cylindrical body for emitting light rays in two opposite directions;

a flexible lead wire for electrically coupling another electrode surface of said pellet to the other of said pair of metal electrodes; and

a lens element at least partially disposed within said hollow cylindrical body and having its optical axis substantially perpendicular to the wall of said hollow cylindrical body, for converting said light rays into focussed or substantially parallel light rays, whereby said light rays are derived from two portions of the wall of said hollow cylindrical body.

4,003,075
GLASS ELECTRONIC DEVICES EMPLOYING ION-DOPED INSULATING GLASSY AMORPHOUS MATERIAL

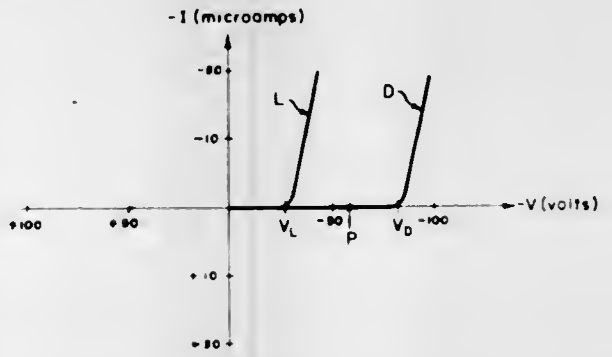
Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,932, Feb. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 122,422, March 9, 1971.

This application Nov. 22, 1974, Ser. No. 526,166

Int. Cl.^{2} H01L *45/00*

U.S. Cl. 357—2 **11 Claims**



1. A junction device having a current-voltage characteristic which is substantially nonconducting for voltages of a first polarity and substantially conducting for voltages of a second polarity, comprising:

a semiconductor substrate having one kind of conductivity; and

disposed thereupon a layer of a noncrystalline glassy amorphous material having the other kind of conductivity, said glassy amorphous material being an insulating material containing a sufficient concentration of ionic impurities to possess useful conductivity.

4,003,076
SINGLE BIPOLAR TRANSISTOR MEMORY CELL AND METHOD

Bohumil Polata, Los Altos, and James A. Marley, Jr., Saratoga, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

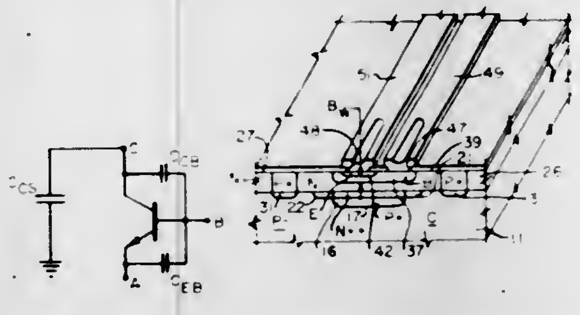
Continuation of Ser. No. 362,495, May 21, 1973, abandoned.

This application May 5, 1975, Ser. No. 574,508

Int. Cl.^{2} H01L *29/72*

U.S. Cl. 357—34 **5 Claims**

1. In a single bipolar transistor memory cell, a semiconductor body of one conductivity type forming a substrate and having a surface, an epitaxial layer of opposite conductivity type formed on said surface and providing a collector region and having a planar surface parallel to the surface of the semiconductor body, a buried layer of said one conductivity type extending into said semiconductor body from the surface of the semiconductor body, a base region of said one conductivity type formed in said epitaxial layer and extending downwardly from the surface of the epitaxial layer and being defined by a first generally dish-shaped PN junction extending to the surface of the epitaxial layer, an emitter region of opposite conductivity type formed in said base region and being defined by a second generally dish-shaped PN junction extending to the surface of the epitaxial layer, the collector to emitter connected reverse breakdown voltage of a given polarity being greater than the oppositely connected emitter to collector reverse breakdown voltage, a layer of insulating material overlying said surface of said epitaxial layer, and metallization on said surface and extending through said insulating material and making contact solely to said base and emitter regions so that the cell is only accessed with two contacts, one a base contact and the other an emitter contact, said bell having a collector-base parasitic capacitance identified as C_{CB} and an emitter-base parasitic capacitance identified as C_{EB}, said cell also having a collector-substrate capacitance identified as C_{CS}, means for applying a voltage between the base and emitter with respect to the substrate so that the voltage between the emitter and substrate is greater than that on the base to cause reverse breakdown from collector to emitter for charging of the capacitance C_{CS}, when the base is substantially fully depleted of mobile charges to a value given by the voltage applied between the emitter and substrate less the voltage drop across the depleted base, thereafter lowering the voltage applied between the emitter and base to approximately that of the base to cause the charge on the capacitance C_{CS} to be isolated from the emitter by the formation of a depletion layer at the collector-base junction, and thereafter applying a voltage between the base and emitter so that the voltage on the base is above that on the emitter causing forward collector to emitter current to remove the stored charge from the capacitance C_{CS}.



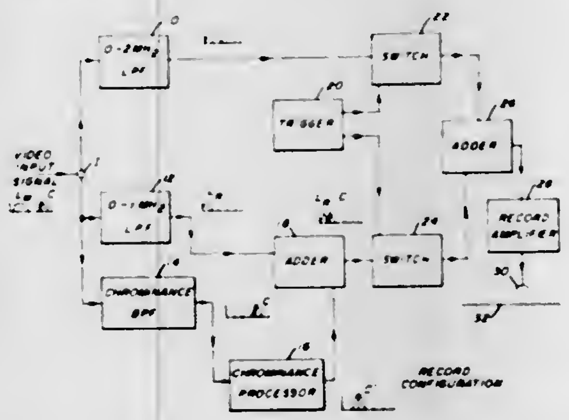
4,003,077
METHOD AND APPARATUS FOR CANCELLING CHROMINANCE ARTIFACTS

William Kelsey Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,205

Int. Cl.^{2} H04N *5/76, 7/12*

U.S. Cl. 358—4 **6 Claims**



1. In a color video recorder of the type employing an alternating line recording scheme wherein chrominance signal information residing on a color carrier and luminance signal information are extracted from a color television signal and are alternately recorded for transmitted lines of the color television signal, the improvement wherein:

the color carrier on which the chrominance signal information resides is converted before recording to a frequency such that the color carrier of one line of the color television signal is substantially 90° out of phase relative to the color carrier of the preceding line.

4,003,078
SUB CARRIER PHASE SHIFTERS

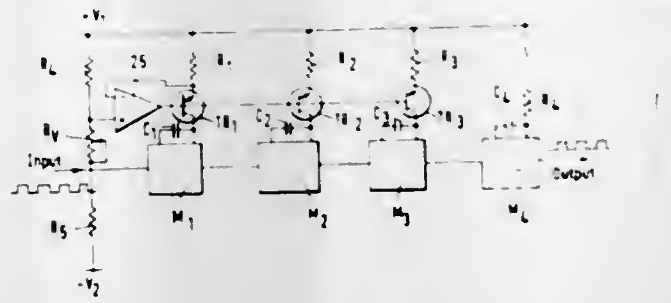
David Peter Owen, Newbury, England, assignor to Quantel Limited, England

Filed June 3, 1975, Ser. No. 583,385

Claims priority, application United Kingdom, June 6, 1974, 25074/74

Int. Cl.^{2} H04N *9/539, 5/22;* **H03K** *1/12, 5/13*

U.S. Cl. 358—22 **6 Claims**



1. In digital television equipment employing sub carrier waves, a smoothly variable circuit for shifting the phase of a sub carrier wave to achieve any shift within the shift capability of the circuit, comprising:

a variable source of phase-shift control voltage;

a monostable multivibrator having an input trigger terminal connected to receive said sub carrier wave, and having an output terminal, and having resistance and capacitance time constant elements for determining the duration of the astable state when the multivibrator is triggered from its stable state by an edge of said wave; and

said resistance time constant element comprising electronic amplifier means having a resistive path therethrough comprising said resistance element of the time constant, and having a control electrode coupled to said variable source, whereby said control voltage controls the time constant of said multivibrator.

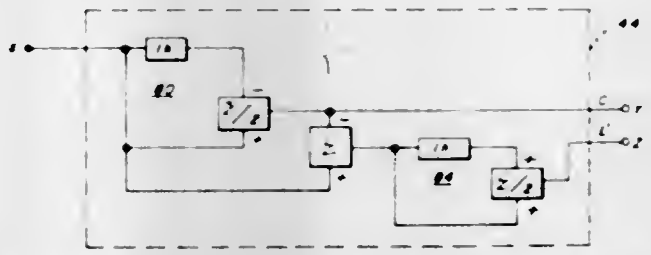
4,003,079
CHROMINANCE-LUMINANCE SIGNAL SEPARATION FOR OFF-AIR VIDEO RECORDER

Nea-Yea Woo, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,095

Int. Cl.^{2} H04N *9/535*

U.S. Cl. 358—31 **2 Claims**



1. Apparatus for processing interleaved chroma and luminance signals produced by line scanning a scene, the chroma being on a carrier that is an odd multiple of half the line scan rate, comprising:

a. means for producing a signal delay that corresponds with a multiple of the duration of a scan line;

b. first means for algebraically differencing a pair of signals;

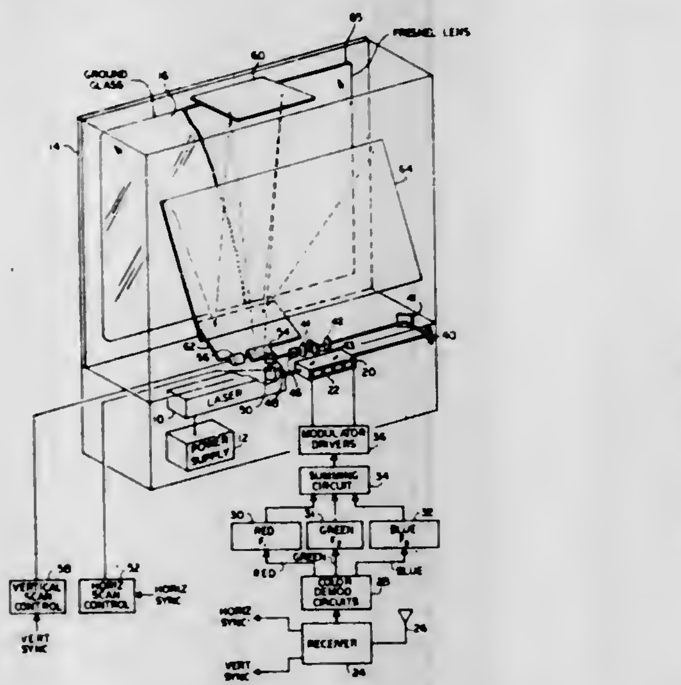
c. means for applying the interleaved signals to said signal

delay means and to said means for algebraically differencing signals, the output of said delay means being applied to said means for algebraically differencing signals, the output of said first algebraic differencing means being said chroma signal;
d. second means for algebraically differencing signals, adapted to receive said interleaved signals and said chroma signal, the output of said second algebraic differencing means being said luminance signal; and
e. comb filter means adapted to receive and process said luminance signal.

4,003,080
LARGE SCREEN VIDEO DISPLAY SYSTEMS AND METHODS THEREFOR

Theodore H. Maiman, Marina del Rey, and Errol G. Payne, Irvine, both of Calif., assignors to Laser Video, Inc., Los Angeles, Calif.

Filed June 2, 1975, Ser. No. 582,653
Int. Cl.² H04N *9/14, 3/02*
U.S. Cl. 358—63 **31 Claims**



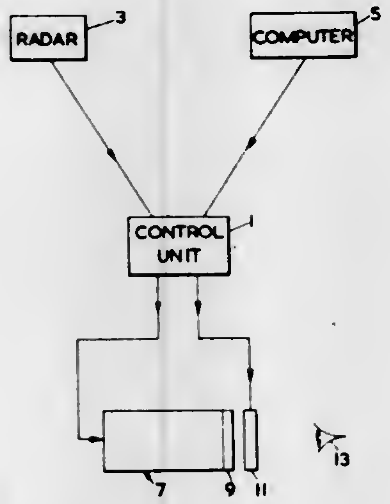
11. A compact system for producing a high contrast large area visual display from a modulated laser beam comprising:
scanning means for scanning the modulated laser beam through a display raster;
optical path folding means disposed in the path of the scanning beam for providing a relatively long optical path for the beam within a confined volume; and
areal display means adjacent the confined volume and substantially coextensive therewith for projecting the image defined by the display raster, the display means being disposed in the path of the focused beam adjacent the optical path folding means, said display including optical gain means.

4,003,081
DISPLAY SYSTEMS WITH CONTROLLED COLOR FILTERING

Cyril Hilsum, and Ian Alexander Shanks, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 20, 1975, Ser. No. 542,625
Claims priority, application United Kingdom, Jan. 21, 1974, 2764/74
Int. Cl.² H04N *9/16*
U.S. Cl. 358—64 **6 Claims**

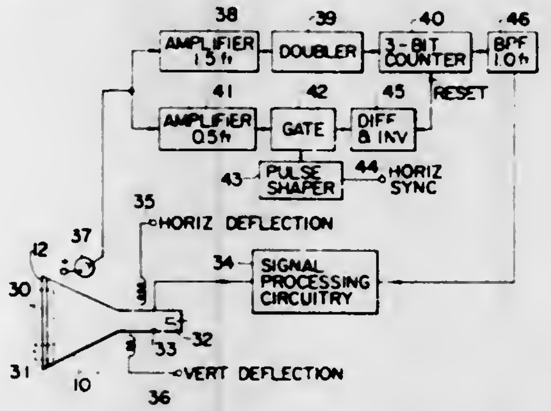
1. A color television display system including a light emitting screen capable of being energized to emit light in the form of a visual image in three colors E1, E2 and E3 of the visible spectrum, means for applying different kinds of input signal to energize said screen, said input signals being video signals representing colors, an electrically controllable filter located in front of said screen, said filter comprising in combination a polarizer, an analyzer and a liquid crystal layer having an electrically adjustable optical activity whereby electrical variation of the optical activity changes the color passed by said analyzer, said filter being capable of separately passing at least two of the colors emitted by the screen, an electrode structure for applying an electric field across said layer, and means for controlling said electric field to change the optical activity of said liquid crystal layer whereby light emitted by said screen is passed in different colors one color at a time by said filter, the passed color being selected to correspond to the input signal applied to energize said screen, said system additionally comprising a further liquid crystal filter located in front of said screen, said first mentioned filter having a first state which passes only color E1 and a second state which prohibits color E1 from passing, and said further filter having a first state which passes only color E3 and a second state which prohibits color E3 from passing, at least one of said second states passing color E2.



4,003,082
COLOR TELEVISION SYSTEM EMPLOYING INDEX SIGNAL GENERATING MEANS

Teruo Fumoto, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 13, 1975, Ser. No. 577,077
Claims priority, application Japan, May 15, 1974, 49-54754
Int. Cl.² H04N *9/24*
U.S. Cl. 358—69 **6 Claims**

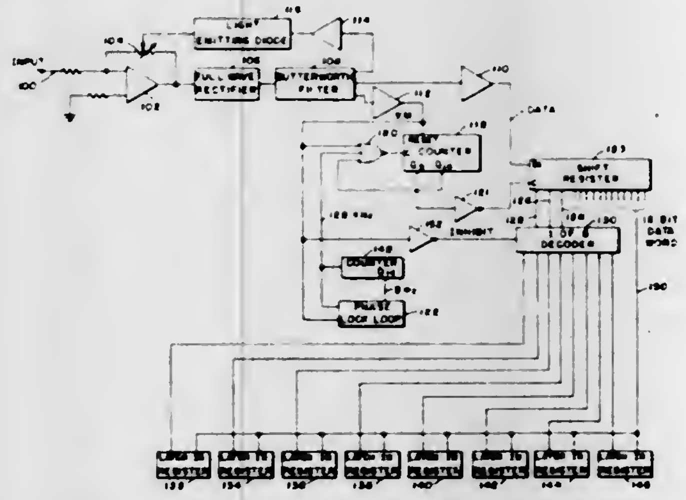


1. In a color television system including a cathode ray tube comprising a screen member having a plurality of parallel laterally disposed vertical strip segments each producing light of one of three primary colors when excited, arranged in sequence according to color generated, and forming substantially identical triplet groups occurring at a predetermined rate along substantially horizontal paths of excitation traversing said segments; and means providing a cathode-ray beam for scanning said screen member and sequentially exciting said groups of segments along said paths, said screen member being provided with a plurality of first index strip elements arranged parallel with said strip segments for sequential excitation by said beam concurrent with the excitation of said triplet groups; said screen member being provided with a plurality of second index strip elements occurring at a predetermined rate along said paths preceding said first elements for sequential excitation by said beam before excitation of said first elements, the rate of said second elements along said paths being different from the rate of said first elements along said paths; first bandpass filter means tuned to the frequency of, and receptive of, the signal from said first elements for filtering the same; second bandpass filter means tuned to the frequency of, and receptive of, the signal from said second elements for filtering the same, and a gate circuit coupled to the second bandpass filter means for gating the output signal from said second bandpass filter means, the improvement comprising: counting means coupled to said first filter means for converting the frequency of the signal therefrom to the frequency of said triplet groups; means for enabling the gate circuit at the start of each scan along said path, and means for coupling the output of the gate circuit to said counting means for resetting said counting means at the start of each scan to erase the contents thereof.

4,003,083
DIGITAL DATA RECORDING AND DECODING

Michael C. Gariazzo, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1975, Ser. No. 568,235
Int. Cl.² G11B *5/06*
U.S. Cl. 360—29 **6 Claims**

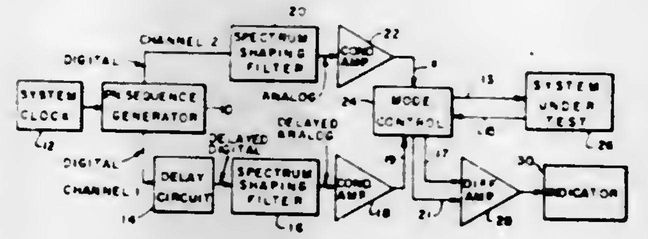


1. A system for multiplexing signals representative of digital data words for recording and thence their decoding, comprising:
shift register means for converting said data signals from parallel to serial form;
means for multiplexing and modulating said data signals for recording, said multiplexing means including:
a counter;
a one of eight decoder coupled to said counter; and
a plurality of analog gates coupled to respective shift registers and said one of eight decoders;
said modulating means including means for modulating said data signals at a first amplitude A_2;
means for providing a unique output signal, said output signal modulated at a second amplitude A_1;
means for detecting and demultiplexing said signals and said unique output signal for conversion into parallel form, said detecting means including a first, second, third and fourth operational amplifier, said first operational amplifier detecting only said unique output signal, said second operational amplifier detecting said signals representative of the data, said third operational amplifier enabling the control of the gain of said fourth operational amplifier whereby the gain of said fourth operational amplifier is adjusted to compensate for amplitude variations in the recording medium.

4,003,084
METHOD OF AND MEANS FOR TESTING A TAPE RECORD/PLAYBACK SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Gabriel R. Wallace, Palm Bay, Fla.; William E. Salter, Palm Bay, Fla.; Glenn D. Weathers, Palm Bay, Fla., and Sidney S. Gussow, Palm Bay, Fla.

Division of Ser. No. 419,831, Nov. 28, 1973, Pat. No. 3,875,500. This application Mar. 25, 1975, Ser. No. 561,956
Int. Cl.² G11B *27/36*
U.S. Cl. 360—31 **14 Claims**

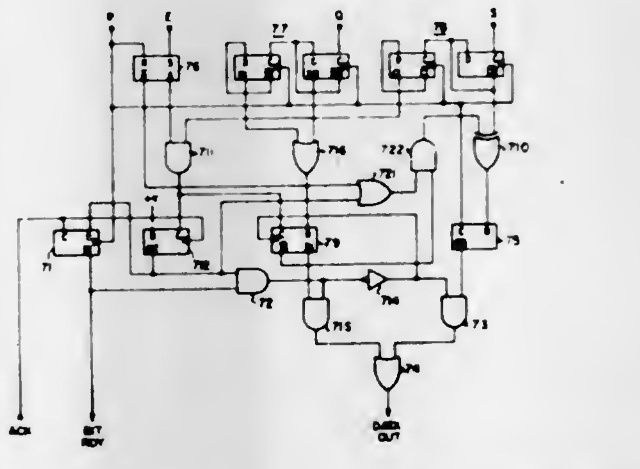


1. A method for testing a tape record/playback system comprising the steps of:
a. deriving an analog test signal and band-limited digital reference signals from a pseudo-noise sequence generator driven by a reference clock signal;
b. recording said test signal and said reference signals on respective tracks of the system during operation thereof in a record mode;
c. playing back the recorded signals during the playback mode of operation of the system;
d. reconstructing a delayed analog reference signal without time base variations from the played back reference signals; and
e. comparing the played back test signal with the reconstructed analog reference signal to obtain an error signal that is a measure of the performance of the tape record/-playback system.

4,003,085
SELF-CLOCKING, ERROR CORRECTING LOW BANDWIDTH DIGITAL RECORDING SYSTEM

Chin Tao Wu, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 485,520, July 3, 1974. This application July 31, 1975, Ser. No. 600,598
Int. Cl.² G11B *5/02*
U.S. Cl. 360—40 **7 Claims**



1. In a system for sensing a record medium having at least two possible recording states, the combination comprising:
sensing means for producing a read signal in response to a change of state on said record medium; and
data decoding means responsive to said read signal for detecting a cell boundary when two read signals occur within an interval not greater than one-half the time between cell boundaries and for producing data output

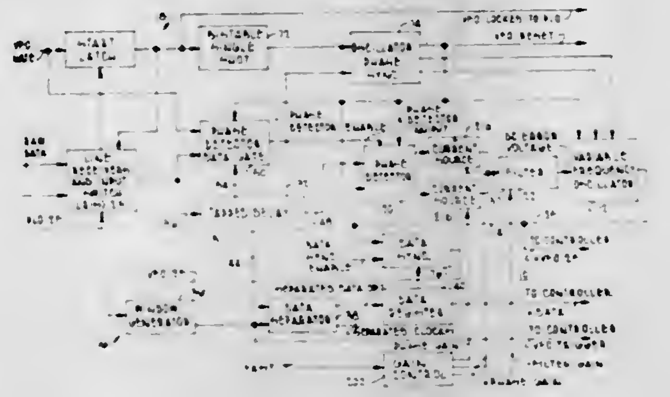
signals when a single read signal occurs within cell boundaries.

4,003,086

DYNAMIC LOOP GAIN ALTERATION FOR DATA RETRIEVAL

Tore Langemyr Larsen, and Kenneth Holly, both of San Jose, Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Apr. 28, 1975, Ser. No. 572,518
Int. Cl.² G11B *5/09*
U.S. Cl. 360—53 **4 Claims**



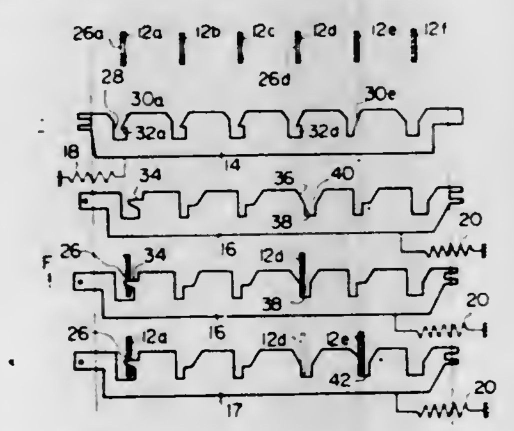
1. A data recovery system comprising:
a. at least one rotating magnetic disc;
b. means for positioning a magnetic transducer head adjacent a desired track on said disc;
c. means for reading data recorded thereon, said means including a variable frequency oscillator and a variable frequency oscillator feedback control loop; and
d. means for attempting to recover recorded data after a predetermined number of unsuccessful retry attempts to read data comprising means for increasing the variable frequency oscillator loop gain for up to a predetermined number of retries, whereby the variable frequency oscillator has decreased response time and increased bandwidth to thereby read marginally recorded data.

4,003,087

MECHANISM FOR USE IN MAGNETIC TAPE RECORDER/PLAYER

Mitsuaki Iwasaki, and Hidehiro Kobayashi, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Dec. 2, 1974, Ser. No. 528,789
Claims priority, application Japan, Dec. 4, 1973, 48-138312[U]
Int. Cl.² G11B *15/04*
U.S. Cl. 360—60 **6 Claims**



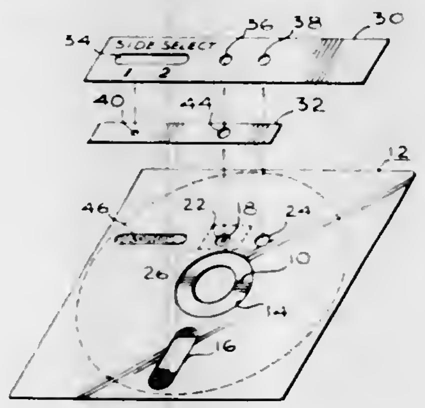
4. A mechanism for use in a magnetic tape recorder/player including a first key for actuating a recording-reproducing mode change switch, a second key for actuating a muting switch and a third key for stopping record operation of the recorder-player, said mechanism comprising:
a first locking plate yieldingly urged to a locking position wherein said first and second keys can be locked in their depressed positions when they are depressed, said first locking plate having a surface engaging with said third key such that upon depression of said third key, said first locking plate shifts to an unlocking position wherein said first and second keys are released; and
second locking plate yieldingly urged to a locking position wherein said first key can be further locked in the depressed position thereof when said second key is depressed, said second locking plate having a surface engaging with said second key such as to be held in said locking position thereof as long as said second key is depressed.

4,003,088

LOCK OUT TAB FOR MAGNETIC DISC ENVELOPE

Vern Schwartz, Sunnyvale, Calif., assignor to Information Terminals Corporation, Sunnyvale, Calif.

Filed Oct. 8, 1975, Ser. No. 620,656
Int. Cl.² G11B *15/04, 23/04*
U.S. Cl. 360—60 **4 Claims**



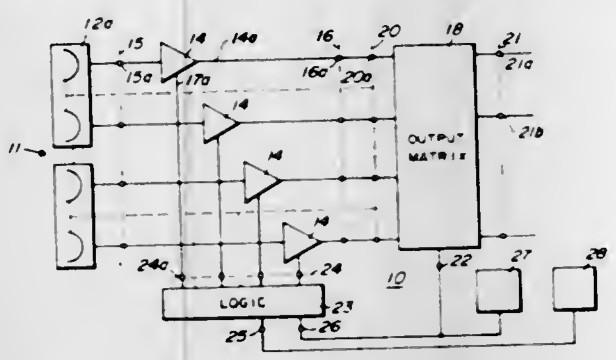
1. In a system wherein a floppy magnetic disc which is rotated within an envelope, is inserted into associated apparatus for rotation of said disc and for applying a magnetic transducer head to one side thereof for reading and writing, apparatus for insuring that writing or erasure from said disc will occur from a desired one side, and not inadvertently from the other side of said disc comprising
a first and a second hole through said envelope,
said first and second holes being positioned on either side of a center line through said envelope, and radially equidistant from the center of said envelope and disc,
a third hole through said disc positioned to be aligned successively with said first and second holes once each revolution of said disc,
a light source positioned within said associated apparatus for directing light through said first hole when said disc and envelope are operatively inserted within said apparatus with one side adjacent to said transducer, and for directing light through said second hole when said disc and envelope are inserted within said apparatus with the other side adjacent to said transducer,
photocell means positioned opposite said light source for receiving light from said light source through said first hole when said disc is operatively inserted within said apparatus with said one side adjacent said transducer and for receiving light from said light source through said second hole, when said disc is operatively inserted within said apparatus with said other side adjacent said transducer,
moveable means, moveable for selectively covering said first hole and permitting light from said light source to pass through said second hole, or for covering said second hole and permitting light to pass from said light source through said first hole, and
means responsive to the output of said photocell means when it is actuated, for enabling said transducer means to function.

4,003,089

ELECTRONIC CHANNEL SELECTING SYSTEM FOR A QUAD-STEREO TAPE PLAYER

Louis Clifford Maurer, Woodridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1974, Ser. No. 537,743
Int. Cl.² G11B *15/12*
U.S. Cl. 360—63 **18 Claims**



1. A magnetic tape playing device for playing a selected one of two or more analog programs on a prerecorded multitrack tape, each program comprised of two or more predeterminedly located tracks on the tape comprising
support means,
a magnetic tape head means having a plurality of pickup areas and being fixedly mounted to the support means for generating output signals representative of information prerecorded on the magnetic tape moved past a pickup area,
means for creating a relative motion between a multitrack prerecorded magnetic tape and the magnetic tape head means for sensing the prerecording on the tape,
the support means permanently aligning each pickup area with a separate track on the tape,
a plurality of output terminals,
a plurality of fully electronic switches, each electronic switch capable of being activated for coupling a predetermied one of the pickups to a predetermined output terminal,
program selecting means for selecting the program to be played, and
control means for automatically determining the number of tracks which comprise a program on the particular tape being played and responding to the program selecting means to activate only those electronic switches which couple a desred pickup to a desired output.

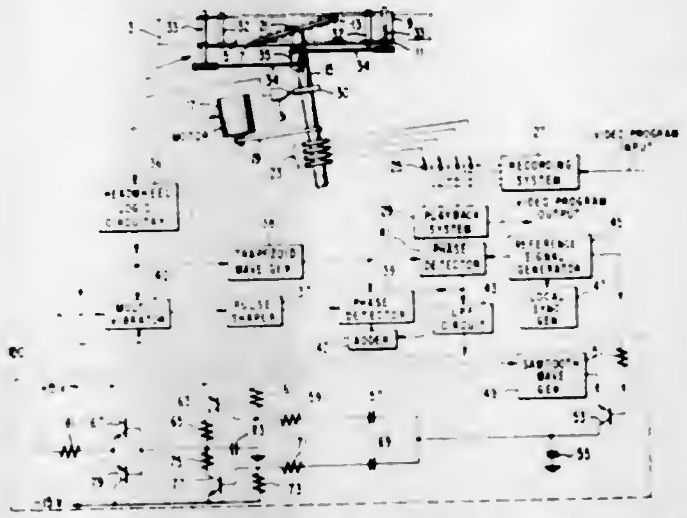
4,003,090

MAGNETIC RECORDING AND REPRODUCING SYSTEM WITH TAPE-TO-HEAD SPEED CONTROL

John Brewer Beck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,155
Claims priority, application United Kingdom, Feb. 18, 1974, 7257/74; Feb. 18, 1974, 7254/74; Feb. 18, 1974, 7256/74
Int. Cl.² H04N *5/78*; **G11B** *15/54, 27/10*
U.S. Cl. 360—70 **7 Claims**

1. In a magnetic recording and reproducing system in which magnetic recording and reproducing head means are mounted on a wheel driven by rotational driving means for recording and reproducing signals on a transported magnetic tape in successive tracks that are skewed relative to the lengthwise direction of the tape, a control system comprising:
means for producing a substantially square wave having a period determined by the rate of rotation of said wheel for providing a repetitive control signal during each cycle of rotation of said wheel at a rate corresponding to said rate of rotation of said wheel;
monostable multivibrator means for generating a pulse signal in a predetermined time relationship with respect to one edge of said square wave for supplying first controllable reference signals having a repetition rate representative of a desired velocity of said wheel;
a first control means responsive to said control signal and said first reference signals for providing a first velocity error signal;
means for providing second reference signals having a substantially fixed repetition rate;
a second control means responsive to said control signal and to said second reference signals for providing a second error signal indicative of relatively slowly varying deviations in the position of said head means from a predetermined positional relation with respect to said tape;
a third control means responsive to said control signal and to said second reference signals for providing a third error signal in response to errors in velocity of said wheel greater than a predetermined threshold;
means coupling said third error signal to said monostable multivibrator means for varying said predetermined time relationship; and
means for coupling said first, second and third error signals to said driving means so as to maintain synchronization of said head means with said tracks.

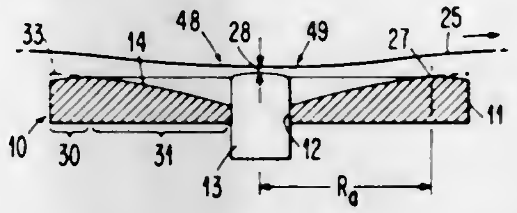


4,003,091

TRANSDUCER SUPPORT AND STABILIZER

Gary Thorup Wright, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,153
Int. Cl.² G11B *15/64, 5/60, 5/82*
U.S. Cl. 360—102 **12 Claims**



1. A combination head support and flexible medium stabilizer comprizing a toroidal member with a radial inner surface portion and an outer surface portion coaxial to the axial axis of said toroid and having a circular convex-shaped medium-facing surface portion with an annular apex being an outward-most line of said convex surface located not less than one-half of the difference between the radii of said outer and inner surfaces; and
means disposed at said inner radial portion and extending thereacross for substantially blocking air flow along said axial axis.

4,003,092

READING OR WRITING HEAD POSITIONING DEVICE

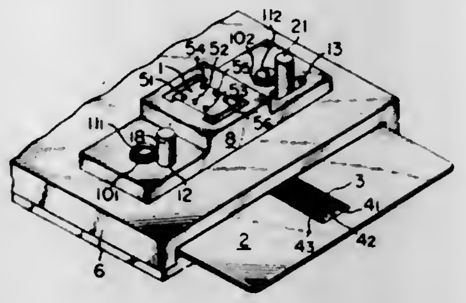
Osamu Hirata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,291

Claims priority, application Japan, Nov. 15, 1973, 48-132640[U]

Int. Cl.² G11B *74/55, 360/129*

U.S. Cl. 360—109 **9 Claims**



1. A magnetic head positioning device for a recording medium reader comprising:

a base (6) formed to receive an advancing recording medium;

a holding member (8) mounted on said base for holding a magnetic head;

a magnetic head (1) held by said holding member in a predetermined relationship to a path along which a recording medium may be advanced;

first eccentric means (13, 21) rotatably mounted on said base and contacting said holding member to adjust the angle of said head relatively to the direction of advance of the recording medium; and

second eccentric means (12, 18) including a member rotatably mounted on said base and contacting said holding member for moving said head in a direction transverse to the direction of movement of the recording medium, movement of said second eccentric means being limited in its ability to move said head by said first eccentric means.

4,003,093

APPARATUS FOR INDICATING TAPE END IN A TAPE RECORDER AND BATTERY LEVEL

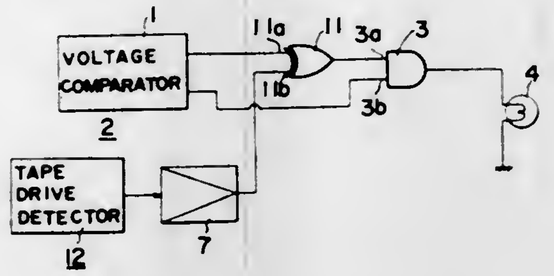
Ken Satoh, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1975, Ser. No. 580,778

Claims priority, application Japan, June 11, 1974, 49-67868[U]; June 13, 1974, 49-68936[U]

Int. Cl.² G11B *15/00;* **G08B** *21/00, 19/00;* **G03B** *1/60*

U.S. Cl. 360—137 **7 Claims**



1. A tape recorder having an apparatus for indicating when one end of a tape in the tape recorder has almost completely unwound from a tape reel in the tape recorder and for indicating the level of a battery provided in the tape recorder comprising voltage comparator means for comparing the voltage of the battery internally housed within the tape recorder against a reference level which is required for the normal operation of the tape recorder and to produce an output signal when the battery voltage is reduced below the reference voltage; said tape having a non-record zone at each end thereof;

tape end detector means positioned adjacent to the tape and being responsive to the movement of the tape for normally producing an output signal during the running of the tape, the output signal of the detector means being absent when a non-record zone at one terminal end of the tape passes said detector means; and AND circuit coupled to the voltage comparator means and the detector means for receiving an output signal from the detector means and from the voltage comparator means, and display means connected with the output of the AND circuit to be illuminated only when the battery voltage is at least equal to the reference level and when the tape is running and has not completely unwound from the reel whereby the signals from said comparator means and detector means are simultaneously applied to the AND circuit under such conditions.

DESIGN PATENTS

GRANTED JANUARY 11, 1977

ERRATA

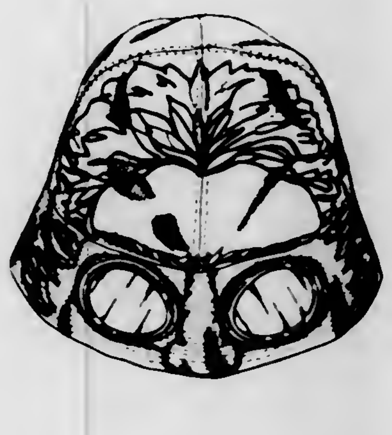
For CLASS	See PATENT NO.
011-152	243,030
011-152	243,031
011-149	243,032

DESIGNS

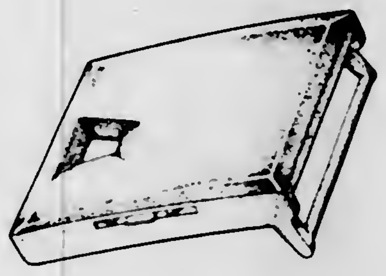
JANUARY 11, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue These entries will be in numerical order by document publication number.

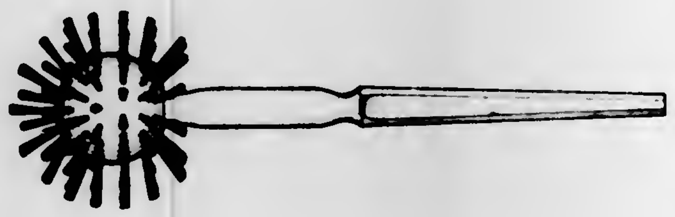
242,961
HAT
Nathan R. Strongin, 53-44 199th St., Flushing, N.Y. 11365
Filed Sept. 8, 1975, Ser. No. 611,069
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—251



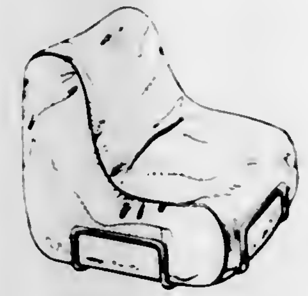
242,962
BELT BUCKLE
Michael Lackman, 9320 St. Lawrence Blvd., Montreal, Quebec, Canada
Filed Sept. 13, 1974, Ser. No. 505,923
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—427



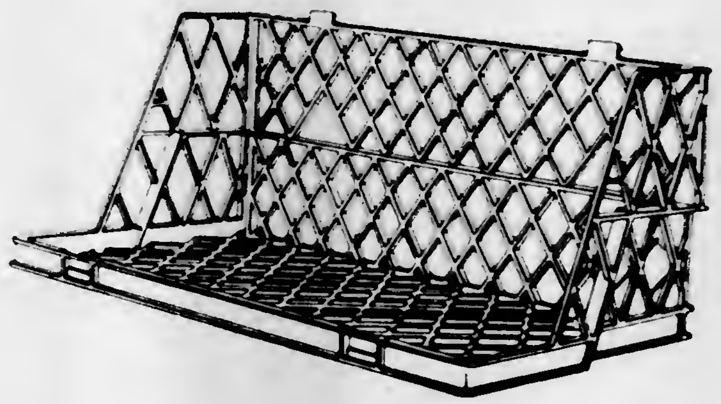
242,963
HAIRBRUSH
Edwin Glasberg, Woodmere, N.Y., assignor to Brynel Incorporated, Allston, Mass.
Filed Oct. 3, 1975, Ser. No. 637,327
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31



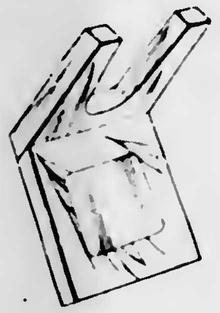
242,964
CHAIR
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 14, 1975, Ser. No. 604,579
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



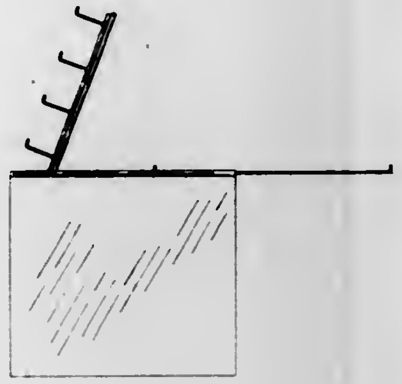
242,965
DISPLAY SHELF
Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730
Filed Apr. 10, 1975, Ser. No. 566,820
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85



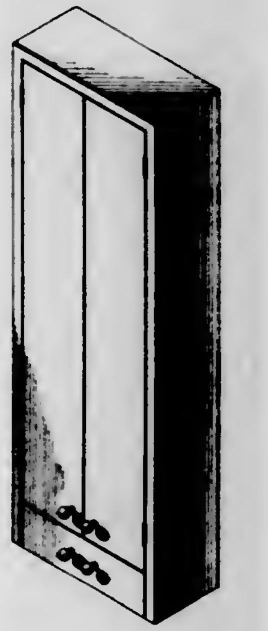
242,966
STRINGED INSTRUMENT HOLDER
Barbara D. MacMillan, 350 Starlight Crest Drive, La Canada, Calif. 91011
Filed Oct. 15, 1973, Ser. No. 406,546
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Term of patent 14 years
Int. Cl. D6—99
U.S. Cl. D6—114



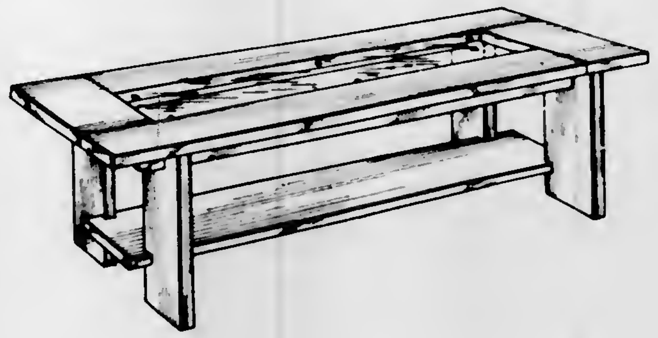
242,967
COMBINED KEY RACK AND CONTAINER THEREFOR
Donald L. Parkins, 846 S. 35th Ave., Omaha, Nebr. 68105
Filed Apr. 7, 1975, Ser. No. 565,520
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



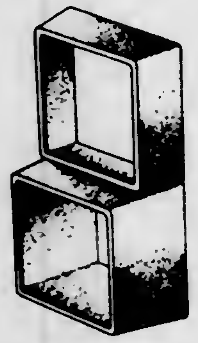
242,968
CABINET FOR HOLDING NECKTIES AND ACCESSORIES
Louis E. Gulick, 13416 Washburn Drive, Burnsville, Minn. 55337
Filed Sept. 2, 1975, Ser. No. 609,209
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



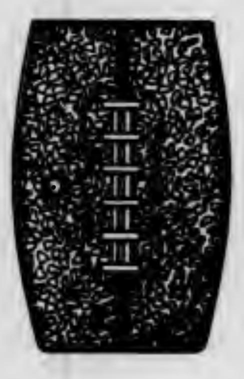
242,969
TABLE
Roland P. Carter, Lynchburg, Va., assignor to The Lane Company, Inc., Altavista, Va.
Filed Dec. 4, 1974, Ser. No. 529,593
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



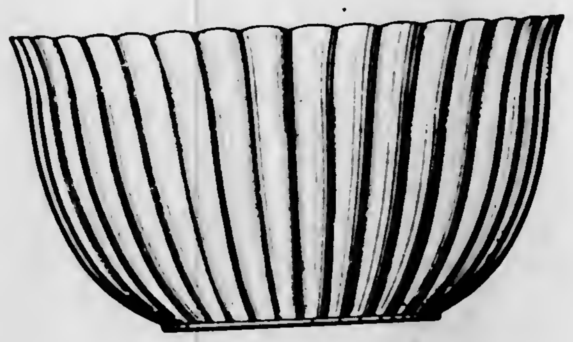
242,970
PHOTOGRAPH HOLDER
Bernard Cohen, Lansdale, Pa., assignor to C. F. Associates, Lansdale, Pa.
Filed Jan. 23, 1975, Ser. No. 543,237
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

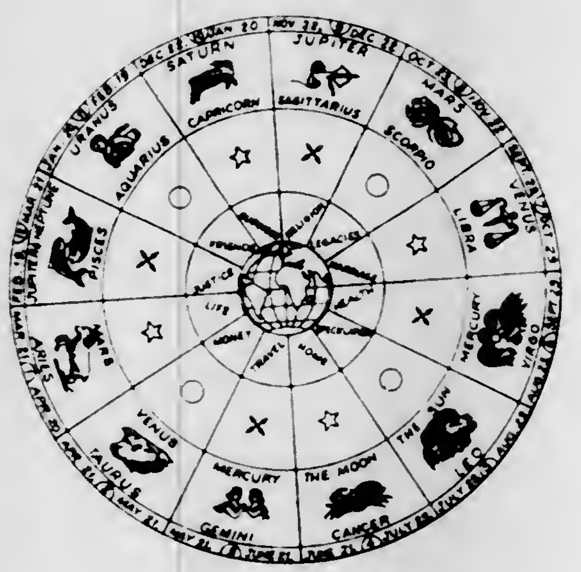


242,971
GLASS TUMBLER
John J. Schlichter, Columbus, Ohio, assignor to Federal Paper Board Company, Inc., Columbus, Ohio
Filed May 9, 1975, Ser. No. 576,154
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5

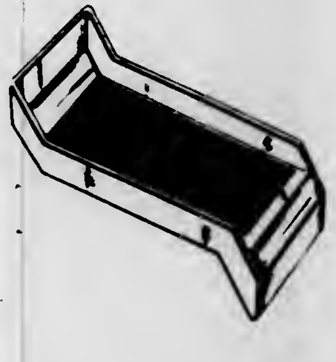


242,972
BOWL
Evangeline Day, 1 Van Buren Ave., Butler, N.J. 07405
Filed June 17, 1975, Ser. No. 587,622
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—24

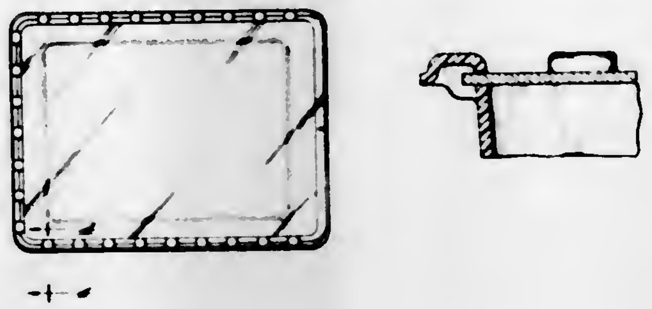




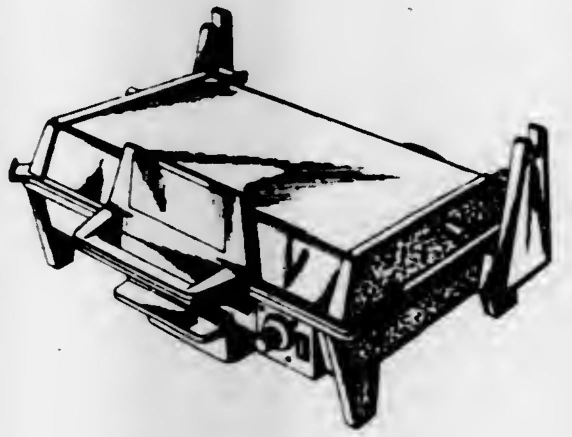
242,973
GRATER
Robert H. C. M. Daenen, Beukenlaan, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 2, 1975, Ser. No. 564,503
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



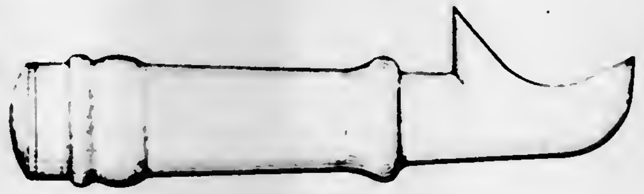
242,974
COVERED STORAGE CONTAINER
Robert C. Hazzard, Portage, Wis., assignor to Portage Industries Corporation, Portage, Wis.
Filed Mar. 17, 1975, Ser. No. 559,150
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—76



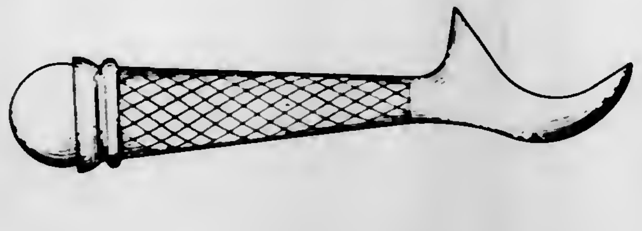
242,975
ELECTRIC BROILER GRILL OR SIMILAR ARTICLE
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed July 21, 1975, Ser. No. 597,826
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88



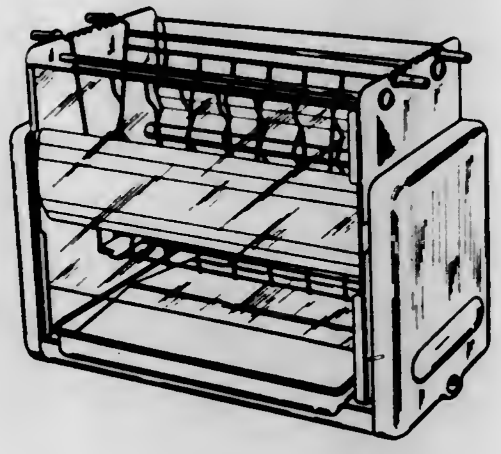
242,976
ICE CREAM SERVER
Clarence M. Mason, 2318 Sherwood Ave., Toledo, Ohio 43614
Filed July 10, 1975, Ser. No. 594,594
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—100



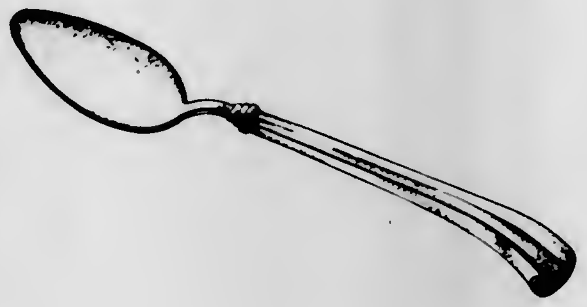
242,977
ICE CREAM SERVER
Clarence M. Mason, 2318 Sherwood Ave., Toledo, Ohio 43614
Filed July 10, 1975, Ser. No. 594,595
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—100



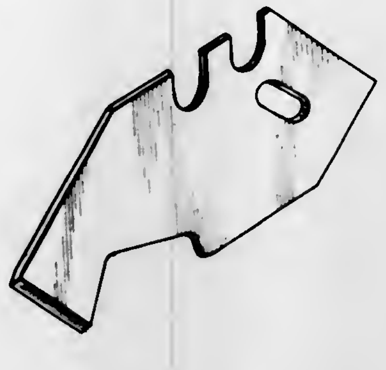
242,978
VERTICAL GRILL
Claude Caudron, Vagney, France, assignor to S E B, Selongey, France
Filed Feb. 20, 1976, Ser. No. 660,025
Claims priority, application France, Sept. 4, 1975, 75.109
Term of patent 14 years
Int. Cl. D7—*05*; D15—*05*
U.S. Cl. D7—110



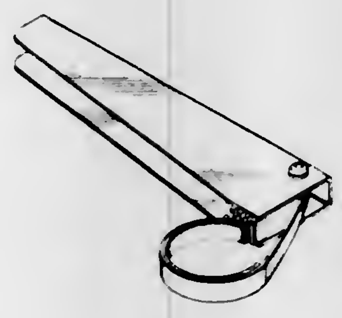
242,979
ARTICLE OF FLATWARE
Ford J. Lanzoni, Yalesville, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Apr. 28, 1975, Ser. No. 571,841
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



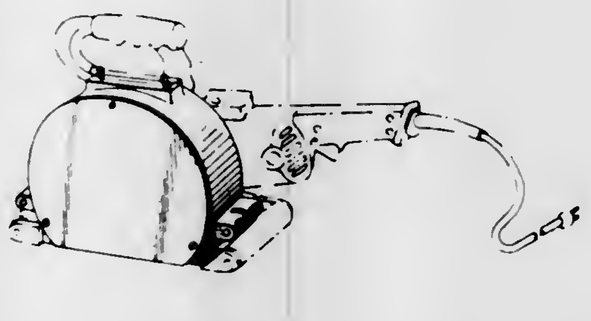
242,980
UTILITY BLADE
Harrison P. Fuller, Roslyn, N.Y., and Howard Strauss, Elberon, N.J., assignors to Omega Precision Hand Tools, Inc., College Point, N.Y.
Filed Oct. 15, 1975, Ser. No. 622,774
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—20



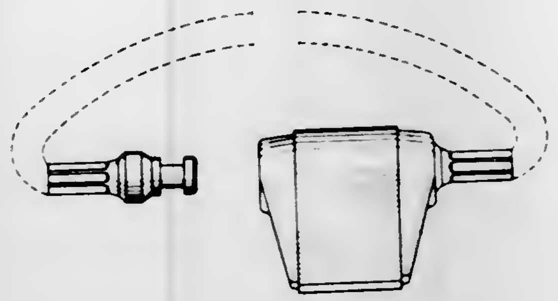
242,981
ADJUSTABLE STRAP WRENCH
Roger R. Craig, 21217 W. Bellini Drive, Topanga, Calif. 90290
Filed Dec. 3, 1975, Ser. No. 637,296
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22



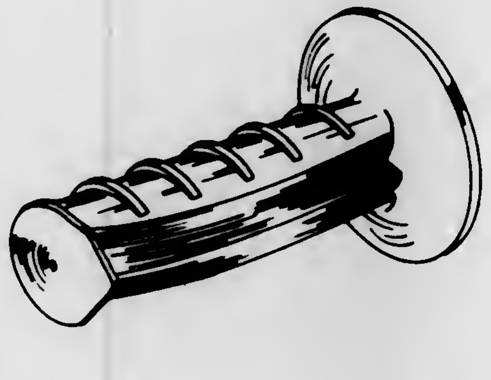
242,982
CASING FOR GRINDER TOOLS
Elwin H. Flickenstein, Alden, and Walter N. Welsch, Tonawanda, both of N.Y., assignors to Dynabrade, Inc., N. Tonawanda, N.Y.
Filed Sept. 17, 1975, Ser. No. 614,211
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



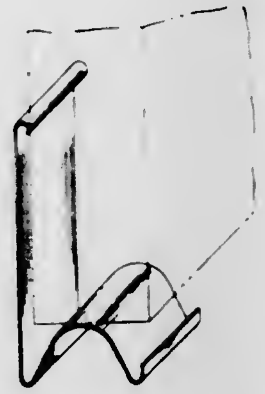
242,983
WIRE LOCK BODY FOR MOTORCYCLES AND THE LIKE
Hisashi Saitou, Nagoya, Japan, assignor to Kabushiki Kaisha Saikosha Seisakusho, Kasugai, Japan
Filed Oct. 10, 1975, Ser. No. 621,623
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—113



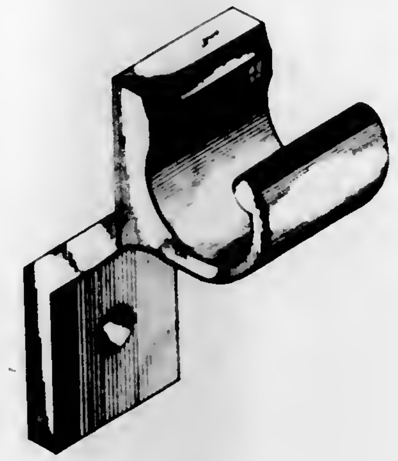
242,984
HAND GRIP
Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed Feb. 9, 1976, Ser. No. 656,724
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138



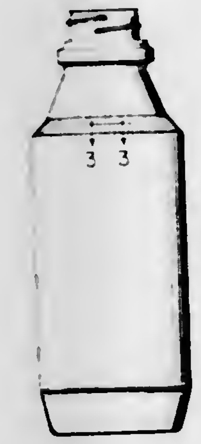
242,985
DOOR STOP
Anthony M. Sasgen, 1S 174 Ingersoll Lane, Villa Park, Ill. 60181
Filed Apr. 21, 1976, Ser. No. 678,915
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—203



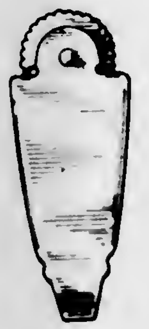
242,986
CURTAIN ROD BRACKET
Ljot M. Inglis, 13463 Sayre, Sylmar, Calif. 91342
Filed Apr. 21, 1975, Ser. No. 558,708
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—239



242,987
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Filed July 2, 1975, Ser. No. 592,426
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



242,988
COMBINED FLINT DISPENSER AND SCREWDRIVER
John S. Derderian, 434 W. Courtland, Mundelein, Ill. 60060
Filed Dec. 1, 1975, Ser. No. 636,683
Term of patent 14 years
Int. Cl. D9—*01*; D27—*99*
U.S. Cl. D9—187



242,989
COVERED BASKET

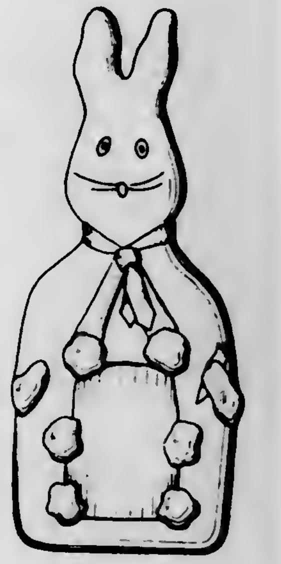
May Becker, 1125 N. Howard Blvd., No. 4, Tucson, Ariz. 85716

Filed Oct. 10, 1974, Ser. No. 513,940

Term of patent 14 years

Int. Cl. D9—*04*

U.S. Cl. D9—246



242,990
WALL CLOCK

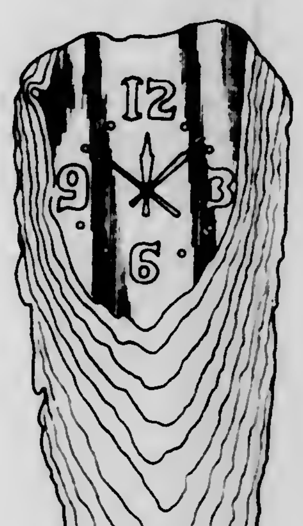
Donald H. Jorgenson, Redwood Falls, Minn., assignor to Earth Clocks Incorporated, Redwood Falls, Minn.

Filed Aug. 15, 1975, Ser. No. 604,948

Term of patent 7 years

Int. Cl. D10—*01*

U.S. Cl. D10—20



242,991
ELECTRICAL CURRENT PROBE

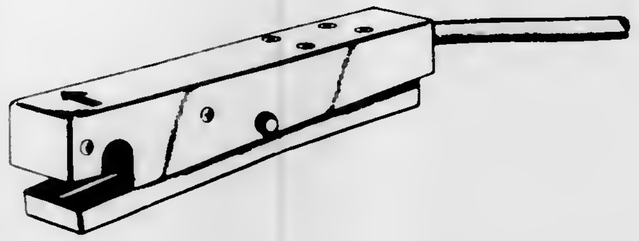
Thomas J. McKenzie, Granby, and Joseph T. Fleming, E. Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 27, 1975, Ser. No. 580,708

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—79



242,992
INTRUSION DETECTOR

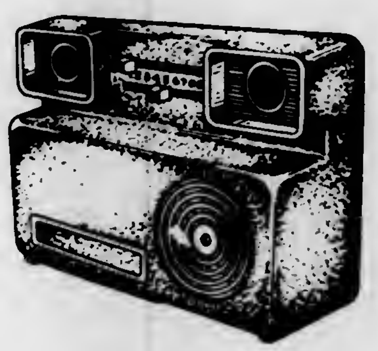
Russ J. Moure, White Plains, Md., assignor to International Armament Corporation, Alexandria, Va.

Filed Aug. 15, 1975, Ser. No. 605,043

Term of patent 14 years

Int. Cl. D10—*06*

U.S. Cl. D10—106



242,993
HULL OF A BOAT

Charles Michael Corbett Ross, Bath, England, assignor to Rotork Marine Limited, Bristol, England

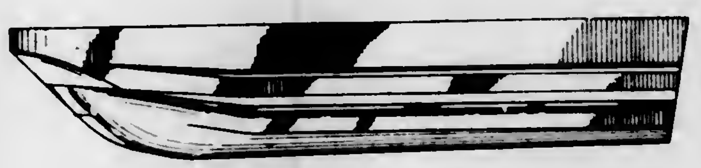
Filed Sept. 2, 1975, Ser. No. 609,748

Claims priority, application United Kingdom, July 22, 1975, 971913/74

Term of patent 14 years

Int. Cl. D12—*06*

U.S. Cl. D12—62



242,994
AIRCRAFT NOSE AND INLET

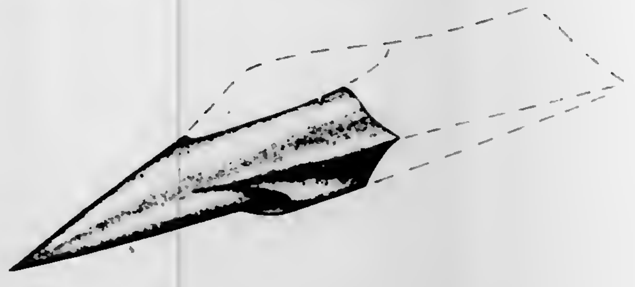
Constant Prokop, Huntington, N.Y., assignor to Fairchild Industries, Inc.

Filed Nov. 24, 1975, Ser. No. 634,820

Term of patent 14 years

Int. Cl. D12—*07*

U.S. Cl. D12—81



242,995
TRUCK

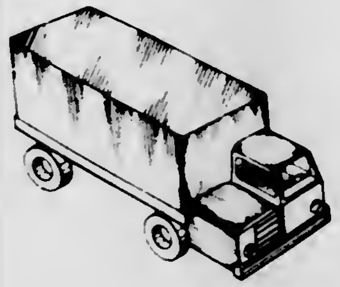
Harold Isaacs, 2567 Lafayette Drive, University Heights, Ohio 44118

Filed Aug. 18, 1975, Ser. No. 605,744

Term of patent 14 years

Int. Cl. D12—*08*

U.S. Cl. D12—96



242,996
TRUCK CAB

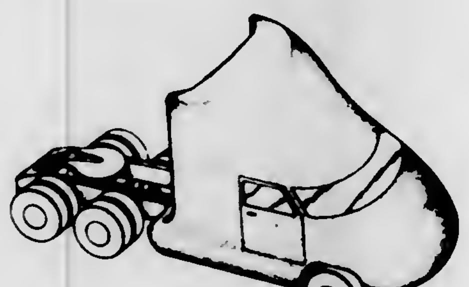
Ronald A. Servais, 7359 Mohawk Trail, Dayton, Ohio 45459, and Paul T. Bauer, 4048 Eckworth Drive, Bellbrook, Ohio 45305

Filed Oct. 8, 1975, Ser. No. 620,593

Term of patent 14 years

Int. Cl. D12—*08*

U.S. Cl. D12—97



242,997
ACCESSORY CONSOLE FOR MOTORCYCLES

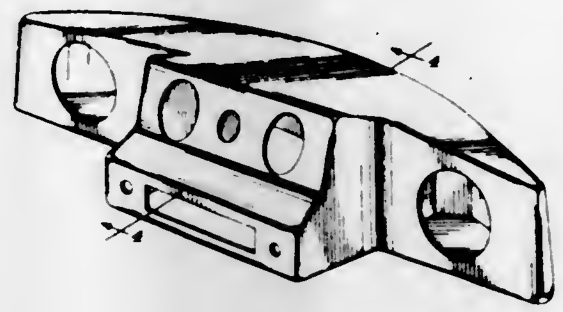
Tommy W. Dixson, 1509 W. Willetta, Phoenix, Ariz. 85007

Filed July 28, 1975, Ser. No. 599,828

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—114



242,998
MOTORCYCLE ACCESSORY CONSOLE

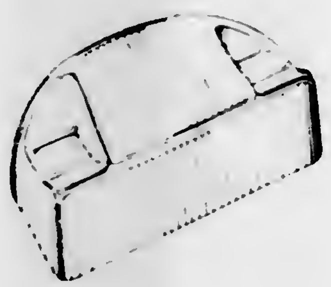
Tommy W. Dixson, 1509 W. Willetta, Phoenix, Ariz. 85007

Filed Jan. 2, 1976, Ser. No. 646,190

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—114



242,999
ACCESSORY CONSOLE FOR MOTORCYCLES

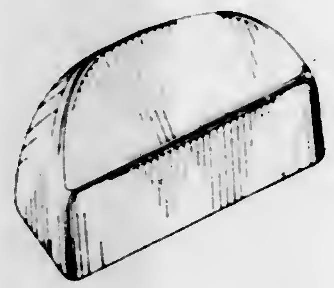
Tommy W. Dixson, 1509 W. Willetta, Phoenix, Ariz. 85007

Filed Jan. 2, 1976, Ser. No. 646,191

Term of patent 14 years

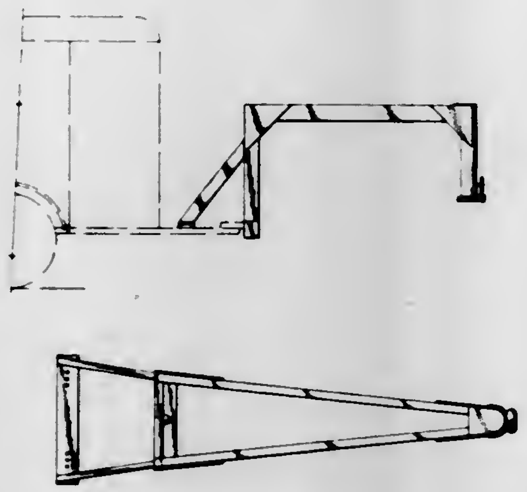
Int. Cl. D12—*11*

U.S. Cl. D12—114



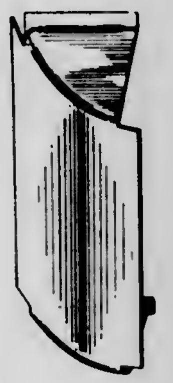
243,000
GOOSENECK TRAILER HITCH CONVERTER

Marvin T. Carnes, Rte. 1, Crescent, Okla. 73028
Filed Dec. 10, 1975, Ser. No. 639,378
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



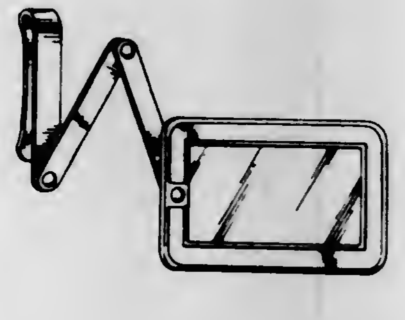
243,001
WIND DEFLECTOR FOR TRUCK TRAILERS

Robert C. Anziano, 4291 Fireside Circle, Irvine, Calif. 92664
Filed Dec. 18, 1975, Ser. No. 641,878
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



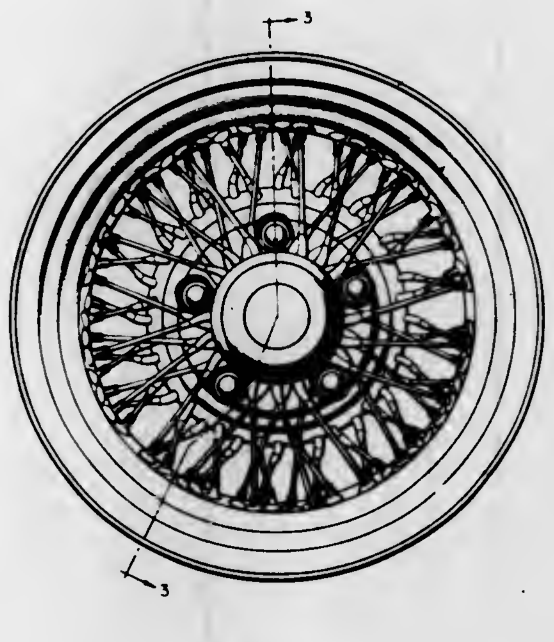
243,002
SUN SHADE FOR AN AUTOMOBILE DRIVER

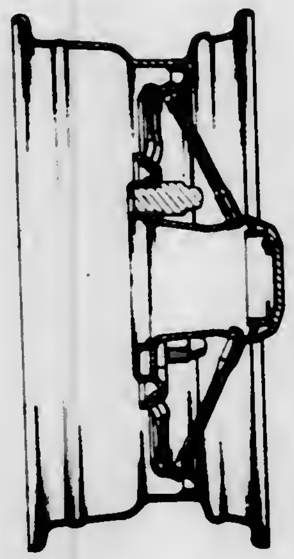
Donald W. Heckathorn, 31556 Agoura Rd. Apt. No. 1, West Lake Village, Calif. 91361
Filed July 17, 1975, Ser. No. 596,802
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191



243,003
AUTOMOBILE WIRE WHEEL

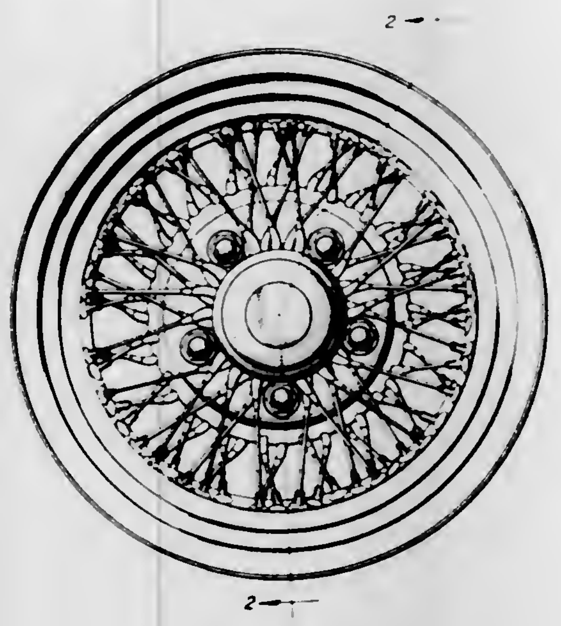
Merlyn R. Reppert, Torrance, Calif., assignor to W. R. Grace & Co., New York, N.Y.
Filed Nov. 7, 1974, Ser. No. 521,705
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

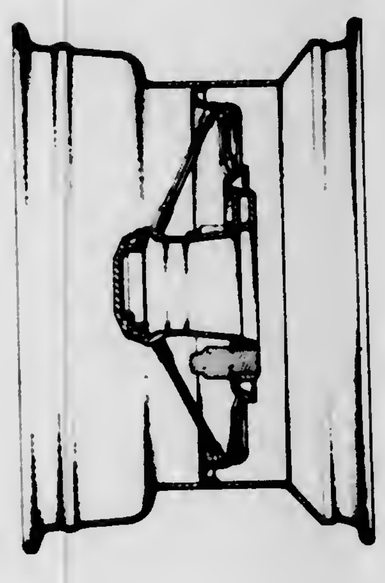




243,004
WIRE WHEEL

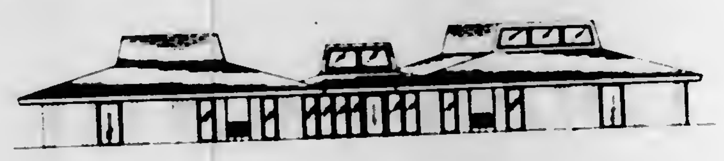
Merlyn Ralph Reppert, Torrance, Calif., assignor to W. R. Grace & Co., New York, N.Y.
Continuation-in-part of Ser. No. 521,705, Nov. 7, 1974. This application Mar. 17, 1976, Ser. No. 667,695
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205





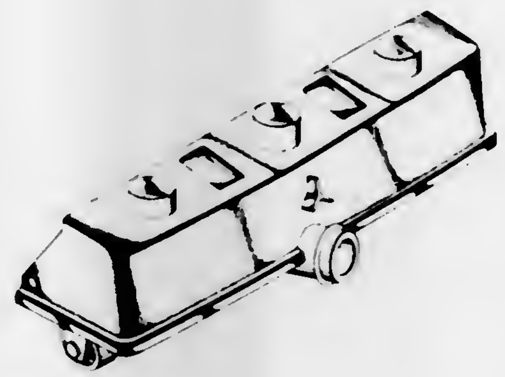
243,005
BUILDING

A. Gilbert McCree, 2110 Alden Road, P.O. Box 7457, Orlando, Fla. 32804
Filed May 10, 1972, Ser. No. 252,147
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



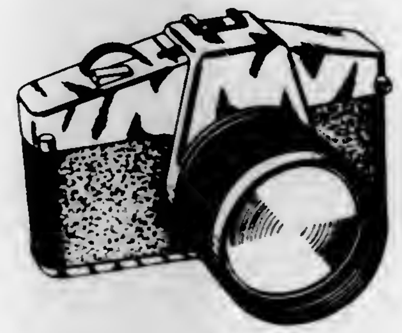
243,006
ADAPTORS FOR VACUUM CLEANERS

Earl R. Clowers, Anderson, S.C., assignor to The Singer Company
Filed May 14, 1975, Ser. No. 577,380
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63



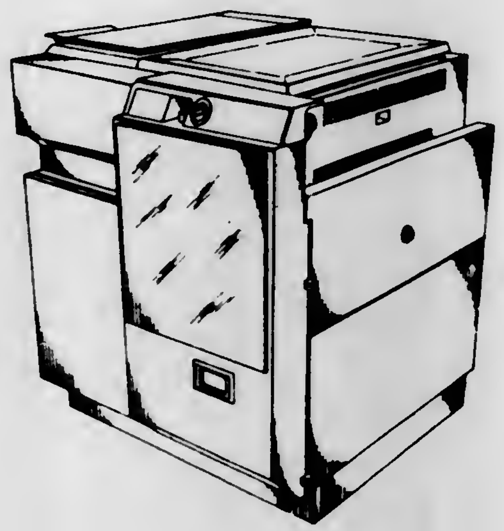
243,007
PHOTOGRAPHIC CAMERA

Hans-Kurt Uellenberg, Edingen, Germany, assignor to Ernst Leitz GmbH
Filed May 29, 1975, Ser. No. 581,891
Claims priority, application Germany, Dec. 18, 1974, 5175
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—8



243,008
COIN OPERATED REPRODUCTION MACHINE

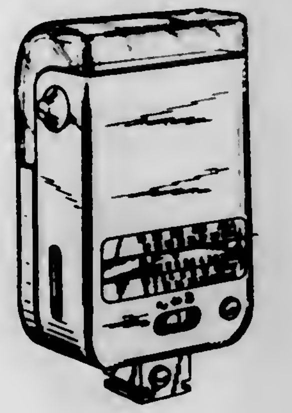
Jacob W. Patla, Fairport; Wayne R. Smith, Henrietta; Wolfgang H. Tinz, Rochester, and Craig A. Smith, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 27, 1975, Ser. No. 544,088
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—30



243,009
FLASH UNIT FOR A PHOTOGRAPHIC CAMERA

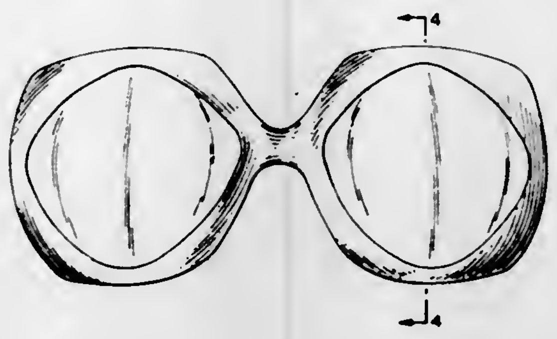
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Foto-Quelle GmbH, Nuremberg, Germany
Division of Ser. No. 506,073, Sept. 16, 1974. This application Dec. 8, 1975, Ser. No. 638,229

Claims priority, application United Kingdom, June 14, 1974, 1090/74
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



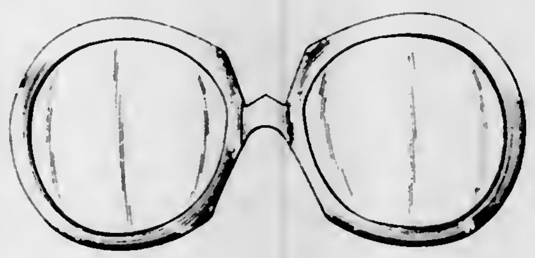
243,010
PAIR OF SPECTACLES

Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 9, 1976, Ser. No. 656,561
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—6 S



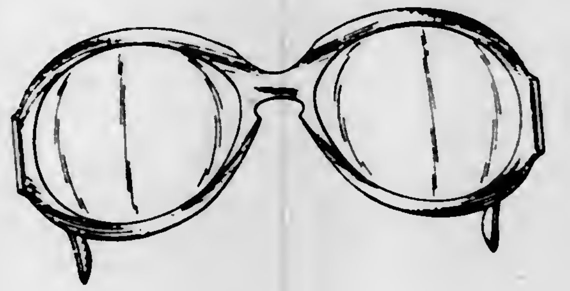
243,011
PAIR OF SPECTACLES

Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 9, 1976, Ser. No. 656,452
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



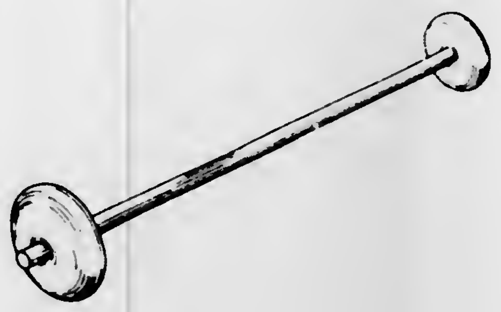
243,012
PAIR OF SPECTACLES

Larry G. Loughner, Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 9, 1976, Ser. No. 656,453
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



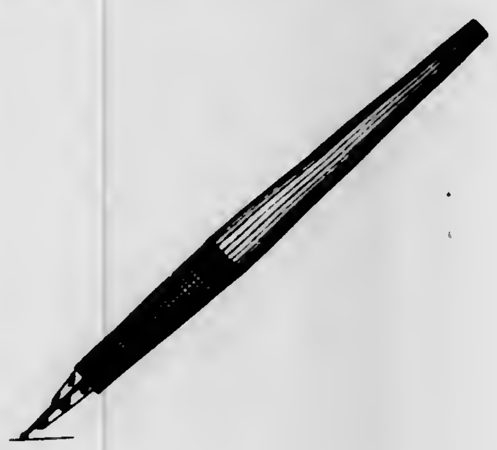
243,013
ROLLING STRAIGHT EDGE

Douglas F. Jones, 5063 Margo Drive, Las Vegas, Nev. 89122, and Eugene F. Costa, 1 Kelton Court, Oakland, Calif. 94611
Filed Feb. 15, 1974, Ser. No. 442,923
Term of patent 3½ years
Int. Cl. D19—*06*
U.S. Cl. D19—37



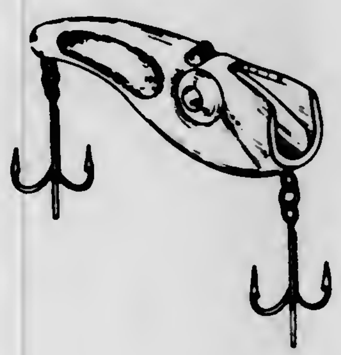
243,014
FOUNTAIN PEN

Frederick R. Wittnebert, Whitewater, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed June 17, 1974, Ser. No. 480,212
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47



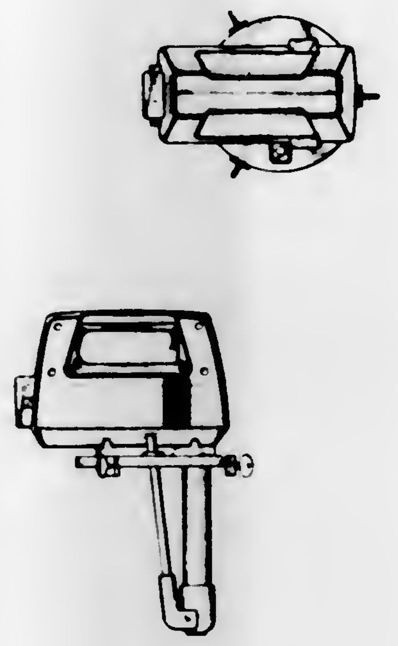
243,015
FISHING LURE

Douglas W. Parker, 2720 S. Waldron Road, Fort Smith, Ark. 72901
Filed Mar. 1, 1976, Ser. No. 662,689
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



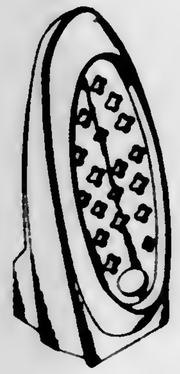
243,016
SPRAY UNIT

George W. Bills, Golden Valley, and Marvin J. Eull, St. Michael, both of Minn., assignors to Graco Inc., Minneapolis, Minn.
Filed Mar. 1, 1976, Ser. No. 662,365
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



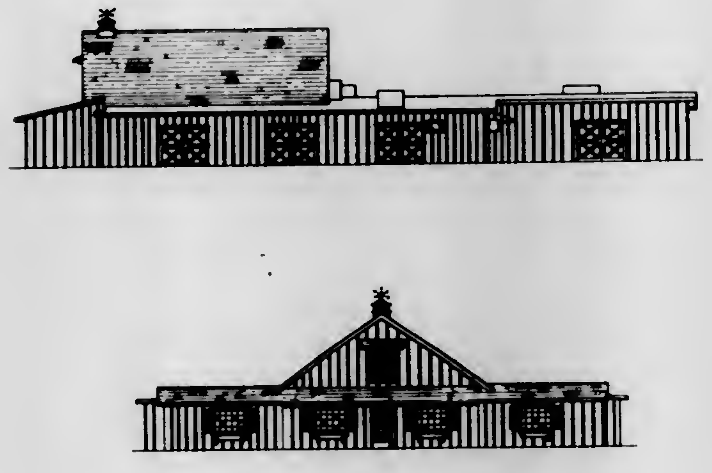
243,017
CONTAINER FOR AIR FRESHENER

Gregory F. Fossella, Marshfield, Mass., assignor to Certified Chemicals Incorporated, Camden, N.J.
Filed July 16, 1975, Ser. No. 596,536
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



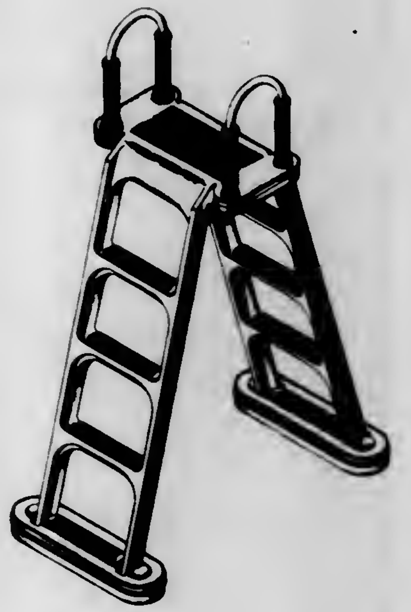
243,018
RESTAURANT BUILDING

Edward Wallace Barr, Jr., Bowling Green, Ky., assignor to Briarpatch, Inc., Bowling Green, Ky.
Filed Sept. 12, 1975, Ser. No. 612,657
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



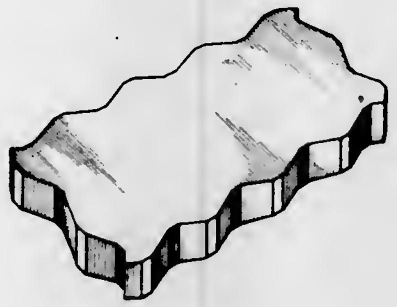
243,019
SWIMMING POOL LADDER

Raymond C. Confer, Gasport, N.Y., assignor to Confer Plastics, Inc., North Tonawanda, N.Y.
Filed May 5, 1975, Ser. No. 574,431
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D25—64



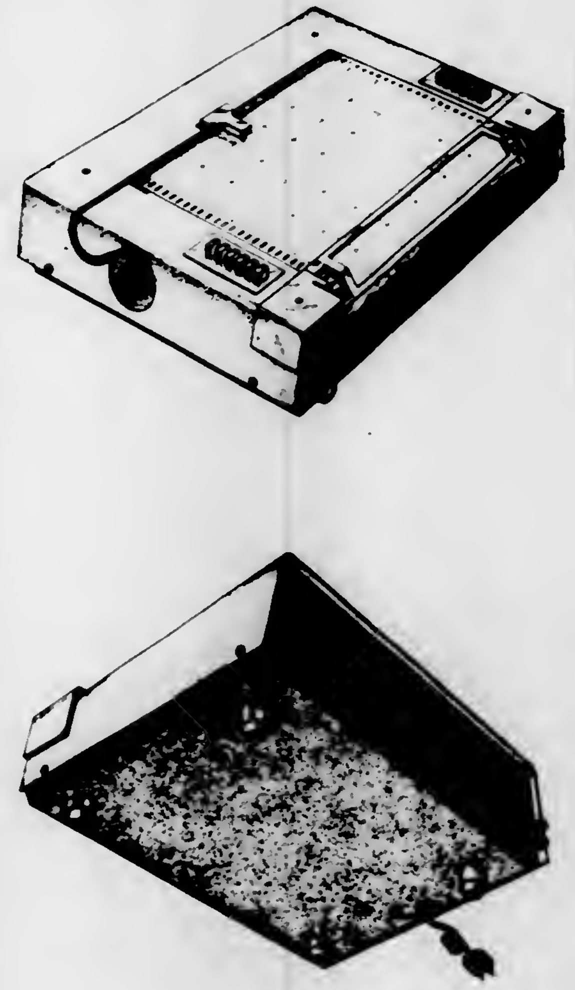
243,020
PAVING BLOCK

Anthony F. Inderwick, 185 Highway 15, Ottawa, Ontario, Canada (K2H 5Z2)
Filed June 5, 1975, Ser. No. 583,912
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



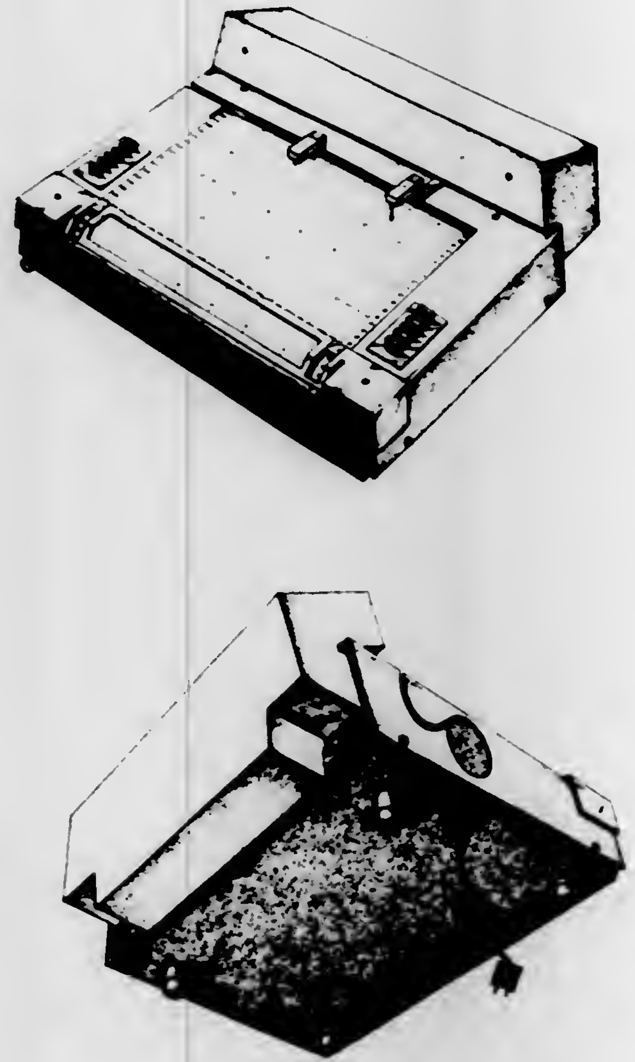
243,021
RECORDING INSTRUMENT

John F. Walker, Warminster, and Harold T. Muse, Drexel Hill, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 28, 1975, Ser. No. 563,110
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—14 C



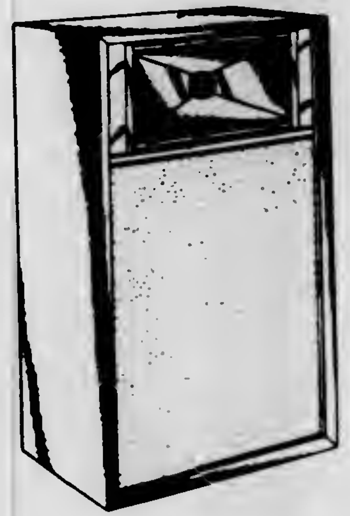
243,022
RECORDING INSTRUMENT

John F. Walker, Warminster, and Harold T. Muse, Drexel Hill, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 28, 1975, Ser. No. 563,111
Term of patent 14 years
Int. Cl. D14—*01*; D10—*04*
U.S. Cl. D26—14 C



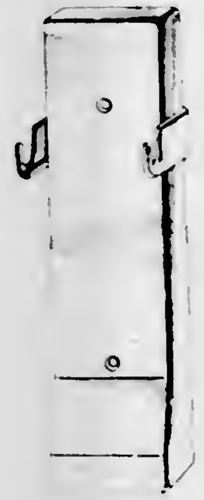
243,023
HORN SPEAKER

Arthur Robson, Jericho, N.Y., assignor to Morse Electro Products Corporation, Brooklyn, N.Y.
Division of Ser. No. D. 388,331, Aug. 13, 1973, Pat. No. 235,562. This application Apr. 7, 1975, Ser. No. 565,771
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 G



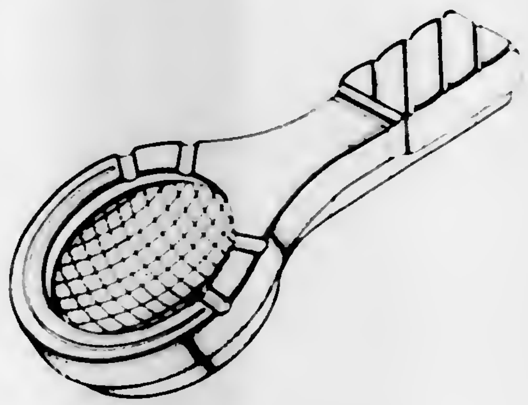
243,024
COMBINED TRANSCEIVER AND MOUNTING BRACKET FOR USE IN INTERCOM DEVICES

Peter Pablik, Salzburg, Austria, assignor to Ring-Control Electronic-Handelsgesellschaft m.b.H., Salsburg, Austria
Filed Nov. 3, 1975, Ser. No. 628,249
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



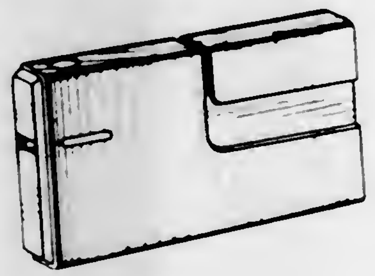
243,025
ASHTRAY

Joan B. Sickul, 10 Hobson St., Stamford, Conn. 06902
Filed Apr. 28, 1975, Ser. No. 572,229
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—22



243,026
LIGHTER

Franz Alban Stuetzer, Mulheim (Main), Germany, assignor to Rowenta-Werke, GmbH, Offenbach(Main), Germany
Filed Nov. 24, 1975, Ser. No. 634,956
Claims priority, application Germany, May 30, 1975, 5 MR 9869
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



243,027
AQUARIUM STAND

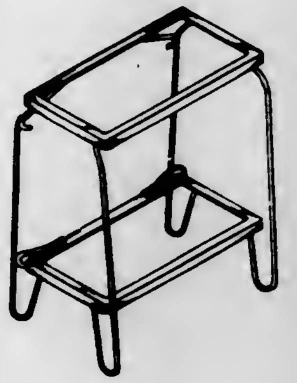
Richard S. Young, Frankenmuth, and Leo E. Hearn, Flint, both of Mich., assignors to Pentaco Enterprises Corporation, Clio, Mich.

Division of Ser. No. 261,096, June 12, 1972, Pat. No. 233,050. This application Dec. 3, 1973, Ser. No. 421,056

Term of patent 14 years

Int. Cl. D6—*06*

U.S. Cl. D30—12



243,028
CYCLE EXERCISER

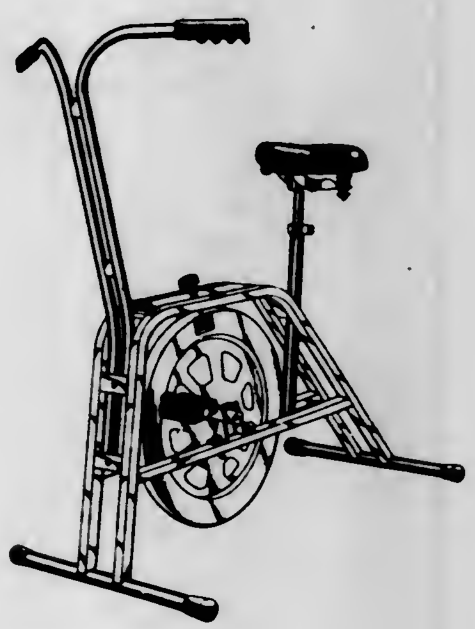
Richard I. Proctor, 3201 Orange Grove Ave., North Highlands, Calif. 95660

Filed June 9, 1975, Ser. No. 585,315

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D34—5 K



243,029
BOOMERANG

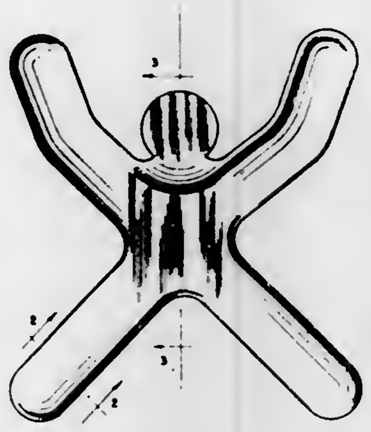
Richard P. Crew, 1635A Walea St., Wahiawa, Hawaii 96786

Filed June 9, 1975, Ser. No. 585,383

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 PP



243,030
PLANT CONTAINER

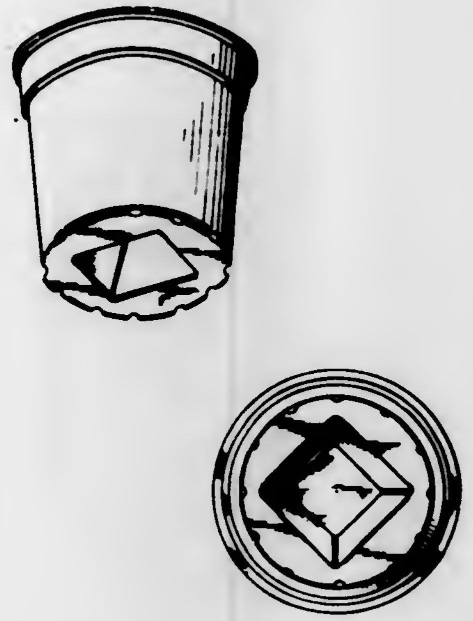
Ronald John Gross, 10 Surrey Road, Mount Waverley, Victoria, Australia

Filed Nov. 11, 1974, Ser. No. 522,916

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—152



243,031
STACKABLE FLOWER POT

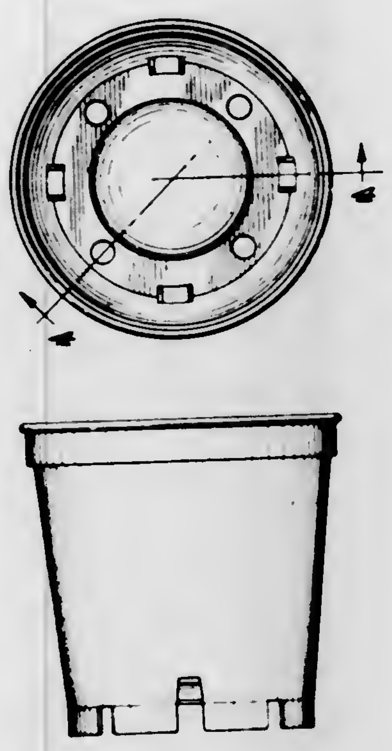
Dennis C. Anderson, Northfield, Minn., assignor to National Polymers, Inc.

Filed June 2, 1975, Ser. No. 582,895

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—152



243,032
PLANTER

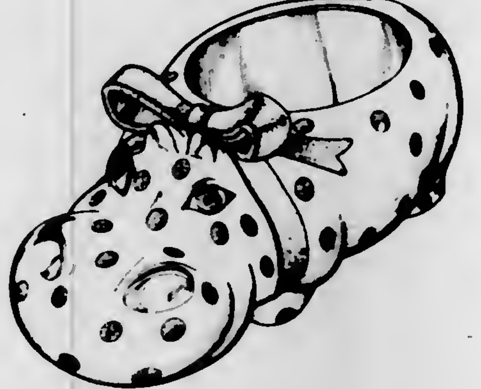
Dale R. Hodges, 4103 Inwood Road, Dallas, Tex. 75209

Filed Sept. 17, 1975, Ser. No. 613,972

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—149



243,033
CANDLE HOLDER

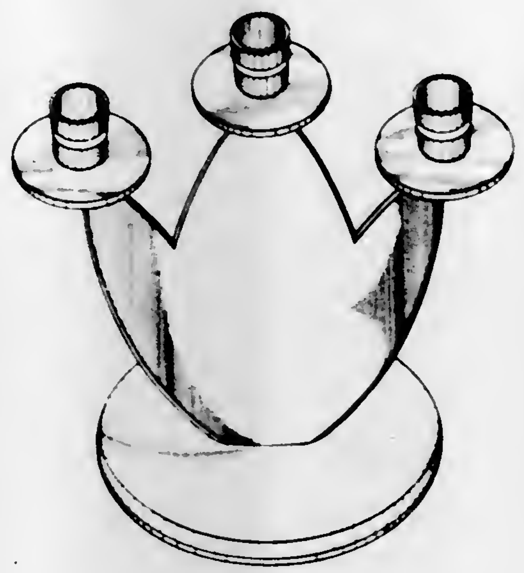
Vladimir Benes, 2157 N. Shore Road, Bellingham, Wash. 98225

Filed Nov. 10, 1975, Ser. No. 630,663

Term of patent 14 years

Int. Cl. D26—*01*

U.S. Cl. D48—2



243,034
REFLECTOR FOR A PORTABLE ELONGATED LAMP

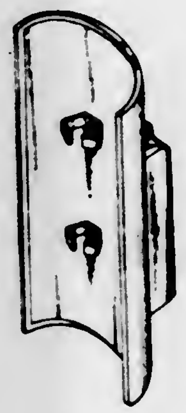
Fred E. Marsh, Jr., P.O. Box 11463, Knoxville, Tenn. 37919

Filed Sept. 10, 1975, Ser. No. 612,001

Term of patent 14 years

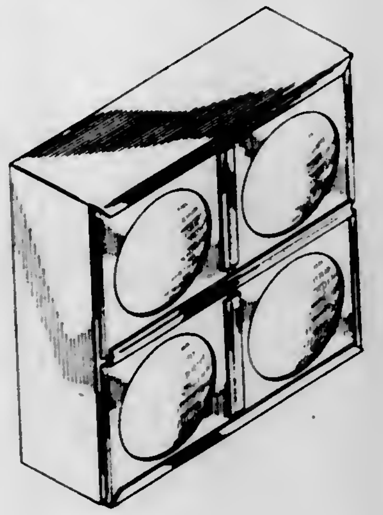
Int. Cl. D26—*05*

U.S. Cl. D48—16 D



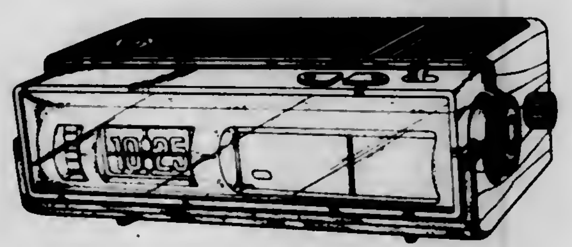
243,035
STAGE LIGHT
Gerald H. Kohlenstein, 310 N. Chicago St., New Buffalo, Mich. 49117

Filed Jan. 9, 1976, Ser. No. 647,992
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



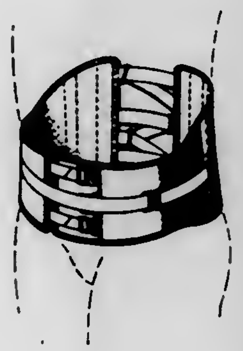
243,036
CLOCK RADIO
Masanori Hamada, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Japan

Filed Oct. 10, 1974, Ser. No. 513,947
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



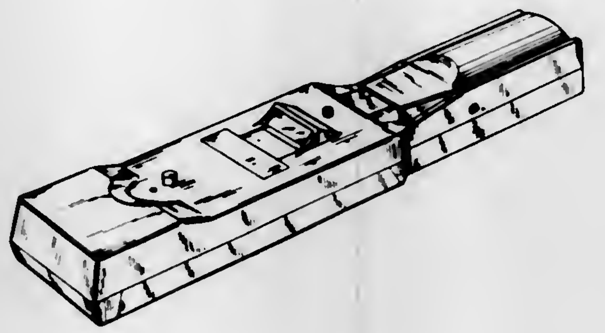
243,037
LUMBO-SACRAL SUPPORT
Irving Spiro, Miami, Fla., assignor to All Orthopedic Appliances, Inc.

Filed Aug. 22, 1974, Ser. No. 499,765
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 J



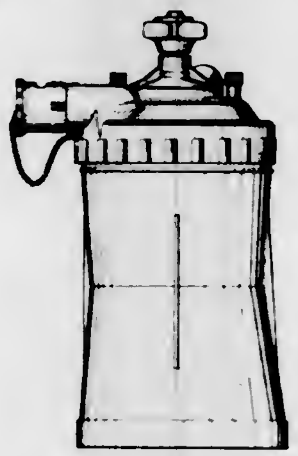
243,038
ELECTRONIC METER FOR DETERMINING HUMAN PULSE RATE FROM A FINGERTIP
Phillip E. Ray, Denver, Colo., assignor to Electromedics, Inc.

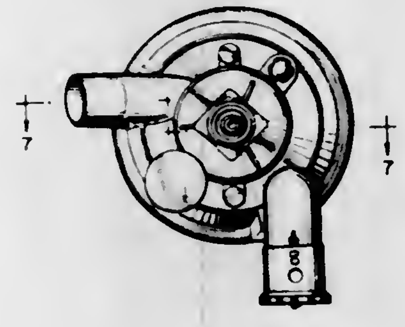
Filed Apr. 14, 1975, Ser. No. 567,542
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



243,039
NEBULIZER UNIT OR SIMILAR ARTICLE
Robert J. Aul, Perrysburg, Ohio; Robert S. Babington, McLean, Va.; Glenn H. Dunlap, Maumee, and Wayne J. Zitkus, Toledo, both of Ohio, assignors to American Hospital Supply Corporation, Evanston, Ill.

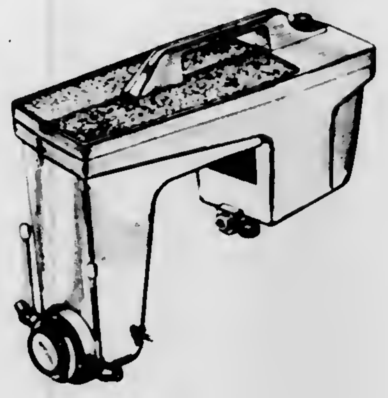
Filed May 14, 1975, Ser. No. 577,528
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 N

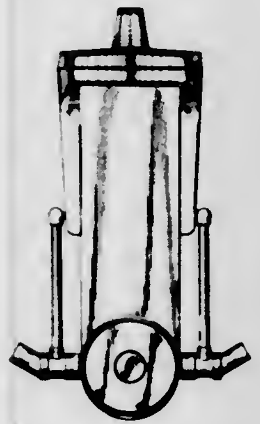




243,040
HYDROTHERAPY BATH ASSEMBLY
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc. an Illinois Corporation, Ill.

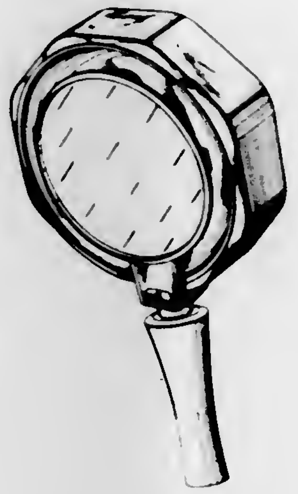
Filed Mar. 12, 1976, Ser. No. 666,481
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 C





243,041
LOOKING GLASS OR SIMILAR ARTICLE
Walter C. Anderson, West Redding, Conn., assignor to General Electric Company

Filed Aug. 29, 1975, Ser. No. 608,918
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 H



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PATENTS WERE ISSUED ON THE 11TH DAY OF JANUARY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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  - Merry, Roydon William; and Sherman, James Lee, 4,002,393.
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  - Reuter, Peter; Eilingsfeld, Heinz; and Patsch, Manfred, 4,002,653
  - Strohmeyer, Max; Hagen, Werner; and Hohenschutz, Heinz, 4,002,539.
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  - Meiser, Werner, Kramer, Wolfgang, Buchel, Karl Heinz; and Plempel, Manfred, 4,002,763.
  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,002,762.
  - Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,002,641.
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  - Mandeville, Gordon James; and McLean, Dale Irving, 4,003,006.
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  - Taplin, Lael Brent, 4,002,077.
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- Bennett, David F. Articulated hose support 4,002,357, Cl 285-61.000.
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- **Biorex Laboratories, Limited**: *See—*
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- **Bissonette, Vernon Leon**, to Eastman Kodak Company. Diffusion transfer processes and elements using or containing inert transitional metal complex oxidizing agents. 4,002,477, Cl. 96-3.000.
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- **Bixby, Leon C.**, to Hendrick Manufacturing Company. Screen having parallel slots. 4,002,540, Cl. 204-24.000.
- **Blachford, John**, to H. L. Blachford Limited. Lubricants for powdered metals. 4,002,474, Cl. 75-211.000.
- **Blackmore, Donald F.**, to General Motors Corporation. Valve assembly for exhaust system. 4,002,370, Cl. 298-1.00H.
- **Blanchard, Carl L.**, to United States of America, Interior. Deductive method for measuring ion concentration electrically. 4,002,428, Cl. 23-230.00R.
- **Blank, Stuart Lawrence**, to Bell Telephone Laboratories, Incorporated. Magnetic bubble devices with controlled temperature characteristics. 4,002,803, Cl. 428-539.000.
- **Blank, Walter G., Sr.; Laacke, Frank; Priser, Jacob W.; and White, Robert W.**, to McDonnell Douglas Corporation. Aircraft conformal load carrying pallet. 4,002,313, Cl. 244-118.00R.
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- **Bliss, Denys Stanley**, to Bliss Pendair Limited. Tracked air cushion vehicle systems. 4,002,124, Cl. 104-23.0FS.
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- **Blucher, Richard L.**, to Catalyst Research Corporation. Electrolyte-depolarizers for thermal batteries. 4,002,498, Cl. 136-205.000.
- **Blumensaadt, Hans Christian**, to Testa-Laboratorium A/S. Resuscitation training apparatus. 4,001,950, Cl. 35-17.000.
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- **Booker, Donald E.**: *See—*
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- **Borge, Magne; and Lode, Torger**, to Exxon Research and Engineering Company. Process of minimizing or preventing fouling. 4,002,554, Cl. 208-48.0AA.
- **Borggrefe, Gerhard**, to Henkel & Cie G.m.b.H. Hydroxyethercarboxylic acids. 4,002,676, Cl. 260-535.00P.
- **Borman, August H.**, to General Motors Corporation. Hydrodynamic drive and slipping clutch. 4,002,228, Cl. 192-3.300.
- **Bornstein, Michael; and Carone, Sandra M.**, to Eli Lilly and Company. Method of preparing sterile essentially amorphous cefazolin for reconstitution for parenteral administration. 4,002,748, Cl. 424-246.000.
- **Borris, David P.**, to Research Corporation. Prevention and/or treatment of poison ivy dermatitis. 4,002,737, Cl. 424-94.000.
- **Borst, John A.**, to Owens-Corning Fiberglas Corporation. Level-sensitive system. 4,002,068, Cl. 73-302.000.
- **Bosik, Barry Sheldon; and Stone, Dale Eugene**, to Bell Telephone Laboratories, Incorporated. Telephone ringing control circuits. 4,002,838, Cl. 179-2.50R.
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- **Braden, Rudolf; Knupfer, Hans; and Hartung, Sigurd**, to Bayer Aktiengesellschaft. Process for the preparation of unsaturated amino compounds. 4,002,673, Cl. 260-510.000.
- **Bradley, William David; and Denham, Keith**, to Aerpat A.G. Rivet. 4,002,099, Cl. 85-74.000.
- **Bradley, Willie Ray.** Prostate massager. 4,002,164, Cl. 128-67.000.
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- **Brandt, Georg; and Kolar, Werner**, to Georg Muller Kugellagerfabrik K.G. Apparatus for handling workpieces such as semiconductor substrates. 4,002,246, Cl. 214-1.0BH.
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- **Brauer, John Robert**, to A. O. Smith Corporation. Reciprocating linear motor. 4,002,935, Cl. 310-27.000.
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- **Brauning, Gerhard**, to Eastman Kodak Company. Automatic photographic shutter control apparatus. 4,003,067, Cl. 354-235.000.
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- **Brey, William Andrew**: *See—*
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- **Bridenbaugh, Paul Michael; Liao, Paul Foo-Hung; Tofield, Bruce Cedric; and Weber, Heinz Paul**, to Bell Telephone Laboratories, Incorporated. Process for growing acicula of rare earth pentaphosphates. 4,002,725, Cl. 423-263.000.
- **Bridgestone Tire Company Limited**: *See—*
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- **Broadbent, Edward Granville**, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Truncated aerofoils having spanwise splitters. 4,002,312, Cl. 244-40.00R.
- **Broce, Fred L.; Bentley, William F., Jr.; and Kilpatrick, William L.**, to United States of America, Federal Communications Commission. Direction finding receiver. 4,003,060, Cl. 343-113.0PT.
- **Broeckx, Willy P.; and Dulog, Lothar G.**, to S.A. Texaco Belgium N.V. Diesel fuel composition. 4,002,437, Cl. 44-66.000.
- **Broersma, Harmen.** Transducer and method of making same. 4,002,863, Cl. 179-180.000.
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- **Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft**: *See—*
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- **Brown, John Buchanan; and Gardiner, Frank J.**, to Laser Graphic Systems Corporation. Apparatus for compensating for optical error in a rotative mirror. 4,002,830, Cl. 358-293.000.
- **Brown, Johnny Milton**: *See—*
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- **Brown, Kenton J.; and Kempf, Arthur W.**, to International Paper Company. Oxygen-alkali delignification of low consistency wood pulp. 4,002,526, Cl. 162-57.000.
- **Brown, Lynnie Barry**: *See—*
  - Konrad, Charles Edward; and Brown, Lynnie Barry, 4,002,972.
- **Brown, Michael Harold**, to United Kingdom Atomic Energy Authority. Thermoelectric batteries. 4,002,497, Cl. 136-202.000.
- **Brown, Richard C.; and Shuster, Stuart B.**, to General Motors Corporation. Compact refrigerator combined with top storage container. 4,002,384, Cl. 312-284.000.
- **Brown, Trenton L.**, to Aluminum Company of America. Automatic setup for machining device. 4,002,102, Cl. 90-15.00R.
- **Brunetti, Heimo; Schmidt, Andreas; and Rosenberger, Siegfried**, to Ciba-Geigy Corporation. Process for the manufacture of acylhydrazines. 4,002,680, Cl. 260-559.00H.
- **Brunnengraber, Hermann**, to Gebr. Hofmann KG. Method and circuit for use in determining unbalance of a rotary body. 4,002,076, Cl. 73-462.000.

- **Bruno, Edward C.** Method and apparatus for packaging goods. 4,002,006, Cl. 53-29.000.
- **Bruno, Edward G.** Combination scaffold and utility platform 4,002,222, Cl. 182-132.000.
- **Brusa, Ugo.** Process for continuously heating and melting prereduced iron ores. 4,002,465, Cl. 75-11.000.
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- **Buchalter, Gilbert.** Method of transmitting ultrasonic impulses to surface using transducer coupling agent. 4,002,221, Cl. 181-.500.
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- **Bucheli, Josef**, to Tuflex AG. Expansion anchor sleeve and method of making the same. 4,002,100, Cl. 85-85.000.
- **Buck, Erville C.**, to Willamette Valley Company, The. Proportioning systems. 4,002,271, Cl. 222-134.000.
- **Buckley, Charles O.**: *See—*
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- **Bukowick, Peter A.**, to Hercules Incorporated. 2-Furaldoximinyl allophanates. 4,002,649, Cl 260-347 300.
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- **Bult, Roelof P.**, to Cominco Ltd. Stabilization of aluminum arsenide. 4,002,505, Cl. 148-20.300.
- **Bumber, Roger L.** Multi-channel decoding circuit for two-channel audio systems 4,002,835, Cl. 179-1.0GQ.
- **Bunda, Tsuchio**: *See—*
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- **Busch, Dieter K.**, to VDO Adolf Schindling AG. Device for measurement and/or control of temperature. 4,002,924, Cl. 307-117.000.
- **Busch, Walter**: *See—*
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- **Butler, James R.**: *See—*
  - Turner, James E., and Butler, James R., 4,002,739.
- **Butler, Walter J.; Barron, Mark B.; and Kurz, Bruno F, deceased (by Kurz-Beerli, Elizabeth, executrix)**, to General Electric Company Bucket-brigade delay line having reduced parasitic capacitances and method for making the same 4,002,513, Cl. 148-187.000.
- **Byrd, Carlisle O., Jr.**, to J. T. Thorpe Company Prefabricated insulating blocks for furnace lining. 4,001,996, Cl. 52-509 000.
- **Bytzek, Max** *See—*
  - Hammer, Klaus-Dieter; Klendauer, Wolfgang, and Bytzek, Max, 4,002,485
- **C.A.V Limited** *See—*
  - Nicholls, Wilfrid Edward Walter; and Lakra, Paul, 4,002,415
- **Calderon, Albert** Pollution control of coke ovens 4,002,537, Cl 202-248.000.
- **Cale, Albert Duncan, Jr.**, to A H. Robins Company, Incorporated. N-(1-substituted-3-pyrrolidinyl)-4-quinolinecarboxamides. 4,002,757, Cl. 424-258.000
- **Calgon Corporation**: *See—*
  - Farley, David E.; and Morgan, Janice Elaine, 4,002,589.
- **Camco, Incorporated.** *See—*
  - Terral, Ben David, 4,002,203.
- **Camerman, Philippe Jean Andre Charles; and Hanotier, Jacques Daniel Victor**, to Labofina S.A. Process for the oxidation of secondary alcohols into ketones. 4,002,685, Cl. 260-593.00R.
- **Camerman, Philippe Jean Andre Charles**: *See—*
  - Hanotier, Jacques Daniel Victor; and Camerman, Philippe Jean Andre Charles, 4,002,656.
- **Cameron, Douglas H., and Clem, Bryan M.**, to Minnesota Mining and Manufacturing Company Magnetic tape cartridge with removable spool. 4,002,238, Cl. 206-408.000.
- **Campanelli, Tony.** Cleaning, polishing, and drying nails by moving them through vibratory troughs. 4,002,488, Cl. 134-7.000.
- **Campbell, Bernerd E.**: *See—*
  - Mallozzi, Philip J.; Epstein, Harold M.; Applebaum, David C; Gallagher, William J.; and Campbell, Bernerd E., 4,002,403
- **Campbell Industries**: *See—*
  - Jangaard, Sverre, 4,002,377.
- **Campbell, Ronald P.**: *See—*
  - Ketler, Albert E.; Campbell, Ronald P.; and Shacreaw, George, 4,002,895.
- **Canada Wire and Cable Limited**: *See—*
  - Paniri, Zvi; and Shakotko, Walter, 4,002,820.
- **Canon Kabushiki Kaisha**: *See—*
  - Hashimoto, Shigeru; and Ito, Masaharu, 4,003,068.
  - Hirata, Osamu, 4,003,092.
  - Sugiura, Yoshinori, Endo, Kiyonobu, Kono, Kimio, and Sato, Hideaki, 4,003,059.
- **Canter, James Allen**, to General Motors Corporation Thermostat control system for an automatic ice maker 4,002,041, Cl 62-137.000
- **Cappel, Marie-Luise**: *See—*
  - Frohlich, Alfons; and Cappel, Marie-Luise, 4,002,045.
- **Capra, Uberto**, to Ceccato & C S p A Vehicle-washing station with scrubbing unit composed of vertically superposed rotary brushes 4,001,907, Cl 15-53 00A
- **Carbonel, Jack; Grammont, Paul D. A.; and Herbin, Jean E. E.**, to Diamond Shamrock Corporation. Cation-exchange resins having cross-linked vinyl aromatic polymer matrix with attached amino alkylene phosphonic acid groups, their use, and preparation. 4,002,564, Cl 210-38 00R
- **Carborundum Company, The.** *See—*
  - Marin, Glenn R., 4,002,225.
- **Cardon, Carlos D, and Griffone, Lawrence P.**, to Sperry Rand Corporation. Programmable high pass digital filter of analog signal 4,002,988, Cl. 328-138.000.
- **Cardon, Carlos D., and Griffone, Lawrence P**, to Sperry Rand Corporation. Programmable low pass digital filter of analog signal. 4,002,989, Cl 328-138.000.
- **Cardpak Incorporated.** *See—*
  - Place, Osmund V; Hungerford, Philip C., Jr., and Gereby, John L., 4,002,003
- **Cardwell, Paul H.**: *See—*
  - Sandberg, Richard G, Kane, William S., and Cardwell, Paul H, 4,002,717
- **Carlo Erba S p.A** *See—*
  - Ambrogi, Vittorio; Logemann, Willy, Parenti, Marc Antonio; and Tommasini, Raffaele, 4,002,750
- **Carlow, Earl F.**: *See—*
  - Bennett, Thomas H.; Carlow, Earl F., Peddle, Charles, and Wiles, Michael F., 4,003,028
- **Carone, Sandra M.** *See—*
  - Bornstein, Michael, and Carone, Sandra M., 4,002,748.
- **Carpenter, Donald E** *See—*
  - Baimbridge, Charles L, Minderhout, James R., Bearman, Robert W.; and Carpenter, Donald E, 4,002,548.
- **Carpi, Carlo, Dorigotti, Luciano, and Pifferi, Giorgio**, to I.S.F. S.p.A 6-Substituted 3-carbethoxyhydrazinopyridazines. 4,002,753, Cl 424-250 000.
- **Cashen, Norton A**, to United States of America, Agriculture. Method of producing anhydrous crystalline reaction products of formaldehyde and methyl-, ethyl carbamate. 4,002,668, Cl. 260-482.00C
- **Casio Computer Co., Ltd.** *See—*
  - Kashio, Toshio, 4,003,031
- **Cassarino, Frank V, Jr** *See—*
  - O'Keefe, David B., Cassarino, Frank V, Jr., and Riikonen, Douglas L., 4,003,033.
- **Cassella Farbwerke Mainkur Aktiengesellschaft** *See—*
  - Heinrich, Ernst; Kindler, Horst, and Ribka, Joachim, 4,002,425
- **Catalyst Research Corporation**: *See—*
  - Blucher, Richard L, 4,002,498.
- **Catania, Basilio**, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Mixed analog/digital transmission system using radio link and method of operating same. 4,002,982, Cl. 325-39.000.
- **Caterpillar Tractor Co** *See—*
  - Erickson, Rodney R; Peters, Melvin H., and McMillan, Daniel L, 4,002,107.
  - Vanlandingham, Harold W., Boggs, Roger L.; Bullock, David A; and Maytum, James N, 4,002,090.
  - Wilson, Eugene M., and Girard, William T., 4,001,956
- **Catozzo, Leo.** Film splicing device. 4,002,522, Cl. 156-506.000.
- **Cavanaugh, Robert E., Jr** *See—*
  - Packard, Lyle E., Polic, Edward F., and Cavanaugh, Robert E., Jr, 4,002,909.
- **Caveney, Jack E**, to Panduit Corporation. Fixed dog ladder strap 4,001,898, Cl. 24-16 0PB
- **Cavin, Daniel C**, to Shell Oil Company. Timing the deposition of an asphalt plugging material from an asphalt-cationic emulsion. 4,002,204, Cl. 166-294.000.
- **CEAC of Illinois, Inc.** *See—*
  - Menninga, Gysbert L., 4,002,952
- **CEBAL**: *See—*
  - Gaborieau, Jean-Yves, and Baumann, Bernard, 4,002,516.
- **Ceccato & C. S.p.A.** *See—*
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- **Celanese Corporation** *See—*
  - Chenevey, Edward Clarence, and Kimmel, Robert Michael, 4,002,426.
- **Century Time Ltd.**: *See—*
  - Klingenberg, Hans Ulrich, 4,002,020.
- **Chambley, Phillip W.**: *See—*
  - Norris, Alan H.; and Chambley, Phillip W., 4,002,012.
- **Champion International Corporation.** *See—*
  - Norris, Alan H.; and Chambley, Phillip W., 4,002,012.
  - Wright, John T., 4,001,974.
- **Chan, Harvey T., Jr.**, to United States of America, Agriculture. Method for removing seeds from papayas. 4,002,774, Cl. 426-484.000.
- **Chandler, Benson.** Wood truss structure with eccentric end support. 4,001,999, Cl. 52-693.000.
- **Chang, Hsu**, to International Business Machines Corporation. Magnetic bubble domain processing apparatus and method. 4,003,037, Cl. 340-174.0TF.

Chang, Ten-Hsiang. Electronic switch for controlling the speed of a motor. 4,002,961, Cl. 318-305.000.

Chang, Yun Feng: *See—*

Labana, Santokh S.; and Chang, Yun Feng, 4,002,699.

Chappell, Ronald George: *See—*

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Chaprnka, Anthony G.: *See—*

Sun, Shan C.; and Chaprnka, Anthony G., 4,002,977.

Charbonnages de France: *See—*

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Chase, Peter McGivery: *See—*

Debortoli, George; and Chase, Peter McGivery, 4,002,832.

Chase, William P.; and Holloschutz, Leon. Prefabricated building structure. 4,001,990, Cl. 52-167.000.

Chasens, Bernard, to General Instrument Corporation. Vertical coil for a deflection yoke. 4,003,012, Cl. 335-213.000.

Chaston, Jack Chambers: *See—*

Bourne, Alan Arthur; Chaston, Jack Chambers; and Darling, Alan Sydney, 4,002,503.

Chem. Pharmaz. Fabrik Dr. Herman Thiemann G.m.b.H.: *See—*

Eiden, Fritz; and Schmiz, Claus, 4,002,617.

Chemical Reactor Equipment A/S: *See—*

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Chen, Nai Yuen, to Mobil Oil Corporation. Selective production of para-xylene. 4,002,697, Cl. 260-671.00M.

Chenevey, Edward Clarence; and Kimmel, Robert Michael, to Celanese Corporation. Production of stabilized non-burning acrylic fibers and films. 4,002,426, Cl. 8-115.500.

Cheplick, Peter G.: *See—*

MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; Thompson, Charles D.; and Cheplick, Peter G., 4,002,466.

Cherry, Sidney J., to Westinghouse Electric Corporation. Vacuum-type circuit interrupters with condensing shield at a fixed potential relative to the contacts. 4,002,867, Cl. 200-144.00B.

Chevron Research Company: *See—*

Csicsery, Sigmund M., 4,002,578.
DeMay, George B., 4,002,728.
Farnham, Robert A., 4,002,555.
Farrell, Thomas R.; Klett, Robert J.; and Craig, James A., 4,002,565.
Guffy, Joseph C.; Winkler, Robert A.; and Paulson, Marvin H., 4,002,721.
West, James M., 4,002,881.

Chew, Thomas: *See—*

Nye, James Leroy; Barr, Samuel Rothrock; Chew, Thomas; and Steyer, William, 4,002,024.

Chikashige, Kiyoshi. Flash device for a focal plane shutter camera. 4,003,065, Cl. 354-132.000.

Chin, Kenneth Gan Gee, to Lawrence Peska Associates, Inc., a part interest. Board game of the hare and tortoise. 4,002,341, Cl. 273-134.00G.

Ching, Yau-Chau; Hofmann, Allan Michael; and Messerschmitt, David Gavin, to Bell Telephone Laboratories, Incorporated. Data compression using nearly instantaneous companding in a digital speech interpolation system. 4,002,841, Cl. 179-15.0AS.

Chiriac, Ilie: *See—*

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Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, to Hoffmann-La Roche Inc. Novel benzofuranyl pest retardants. 4,002,647, Cl. 260-346.20R.

Christian, James Vernon: *See—*

Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, 4,002,372.

Christiansen, Soren Bent, to F. L. Smidth & Co. Method of burning calcined and uncalcined pulverous raw material and rotary kiln plant therefor. 4,002,420, Cl. 432-14.000.

Chua, H. T.: *See—*

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Ciba-Geigy Corporation: *See—*

Allgeier, Hans; and Gagneux, Andre, 4,002,764.
Anner, Georg; and Wieland, Peter, 4,002,614.
Brunetti, Heimo; Schmidt, Andreas; and Rosenberger,-Siegfried, 4,002,680.
Dengler, Siegfried; Loew, Peter; Zickendraht, Christian; and Schwander, Hansrudolf, 4,002,619.
Frey, Christoph, 4,002,635.
Habermeier, Jurgen, 4,002,600.
Jager, Horst, 4,002,657.
Karrer, Friedrich; and Farooq, Saleem, 4,002,768.
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Cikotte, Leonard Joseph: *See—*

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Ciments Lafarge S.A.: *See—*

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Citizen Watch Co., Ltd.: *See—*

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Clarke, Christopher Keith Perry, to Marconi Company Limited, The; and Standard Telephones & Cables Limited. Digital signal transmission. 4,003,020, Cl. 340-146.1AL.

Clauss, Richard John; and Tremmel, Robert Arnold, to Oxy Metal Industries Corporation. Electrodeposition of bright nickel-iron deposits. 4,002,543, Cl. 204-41.000.

Clavin, Edward Albert, to Mid-Continent Pipeline Equipment Co., a division of Harrisburg, Inc. Force maintaining toggles systems. 4,002,050, Cl. 72-466.000.

Clem, Bryan M.: *See—*

Cameron, Douglas H.; and Clem, Bryan M., 4,002,238.

Cleveland Machine Controls, Inc.: *See—*

Reiner, Robert Leopold, 4,002,270.

Cloke, Robert L.: *See—*

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Coca-Cola Co., The: *See—*

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Cocci, James Alfred; and Schiff, Maurice L., to United States of America, Navy. PCM synchronization and multiplexing system. 4,002,834, Cl. 178-69.100.

Coenen, Matthias Christian, to Jenaer Glaswerk Schott & Gen. Glass compositions suitable for incorporation into concrete. 4,002,482, Cl. 106-40.00V.

Coffin, Jack Caryl, to RCA Corporation. Photodetector non-responsive to cerenkov radiation. 4,002,901, Cl. 250-211.00R.

Cohen, Neal Ian, to Magid Glove Manufacturing Company, Inc. Paneled dip-coated work glove. 4,001,895, Cl. 2-161.00R.

Cole, Geoffrey Alan: *See—*

Jones, Eric; Padget, John Christopher; and Cole, Geoffrey Alan, 4,002,814.

Colechia, Edward A., to Textron, Inc. Notched head nail having a pair of depending annularly spaced radial abutment ribs and package thereof. 4,002,098, Cl. 85-28.000.

Coleman, Kenneth R.; Steinebach, Hans G.; Waden, H. Werner; and Zamek, Paul, to Colenta American Corporation. Film transport apparatus utilizing rollers to provide a U-path. 4,002,280, Cl. 226-171.000.

Coleman, Richard R., Jr.; and Weber, Helmut E. Compressor-expander rotor as employed with an integral turbo-compressor wave engine. 4,002,414, Cl. 416-223.00A.

Colenta American Corporation: *See—*

Coleman, Kenneth R.; Steinebach, Hans G.; Waden, H. Werner; and Zamek, Paul, 4,002,280.

Colgate-Palmolive Company: *See—*

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Collins, Cecil A.: *See—*

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Collins, William J. Device and method for obtaining one or more samples of liquid. 4,002,071, Cl. 73-425.40R.

Collins, William J. Device and method of obtaining a sample of liquid. 4,002,072, Cl. 73-425.600.

Collins, William J. Molten metal sampler. 4,002,073, Cl. 73-425.40R.

Collins, William J. Device and method for obtaining one or more samples of mollen metal. 4,002,074, Cl. 73-425.40R.

Colt Industries Operating Corporation: *See—*

Bell, Oliver A., Jr.; and Gilleland, Randall C., 4,002,885.

Comalco Aluminium (Bell Bay) Limited: *See—*

Bainbridge, Ian Frank; and Adam, Colin McLean, 4,002,502.

Combustion Engineering, Inc.: *See—*

Andrea, Christo; Dupen, Clive Frederick George; and Noyes, Richard Croissant, 4,002,529.
Skalka, Clemens John, 4,002,299.

Cominco Ltd.: *See—*

Bult, Roelof P., 4,002,505.

Compagnie Francaise de Raffinage: *See—*

D'Aubigne, Jean Merle; Maurin, Jean; and Weisang, Joseph Edouard, 4,002,687.

Compagnie Industrielle des Piles Electriques "Cipel": *See—*

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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*

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Conax Corporation: *See—*

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Cone, Eugene J., to PPG Industries, Inc. Glass bead forming nozzles and method. 4,002,447, Cl. 65-21.000.

Cone, Eugene J.: *See—*

Hammel, Joseph J.; and Cone, Eugene J., 4,002,446.

Conley, Robert F., to IMC Chemical Group. Process for bleaching kaolin. 4,002,487, Cl. 106-288.00B.

Connell, Maurice W.: *See—*

Jankowiak, Roman; Okonzak, David M.; and Connell, Maurice W., 4,002,345.

Connon, Frederick L., Jr. Automatic unloading metal pickling rack. 4,002,250, Cl. 214-8.000.

Continental Group, Inc., The: *See—*

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Continental Oil Company: *See—*

Satchell, Donald P., Jr., 4,002,556.

Conwell, Esther M.; and Kermisch, Dorian, to Xerox Corporation. Externally controllable miniature lasers. 4,002,998, Cl. 331-94.50C.

Cook, Albert W. Treatment of humans with cholinesterase reactivators. 4,002,760, Cl. 424-263.000.

Cooley, Denton A.: *See—*

Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,002,174.

Coop, Jackie A., to Aluminum Company of America. Pry-off closure. 4,002,260, Cl. 215-305.000.

Cooper, Abraham J. Dental restoration jig. 4,001,938, Cl. 32-11.000.

Cordiano, Dominic D.; Kastelic, Joseph D.; and Thomas, Vernon E., to General Electric Company. Single latch snap-lock base for annular fluorescent lamps. 4,002,394, Cl. 339-50.00C.

Corman, Edward M.: *See—*

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Cornell, Paul A.: *See—*

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Gregory, Jerry L.; and Pitcher, Wayne H., Jr., 4,002,576
Griffith, James L.; and Spremulli, Paul F., 4,002,448.
Knapp, Warren R.; and West, Richard L., Sr., 4,002,451.
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Cotter, Donald, to Field Form, Inc. Metal roofing/siding system 4,001,995, Cl. 52-460.000.

Coulthard, James Albert, to Kepac, Limited. Screen constructions 4,001,987, Cl. 52-79.900.

Council of Livestock Protection, Inc.: *See—*

Prince, Ralph P.; and Westervelt, Rudy G., 4,001,915.

Coutarel, Yves, to Intertechnique S.A. Program selection, particularly for liquid scintillation spectrometers 4,002,908, Cl. 250-328.000.

Craig, James A.: *See—*

Farrell, Thomas R.; Klett, Robert J.; and Craig, James A., 4,002,565.

Cramer, Robert L.; and Mientus, James A., to Bendix Corporation, The. Self-regulating cryostat. 4,002,039, Cl. 62-224.000.

Crawford, Alexander; and Bailey, Alfred J., to Massey-Ferguson Services N.V. Material unloading implements. 4,002,272, Cl 222-392.000.

Cricchio, Renato; and Arioli, Vittorio, to Gruppo Lepetit S.p.A. Piperazinylimino rifamycins. 4,002,752, Cl. 424-250.000.

Cricchio, Renato; and Arioli, Vittorio, to Gruppo Lepetit S.p.A. Substituted piperazinyliminorifamycins. 4,002,754, Cl. 424-250.000

Cross, David E., to Smiths Industries Limited. Liquid-measuring apparatus. 4,002,075, Cl. 73-426.000.

Crowle, William G., and Ostrowsky, Efrem M., to VCA Corporation. Safety cap. 4,002,275, Cl. 222-543.000.

Cruz, Gustavo Joel. Graphic reproduction apparatus. 4,001,941, Cl 33-1.00K.

CSELT - Centro Studi e Laboratori Telecomunicazioni SpA: *See—*

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Csicsery, Sigmund M., to Chevron Research Company. Catalyst activation process. 4,002,578, Cl. 252-455.00Z.

Culbertson, Samuel W.: *See—*

Krohn, Duane D.; and Culbertson, Samuel W., 4,001,935

Cupler, John A., II. Method and apparatus for performing surgery without tissue incision. 4,002,169, Cl. 128-276.000.

Curchack, Herbert D., to United States of America, Army. Rifled soft recovery system. 4,002,064, Cl. 73-167.000.

Curry, John J., to Plastisonics Company, Inc. Child resistant closure. 4,002,258, Cl. 215-206.000.

Cusato, Anthony J., to Henry Mann, Inc. Elastic positioner apparatus for orthodontists. 4,001,940, Cl. 32-40.00R.

Cutler-Hammer, Inc.: *See—*

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Czerner, Peter A., to Sperry Rand Corporation. Cutter drive arrangement for an electric dry shaver. 4,001,933, Cl. 30-43.920

Dail, James Edward, to Bell Telephone Laboratories, Incorporated. Fault isolation in a serial-looped transmission system. 4,002,847, Cl. 179-15.0AL.

Daimler-Benz Aktiengesellschaft: *See—*

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Tank, Eggert; and Pigisch, Franz, 4,001,930.
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Daiwa Boseki Kabushiki Kaisha: *See—*

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Dalla Betta, Ralph A.; Piken, Ann G.; and Shelef, Mordecai, to Ford Motor Company. Methanation catalyst and process of using the same. 4,002,658, Cl. 260-449.00M.

Damgaard-Iversen, Jorgen; Gude, Klaus Erik; Hansen, Ove Emil; Lund, Bjorn; and Petersen, Mogens, to Aktieselskabet Niro Atomizer. Method and apparatus for evaporating liquid. 4,002,524, Cl. 159-4.00B.

Damon, James J., to Ford Motor Company. Resilient bushing. 4,002,327, Cl. 267-57.10A.

Damzog, Bodo: *See—*

Berges, Dietrich; Damzog, Bodo; and Saam, Ulrich, 4,002,015.

Dana Corporation: *See—*

Kestner, Michael A., 4,002,154.

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Dart Industries Inc.: *See—*

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da Silva, Herman: *See—*

van Duuren, Henrik Cornelis Anthony; and da Silva, Herman, 4,003,041

Da Silva Passos, Domicano. Harvester for rice, wheat and similar cereals 4,002,010, Cl 56-126.000.

D'Aubigne, Jean Merle; Maurin, Jean, and Weisang, Joseph Edouard, to Compagnie Francaise de Raffinage. Process for the hydroperoxidation of branched alkanes in a plurality of stages, comprising washings between the said stages. 4,002,687, Cl. 260-610.00B.

Daugherty, Kenneth E.; Luker, John P., Allen, Joseph H., and Klemm, Waldemar A., to General Portland, Inc. Expansive cement 4,002,483, Cl. 106-89.000.

Davey, Ernest A., Mathieu, Norman A.; and Parent, Edward D., to GTE Sylvania Incorporated. Evaporation source 4,002,880, Cl 219-275.000.

Davies, David Evan Naunton; and Kingsley, Stuart Alexander. Telecommunication system. 4,002,896, Cl. 250-199.000

Davis, Charles S.: *See—*

Schwan, Thomas J.; Davis, Charles S., and Honkomp, Leroy J., 4,002,652.

Davis, Hubert Greenidge: *See—*

Albright, Charles William, and Davis, Hubert Greenidge, 4,002,535.

Davis, Kirk Emerson, and Wierber, Emil Thomas, to Lubrizol Corporation, The. Method of preparing primary aliphatic mercaptans 4,002,686, Cl. 260-609.00R.

Davis, Ross Alan. Windshield antenna system with resonant element and cooperating resonant conductive edge. 4,003,056, Cl 343-704.000.

Dawihl, Walther; and Eicke, Walter, to Klockner-Werke AG. Method of and apparatus for transporting of metal fibers 4,002,464, Cl 75-.5AA.

Dayco Corporation: *See—*

Waugh, Dale L., 4,002,082

Dean Products, Inc.: *See—*

Raskin, Walter, 4,002,200

De Boer, Thijs Johannes: *See—*

Van Houten, Sjouke, and De Boer, Thijs Johannes, 4,002,945

Debortoli, George, and Chase, Peter McGivery, to Northern Electric Company Limited. Loading coil assemblies for communications cables. 4,002,832, Cl. 178-46.000.

Deepsea Ventures, Inc.: *See—*

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Deering Milliken Research Corporation: *See—*

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Degen, Peter John; and Lucas, Anthony James, to Minnesota Mining and Manufacturing Company. Sunscreening compositions 4,002,733, Cl. 424-59.000.

DeGrado, Costabile, to Okonite Company, The. Gas cable with compression type pulling assembly. 4,002,817, Cl. 174-10.000.

Deitch, James C.; and Leistiko, Lawrence F., to Magnetic Controls Company. Printed circuit jack. 4,002,399, Cl. 339-221.00M.

Delarge, Jacques E.; Thunus, Leopold N., Lapiere, Charles-Leon, and Georges, Andre H., to A. Christiaens Societe Anonyme. Certain pyridine carboxamide derivatives. 4,002,629, Cl. 260-268.00H.

de Lima Castro, Eduardo Neto. Label holder for mail bags and the like. 4,001,957, Cl. 40-10.00R.

De Loucker, Gustaaf: *See—*

Aelterman, Marcel, De Loucker, Gustaaf; Van Bouwel, Leo; Stievenart, Emile; Koninger, Horst; Schausberger, Helmut; Ertl, Franz; Rohr, Horst; and Geyken, Erwin, 4,002,267.

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Spoler, Johannes Gerhard, 4,002,125.

DeMay, George B., to Chevron Research Company. Hydrogen sulfide removal from contaminated sulfur. 4,002,728, Cl. 423-578.00R.

Demmy, Robert C., to RCA Corporation. Shadow mask cathode ray tube shield. 4,002,941, Cl. 313-402.000.

Dendy, Jackie D.: *See—*

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Dengler, Siegfried; Loew, Peter; Zickendraht, Christian; and Schwander, Hansrudolf, to Ciba-Geigy Corporation. Coumarine dyestuffs of the dispersion series. 4,002,619, Cl. 260-240.00G.

Denham, Keith: *See—*

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den Hollander, Willem, to RCA Corporation. Synchronized and regulated power supply. 4,002,965, Cl. 323-17.000.

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Desio, Frank B., to Illinois Tool Works Inc. Electrical switch housing detachably mountable on a gas valve structure 4,002,872, Cl. 200-294.000.

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Carbonel, Jack; Grammont, Paul D. A.; and Herbin, Jean E. E., 4,002,564.

- Dickens, Elmer Douglas, Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 4,002,597, Cl. 260-45.75N.
- Dickerson, Arthur F., to Hughes Aircraft Company. Power transmission control system. 4,002,950, Cl. 317-16.000.
- Dickey-john Corporation: *See—*
  - Anson, James H., 4,002,937.
- Dietrich, Ernst: *See—*
  - Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Valentin, Guenter; and Dietrich, Ernst, 4,002,430.
- Dietzgen Corporation: *See—*
  - Putnam, Dean H., 4,002,142.
- Digital Communications Corporation: *See—*
  - Kaul, Pradman P.; and Kaul, Pradeep, 4,002,845.
- DiMatteo, Paul L., to Dynell Electronics Corporation. Arrangement for varying the rate of recording of information. 4,003,027, Cl. 340-172.500.
- Dir, Gary A., to Xerox Corporation. Imaging system with latent alignment image. 4,002,404, Cl. 350-160.0LC.
- Disney, John A., to Utah State University Foundation. Gas tungsten arc welding electrode. 4,002,878, Cl. 219-121.00P.
- Dittmar, Bruce I.: *See—*
  - Aldrich, Paul E.; Berezin, Gilbert H.; and Dittmar, Bruce I., 4,002,767.
- DiTusa, Anthony J.: *See—*
  - Giori, Francis A.; and DiTusa, Anthony J., 4,002,979.
- Dixon, Paul H., to Babette Dixon, Trustee of Paul H. Dixon, Trust dated Jan. 28, 1975. Machine for picking up, transferring, turning and placing parts. 4,002,247, Cl. 214-1.0QA.
- Dixon, Paul H., to Babette Dixon, Trustee of Paul H. Dixon, Trust dated Jan. 28, 1975. Apparatus for pneumatically delivering parts. 4,002,265, Cl. 221-210.000.
- Dobala, Ronald J. Auto safety flag and holder. 4,002,138, Cl. 116-28.00R.
- Dolce, Thomas Joseph, to General Electric Company. Foamed thermoplastic compositions of a linear polyester and an ionically crosslinked copolymer. 4,002,581, Cl. 260-2.50N.
- Dolhyj, Serge R.: *See—*
  - Bremer, Noel J.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,002,650.
- Dollat, Michel Paul, to Establissements A. Chromarat & Cie. Yarn stop motion. 4,002,044, Cl. 66-161.000.
- Donaldson, Desmond M., to Borg-Warner Corporation. Multiple fluid stacked plate heat exchanger. 4,002,201, Cl. 165-140.000.
- Donjon, Jacques; Grenot, Michel; and Hazan, Jean-Pierre, to U.S. Philips Corporation. Optical image converting relay having an electro-optical element and a photoconductive element. 4,002,902, Cl. 250-213.00R.
- Donnelly, William R., to Readi Temp, Inc. Heat transfer package with a collapsible, pleated, frusto-conical, upper wall section. 4,002,235, Cl. 206-219.000.
- Dopp, Kip H. Ski clip device. 4,002,349, Cl. 280-11.37A.
- Dorigotti, Luciano: *See—*
  - Carpi, Carlo; Dorigotti, Luciano; and Pifferi, Giorgio, 4,002,753.
- Dorn, Edward G. Combined bookrack and book support. 4,002,240, Cl. 211-42.000.
- Doty, Verle L., to Kornylak Corporation. Load transfer mechanism and jam preventing controls for a vertical shelf conveyor. 4,002,231, Cl. 198-483.000.
- Doussoux, Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for multiplexing N asynchronous digital trains. 4,002,844, Cl. 179-15.0AF.
- Dover, Jerry D., to Indian Head Inc. Hot end glass container coating system. 4,002,143, Cl. 118-610.000.
- Dow Chemical Company, The: *See—*
  - Plomer, John J.; Staudacher, Gerald R.; and Roberson, Keith, 4,002,514.
  - Trepanier, Donald L., 4,002,624.
  - Trepanier, Donald L., 4,002,625.
  - Wessling, Ritchie A.; Klingler, Thomas C.; and Meyer, Victor E., 4,002,586.
- Dresser Industries, Inc.: *See—*
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- Drogen Incorporated: *See—*
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- Drori, Mordeki. Ventilated back-seat rest particularly for automotive vehicles. 4,002,108, Cl. 98-2.030.
- Drori, Mordeki. Self-regulating sprinkler. 4,002,295, Cl. 239-230.000.
- Drori, Mordeki. Rotary sprinkler particularly for use with low-energy water jets. 4,002,296, Cl. 239-230.000.
- Dubois, Roland; and Bernasconi, Alexandre Antoine, to Les Fabriques d'Assortiments Reunies. Rotary escapement for timepiece. 4,002,021, Cl. 58-117.000.
- Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, to Societe de Vente de l'Aluminium Pechiney. Process and apparatus for collecting the fumes given off during the production of aluminium in an electrolysis cell with a continuous anode. 4,002,551, Cl. 204-247.000.
- Duer, Morris J., to General Motors Corporation. Piston pump or motor having internal fluid filter. 4,002,104, Cl. 91-499.000.
- Duff, Jerry: *See—*
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- Dumesnil, Maurice E.; and Schreier, Ulrich, to Technology Glass Corporation. Glass sealed products. 4,002,799, Cl. 428-428.000.
- Duncan, Frederic James; and Chappell, Ronald George, to Imperial Chemical Industries Limited. Cementing compositions and concretes and mortars derived therefrom. 4,002,713, Cl. 264-234.000.
- Dunlop, Clifford Arthur Allen: *See—*
  - Henderson, Gary Arthur; and Dunlop, Clifford Arthur Allen, 4,002,771.
- Dunn, Robert Brian; and Lee, John Davidson, to Northern Electric Company Limited. Insulation slicing terminal. 4,002,391, Cl. 339-98.000.
- Dunphy, Matthew J., to Pyrotector, Incorporated. Optical fire detection system. 4,003,039, Cl. 340-228.00R.
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  - Howell, Gary W., 4,002,070.
  - Johnson, Melvin Harry; and Walker, Calvin Brooks, 4,002,013.
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  - Robinson, Ivan Maxwell, 4,002,646.
  - Smith, Sanford Byrom, 4,002,424.
  - Wood, Everitt Franklin, 4,001,981.
- Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, to Smith Kline & French Laboratories Limited. Pyridylbutylamino ethylene compounds. 4,002,759, Cl. 424-263.000.
- Dyer, Lawrence Dean, to Texas Instruments Incorporated. Dislocation-free growth of silicon semiconductor crystals with <110> orientation. 4,002,523, Cl. 156-617.0SP.
- Dynamit Nobel Aktiengesellschaft: *See—*
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  - Nestler, Heinz; Amort, Jurgen; and Plankl, Leo Hans, 4,002,800.
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- Dynell Electronics Corporation: *See—*
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- E. R. Squibb & Sons, Inc.: *See—*
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  - Vogt, Berthold Richard, 4,002,639.
- Eachus, Joseph J., to Honeywell Information Systems, Inc. Rate independent signalling means. 4,002,833, Cl. 178-66.00R.
- Easter, Michael J., to Westinghouse Electric Corporation. Turbine lubrication and emergency gas system. 4,002,224, Cl. 184-6.110.
- Eastman Kodak Company: *See—*
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  - Brauning, Gerhard, 4,003,067.
  - Edelman, Robert I.; Stockdale, Willis L.; Sylvester, Robert A.; and Zollo, Corrado, 4,002,517.
  - Galbraith, Floyd Malcolm, Jr., 4,003,062.
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  - Ott, Robert J.; and Franke, Hans G., 4,002,475.
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- Eberspacher, J.: *See—*
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- Ebner, Theran L.; and Hawkins, Donald W., to Houston Natural Gas Corporation. Transceiver. 4,002,837, Cl. 179-2.0AM.
- Eckert, Albin F. Putter pointer. 4,002,343, Cl. 273-163.00R.
- Edelman, Robert I.; Stockdale, Willis L.; Sylvester, Robert A.; and Zollo, Corrado, to Eastman Kodak Company. Tacked film roll and method of making same. 4,002,517, Cl. 156-73.400.
- Edmo, Torbjorn, to Bispgardens Svets & Smide AB. Piston-cylinder mechanism. 4,002,106, Cl. 92-65.000.
- Edwards, John A.: *See—*
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- Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, to General Shale Products Corporation. Pulverulent material metering and delivery system and method. 4,002,372, Cl. 302-25.000.
- Edwin Cooper & Company Limited: *See—*
  - Jayne, Gerald John Joseph; and Askew, Herbert Frank, 4,002,568.
- Egbers, Gerhard; and Artzt, Peter, to Patentverwertungs-AG der Spinnerei am Uznaberg. Method of making yarns from angora rabbit's-wool and yarns so made. 4,002,019, Cl. 57-140.0BY.
- Eggermont, Ludwig Desire Johan, to U.S. Philips Corporation. Digital converter from delta-modulated signals into PCM signals. 4,002,981, Cl. 325-38.00R.
- Eggert, Hans-Joachim; Jungnitsch, Georg; Kuehne, Rudi; Waliczek, Walter; and Zenkert, Heinrich, to Siemens Aktiengesellschaft. Housing for electrical, communications and measuring devices. 4,002,955, Cl. 317-120.000.
- Eic International Corporation: *See—*
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- Eicke, Walter: *See—*
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- Eiden, Fritz; and Schmiz, Claus, to Chem. Pharmaz. Fabrik Dr. Herman Thiemann G.m.b.H. Hydrodipyrano-phthalazine compounds. 4,002,617, Cl. 260-240.00F.

- Eilingsfeld, Heinz: *See—*
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- Einar Welins Patenter Kommanditbolag: *See—*
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- Eisenhardt, Fred W., to Alloway Manufacturing, Inc. Ditcher. 4,002,206, Cl. 172-90.000.
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- Ekzemplyarov, Oleg Nikolaevich: *See—*
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- Electro Networks, Division of Chloride, Inc. N. American Operations: *See—*
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- Eley, James M.; and Smith, Fred T., to Tyrone Hydraulics, Inc.; and Sargent Industries, Inc., part interest to each. Multiple pump control system. 4,002,027, Cl. 60-430.000.
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  - Bornstein, Michael; and Carone, Sandra M., 4,002,748.
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- Enderle, Norman Edward. Hand tool for removing a movable member from a confined space adjacent a fixed member. 4,001,927, Cl. 29-267.000.
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- Erickson, Dennis C.; and Massey, Gail A., to United States of America, Interior. Electro-optic measurement of voltage on high-voltage power lines. 4,002,975, Cl. 324-96.000.
- Erickson, Harold L.; and Weaver, Wayne S., to Quick Rip Corporation. Metal saw. 4,002,094, Cl. 83-471.300.
- Erickson, Rodney R.; Peters, Melvin H.; and McMillan, Daniel L., to Caterpillar Tractor Co. Disposable fluid actuator. 4,002,107, Cl. 92-163.000.
- Erickson, Wallace A.; and Erickson, David K., to Wallace A. Erickson & Company. Child's toothbrush having a whistle. 4,001,909, Cl. 15-105.000.
- Erie Manufacturing Company: *See—*
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- Eriksson, Mats Erik, to Hiab-Foco Aktiebolag. Vehicle cranes. 4,002,242, Cl. 212-8.00R.
- Eriksson, Nils Tage; Jacobsson, Rune William; and Sundstrom, Ingvar Georg, to Telefonaktiebolaget L M Ericsson. Radar function testing apparatus. 4,003,055, Cl. 343-17.700.
- Eriksson, Stig-Lennart, to Seco Tools AB. Cutting tool. 4,001,925, Cl. 29-96.000.
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- Esparza, Jose O., to Shell Oil Company. Removal of coatings by rotating chain flails. 4,002,491, Cl 134-6.000
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- Fafa, Jean, to Compagnie Industrielle des Piles Electriques "Cipel". Electrochemical cell. 4,002,808, Cl. 429-157.000.
- Fahrbach, Gerhard; Seiler, Erhard; and Stein, Dieter, to BASF Aktiengesellschaft. Graft copolymers based on methyl methacrylate polymers. 4,002,703, Cl. 260-901.000.
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- Falk, David C. Horticultural device. 4,002,205, Cl. 172-15.000.
- Farley, David E.; and Morgan, Janice Elaine, to Calgon Corporation. Preparation of water soluble segmented polymers. 4,002,589, Cl. 260-29.6WQ.
- Farnham, Robert A., to Chevron Research Company. Hydrocarbon reforming process 4,002,555, Cl 208-80.000.
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- Fasse, Wolfgang G. Breast cancer detection training device. 4,001,951, Cl. 35-17.000.
- Favrot, Paul, to Landis-Gendron S.A. Loader assembly. 4,001,983, Cl. 51-215.00R.
- Fawkes, David Melville; and Leng, John Lindley, to Imperial Chemical Industries Limited. Azo dyestuff including a 1,3 or 1,4-benzodioxan ring structure fused to a thiazole ring. 4,002,604, Cl. 260-155.000.
- Fecko, Francis D., to A. L. Garber Company, The. "Take-one" display card. 4,001,958, Cl. 40-124.100.
- Federal-Mogul Corporation: *See—*
  - LeBrasse, Gordon J.; and Gallatin, Victor, 4,002,472.
  - Sarnes, Myron C.; and Haynie, Robert N., 4,002,471.
- Fehiner, Francis P.; Whitman, Arthur J.; and Young, Peter L., to Corning Glass Works. Method of forming a thin film capacitor. 4,002,545, Cl. 204-192.000.

- Feighery, James M., to Tex Del Inc. Carpet roll-up mechanism. 4,002,308, Cl. 242-66.000.
- Feldman, Mark I., to Johnson & Johnson. Diaper having tab fastener with central flap. 4,002,172, Cl. 128-284.000.
- Feldman, Nicholas, to Exxon Research and Engineering Company. Removing water haze from distillate fuels. 4,002,558, Cl. 208-188.000.
- Fender, C. Leo. Tone control circuit. 4,002,994, Cl. 330-107.000.
- Fennell, S. Reed, to Aluminum Company of America. Annular eddy current test coil with magnetic laminations adjacent a limited circumferential extent. 4,002,967, Cl. 324-40.000.
- Fenoglio, David J., to Standard Oil Company (Indiana). Bis-(1,4-dihydronaphtho)[2,3-c; 2,3-f]1,2,5-trithiepane. 4,002,644, Cl. 260-327.00B.
- Fensholt, Edward C.: *See—*
  - Hanisch, Alfred H.; and Fensholt, Edward C., 4,002,398.
- Fenton, Sidney Desmond, to Storey Brothers and Company Limited. Manufacture of vehicle seats. 4,002,520, Cl. 156-246.000.
- Ferrand, Michel, to Societe d'Etudes de Machines Thermiques. Machine crank-shaft with improved dynamic balance ratio. 4,002,087, Cl. 74-595.000.
- Ferret, Georges Paul: *See—*
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- Feterl, Leon G., to SOS Consolidated, Inc. Bale handling apparatus. 4,002,147, Cl. 119-60.000.
- Fetterman, Miles Q., to PPG Industries, Inc. Scorch retardants for rubber reinforced with siliceous pigment and mercapto-type coupling agent. 4,002,594, Cl. 260-42.370.
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- Fields, Ellis K.: *See—*
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- Fiore, Joseph V.; Kelly, T. Kenneth; and Nellen, William J., to AMF Incorporated. Foams and sponge sheet for cigar manufacture. 4,002,178, Cl. 131-15.00R.
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- Fischer, Artur. Apparatus for fixing an object to a low-strength support structure. 4,001,989, Cl. 52-127.000.
- Fischer, Earl L., to Victor Comptometer Corporation. Air gun. 4,002,156, Cl. 124-67.000.
- Fischer, Ernst, to Gebr. Bohler & Co. AG. Casting mold assembly. 4,002,317, Cl. 249-79.000.
- Fischer, Peter; Schmidt, Bruno; Langer, Rolf; and Trommer, Gunter, to VEB Spinnereimaschinenbau. Open end spinning apparatus. 4,002,016, Cl. 57-58.950.
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- Fisher, Evan D., to United States of America, Army. Dual channel redundant fuze. 4,002,123, Cl. 102-70.20G.
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- Flair, Henry J., to Illinois Tool Works Inc. Variable involute disc gauge. 4,001,943, Cl. 33-174.00R.
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- Fleissner, Heinz, to Vepa AG. Process for the production of textile material lengths containing bonding agents. 4,002,783, Cl. 427-335.000.
- Fleming, Joseph. Organic conversion system. 4,002,438, Cl. 48-76.000.
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- Flodin, Benny: *See—*
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  - Smirnov, Svetoslav Georgievich; Gorbacheva, Nadezhda Semenovna; Ershova, Ljubov Valentinovna; Ljubimova, Nina Andreevna; Pestova, Galina Grigorievna; Selekhova, Nina Pavlovna; Smirnova, Margarita Ilinichna; Tiflov, Alexandr Vladimirovich; and Fomina, Nina Alexeevna, 4,002,550.
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  - Damon, James J., 4,002,327.
  - Gupta, Nirmal K.; and Ludwig, Frank A., 4,002,806.
  - Labana, Santokh S.; and Chang, Yun Feng, 4,002,699.
  - Ludwig, Frank A., 4,002,807.
- Foster, Phillip W., to Lee Blacksmith, Inc. Adjustable mounting for auxiliary farm implement. 4,002,413, Cl. 403-234.000.
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- Frank, Gerhard; and Roth, Ernst, to Siegenia-Frank KG. Window hardware. 4,002,360, Cl. 292-336.300.
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- Franklin, David W. Sweeping apparatus for coupling to a motorized vehicle. 4,001,908, Cl. 15-83.000.
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- Freedland Industries Corporation: *See—*
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- Freedland, Richard: *See—*
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- Fridinger, Tomas L., to Minnesota Mining and Manufacturing Company. Perfluoroalkanesulfonate esters. 4,002,661, Cl. 260-456.00R.
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- Galvin, Thomas J., to ICI United States Inc. Hydroxyethyl cellulose thickened hydrazine and substituted hydrazines. 4,002,515, Cl. 149-36.000.
- Gamber, William V., to Elias, Jerry D. Amusement game device. 4,002,338, Cl. 273-122.00A.
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- Gardner, Gilbert MacLean. Audio signal distributor. 4,002,836, Cl. 179-1.0GQ.
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- Graham, Roy R., to PPG Industries, Inc. Method of forming and sizing glass fibers. 4,002,445, Cl. 65-3.00C.
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  - Hendy, Brian Norman, 4,002,811.
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Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, to Ovutime, Inc. Processes and devices for determining properties of viscous fluids. 4,002,056, Cl. 73-53.000.

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Koyano, Takashi; Matsushima, Yoshihisa; and Kitamura, Tetsuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Copper carbonyl-containing catalytic solutions. 4,002,577, Cl. 252-433.000.

Kozak, John. Architectural constructional system. 4,001,986, Cl. 52-73.000.

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Kuhn, Leroy B., to Stauffer Chemical Company. Novel method for manufacturing plastisol resins. 4,002,702, Cl. 260-899.000.

Kuhn, Wolfgang Hans, to Siemens Aktiengesellschaft. Circuit arrangement for limiting the transmission speed of data signals. 4,002,987, Cl. 328-138.000.

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Larsson, Lars-Ake Evert, to Telefonaktiebolaget L M Ericsson. Telecommunication system controlled by stored program instructions. 4,002,851, Cl. 179-18.0ES.

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Lind, Gertrud Agnes Matilda. Auto-traction table. 4,002,165, Cl. 128-71.000.

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Linder, Jerome, to Sandoz, Inc. 5-Hydrazinopyridazin-3(2H)-ones. 4,002,751, Cl. 424-250.000.

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- Maas, Willem, to U.S. Philips Corporation. Plant-growth promoting agent which is provided with trace elements and which is suited for use in ultra-low-volume applications. 4,002,456, Cl. 71-3.000.
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- MacMillan, William Robertson, to Wheelabrator-Frye, Inc. Apparatus for cleaning casting. 4,001,976, Cl. 51-9.00R.
- Maçovski, Albert, to Maxim Diagnostic Imaging. Transparency contrast enhancement system. 4,002,914, Cl. 250-461.00R.
- MacPhee, John M.; and Gasparrini, Charles Robert, to Baldwin-Gegenheimer Corporation. Sheet material decurling apparatus. 4,002,047, Cl. 72-160.000.
- MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; Thompson, Charles D.; and Cheplick, Peter G., to Bethlehem Steel Corporation. Method of reducing ores. 4,002,466, Cl. 75-11.000.
- Maddox, Chesford M. Ore beneficiation method and apparatus. 4,002,462, Cl. 75-1.00R.
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- Marcellini, Robert, to Charbonnages de France. Leakproof mounting device for the support plate of a fluidization reactor grid. 4,002,263, Cl. 220-378.000.
- Marchesani, Cesare N., to Colgate-Palmolive Company. Dispensing means for moist tissues. 4,002,264, Cl. 221-63.000.
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- Martin, Guy E., to Aluminum Company of America. Oil mist lubrication of centrifugally loaded bearings. 4,002,379, Cl. 308-187.000.
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- Miller, Charles E.: *See—*
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- Miller, Donald G., to American Pulverizer Company. Reducing machine having a positively displaced grate. 4,002,302, Cl. 241-89.000.
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Miller, Jeffrey Ellis, to RCA Corporation. Full range correlator for use in a collision avoidance system. 4,003,050, Cl. 343-7.300.
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Miller, Samuel A., to United States of America, Navy. Phase locked servo loop circuit. 4,002,962, Cl. 318-329.000.
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Mink, George. Material handling apparatus having gripping means for moving articles in several directions. 4,002,245, Cl. 214-1.0BD.
Minnesota Mining and Manufacturing Company: *See*—
  Cameron, Douglas H.; and Clem, Bryan M., 4,002,238.
  Degen, Peter John; and Lucas, Anthony James, 4,002,733.
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  Slezinger, Isaak Isaevich; Belitsky, Georgy Mironovich; Shiryaev, Vladimir Alexandrovich; and Mironov, Jury Vasilievich, 4,002,934.
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Mito, Hiroshi. Lens hood for zoom lenses. 4,002,402, Cl. 350-58.000.
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Mitsui Shipbuilding and Engineering Co., Ltd.: *See*—
  Yamamoto, Etsuji; and Nakase, Noriaki, 4,002,149.
Miura, Hideki, to Sony Corporation. Phase switching circuit. 4,002,930, Cl. 307-262.000.
Miyajima, Toshiyuki: *See*—
  Watanabe, Yasuo; and Miyajima, Toshiyuki, 4,002,587.
Miyamoto, Akio. Closable counter device for vertical wall. 4,001,970, Cl. 49-171.000.
Miyano, Masateru, to G. D. Searle & Co. Deuterated prostaglandin analogs. 4,002,663, Cl. 260-468.00D.
Miyazawa, Yoshihide; Ozutsumi, Minoru; and Ogawa, Satoshi, to Hodogaya Chemical Co., Ltd. Tetrahydroquinoline or jujolidine derivative of a lactone compound of pyridine-carboxylic acid. 4,002,631, Cl. 260-287.00T.
Mizutani, Hiroshi; Tokiwa, Fumikatsu; Imamura, Tetsuya; and Sakurada, Toshiro, to Kao Soap Co., Ltd. Detergent composition. 4,002,579, Cl. 252-544.000.
Moberg, Sigurd M.; and Lundberg, George A., to E. J. Brooks Company. Seal. 4,001,919, Cl. 24-16.0PB.
Mobil Oil Corporation: *See*—
  Chen, Nai Yuen, 4,002,697.
  Kaeding, Warren W., 4,002,698.
  Owen, Hartley; and Venuto, Paul B., 4,002,557.
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Modi, Jitendra J.: *See*—
  Petersen, Richard E.; and Modi, Jitendra J., 4,002,792.
Mohrbacher, Richard J.; and Grous, Philip P., to McNeil Laboratories, Incorporated. 2-Aminobenzodiazepine-5-ones. 4,002,610, Cl. 260-239.30D.
Molina, Orlando G., to Rockwell International Corporation. Penetrant flaw inspection method. 4,002,905, Cl. 250-302.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazole derivatives. 4,002,641, Cl. 260-310.00R.
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Moller, Walter H. Multi-stage pipe feeder. 4,002,248, Cl. 214-1.00P.
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Moore Business Forms, Inc.: *See*—
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Moore, Jimmy E., to Stratoflex, Inc. Guard retainer. 4,001,918, Cl. 24-16.00R.
Moore, Thomas B. Static-type mixer and receptacle. 4,002,289, Cl. 229-44.00R.
Morgan, Charles R., to W. R. Grace & Co. Curable polyene-polythiol compositions. 4,002,798, Cl. 428-419.000.
Morgan, Janice Elaine: *See*—
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Moser, Kurt; Wegmann, Helmut; and Weigele, Reinhold, to Develop KG/Dr. Eisbein and Co. Apparatus for applying and fixing a magnetizable powder on a charged sheet. 4,002,145, Cl. 118-661.000.
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  Maurer, Louis Clifford, 4,003,089.
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Mowatt-Larssen, Erling, to General American Transportation Corporation. Railway tank car train having a two-way loading and unloading system. 4,002,192, Cl. 141-35.000.
Moyer, Norman E., to Hughes Aircraft Company. High speed divide-by-N circuit. 4,002,926, Cl. 307-225.00C.
Mozer, Larry P., to Phillips Petroleum Company. Controlled air in polyester tube extrusion for clear sealable parison. 4,002,709, Cl. 264-90.000.
Mruck, Hans-Joachim; and Maier, Gerhard, to Maschinenfabrik B. Maier KG. Chip-forming apparatus. 4,002,300, Cl. 241-37.500.
Mueller, Martin; and St. Clair, David L., to Owens-Illinois, Inc. Package of nested containers and method and apparatus for producing same. 4,002,005, Cl. 53-26.000.
Muhring, Walter; and Gossling, Ernst-Gunther. Matting for the prevention of hydraulic erosion. 4,002,034, Cl. 61-3.000.
Mukherjee, Samir; and Shepherd, William Ford, to Electro Networks, Division of Chloride, Inc. N. American Operations. Bidirectional constant impedance low pass/high pass filter circuit. 4,003,005, Cl. 333-8.000.
Mullan, Philip Joseph: *See*—
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Muller, Herbert: *See*—
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Murdoch, Francis J., to United States of America, Army. Insulation of microcircuit interconnecting wires. 4,002,282, Cl. 228-4.500.
Murdock, Robert E., to Kearney-National, Inc. Electric connector apparatus. 4,002,396, Cl. 339-111.000.
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Nagase, Mitsuo, to Yoshida Kogyo Kabushiki Kaisha. Middle rail assembly for use in screen doors and sashes. 4,002,195, Cl. 160-379.000.
Nagel-Chase Manufacturing Company: *See*—
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Naglieri, Anthony N.; and Rizkalla, Nabil, to Halcon International, Inc. Process for preparing carboxylic acid anhydrides. 4,002,677, Cl. 260-549.000.
Naglieri, Anthony N.; and Rizkalla, Nabil, to Halcon International, Inc. Preparation of carboxylic acid anhydrides. 4,002,678, Cl. 260-549.000.
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Nanoia, Maurice. Double baling press. 4,002,115, Cl. 100-53 000.
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Nestler, Heinz; Amort, Jurgen; and Plankl, Leo Hans, to Dynamit Nobel Aktiengesellschaft. Impregnation of masonry having a neutrally or acidly reaction surface. 4,002,800, Cl. 428-447.000.
Nestoridis, Antonios, to Financial Mining - Industrial and Shipping Corporation. Upgrading the nickel content from low grade nickel lateritic iron ores. 4,002,463, Cl. 75-1.00R.
Neti, Radhakrishna M.; and Bing, Colin C., to Beckman Instruments, Inc. Electrochemical reference electrode. 4,002,547, Cl. 204-195.00F.
Neumer, John Fred, to Du Pont de Nemours, E. I., and Company. Disperse bisanil dyes derived from diaminomaleonitrile and their preparation. 4,002,616, Cl. 260-240.00G.
Nevin, Robert Leland; O'Leary, John Joseph; and Cikotte, Leonard Joseph, to General Electric Company. Polar coordinate format to a cartesian coordinate format scan converter. 4,002,827, Cl. 343-5.0SC.
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr. Illuminated playball. 4,002,893, Cl. 240-6.40R.
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Niiho, Masaaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Information search system. 4,003,029, Cl. 340-172.500.
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Nikolaus, Harold W.; and Wasson, Kenneth L., to Armstrong Cork Company. Ceiling support frame with pivotally attached outriggers. 4,001,985, Cl. 52-28.000.
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Nonoyama, Tikahiro. Method for reinforcing a load-bearing surface. 4,002,283, Cl. 228-112.000.
Norback, Per: *See*—
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- Oishi, Toshio; Yoshimoto, Satoru; and Sasaki, Hiroshi, to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Printing ink binder resin. 4,002,585, Cl. 260-25.000.
- Oita, Masahiro: *See—*
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- Okamoto, Tadashi: *See—*
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- O'Keefe, David B.; Cassarino, Frank V., Jr.; and Riikonen, Douglas L., to Honeywell Information Systems, Inc. Architecture for a microprogrammed device controller. 4,003,033, Cl. 340-172.500.
- Okonite Company, The: *See—*
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- Oliver, Bill N., to AMF Incorporated. Bypassed scuba regulator. 4,002,166, Cl. 128-142.200.
- Oliver, Raymond Edward; and McGuire, George, to Matthey Rustenburg Refiners (Pty) Ltd. Separation of metals. 4,002,469, Cl. 75-101.00R.
- Ollis, William John Bernard; and Long, Clive Beech Ansley. Door mounting. 4,001,913, Cl. 16-88.000.
- Olofsen, Oluf Per, to Chemical Reactor Equipment A/S. Method and a pick-up device for lifting and moving semiconductor wafers. 4,002,254, Cl. 214-300.000.
- Olympus Optical Co., Ltd.: *See—*
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  - Satoh, Ken, 4,003,093.
- Omnium Chimique Societe Anonyme: *See—*
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- Omori, Shigenori; Maeda, Isamu; and Terada, Fumio, to Yoshida Kogyo Kabushiki Kaisha. Method and apparatus for feeding a filler cord for slide fasteners. 4,002,278, Cl. 226-1.000.
- Omron Tateisi Electronics Co.: *See—*
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- Oram, Michael Allen. Method and apparatus for the construction of concrete shells. 4,002,707, Cl. 264-31.000.
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- Orlando, Carl, to United States of America, Army. Trigger circuit. 4,002,954, Cl. 318-117.000.
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- Otoshi, Nobumasa: *See—*
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- Ouimette, Blaine N., to King Radio Corporation. Digital area navigation system and combined magnetic card reader and encoder. 4,002,887, Cl. 235-61.11D.
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  - Heimala, Seppo Olavi; Hyvarinen, Olli Viljo Juhani; Kinnunen, Jorma Pentti Eenokki; and Tiitinen, Heikki Aukusti, 4,002,544.
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- Owen, David Peter, to Quantel Limited. Sub carrier phase shifters. 4,003,078, Cl. 358-22.000.
- Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Catalytic conversion of high metals feed stocks. 4,002,557, Cl. 208-120.000.
- Owens-Corning Fiberglas Corporation: *See—*
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  - Thomas, William R., 4,002,367.
- Owens-Illinois, Inc.: *See—*
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  - Mather, George R., Jr., 4,002,160.
  - Mueller, Martin; and St. Clair, David L., 4,002,005.
  - Nolan, James F., 4,002,828.
  - Spanoudis, Louis, 4,002,449.
  - Taylor, Lynn J.; and Grier, John D., 4,002,583.
- Oxy Metal Industries Corporation: *See—*
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- Ozaki, Tadashi: *See—*
  - Yamaguchi, Shunzo; Ozaki, Tadashi; Kida, Masashi; and Konomi, Toshiaki, 4,002,025.
- Ozutsumi, Minoru: *See—*
  - Miyazawa, Yoshihide; Ozutsumi, Minoru; and Ogawa, Satoshi, 4,002,631.
- P. R. Mallory & Co., Inc.: *See—*
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- Packard Instrument Company, Inc.: *See—*
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- Page, Vernon, Jr., to Lawrence Peska Associates, Inc., a part interest. Knock-down display case kit. 4,002,233, Cl. 206-45.340.
- Pallos, Ferenc M., to Stauffer Chemical Company. Triazine-antidote compositions and methods of use for cotton. 4,002,460, Cl. 71-93.000.
- Palmer-Shile Company: *See—*
  - Howard, Robert W.; and Rose, Desmond K., 4,002,000.
- Palson, Richard C. J., to International Packaging Corporation. Article retaining pouch. 4,002,232, Cl. 206-5.000.
- Paluch, Edward S.: *See—*
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- Pandel-Bradford, Inc.: *See—*
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- Panduit Corporation: *See—*
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- Pankratz, Duane C. Porcine bacterin. 4,002,736, Cl. 424-92.000.
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- Parchmont, Harvey O., to ACF Industries, Incorporated. Telescopic shock absorber mount for a hydraulic cushioning unit in a railway car trailer hitch. 4,002,316, Cl. 248-119.00S.
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- Parkinson Cowan GWB Limited: *See—*
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- Parks, James G. Timing device for thermostatic-control units. 4,002,292, Cl. 236-46.00R.
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- Paterson, Malcolm M.; and Theodore, Michael J., to Raytheon Company. Screw conveyor with dewatering means. 4,002,559, Cl. 209-3.000.
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- Peszeszer, Endre F., to General Atomic Company. Method and apparatus for stressing a tendon and banding a structure. 4,002,304, Cl. 242-7.210.
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- Phares, Lindsey J.; and Gendron, George J., to Raymond International Inc. Method and apparatus for rapid erection of offshore towers. 4,002,038, Cl. 61-91.000.
- Phifer Wire Products, Inc.: *See—*
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- Philip Morris Incorporated: *See—*
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- Phillips, Bernard L., to Arrow-Hart, Inc. Arcing contact for a high current switch. 4,002,870, Cl. 200-146.00R.
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  - Hutchinson, William Milton, deceased, 4,002,573.
  - Mozer, Larry P., 4,002,709.
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- Pickford, Melcina H. Hair grooming composition. 4,002,734, Cl. 424-74.000.
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- Pifferi, Giorgio: *See—*
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- Pipkin, Edward L., to United States of America, Navy. Multipath sonar system. 4,003,015, Cl. 340-3.00R.
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- Plastisonics Company, Inc.: *See—*
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- Plempel, Manfred: *See—*
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  - Fetterman, Miles Q., 4,002,594.
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  - Sterzer, Fred; and Kaplan, Gerald Stanley, 4,003,049.
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- Recherche et Industrie Therapeutiques (R.I.T.): *See—*
  - T.oonen, Hugo; Roelants, Piet; and Boon, Bernard, 4,002,530.
- Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., to Texas Medical Products, Inc. Air embolus aspirator. 4,002,174, Cl. 128-347.000.
- Reed, L. J., to Motorola, Inc. Digital frequency synthesizer having selectable frequency offset between transmit and receive frequencies. 4,002,995, Cl. 331-1.00A.
- Regan, Robert J.; and Haugsjaa, Paul O., to GTE Laboratories Incorporated. Tunable microwave cavity. 4,002,943, Cl. 315-39.000.
- Regan, Robert J.: *See—*
  - McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph M.; and Regan, Robert J., 4,002,944.
- Reichard, Thomas E.: *See—*
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- Reid, Ian, to General Signal Corporation. Ground fault detector for a two-wire power supply. 4,002,968, Cl. 324-51.000.
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- Reiner, Lawrence L.; and Brady, William A. Poker pool game. 4,002,339, Cl. 273-123.00A.
- Reiner, Robert Leopold, to Cleveland Machine Controls, Inc. Vibratory feeder system. 4,002,270, Cl. 222-58.000.
- Reinhall, Rolf Bertil. Device for automatic correction of unbalance in rapidly rotating machine elements. 4,002,086, Cl. 74-573.00F.
- Reliable Electric Company: *See—*
  - Sedlacek, William S.; Paluch, Edward S.; and Brey, William Andrew, 4,002,856.
  - Stein, Richard P., 4,002,848.
- Remley, Winslow Rodeck, to United States of America, Navy. Digital beamforming system. 4,003,016, Cl. 340-6.00R.
- Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., to Westvaco Corporation. Two-step process for conditioning sized coal and 'resulting product. 4,002,533, Cl. 201-1.000.
- Research Corporation: *See—*
  - Borris, David P., 4,002,737.
- Resources Conservation Co.: *See—*
  - Ames, Robert K.; and Peters, Hans H., 4,002,562.
- Restall, Raymond B., to Raymond Lee Organization, Inc., The, a part interest. Plaque removing device. 4,002,183, Cl. 132-91.000.
- Reuter, Peter; Eilingsfeld, Heinz; and Patsch, Manfred, to BASF Aktiengesellschaft. Manufacture of anthraquinone. 4,002,653, Cl. 260-369.000.
- Revells, Robert G.: *See—*
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- Revere Copper and Brass, Incorporated: *See—*
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- Reynolds, Gordon S.: *See—*
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- Rheem Manufacturing Company: *See—*
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- Rhodes, Kenneth R.: *See—*
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- Rhone-Poulenc-Textile: *See—*
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- Ribka, Joachim: *See—*
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- Rice, Dale W., to Corning Glass Works. Particulate material feeder for high temperature vacuum. 4,002,274, Cl. 222-410.000.
- Rice, Frank L.; and Wilson, Arthur C., to General Electric Company. Removable door hinge system. 4,001,973, Cl. 49-386.000.
- Richards, Glenn L.; and Pommerening, Uwe A., to Stromberg-Carlson Corporation. Trunk adapter. 4,002,850, Cl. 179-18.0AH.
- Richmond, William O., Jr., to Wolsk Associates, Ltd. Alarm device having an oscillator. 4,003,044, Cl. 340-253.00C.
- Ricoh Co., Ltd.: *See—*
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- Ridler, Kenneth B.; and Walsh, Frank, to Vesco Manufacturing and Supply Limited. Attachment for articulated vehicle. 4,002,253, Cl. 214-147.00G.
- Riefler, Monte. Concrete block panel. 4,001,988, Cl. 52-125.000.
- Riegler, Ernst; Kron, Heinrich; and Bittner, Klaus-Jurgen, to Hoechst Aktiengesellschaft. Process and apparatus for shirring tubular casings. 4,001,914, Cl. 17-42.000.
- Riganati, John P.; and Vitols, Visvaldis A., to Rockwell International Corporation. Two-dimensional binary data enhancement system. 4,003,024, Cl. 340-146.30H.
- Riikonen, Douglas L.: *See—*
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- Ritter, Karl Heinz: *See—*
  - Ganser, Friedrich; Hammer, Thomas; Frick, Hans Dieter; Viehrig, Wolfgang; Ritter, Karl Heinz; Kwiatkowski, Wolfgang; Osegowitsch, Viktor; Glass, Josef; and Laar, Erwin, 4,002,310.
- Ritzerfeld, Gerhard. Rotary copying machine. 4,002,117, Cl. 101-91.000.
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  - Naglieri, Anthony N.; and Rizkalla, Nabil, 4,002,678.
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- Robbins, Woodrow Wilson: *See—*
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- Rock, Erwin H.: *See—*
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  - Tamura, Ronald K., 4,002,501.
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- Rohm and Haas Company: *See—*
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- Rohr, Horst: *See—*
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- Rougeau, Adam. Plowing and levee cutting device. 4,002,208, Cl. 172-398.000.
- Round Rock Lime Company: *See—*
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- Rovin, Herman; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., to Automatech Industries, Inc. Automatic bobbin rewinding for sewing machines. 4,002,130, Cl. 112-180.000.
- Rovnyak, George C., to E. R. Squibb & Sons, Inc. Substituted indolinones. 4,002,749, Cl. 424-246.000.
- Rowe, George E., deceased (by Rowe, Selma S., executrix), to Emhart Industries, Inc. Glassware forming machine of the I. S. type for upright press and blow process. 4,002,454, Cl. 65-229.000.
- Rowe, Selma S., executrix: *See—*
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- Rowland, Ronald: *See—*
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- Rowles, Howard C.: *See—*
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- Royal Seating Corporation: *See—*
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- Royer, Garfield P., to Pierce Chemical Company. Modifying enzymes with polyethylene glycol and product produced thereby. 4,002,531, Cl. 195-68.000.
- Rubin, Isaac D.; Love, Richard F.; and Holder, Charles B., to Texaco Inc. Lubricating oil composition containing aminoester dispersant. 4,002,569, Cl. 252-51.50A.
- Ruiz-Barbotteau, Alejandro. Bobbin for cinematographic films. 4,002,309, Cl. 242-71.800.
- Rundberg, Eric G. S., Jr.; Johnson, William R., Jr.; and Grubbs, Harvey J., to Philip Morris Incorporated. Smoking compositions incorporating a menthol-release agent. 4,002,179, Cl. 131-17.00A.
- Russo, Robert Victor, to GAF Corporation. Fire-retardant polyurethane. 4,002,580, Cl. 260-2.5AJ.
- Ruti Machinery Works Ltd.: *See—*
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- S & C Electric Company: *See—*
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- S. C. Johnson & Son, Inc.: *See—*
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- Saam, Ulrich: *See—*
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- Saari, Risto. Method and apparatus for operating on liquids and gases. 4,002,440, Cl. 55-25.000.
- Sagami Chemical Research Center: *See—*
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- Sandall, William R.: *See—*
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Schwan, Thomas J., to Morton-Norwich Products, Inc. 1-(2-Naphthylmethyl)-3,4,5,6-tetrahydro-2(1H)pyrimidone. 4,002,626, Cl. 260-251.00R.
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Shirahata, Ryuji; Kitamoto, Tatsuji; and Suzuki, Masaaki, to Fuji Photo Film Co., Ltd. Method for producing a magnetic recording medium. 4,002,546, Cl. 204-192.000.
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Smith, Lowell R., to Monsanto Company. Process for producing N-phosphonomethyl glycine. 4,002,672, Cl. 260-502.500.

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Smith, Norman Douglas Patrick: *See—*

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Solow, Benjamin. Portable scale. 4,002,216, Cl. 177-208.000.

Sonnenberg, Joseph, to Raychem Corporation. Bis aromatic anhydrides. 4,002,645, Cl. 260-345.200.

Sonoda, Takezo; Nakano, Masao; Okane, Michito; and Suzuki, Hideo, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Desulfurization process for hydrogen sulfide-containing gases. 4,002,727, Cl. 423-573.00R.

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Nakamura, Hideo; and Iga, Akira, 4,002,927.

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Sordello, Frank J.; and Cloke, Robert L., to Sperry Rand Corporation. Sinusoidal oscillator with electronically variable frequency. 4,003,000, Cl. 331-117.00R.

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Stahler, Gerhard; Emmel, Ludwig; and Bonin, Werner, to Hoechst Aktiengesellschaft. Mono- and dithiophosphonic acid esters and their use as pesticides. 4,002,743, Cl. 424-200.000.

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Stauffer, William O., to Swiss Aluminium Ltd. Scrap smelting process. 4,002,468, Cl. 75-68.00R.

Steck, Arnold, to Heberlein Maschinenfabrik AG. Device for modifying the yarn wrap angle in a friction false-twist device. 4,002,018, Cl. 57-77.400.

Stein, Dieter: *See—*

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Stein, Richard P., to Reliable Electric Company. Toll fraud eliminator for telephone systems. 4,002,848, Cl. 179-18.0DA.

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Steinmann, Helmut, to Robert Bosch G.m.b.H. Automatic safety belt system, particularly for vehicular, especially automotive use. 4,002,219, Cl. 180-82.00C.

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Streander, George W., to Design Systems, Inc. Solar energy absorbing article and method of making same. 4,002,541, Cl. 204-33.000.

Streckenbach, Wiilf-Christian, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for determining the time duration of received oscillations. 4,002,984, Cl. 325-392.000.

Streit, Kenneth F., to Phone-Ducs, Inc. Adapter for connecting conduit to pipe. 4,002,358, Cl. 285-137.00R.

Stringer, James L., to United States of America, Energy Research and Development Administration. Apparatus for measuring a flux of neutrons. 4,002,916, Cl. 250-392.000.

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Stromberg-Carlson Corporation: *See—*

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Sundelin, Ronald Murl. Electronic price display unit. 4,002,886, Cl. 235-61.70R.

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Takemura, Yozo; Akiyoshi, Eisuke; Matsukubo, Hiroshi; and Shibata, Toshihiko, to Nippon Steel Corporation. Measuring lance for molten metal such as steel. 4,002,069, Cl. 73-354.000.

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- Thompson, George H. B., to International Standard Electric Corporation. Integrated optical circuit. 4,002,997, Cl. 331-94.50H.
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- Todd, Paul H., Jr., to Kalsec, Inc. Process for isomerizing alpha acids to iso-alpha acids. 4,002,683, Cl. 260-586.00D.
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Wu, Chin Tao, to RCA Corporation. Self-clocking, error correcting low bandwidth digital recording system. 4,003,085, Cl. 360-40.000.

Wuttke, Joerg: *See*—
Schoeps, Karl; and Wuttke, Joerg, 4,002,859.

Xerox Corporation: *See*—
Braun, Robert A.; and Mermelstein, Robert, 4,002,776.
Conwell, Esther M.; and Kermisch, Dorian, 4,002,998.
Dir, Gary A., 4,002,404.
Lindblad, Nero R.; and Pearson, James M., 4,002,570.
Valentine, William L., 4,002,409.
Wales, John, 4,002,476.

Yackiw, Charles: *See*—
Williams, Fred; and Yackiw, Charles, 4,001,994.

Yamaguchi, Nobutaka: *See*—
Akashi, Goro; Fujiyama, Masaaki; Yamaguchi, Nobutaka; Takayama, Satoru; and Sasazawa, Koji, 4,002,804.

Yamaguchi, Shunzo; Ozaki, Tadashi; Kida, Masashi; and Konomi, Toshiaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. System for heating intake pipe of internal combustion engine. 4,002,025, Cl. 60-274.000.

Yamamoto, Etsuji; and Nakase, Noriaki, to Mitsui Shipbuilding and Engineering Co., Ltd.; and Mitsui Petrochemical Industries, Ltd. Arrangement of heat transfer tubes in a heating furnace. 4,002,149, Cl. 122-356.000.

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Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 4,002,611.

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Yanikoski, Florian F., to Union Special Corporation. Automatic sewing machine. 4,002,128, Cl. 112-121.110.

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Sasaki, Hiromu; Yasuda, Syoichi; and Nagano, Humikazu, 4,003,021.

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Kozuka, Ko; Kurioka, Shunichiro; Yasumoto, Taizo; Kobayashi, Shigeru; Kubota, Atsuo; and Otoshi, Nobumasa, 4,002,809.

Yatsushiro, Kenji: *See*—
Kuchuris, George F.; and Yatsushiro, Kenji, 4,003,010.

Yen, Chung H., to G. D. Searle & Co. 2,2-Diphenyl-5-(4-substituted-piperidino)-3-trans-pentenenitriles. 4,002,618, Cl. 260-240.00R.

Yoda, Kenichi: *See*—
Suemasa, Hideo; Honda, Kazuyoshi; Fukutake, Katsuhiko; and Yoda, Kenichi, 4,002,929.

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Fukuzaki, Hiroshi; Niki, Masao; Yokota, Yukinaga; and Furukawa, Jun-ichi, 4,002,700.

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Matsubara, Isamu, 4,002,322.
Nagase, Mitsuo, 4,002,195.
Omori, Shigenori; Maeda, Isamu; and Terada, Fumio, 4,002,278.

Yoshimoto, Satoru: *See*—
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Yoshino, Eiichi: *See*—
Shinomiya, Tsutomu; and Yoshino, Eiichi, 4,002,249.

Young, Peter L., to Corning Glass Works. Thin film capacitor and method. 4,002,542, Cl. 204-38.00A.

Young, Peter L.: *See*—
Fehiner, Francis P.; Whitman, Arthur J.; and Young, Peter L., 4,002,545.

Young, Robert A. Vacuum ultraviolet continuum lamps. 4,002,922, Cl. 307-88.300.

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Coleman, Kenneth R.; Steinebach, Hans G.; Waden, H. Werner; and Zamek, Paul, 4,002,280.

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Sitnichenko, Valentin Mikhailovich; Zamuruev, Alexandr Mikhailovich; and Kogut, Andrei Isakovich, 4,002,900.

Zaslav, Harold, to Hughes Aircraft Company. Pulse modulator gating circuit with trailing edge control. 4,002,932, Cl. 307-265.000.

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Kulbakh, Valter Osvaldovich; Kokushina, Tatyana Mikhailovna; Lagert, Irina Kondratievna; Mikhailets, Georgy Avxentievich; Kholodova, Galina Vasilievna; Ekzemplyarov, Oleg Nikolaevich; Zelmanov, Ruvim Bentsionovich; Sokolov, Leonid Borisovich; Etingov, Evgeny Davidovich; and Lushitskaya, Irina Mikhailovna, 4,002,741.

Zenith Radio Corporation: *See*—
Ma, John Y., 4,002,986.
Merrell, Richard G., 4,002,985.

Zenkert, Heinrich: *See*—
Eggert, Hans-Joachim; Jungnitsch, Georg; Kuehne, Rudi; Waliczek, Walter; and Zenkert, Heinrich, 4,002,955.

Zhivichkin, Lev Alexandrovich: *See*—
Zhupakhin, Anatoly Dmitrievich; Prokoshev, Gennady Ivanovich; Karavashkin, Boris Konstantinovich; Shved, Felix Iosifovich; Maksutov, Rashat Faskheevich; Gavrilin, Evgeny Fedorovich; Mushenkov, Vasily Andreevich; Sergeev, Anatoly Borisovich; Shkapa, Alexandr Fedorovich; and Zhivichkin, Lev Alexandrovich, 4,002,816.

Zhupakhin, Anatoly Dmitrievich; Prokoshev, Gennady Ivanovich; Karavashkin, Boris Konstantinovich; Shved, Felix Iosifovich; Maksutov, Rashat Faskheevich; Gavrilin, Evgeny Fedorovich; Mushenkov, Vasily Andreevich; Sergeev, Anatoly Borisovich; Shkapa, Alexandr Fedorovich; and Zhivichkin, Lev Alexandrovich. Device for measuring mass of consumable electrodes being remelted in electric furnaces. 4,002,816, Cl. 13-12.000.

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Arkangel, Robert, 4,001,896.

Zlotek, David A.: *See*—
Kotler, Frederick; and Zlotek, David A., 4,002,849.

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Edelman, Robert I.; Stockdale, Willis L.; Sylvester, Robert A.; and Zollo, Corrado, 4,002,517.

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Zulaski, John A., to S & C Electric Company. Voltage sensing device for use at high voltage. 4,002,976, Cl. 324-126.000.

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Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, 4,002,647.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov 23, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 417,014	3,981,851	Jan 13, 1976	Sep. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976	B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976	B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976	B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977	B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976	B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976	B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976	B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov 9, 1976

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JANUARY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atwater, William M., to Harriss-Conners Chevrolet, Inc. Drill-operated abrading tool. Re. 29,108, Cl. 51-170.0PT.

Carter, J. Warne, to Ciba-Geigy Corporation. Methods of forming a fiber reinforced pipe on an inflatable mandrel. Re. 29,112, Cl. 156-156.000.

Ciba-Geigy Corporation: *See*—
  Carter, J. Warne, Re. 29,112.

Eastman Kodak Company: *See*—
  Masseth, Thomas J., Re. 29,111.

Folberth, William M. Display rack for locksets. Re. 29,106, Cl. 35-49.000.

Halter, Jerome Barth, to RCA Corporation. Triangular piezoelectric transducer for recording video information. Re. 29,113, Cl. 358-128.000.

Harris Corporation: *See*—
  Miaskoff, Leonard; and Reed, David A., Re. 29,105.

Harriss-Conners Chevrolet, Inc.: *See*—
  Atwater, William M., Re. 29,108.

Imhoff, William B., to Leigh Products, Inc. Door coordinator. Re. 29,107, Cl. 49-366.000.

Leigh Products, Inc.: *See*—
  Imhoff, William B., Re. 29,107.

Masseth, Thomas J., to Eastman Kodak Company. Photographic developer composition containing formaldehyde bisulfite alkanolamine condensation product and free alkanolamine. Re. 29,111, Cl. 96-66.400.

Miaskoff, Leonard; and Reed, David A., to Harris Corporation. Apparatus for making books. Re. 29,105, Cl. 11-3.000.

Oury, Robert F., to Rotec Industries, Inc. Boom mounted conveying means. Re. 29,110, Cl. 198-314.000.

Petersen, Hans-Gunther; and Requardt, Heiko, to Volkswagenwerk Aktiengesellschaft. Apparatus for the determination of internal combustion engine compression pressure. Re. 29,109, Cl. 73-117.200.

RCA Corporation: *See*—
  Halter, Jerome Barth, Re. 29,113.

Reed, David A.: *See*—
  Miaskoff, Leonard; and Reed, David A., Re. 29,105.

Requardt, Heiko: *See*—
  Petersen, Hans-Gunther; and Requardt, Heiko, Re. 29,109.

Rotec Industries, Inc.: *See*—
  Oury, Robert F., Re. 29,110.

Volkswagenwerk Aktiengesellschaft: *See*—
  Petersen, Hans-Gunther; and Requardt, Heiko, Re. 29,109.

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Larsen, Carl A. Lady uarda. 4,009, 1-11-77, Cl. 66.000.

LIST OF DESIGN PATENTEES

All Orthopedic Appliances, Inc.: *See*—
  Spiro, Irving, 243,037.

American Hospital Supply Corporation: *See*—
  Aul, Robert J.; Babington, Robert S.; Dunlap, Glenn H.; and Zitkus, Wayne J., 243,039.

American Optical Corporation: *See*—
  Loughner, Larry G., 243,012.
  Shindler, Anthony, 243,010.
  Shindler, Anthony, 243,011.

Anderson, Dennis C., to National Polymers, Inc. Stackable flower pot. 243,031, 1-11-77, Cl. D11-152.000.

Anderson, Walter C., to General Electric Company. Looking glass or similar article. 243,041, 1-11-77, Cl. D86-10.00H.

Anziano, Robert C. Wind deflector for truck trailers. 243,001, 1-11-77, Cl. D12-181.000.

Associated Mills, Inc. an Illinois Corporation: *See*—
  Grube, Clifford E., 243,040.

Aul, Robert J.; Babington, Robert S.; Dunlap, Glenn H.; and Zitkus, Wayne J., to American Hospital Supply Corporation. Nebulizer unit or similar article. 243,039, 1-11-77, Cl. D83-1.00N.

Babington, Robert S.: *See*—
  Aul, Robert J.; Babington, Robert S.; Dunlap, Glenn H.; and Zitkus, Wayne J., 243,039.

Barr, Edward Wallace, Jr., to Briarpatch, Inc. Restaurant building. 243,018, 1-11-77, Cl. D25-22.000.

Bauer, Paul T.: *See*—
  Servais, Ronald A.; and Bauer, Paul T., 242,996.

Becker, May. Covered basket. 242,989, 1-11-77, Cl. D9-246.000.

Benes, Vladimir. Candle holder. 243,033, 1-11-77, Cl. D48-2.000.

Bills, George W.; and Eull, Marvin J., to Graco Inc. Spray unit. 243,016, 1-11-77, Cl. D23-17.000.

Box, Theodor M. Display shelf. 242,965, 1-11-77, Cl. D6-85.000.

Briarpatch, Inc.: *See*—
  Barr, Edward Wallace, Jr., 243,018.

Brynel Incorporated: *See*—
  Glasberg, Edwin, 242,963.

C. F. Associates: *See*—
  Cohen, Bernard, 242,970.

Carnes, Marvin T. Gooseneck trailer hitch converter. 243,000, 1-11-77, Cl. D12-162.000.

Carter, Roland P., to Lane Company, Inc., The. Table. 242,969, 1-11-77, Cl. D6-175.000.

Caudron, Claude, to S E B. Vertical grill. 242,978, 1-11-77, Cl. D7-110.000.

Certified Chemicals Incorporated a Delaware Corporation: *See*—
  Fossella, Gregory F., 243,017.

Clowers, Earl R., to Singer Company, The. Adaptors for vacuum cleaners. 243,006, 1-11-77, Cl. D15-63.000.

Cohen, Bernard, to C. F. Associates. Photograph holder. 242,970, 1-11-77, Cl. D6-234.000.

Confer Plastics, Inc. a New York State corporation: *See*—
  Confer, Raymond C., 243,019.

Confer, Raymond C., to Confer Plastics, Inc. a New York State corporation. Swimming pool ladder. 243,019, 1-11-77, Cl. D25-64.000.

Costa, Eugene F.: *See*—
  Jones, Douglas F.; and Costa, Eugene F., 243,013.

Craig, Roger R. Adjustable strap wrench. 242,981, 1-11-77, Cl. D8-22.000.

Crew, Richard P. Boomerang. 243,029, 1-11-77, Cl. D34-15.0PP.

Daenen, Robert H. C. M., to Dart Industries Inc. Grater. 242,973, 1-11-77, Cl. D7-47.000.

Daher, Theodore G., to General Electric Company. Electric broiler grill or similar article. 242,975, 1-11-77, Cl. D7-88.000.

Dart Industries Inc.: *See*—
  Daenen, Robert H. C. M., 242,973.
  Haynes, Rodney R., Sr., 242,964.

Day, Evangeline. Bowl. 242,972, 1-11-77, Cl. D7-24.000.

Derderian, John S. Combined flint dispenser and screwdriver. 242,988, 1-11-77, Cl. D9-187.000.

Dixson, Tommy W. Accessory console for motorcycles. 242,997, 1-11-77, Cl. D12-114.000.

Dixson, Tommy W. Motorcycle accessory console. 242,998, 1-11-77, Cl. D12-114.000.

Dixson, Tommy W. Accessory console for motorcycles. 242,999, 1-11-77, Cl. D12-114.000.

Dunlap, Glenn H.: *See*—
  Aul, Robert J.; Babington, Robert S.; Dunlap, Glenn H.; and Zitkus, Wayne J., 243,039.

- Dynabrade, Inc.: *See*—
  - Flickenstein, Elwin H.; and Welsch, Walter N., 242,982.
- Earth Clocks Incorporated, Minnesota Corporation: *See*—
  - Jorgenson, Donald H., 242,990.
- Electromedics, Inc.: *See*—
  - Ray, Phillip E., 243,038.
- Ernst Leitz GmbH: *See*—
  - Uellenberg, Hans-Kurt, 243,007.
- Eull, Marvin J.: *See*—
  - Bills, George W.; and Eull, Marvin J., 243,016.
- Fairchild Industries, Inc. a Maryland corporation: *See*—
  - Prokop, Constant, 242,994.
- Federal Paper Board Company, Inc.: *See*—
  - Schlichter, John J., 242,971.
- Fleming, Joseph T.: *See*—
  - McKenzie, Thomas J.; and Fleming, Joseph T., 242,991.
- Flickenstein, Elwin H.; and Welsch, Walter N., to Dynabrade, Inc. Casing for grinder tools. 242,982, 1-11-77, Cl. D8-70.000.
- Fossella, Gregory F., to Certified Chemicals Incorporated a Delaware Corporation. Container for air freshener. 243,017, 1-11-77, Cl. D23-150.000.
- Foto-Quelle GmbH: *See*—
  - Schade, Hans-Ulrich, 243,009.
- Fuller, Harrison P.; and Strauss, Howard, to Omega Precision Hand Tools, Inc. Utility blade. 242,980, 1-11-77, Cl. D8-20.000.
- General Electric Company: *See*—
  - Anderson, Walter C., 243,041.
  - Daher, Theodore G., 242,975.
- Glasberg, Edwin, to Brynel Incorporated. Hairbrush. 242,963, 1-11-77, Cl. D4-31.000.
- Graco Inc.: *See*—
  - Bills, George W.; and Eull, Marvin J., 243,016.
- Gross, Ronald John. Plant container. 243,030, 1-11-77, Cl. D11-152.000.
- Grube, Clifford E., to Associated Mills, Inc. an Illinois Corporation. Hydrotherapy bath assembly. 243,040, 1-11-77, Cl. D83-1.00C.
- Gulick, Louis E. Cabinet for holding neckties and accessories. 242,968, 1-11-77, Cl. D6-164.000.
- Hamada, Masanori, to Matsushita Electric Industrial Co. Clock radio. 243,036, 1-11-77, Cl. D56-4.00B.
- Haynes, Rodney R., Sr., to Dart Industries Inc. Chair. 242,964, 1-11-77, Cl. D6-47.000.
- Hazzard, Robert C., to Portage Industries Corporation. Covered storage container. 242,974, 1-11-77, Cl. D7-76.000.
- Hearn, Leo E.: *See*—
  - Young, Richard S.; and Hearn, Leo E., 243,027.
- Heckathorn, Donald W. Sun shade for an automobile driver. 243,002, 1-11-77, Cl. D12-191.000.
- Hodges, Dale R. Planter. 243,032, 1-11-77, Cl. D11-149.000.
- Honeywell Inc.: *See*—
  - Walker, John F.; and Muse, Harold T., 243,021.
  - Walker, John F.; and Muse, Harold T., 243,022.
- Inderwick, Anthony F. Paving block. 243,020, 1-11-77, Cl. D25-80.000.
- Inglis, Ljot M. Curtain rod bracket. 242,986, 1-11-77, Cl. D8-239.000.
- International Armament Corporation: *See*—
  - Moure, Russ J., 242,992.
- International Silver Company (a Delaware corporation): *See*—
  - Lanzoni, Ford J., 242,979.
- Isaacs, Harold. Truck. 242,995, 1-11-77, Cl. D12-96.000.
- Jones, Douglas F.; and Costa, Eugene F. Rolling straight edge. 243,013, 1-11-77, Cl. D19-37.000.
- Jorgenson, Donald H., to Earth Clocks Incorporated, Minnesota Corporation. Wall clock. 242,990, 1-11-77, Cl. D10-20.000.
- Kabushiki Kaisha Saikosha Seisakusho: *See*—
  - Saitou, Hisashi, 242,983.
- Kohlenstein, Gerald H. Stage light. 243,035, 1-11-77, Cl. D48-20.00K.
- Lackman, Michael. Belt buckle. 242,962, 1-11-77, Cl. D2-427.000.
- Lane Company, Inc., The: *See*—
  - Carter, Roland P., 242,969.
- Lanzoni, Ford J., to International Silver Company (a Delaware corporation). Article of flatware. 242,979, 1-11-77, Cl. D7-137.000.
- Loughner, Larry G., to American Optical Corporation. Pair of spectacles. 243,012, 1-11-77, Cl. D16-65.000.
- MacMillan, Barbara D. Stringed instrument holder. 242,966, 1-11-77, Cl. D6-114.000.
- Marsh, Fred E., Jr. Reflector for portable elongated lamp. 243,034, 1-11-77, Cl. D48-16.00D.
- Mason, Clarence M. Ice cream server. 242,976, 1-11-77, Cl. D7-100.000.
- Mason, Clarence M. Ice cream server. 242,977, 1-11-77, Cl. D7-100.000.
- Matsushita Electric Industrial Co.: *See*—
  - Hamada, Masanori, 243,036.
- McCree, A. Gilbert. Building. 243,005, 1-11-77, Cl. D25-17.000.
- McKenzie, Thomas J.; and Fleming, Joseph T., to United Technologies Corporation, a Corporation of the State of Delaware. Electrical current probe. 242,991, 1-11-77, Cl. D10-79.000.
- Morse Electro Products Corporation: *See*—
  - Robson, Arthur, 243,023.
- Moure, Russ J., to International Armament Corporation. Intrusion detector. 242,992, 1-11-77, Cl. D10-106.000.
- Muse, Harold T.: *See*—
  - Walker, John F.; and Muse, Harold T., 243,021.
  - Walker, John F.; and Muse, Harold T., 243,022.
- National Polymers, Inc.: *See*—
  - Anderson, Dennis C., 243,031.
- Omega Precision Hand Tools, Inc.: *See*—
  - Fuller, Harrison P.; and Strauss, Howard, 242,980.
- Owens-Illinois, Inc.: *See*—
  - Weckman, Richard L., 242,987.
- Pablik, Peter, to Ring-Control Electronic-Handelsgesellschaft m.b.H. Combined transceiver and mounting bracket for use in intercom devices. 243,024, 1-11-77, Cl. D26-14.00K.
- Parker, Douglas W. Fishing lure. 243,015, 1-11-77, Cl. D22-28.000.
- Parker Pen Company, The: *See*—
  - Wittnebert, Frederick R., 243,014.
- Parkins, Donald L. Combined key rack and container therefor. 242,967, 1-11-77, Cl. D6-157.000.
- Patla, Jacob W.; Smith, Wayne R.; Tinz, Wolfgang H.; and Smith, Craig A., to Xerox Corporation. Coin operated reproduction machine. 243,008, 1-11-77, Cl. D16-30.000.
- Pentaco Enterprises Corporation: *See*—
  - Young, Richard S.; and Hearn, Leo E., 243,027.
- Petty, Preston L. Hand grip. 242,984, 1-11-77, Cl. D8-138.000.
- Portage Industries Corporation: *See*—
  - Hazzard, Robert C., 242,974.
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  - Pablik, Peter, 243,024.
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  - Ross, Charles Michael Corbett; and Ross, Corbett, 242,993.
- Rotork Marine Limited: *See*—
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- Rowenta-Werke, GmbH: *See*—
  - Stuetzer, Franz Alban, 243,026.
- S E B: *See*—
  - Caudron, Claude, 242,978.
- Saitou, Hisashi, to Kabushiki Kaisha Saikosha Seisakusho. Wire lock body for motorcycles and the like. 242,983, 1-11-77, Cl. D8-113.000.
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  - Clowers, Earl R., 243,006.
- Smith, Craig A.: *See*—
  - Patla, Jacob W.; Smith, Wayne R.; Tinz, Wolfgang H.; and Smith, Craig A., 243,008.
- Smith, Wayne R.: *See*—
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- Spiro, Irving, to All Orthopedic Appliances, Inc. Lumbo-sacral support. 243,037, 1-11-77, Cl. D83-1.00J.
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  - Fuller, Harrison P.; and Strauss, Howard, 242,980.
- Strongin, Nathan R. Hat. 242,961, 1-11-77, Cl. D2-251.000.
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  - McKenzie, Thomas J.; and Fleming, Joseph T., 242,991.
- W. R. Grace & Co.: *See*—
  - Reppert, Merlyn R., 243,003.
  - Reppert, Merlyn Ralph, 243,004.
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- Walker, John F.; and Muse, Harold T., to Honeywell Inc. Recording instrument. 243,022, 1-11-77, Cl. D26-14.00C.
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CLASSIFICATION OF PATENTS

ISSUED JANUARY 11, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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460	4,001,995
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608	4,001,998
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200	4,002,743
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	162	243,000
	181	243,001
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PATENT AND TRADEMARK OFFICE NOTICES

October and November 1976 Classification Orders

The reclassifications covered by the following classification changes became effective during October and November 1976.

	Class	Subclasses
Classification Order 545, effective Nov. 1, 1976:		
Abolished	206	2; 10; 84 and 808.
Established	206	213.1; 278.1; 484.1; 484.2; 524.1–524.9.
Position changes	206	213.
Title changes	206	205; 484 and 525.
Classification Order 546, effective Nov. 2, 1976:		
Abolished	296	37.
Established	296	37.1; 37.3–37.9; 37.11–37.16.
Classification Order 547, effective Nov. 3, 1976:		
Abolished	239	533–535.
Established	239	533.1–533.9; 533.11–533.15.
Classification Order 548, effective Nov. 8, 1976:		
Abolished	244	12 and 129.
Established	244	12.1–12.6 and 129.1–129.6.
Classification Order 549, effective Nov. 9, 1976:		
Abolished	180	89.
Established	180	89.1; 89.11–89.19.
Classification Order 550, effective Nov. 10, 1976:		
Abolished	346	74.
Established	346	150–165.
Classification Order 551, effective Nov. 10, 1976:		
Abolished	415	198 and 199.
Established	415	198.1; 198.2; 199.1–199.6.
Classification Order 552, effective Nov. 12, 1976:		
Abolished	118	637.
Established	118	644–662.
Classification Order 553, effective Nov. 12, 1976:		
Abolished	166	224–226.
Established	166	316–334.
Classification Order 554, effective Nov. 12, 1976:		
Abolished	403	232.
Established	403	232.1.
Title changes	403	189.
Classification Order 555, effective Nov. 17, 1976:		
Abolished	211	54; 57 and 59.
Established	211	54.1; 57.1 and 59.1.
Classification Order 556, effective Nov. 22, 1976:		
Abolished	47	1.2 and 34–38.1.
Established	47	59–87.
Classification Order 557, effective Nov. 23, 1976:		
Abolished	424	248.
Established	424	248.4; 248.5; 248.51–248.58.
Classification Order 558, effective Nov. 24, 1976:		
Established	222	629.
Classification Order 559, effective Nov. 24, 1976:		
Established	423	179.5.
Classification Order 560, effective Nov. 29, 1976:		
Abolished	178	5–14 and 69.5.
Established	178	69.1.
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ALFRED C. MARMOR
Administrator for Documentation
December 21, 1976

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2,794,417. (See 2,685,536.)

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3,107,613, Armstrong, Parshall and Thatcher, NEW COMPOSITION; **3,126,305**, R. K. Armstrong, IGNITION COMPOSITIONS COMPRISING BORON CONTAINING SALTS; **3,148,938**, W. H. Knoth, AMMONIA AND HYDRAGINE SALTS OF THE $B_{10}H_{10}^{-2}$ ANION; **3,149,163**, same, AMINE AND ORGANO-SUBSTITUTED HYDRAZINE SALTS OF THE $B_{10}H_{10}^{-2}$ ANION AND PROCESS FOR PREPARING SAME; **3,149,939**, B. W. Larsen, CENTRIFUGAL SEPARATOR; **3,184,286**, D. C. England, $Cs_2B_{12}H_{12}CsNO_3$ PRODUCT AND PROCESS FOR MAKING SAME; **3,365,275**, E. L. Muetterties, POLYHYDROPOLYBORATES AND PROCESSES FOR PREPARING THEM; **3,431,089**, V. A. Engelhardt, REACTION PRODUCTS AND PROCESSES; **3,446,604**, E. L. Muetterties, ACID AND SALTS OF $B_{20}H_{18}^{-2}$ION, filed Sept. 3, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–1892–CBR, *Teledyne McCormick Selph* v. *Robert C. Allen, doing business as R & N Chemical Company.*

3,126,305. (See 3,107,613.)

3,131,106, F. W. Mackenzie, ADHESIVE TRANSFERS; **3,212,913**, same, filed Jan. 30, 1974, D.C., N.D. Ill. (Chicago) Doc. 74–C–289, *Letraset USA Inc.* v. *Pressure Graphics Inc.* Ordered, U.S. Letters Patent are valid, the defendants' counterclaims are hereby dismissed with prejudice. Defendant and all persons in active concert or participation with any of them, are hereby restrained and enjoined. Plaintiff is entitled to and is hereby awarded judgment, July 22, 1975.

3,148,938. (See 3,107,613.)

3,149,163. (See 3,107,613.)

3,149,939. (See 3,107,613.)

3,150,313. (See 2,975,330.)

3,164,288, C. J. Boomgaard, CLOSURE AND VALVE CONSTRUCTION; **3,601,181**, W. C. Avrea, METHOD AND APPARATUS FOR PURGING AIR FROM INTERNAL COMBUSTION ENGINE COOLING SYSTEMS; **Re. 27,695**, A. F. Barnes, BEET TOPPING ASSEMBLY, filed May 28, 1976, D.C. Ariz. (Phoenix) Doc. 76–374–Phx, *Saf-Gard Systems Inc.* v. *Performance Products Inc., Peter D. Avrea, Walter C. Avrea, Dilworth C. Brinton and William Campbell.*

3,181,991, N. G. Leveskis, PIGMENTED PEROXIDE COMPOSITIONS; **3,182,036**, Baptist and Werber, PLASTICIZED POLY-BETA-HYDROXYBUTYRIC ACID AND PROCESS; **3,507,800**, N. G. Leveskis, FLAME RESISTANT PEROXIDES, filed Nov. 24, 1975, D.C., N.D. Calif. (San Francisco) Doc. C–75–2483–OJC. *Argus Chemical Corporation* v. *Pacific Coast Lacquer Co. et al.* Defendants enjoined permanently from infringing plaintiff's valid patents, judgment by consent, Aug. 25, 1976.

3,182,036. (See 3,181,991.)

3,184,286. (See 3,107,613.)

3,187,251. (See 2,975,330.)

3,212,913. (See 3,131,106.)

3,217,546, Cordell and Gustafson, AUTOMATIC GRAIN SAMPLING DEVICE; **3,217,549**, same; **3,383,924**, R. R. Cordell, RETRACTABLE SAMPLING DEVICE FOR PRESSURIZED CONVEYORS, filed June 4, 1976, D.C., S.D. Iowa (Des Moines) Doc. 76–192–1, *Gustafson Inc.* v. *Corn States Hybrid Service Inc.*

3,217,549. (See 3,217,546.)

3,237,319, A. W. Hanson, SKI BOOTS HAVING A THIXOTROPIC MATERIAL ENCIRCLING THE ANKLE PORTION THEREOF; **3,402,411**, same, PROCESS FOR MAKING BOOTS, SPORTS EQUIPMENT AND HATS, filed Aug. 25, 1976, D.C., N.D. Utah (Salt Lake City), Doc. NC–76–42, *University Patents Inc.* v. *RNC Inc., Nordica Calzaturificio di A. F. Vaccari and C. Sas, and Rossignol Ski Co., Inc.*

3,246,254. (See 2,975,330.)

3,267,360. (See 2,975,330.)

3,363,193. (See 2,975,330.)

3,365,275. (See 3,107,613.)

3,382,452. (See 2,975,330.)

3,383,924. (See 3,217,546.)

3,402,411. (See 3,237,319.)

3,408,591. (See 2,975,330.)

3,431,089. (See 3,107,613.)

3,446,604. (See 3,107,613.)

3,499,302, Spain, Oliver, Flora and Powell, CYLINDER LOCK; **Reg. No. 878,843**, Richmar Products Inc. (GREAT LEGS AND DESIGN), filed Apr. 22, 1975, D.C., N.D.N.Y. (Utica) Doc. 75–CV–191, *Medeco Security Locks Inc.* v. *Dominion Lock-USA Inc., and Dominion Lock Co. Ltd.* Consent decree was filed on Aug. 14, 1975.

3,504,420, R. F. Shores, PLUGGING DEVICE; **3,586,202**, same, filed May 25, 1976, D.C. Md. (Baltimore) Doc. N76–788, *Ray Shores and Norma Pugh* v. *R.P.S. Products Inc. et al.*

3,507,800. (See 3,181,991.)

3,519,617, Rast and Steiner, RED PHENYL-AZO-NAPHTHOL DYESTUFFS FOR EDIBLE COMPOSITIONS; **3,640,733**, same, EDIBLE SUBSTRATES COLORED WITH MONOAZO DYESTUFFS, filed June 22, 1976, D.C., S.D.N.Y., Doc. 76–C–2744 MEF, *Warner-Jenkinson Co. and H. Kohnstamm & Co. Inc.* v. *Allied Chemical Corporation.*

3,524,023, S. Whang, BAND LIMITED TELEPHONE LINE DATA COMMUNICATION SYSTEM; **3,619,503**, R. Ragsdale, PHASE AND AMPLITUDE MODULATED MODEM; **3,783,194**, Villps, Lowey and Payne, DATA MODEM HAVING A FAST TURN-AROUND TIME OVER DIRECT DISTANCE DIALED NETWORKS, filed Sept. 13, 1976, First Circuit Court, Boston, Doc. 76–1433, *Codex Corp. and Yellow Freight System Inc.* v. *Milgo Electronic Corp. and International Communication Corp.*

3,563,399, C. C. Shivvers, METHOD FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN; **3,765,547**, same, APPARATUS FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN; **3,765,548**, same, SWEEP AUGER STRUCTURE, filed July 14, 1976, D.C., S.D. Iowa (Des Moines) Doc. 76–222–1, *Nebraska Engineering Corporation* v. *Shivvers Enterprises Inc. and Charles C. Shivvers.*

3,567,117, W. E. Eustis, ICE NUCLEI FORMATION; **3,733,029**, Eustis and Howell, SNOW PRECIPITATOR; **3,774,842**, W. E. Howell, METHOD OF PRESERVING ICE NUCLEI FOR SNOW FORMATION, filed Jan. 9, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c67, *Hedco Inc.* v. *Villa Olivia Country Club Inc.* Stipulated dismissal on May 26, 1976.

3,575,655. (See 2,975,330.)

3,584,292. (See 2,975,330.)

3,586,202. (See 3,504,420.)

3,601,181. (See 3,164,288.)

3,619,503. (See 3,524,023.)

3,640,733. (See 3,519,617.)

3,669,499, Semplonius and Kolk, CHAIR, filed Dec. 12, 1975, D.C., E.D. Mo. (St. Louis), Doc. 75–1130C(2), *Harvard Industries Inc.* v. *Steelcase Inc.* Motion of defendant to dismiss, stay and or transfer this action to U.S. District Court of Delaware, Aug. 11, 1976.

3,699,604, S. J. Hunt, BUTCHER'S BONE DUST SCRAPER; **D. 229,397**, same, filed Jan. 29, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–70171, *Vulcan Corporation and Hubert Distributing Company* v. *Detroit Cutlery Rental Service Inc.*

3,733,029. (See 3,567,117.)

3,765,547. (See 3,563,399.)

3,765,548. (See 3,563,399.)

3,774,842. (See 3,567,117.)

3,778,614, G. N. Hounsfield, METHOD AND APPARATUS FOR MEASURING X-OR-Y RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,866,047**, same, PENETRATING RADIATION EXAMINING APPARATUS HAVING A SCANNING COLLIMATOR; **3,919,552**, same, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,924,129**, C. LeMay, METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131**, G. N. Hounsfield, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,944,833**, same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,946,234**, same, APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION; **3,956,633**, same, RADIOLOGY METHOD AND APPARATUS; **3,965,357**, same, APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION, filed July 12, 1976, D.C., N.D. Ohio (Cleveland) Doc. C–76–684, *EMI Limited* v. *Ohio Nuclear Inc.*

3,783,194. (See 3,524,023.)

3,866,047. (See 3,778,614.)

3,887,187, Crossman, Kenrick and LeMieux, AIR CUSHION TABLE GAME; **3,927,885**, same, PUCK AND BAT FOR AN AIR CUSHION TABLE GAME, filed Aug. 6, 1976, D.C., S.D.N.Y., Doc. 76–C–3508, *Brunswick Corporation* v. *Brewster Industries Inc.*

3,902,548, Lee and Asbo, PAPER FEED SYSTEM FOR HIGH-SPEED PRINTER; **3,954,163**, A. Gabor, HIGH SPEED PRINTER WITH INTERMITTENT PRINT WHEEL AND CARRIAGE MOVEMENT, filed May 7, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–934 GBH, *Xerox Corporation* v. *Qume Corporation and Sen Lin Lee, also known as David Lee.*

3,915,362, D. G. Hart, VEHICLE LUGGAGE CARRIER AND COMPLEMENTARY MOUNTING MEMBERS; **D. 235,428**, same, CAR TOP LUGGAGE CARRIER, filed Sept. 16, 1976, D.C., N.D. Iowa (Fort Dodge) Doc. C–76–3035, *Donald G. Hart and Createform Ltd.* v. *Winnebago Industries Inc.*

3,919,552. (See 3,778,614.)

3,924,129. (See 3,778,614.)

3,924,131. (See 3,778,614.)

3,927,885. (See 3,887,187.)

3,944,833. (See 3,778,614.)

3,946,234. (See 3,778,614.)

3,954,163. (See 3,902,584.)

3,956,633. (See 3,778,614.)

3,965,357. (See 3,778,614.)

Re. 23,950. (See 2,975,330.)

Re. 27,695. (See 3,601,181.)

D. 229,397. (See 3,699,604.)

D. 235,428. (See 3,915,362.)

D. 236,821, Larsen and Oehring, MOTORCYCLE SADDLE BAG; **D. 236,822**, same, MOTORCYCLE TOTE BOX; **Reg. No. 975,374**, Bates Industries Inc. (BATES), filed Mar. 30, 1976, D.C., N.D. Tex. (Dallas) Doc. CA 3–76–0462, *Bates Industries Inc.* v. *American Easy-Rider Inc.*

D. 236,822. (See 236,821.)

Reg. No. 878,843. (See 3,499,302.)

Reg. No. 975,374. (See 236,821.)

PATENT NOTICES

Certificates of Correction for the Week of Jan. 18, 1977

3,664.717
3.764,358
3,773.789
3,792,976
3,799,995
3,878,193
3,884,333
3,884.532
3,895,725
3,896,198
3,911,285
3,915,949
3,918,642
3,923,721
3,927,195
3,927,976
3,931,326
3,934,884
3,937,245
3,939,356
3,941,796
3,944,646
3,953.944
3,954.584
3,955,565
3,955,997
3,957,634
3,957,922
3,958,160
3,958,262
3,959,749
3,961,971
3,964,167
3,965,209
3,966,933
3,968,620
3,968,797
3,968,868
3,969,427
3,969,769
3,970,392
3,970,463
3,971,395
3,971,802
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3,972,385
3,973,390
3,973,489
3,973,587
3,973,788
3,973,908
3,974,224
3,975,629
3,975,964
3,977,848
3,978,077
3,978,153
3,978,236
3,978,837
3,979,585
3,979,622
3,980,245
3,980,676
3,980.680
3,980,836
3,981,753
3,981,809
3,982.076
3,982,115
3,982,126
3,982,150
3,982,238
3,982,396
3,982,459
3,982,470
3,982,635
3,982,718
3,983.241
3,983,930
3,984,030
3,984,725
3,985,444
3,985,939
3,986,812
3,986.825
3,987,259
3,987,290
3,990,310

Disclaimer and Dedication

3,636,366.—***Edward Emanuel Sheldon,*** New York, N.Y. OPTO-ELECTRIC SCREENS PROVIDED WITH LIGHT CONDUCTING MEMBERS. Patent dated Jan. 18, 1972. Disclaimer and Dedication filed Nov. 11, 1976, by the assignee, ***American Optical Corporation.***

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Dedications

Design No. 241,998.—*Mervin Rohrer,* Anoka, and *Carl Wettlaufer,* Albert Lea, Minn. ROTATABLE STORAGE UNIT OR SIMILAR ARTICLE. Patent dated Oct. 26, 1976. Dedication filed Nov. 24, 1976, by the assignee, *Litton Business Systems, Inc.*

Hereby dedicates the remaining term of said patent to the Public.

3,555,383.—*Donald J. Hackman,* Columbus, *Jeremy M. Harris,* Worthington, *Ronald L. Legue,* Columbus, and *Donald E. Roop,* Worthington, Ohio. SUBMERSIBLE ELECTRIC MOTOR FOR TOOL OPERATION. Patent dated Jan. 12, 1971. Dedication filed July 23, 1976, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Disclaimers

3,425,155.—*John W. Ryan,* Bel Air, and *Jack Lewis Lemkin,* Torrance, Calif. DOLL CONSTRUCTION FOR NATURAL MOVEMENTS AND POSITIONS. Patent dated Feb. 4, 1969. Disclaimer filed Aug. 30, 1976, by the assignee, *Mattel, Inc.*

Hereby enters this disclaimer to claims 1, 3, 6 and 7 of said patent.

3,994.319.—*Tom P. Airhart,* Hurst, Tex. REED TYPE VALVE FORMED OF HIGH MODULUS FIBER REINFORCED COMPOSITE MATERIAL. Patent dated Nov. 30, 1976. Disclaimer filed Aug. 20, 1976, by the inventor.

The term of this patent subsequent to Oct. 5, 1993 has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-19-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-17-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-22-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS; Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-5-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-20-76

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,919.443 to 2,923,007 inclusive
Plant Patents	Numbers 1,893 to 1,900, inclusive

REISSUES

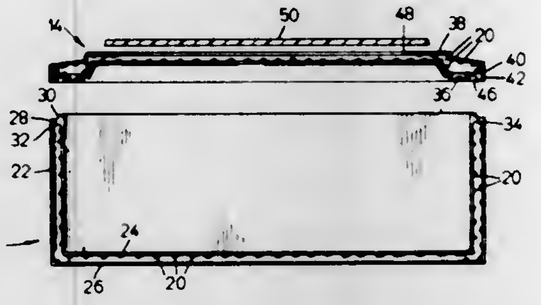
JANUARY 18, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,114
BURIAL VAULT

James H. McQuestion, 4460 Coral Drive, Brookfield, Wis. 53005
Original No. 3,839,768, dated Oct. 8, 1974, Ser. No. 341,688, Mar. 15, 1973. Application for reissue Sept. 29, 1975, Ser. No. 617,302
Int. Cl.^{2} A61G *17/00*
U.S. Cl. 27—35 **6 Claims**

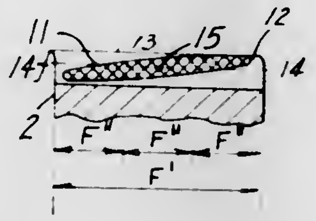


5. A burial vault comprising a hollow rectangular shell preformed from a fiberglass resin composition, said shell including side walls, end walls and a base wall at the bottom closing the bottom of the side walls and end walls to form a chamber for a coffin,

a cement-sand-stone composition covering the outside surface of the side walls, end walls and base wall and a plurality of anchoring means partially embedded in the surface of the shell for mechanically locking the cement-sand-stone composition to the surfaces of the walls.

Re. 29,115
CONTACT GEARING

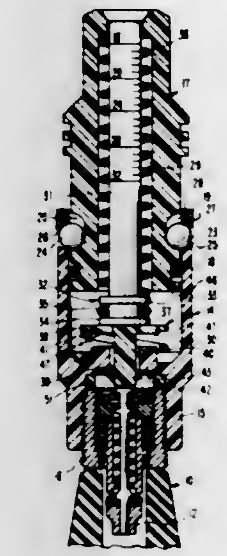
William S. Rouverol, 52 Lovell Ave., Mill Valley, Calif. 94941
Original No. 3,824,873, dated July 23, 1974, Ser. No. 99,587, Dec. 18, 1970. Application for reissue Feb. 18, 1975, Ser. No. 550,227
Int. Cl.^{2} F16H *55/06*
U.S. Cl. 74—462 **55 Claims**



1. A pair of mating gears comprising a driving gear and a driven gear turned by pressure exerted by the teeth of said driving gear, mechanical means connected to said driven gear to remove power therefrom, said teeth being formed to have active profiles in planes perpendicular to the pitch line for which the pressure angle is greater than 40°, the active portion of said profiles of one of said pair being curved, a portion of one working surface of the teeth of one of said pair intersecting the pitch circle of said one of said pair, *the radii of curvature of the undeformed profiles of the teeth of both of said pair being greater than half the circular pitch,* and both flanks of each of said teeth on one of said pair having at all points diametral pressure angles of at least 0°.

Re. 29,116
PRESSURE GAUGE

Billy Lynn Guy, and Walden Sam Campbell, both of Lexington, Ky., assignors to Kalinco, Inc., Lexington, Ky.
Original No. 3,592,218, dated July 13, 1971, Ser. No. 846,518, July 31, 1969. Application for reissue July 2, 1973, Ser. No. 375,468
Int. Cl.^{2} F16K *15/20*
U.S. Cl. 137—227 **32 Claims**



21. A combined gauge and inflator for indicating the fluid pressure in an enclosed chamber and allowing the supply of fluid thereto including:

a support member for connection to the enclosed chamber;

a body supported by said support member for movement between first and second positions;

said body and said support member cooperating to form a chamber therebetween when said body is in its first position;

said body having a passage extending therethrough to provide communication from exterior of said body to the chamber;

means to open a valve that controls communication to the enclosed chamber, said valve opening means being supported by said support member;

means urging said valve opening means to an inactive position;

means slidably disposed in said passage in said body;

said slidably disposed means being responsive to the fluid pressure in the enclosed chamber when said body is moved to its second position, said body moving said valve opening means to a valve opening position to open the valve that controls communication to the enclosed chamber when said body is in its second position;

at least one of said slidably disposed means and said body having sealing means to prevent flow of fluid through said passage when said body is in its second position;

means to indicate the fluid pressure of the enclosed chamber in accordance with the position of said slidably disposed means when said body is in its second position;

and said slidably disposed means has means to cause movement of said valve opening means to a valve opening position when said body is in its first position and said slidably disposed means is moved by a fluid dispensing chuck or the like to allow fluid to be supplied from the chuck through said body passage to the chamber and from the chamber to the enclosed chamber, said sealing means being rendered ineffective when said body is in its first position and said slidably disposed means has moved said valve opening means to its valve opening position.

Re. 29,117

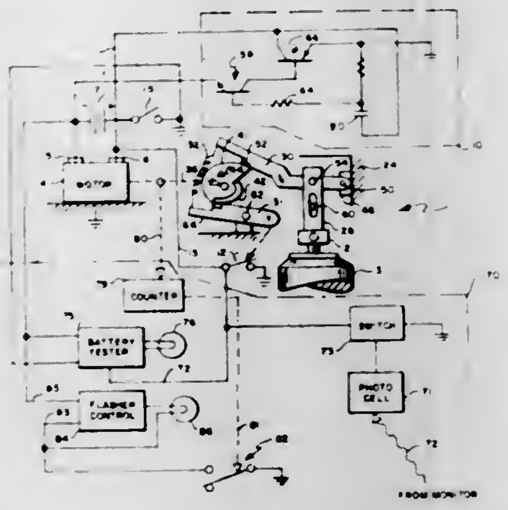
AUTOMATIC SPRAY DISPENSER WITH INTEGRATED TEST APPARATUS

Edward Sahajian, 98 Cedar St., Lexington, Mass. 02173, and Gottfried Maurer, 281 Country Way, Needham, Mass. 02192

Original No. 3,837,532, dated Sept. 24, 1974, Ser. No. 379,373, July 16, 1973. Application for reissue Sept. 22, 1975, Ser. No. 615,814

Int. Cl.² B67D *5/28*

U.S. Cl. 222—70 **12 Claims**



1. In automatic spray apparatus for use with an aerosol container having a [metering] valve mechanism which includes a spray valve moveable to an operative position to release a spray burst of material from the container at regular intervals, an electrical [motor] drive *means* for cyclically moving the spray valve to the operative position, a source of electrical energy for the drive *means* [motor, a motor switch actuated by the motor drive for coupling the source to the motor during a portion of the motor drive cycle] and a timer *means* for controlling energization of the [motor] *drive means at regular intervals, the improvement comprising a system* [, means] for testing said apparatus *and* comprising,

a light actuated photocell producing an electrical output, and

means, [a test switch in parallel with the motor switch] controlled by the photocell output, *for energizing said electrical drive means to cause said spray valve to move to an operative position,*

whereby *the apparatus which may be located in an out-of-reach location, may be tested for operativeness by illuminating the photocell, as with a flashlight, to cause the drive means to move* [illumination of the photocell causes the motor to drive through a cycle moving] the spray valve to the operative position.

Re. 29,118

METHOD OF PREPARING POLYURETHANES FROM LIQUID, STABLE, REACTIVE, FILM-FORMING POLYMER/POLYOL MIXTURES FORMED BY POLYMERIZING AN ETHYLENICALLY UNSATURATED MONOMER IN A POLYOL

Paul Stamberger, 552 W. University Parkway, Baltimore, Md. 21210

Original No. 3,304,273, dated Feb. 14, 1967, Ser. No. 256,531, Feb. 6, 1963. Continuation-in-part of Ser. No. 155,467, Nov. 28, 1961, abandoned. Application for reissue Feb. 19, 1974, Ser. No. 443,774

Int. Cl.² C08G *18/63*

U.S. Cl. 260—2.5 BE **42 Claims**

1. A method for preparing *elastic* polyurethanes comprising reacting

(A) a liquid, stable reactive polymer-polyol mixture *convertible to an elastic polyurethane product* having a viscosity of less than about 40,000 cps. at 10% polymer concentration and having a combining weight in a range yielding elastic [-to rigid] polyurethane products, the essential components of said reactive mixture consisting of

(1) a substantial but minor amount of film forming polymer having a molecular weight of at least 5,000 and having a plurality of radicals containing active hydrogen atoms which are reactive with the —N=C=O radicals of an organic polyisocyanate

and

(2) a major amount of a solvent medium for said polymer consisting essentially of at least one normally liquid polyol essentially free from ethylenic unsaturation and having a molecular weight of at least about [500] *1000*, said polymer (1) being the polymerizate obtained by polymerizing, to a molecular weight of at least 5,000 and to a solids concentration of about 10% to about 50% by weight, an ethylenically unsaturated monomer in such polyol,

with

(B) an organic polyisocyanate to form such polyurethane, the ratio of the —N=C=O equivalents of (B) to the equivalents of reactive radicals of (A) being in the range of about 1–5 to 1.

23. A method for preparing cellular polyurethanes comprising reacting

(A) a liquid, stable reactive polymer-polyol mixture having a viscosity of less than about 40,000 cps. at 10% polymer concentration and having a combining weight in a range yielding elastic-to-rigid polyurethane products, the essential components of said reactive mixture consisting of

(1) a substantial but minor amount of film-forming polymer having a molecular weight of at least 5,000 and having a plurality of radicals containing active hydrogen atoms which are reactive with the —N=C=O radicals of an organic polyisocyanate, and

(2) a major amount of a solvent medium for said polymer consisting essentially of at least one normally liquid polyol essentially free from ethylenic unsaturation and having a molecular weight of at least about 500, said polymer (1) being the polymerizate obtained by polymerizing, to a molecular weight of at least 5,000 and to a solids concentration of about 10% to about 50% by weight, an ethylenically unsaturated monomer in such polyol, with

(B) an organic polyisocyanate to form such polyurethane, the ratio of the —N=C=O equivalents of (B) to the equivalents of reactive radicals of (A) being in the range of about 1–5 to 1, wherein mixture (A) and polyisocyanate (B) are reacted while in intimate admixture with a blowing agent to provide simultaneously reaction of said mixture (A) and polyisocyanate (B) and formation of cells in the polyurethane reaction product.

Re. 29,119

7-PYRIDINIUM METHYL CARBOXYL DERIVATIVES OF 7-AMINO-CEPHALOSPORANIC ACID

Hans Bickel, Binningen; Johannes Muller, Arlesheim, both of Switzerland; Rolf Bosshardt, deceased, late of Arlesheim, Switzerland, by Ruth Elisabeth Bosshardt-Schar, legal representative; Heinrich Peter, Binningen, and Bruno Fechtig, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

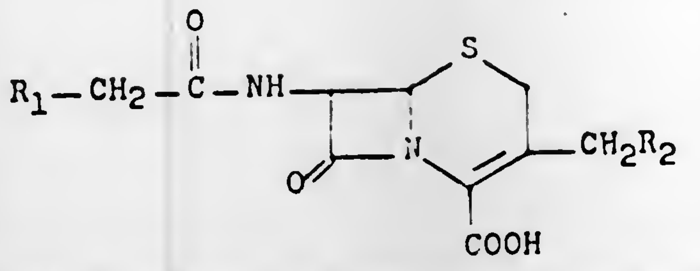
Original No. 3,757,013, dated Sept. 4, 1973, Ser. No. 76,283, Sept. 28, 1970. Application for reissue Sept. 18, 1975, Ser. No. 614,397

Claims priority, application Switzerland, Oct. 10, 1969, 15269/69

Int. Cl.² C07D *501/22, 501/34, 501/36*

U.S. Cl. 260—243 C **8 Claims**

9. *A compound of Formula I*



in which R_1 represents an aminopyridinium radical substituted by lower alkyl and R_2 is hydrogen, hydroxyl, lower alkanoyloxy, halogeno-lower alkanoyloxy or monocyclic carbocyclic arylcarbonyloxy or -thiocarbonyloxy, monocyclic carbocyclic arylcarbonylmercapto or -thiocarbonylmercapto, unsubstituted or substituted by lower alkyl, lower alkoxy, lower alkylmercapto, halogen or nitro, or is an unsubstituted or N-lower alkyl, lower alkoxy-lower alkyl or halogeno-lower alkyl-substituted carbamoyloxy group or thiocarbamoylmercapto group.

PLANT PATENTS

GRANTED JANUARY 18, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,010

PLANT OF THE FERN FAMILY

Donald L. Biggers, Rte. 1, Box 107, Winter Garden, Fla. 32787

Filed Jan. 22, 1976, Ser. No. 651,538

Int. Cl.^{2} A01H *9/00*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the fern family substantially as herein described and characterized by a growth habit providing specimens during the sporophyte generation with a rosette arrangement of long, erect, robust, pinnately compound, mature fronds which have curly, relatively short pinnae that are inserted in a compact arrangement on a long, erect, robust and relatively thick rachis which is heavily endowed with hairs and basally merges with a stipe that is also heavily endowed with hairs, the stipe having a pair of longitudinally extending thin stripes which continue along the pinna insertions on the rachis and which in color are dominated during early frond maturity by reddish orange, brown, brownish orange, orange, yellowish brown, orange yellow and/or olive brown hues.

PATENTS

GRANTED JANUARY 18, 1977

ERRATA

For CLASS	See PATENT NO.
139–080	4,003,406
214–014	4,003,473
051–105 SP	4,003,721
062–078	4,003,728
062–093	4,003,729
429–199	4,003,753
429–149	4,003,754
429–178	4,003,755
429–219	4,003,757
264–119	4,003,758
202–241	4,003,802
202–262	4,003,803
427–311	4,004,026
358–083	4,004,078
358–256	4,004,079
358–128	4,004,080
358–128	4,004,081
358–141	4,004,082
358–125	4,004,083
358–133	4,004,084
340–324 AD	4,004,085
358–109	4,004,086
358–113	4,004,087
358–246	4,004,092
358–060	4,004,093
296–028	4,004,124
240–010.63	4,004,132
324–003	4,004,212
324–015	4,004,213
232–044	4,004,252

PATENTS

GRANTED JANUARY 18, 1977

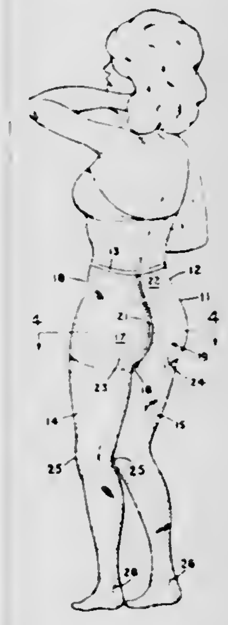
NOTE Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number

GENERAL AND MECHANICAL

4,003,094

PANTYHOSE WITH SHAPING BAND FOR CHEEKY DERRIER RELIEF

Julie Newmar, 12 Beekman Place, New York, N.Y. 10022
Continuation-in-part of Ser. No. 509,080, Sept. 25, 1974, Pat. No. 3,914,799. This application Aug. 28, 1975, Ser. No. 608,549
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² A41B *9/04*
U.S. Cl. 2—409 **6 Claims**



1. Pantyhose for a female wearer and comprising:

a panty portion made of a stretchable knit fabric of a blend of nylon and elastomeric fibers, said fabric having a low degree of elasticity encircling the wearer's lower torso and having an elastic waist encircling band,

the panty portion including a rear panty portion which covers and confines the wearer's buttocks,

leg portions each depending from the panty portion and each arrangeable to receive one of the wearer's legs,

the pantyhose defining a crotch zone between the leg portions,

a shaping band attached to the rear panty portion centrally thereof and connected from the vicinity of the crotch zone to the vicinity of the waist band,

the shaping band having a high degree of elasticity substantially greater than that of the fabric of the panty portion,

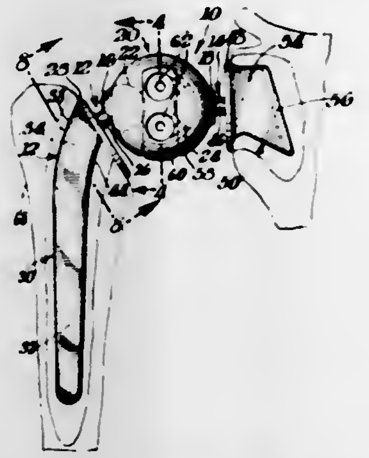
the elasticity of the shaping band being sufficient to constrict the band into fitting engagement between the wearer's buttocks to produce cheeky relief.

4,003,095

TRISPHERICAL PROSTHETIC SHOULDER DEVICE

Anthony G. Gristina, Winston-Salem, N.C., assignor to Howmedica, Inc., New York, N.Y.
Filed Apr. 29, 1976, Ser. No. 681,805
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **10 Claims**

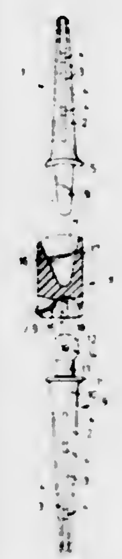
1. A trispherical prosthetic shoulder device comprising a relatively small ball-headed humeral component of a biocompatible metal, a humeral stem on the ball-headed humeral component for affixing it to the intermedullary canal of the humerus, a humeral flange separating the ball-headed component from the stem, a ball-headed scapular component of a biocompatible metal, a scapular stem on the scapular component for attaching it to the scapular region of the shoulder, a scapular flange separating the scapular ball from the scapular stem, a spheroidal ball-capturing member having a pair of spherical sockets disposed substantially 180° from each other, the ball-capturing member comprising a pair of biocompatible cutout plastic hemispheres sharing the sockets between them, and clamping means joining the hemispheres together whereby the ball-heads are rotatably trapped in the sockets to provide a substantially stable shoulder prosthesis with a substantially wide range of movement.



4,003,096

WRIST JOINT ENDOPROSTHESIS

Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed May 24, 1976, Ser. No. 688,995
Claims priority, application Switzerland, June 17, 1975, 7807/75
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **6 Claims**



6. A wrist joint endoprosthesis comprising

a proximal joint part adapted for anchoring in a forearm and including an extension having a pair of parallel side walls;

a distal joint part adapted for anchoring in at least one metacarpal bone and including a spherical joint head having at least one extension projecting therefrom; and

an intermediate member between said joint parts having a spherical socket at one end receiving said joint head, a groove within said socket receiving said extension of said joint head to prevent rotation of said joint head about an axis longitudinal of said distal joint part, and a slot-like V-shaped recess at an opposite end receiving said exten-

PATENTS

GRANTED JANUARY 18, 1977

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GENERAL AND MECHANICAL

4,003,094

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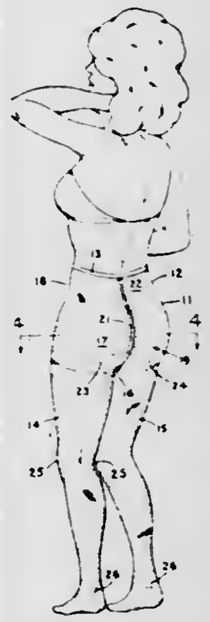
Julie Newmar, 12 Beekman Place, New York, N.Y. 10022
Continuation-in-part of Ser. No. 509,080, Sept. 25, 1974, Pat. No. 3,914,799. This application Aug. 28, 1975, Ser. No. 608,549
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.^{2} A41B *9/04*
U.S. Cl. 2—409 **6 Claims**



1. Pantyhose for a female wearer and comprising:
- a panty portion made of a stretchable knit fabric of a blend of nylon and elastomeric fibers, said fabric having a low degree of elasticity encircling the wearer's lower torso and having an elastic waist encircling band,
- the panty portion including a rear panty portion which covers and confines the wearer's buttocks,
- leg portions each depending from the panty portion and each arrangeable to receive one of the wearer's legs,
- the pantyhose defining a crotch zone between the leg portions,
- a shaping band attached to the rear panty portion centrally thereof and connected from the vicinity of the crotch zone to the vicinity of the waist band,
- the shaping band having a high degree of elasticity substantially greater than that of the fabric of the panty portion,
- the elasticity of the shaping band being sufficient to constrict the band into fitting engagement between the wearer's buttocks to produce cheeky relief.

4,003,095

TRISPHERICAL PROSTHETIC SHOULDER DEVICE

Anthony G. Gristina, Winston-Salem, N.C., assignor to Howmedica, Inc., New York, N.Y.
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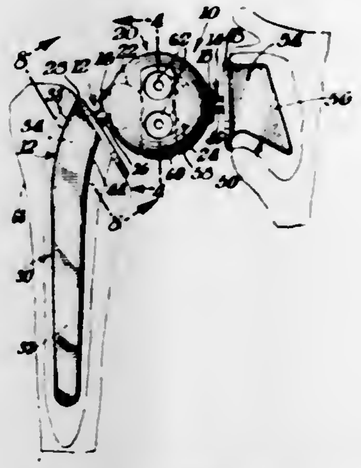
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1.91 **10 Claims**

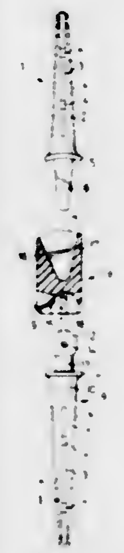
1. A trispherical prosthetic shoulder device comprising a relatively small ball-headed humeral component of a biocompatible metal, a humeral stem on the ball-headed humeral component for affixing it to the intermedullary canal of the humerus, a humeral flange separating the ball-headed component from the stem, a ball-headed scapular component of a biocompatible metal, a scapular stem on the scapular component for attaching it to the scapular region of the shoulder, a scapular flange separating the scapular ball from the scapular stem, a spheroidal ball-capturing member having a pair of spherical sockets disposed substantially 180° from each other, the ball-capturing member comprising a pair of biocompatible cutout plastic hemispheres sharing the sockets between them, and clamping means joining the hemispheres together whereby the ball-heads are rotatably trapped in the sockets to provide a substantially stable shoulder prosthesis with a substantially wide range of movement.



4,003,096

WRIST JOINT ENDOPROSTHESIS

Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed May 24, 1976, Ser. No. 688,995
Claims priority, application Switzerland, June 17, 1975, 7807/75
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1.91 **6 Claims**

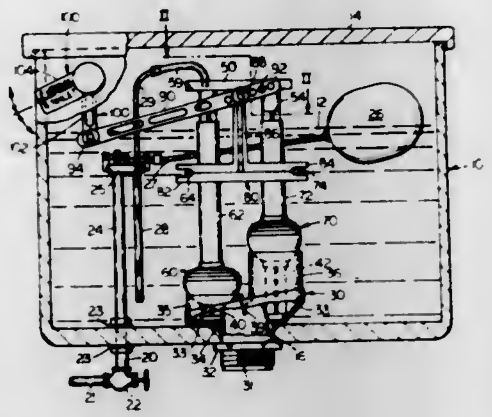


6. A wrist joint endoprosthesis comprising
- a proximal joint part adapted for anchoring in a forearm and including an extension having a pair of parallel side walls;
- a distal joint part adapted for anchoring in at least one metacarpal bone and including a spherical joint head having at least one extension projecting therefrom; and
- an intermediate member between said joint parts having a spherical socket at one end receiving said joint head, a groove within said socket receiving said extension of said joint head to prevent rotation of said joint head about an axis longitudinal of said distal joint part, and a slot-like V-shaped recess at an opposite end receiving said exten-

sion of said proximal joint part, said recess having a pair of parallel side walls in the plane of said groove to guide said side walls of said joint extension.

4,003,097
TWO LEVEL FLUSH TANK VALVE MECHANISM

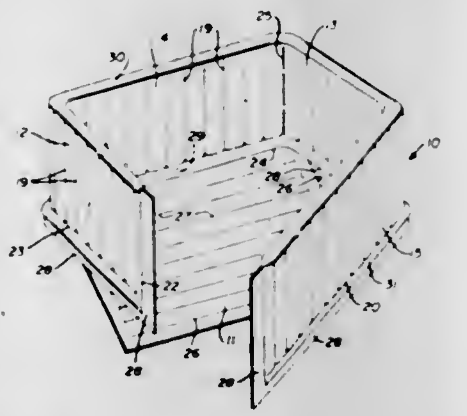
Harold M. Book, 7730 Wildwood Road, P.O. Box No. 361, Findlay, Ohio 45840
Filed Sept. 19, 1975, Ser. No. 614,751
Int. Cl.^{2} E03D *1/14*
U.S. Cl. 4—67 A **25 Claims**



1. A valve mechanism for draining liquid from a tank having two vertically spaced drain levels, comprising:
  - A. a tank having an outlet means at each of said levels,
  - B. a guide means mounted in said tank for each said outlet means,
  - C. a movable valve normally closing each outlet means, each valve having an overflow tube connected thereto, each said valve and over flow tube being guided for vertical movement along each said guide means,
  - D. a fulcrum pivot mounted on each said overflow tube,
  - E. a rocking lever having opposite ends journalled in said fulcrum pivots, and having an offset intermediate link pivot, and
  - F. a push-pull link attached to said link pivot for opening one valve while holding the other closed, and vice versa.

4,003,098
INFLATABLE CRIB

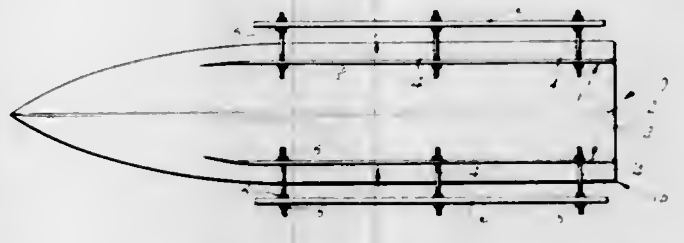
Leonard Fink, 7868 Southern Blvd., Youngstown, Ohio
Filed Nov. 10, 1975, Ser. No. 630,740
Int. Cl.^{2} A47D *7/00*
U.S. Cl. 5—93 R **6 Claims**



1. An inflatable structure in the form of a baby's crib having a base portion and vertical side walls attached to the outermost edges thereof and in communication therewith, an opening in said inflatable structure and an air valve in said opening, said base portion having a plurality of longitudinally extending heat sealed seams therein terminating substantially inwardly of the ends and sides thereof so as to define a plurality of air passageways therebetween and communicating air passageways at the ends and sides thereof together with a peripheral flap therearound, a plurality of secondary heat sealed seams in said side walls terminating substantially inwardly of the upper and lower edges thereof so as to define continuously extending enlarged inflatable upper and lower rolled edge portions on said side walls and a plurality of inflatable interconnecting areas therebetween and flaps extending outwardly thereof, said flaps on said enlarged lower rolled edge portions of said side walls continuously joined to said peripheral flap around said base portion so that said vertical side walls are located inwardly of the outermost sections of said enlarged lower rolled edge portions thereof.

4,003,099
BOAT HULL WITH GRAB RAILS ON ITS UNDERSIDE

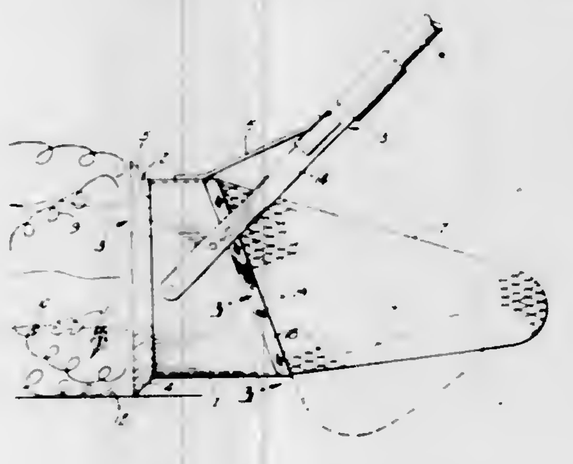
Stephen Hivko, 1001 Hazelwood Ave., Middlesex, N.J. 08846
Filed Nov. 25, 1975, Ser. No. 635,145
Int. Cl.^{2} B63B *17/00*
U.S. Cl. 9—1.6 **2 Claims**



1. A safety device for a boat, comprising in combination, a pair of parallel, longitudinally running spaced apart tubes which serve as grab rails for the occupants of a capsized boat, a pair of longitudinally extending runners formed on the underside of the hull of said boat, one tube and one runner being located on each side of the keel of the boat hull, a plurality of parallel, spaced apart rods being threaded at each end, the rods extending through said tubes and being slideably supported in transverse openings through said runners, each rod being secured to a runner by means of a nut fastener threadably attached to one end of the rod and in abutting relationship with the runner to prevent disengagement of the rod from the runner, each rod being secured to a tube by means of nut fasteners, one abutting each side of the tube, and being threadably attached to the other end of the rod.

4,003,100
POOL CLEANING DEVICE

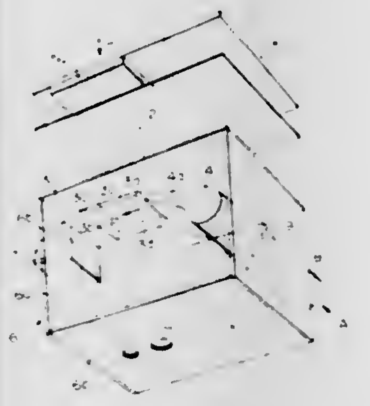
James L. Whitaker, 1420 NE. 16th Terrace, Fort Lauderdale, Fla. 33304
Filed Jan. 15, 1975, Ser. No. 541,119
Int. Cl.^{2} E04H *3/20*
U.S. Cl. 15—1.7 **4 Claims**



1. In a pool cleaning device of the class described, in combination, a hollow rectilinear body of thin sheet material constructed to be moved through water whilst submerged therein, and having provision for water passage therethrough, flat angular lips extending around the opening, the lips being divergently angularly positioned with respect to the body and forward end thereof, and of sufficient extent whereby to create a rolling current at said end, cause light foreign materials affected thereby to be moved upwardly from the surface upon which they are resting and pass into the body and a collecting member attached thereto whilst said body is moved as stated, the rear end of the body having means to attach a collecting member thereto, a bag-like collecting member of flexible formainous material connected to the rear end of the body so as to trail therebehind when the body is moved in the direction of the forward end, said member being of sufficient length whereby to collapse over and close the said rear end when the body is at rest and moved in the direction of said end, to retain foreign materials collected in the member, and means to move said body.

4,003,101
APPARATUS FOR DRYING FILMS

Eiichi Saito, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan
Filed Jan. 27, 1976, Ser. No. 652,749
Claims priority, application Japan, Jan. 31, 1975, 50-14322
Int. Cl.^{2} G03D *15/02*
U.S. Cl. 15—303 **8 Claims**

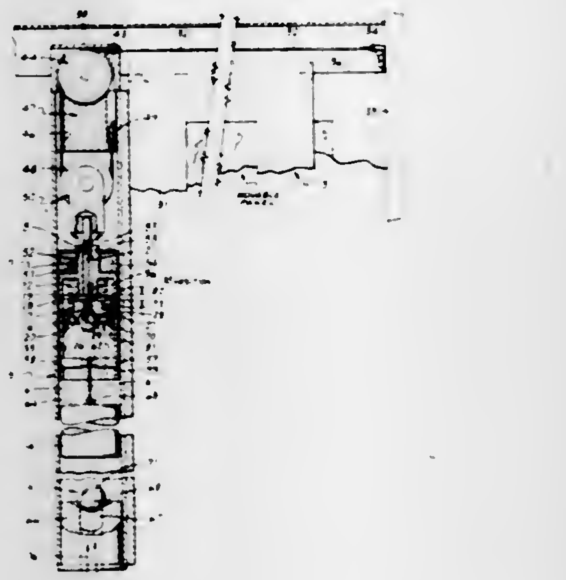


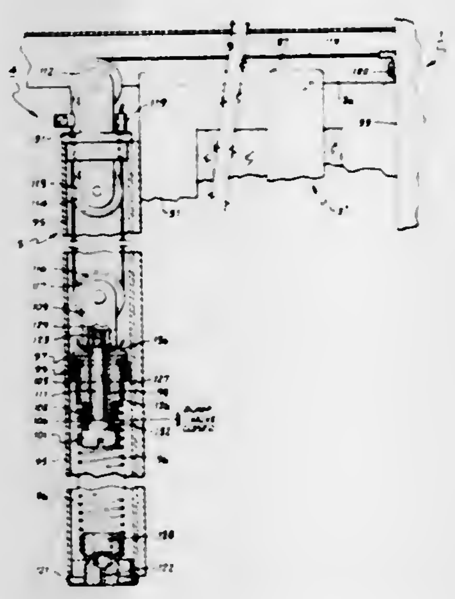
1. A drying apparatus for drying the surface of a film comprising:
  - a film support member having a rectangular aperture of the size substantially smaller than the size of the film to be dried, said aperture being defined by four side edges and put into contact with the surface of the film to be dried, said side edges being slanted to extend from the outer surface of the film support member down to the surface of the film located in contact with the support member at an angle not larger than 45° with respect to the surface of the film, and
  - a compressed air supplying means provided above the film support member for supplying an air blow in a direction parallel to two opposite side edges of the aperture to provide a uniform pressure distribution over the surface of the film along the lateral dimension thereof.

4,003,102
DOOR AND WINDOW CLOSER

Nathaniel L. Hawks, and John R. Shively, both of Albany, Calif., assignors to Elmer E. Jones, Oakland, Calif.
Filed Aug. 7, 1975, Ser. No. 602,731
Int. Cl.^{2} E05F *1/02, 1/08*
U.S. Cl. 16—72 **6 Claims**

1. A closer apparatus for a movable panel having a first closed position covering a portion of a framed opening and a second open position uncovering a portion of said opening comprising:
  - a. motor means connected to said frame and movable panel and biasing said movable panel to said first closed position; and said motor means includes a weight mounted for substantially vertical reciprocating travel and connected to said piston for travel therewith;
  - b. a pneumatic cylinder forming a compression chamber;
  - c. a piston formed with a passage therethrough and mounted for slidable movement within said cylinder and operatively connected to said movable panel for compressing air within said chamber;
  - d. check valve means permitting the inlet of air to said compression chamber of said cylinder upon movement of said panel from said first closed position to said second open position and blocking passage of air upon movement of said panel to said closed first position;
  - e. air restriction means regulating the escape of compressed fluid from said chamber;





  - f. an override valve means mounted on said piston having a first position out of sealing contact with said fluid passage through said piston permitting flow of fluid therethrough from said chamber when said panel is forced to close at a rate faster than the normal closing of said panel by said motor means and a second position in substantial sealing engagement with said fluid passage in said piston and said override valve means includes a valve plate having a valve seat at one end formed for sealably mating with a valve seat on said piston;
  - g. means biasing said override valve means to said first open position;
  - h. force means normally overcoming said biasing means

during movement of said panel from said second to said first position thereby forcing said override valve means to said second position in substantial sealing engagement with said piston passage;

i. said valve plate is formed with openings which are in communication with said compression chamber and said passage through said piston in said first position of said override valve means and out of communication with said passage through said piston in said second position of said override valve means; and

j. said motor means includes a connection cable operably connected at one end to said frame and has a connection member on the other end operably connected to said piston.

4,003,103

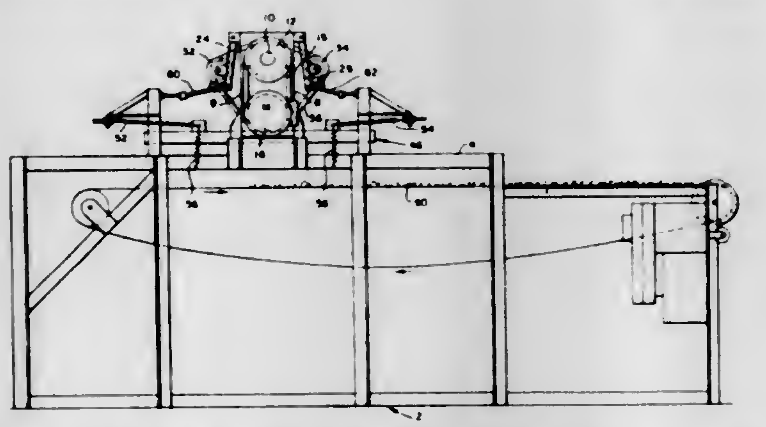
APPARATUS FOR SEPARATING EDIBLE CRAB MEAT FROM NON-EDIBLE PORTIONS OF COOKED CRABS

Richard T. Wenstrom, Hampton, Va.; Theodore S. Reinke, Rehoboth Beach, Del.; Calvert B. Tolley, Wingate, and J. Clayton Brooks, Cambridge, both of Md., assignors to Sea Savory, Inc., Cambridge, Md.

Continuation-in-part of Ser. No. 457,554, April 3, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,706

Int. Cl.^{2} A22C *29/00*

U.S. Cl. 17—71 **8 Claims**



1. Apparatus for removing particles of edible crab meat from the cores of crab bodies which have been cooked, de-shelled, de-legged and de-fingered and the body cavities of which have been cleaned out, comprising a generally horizontal core box including a bottom wall containing a plurality of discharge openings of a size slightly smaller than that of the crab bodies, said bottom wall having a plurality of pockets that converge toward said openings, respectively, said pockets having a generally frustopyramidical configuration, resilient pad means for pressing the crab bodies downwardly in tight engagement with said bottom wall opposite said openings, said crab bodies being arranged with their cavities facing downwardly, cover means connected with said core box for compressing said resilient pad means to bias said crab bodies into engagement with said bottom wall, means for vibrating said core box between 1500 and 5000 vibrations per minute, thereby to shake the edible crab meat from the crab bodies, said vibrating means including a core box holder, and connecting means removably connecting said core box with said core box holder, and wherein said resilient pad means comprises a plurality of resilient pads associated with said openings, respectively; wherein said cover means comprises an inverted tray-shaped cover member having top and downwardly depending side and end walls adapted for cooperation with said core box to define an assembly in which the resilient pad means are compressed between said cover member and said core box; and further wherein said connecting means comprises spaced opposed channel means for slidably receiving corresponding sides of said assembly.

4,003,104

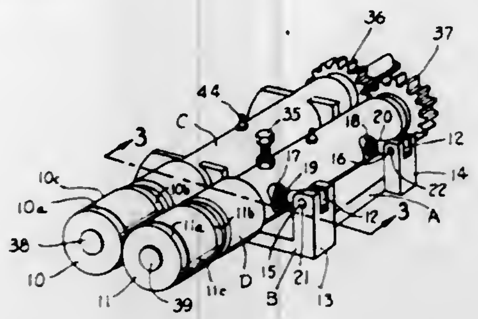
COILER CALENDER ROLLS

Wilburn J. Gunter, 315 Virginia Ave., Greenwood, S.C. 29646

Filed Apr. 23, 1975, Ser. No. 570,620

Int. Cl.^{2} D01G *25/00*

U.S. Cl. 19—150 **6 Claims**



1. A calender roller apparatus for handling textile slivers in sliver coilers comprising:

a. a base member carrying a pivot support;

b. a pair of roller assemblies having surface engaging coiler rollers rotatably carried thereon with parallel center lines between which said sliver is passed for delivery;

c. one of said roller assemblies being fixedly mounted to said base member;

d. means for pivotably carrying the other of said roller assemblies on said pivot support;

e. said pivot support including a fulcrum located above a horizontal plane passing through the center of said pivotably carried roller assembly when in an operational position for sliver delivery providing a biasing force opposing the tendency of the pivoted roller assembly to flip up and for properly compressing the sliver held between the coiler rollers;

f. said biasing force effectively maintaining said pivoted roller assembly in said operational position at high speed operation while permitting said pivoted roller assembly to release should excessive sliver buildup occur beneath or around said coiler rollers; and

g. said pivot support including at least one support member extending vertically above the center line of said pivoted roller assembly with said fulcrum located adjacent an upper end thereof, and said means for carrying said pivoted roller assembly including an adjustable linkage means connected between said support and said pivoted roller assembly to adjust the distance therebetween.

4,003,105

APPARATUS FOR TRANSFORMING AN AIR-FIBRE DISPERSION STREAM IN THE MANUFACTURE OF HOMOGENEOUS FIBROUS MATERIALS

Alexandr Evgenievich Guschin, Kovensky pereulok, 13, kv. 18; Alexandr Andreevich Khokhryakov, Institutsky prospekt, 9, kv. 62; Evgeny Yakovlevich Pechko, Krasnoe selo, Fabrichny poselok, 4, kv. 7; Konstantin Ivanovich Obraztsov, prospekt Parkhomenko, 6, kv. 68; Anatoly Vasilievich Konstantinov, Svetlanovsky prospekt, 21, kv. 46, and Vyacheslav Sergeevich Alexandrov, ulitsa Nezhinskaya, 4, kv. 123, all of Leningrad, U.S.S.R.

Filed Sept. 15, 1975, Ser. No. 613,511

Int. Cl.^{2} D01G *25/00*

U.S. Cl. 19—155 **1 Claim**

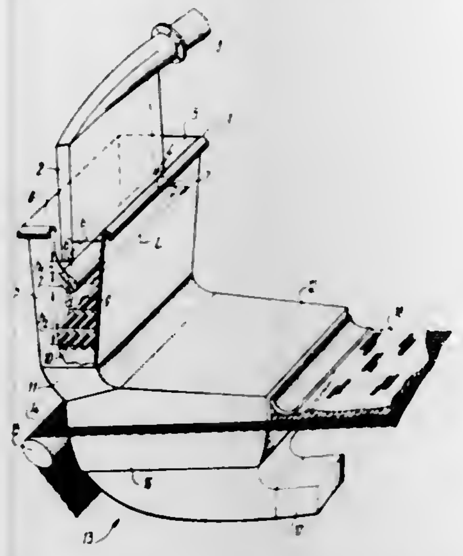
1. An apparatus for transforming an air-fibre dispersion stream, comprising:

a. a chamber having an elongated cross-section defined by a pair of opposed side walls and a pair of opposed elongated parallel front and back walls connecting said side walls, and having at least one open end;

b. a slot nozzle having an elongated slot opening and disposed within said chamber for injecting a dispersion stream into said chamber, said slot nozzle being positioned with its slot opening generally parallel to the elongated front and back walls of said chamber and facing the open end of said chamber;

c. an elongated body having a length at least equal to a length of the elongated slot opening and disposed with said chamber opposite said slot opening and substantially parallel thereto, said elongated body having a generally cylindrical cross section with a diameter at least 1.2 times a width of the slot opening and opposite the slot opening for dispersing the dispersion stream throughout the chamber in use, wherein said elongated body is spaced from the slot opening about 0.3 to about one diameter of the generally cylindrical cross section thereof; and

d. means defining a spatial lattice across a cross section of said chamber downstream from the slot opening at a distance equal to from about two to about six diameters of said elongated body for smoothing the flow of the dispersion dispersed throughout said chamber and flowing out of said at least one open end.



4,003,106

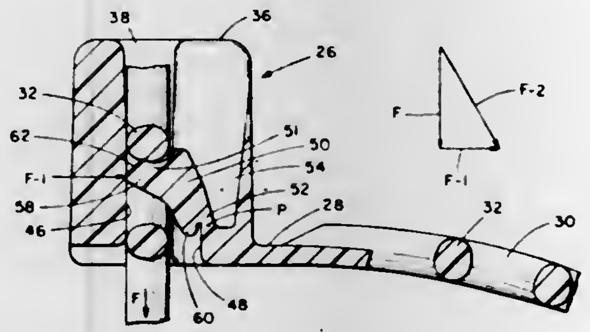
LADDER STRAP CABLE TIE WITH PIVOTAL DOG

Charles G. Schumacher, Tinley Park, and Robert E. Dravec, Palos Heights, both of Ill., assignors to Pandult Corporation, Tinley Park, Ill.

Filed June 19, 1975, Ser. No. 588,273

Int. Cl.^{2} B65D *63/00*

U.S. Cl. 24—16 PB **12 Claims**



1. A self-locking cable tie for forming a plurality of elongate objects such as wires into a bundle comprising:

an elongate strap including a pair of spaced longitudinally extending side rails joined by a plurality of spaced transverse rungs;

a head extending from adjacent one end of said strap and including a strap entry face, a strap exit face and a strap-receiving aperture extending between said faces;

a locking dog for holding said strap formed of a material having greater strength in compressive loading than in shear loading per unit cross-sectional area and sequentially engagable with said rungs, said dog including a flexible neck pivotally joining said dog to said head and resiliently biasing said dog to extend between adjacent rungs of said strap, said dog further including a free end portion comprising positioning means which comprises a saddle surface in spaced facing relationship with said strap exit face for cradling the rung to be held; and

limiting means for limiting pivotal movement of said dog towards said strap entry face after application of a strap withdrawal force so that the major component of said force is directed through said dog from said free end portion to said neck whereby after application of the strap withdrawal force, said dog securely holds said strap and the dog is predominantly in columnar loading.

4,003,107

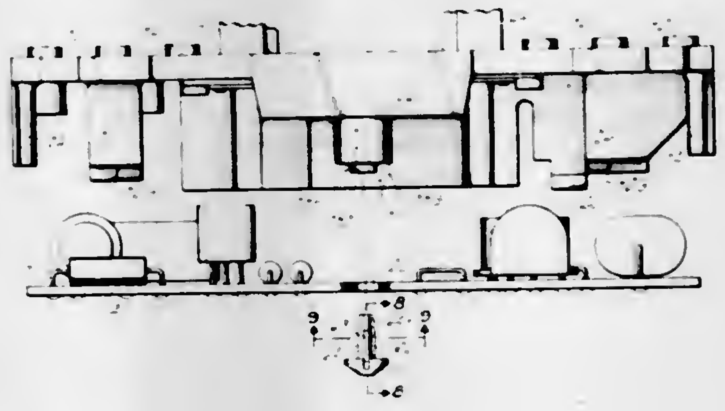
ONE PIECE PLASTIC PIN FASTENER

Keith William Klein, Simsbury, and Joseph Michael Palmieri, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,849

Int. Cl.^{2} A44B *21/00*

U.S. Cl. 24—73 P **15 Claims**



1. A one-piece plastic pin fastener comprising, in combination:

A. an elongated shank of T-shaped cross-section consisting of
   1. a flexible, normally straight cross beam arranged transversely to the direction of elongation of said shank, and
   2. a loading beam arranged perpendicular to said cross beam with one end joined to said cross beam at substantially the mid-length of the latter, the junction between said beams extending substantially the full length of said shank,
   3. the ends of said cross beam and the other end of said loading beam each providing smooth, uninterrupted bearing surface extending from one end of said shank along a major portion of the shank length,
   4. whereby, upon insertion of said shank in an undersized bore, said bearing surfaces of said beams engage the bore sidewall causing said cross beam to buckle along its length, said buckled cross beam achieving forceful frictional engagement of said beam bearing surfaces with the bore sidewall to removably secure said shank in the bore, and

B. an enlarged head joined to said one end of said shank.

4,003,108

SLIDER FOR SLIDE FASTENERS

St-Onge, Georgette G., 325 Sauve St., W., Apt. 5, Montreal, Quebec, Canada (H3L 1Z6)

Filed Aug. 11, 1975, Ser. No. 603,273

Int. Cl.^{2} A44B *19/28*

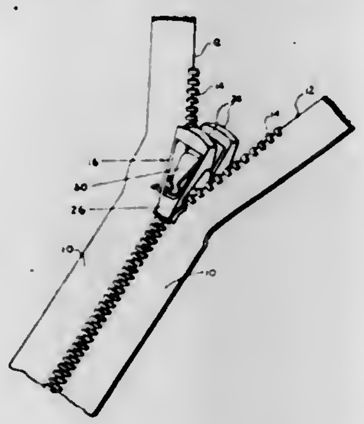
U.S. Cl. 24—205.15 E **1 Claim**

1. A slider for slide fasteners of the type having interlocking elements attached to opposed stringers comprising:

a. an upper and lower member superposed over each other, each member having, at one end, a jaw portion for slidingly receiving the interlocking elements of a slide fastener, and, at the other end, a handle portion, both said portions being separated by a transverse pivot axis pivoted on and across the side of the members facing each other for allowing a rocking action of one member over the other, the handle portions being provided with an aperture, each aperture facing each other,

b. a spring for maintaining said members into a superposed position and for resiliently urging the jaw portions towards each other and in a position for overlapping the said interlocking elements, the facing sides of said members corresponding to said handle portions tapering away from the said pivot axis so that when the handle portions are manually urged together, the jaw portions spread apart to release the interlocking elements, the said spring being V-shaped, the apex of said spring being aligned with the said apertures and both legs of said spring extending over both jaw portions, the free end of said legs grippingly engaging said jaw portions to urge the latter together, each jaw portion comprises a guide plate provided with side flanges adapted to cause engagement of the interlocking elements when the slider is moved in the direction of the handle, and a wedge shaped member secured to the rear of the said guide plates facing each other and along the median line passing therethrough, the said wedge shaped member adapted to disengage the interlocking elements when the slider is moved in the direction of the jaw portions, the said upper and lower members being provided, on their side facing each other, with two spaced lateral walls rearwardly of said wedge shaped members, wherein the paths defined by the guide plates, the side flanges, the wedge shaped members and the said lateral walls have an angle of about 25° ± 5°,

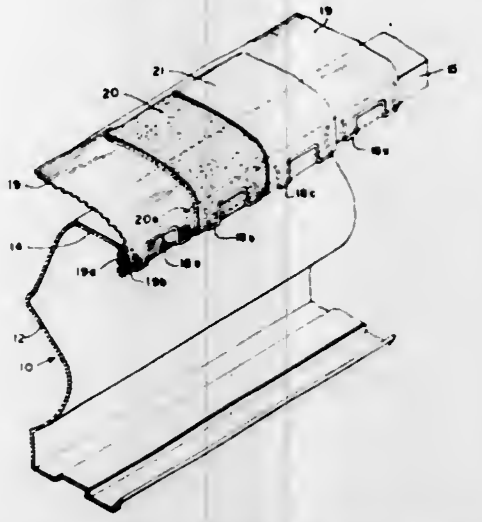
whereby a constant manual pressure exerted on said handle portions towards one another will cause a continuous and progressive opening of said jaw portions and permit disengagement of the slider from the interlocking elements.



4,003,109
CASKET LINING MEANS

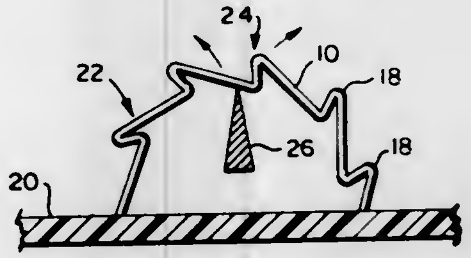
William Matichak, 424 Delaware St., Peckville, Pa. 18452
Filed May 16, 1975, Ser. No. 578,233
Int. Cl.² A61G *17/00*
U.S. Cl. 27—19 **11 Claims**

1. In a casket structure; a case including a side wall defining a portion of the case, an upper edge portion of said side wall having an inwardly directed, generally horizontal flanging which terminates in a lip which depends within the case and has a forward side facing away from said wall; a lining secured to said lip and having an edge portion folded to form an elongate lining channel, one side of which extends along and faces one side of said lip, and the other side of which extends along and faces the opposite side of said lip; and detachable means securing said lining channel to said lip, said means comprising a plurality of resilient fasteners spaced along said lip, each fastener having portions straddling said lip and in engagement with the two sides of said lining channel and forcing each of the sides of said channel toward the side of the lip which it faces, whereby to support said lining from said lip.



4,003,110
METHOD OF MANUFACTURING THE HOOK PORTIONS OF A STATISTICAL HOOK AND LOOP AREA FASTENER

Robert A. Bennett, Easton, Conn., assignor to Robert A. Bennett, Easton and Mattern, Ware, Davis and Stoltz, Bridgeport, both of, Conn., part interest to each
Continuation of Ser. No. 424,221, Dec. 13, 1973, abandoned, Division of Ser. No. 213,464, Dec. 29, 1971, Pat. No. 3,778,870. This application Feb. 24, 1975, Ser. No. 552,291
Int. Cl.² D06C *13/08*; D02G *1/14*
U.S. Cl. 28—72 P **6 Claims**



1. The method of manufacturing the hook portions of a statistical hook and loop area fastener comprising:

A. forming a continuous filament into a plurality of zigzag multiple hook-like portions facing in both directions along said filament by bending the filament into a series of substantially straight portions interconnected by substantially straight connecting return portions at acute angles to said straight portions;

B. forming said filament into a plurality of loops attached to a backing member such that a plurality of said hook-like portions are comprised in each loop; and

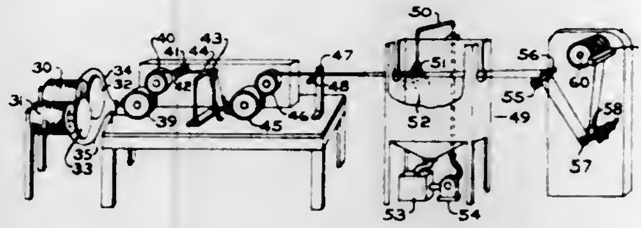
c. severing the loops to form upstanding filaments bearing said hook-like portions.

4,003,111
PROCESS FOR PREPARING A TEXTURIZED GLASS FIBER STRAND

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 3, 1975, Ser. No. 637,345
Int. Cl.² D02G *1/20, 1/16*
U.S. Cl. 28—72.11 **8 Claims**

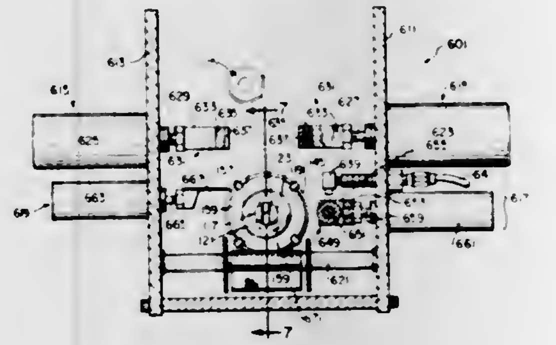
1. A process for preparing a texturized glass fiber containing strand comprising feeding a glass fiber strand from at least one forming package to a zone of fluid turbulence, passing the strand through said zone of fluid turbulence while passing

fluid in said zone at high speed in a circumferential direction around the zone and perpendicular to the path of travel of the strand to thereby introduce a false twist into the strand, passing the strand having a false twist therein from said zone of turbulence into a texturizing zone, texturizing the strand having a false twist therein with a second fluid in said texturizing zone and collecting the resulting texturized glass fiber strand.



4,003,112
AUTOMATIC CAPACITOR WINDING MACHINE AND METHOD

Fredric S. Miller; Armando A. De Mauro, both of Wayne, N.J., and Robert James Delvy, Bridgeport, Conn., assignors to Universal Manufacturing Corporation, Paterson, N.J.
Filed Mar. 25, 1975, Ser. No. 562,012
Int. Cl.² H01G *4/16*
U.S. Cl. 29—25.42 **30 Claims**



1. A method for winding capacitors including:

moving a bifurcated arbor having a slot to a retracted position;

clamping portions of dielectric layers into a substantially planar configuration above said arbor;

retracting said arbor;

rotating said arbor so that its slot is substantially in alignment with the plane of said dielectric layers;

carrying the planar portion of said dielectric layers into alignment with the axis of said arbor;

maintaining said alignment while extending said arbor axially to an advanced position to grasp said dielectric layers;

rotating said arbor to wind the capacitor;

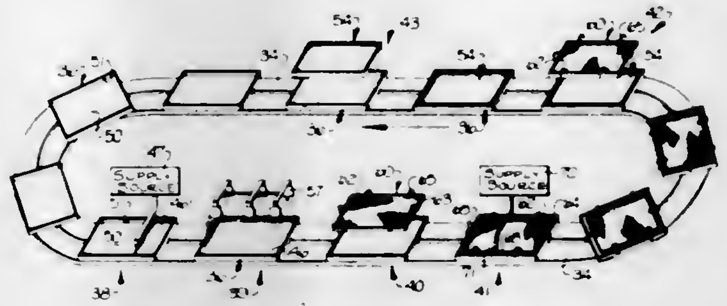
feeding electrodes from continuous supplies to said rotating arbor;

supplying a relatively thick structural insert while said capacitor is being wound to reinforce the capacitor;

moving said arbor to a retracted position while stripping said capacitor off said arbor.

4,003,113
METHOD OF FORMING A SPRING CUSHION CONSTRUCTION

Carl Gordon Bulloch, Jr., 31 Kingwood Place, Asheville, N.C. 28804
Division of Ser. No. 478,618, June 12, 1974, Pat. No. 3,906,560, which is a continuation-in-part of Ser. No. 298,953, Oct. 19, 1972, Pat. No. 3,818,560, which is a division of Ser. No. 130,328, April 1, 1971, Pat. No. 3,719,963. This application May 5, 1975, Ser. No. 574,598
Int. Cl.² B68G *7/00*; B29D *3/00*
U.S. Cl. 29—91.1 **18 Claims**



14. A method of making foam pads suitable for use in a seat, mattress, or the like comprising the steps of

conveying a plurality of open top molds having a predetermined peripheral outline about an endless path of travel,

depositing a predetermined quantity of foamable elastomeric material in each mold as the same passes a predetermined filling station located along said path of travel, said foamable elastomeric material being capable of expanding and rising within the mold and forming a resilient cellular pad having a dense, tough upper crust on the upper surface thereof which is in contact with the surrounding air,

positioning an openwork mold insert on the upper surface of the foaming material in each mold so as to be substantially floatingly carried thereon as the mold passes a predetermined assembly station located downstream of said filling station, said mold insert having a generally planar lower surface and a peripheral outline somewhat smaller than that of said open top mold such that a relatively narrow open channel is defined between the mold and mold insert, and wherein said mold insert is free to rise upwardly with the foaming material and serves to level the underlying portion of the upper surface while permitting air to contact a significant portion of the same to thereby result in a dense upper crust being formed thereon,

depositing additional foamable material in the open channel of each mold as the mold passes a predetermined edge forming station located downstream of said assembly station to thereby form a raised foam edge along the periphery of said upper surface, and

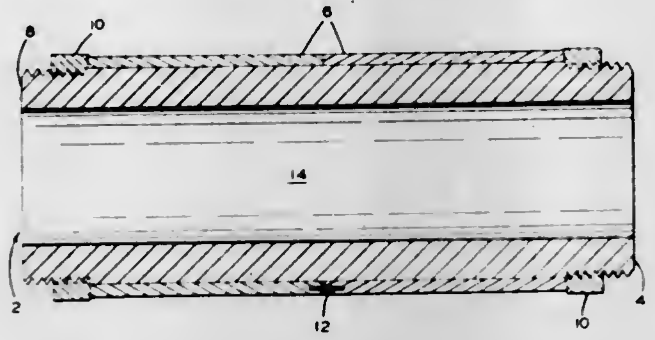
removing the resulting pad from the mold and mold insert at a removal station located downstream of said edge forming station.

4,003,114
COMPRESSIBLE SLEEVE EMBOSSING ROLL

Walter J. Lewicki, Jr., and Jacob A. Otthofer, Jr., both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Filed Feb. 25, 1976, Ser. No. 661,279
Int. Cl.² B21B *31/08*
U.S. Cl. 29—125 **4 Claims**

1. An embossing roll which is composed of a hollow material mandrel having means therethrough to permit the passage of a cooling fluid and a plurality of sleeves pressed on the outer surface thereof, said sleeves being of a material having a higher thermal conductivity and higher thermal expansion

than the material of the mandrel, pins locking together adjacent sleeves to prevent relative movement thereof and locking



means on the ends of the mandrel for applying a pressure to the plural sleeves to hold the plural sleeves together.

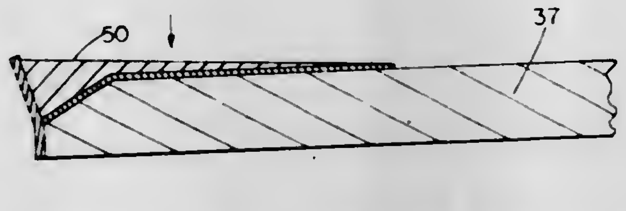
4,003,115
METHOD OF MAKING CENTRIFUGE CONVEYOR

William F. Fisher, Walpole, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Sept. 25, 1975, Ser. No. 616,632

Int. Cl.² B21K *3/04*; B23P *15/02, 15/04*

U.S. Cl. 29—156.8 R **6 Claims**



1. The method of providing a hard wear-resistant outer forward edge on at least a portion of a blade of a helical bladed centrifuge conveyor which comprises

securing to a blade of said conveyor a band of metal having an upstanding marginal portion thereof extending beyond the forward face of said blade adjacent its outer edge to form with said forward face a cavity, said band defining the outer margin of said cavity,

fusing a wear-resistant material at elevated temperature into said cavity to bond said material to said band and to said blade and to fill said cavity to the desired depth with said bonded wear-resistant material forming a portion of the forward face of said blade.

4,003,116
APPARATUS FOR SETTING INSULATORS AND PRESSING END TURNS

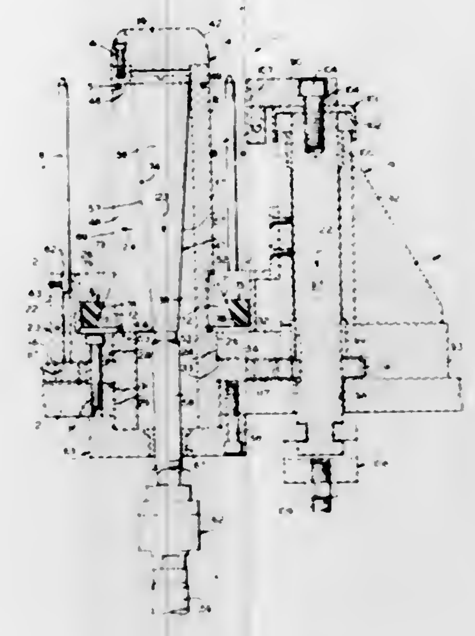
Richard W. Bale, Fennville, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed July 7, 1975, Ser. No. 593,491

Int. Cl.² H02K *15/00*

U.S. Cl. 29—734 **5 Claims**

1. Apparatus for use in performing operations on stator assemblies that comprise a magnetic core having an axially extending bore and axially extending winding accommodating slots, winding turns having end portions and also having portions supported in at least some of the slots, and wedges overlying at least some coil turn portions in at least two of the slots, the apparatus comprising: a driving member; means for moving at least one wedge along a core slot in a generally radial direction relative to the bore of the core; and means for shaping end portions of a plurality of winding turns; said means for moving and means for shaping both being driven to operative position by the driving member; said means for shaping end portions including at least one driven section; the means for moving at least one wedge including at least one elongate member having at least one driven portion and at least one driving portion, with said driving portion being drivingly engageable with the at least one driven section; and the driving member being engageable with the at least one driven portion.



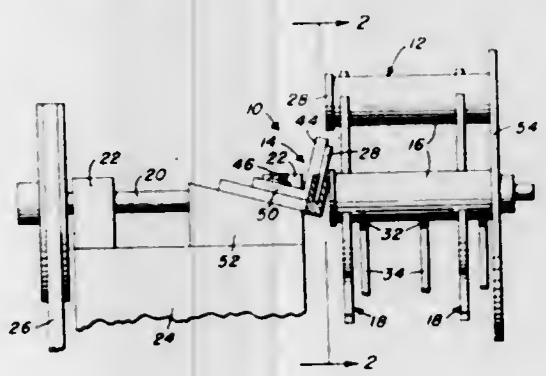
4,003,117
OVERCAPPING APPARATUS

Wade D. Fletcher, and Jerry F. Sansbury, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Mar. 9, 1976, Ser. No. 665,337

Int. Cl.² B67B *3/22*; B65B *7/28*; B23P *19/02*

U.S. Cl. 29—809 **3 Claims**



1. Overcapping apparatus for the application of flexible lids to the ends of horizontally oriented elongated flexible cylindrical containers, said apparatus comprising container carrying means for horizontally receiving and carrying elongated containers along a vertical arcuate path; container feeding means for introducing containers to said container carrying means; lid positioning means for sequentially generally vertically orienting lids in the path of the ends of moving containers for engagement therewith and thereon; and lid feeding means for introducing lids to said lid positioning means; said container carrying means comprising a pair of spaced vertically oriented wheels with multiple pockets defined about the periphery of each wheel, each pocket having a horizontally aligned companion pocket on the other wheel for simultaneous seating of a horizontal container, means for rotating said wheels simultaneously about a common horizontal axis whereby the pockets on each wheel describe a circular vertical path including an upwardly directed path portion during which containers are engaged within said pockets and raised from the container feeding means, and a downwardly directed path portion during which containers are gravity discharged from said pockets, said pockets opening forwardly in the direction of rotation of said wheels, each pocket being arcuate and of an extent so as to encircle approximately, but no more than, one half the circumference of a cylindrical container to maintain free entry to and free discharge from the pocket by a container while maintaining a high degree of lateral stability to a container received within the pocket, one of said wheels being positioned closely adjacent said lid positioning means for direct support and stabilization of a lid receiving container end closely adjacent said lid positioning means, said lid positioning means being located along the upwardly directed path portion of said pockets, and a vertically orientated backup laterally of and parallel to the wheel remote from said lid positioning means.

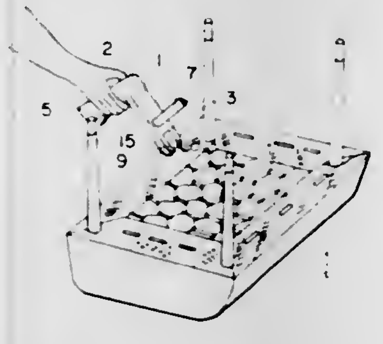
4,003,118
HOG STAPLE GUN

George W. Jensen, Pensacola, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 11, 1976, Ser. No. 666,129

Int. Cl.² B23P *11/00*

U.S. Cl. 29—243.56 **3 Claims**



1. A hog staple gun, comprising

a flat barrel-type housing having spaced opposite first and second ends and an axial chamber formed therethrough, extending between said ends and opening at the second end of said housing;

a pistol-type hand grip extending from the housing at the first end thereof;

a feed bore formed through the housing in the area of the second end thereof and extending substantially perpendicularly from the chamber;

guide means mounted in the feed bore and extending out of the housing for movably guiding a stack of hog staples individually into the chamber;

a pair of curved arms extending from the housing at the second end thereof on opposite sides of the opening of the chamber thereat, said arms curving toward each other to form a substantially circular area therebetween and having free ends spaced from each other; and

feed means operated by a holder of the gun for moving a single staple at a time from the guide means in the chamber at the feed bore through the chamber and the opening at the second end of the housing into contact with the arms whereby said arms form a substantial circle of each staple.

4,003,119
PULLING DEVICE

Melvin Dong Hugh, Wilmington, Calif., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 16, 1976, Ser. No. 649,851

Int. Cl.² B23P *19/04*

U.S. Cl. 29—254 **6 Claims**

1. A pulling device comprising:

a mandrel having a handle for gripping said pulling device;

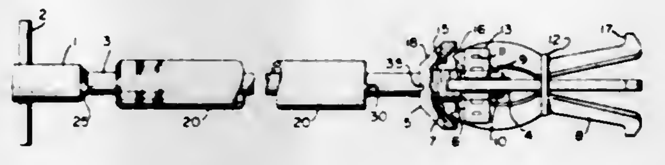
a gripping jaw mounting means securely fastened to one end of said mandrel;

adjustable gripping jaws mounted on said gripping jaw mounting means;

adjustment means for said jaws threadably mounted for rotation on said mandrel;

impacting means slidably mounted on said mandrel for imparting an impact to said mandrel; and

coupling means between said adjustment means and said impacting means whereby rotation of said impacting means relative to said mandrel operates said adjustment means.



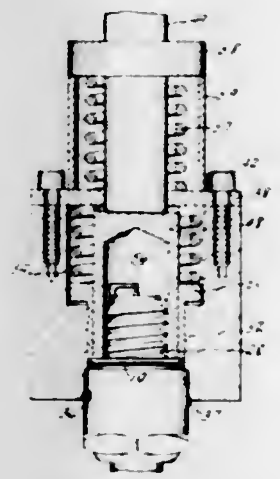
4,003,120
CAPTIVE TYPE SPARK PLUG GASKET AND TOOL FOR INSTALLING SAME

Harold P. Hopp, 35 Industrial Road, Lodi, N.J. 07644

Filed July 8, 1975, Ser. No. 593,985

Int. Cl.² B25B *27/14*

U.S. Cl. 29—278 **5 Claims**



1. In a combination spark plus and captive gasket therefor, in which said spark plug includes a plug body having a threaded shank extending outwardly along the principal axis of said plug from a main body, said threaded outer shank including an undercut area adjacent said main body, said gasket including a plurality of mutually compressible flanges and a locking flange lying in a curved plane and extending inwardly of said compressible flanges to be engaged within said undercut area, said locking flange having a free and generally arcuate edge, said threaded shank having a given pitch and defining a continual spiral recess between adjacent convolutions of said thread, the improvement comprising: said arcuate free edge of said locking flange being bent out of said curved plane, whereby the effective thickness of said edge is substantially greater than the thickness of metal forming said locking flange; said locking flange upon being compressed during installation of said plug and gasket with a threaded spark plug opening being deformed to lie in a plane perpendicular to said principal longitudinal axis of said spark plug wherein the bent portion of said arcuate free edge is reduced in diameter to substantially correspond to the diameter of said undercut area, said bent portion being substantially continuous and lying at least partially in a curved plane intersecting the plane of said locking flange, the effective thickness of said bent portion providing sufficient rigidity to said locking flange to prevent cross-threading thereof with said spiral recess upon the disengagement of said plug from said threaded opening.

4,003,121

METHOD AND ARRANGEMENT FOR THE PRODUCTION OF ANNULAR ARTICLES

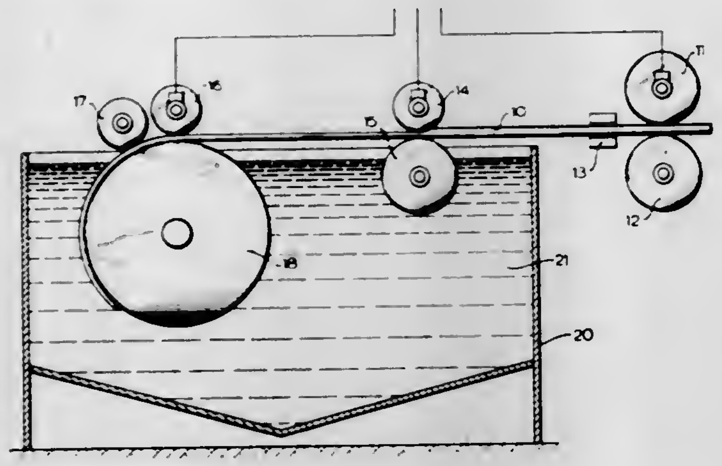
Albert Hagen, Dortmund; Theodor Kaiser, Hagen-Emst, and Heinz Pohler, Herdecke-Kirchende, all of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed July 15, 1974, Ser. No. 488,718

Claims priority, application Germany, July 17, 1973, 2336281

Int. Cl.² C21D *9/40;* **B23P** *17/00;* **B21H** *1/12*

U.S. Cl. 29—415 **10 Claims**



1. A method of making ring-shaped articles, comprising hot-forming an elongated blank, which is in an unhardened condition and is hardenable by cooling from a predetermined elevated temperature, so as to impart to said blank a predetermined cross-sectional configuration; coiling said blank subsequent to said hot-forming, and prior to substantial cooling of said blank from the hot-forming temperature, so as to produce a coiled element having a plurality of convolutions of predetermined diameter substantially equal to the desired diameter of the finished articles, said blank having a temperature subsequent to initiation of said coiling which at least equals said predetermined temperature; cooling said blank subsequent to initiation of said coiling so as to harden said blank and obtain said coiled element in a hardened condition, said cooling comprising quenching of said blank, and said coiling and said quenching being performed substantially simultaneously by bending said blank about a rotatable member which is at least partially immersed in a quenching medium and which guides said blank into the same; and subdividing said coiled element subsequent to said quenching so as to produce from each of at least some of said convolutions a substantially annular article.

4,003,122

APPARATUS AND METHOD FOR APPLYING FILTER TO A DRAINAGE TUBING

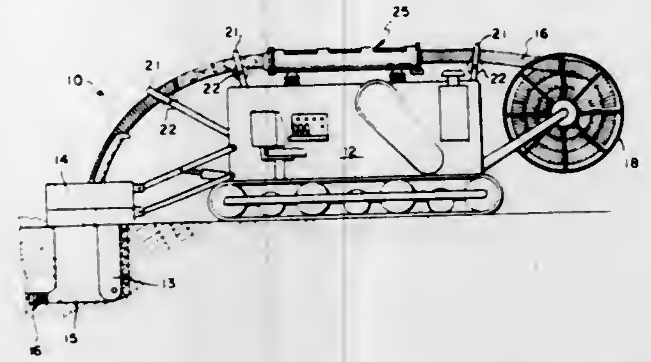
Richard C. Overmyer, Francesville, and Mario Guerra, Indianapolis, both of Ind., assignors to Francesville Drain Tile Corporation, Francesville, Ind.

Filed Dec. 29, 1975, Ser. No. 645,254

Int. Cl.² B23P *19/00, 19/04*

U.S. Cl. 29—429 **13 Claims**

1. Apparatus for applying filter cloth or the like to a continuous length of flexible drainage tubing as the same is being installed in the ground, comprising
- an installation machine having a tube-laying boot,
- means for supplying a continuous length of flexible drainage tubing to the machine,
- filter-cloth dispensing means mounted on the machine and including a tubular mandrel of a size and mounted in position to pass the drainage tubing therethrough as it progresses from the supply means to the tube-laying boot,
- a long sleeve of filter cloth or the like gathered and packed on the mandrel so that by attaching the end of the sleeve to the tubing passing through the mandrel the sleeve will be drawn off the mandrel onto the tubing,
- and feed-controlling means at the end of the mandrel at which the sleeve is drawn off, for controlling the rate at which the sleeve is drawn off from the mandrel onto the tubing.



10. The method of applying filter material to drainage tubing concurrently with the installation thereof in the ground, comprising the steps of passing the pipe tubing through a tubular mandrel having a long sleeve of filter material gathered thereon as said tubing is installed in the ground, and securing to the tubing the end of said sleeve adjacent the mandrel end at which the tubing exits to cause the tubing to pull the said sleeve off the mandrel and about itself.

4,003,123

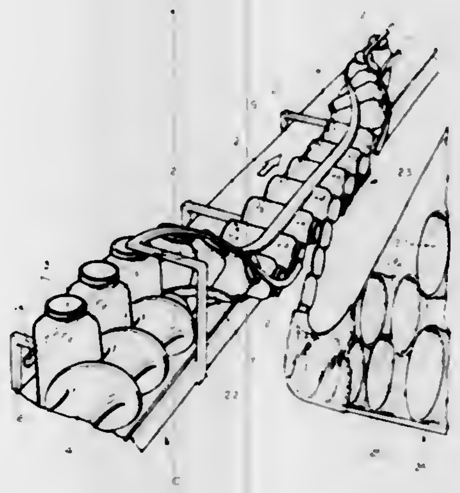
METHOD OF APPLYING TWO-PIECE JAR LIDS TO CONTAINERS

Charles W. Duke, Huntington, W. Va., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 21, 1976, Ser. No. 650,824

Int. Cl.² B23P *19/00*

U.S. Cl. 29—429 **4 Claims**



1. A method of continuously assembling threaded, two-piece closures having open and closed ends connected by a threaded skirt to containers having a threaded finish portion, said method comprising the steps of:
- conveying a plurality of said containers in series in an upright position;
- pivoting said plurality of containers in series to a position with their axes substantially horizontal;
- moving said plurality of containers in series to an assembly area with the threaded finish on each of the containers extending in the same direction;
- moving a plurality of assembled two-piece closures in series to the assembly area, the closures having their open ends facing in the direction of the threaded finishes of the containers; and
- simultaneously therewith engaging the skirt of the closure with a stationary friction member which imparts rotation to said closure while maintaining the container in a relative non-rotative state, whereby the closure is rotated relative to the container finish and threaded thereon.

4,003,124

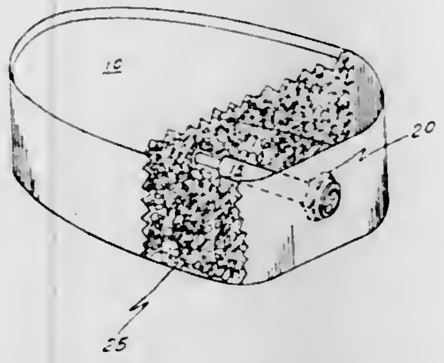
METHOD OF MAKING CANNED FOOD RECYCLABLE THERMAL SIMULATOR

Francis G. Connick, Downers Grove, Ill., assignor to Swift and Company Limited, Chicago, Ill.

Division of Ser. No. 499,296, Aug. 21, 1974, Pat. No. 3,964,313. This application Nov. 26, 1975, Ser. No. 635,658

Int. Cl.² B23P *3/00, 19/04*

U.S. Cl. 29—460 **13 Claims**



1. A method for producing recyclable canned food thermal simulators, comprising: filling a conventional food container with a suitable open cell porous matrix material, permanently securing any suitable thermometer to a panel of the container and positioning the thermometer to measure the internal temperature within about 1/16th inch of the centermost portion of the container, adding a suitable liquid for distribution throughout the porous matrix material when sealed under partial vacuum, said liquid having a specific gravity designed to produce the thermal conductivity constant of the canned food being simulated when subjected to the same external temperatures, drawing a partial vacuum on the filled container to distribute the liquid throughout the porous matrix material and thereafter sealing the container.

4,003,125

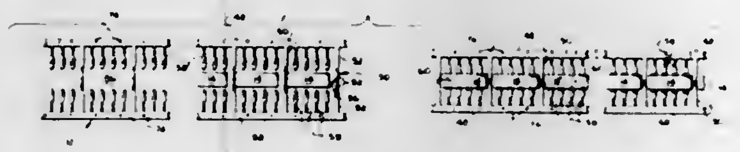
APPARATUS FOR MANUFACTURING DUAL IN-LINE PACKAGES

Charles W. Wallick, York, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 3, 1975, Ser. No. 628,367

Int. Cl.² H01L *21/28*

U.S. Cl. 29—569 R **13 Claims**



1. Apparatus for manufacturing dual in-line packages from leadless circuit modules and a lead frame assembly having a pair of spaced carrier strips with inwardly facing leads; the apparatus comprising a support; loading, closing, bonding, and bending stations on the support arranged along a lead frame assembly feed path, and feed means for moving the lead frame assembly along the feed path; the loading station including a leadless circuit module feed mechanism for positioning leadless circuit modules between the ends of the leads in the assembly as the assembly is moved past the loading station; the closing station including a number of closing units spaced along the feed path, each unit having a pair of collapse surfaces on opposite sides of the feed path and engagable with the outer edges of the carrier strips in the lead frame assembly, the surfaces of the units being spaced progressively closer together downstream along the feed path so that as the lead frame assembly is moved downstream past the closing station the carrier strips are forced together to move the ends of the leads against the leadless circuit modules; the bonding station including a lead bonder operable to bond the ends of the leads to the circuit pads on the leadless circuit modules; and the bending station including a lead bender for bending the ends of leads to a dual in-line configuration.

4,003,126

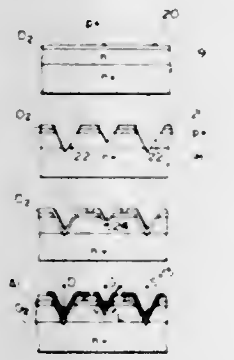
METHOD OF MAKING METAL OXIDE SEMICONDUCTOR DEVICES

Frank E. Holmes, Willowdale, and Clement A. T. Salama, Toronto, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sept. 12, 1974, Ser. No. 505,369

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **2 Claims**



1. A method of making metal oxide semiconductor field effect transistor devices comprising:
- a. forming epitaxially a slice or slab of semiconducting material composed of an n^+ substrate layer and an n layer, said material having a (100) crystal orientation normal to the surface of the n layer,
- b. forming by diffusion, a p^+ layer in said surface of the n layer,
- c. forming an oxide layer on said p^+ layer,
- d. opening a central and two outer windows in the oxide layer,
- e. forming through the central window a central V-groove by anisotrophically etching the semiconducting material along a (100) plane, said groove extending through the p^+ layer, separating it into separate regions, and into the n layer and defining a conduction channel between said separated regions around the groove through the n-type material,
- f. forming through the outer windows, outer V-grooves extending through the p^+ layer and the n layer into the n^+ substrate layer to effectively define the outer edges of the separated regions,
- g. growing a gate oxide layer on the surface of the semiconductor, said layer extending over the surface of the said central V-groove, and
- h. forming metal contacts to the two separate regions defining source and drain electrodes and to the gate oxide layer defining the gate electrode.

4,003,127

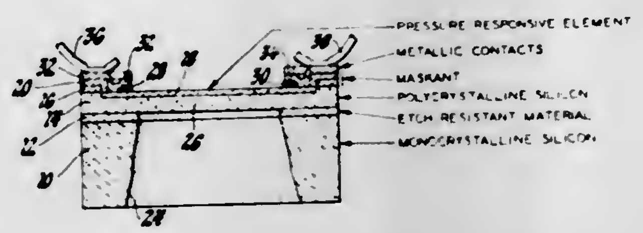
POLYCRYSTALLINE SILICON PRESSURE TRANSDUCER

James M. Jaffe, Southfield, and John Y. W. Seto, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 526,580, Nov. 25, 1974, Pat. No. 3,938,775, which is a continuation-in-part of Ser. No. 463,515, April 24, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 616,959

Int. Cl.² B01J *17/00*

U.S. Cl. 29—580 **2 Claims**



1. A method of accurately and consistently making an extremely sensitive and temperature stable semiconductor pressure transducer having a thin vapor deposited polycrystalline silicon diaphragm, said method comprising:

forming on one surface of a supporting semiconductor wafer a layer of etch-resistant material having a crystallographic structure which promotes vapor deposition of polycrystalline silicon;

vapor depositing an extremely thin, high resistivity polycrystalline silicon film of a predetermined thickness on said etch-resistant layer wherein said vapor deposition of polycrystalline silicon consistently and accurately defines the thickness of a diaphragm for said pressure transducer;

forming a pressure responsive electronic device into centrally located portions of said polycrystalline silicon film wherein said electronic device is automatically electrically isolated by said high resistivity polycrystalline silicon;

etching said semiconductor wafer from its opposite surface to remove central portions of said wafer in a predetermined geometry corresponding to a desired geometry for said diaphragm;

stopping the etch upon exposure of corresponding portions of said etch-resistant layer thereby defining a polycrystalline silicon diaphragm being peripherally supported by the remaining portions of said wafer;

removing said exposed portions of said etch-resistant layer from one surface of said polycrystalline silicon diaphragm and any oxide-based coating on its opposite surface, thereby providing a temperature stable diaphragm which is noncontiguous with any material having a dissimilar coefficient of thermal expansion; and

applying electrical contacts to said pressure responsive electronic device thereby providing electrical access to said pressure transducer.

4,003,128

METHODS OF MAKING INDUCTIVE DEVICES AND TERMINATION ARRANGEMENTS FOR SAME

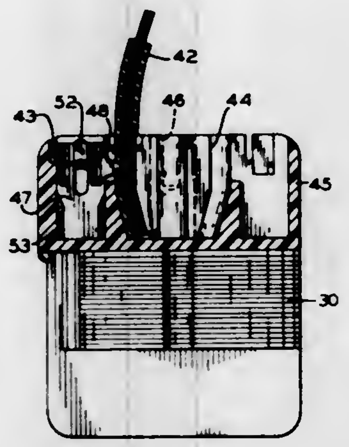
Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 437,336, Jan. 28, 1974, Pat. No. 3,974,407. This application July 10, 1975, Ser. No. 594,582

Int. Cl.² H02K *15/00;* **H01F** *41/10*

U.S. Cl. 29—596 **1 Claim**

1. A method of making an assembled device including a magnetic core and coil assembly having at least one insulating body associated therewith, and at least one insulated lead wire, the device further including at least one terminal having at least one insulation piercing tang, the method comprising the steps of: assembling together the magnetic core, the insulating body, and a coil having at least one coil lead extending therefrom; attaching the at least one coil lead to the terminal so as to establish electrical continuity therebetween and inserting the terminal into a connection receiving and retaining portion of the insulating body with the piercing tang pointed toward a pocket established by the insulating body; placing the insulated lead wire adjacent the insulation piercing tang of the terminal and at least in proximity to the pocket established by the insulating body; and moving a wedging member relative to and along the pocket, and thereby forcing the insulated lead wire against the piercing tang and causing the piercing tang to pierce insulation on the insulated lead wire and establish electrical continuity between the insulated lead wire and the coil lead attached to the terminal.



4,003,129

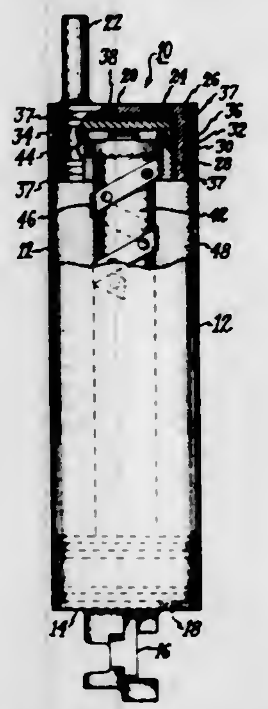
METHOD OF MAKING CURRENT LIMITING FUSE HAVING A FILTER DISPOSED IN ONE END CAP

Robert E. Koch, Pittsfield, and James H. Ceder, Lenox, both of Mass., assignors to General Electric Company

Division of Ser. No. 621,053, Oct. 9, 1975, Pat. No. 3,967,228. This application Jan. 23, 1976, Ser. No. 651,707

Int. Cl.² H01H *69/02*

U.S. Cl. 29—623 **3 Claims**



1. The method of manufacturing a current limiting fuse, comprising the steps, of:

a. assembling internal components of the fuse in a housing which includes end caps provided, respectively, with fill port and drain port;
b. packing the fuse with a particulate filler;
c. filling the fuse with colloidal silica suspension by forcing said suspension into said fill port and passing it at the other end of said fuse through a filter just before it drains out through said drain port;
d. removing excess solution from said fuse, and
e. drying said fuse by passing a drying gas through said fuse to remove the fluid from the residual suspension and to thereby result in a bonding together of said particulate filler inside said fuse.

4,003,130

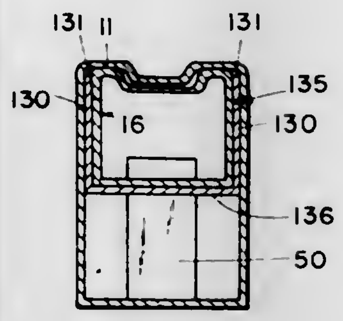
HAIR RAISING PANEL FOR ELECTRIC SHAVERS

James E. Rookus, 2902 Marshall SE., Apt. E-11, Grand Rapids, Mich. 49508

Continuation-in-part of Ser. No. 478,620, June 12, 1974, Pat. No. 3,940,851. This application Dec. 24, 1975, Ser. No. 644,142

Int. Cl.² B26B *19/10*

U.S. Cl. 30—34.2 **16 Claims**



12. In a cutting head for an electric shaver having a thin screen and a driven cutting blade movably mounted within and engaging the inside surface of said screen, said screen and said blade each having a top surface and a pair of sides, a plurality of openings through said top surfaces of said screen and said blade, portions of said openings extending down said sides through which individual hairs may pass to be sheared by said blade, the improvement in said cutting head comprising: a thin, rigid element fixed within said blade for movement therewith and seated against an inner side face of said blade, the top edge of said element being parallel with the top surface of said blade and in the same general horizontal plane as the inside surface of said top surface of said blade and overlaying the lower part of those portions of said openings extending down said sides of said blade for erecting individual hairs into a posture generally normal to the skin as the hairs pass through said openings.

4,003,131

DRY-SHAVING APPARATUS WITH RECIPROCATABLE CUTTING BLOCK

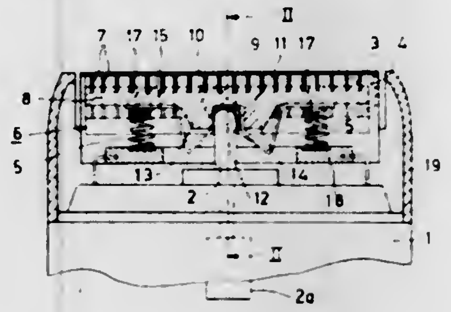
Gerrit Jan Groothuis, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,226

Claims priority, application Netherlands, Apr. 5, 1974, 7404655

Int. Cl.² B26B *19/02*

U.S. Cl. 30—43.92 **3 Claims**



1. An electric shaver comprising a housing, a shaving head at the top of said housing, an electric motor mounted in said housing, a drive pin reciprocally driven by said motor, the pin having an end part extending into said shaving head, a thin shear plate having a plurality of hair-entrance apertures mounted in said shaving head, a cutter assembly comprising a frame, a plurality of cutters carried by the frame, the cutters having cutting edges having shape conforming to and engaging said shear plate, said frame further including a coupling slot defining spaced first and second walls for receiving therein said drive end of the drive pin in drive engagement, and connection means in said slot adjacent said first wall of said slot contacting and resiliently urging said drive pin end firmly against said second wall of the slot, said connection means comprising a strip of material conforming generally in shape to and situated in said coupling slot, said strip comprising a spring section adjacent said first wall of the coupling slot, this section including a slot defining a tab bent out of the plane of said section for resiliently engaging said drive end of the drive pin.

4,003,132

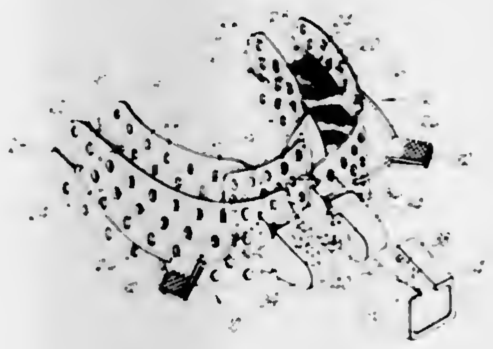
DEVICES AND METHODS FOR TAKING DENTAL IMPRESSIONS

Joseph F. Beck, 33 Huntington Road, Newton, Mass. 02158

Filed May 19, 1975, Ser. No. 578,718

Int. Cl.² A61C *9/00*

U.S. Cl. 32—17 **9 Claims**



1. A tray assembly for taking a dental impression in a patient's mouth in an impression medium contained in the tray assembly comprising buccal and lingual plates each relatively rigid to resist deformation in a vertical plane by the hydraulic pressure of the medium while in the patient's mouth when the patient bites down upon the medium but sufficiently bendable to adapt to the contour of the patient's arch, flexible strand means interconnecting the two plates for forcing the plates closer together to apply lateral pressure to the medium and a medium supporting means including a web interposed between the lingual and buccal plates and positioned to coincide with the patient's occlusal plane.

4,003,133

METHOD FOR THE ALIGNMENT OF MACHINE PARTS

Johannes A. F. Pierik, Santpoort, Netherlands, assignor to Papierfabrieken Van Gelder Zonen N.V., Amsterdam, Netherlands

Filed May 21, 1974, Ser. No. 471,971

Claims priority, application Netherlands, May 21, 1973, 7307071

Int. Cl.² G01B *11/27*

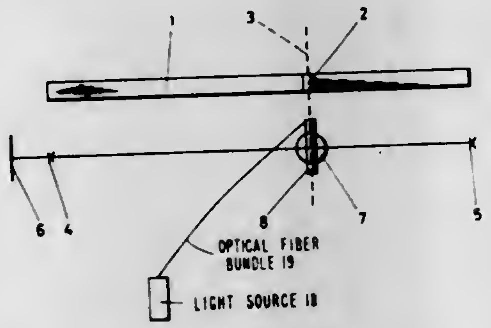
U.S. Cl. 33—228 **9 Claims**

1. A method of optically aligning parts of a machine comprising the following steps:

a. providing two reference marks entirely outside the machine and at a distance from each other as long as possible, determining a base line usually running parallel to the longitudinal center line of the machine;
b. mounting, beyond the machine as seen in the longitudinal direction of the machine and to the side of the machine as seen perpendicularly to the longitudinal direction of the machine, a reflecting device with the aid of optical means, the effects of the reflecting device corresponding

to that of one single reflecting surface and the mounting carried out in such a way that each intersection of this reflecting surface with a horizontal plane is a straight line intersecting or crossing the base line perpendicularly;

c. placing the viewer of a theodolite approximately in line with the center line of a machine part to be aligned, or in line with a generating line on the surface of said part and extending parallel to said machine part center line;
d. turning the view direction of the viewer over about 90° around a vertical axis and pointing the viewer towards the reflecting device in such a way that the point of intersection of the reticle of the viewer coincides with a point of the reflection image of the vertical line of said reticle;
e. turning the view direction of said viewer over exactly 90° about a vertical axis;
f. determining with the aid of the viewer adjusted in step (e) and rotatable in a vertical plane perpendicular to the base line, the distance between a point of the machine part center line or a generating line of said machine part at the front of this part and a vertical plane perpendicular to the base line and the distance between such a point at the back of this part and the same vertical plane;



g. determining in a numerical way the deviation of said machine part in a horizontal plane by calculating the differences between the two distances determimed in step (f);
h. determining with the aid of a water level and a theodolite the distance between a point of the center line or the generating line at the front of said machine part and a horizontal plane and the distance between such a point at the back of said machine part and the same horizontal plane;
i. determining in a numerical way the deviation of said machine part in a vertical plane by calculating the difference between the two distances determined in step (h);
j. correcting the position of said machine part in accordance with the numerical values of the deviations obtained in steps (g) and (i) respectively; and
k. repeating steps (c–j) for the other machine parts to be aligned.

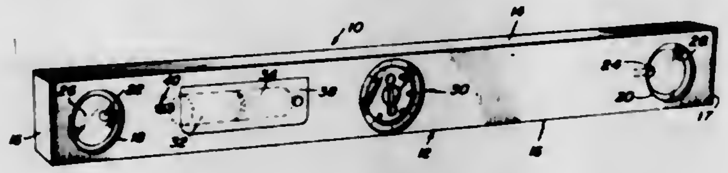
4,003,134

AUTOMATIC LIGHTED LEVEL AND ANGLE FINDER

David Adams, Box 161, Spring Branch Road, Jeremiah, Ky. 41826

Filed Aug. 6, 1975, Ser. No. 602,307
Int. Cl.² G01C ***9/06***

U.S. Cl. 33—348 **12 Claims**



1. An automatic lighted level and angle finder, comprising, in combination:

a. a frame having a planar surface arranged for abutting against an object the orientation of which is to be determined and adjusted;
b. electrical energized visual indicator means mounted in the frame for indicating when the planar surface is oriented at an angle corresponding to the angular orientation being determined; and
c. angle-sensing switch means adjustably mounted on the frame and connected to the indicator means and a source of electrical power for being set at an angle relative to the planar surface and energizing the indicator means by closing an electrical circuit connecting the indicator means to the source of electrical power when the orientation of the planar surface corresponds to the angle set on the switch means, the frame being provided with an opening receiving the level sensing switch means, and the level sensing switch means including a reel assembly, comprising, in combination:

1. an annular reel body rotatably disposed in the opening provided in the frame;
2. a gravity-responsive electrical switch mounted in the reel body; and
3. a side wall removably affixed to the reel body and provided with manipulating means for permitting selective rotation of the side wall and the reel body with respect to the frame, the reel assembly further including a pair of substantially liquid-filled arcuate vials curved to conform to the circumference of and mounted in opposed relation within the side wall, the uppermost vial in any orientation of the planar surface forming a reading bubble.

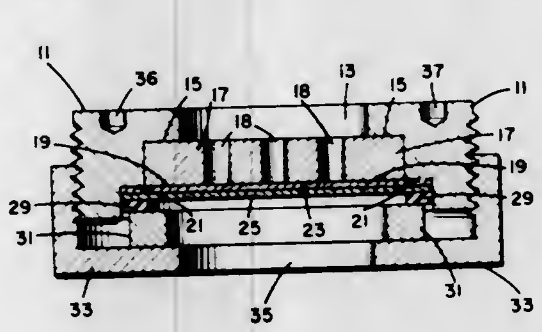
4,003,135

SPECIMEN HOLDER AND TECHNIQUE EMPLOYED TO EFFECT A CONTINUOUS MAXIMUM CONCENTRATION GRADIENT IN CRITICAL POINT DRYING

Frederick L. Baker, Lacon, and Lambertus H. Princen, Peoria, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 13, 1975, Ser. No. 586,783
Int. Cl.² F26B ***5/00, 25/18***

U.S. Cl. 34—9 **10 Claims**



10. A method for drying small particle materials for viewing through an electron microscope, said method comprising:

a. placing said material between a first filter and a second filter;
b. passing ethanol through said filters and in contact with said material;
c. subsequently passing amyl acetate through said filters and in contact with said material;
d. subsequently passing liquid CO_2 through said filters and in contact with said material; and
e. removing said liquid CO_2 from said material.

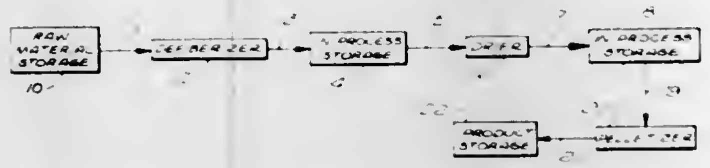
4,003,136

METHOD FOR THE DRYING AND RECOVERY OF POLYETHYLENE WASTE MATERIAL

David N. Vincent, and Charles L. Segal, both of 6458 Bluefield Place, San Diego, Calif. 92120

Filed Feb. 3, 1975, Ser. No. 546,441
Int. Cl.² F26B ***7/00***

U.S. Cl. 34—12 **14 Claims**



1. A method for drying wet polyethylene waste material to a predetermined moisture level, said waste material being confined in an enclosure, said enclosure having a hollow drum and an air inlet and outlet therein, said drum defining an enclosed area and having perforations of a size suitable for retaining said waste material, comprising:

exposing said waste material to a high velocity heated air flowing into said enclosure through said inlet and out of said enclosure through said outlet,
controlling the temperature of said heated air at said inlet to be at a specified value within a predetermined temperature range, whereby said waste material is dried by said heated air with minimal fusing of said waste material to said drum, and
controlling the time duration that said waste material is exposed to high velocity heated air by terminating said heated air flow when the temperature of said heated air at said outlet reaches a specified temperature between about 3° F and about 15° F lower than said specified value at said inlet.

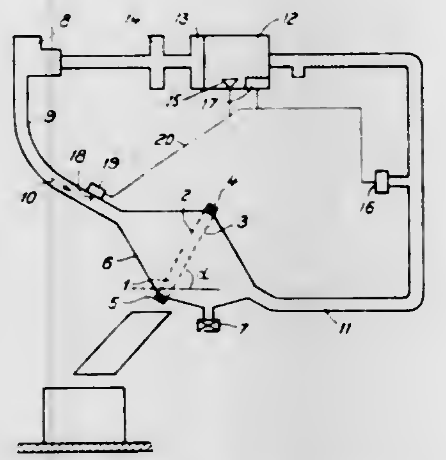
4,003,137

METHOD OF DRYING WET POWDER

Lars-Erik Björn, and Mats Jurgen Martin Olsson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Oct. 1, 1974, Ser. No. 510,876
Claims priority, application Sweden, Oct. 1, 1973, 7313296
Int. Cl.² F26B ***3/14***

U.S. Cl. 34—25 **4 Claims**



1. A method for the drying of nitrocellulose powder comprising the steps of:

a. admitting the wet powder with liquid into the upper part of a frame comprising a pair of generally parallel spaced foraminous members which are inclined at an acute angle to the horizontal, the wet powder being admitted in sufficient quantity to substantially fill the spaces between the members;
b. directing a stream of a drying gas against the upper one of said members;
c. receiving the dried powder from between the spaced members at the bottom of the frame;
d. removing the liquid through the apertures in the lower one of said members;
e. selecting the angle of inclination of the frame to be between 5° and 45° to the horizontal;
f. selecting the velocity of the drying gas such that in conjunction with the selected said angle of inclination the powder is spread on a substantially even layer over the lower one of said frame members throughout the drying of the powder.

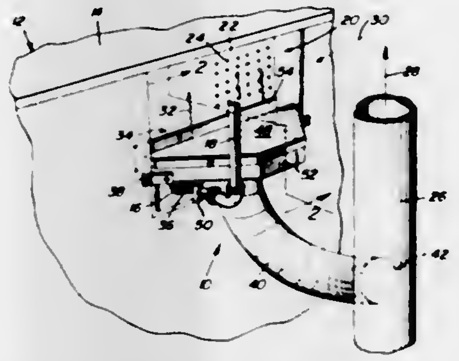
4,003,138

AIR CURTAIN FOR CLOTHES DRYER

Wayne M. Wicks, 13th and Johnson Sts., Sturgis, Ky. 42459

Filed Sept. 23, 1975, Ser. No. 615,974
Int. Cl.² F26B ***19/00***

U.S. Cl. 34—86 **9 Claims**



1. In combination with an air heating dryer or the like having an enclosure within which a heating device is located for heating air entering the enclosure through an intake opening to atmosphere and wherein the enclosure is vented by an exhaust conduit through which an outflow stream of heated air is conducted, means for preheating air entering the enclosure, comprising flow diverting means connected to the exhaust conduit for receiving said heated air under a relatively high outflow velocity, and flow directing means connected to said flow diverting means for atmospherically discharging said heated air adjacent to said intake in a direction transversely of the inflow through the intake to establish an unconfined curtain of heated air externally of the enclosure through which the air entering the intake must pass.

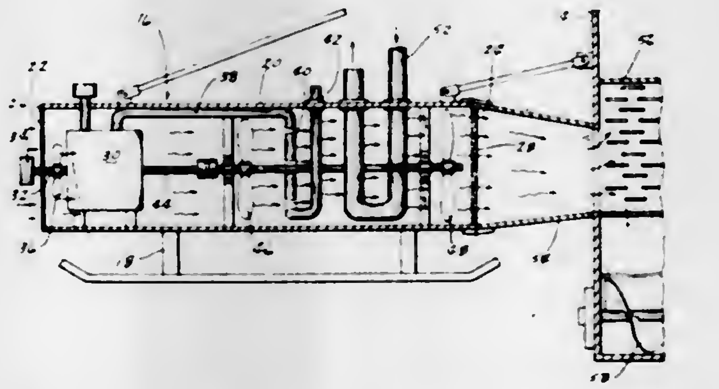
4,003,139

GRAIN DRYER

Clinton T. Van Winkle, Cairo, Nebr. 68824

Filed May 6, 1975, Ser. No. 567,726
Int. Cl.² F26B ***19/00***

U.S. Cl. 34—86 **1 Claim**



1. In combination with a combine having a first engine and a grain tank, comprising,

a portable grain dryer mounted on said combine,
said grain dryer comprising a housing having first and second ends, an air cooled engine mounted in said housing

inwardly of said first end, said air cooled engine having an exhaust pipe extending therefrom through said housing and thence outwardly to the atmosphere, a fan means rotatably mounted in said housing and being driven by said air cooled engine whereby said fan means will draw air inwardly into said housing first end and force air outwardly from said housing second end,

said second end of said housing being in operative communication with the lower interior of the grain tank whereby the air passing through said housing will be heated by the heat from said air cooled engine and said exhaust pipe and will be forced into the lower interior of the grain tank by said fan means,

and an exhaust pipe portion extending from said first engine through said housing so that the heat from said exhaust pipe portion will further heat the air passing through said housing.

4,003,140

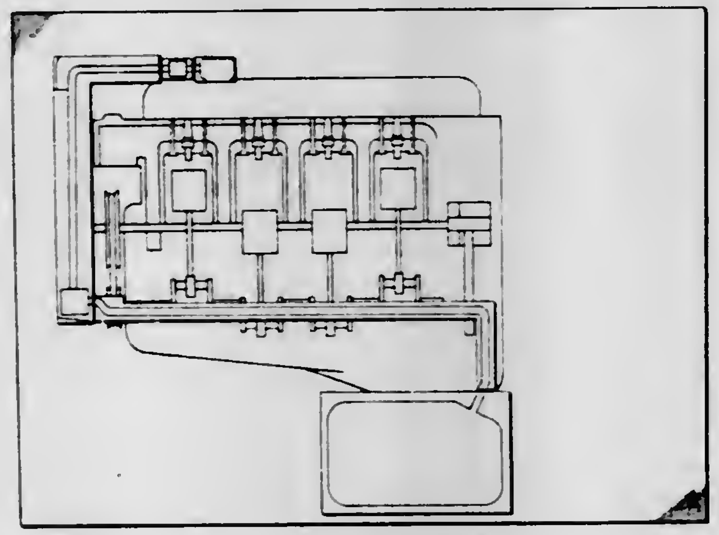
EDUCATIONAL DEVICE FOR LEARNING ENGINE FUEL, LUBRICATION AND COOLING SYSTEMS

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,135

Int. Cl.² G09B ***25/02***

U.S. Cl. 35—13 **5 Claims**



1. An educational kit programmed for teaching automobile fuel, engine lubrication, and engine cooling systems comprising as integrated component parts thereof:

a. a simulator board having a surface of magnetically attractive material and including graphic indicia on the surface thereof defining a schematic sectional diagram of an automobile engine block, the indicia on said simulator board being as shown by the non-numerical indicia of FIG. 1;

b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces specific graphic indicia defining schematic representative diagrams of automobile engine fuel, lubrication, or cooling system component parts,

said pieces adapted for positioning on said simulator board such that the indicia on said pieces complements the indicia on said board and the indicia on each of the several pieces coacts with the indicia on other pieces to form completed schematic diagrams of automobile fuel, lubrication or cooling systems;

said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces, the indicia on said manipulative pieces being as shown by the non-numerical indicia of FIG. 3; and

c. audio-visual instructional means including synchronized recordings and visual slides or filmstrips presenting information relevant to the automotive systems including information defining the relationship between the indicia on said pieces and the indicia on said simulator board;

said audio-visual instructional means further characterized in that it is periodically stopable to permit the user to perform a manipulative activity requested by the instructional means using said simulator board and said manipulative pieces, and being restartable again by the user upon completion of the activity;

d. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board.

4,003,141

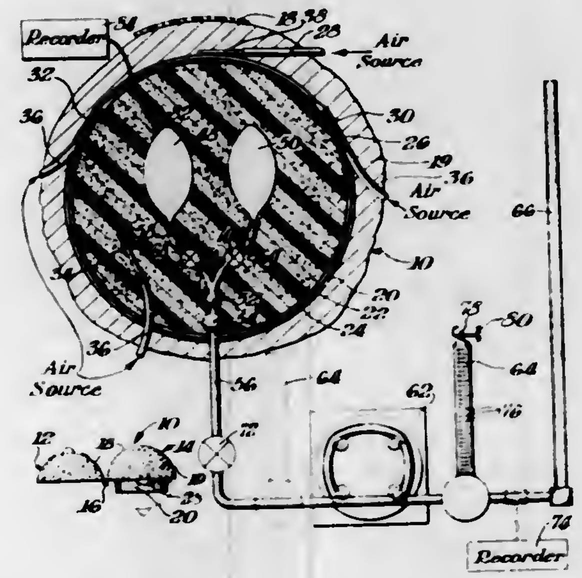
INTRACRANIAL PRESSURE MONITORING DEVICE

Pierre L. Le Roy, Wilmington, Del., assignor to New Research and Development Lab., Inc., Wilmington, Del.

Filed Apr. 1, 1975, Ser. No. 564,039

Int. Cl.² G09B ***23/32***

U.S. Cl. 35—17 **16 Claims**



1. An intracranial pressure monitoring device comprising a pressure sensor, means for mounting said sensor within the skull of a body at the situs where the pressure is to be monitored, pressure indicating means disposed externally of the body, situs pressure transmitting means associated with said sensor for transmitting a value representative of the pressure at the body situs to said indicating means, said body being an inanimate body, said device being in combination therewith, said situs being a simulated body component, pressure creating means mounted externally of said body and connected thereto remote from said simulated component for creating an abnormal pressure condition, and abnormal pressure transmitting means in said body between said pressure creating means and said simulated body component for transmitting the abnormal pressure condition to said simulated body component.

4,003,142

SCULPTURING KIT AND METHOD FOR PRODUCING DEHYDRATED FORMS FROM HYDRATED ARTICLES

Howard J. Morrison, Deerfield, and Robert K. Allen, Frankfort, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,251

Int. Cl.² A63H ***9/00;*** **A21B** ***1/22***

U.S. Cl. 35—26 **11 Claims**

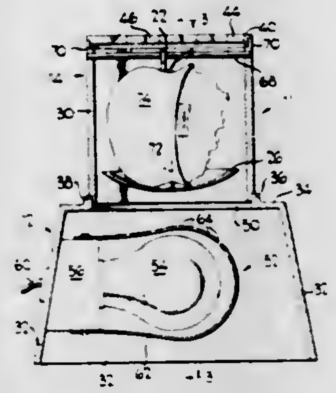
1. A sculpturing kit for use with a hydrated article, such as a fruit or vegetable, for forming dehydrated sculptures from said articles, comprising, in combination:

a base structure including a heat source mounted within the base;

at least one heating chamber removably mounted on the base in a heat transfer relationship with the heat source therein;

at least one implement for sculpturing the article;

template means to assist the user in sculpturing the desired shape of the article prior to dehydration, said template means including a plurality of individual templates, each template having at least one pin for puncturing the article to mount the template thereon, said templates being in the form and shape of various facial features to permit sculpturing of the article therearound to provide more distinguishable facial characteristics on the article; and



means for mounting the article in the heating chamber, said mounting means including a generally horizontal rod mounted generally at the top of the heating chamber and means for embedding within the article including an extended member for supporting the article in a hanging position from the horizontal rod out of contact with any portion of the heating chamber whereby heat derived from the heat source partially dehydrates the article to form a sculpture.

4,003,143

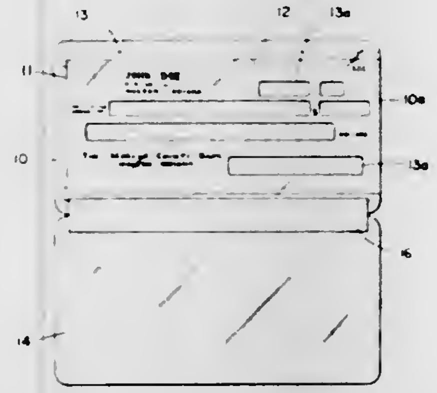
CHECK WRITING GUIDE

John E. Keitzer, and Betty Jo Keitzer, both of Lake Wales, Fla., assignors to Betty J. Keitzer, Lake Wales, Fla.

Filed Dec. 15, 1975, Ser. No. 640,462

Int. Cl.² G09B ***21/00***

U.S. Cl. 35—38 **2 Claims**



1. A check writing guide for use by the blind comprising a rigid generally rectangular backing plate, a rectangular cavity formed in one face of said backing plate sized to freely accommodate a conventional blank bank check and extending to one end margin of said backing plate, a template insertable in said cavity from said one end margin of the backing plate for closing the cavity and overlying a check received therein, said template being apertured to guide the hand-written information conventionally applied to a check, and a base plate having substantially the same size as said backing plate and hinged thereto along adjacent long margins of the plates, whereby a check may be inserted at said one margin of said backing plate into said cavity and under said template, the base plate serving as a stabilizing rest for the wrist of the check writer and the orientation of said base plate with respect to said backing plate and template being reversible by removing said template, rotating said backing plate through 180°, and then reinserting the template into said cavity thereby accommodating the stabilizing rest function of the base plate to either right or left handed users.

4,003,144

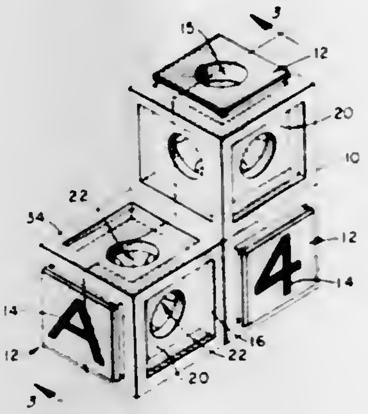
EDUCATIONAL BLOCK WITH REPLACEABLE CHIP

Robert Maddestra, Canton, and David E. Munn, Framingham, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed July 11, 1975, Ser. No. 595,301

Int. Cl.² A63H ***33/08***

U.S. Cl. 35—70 **4 Claims**



1. An educational block comprising a block and a removable chip in combination, said block being formed of a polymeric material and having the general configuration of a cube with a square recess of predetermined depth on each face for receiving the removable chip, each face of the block also defining an aperture for reducing the weight of the block without reducing its strength, said chip being fabricated of a polymeric material and including opposed flexible lips about a groove around the perimeter of the chip, each of said lips having a first predetermined thickness and said groove having a second predetermined thickness, the combined thickness of a lip and said groove being more than said recess depth, whereby an exposed portion of the groove of a first chip received in a block recess enables a second chip's lip to be received therein, whereby one chip can be used to remove another chip secured in a recess in the block, said chip also having a thickness substantially twice the depth of the recess on the face of the block in order that a single chip may be used to fasten opposed faces of two blocks together and wherein the chip has a square configuration to prevent the movement of mated faces when secured together.

4,003,145

FOOTWEAR

Anton Liebscher, Waynesville; Sven Oberg, Lake Junaluska; Kenneth Smathers, and Horace Auberry, both of Waynesville, all of N.C., assignors to Ro-Search, Inc., Waynesville, N.C.

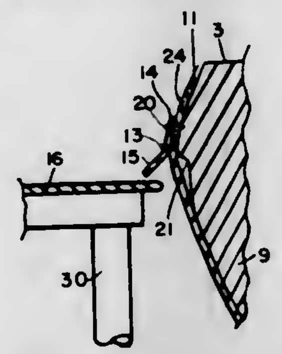
Filed Aug. 1, 1974, Ser. No. 493,965

Int. Cl.² A43B ***13/18;*** **A43D** ***21/00***

U.S. Cl. 36—17 PW **7 Claims**

1. Footwear comprising an upper, a welt secured to said upper substantially above the insole level, a tread sole, said tread sole having a portion thereof extending upwardly substantially above the insole level to form a peripheral side

extension molded to said welt, said sole and side extension being formed of elastomeric material, said welt having a portion thereof extending over and covering and sealing the entire upper peripheral edge of the extension of the tread sole.



4,003,146

METHOD OF MANUFACTURE OF A SHOE

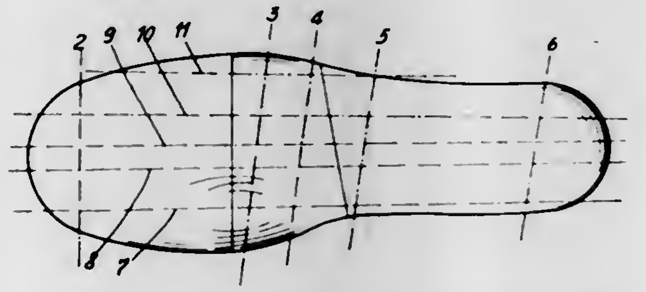
Ernst Meier, Schutzengasse 22, CH-8001 Zurich, and Alois Odermatt, Barzstrasse 2, CH-8437 Zurzach, both of Switzerland

Filed Feb. 13, 1975, Ser. No. 549,580

Claims priority, application Switzerland, May 31, 1974, 7487/74; Dec. 11, 1974, 16447/74

Int. Cl.^{2} A43B *13/18*

U.S. Cl. 36—44 **9 Claims**



1. An inner bottom member for a shoe for fitting onto a last and connection with a shank and outer sole and comprising,
   an under surface for said member which is substantially flat both between the location of the tips and balls of the toes toward the front of the foot and also in the heel region,
   an upper surface for said member which defines depressions therein both for the ball of the big toe and the small toe while arching upwardly between said depressions in the lateral cross-section of said member, the depression for the small toe being shallower than that for the big toe,
   said upper surface of said member being of concave curvature in lateral cross section in the region of the heel with a maximum radius of curvature which is 1.5 times the greatest width of said member,
   said upper surface of said member having a longitudinal inclination of no more than 10° with the plane of the toe region.

4,003,147

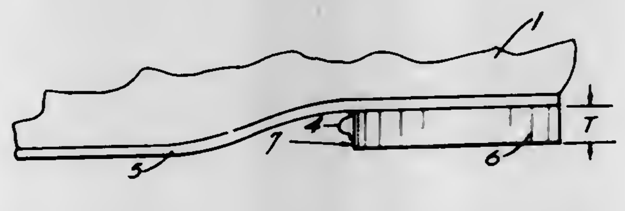
SHOE SHOELACE ACCESSORY

George J. Bayder, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 27, 1975, Ser. No. 581,360

Int. Cl.^{2} A43B *23/00*

U.S. Cl. 36—136 **2 Claims**



1. A shoelace accessory in combination with a shoe, said shoe having a bottom, a heel having a thickness defined by a front surface substantially perpendicular to the bottom and extending a predetermined distance beneath the bottom of the shoe, a back, a pair of sides and a shoelace, said shoelace accessory comprising
   a sealed container permanently affixed to the front surface of the heel and having an openable cover; and
   an extra shoelace housed in the container.

4,003,148

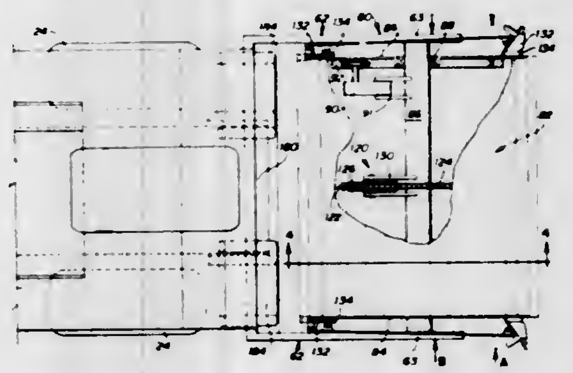
WHEEL EXCAVATOR WITH PIVOTALLY MOUNTED SIDE CUTTING TEETH

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Continuation of Ser. No. 596,679, July 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application Feb. 2, 1976, Ser. No. 654,654

Int. Cl.^{2} E02F *3/24*

U.S. Cl. 37—190 **20 Claims**



1. An excavating and loading system comprising in combination:
   a vehicle;
   means supporting the vehicle for movement over a surface;
   excavating wheel means for forming an excavation including a plurality of digging buckets each having a cutting edge which extends to the stationary rear wall and a movable front wall mounted for pivotal movement from a material receiving position to a material dumping position, movable side walls mounted for pivotal movement between a first material receiving position wherein the walls pivot outward wider than the widest portion of the vehicle and a second material discharge position wherein the walls pivot inward to a position flush with the side of the wheel means;
   means pivotally attached to said vehicle and supporting the excavating wheel means on the vehicle whereby the excavating wheel means is positioned in the front of the vehicle, said means supporting said excavating wheel having portions extending axially out from and engaging the ends of the excavating wheel means;
   means for selectively varying the relative position of said excavating wheel means and said vehicle whereby said excavating wheel means can be selectively raised or lowered to excavate at various depths;
   drive means for rotating the excavating wheel means so that the digging buckets follow a circular path;
   means located within the margins of the excavating wheel means and responsive to rotation thereof for positively positioning the movable front wall of each digging bucket in the material dumping position when the bucket is in the upper and rearward portion of the path and for positively positioning the movable side walls in the material digging and dumping positions; and
   conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheel means and a relatively high discharge position located rearwardly on the vehicle.

4,003,149

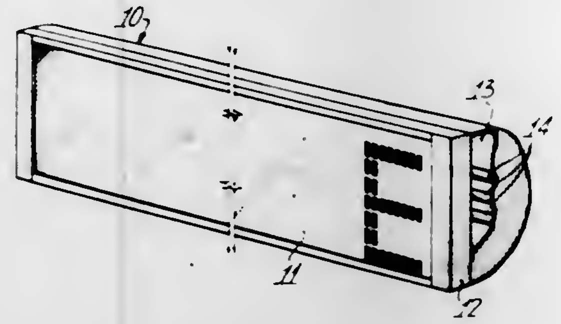
DISPLAY DEVICE AND DISPLAY UNIT FOR USE THEREIN

Peter de Vries, R.R. No. 1, Lachute, Quebec, Canada

Filed Nov. 26, 1974, Ser. No. 527,270

Int. Cl.^{2} G09F *9/30, 13/34*

U.S. Cl. 40—28 C **18 Claims**



1. A display device comprising:
   a. an array of a plurality of display units arranged in rows and columns,
   b. means defining a path for light through each unit,
   c. each said unit having a movable control member having a light transmitting condition and a light occluding condition for displaying a selected pattern of light by actuation of selected ones of said units to their transmitting condition,
   d. first energization means interconnecting all the units of alternate columns of units as a first group,
   e. second energization means interconnecting as a second group all the units of the columns of units intermediate those of the first group,
   f. means interconnecting each individual unit to the adjacent unit of the same row in a downstream direction for controlling said downstream unit and hence rendering said downstream unit a "slave" unit to the upstream unit which latter thus becomes a "master" unit for reproducing in the slave unit the condition of such upstream master unit,
   g. first means for actuating said first energization means for simultaneously rendering all units of said first group master units and all units of the second group slave units,
   h. second means for actuating said second energization means for simultaneously rendering all units of the second group master units and all units of the first group slave units, and
   i. means for operating said first and second actuating means alternately to cause said pattern to travel along the array.

4,003,150

SCHEDULING BOARD

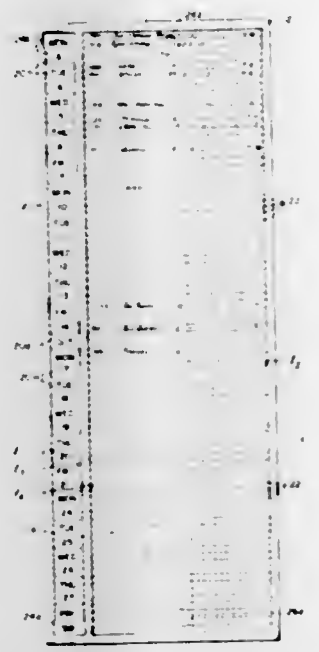
John S. Anderson, and Virginia B. Anderson, both of Manor Hill Farm, Glenarm, Md. 21057

Filed Mar. 19, 1976, Ser. No. 668,576

Int. Cl.^{2} G09F *3/20*

U.S. Cl. 40—64 R **8 Claims**

1. A job or operation scheduling board providing a visual listing of a plurality of jobs, operations, etc. scheduled or contracted to be undertaken and the progress thereof in relationship to the time allotted to each for their completion, comprising:
   an elongate rectangular planar board of rigid material, means providing with the planar outer face of the board a relatively narrow-width vertical slideway extending along one side edge thereof and for substantially the full length of said side edge, a plurality of discrete planar tabs of equal vertical height and having horizontal top and bottom edges arranged in column formation in said slideway and with said edges disposed in abutting relationship, said tabs being inscribed on their outer planar faces with markings indicative of the days of a normal work week and the consecutive dates of a plurality of such working days within a specified time such as a month, means providing with the planar outer face of said board a channel of substantially greater lateral dimension than that of said slideway and extending from said slideway to the opposite side edge of the board and a multiplicity of transversely elongate semi-rigid strips normally disposed in top-to-bottom edge engagement in said channel and being inscribed on their outer faces with job or operation data, the vertical height of said strips being a known fraction of the vertical height of any one of said tabs whereby the total vertical height of a plurality of said strips equals the vertical height of one or more tabs of the vertical column thereof, means normally retaining both the tabs and elongate strips in slidable engagement on the outer planar face of the board, the tabs being slidable upwardly in the slideway as a column upon removal of the topmost tab and said topmost strips being each manually liftable from the channel in response to bowing force applied to their middle length portions from beneath same whereupon all lower strips may be slid upwardly in their channel to positions filling the space or spaces previously occupied by said topmost strips.



4,003,151

TEST PLATE READER

Felix P. Tolosa, and Miles G. Hossom, both of Alexandria, Va., assignors to Dynatech Laboratories, Incorporated, Alexandria, Va.

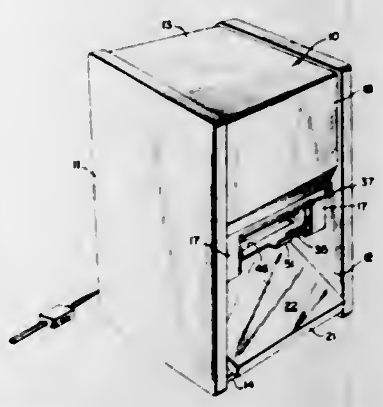
Filed Oct. 3, 1975, Ser. No. 619,183

Int. Cl.^{2} G09F *13/10*

U.S. Cl. 40—106.1 **9 Claims**

1. Apparatus for viewing the wells of a transparent test plate having a multiplicity of individual test material containing wells arranged in predetermined relative location, comprising means including a light source defining a light path, means for mounting said test plate in predetermined location in said path, and a target mounted across said light path between the

source and said test plate, said target having a multiplicity of individual substantially opaque areas corresponding in number and relative location to the number and relative location of the wells in the test plate.



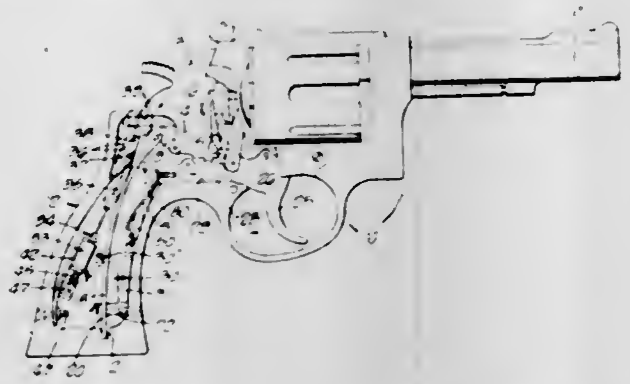
4,003,152
SAFETY SYSTEM

James N. Barker, Ontario, and Edward A. Cartwright, Montclair, both of Calif., assignors to Precision Thin Film Corporation, Los Angeles, Calif.

Division of Ser. No. 451,975, March 18, 1974, Pat. No. 3,939,679, and a continuation-in-part of Ser. No. 371,378, June 19, 1973, abandoned. This application Oct. 7, 1975, Ser. No. 620,357

Int. Cl.² F41C *17/00*

U.S. Cl. 42—70 R **23 Claims**



1. In a hand-held firearm for operation only by authorized personnel, the combination comprising:
   a firing mechanism;
   first means positioned on said firearm and normally locking said mechanism in an inoperative position; and
   second means adapted to be carried by said authorized personnel and including means for transmitting a radiated energy control signal to which said first means is responsive only at the option of said authorized personnel to deactivate said first means and restore the operability of said firing mechanism.

4,003,153
FISHING ROD MOUNTED LINE-DETAINING DEVICE

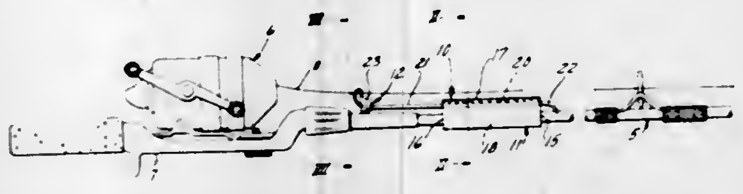
James E. Khalil, 6511 Marsol Road, Apartment 204, Mayfield Heights, Ohio 44122

Filed Jan. 12, 1976, Ser. No. 647,881

Int. Cl.² A01K *87/00*

U.S. Cl. 43—25 **8 Claims**

1. A line-detaining device for attachment to a fishing rod comprising:
   a support body having an upper surface and an undersurface at opposite sides thereof, said undersurface being adapted in the lengthwise sides thereof, said undersurface being adapted in the lengthwise direction of the body to engage a longitudinal surface of a fishing rod with the rear end of the body nearer the handle and reel of the fishing rod, said body having an elongate guideway extending in said lengthwise direction through said body;
   a slide member having a substantially straight elongate bar portion of a length substantially exceeding that of the passageway, a head portion connected with the rear end of the bar portion, and a detent portion connected with the front end of the bar portion, said head detent portions being arranged in lateral directions relative to the bar portion to engage said body at opposite ends of the guideway to limit the member to a range of movement relative to the body, said head portion extending laterally from the bar portion to terminate in a crest surface;
   said head portion having line-gripping means for receiving a line inwardly from said crest surface which enables a fishing line to be pinched and frictionally gripped by said head portion.



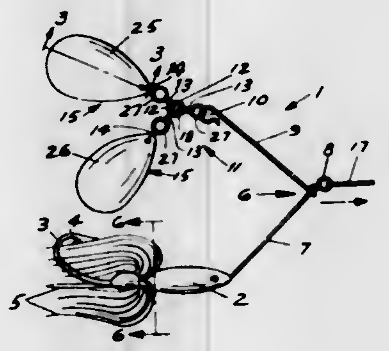
4,003,154
FISHING LURE

Robert G. Carver, P.O. Box 44, Athens, La. 71003

Filed Aug. 25, 1975, Ser. No. 607,106

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.13 **16 Claims**



1. A fishing lure comprising:
a. a body;
b. at least one hook carried by said body;
c. at least one wire harness, one end of which is carried by said body and the opposite end of which is disposed at a distance from said body;
d. triangle swivel means having a first, second and third seivel leg, each disposed in spaced, rotatable relationship with respect to the other, said first swivel leg carried by said opposite end of said wire harness;
e. eye means in said wire harness for attaching a fishing line; and
f. a first spinner carried by said second swivel leg of said triangle swivel means and a second spinner carried by said third swivel leg of said triangle swivel means, said first spinner and said second spinner disposed to move when said lure is pulled through the water.

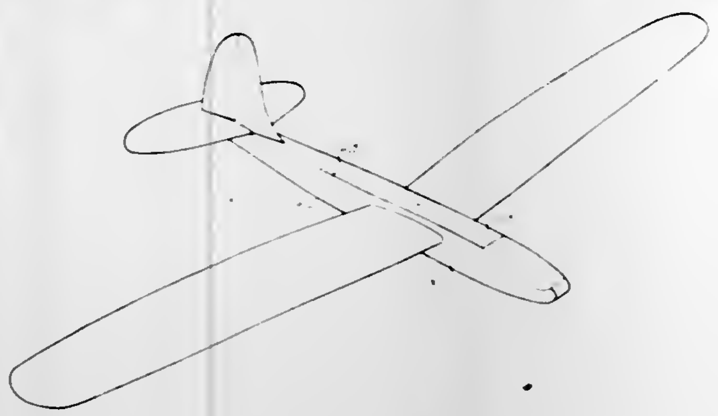
4,003,155
MODEL AIRCRAFT AND PACKAGE

Jef Raskin, Brisbane, Calif., assignor to Jef's Friends, Brisbane, Calif.

Filed Apr. 7, 1975, Ser. No. 565,766

Int. Cl.² A63H *27/00*

U.S. Cl. 46—79 **12 Claims**



8. In a model aircraft, an airfoil comprising:
a plurality of rib elements for defining an airfoil shape;
a forming element of a material having on one side a plurality of parallel channels, said forming element being stretched around said plurality of rib elements with said channels facing away from said rib elements; and
a covering sheet stretched around said forming element.

4,003,156
PROCESS FOR OBTAINING VARIANTS OF PLANTS WITH IMPROVED CHARACTERISTICS

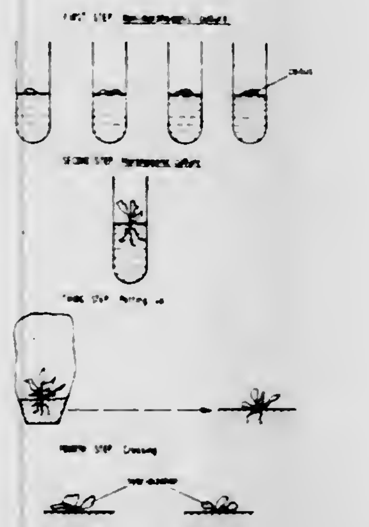
Monique Sibi, Orsay, and Yves Demarly, Versailles, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 17, 1975, Ser. No. 587,611

Claims priority, application France, June 20, 1974, 74.21535

Int. Cl.² A01G *1/00;* **A01H** *1/00*

U.S. Cl. 47—58 **27 Claims**



1. A process for obtaining variants of plants having improved characteristics which comprises the following steps of
1. placing and culturing, on a non-morphogenic synthetic nutrient medium, tissues obtained from the germination of seed from a single homozygous seed-plant, the said culture medium essentially consisting, firstly, of a basic medium formed of mineral salts, vitamins, iron and saccharose, and secondly, of growth substances in an amount sufficient to ensure callus formation,
2. sub-culturing the so formed calluses on a morphogenic medium consisting of the above basic medium having different levels of saccharose and growth substances until plants of varying characteristics are formed,
3. selecting each viable plant, and,
4. selfing it to obtain a strain thereof.

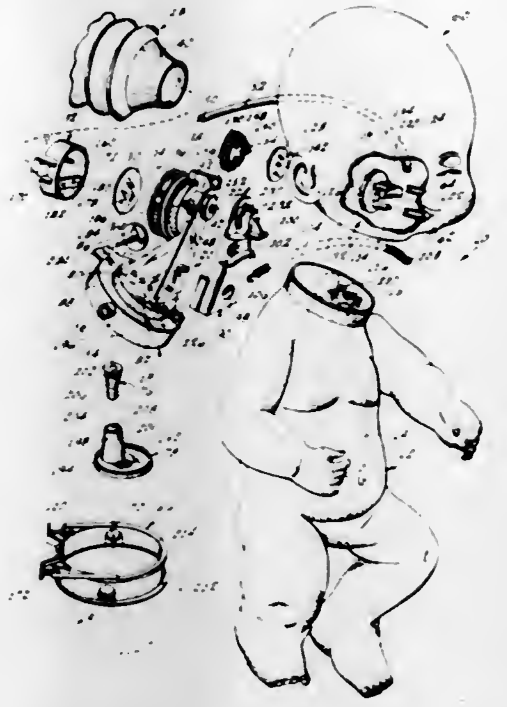
4,003,157
SNEEZING DOLL IMPROVEMENT

Benjamin Guzman Guerrero, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 3, 1975, Ser. No. 637,357

Int. Cl.² A63H *5/00*

U.S. Cl. 46—118 **2 Claims**



2. In an animated figure toy including a head in which a liquid-containing reservoir and means for pressurizing said reservoir are mounted, said figure toy being adapted to simulate a sneezing seizure, said simulation including the expulsion from said head of liquid supplied from said reservoir, wherein the improvement comprises that said reservoir includes:
   a first housing member including a front wall having a rear surface, an encompassing side wall and an open rear portion;
   a water inlet, a water outlet and an air inlet mounted on said front wall in fluid communication with its rear surface;
   a second housing member sealed to the open rear portion of said first housing member; and
   a check valve mounted in said reservoir between said housing members.

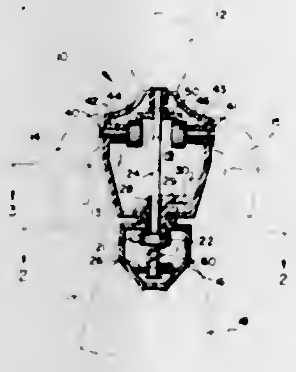
4,003,158
FIGHTING DOLL

Tobin Wolf, Passaic, N.J., and Tit Shing Wong, Kowloon, Hong Kong, assignors to Mego Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 502,436, Sept. 3, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,090

Int. Cl.² A63H *11/00*

U.S. Cl. 46—120 **13 Claims**



1. A fighting doll comprising:
a. a lower torso having legs depending therefrom;
b. an upper torso pivotably mounted to said lower torso;
c. a first arm rotatably mounted to said upper torso;

- d. a second arm rotatably mounted to said upper torso;
- e. a first shaft extending from said first arm at its shoulder portion to rotatably support said first arm in said upper torso;
- f. a second shaft extending from said second arm at its shoulder portion to rotatably support said second arm in said upper torso; and
- g. actuating means in communication with said first and second shafts including
  - i. a central shaft within said upper and lower torsos said central shaft being fixed at one end to said lower torso;
  - ii. a first means in communication with said central shaft and said upper torso; and
  - iii. a second means in communication with said central shaft and said first and second shafts;
- h. said actuating means permitting said upper torso to pivot relative to said lower torso and said first and second arms to swing simultaneously with said movement of said upper torso in a fighting motion when said actuating means is activated.

4,003,159

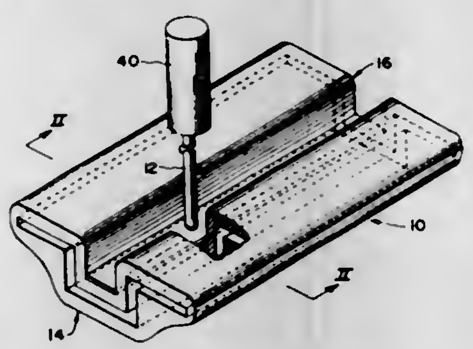
GAME CALL

Frank R. Piper, Delmont, Pa., assignor to Penn's Woods Products, Inc., Delmont, Pa.

Filed Jan. 12, 1976, Ser. No. 648,412

Int. Cl.² A63H *5/00*

U.S. Cl. 46—189 **5 Claims**



1. A game call comprising the combination of:

a unitary member consisting of a carrier and sounder board, said carrier including an elongated base and support arms projecting laterally above the opposed sides of said base to thereby define said carrier with a generally U-shaped cross section,

said sounder board having a generally U-shaped cross section formed by an elongated planar sounder head having a planar top face coextending with and lying between two sounder arms, said sounder arms being connected to the support arms of said carrier by web sections in such a manner to define an open-ended sound slot by a gap formed between the U-shaped configurations of said carrier and said sounder board,

an elongated striker plate adhered to the top face surface of said sounder head, and

means for vibrating said striker plate and thereby said sounder board to radiate an audible sound corresponding to a sound made by wild game from said open-ended sound slot.

4,003,160

PROCESS FOR GROWING CHLOROPHYLLOSE PLANTS USING CARBON DIOXIDE AND HEAT GENERATED IN EXOTHERMIC AEROBIC FERMENTATION PROCESSES

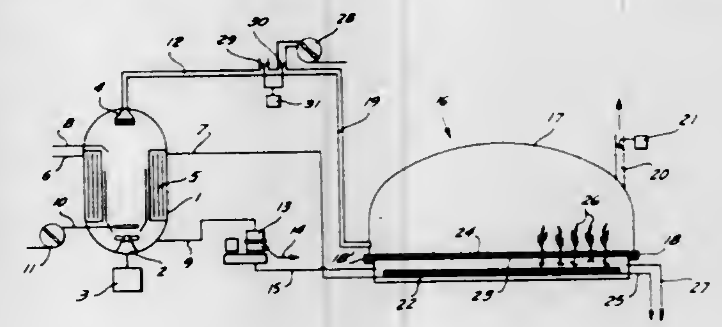
Hans Müller, Im Almendli, Erlenbach, Zurich, Switzerland

Continuation-in-part of Ser. No. 551,348, Feb. 20, 1975, abandoned. This application Feb. 24, 1976, Ser. No. 661,118

Claims priority, application Switzerland, Mar. 14, 1974, 3687/74; June 25, 1974, 8804/74

Int. Cl.² A01G *31/02*

U.S. Cl. 47—58 **3 Claims**



1. A continuous process for growing chlorophyllose plants or vegetation in a greenhouse which comprises

- a. aerobically cultivating a yeast in a nutrient medium in a fermentor,
- b. continuously controlling the temperature of the nutrient medium in the said fermentor during the fermentation by heat exchange with a coolang passing through a heat exchanger in contact with the nutrient medium in the said fermentor,
- c. continuously passing the effluent coolant from the said heat exchanger to a second heat exchanger that is located in the greenhouse below the surface of a layer of liquid that is located below a bed of chlorophyllous plants that are growing in the said greenhouse,
- d. continuously passing the nutrient medium in which the yeast cells have been grown from the fermentor into a separator,
- e. separating the yeast cells from the liquid portion of the nutrient medium in which the yeast cells have been grown in the said separator and recovering the said yeast cells,
- f. continuously passing the said liquid portion of the nutrient medium from which the yeast cells have been separated into and through the greenhouse below the bed of chlorophyllous plants that are growing in the said greenhouse and into contact at least with roots of the plants growing in the said bed,
- g. continuously passing the carbon dioxide that is generated during the cultivation of the yeast from the fermentor into the atmosphere of the greenhouse, and
- h. harvesting the plants that have been grown in the said bed in the said greenhouse.

4,003,161

MECHANICAL BARRIER

Wesley A. Collins, 1315-C Via Santiago, Corona, Calif. 92720

Filed Mar. 1, 1976, Ser. No. 662,477

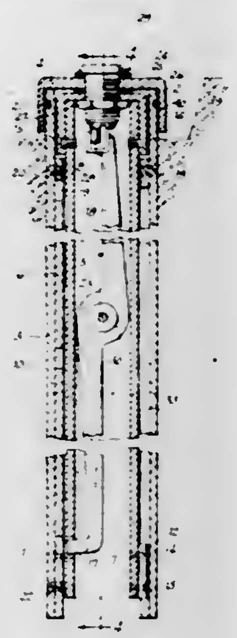
Int. Cl.² E01F *13/00*

U.S. Cl. 49—35 **2 Claims**

1. A temporary barrier which comprises:

a ground imbedded receptacle comprising an outer tube with a short upper section extending above ground, a sleeve fastened to the inside of said outer tube having a plurality of holes at various depth positions forming mortised areas;

a movable post comprising a tubular enclosure slidably engaged into said sleeve, a cap closing the upper section of said enclosure, a lever pivotally mounted within said enclosure, a bolt at the lower part of said lever engaging said mortised areas, actuating means in the upper part of said lever and of said cap, a larger concentric cap fastened above said cap and fitting the upper end section of said outer tube.



4,003,162

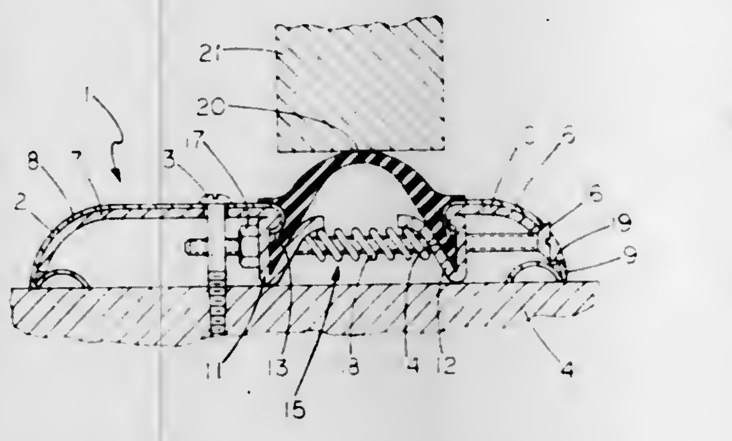
DISCOVERY IN ADJUSTABLE THRESHOLDS AND METHODS OF MAKING AND USING THE SAME

Robert E. Britt, No. 11 Cumberland, Maryland Heights, Mo. 63042

Filed June 2, 1975, Ser. No. 582,979

Int. Cl.² E06B *1/70*

U.S. Cl. 49—468 **1 Claim**



1. An adjustable threshold for use in door openings comprising,

first and second separate elongated partial threshold sections, each of said sections provided with elongated recesses disposed such that they open towards the space between said sections,

fastening means to secure said first section to the floor of said door opening,

elongated flexible and resilient center section means operably coupled to said first and second sections and disposed therebetween said center section provided with elongated hook means along its edges adapted to secure with said recesses,

adjusting means operably coupled to said first and second sections and disposed therebetween comprising bolt means extending through said first and second section means, nut means at one end thereof and spring means operably disposed about said bolt means and between said first and second sections.

4,003,163

DOOR CONSTRUCTION

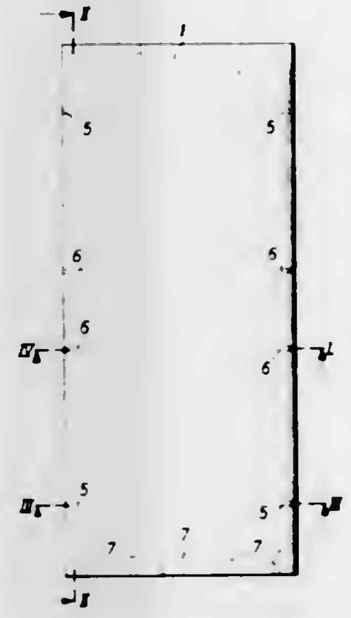
Gerhard R. Schmidt, Nierfeldstr. 2, 5804 Herdecke (Ruhr), Germany

Filed May 27, 1975, Ser. No. 581,282

Claims priority, application Germany, May 29, 1974, 2426290

Int. Cl.² E06B *3/70*

U.S. Cl. 49—503 **8 Claims**



1. A door construction adapted to have fittings such as hinge plates, a lock, and the like mounted thereon, said construction comprising a core member formed of chip plate, said core member having cylindrical bores extending inwardly from the edge surfaces thereof at positions corresponding to those at which said fittings are to be mounted, a cylindrical hardwood plug seated in each of said bores, said core member having at least one rabbeted edge, and an outer layer of veneer adhesively bonded directly to the surfaces of said core member and to said rabbeted edge.

4,003,164

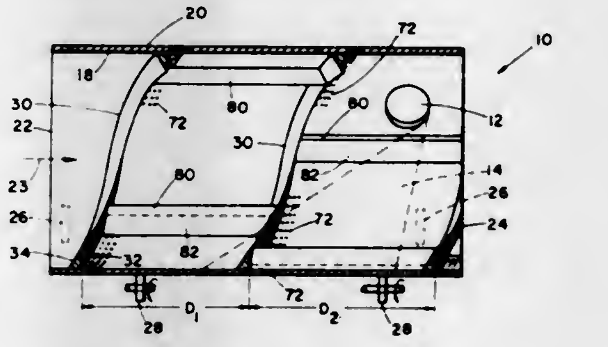
WORKPIECE TREATING BARREL

James H. Carpenter, Jr.; Charles H. Bradley, and Bernard W. Ixer, all of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Apr. 22, 1974, Ser. No. 463,073

Int. Cl.² B02C *17/02*; **B24C** *3/26*

U.S. Cl. 51—13 **18 Claims**



1. An abrasive blast-resistant barrel for use in blast treatment of workpieces such as metal castings and the like; said blast-resistant barrel being constructed of a wear resistant material for withstanding the impact of abrasive particles and the like incident to a blast treatment of said workpieces and being generally tubular and including an inner wall and an outer wall; said barrel having a hollow interior, an open first end for passing a series of workpieces into said barrel and an open second end for passing workpieces out of said barrel; workpiece pushing means constructed of a wear-resistant

material for withstanding the impact of abrasive particles and the like disposed on said inner wall for pushing each of said workpieces along the length of said barrel from adjacent said first end toward and out of said second end; said workpiece pushing means including a leading face portion on a side thereof disposed toward said open second end for engaging workpieces and pushing said workpieces toward said open second end and a trailing face portion on a side thereof disposed toward said open first end; the improvement comprising said trailing face portion being inclined in a direction toward said open second end for allowing workpieces to move upwardly and over said trailing face portion toward said open second end.

4,003,165
MACHINE FOR BEVELING LENSES

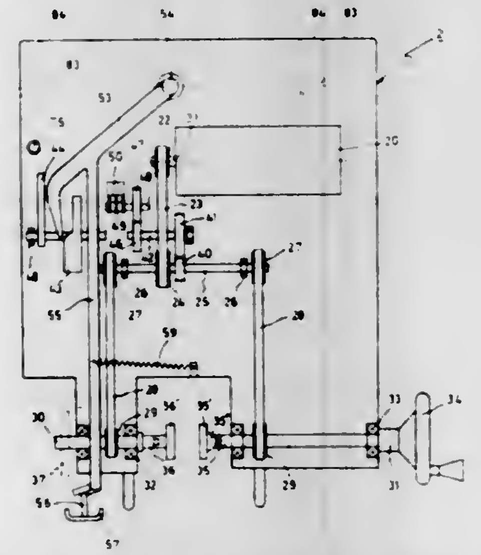
Antonio Angaron Saun, Hospitalet De Llobnegat, Spain, assignor to Proptic, S.A., Barcelona, Spain

Continuation-in-part of Ser. No. 520,142, Nov. 1, 1974, abandoned. This application July 8, 1975, Ser. No. 594,038

Claims priority, application Spain, Nov. 2, 1973, 420190

Int. Cl.² B24B *13/04*

U.S. Cl. 51—101 LG **6 Claims**



1. A machine for beveling lenses by accomplishing a rough grinding stage and beveling stage upon said lens comprising:
  - a fixed base,
  - a reducing wheel rotatably mounted on said fixed base for accomplishing said reducing stage,
  - a beveling wheel rotatably mounted on said fixed base in juxtaposed relation to said reducing wheel for accomplishing said beveling stage,
  - means for driving said reducing wheel and said beveling wheel in rotation,
  - a carriage mounted on said fixed base, said carriage being laterally movable with respect to said base between a rough grinding position and a beveling position, and being vertically movable with respect to said base between an inoperative position wherein said lens is held spaced from said wheels and an operative position,
  - first and second halfshafts mounted coaxially on said carriage for rotation thereon, said halfshafts terminating in first ends in opposed spaced relationship to one another, each of said first ends having lens holding means attached thereto for cooperating together to hold a lens to be beveled, said first halfshaft being adjustably movable axially with respect to said second halfshaft so that a lens can be held clamped between the pair of said lens holding means, said second halfshaft having a template mounted thereon, said halfshafts being so located on said carriage as to hold a lens generally vertically aligned with said grinding wheel and said beveling wheel,
  - motor means operatively connected to said halfshafts for selectively rotating said halfshafts,
  - first carriage moving means for moving said carriage laterally between said rough grinding position and said beveling position comprising a rotatable first cam having first and second side cam surfaces spaced from one another along the direction of lateral movement of said carriage, and spaced radially from one another on said first cam, said first side cam surface being associated with said rough grinding position and said second side cam surface being associated with said beveling position, said first cam being mounted on a first shaft, an arm pivotally mounted on said carriage and extending across said carriage generally perpendicularly to the direction of lateral movement of said carriage, said arm being movable in a plane generally parallel to said carriage and comprising a follower portion engageable with said first and second side cam surfaces and an end portion terminating in a feeler, first resilient means biasing said arm toward said first and second side cam surfaces, an inclinable guide mounted on said fixed base and engaging said feeler, said guide positioning said feeler laterally with respect to said fixed base, whereby rotation of said first cam causes said carriage to move between said rough grinding position and said beveling position, and motor means operatively connected to said first shaft for rotating said first shaft in synchronized relationship with said halfshafts whereby said halfshafts make at least a portion of one revolution with said follower portion in contact with said first side cam surface and then at least a portion of a revoluation with said follower portion in contact with said second side cam portion,
  - second carriage moving means for moving said carriage vertically from said operative position to said inoperative position comprising a raised first peripheral cam surface on the periphery of said first cam, a roller mounted on said base and engageable by said first peripheral cam surface to cause said carriage to move from said operative position to said inoperative position when engaged by said first peripheral surface, whereby when said first cam is rotated to the point where said first peripheral cam surface engages said roller, said carriage is moved to said inoperative position,
  - third carriage moving means for moving said carriage from said operative position to said inoperative position comprising a rotatable second cam having a second peripheral cam surface, a lever pivotally mounted on said base and engageable with said second peripheral cam surface, second resilient means biasing said lever into engagement with said second peripheral cam surface, a rocker arm engageable by said lever, a pendulum pivotally attached at one end to said base and having a second feeler means attached to its free end, said second feeler means being engageable with the lower portion of said template, said pendulum being engageable by said rocker arm whereby operation of said lever by said second peripheral cam surface causes said rocker arm to move said pendulum and said second feeler means upwardly to engage said template and thereafter move said carriage upwardly to said inoperative position, and
  - switch means for controlling said motor means for driving said halfshafts and said first and second cams, said switch means being mounted on said pendulum and being operated when said feeler means contacts said template to incrementally rotate said halfshafts and said cams.

4,003,166
LOADING APPARATUS FOR A MACHINE TOOL

Toshihito Kawamura, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed Sept. 15, 1975, Ser. No. 613,521

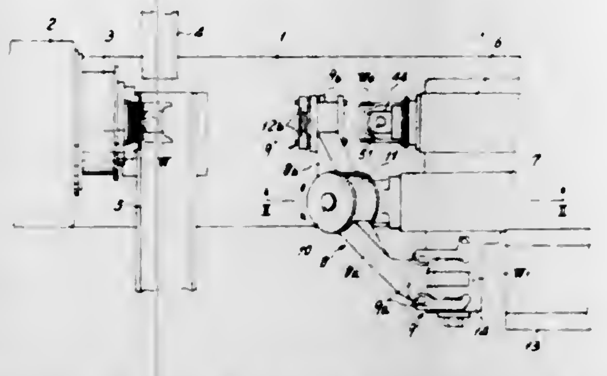
Claims priority, application Japan, Sept. 14, 1974, 49-105527

Int. Cl.² B24B *47/10*

U.S. Cl. 51—215 HM **7 Claims**

1. A loading apparatus for loading non-circular workpieces

upon a spindle chuck rotatably supported upon a headstock of a machine tool, comprising in combination:
  - charging means spaced from said headstock and provided with a charging way extending parallel with the axis of said spindle chuck for charging said workpieces in a single line;
  - shutter means provided at the advanced end of said charging means and operable to be selectively opened and closed for preventing selected ones of said workpieces from further advancing;
  - shifting means disposed in co-axial alignment with said spindle chuck and shiftable toward and away from said spindle chuck for facilitating mounting of said non-circular workpieces upon said spindle chuck;
  - a transfer arm pivotably provided for transferring said non-circular workpieces from said charging means to said shifting means and shiftable along an axis parallel with said shifting means for delivering a non-circular workpiece to said shifting means while at the same time receiving another non-circular workpiece from said charging means, said transfer arm having a pair of grippers at the opposite ends thereof; and
  - angular adjusting means for correcting the angular disposition of said workpiece gripped by one of said grippers disposed at the side of said charging means.



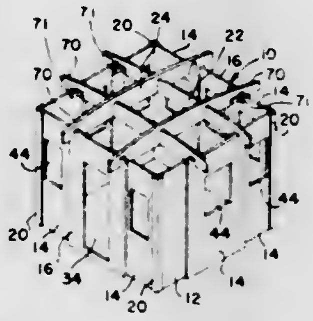
4,003,167
CABIN CONSTRUCTION

Reginald E. Saunders, 620 W. Diamond St., Philadelphia, Pa. 19122

Filed Mar. 3, 1975, Ser. No. 554,455

Int. Cl.² E04B *7/02*; E04C *2/42*

U.S. Cl. 52—92 **18 Claims**



1. In a cabin construction, the combination of
- A. a plurality of side panels arranged in vertical edge-overlapping relationship to form a cabin side,
  - 1. each side panel having a first edge, a second edge, and a top edge,
    - a. at least some of said side panels being provided with a plurality of vertically spaced holes, a first plurality of said holes being spaced inwardly from the first edge and a second plurality of said holes being spaced inwardly from the second edge,
    - b. the first edge of at least one panel overlapping and being joined to the second edge of the next adjacent side panel,
    - c. at least some of said first plurality of holes being aligned with some of said second plurality of holes of an adjacent panel to receive fasteners therethrough;
- B. a plurality of cabin sides being arranged in edge to edge relationship to define an enclosed space; and
- C. a plurality of roof rafters arranged in parallel and intersecting relationship,
  - 1. the roof rafters resting upon and being supported by at least some of said side panels at the top edges thereof,
  - 2. the roof rafters defining the top margins of the said enclosed space.

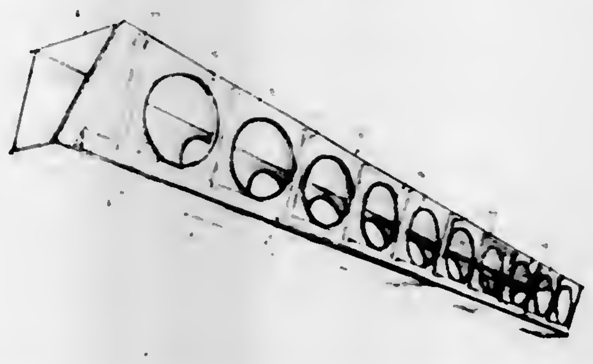
4,003,168
CRANE BOOM OF TRAPEZOIDAL BOOM SECTIONS HAVING REINFORCING RINGS

Rupert J. Brady, Bethesda, Md., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed June 27, 1975, Ser. No. 590,854

Int. Cl.² B66T *11/00*; E04H *12/34*

U.S. Cl. 52—118 **5 Claims**



1. In a crane boom, a boom section having top, bottom and side plates structurally joined to provide a boom section having a cross sectional form of an inverted trapezoid; continuous, longitudinally extending side plate stiffeners joined to said bottom plate and side plates and being substantially vertical and extending for a portion only of the height of the side plates, relatively large openings in the side plates at spaced points therealong and located above said stiffeners in close proximity to the top longitudinal edges of the stiffeners, and reinforcing ring elements positioned within said openings and being joined to said side plates around the peripheral edge of said openings, the outer peripheral surface of the bottom of said ring elements substantially resting on the top edges of the stiffeners and being structurally joined thereto, whereby stresses on the boom section are transmitted diagonally from the top plate to the side plate, circumferentially around the ring to the side plate stiffeners.

4,003,169
ANCHOR SYSTEM

Elliott B. Young, II, Rte. 1 Box 77, Edwards, Ill. 61554

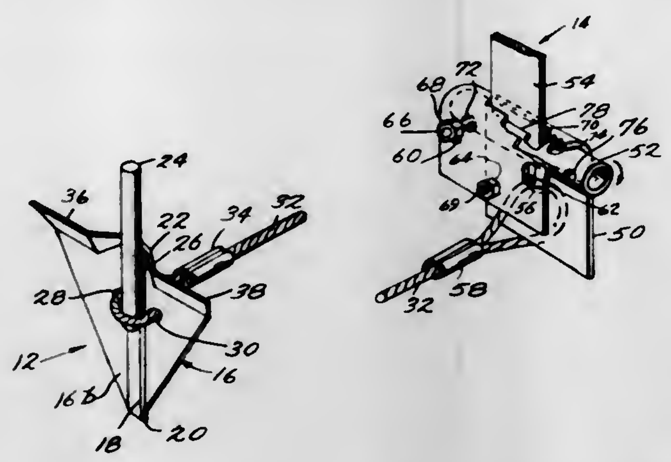
Continuation-in-part of Ser. No. 332,255, Dec. 12, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,570

Int. Cl.² B66F *13/00*; E02D *5/80*

U.S. Cl. 52—155 **7 Claims**

1. An anchoring system including an anchor member comprising a solid wedge-shaped head having top and bottom sides bounded by a rear edge and two side edges, said side edges tapering to a front point, a centrally positioned channel extending from the front point to said rear edge, said head being provided with two holes therethrough, the holes being substantially equally spaced from the centroid of said head and from said channel, a rod-like neck secured to one side of said head within said channel, so that a portion of said neck protrudes beyond said rear edge, wherein at least part of the rear portion of said head is bent so as to form at least one wing along at least a portion of said rear edge, said wing being positioned on each side of said channel, a self-tightening clamp comprised of an essentially J-shaped clamp member provided with a plurality of apertures extending therethrough and at least one elongated opening extending therethrough, a strap securing shaft provided with a plurality of apertures, and

at least one elongated opening therein, bolt means for securing said shaft within said clamp member, a cable attached to and extending between said anchor member and said clamp,



and drive pole means for engaging the portion of said neck extending beyond said rear edge and for embedding said anchor member.

4,003,170

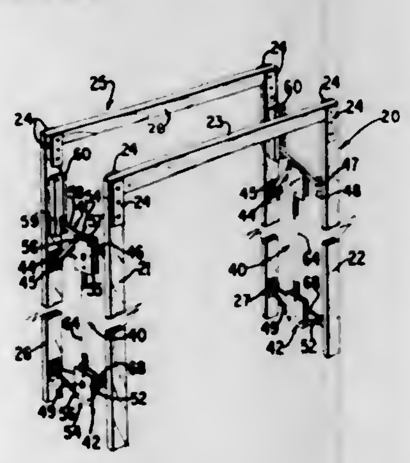
LOADING DOCK SHELTER STRUCTURE

Charles W. Mellyn, Hudson, N.Y., assignor to W. B. McGuire Co., Inc., Hudson, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,676

Int. Cl.^{2} E04F *10/04*

U.S. Cl. 52—173 DS **13 Claims**



1. In a truck dock shelter including a substantially rigid front frame member comprising a header element and spaced apart upright side frame elements for supporting cover material over space at a dock door opening and for carrying upright face panels for engagement by a truck end being docked opposite said opening, and extension means normally holding said frame member in an outward position away from support structure adjacent to said opening yet enabling said panels to be displaced toward said opening by said truck end, the improvement wherein said extension means comprise yieldably biased means connected pivotably with and supporting each of said side frame elements at at least two vertically spaced locations thereon which are displaceable toward said opening either together or independently of one another under pressure from said truck end so that said face panels will conform to any posture of said truck end relative to said opening, said yieldably biased means including for each said side frame element upper and lower sets of arms each of which sets comprises an inner arm and an outer arm pivotably interconnected to define an angle therebetween and having respective ends thereof pivotably connected with said support structure and the related side frame element, and means interconnecting the said sets of arms for applying oppositely to them in common a force constantly urging the arms of each of said sets toward a more open angular position.

4,003,171

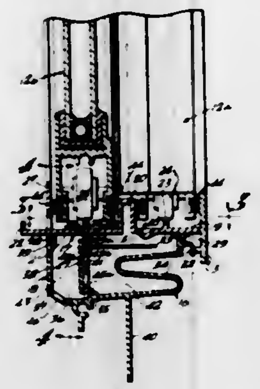
HYDROSTATIC WATER DISCHARGE VALVE FOR WINDOW FRAME SILLS

Henry W. Mitchell, Miami, Fla., assignor to Crossley Window Co., Inc., Miami, Fla.

Filed July 3, 1975, Ser. No. 592,943

Int. Cl.^{2} E06B *7/14*

U.S. Cl. 52—209 **5 Claims**



1. A hydrostatic discharge valve assembly for window frame sills comprising, in combination, an upper longitudinally-extending sill section, a lower longitudinally-extending sill section and inner and outer sill wall sections, said upper, lower, inner and outer sections together defining a coextensive enclosure, a vertical, longitudinally-extending partition wall dividing said enclosure into a longitudinally-extending water chamber between said partition wall and said inner wall section and an air-balance chamber between said partition wall and said outer wall section, a weep opening in said upper sill section for the drainage of condensate water into said water chamber, means controlled by water draining through said weep opening for discharging water collected in said water chamber into said air-balance chamber, and a discharge opening in said lower sill section and communicating with said air-balance chamber for discharging water to the outside of said lower sill section, said water draining controlled water discharging means comprising a water outflow through opening in a lower end portion of said partition wall, a flap member, means for swingably mounting an upper end portion of said flap member against the air-balance chamber side of said partition wall and in vertical alignment with said through opening so that said flap member will normally rest in face-to-face relation against said partition wall for blocking flow through said through opening, and a substantially horizontally disposed actuating vane carried by said flap member along an upper end portion thereof and extending into said water chamber directly below said weep opening, whereby the force of window frame sill drainage water falling through said weep opening and upon said vane serves to break the adhesive force of water film tension between said flap member and said partition wall to permit outward swinging of said flap member for water drainage through said partition wall through opening and said lower sill section drainage opening.

4,003,172

PERIPHERALLY GROOVED BUILDING BLOCKS IN A WALL CONSTRUCTION

Walter S. Pawl, 2844 Powder Mill Road, Adelphia, Md. 20783

Filed Sept. 30, 1975, Ser. No. 618,024

Int. Cl.^{2} E04B *2/72;* **E04C** *1/10, 2/46*

U.S. Cl. 52—279 **4 Claims**

1. A wall construction of concrete blocks assembled without a binder therebetween and comprising a plurality of linear wall segments each comprising a double layer of blocks with the blocks in one layer overlapping the blocks in the other layer both horizontally and vertically,

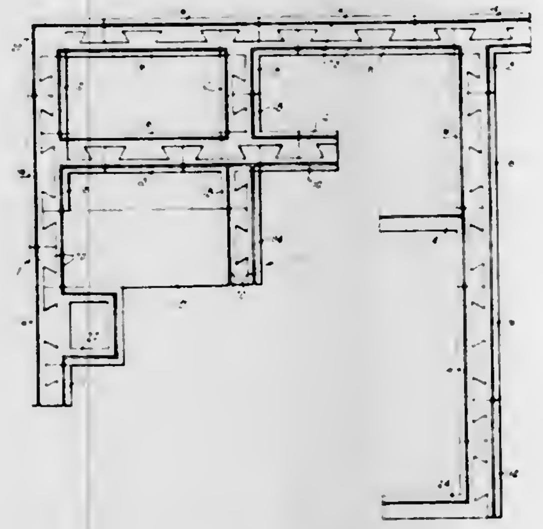
said blocks having identical horizontal sections with the inner faces of blocks in one layer having alternate and equal vertically co-extensive dove-tail grooves and ridges slidably interlocked with similar vertical coextensive dove-tail grooves and ridges in the inner faces of the blocks in the other layer,

a corner wall segment comprising corner blocks having a plurality of angularly extending block portions joined to the linear wall segments,

the corner block portions each having an identical half groove and half ridge interlocked in a running fit with the inner faces of end blocks of the linear wall segments,

two spaced linear wall segments having a beam supported between them at points normally provided for a block in each of said wall segments,

said beam having end faces formed like the interlocking inner faces of the blocks which they replace at their points of support in the respective wall segments,



the dove-tail grooves and ridges on said blocks having planar faces which are positioned in face-to-face relationship when interlocked to define a close yet free fit without any noticeable play between interlocked blocks so that the wall is assembled without a binding agent between blocks,

each block and beam end in said wall construction having a peripheral undercut groove extending completely around its face edges, the edge grooves of adjacent blocks forming undercut double groove channels along the joints, holding non-adhesive resilient packing strips for sealing without binding said joints and providing some frictional sliding movement between load-bearing surfaces of the blocks limited by the lateral clearances between their interlocking faces.

4,003,173

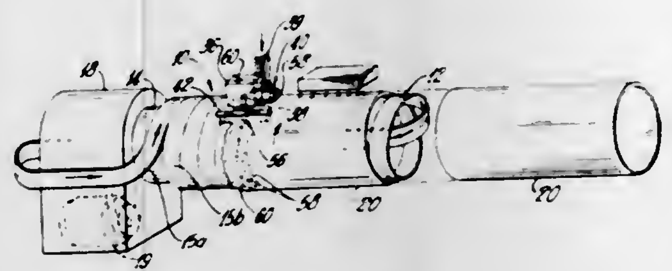
WALL CONSTRUCTION

Kevin M. Foley, Toledo; Harold A. Dewhurst, and Frank P. McCombs, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 29, 1975, Ser. No. 617,353

Int. Cl.^{2} E04C *2/16*

U.S. Cl. 52—309.17 **10 Claims**



1. A wall consisting essentially of:

a. a thermosetting resin cured and comprising from about 30 to 40 percent by weight of said wall;

b. glass fibers randomly oriented and substantially uniformly distributed through said resin, comprising from about 10 to 20 percent by weight of said wall;

c. a filler uniformly distributed in said resin comprising about 15 to 60 percent of said wall;

d. inorganic cement; and

e. at least one polyhydric phenolic compound

wherein the resin is phenol-formaldehyde condensate or a phenol-amino compound-formaldehyde condensate formed in the presence of the cement and the polyhydric phenolic compound,

wherein the resin and cement have a weight ratio of resin to cement ranging from 1:9 to 9:1 based on the dry weight of cement and the weight of resin solids, and

wherein the polyhydric phenolic compound and the phenol in the resin have a mole ratio polyhydric phenolic compound to phenol ranging from 1:10 to 10:1.

4,003,174

METHOD OF MOUNTING A COMPOSITE WALL STRUCTURE AND CORRESPONDING WALL STRUCTURE THUS OBTAINED

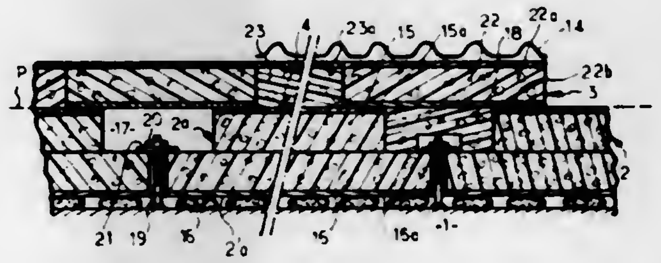
Michel Kotcharian, Paris, France, assignor to Technigaz, Paris, France

Filed Sept. 26, 1975, Ser. No. 617,237

Claims priority, application France, Sept. 27, 1974, 74.32739

Int. Cl.^{2} E04B *2/00;* **E04F** *13/08;* **E04G** *21/00*

U.S. Cl. 52—415 **18 Claims**



1. A method of making a composite wall structure comprising a rigid self-supporting outer wall, and at least one layer of juxtaposed lining elements substantially parallel to and secured to said outer wall, each one of said lining elements being previously provided on that of its faces which will face towards said outer wall with a deformable and non resilient compound having the consistency of a thick paste and settable in a hardened condition and wherein the improvement consists in the steps of rigidly securing abutment means to said outer wall, that face of said lining elements which faces towards said outer wall abutting on said abutment means, regularly distributing and arranging said compound in patches over the whole surface area of said face according to an at least approximately regular network-like pattern with polygonal meshes, then applying it against said outer wall; causing then said patches to be squashed and flowed by moving each lining element to a predetermined final position defined by said abutment means so that said compound lies in the space left between said outer wall and said lining elements; allowing said compound to set with a view to rigidly securing each lining element into said predetermined final position to said outer wall; and completing the fastening of each lining element in said predetermined final position by the actuation of mechanical fastening means.

4,003,175

FASTENER AND ROOF ARRANGEMENT USING THE FASTENER

Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

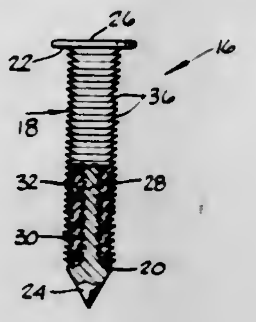
Filed June 30, 1975, Ser. No. 591,585

Int. Cl.^{2} E04B *1/38*

U.S. Cl. 52—506 **3 Claims**

1. A fastener comprising:

a. a substantially solid plastic longitudinal body having a front end portion of predetermined maximum outer cross-section, said outer portion extending from said front end to said back end, said outer portion including,
    i. a plurality of integral longitudinally adjacent outer circumferential ribs located in plane normal to the axis of said body, said ribs together extending the length of said outer portion;
b. a pointed metal tip affixed to the front end of said body, said tip having a maximum outer cross-section less than the predetermined maximum outer cross-section of the outer portion of said body;

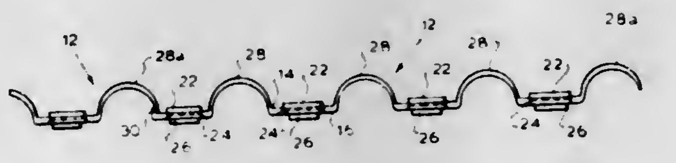


c. an integral longitudinal shank having a cross-section less than the cross-section of said body and longitudinally shorter than said body, said shank extending into said body from the front end thereof;
d. said shank and an inner surface of said body including longitudinally interlocked complementary serrations; and
e. a plastic head integrally connected with the back end of said body, said head having a greater outer cross-section than said body.

4,003,176

ROOF TILE SYSTEM

Richard A. Shumway, 681 St. Clair St., Eau Gallie, Fla. 32935
Filed July 24, 1975, Ser. No. 598,576
Int. Cl.^{2} E04D *1/00, 3/362*
U.S. Cl. 52—539 **9 Claims**

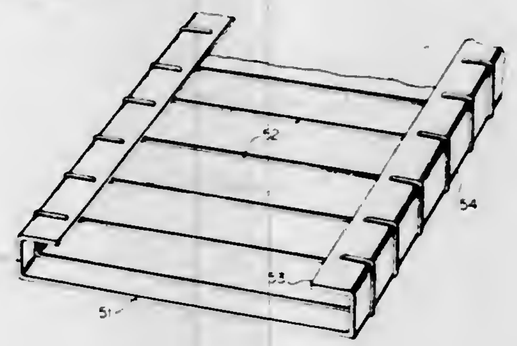


1. A roof covering system comprising:
an array of panels, each panel comprising a unitary, molded member having first and second opposing, substantially parallel surfaces and first and second opposing ends, with each panel having a plurality of recesses along said first surface adjacent said first end thereof, and a plurality of protrusions from said second surface adjacent said second end, said first and second surfaces defining a plurality of arcuate portions in said panel, each one of said arcuate portions extending across said panel between adjacent ones of said recesses, and further extending across said panel between adjacent ones of said protrusions, said panels being overlapped end-to-end such that said protrusions in one panel extend into said recesses of another panel;
a plurality of support pads joined with each said panel, each said support pad positioned between said first and second ends and between adjacent ones of said arcuate portions and further extending from said first surface of the corresponding one of said panels;
one of said arcuate portions comprising an edge arcuate portion extending to one edge of said panel between said first and second ends;
a dam extending from said second surface along another edge between said first and second ends of each said panel, said panels disposed edge-to-edge such that said dam in one panel is overlapped by said edge arcuate portion of another panel.

4,003,177

HERMETICALLY SEALED SECTIONAL AND DETACHABLE PROTECTIVE COVERS

Francisco de la Concha, Refineria 18 de Marzo casa No. 21, Mexico 16, Mexico City, Mexico
Continuation of Ser. No. 401,963, Sept. 28, 1973, abandoned, which is a continuation of Ser. No. 187,089, Oct. 6, 1971, abandoned. This application Apr. 21, 1975, Ser. No. 569,654
Claims priority, application Mexico, Oct. 8, 1970, 122,590
Int. Cl.^{2} E04C *2/32*
U.S. Cl. 52—630 **1 Claim**



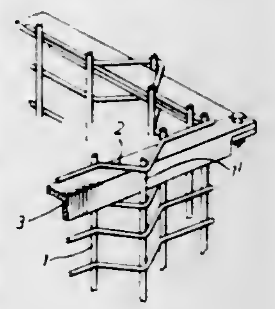
1. In a hermetically sealable sectional structural cover member in the form of a channel-like plate, said member being free of perforations and comprising a longitudinally extending substantially planar web portion with upstanding, substantially planar longitudinal flange portions integral with and extending along opposite sides of said web portion, the improvement comprising:
two substantially planar lateral portions, the first one extending inwardly from the top of one of said flange portions and being integral therewith, and the second one extending inwardly from the top of the other of said flange portions and being integral therewith,
said lateral portions extending generally parallel to said web portion and overlying said web portion; and
reinforcing means in the form of corrugations for reinforcing said member against compression loading in the direction of said corrugations,
said corrugations extending continuously in the transverse direction along said web portion, along said upstanding longitudinal flange portions and along said lateral portions but terminating short of the free edges of said lateral portions so that said free edges form continuous straight lines over their respective lengths, thereby providing an efficacious sealing surface along these free edges,
said corrugations in said web portion, said flange portions and said lateral portions also providing a significant measure of flexibility to said member to facilitate deformation thereof in a direction transverse to said corrugations.

4,003,178

OPEN MESH METAL PANELS

Robert Charles Douthwaite, 2, Elloughton Grove, Castle Park, Cottingham, North Humberside, England
Filed May 13, 1975, Ser. No. 577,125
Claims priority, application United Kingdom, May 13, 1974, 21065/74
Int. Cl.^{2} E04C *2/42*
U.S. Cl. 52—664 **6 Claims**

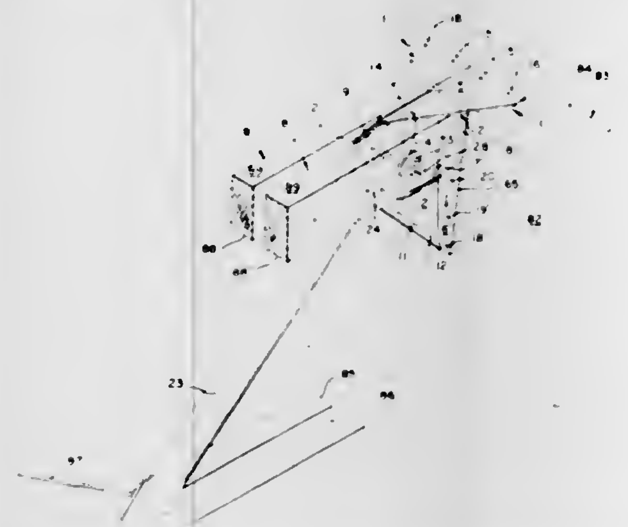
1. A length or panel of welded wire rod mesh defined by longitudinal rods, equally spaced apart and transverse rods, equally spaced apart and, which panel is corrugated or deformed at spaced intervals such that rods extending in the same direction are off-set from the remaining rods parallel thereto with deformation of the adjacent portions of the rods at right angles thereto, and a rigid metal member is inserted through between the off-set rods and those parallel thereto at least adjacent one edge.



4,003,179

TRUSS HANGER

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed Jan. 21, 1976, Ser. No. 650,848
Int. Cl.^{2} E04C *3/02*
U.S. Cl. 52—696 **8 Claims**

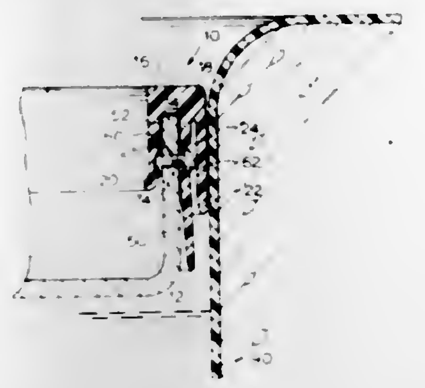


1. A truss hanger for connecting the end of a truss to an end support, said truss having two vertically spaced chords joined by a plurality of metal web members at joints by pin type connector means, said top chord comprising two parallel juxtaposed structural members, said hanger comprising:
a. a pair of sheet metal members placed in side by side relation each having:
    1. a generally planar side member mounted substantially vertically and having a generally straight and horizontal top edge, and a generally vertical back edge;
    2. a top flange having a forward portion integrally connected to a substantial portion of said top edge adapted for bearing against the top edges of said top chord structural members and positioned at a generally right angle to said side member for rigidizing said side member along said top edge, and having a rear portion extending rearwardly beyond said side member adapted for bearing upon said end support;
    3. a back flange integrally connected to substantially the entire length of said back edge of said side member and positioned at a generally right angle to said side member and said top flange for rigidizing said side member along said back edge and adapted for connection to said end support;
    4. a tab member extending from said side member at right angles thereto forming a horizontal base for receiving said structural member forming the top chord of said truss and rigidizing a portion of the mid-portion of said side member; and
    5. an opening formed in said side member between said tab member and said top flange adapted for receipt of said pin type connector means.

4,003,180

EDGE MOLDING

Peter C. Messuri, 7824 Biltmore Blvd., Miramar, Fla. 33023
Filed Apr. 8, 1976, Ser. No. 674,835
Int. Cl.^{2} E04F *19/02*
U.S. Cl. 52—716 **11 Claims**

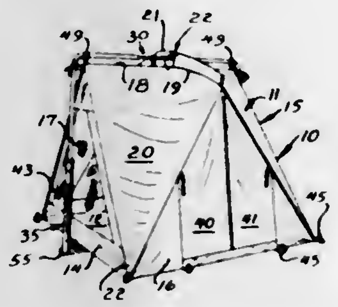


1. Trim molding for being coupled by a fastener over the edge section of a surface, said trim molding comprising: an elongated strip of relatively flexible material, said strip being generally T-shaped in cross-section, with a stem section thereof coupled to said surface by said fastener communicating therethrough, and wherein a bridge section of said strip includes a distended first end displaced from said stem section sufficient to overlap said edge section of said surface, with said bridge section having a first flange integrally formed at said first end thereof, said first flange extending in the same direction as said stem section and of a cross-sectional length sufficient to overlap a first end of said fastener adjacent thereto, and wherein a distended second end of said bridge section includes having a second flange integrally formed therewith for extending in the same direction as said stem section, with said second flange having a sufficient cross-sectional length to communicate with and overlap a second end of said fastener adjacent thereto, whereby said edge section of said surface and said end sections of said fastener are completely enclosed by said trim molding.

4,003,181

METHOD OF ERECTING A TENT STRUCTURE

Denis Wilson Robinson, Mercer Island, Wash., and George Benjamin Madison, Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Division of Ser. No. 529,742, Dec. 5, 1974, Pat. No. 3,951,159. This application Dec. 22, 1975, Ser. No. 642,785
Int. Cl.^{2} E04G *21/12, 21/14*
U.S. Cl. 52—745 **5 Claims**

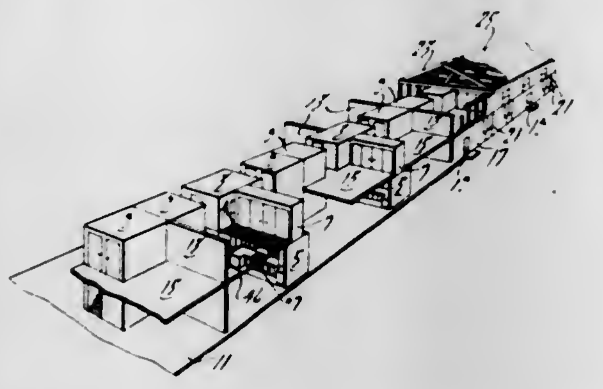


1. In a method of erecting a tent having a bottom secured to the ground and a shell defining first and second intersecting ridges, each ridge extending between opposing upright side walls, the steps comprising: inserting a rigid ridge support through flexible connector means along said first ridge; inserting a flexible ridge support through flexible connector means along said second ridge; said steps of inserting further includ-

ing interconnecting said rigid ridge support with said flexible ridge support such that said flexible ridge support is carried by said rigid ridge support, each of said ridge supports extending substantially the entire length of its associated ridge; inserting an upright extensible support between the ground and each of said rigid ridge support, the length of each of said extensible supports being adjusted sufficient to support said rigid ridge support above the ground while not stretching taut said tent material; and then extending said extensible supports to stretch said tent taut.

4,003,182
BUILDING CONSTRUCTION

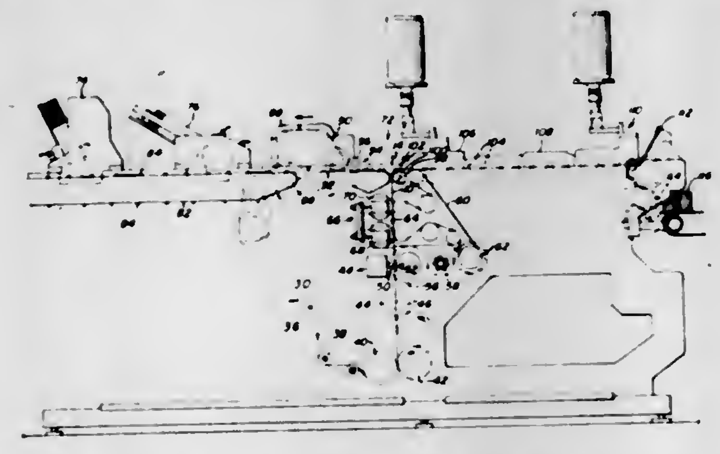
Albert L. Wokas, 22245 Thorofare, Grosse Ile, Mich. 48138
Division of Ser. No. 287,883, Sept. 11, 1972, Pat. No. 3,855,743, which is a continuation of Ser. No. 80,891, Oct. 15, 1970, abandoned. This application Dec. 19, 1974, Ser. No. 534,319
Int. Cl.² E04B *1/00*
U.S. Cl. 52—745 **1 Claim**



1. The method of constructing a building which comprises building at least portions of a plurality of rooms in a plurality of boxes wherein at least two of said boxes contain internal room structure for two rooms and each has hollow vertical walls separating said two rooms and having utility service lines in said hollow walls, setting the boxes on a foundation so that said hollow walls of said two boxes are substantially aligned and coplanar so that the service lines may cross from one box to another, thereafter erecting walls and ceilings and laying floors with said boxes as a core and with the outer sides of the boxes as part of said walls, and erecting a roof on the building.

4,003,183
METHOD OF ENCLOSING INSERT MATERIAL IN A CONTINUOUSLY ADVANCING ENVELOPE BLANK

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.
Filed Oct. 16, 1974, Ser. No. 515,192
Int. Cl.² B65B *11/48*
U.S. Cl. 53—31 **9 Claims**

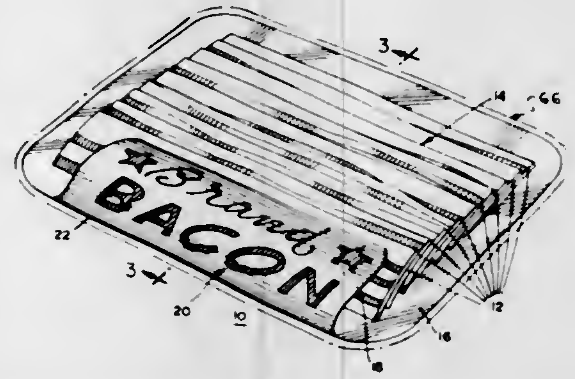


1. A method of enclosing insert material in a continuously advancing blank having a body portion and a bottom flap portion comprising,

conveying insert material along a first straight line path at a preselected speed,
continuously conveying a blank along a second straight line path to an intersection where a second straight line path intersects said first straight line path,
rotating a vacuum cylinder having vacuum ports thereon at a location adjacent to said intersection of said first straight line path and said second straight line path,
while said blank is being conveyed along said second straight line path, engaging the body portion of said blank to said vacuum cylinder by means of a negative pressure through said vacuum ports at a location on said blank adjacent said bottom flap portion and folding said blank bottom flap portion into overlying relation with said blank body portion,
inserting insert material between said blank body portion and bottom flap portion while said blank is being folded and conveyed, and
thereafter conveying said folded blank with said insert material positioned therein along a third straight line path substantially aligned with said first straight line path.

4,003,184
METHOD AND APPARATUS FOR PACKAGING SLICED BACON AND THE LIKE

Thomas B. Shiu, 131 Stirrup Lane, Burr Ridge, Ill. 60521
Filed Apr. 28, 1975, Ser. No. 572,431
Int. Cl.² B65B *11/08*
U.S. Cl. 53—32 **12 Claims**



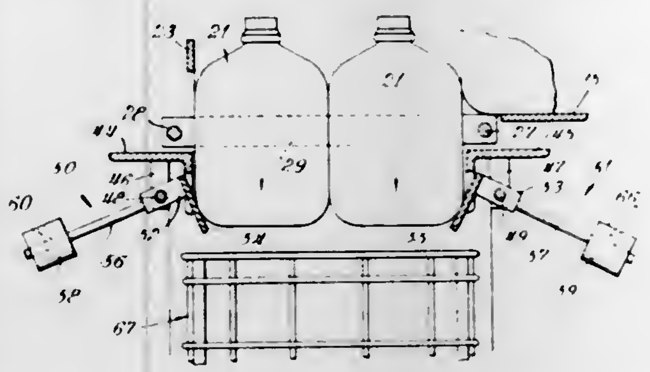
1. A method of packaging sliced bacon strips arranged in shingled relation in a bacon shingle comprising the steps of first placing a shingle of sliced bacon on top of a body portion of a flat sheet of semi-rigid impervious styrene plastic material having an integral flap formed along a fold line between said body portion and said flap with an edge of said shingle closely adjacent said fold line, heating said plastic material only in a narrow trough formed along said fold line to an elevated bending temperature, folding said flap along said fold line over and downwardly toward an edge portion of said shingle of sliced bacon on said body portion and applying pressure to said fold line to effect a permanent set to said folded flap to permanently overlie said edge portion of said shingle of bacon.

4,003,185
CASER APPARATUS

Otis Ward Goff, 7151 Carisbrook, Portage, Mich. 49081
Filed June 6, 1975, Ser. No. 584,266
Int. Cl.² B65B *57/14, 39/02*
U.S. Cl. 53—61 **14 Claims**

1. An apparatus for assembling a charge of a plurality of articles of similar size and shape and dropping said articles into a container at a controlled velocity, comprising:

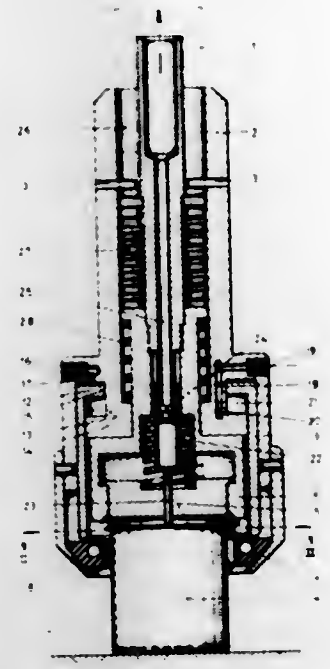
frame means,
means for assembling a charge of said articles at a container-filling station,
article support means for supporting said articles until a full charge has been assembled, container support means for supporting at said container-filling station a container adapted to receive said charge, and release means for releasing said charge of articles to permit it to fall into a container positioned therebelow on said support means; and
means entirely independent of said container for controlling the rate of fall of said articles thereinto to prevent damage thereto, comprising:
at least one retarder member comprising a supporting body pivotally mounted on said frame, an elongate member mounted on said supporting body supporting a weight mounted thereon, and means on said supporting body defining a retarding surface positioned to interrupt the fall of said charge by engaging an outwardly-positioned bottom edge of said charge, said weight being insufficient to completely counterbalance the weight of said charge and said retarding surface and the pivot of said supporting body being so located relative to each other and to said charge that further downward movement of said charge causes said retarding surface to rotate about said pivot until said charge can slip past said retarding surface, said weight then causing said retarding surface to bear on a lateral side of said charge with sufficient force to retard to a safe value the rate of descent of said charge as it drops into the said container, said container support being located sufficiently below said retarding surface that when the charge is seated in said container, the top of said charge is below said retarding surfaces and said container never comes in contact with said retarding surfaces.



4,003,186
SEALING HEAD FOR A SEALING DEVICE ADAPTED TO BE USED FOR A CONTAINER

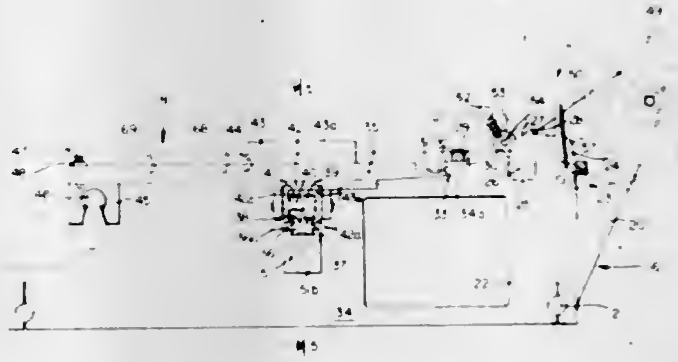
Anthonie Jacobus van Rede, Jacob Catslaan 38, Uithoorn, Netherlands
Filed Nov. 3, 1975, Ser. No. 628,410
Claims priority, application Netherlands, Nov. 8, 1974, 7414622
Int. Cl.² B65B *31/02*
U.S. Cl. 53—88 **5 Claims**

1. A sealing head for sealing a container comprising a tubular housing open at its lower end, said housing having an upper portion and a lower portion with the lower portion having a larger internal diameter than the upper portion, said lower portion being adapted to be disposed partly around the upper portion of a container to be sealed, a sealing ring support carried by the lower end of said housing and said sealing ring support having an inwardly tapered wall portion adapted to surround the upper end of the container to be sealed, a sealing ring carried by said sealing ring support on the inwardly tapered wall portion thereof, a pressing element carried within the lower portion of said housing for sliding said sealing ring downwardly along said inwardly tapered wall portion to seal said ring against the container to be sealed, and means for evacuating air from the lower end of said housing.



4,003,187
MICROFILM JACKET MICROFILM FEEDING DEVICE AND PROCESS

Paul A. Kiejzik, 2907 Monterey Court, Springfield, Pa. 19069
Filed Sept. 8, 1975, Ser. No. 611,004
Int. Cl.² B65B *63/00, 43/26*
U.S. Cl. 53—123 **9 Claims**



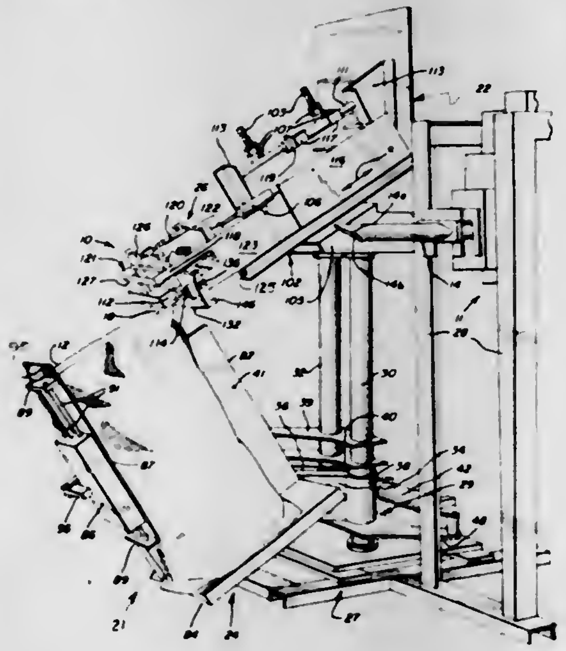
1. A device for inserting microfilm into a microfilm jacket, comprising in combination: jacket support means comprising a platform structure supportable of a microfilm jacket with an insert opening portion of a supported microfilm jacket at a predetermined support-position at substantially a predetermined edge of the platform structure, adapted such that a microfilm jacket edge portion anterior of a supported microfilm jacket's insert opening is suspended substantially without support whereby the microfilm jacket edge portion is susceptible to be flexed in an opening-direction away from and further exposable of its insert opening; and a microfilm inserter means including a film-guiding structure forming feed-path for microfilm and a rearward feed-opening of the film-guiding structure, positioned in a predetermined feed-position relative to and over-lapping said predetermined edge with said feed-path and said rearward feed-opening being alignable with said insert opening of a microfilm jacket supported at said predetermined support position and adapted such that at-least a

part of leading structure of the rearward feed-opening of the film-guiding structure thereof are positioned substantially within said insert opening, said microfilm inserter means being for mechanically impelling microfilm toward and in alignment with an insert opening of a supported microfilm jacket at said predetermined support-position; and a cutter means for severing microfilm situated within said feed-path, positioned anterior to and spaced-away from said rearward feed opening; and microfilm jacket edge-flexing means mounted in a fixed position relative to at least one of said jacket support means and said microfilm inserter means, and the microfilm jacket edge-flexing means being for applying pressure to the suspended edge portion of a supported microfilm jacket whereby the suspended edge portion is flexed in said opening direction, and said microfilm jacket edge-flexing means being further for anchoring the suspended edge portion by clamping pressure by said applying pressure whereby a supported microfilm jacket is thereby prevented from shifting and from slipping away from the microfilm inserter means when a film is being inserted from said feed-path into the aligned jacket insert opening.

4,003,188
VALVE BAG FILLER, HANDLING AND SEALING SYSTEM

Erwin M. Lau, Dolton, Ill., assignor to Black Products Company, Chicago, Ill.

Filed Nov. 24, 1975, Ser. No. 634,731
Int. Cl.^{2} B65B *1/22*
U.S. Cl. 53—126 **17 Claims**



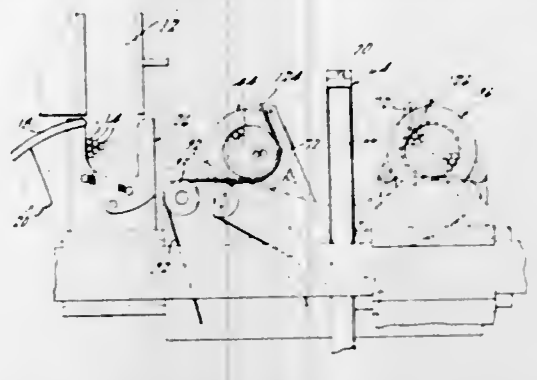
1. In combination with a valve bag having a sealable filling sleeve and a filling tube of a bag filling apparatus;
  support means for removing a filled bag from said filling tube in substantially upright position,
  means for settling the contents of said filled bag to a level below said sealable filling sleeve,
  means for closing and sealing said sealable filling sleeve, and
  means for folding an outer end portion of said sealed filling tube of said filled bag toward said bag.

4,003,189
BUNDLING MECHANISM

Keith W. Little, Georgetown, and Barry C. Millar, Islington, both of Canada, assignors to Bundy Corporation, Detroit, Mich.

Filed Apr. 18, 1975, Ser. No. 569,483
Int. Cl.^{2} B65B *13/02, 27/10*
U.S. Cl. 53—198 R **16 Claims**

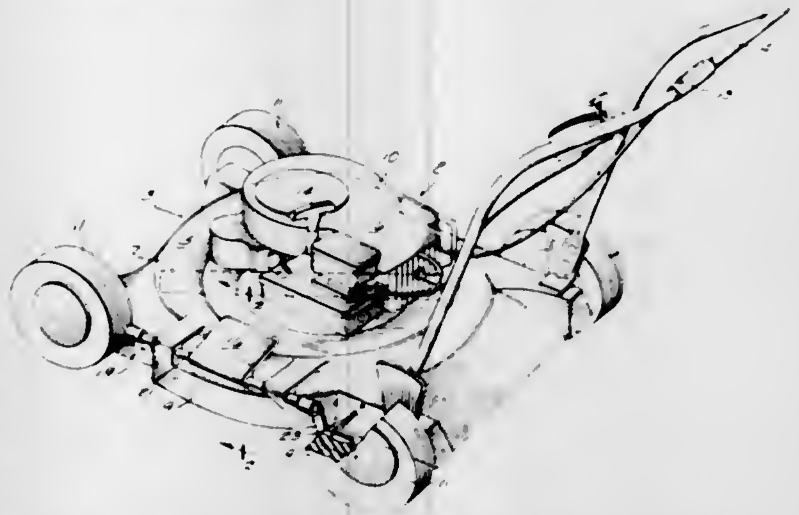
1. A bundling mechanism including: means operable to support bundles of workpieces in first and second spaced wrapping positions, means operable to move a bundle from said first wrapping position to said second wrapping position, means for supporting a supply of adhesive-backed tape with an end length thereof extending between said wrapping positions peripherally of the bundles at said positions, and tape-wrapper means operable to sever said tape end length from the supply of tape between said wrapping positions and to define a first cut end at the severed end of said end length and a second cut end at the associated resultant end terminating the supply of tape, said tape-wrapper means including means for wrapping said end length and said first cut end around the one of the bundles at said second wrapping position and wrapping said second cut end and tape from the supply of tape partly around the other of the bundles at said first wrapping position whereby each of the bundles is wrapped partly at said first wrapping position and completed with said end length as severed at said second wrapping position.



4,003,190
SAFETY DEVICE FOR WALK-BEHIND ROTARY MOWERS

Daniel E. Braun, Brookfield, and Joseph R. Harkness, Germantown, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Aug. 7, 1975, Ser. No. 602,815
Int. Cl.^{2} A01D *53/00;* **F02N** *11/08*
U.S. Cl. 56—10.5 **7 Claims**

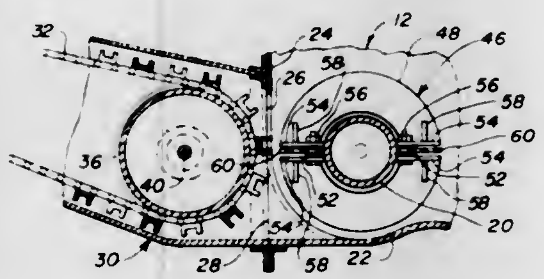


1. In a walk-behind power lawn mower comprising a carriage mounted on wheels, an internal combustion engine on the carriage that has a manually energized starter and an electrical ignition system, a cutting element beneath the carriage that is driven for rotation by the engine, a skirt on the carriage that substantially surrounds the cutting element but has a clipping discharge outlet through which the cutting element can be contacted when it is rotating, and a guide handle projecting rearwardly and upwardly from the carriage for guiding the mower across the ground, safety means for preventing contact with the rotating cutting element by a person who starts the engine and uses the mower, said safety means comprising:
  A. a treadle mounted on the carriage at a location adjacent to the skirt but remote from its discharge outlet, said treadle being biased to a raised position and being arranged to be depressed by one foot of a person who has his other foot well spaced from said discharge outlet and who is in a position for starting the engine;
  B. a first electric switch connected with said treadle to be actuated thereby and which has one condition when the treadle is in its raised position and an opposite condition when the treadle is depressed;
  C. a second electric switch located at said handle and arranged to have one condition when the handle is not being gripped and an opposite condition when the handle is gripped; and
  D. conductor means so connecting said switches with one another and in the engine ignition system that the ignition system is disabled unless at least one of said switches is in its said opposite condition.

4,003,191
BARRIER MEANS IN A COMBINE HARVESTING HEADER

Robert R. Todd, Leola, Pa., and Thomas W. Taege, Columbia, Mo., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 29, 1976, Ser. No. 671,647
Int. Cl.^{2} A01D *45/02*
U.S. Cl. 56—14.6 **9 Claims**



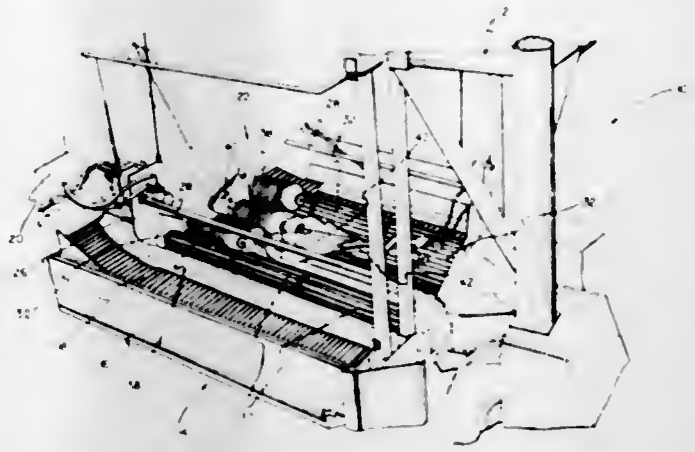
1. A mobile combine having a threshing compartment, an elevator unit extending generally forwardly from the inlet end of said threshing compartment, and a header supported forwardly of the lower end of said elevator unit and extending transversely in opposite directions from the longitudinal axis of said combine, said header including a transverse auger of substantial length including a transversely-extending tube and flights fixed to said tube and respectively extending therealong from the outer ends of said header toward the center thereof, in combination with disc means mounted to a generally central portion of said auger tube between the inner ends of said flights thereon and operable to prevent axial movement of crop material from one of said flights past the central portion of said auger tube to the other of said flights, said disc means generally having a height relative to the height of the flights of said auger to provide a sharply defined barrier to said aforementioned axial movement of crop material between said flights and thereby assure relatively even feeding of crop material to said threshing compartment.

4,003,192
TOBACCO HARVESTER DEFOLIATOR HEAD HAVING A POSITIVE STALK GRIPPING ASSEMBLY

Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed May 20, 1975, Ser. No. 579,194
Int. Cl.^{2} A01D *45/16*
U.S. Cl. 56—27.5 **3 Claims**

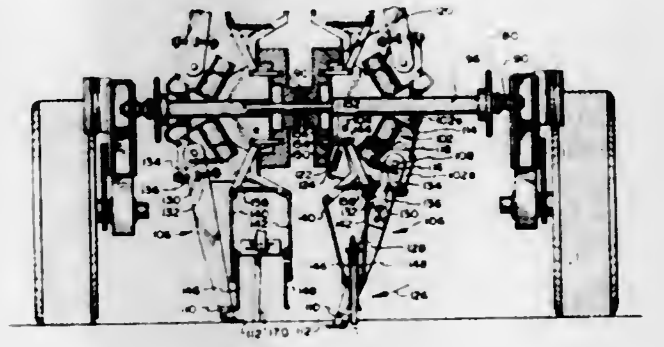
1. In an automatic tobacco harvester adapted to move through a tobacco field and harvest tobacco leaves from individual stalks of a tobacco row, a defoliator head assembly mounted on said harvester and carried thereby and comprising:
  a. a frame structure;
  b. defoliating means mounted on said frame structure for defoliating leaves from respective tobacco stalks of a row passing through a row opening defined between said defoliating means;
  c. conveying means operatively associated with said defoliator head assembly for conveying the defoliated leaves from the defoliator head assembly;
  d. stalk gripping means disposed below said defoliating means for engaging respective stalks as they pass through said defolitor means, said stalk gripping means including cooperative first and second driven belts disposed in side-by-side relationship wherein respective innermost segments of the belts are disposed adjacent each other where they cooperate to receive respective tobacco stalks therebetween, and wherein at least one of said driven belts includes projecting means in the form of a continuous series of spaced apart lugs disposed on the outer side thereof and particularly spaced to receive respective tobacco stalks therebetween as the stalks pass through said defoliating means such that the respective stalks are substantially encompassed by the innermost segment of said belts and respective lugs, whereby the projecting lugs generally co-act with said belts to generally stablize the stalks and prevent the stalks from moving back and forth longitudinally within said defoliator means;
  e. hydraulic drive means operatively connected to said stalk gripping means for driving the same; and
  f. hydraulic speed control means operatively connected to said hydraulic drive means for continuously effectively sensing the ground speed of said tobacco harvester and driving said stalk gripping means at a horizontal speed generally equal and opposite said tobacco harvester ground speed.



4,003,193
STALK SELECTIVE HARVESTING MACHINE

Spencer Kim Haws, 88 W. 50 South, Centerville, Utah 84014

Filed Mar. 14, 1975, Ser. No. 558,349
Int. Cl.^{2} A01D *45/00*
U.S. Cl. 56—327 A **33 Claims**

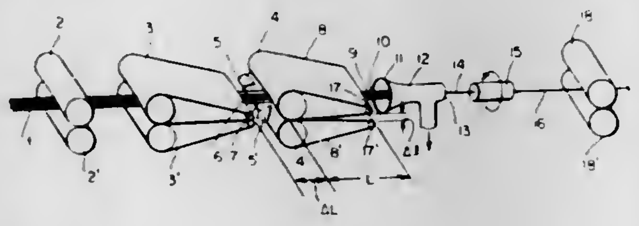


1. A machine for harvesting crops which grow in stalks or the like comprising
  a frame adapted to be moved along the ground,

means mounted on said frame for detecting stalks of a selected height and in a selected pathway,
a first cutting assembly mounted on the frame to selectively rotate downwardly toward the ground to a cutting position beside a selected stalk and then upwardly away from the cutting position, said cutting assembly including cutting means movable to sever the selected stalk, and means for grasping the severed stalk and elevating it as the cutting assembly rotates upwardly, and
means mounted on the frame and responsive to said detecting means for actuating said cutting assembly to rotate.

4,003,194
METHOD AND APPARATUS FOR PRODUCING HELICALLY WRAPPED YARN

Seiichi Yamagata, and Kozo Susami, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Division of Ser. No. 459,396, April 9, 1974. This application Mar. 24, 1975, Ser. No. 561,304
Claims priority, application Japan, Apr. 10, 1973, 48-39991
Int. Cl.² D01H *5/28*
U.S. Cl. 57—51 **22 Claims**



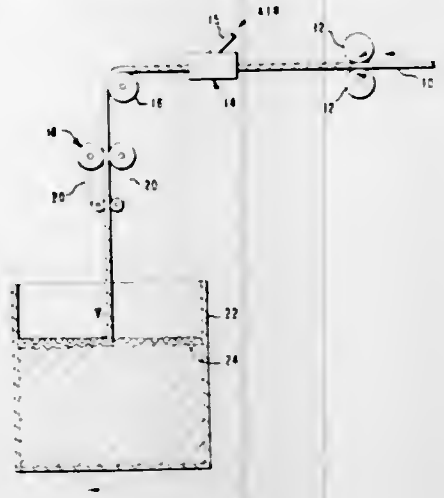
1. A method of producing a helically wrapped yarn which comprises advancing a bundle of staple fibers, false twisting them to form a twisted bundle having a bundle axis, said staple fibers being false twisted substantially helically about said bundle axis, advancing a plurality of outside fibers adjacent to but separately from said false twisted bundle, said outside fibers being substantially parallel to said bundle axis, advancing said bundle and said outside fibers to a condition wherein both ends of substantially each of said outside fibers are free, uniting said outside fibers to said false twisted bundle and detwisting said bundle thereby helically wrapping said outside fibers around said bundle.

7. An apparatus for producing a helically wrapped yarn which comprises means providing a nip point, means for continuously supplying drafted staple fibers in a downstream direction to said nip point, means for imparting false twist downstream of the nip point to the advancing bundle of fibers, means for supplying and advancing substantially straight ahead a group of outside fibers downstream of the nip point, and then arranging said outside fibers substantially parallel to the path of downstream flow of the false twisted bundle but separate therefrom, uniting means for bringing the outside fibers downstream of the nip point closely adjacent to said false twisted bundle with said outside fibers separated from said bundle and with both ends of the outside fibers free of the nip point, whereby the detwisting of the false twisted bundle wraps said outside fibers helically around said detwisted bundle.

4,003,195
FILAMENTARY TOW PACKAGING METHOD

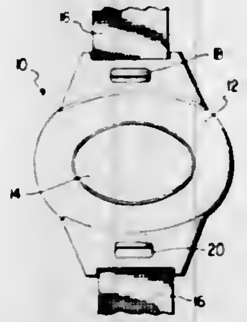
George Arvid Fernstrom, Seaford, and James Richard Osborn, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 505,493, Sept. 12, 1974, Pat. No. 3,944,071. This application Feb. 2, 1976, Ser. No. 654,280
Claims priority, application Canada, Sept. 10, 1975, 235383; Japan, Sept. 10, 1975, 50-109045
Int. Cl.² B65H *54/84;* **D02J** *1/04*
U.S. Cl. 57—157 F **11 Claims**

1. A method for delivering an advancing filamentary tow into a container to form a tow package, said method comprising:
applying alternate twist of varying helix angle to the tow;
forwarding the alternately twisted tow at a predetermined speed downwardly toward the container;
moving said container continuously with respect to downwardly moving tow at a speed of from about ⅕ to about 1/20 the forwarding speed of the tow to lay the tow down in layers of substantially vertical folds; and
increasing the varying helix angle applied to the tow by impacting the tow into the layers previously laid down.



4,003,196
SOLID STATE LADIES' WRISTWATCH

Arthur Herman O'Connor, and Robert Eugene McCullough, both of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa.
Filed Sept. 10, 1974, Ser. No. 504,770
Int. Cl.² G04B *19/24, 39/00*
U.S. Cl. 58—4 A **18 Claims**



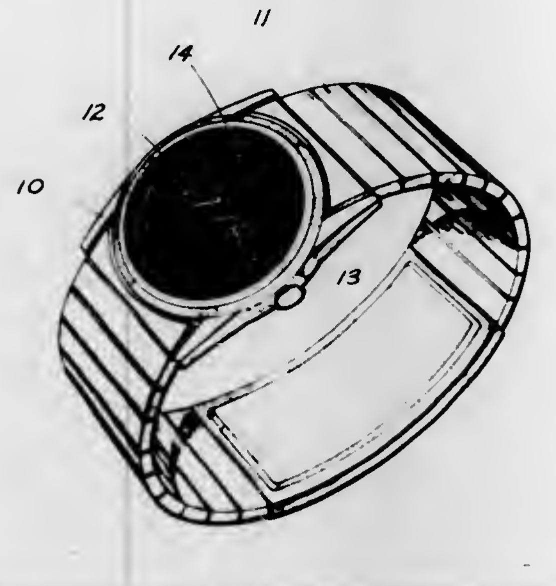
1. A solid state wristwatch comprising a watch case, an electrically insulating frame mounted in said case, an electrically insulating substrate carried by said frame, a plurality of electro-optical digital display stations on one side of said substrate, a combination time and calendar integrated circuit chip on the other side of said substrate and electrically coupled to said display stations, said watch case including a viewing window adjacent said display stations elongated along the three o'clock – nine o'clock axis of said wristwatch, and a band pass optical filter in said window, said filter being arcuately curved about only one axis, which axis lies in the conventional 6 o'clock to 12 o'clock vertical plane through the center of the wristwatch.

4,003,197
WATCH MONITOR

Terry M. Haber, 3050 S. Bristol, No. 8C, Santa Ana, Calif. 92707
Filed June 9, 1975, Ser. No. 584,858
Int. Cl.² G04B *19/34*
U.S. Cl. 58—50 R **8 Claims**

1. A watch including
a. a time indicating means;
b. a source of electrical energy;

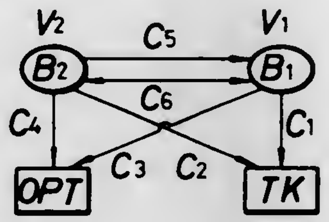
c. a crystal oscillator circuit connected to said source for continuous energization;
d. divider circuit means connected to said crystal oscillator circuit for providing timing pulses to control said time indicating means.
e. light emitting means;
f. means in said divider circuit means for providing low frequency, low level current pulses derived from said crystal oscillator circuit and connected to said light emitting means for periodically energizing said light emitting means at said low frequency to provide an attention attracting blnking light on said watch;



g. illuminating means for rendering visible said time indicating means when actuated;
h. a first switch means connected to actuate said illuminating means when closed by a user to tell thc time; and
i. a second switch means connected to said light emitting means and responsive to closing of said first switch means to open and disconnect said light emitting means and responsive to opening of said first switch means to close and reconnect said light emitting means so that said blinking light stops during the period of time said first switch means is closed.

4,003,198
ELECTRONIC TIMEPIECE

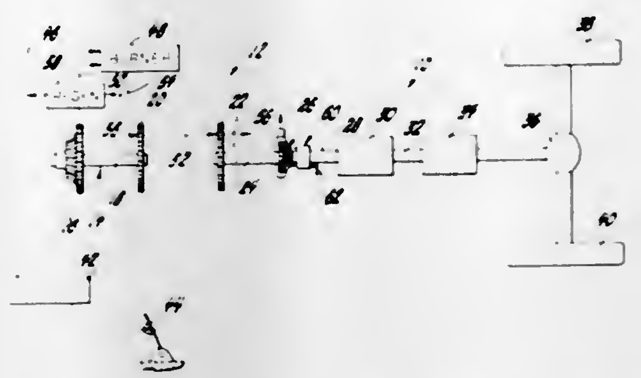
Shigeru Morokawa, Higashiyamato, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 31, 1974, Ser. No. 519,557
Claims priority, application Japan, Nov. 13, 1973, 48-127481
Int. Cl.² G04C *21/16, 3/00*
U.S. Cl. 58—152 R **11 Claims**



1. An electronic timepiece comprising: a main component of said timepiece, at least one electric cell for said main component; an optional component, at least one electric cell for said optional component; a connecting system having a switching element for selectively connecting in parallel said cells for said main and optional components to each other, means for detecting the difference in the terminal voltage between said cells and means for controlling said switching element in accordance with the signal from said difference detecting means.

4,003,199
TURBINE ENGINE WITH AIR BRAKE

Albert H. Bell, III, Birmingham, Mich., and Hans Egli, Santa Monica, Calif., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 1, 1976, Ser. No. 662,611
Int. Cl.² F02C *3/10, 7/02*
U.S. Cl. 60—39.16 R **4 Claims**



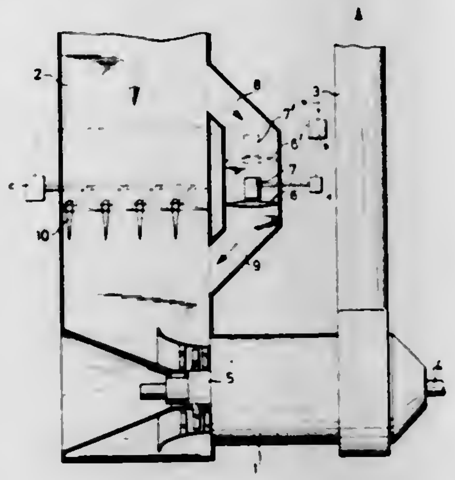
1. In a two-shaft gas turbine engine of the type including a gasifier compressor coupled on one end of a first shaft having a gasifier turbine on the opposite end thereof and a power turbine connected to a second shaft having means thereon for transferring power from the power turbine shaft to a vehicle transmission and wherein the gasifier compressor supplies compressed air to a burner assembly which discharges combustion products through the gasifier turbine and the power turbine, the improvement comprising: a rear bulkhead on the engine having a concave opening extending axially inboard of said engine, a portion of the power shaft extending axially through said opening, an air brake compressor mounted directly on the power turbine shaft within said opening, said air brake compressor having an inlet and an outlet, said compressor including an impeller having a hub with a radially outwardly curved surface extending from said inlet to outlet, a plurality of blades on said impeller secured to said curved surface, each of said blades having an inducer portion for directing flow from said inlet into said impeller, each of said blades having a segment downstream of and curved continuously from said inducer portion forwardly in the direction of impeller rotation and extending to the outlet, said downstream segment having a forward curvature at the outer periphery of said impeller in excess of 60° from a plane through the center of the impeller, inlet guide vanes in the inlet to said air brake compressor to control mass air flow to the compressor, said vanes having an open brake position and a partially closed run position, said vanes throttling the inlet air flow to the air compressor in the run position to cause limited air flow through the air brake compressor to maintain cooling thereof during run operation and reduced parasitic power losses, said vanes guiding greater mass air flow to said blades at said brake position and said downstream segments of said blades to produce a high level of specific work on said greater mass air flow to produce a ratio of brake power loss when the vanes are in a brake position to parasitic power loss when the vanes are in a run position not less than eight-to-one.

4,003,200
METHOD AND APPARATUS FOR COOLING TURBOMACHINES

Ferdinand Zerlauth, Andelfingen, Switzerland, assignor to Brown Boveri-Sulzer Turbomachinery, Ltd., Zurich, Switzerland
Continuation of Ser. No. 416,685, Nov. 16, 1973, abandoned. This application July 14, 1925, Ser. No. 595,490
Claims priority, application Switzerland, Nov. 17, 1972, 16576/72
Int. Cl.² F02C *7/00*
U.S. Cl. 60—39.02 **8 Claims**

1. A method of cooling a turbomachine having at least one

axial turbocompressor including a rotor and a plurality of vanes within a flow path through the turbocompressor, said method comprising the step of blowing a flow of pressurized gaseous medium into the turbocompressor for flow through said flow path during shut-down of said turbocompressor in response to said rotor slowing to a reduced speed to maintain said rotor at said reduced speed until said rotor has cooled to a predetermined temperature.



4,003,201

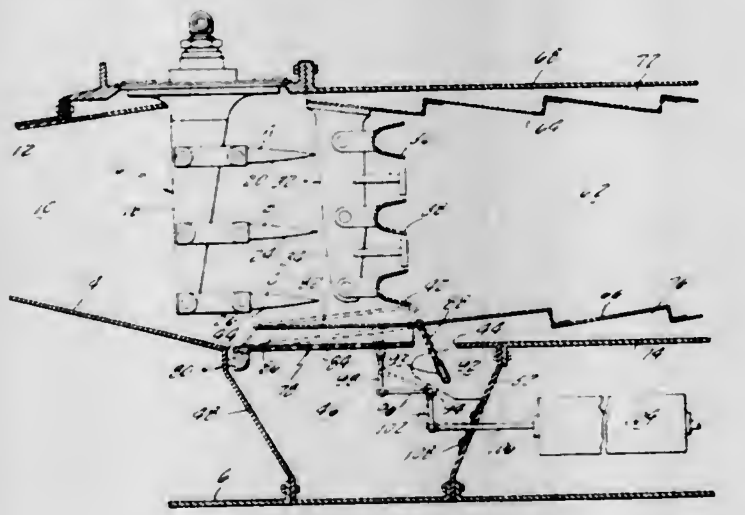
VARIABLE AREA FLAMEHOLDER DUCT

George D. Lewis, North Palm Beach; Norman W. Mangum, Jr., Palm Beach Gardens, and James P. Rusnak, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 31, 1975, Ser. No. 600,531

Int. Cl.² F02C *7/22*

U.S. Cl. 60—262 **7 Claims**



1. An air breathing reaction propulsion engine, said engine having a combustion chamber with combustion occurring in said chamber at subsonic air velocities, fuel injection means for injecting fuel into said combustion chamber, flameholder means in said combustion chamber, a variable area exhaust nozzle, a wall of said combustion chamber being movable to vary the effective flow area of the combustion chamber across the flameholder, a portion of said wall being located in radial alignment with said flameholder.

4,003,202

VARIABLE FEEDBACK STEERING SYSTEM

Lanson Becker, Galesburg, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,824

Int. Cl.² F15B *13/12*

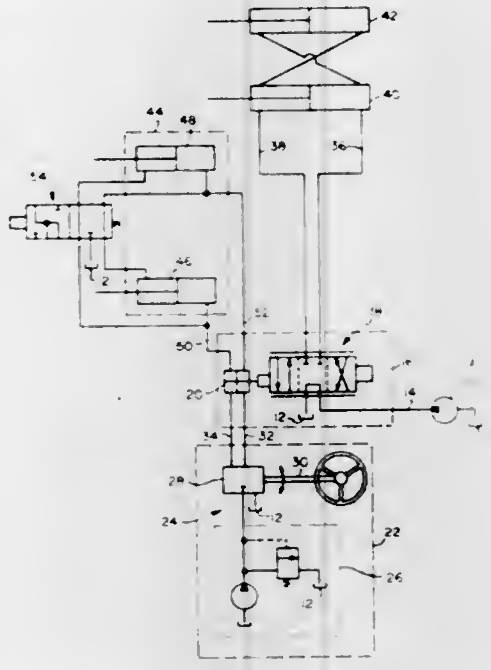
U.S. Cl. 60—385 **8 Claims**

1. A hydraulic control circuit comprising:

a. a source of pressurized fluid;

b. means for apportioning said pressurized fluid between a plurality of paths;

c. input means in fluid communication with said apportioning means for changing the apportioning of said pressurized fluid;



d. feedback means in fluid communication with said apportioning means for developing a feedback signal to counteract the effect of said input means; and

e. means in fluid communication with said feedback means for varying said feedback signal to thereby vary the rate of counteracting said input signal.

4,003,203

HYDRAULIC EXCITER OF VIBRATIONS FOR A VIBRATORY COMPACTOR

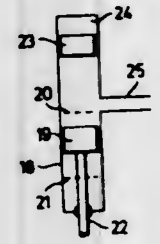
Gulertan Vural, Emmelshausen, Germany, assignor to Koehring GmbH - BOMAG Division, Boppard, Germany

Division of Ser. No. 372,622, June 22, 1973, Pat. No. 3,849,986. This application Nov. 25, 1974, Ser. No. 527,051

Claims priority, application Germany, June 24, 1972, 2231106

Int. Cl.² F15B *7/02*

U.S. Cl. 60—537 **1 Claim**



1. An hydraulic exciter for vibrations for a vibratory compactor comprising:

relatively movable exciter piston and cylinder means, one of which is adapted to be connected to a compacting member for transmitting power thereto as said piston means moves relative to said cylinder means;

means for delivering to said piston and cylinder means a pressure medium producing a pressure which varies cyclically at a selected frequency in a manner to cause relative vibratory movement between said piston means and said cylinder means; and

means including a cylinder, a free piston in said cylinder and having one side in communication with the pressure medium, and a mass of gas under pressure disposed in said cylinder at the side of said free piston opposite from that in communication with the pressure medium, said free piston undergoing movement counter to that of said exciter piston and having a natural frequency of movement under the influence of the cyclically varying pressure, which natural frequency of movement is determined by the pressure of the gas in said cylinder, for influencing the relative movement of said exciter piston and cylinder means to produce movement of said exciter piston and said free piston at a resonant frequency of said exciter, which resonant frequency is substantially equal to the selected frequency of the cyclic pressure variation of the pressure medium.

4,003,204

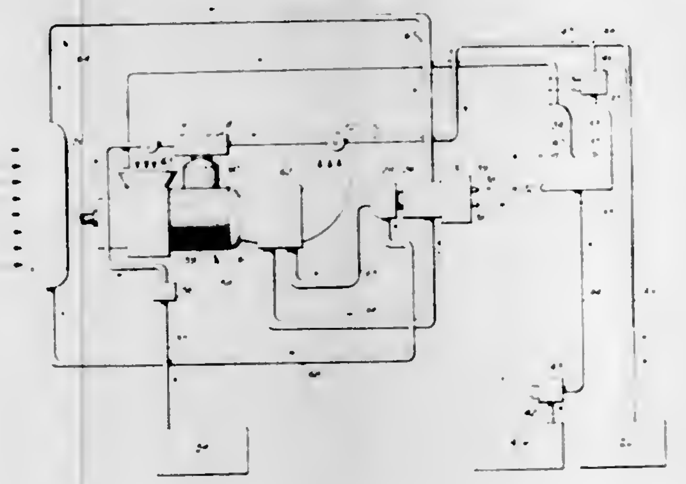
FUEL REGENERATED NON-POLLUTING INTERNAL COMBUSTION ENGINE

Curtis E. Bradley, 4517 Calle Ventura, Phoenix, Ariz. 85018

Division of Ser. No. 456,974, April 1, 1974, Pat. No. 3,939,806. This application Oct. 6, 1975, Ser. No. 620,021

Int. Cl.² F01K *23/10*

U.S. Cl. 60—618 **2 Claims**



1. In an internal combustion engine of the turbine type.

a. a turbine block providing a combustion chamber.

b. an exhaust pipe extending from said block and communicating with said combustion chamber;

c. a closed system for a working fluid including a pump for circulating the working fluid through the system, a turbine which is operated by the working fluid when in a gaseous state and a condenser for returning the working fluid from a gaseous state to a liquid;

d. a heat exchanger disposed about said exhaust pipe and through which said closed system passes to derive heat from the exhaust pipe and heat the working fluid;

e. a generator driven by said turbine to produce a DC electric current;

f. an electrolysis cell containing water and connected to said generator so that the DC current therefrom decomposes the water into oxygen and hydrogen;

g. a water tank for supplying water to said electrolysis cell.

h. a fuel intake on said turbine block and communicating with said combustion chamber;

i. a hydrogen metering control communicating with said fuel intake;

j. a conduit extending from said electrolysis cell to said hydrogen metering control which conveys hydrogen from the cell to the metering control;

k. a fuel tank for a hydrocarbon fuel;

l. a hydrocarbon fuel metering control on said fuel intake communicating with said combustion chamber and connected to said hydrocarbon fuel tank;

m. linkage connected to said metering controls operable to vary the ratio of hydrogen and hydrocarbon fuel which is introduced into the combustion chamber of said turbine block, and

n. an air intake on said block and communicating with said combustion chamber

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4,003,205

METHOD AND APPARATUS FOR OPERATING A STEAM TURBINE PLANT HAVING FEED WATER HEATERS

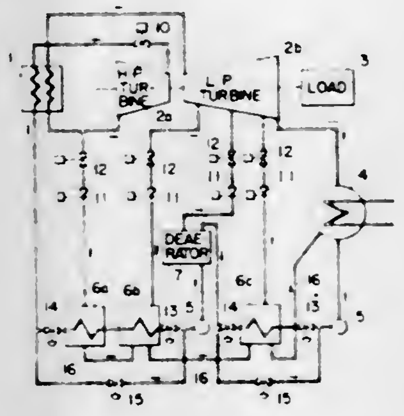
Jube Matsumura, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1975, Ser. No. 602,723

Claims priority, application Japan, Aug. 9, 1974, 49-90825

Int. Cl.² F01K *7/38*

U.S. Cl. 60—646 **15 Claims**



1. Rapid load limiting apparatus for a steam turbine plant having a turbine driven by steam from a boiler and feed water heaters in which feed water supplied to the boiler is preheated by steam extracted from the turbine, said apparatus comprising: means for detecting drain water level in the feed water heater, control means for automatically reducing the amount of steam supplied to the turbine when the drain level in the feed water heater reaches an abnormal level and stopping the extraction of steam from the turbine to the feed water heater.

4,003,206

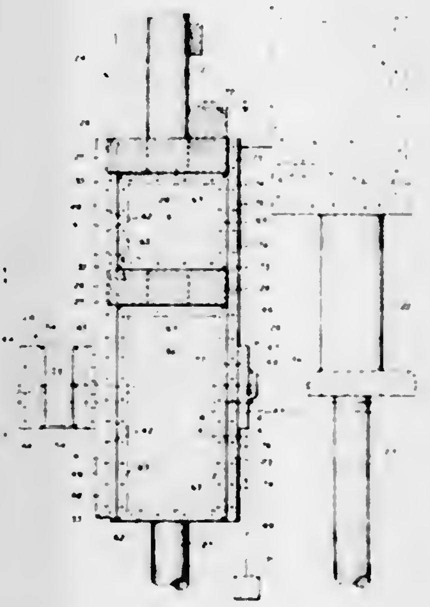
UNIVERSAL END CONNECTOR FOR FLOATING BOOM

Neeld D. Tanksley, Antioch, Calif., assignor to Pacific Pollution Control, Inc., Emeryville, Calif.

Filed Aug. 20, 1975, Ser. No. 605,978

Int. Cl.² E02B *15/04*

U.S. Cl. 61—1 F **12 Claims**



1. In a universal end connector for releasably coupling together aligned ends of a floating boom or the like, said end connector including a connector body formed with a first side adapted for mounting to an end of a floating boom and a second side formed for releasable coupling to another end connector, the improvement comprising:

said second side being formed as a yoke-like bifurcated side having a pair of spaced apart neck portions each terminating in enlarged head portions, said neck portions and said head portions defining therebetween a throat and an enlarged cavity, said throat and cavity being formed for mating receipt of a head portion and a neck portion on a similarly formed end connector with the head portion of said similarly formed end connector positioned in said cavity and the neck portion thereof extending outwardly through said throat, said throat and said cavity being open at at least one of a top and a bottom end thereof to permit positioning of said end connector in coupled relation to said similarly formed end connector, said head portions each include inwardly facing surfaces formed to engage oppositely facing surfaces on the head portion of said similarly formed end connector, and said inwardly facing surfaces are inclined to cause said head portions to be pulled together to tend narrow said throat when coupled to said similarly formed end connector and a longitudinal force is applied to the connectors.

4,003,207
METHOD OF AND DEVICE FOR ANCHORING A REINFORCEMENT BEAM TO A SHEET PILING

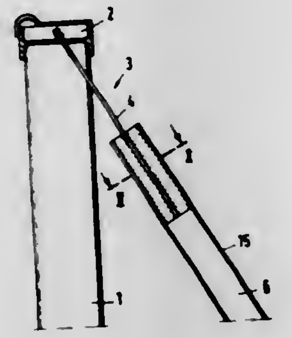
Ludwig Müller, Heinrich-Heine-Strasse, 44-46, 355 Marburg an der Lahn, Germany

Filed Oct. 28, 1975, Ser. No. 626,113

Claims priority, application Germany, Dec. 19, 1974, 7442205[U]

Int. Cl.² E02D *5/74*

U.S. Cl. 61—39 **5 Claims**



1. A method of securing a driven-into the ground reinforcement beam to a sheet piling, said method comprising the steps of:

first providing a T-beam, an elongate strap having a lengthwise slot extending from one end of the strap and fitting the width of the web of the T-beam, and a pair of rigid bars welded to said strap along the edges of said slot in the strap;
then driving part of the length of said beam into the ground adjacent to one side of the sheet piling;
then inserting the web of the beam into the slot of the strap with the bars facing the cross arm of the beam;
then welding the facing bar sides to the cross bars of the beam; and
securing the other end of the strap to the sheet piling.

4,003,208
ASSEMBLY FOR PREVENTING THE FALL OF DUST AND DEBRIS IN A MINE

Gerd Hornung, Opmunder Weg 14; Franz Disse, Deventerweg, both of 477 Soest, and Peter Rössler, Lippestrasse 49, 470 Hamm, all of Germany

Filed Sept. 2, 1975, Ser. No. 609,614

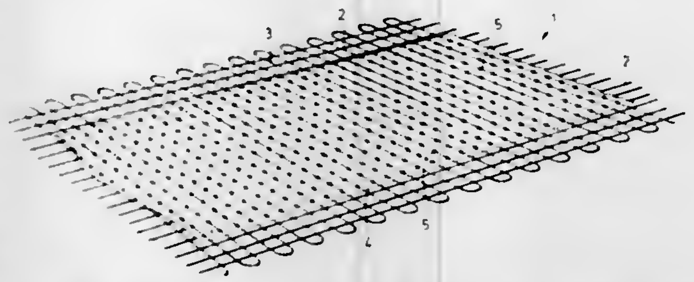
Claims priority, application Germany, Sept. 3, 1974, 2442177

Int. Cl.² L21D *19/00*

U.S. Cl. 61—45 D **9 Claims**

1. An assembly for preventing the falling of dust and debris from the roof and from the break of a mine, said assembly comprising:

a. a shield support structure having roof bars,
b. a roof covering disposed between the roof of the mine and the roof bars,
c. said roof covering including a welded wire-netting sheet having longitudinal and transverse wires with a dust-tight web welded in between and at points of intersection of said longitudinal and transverse wires, and
d. said longitudinal wires being disposed on one side of the web and said transverse wires being disposed on the other side of the web.



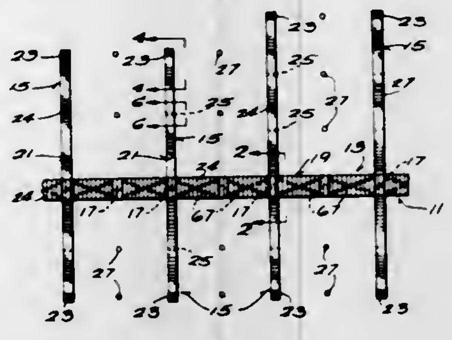
4,003,209
PIER CONSTRUCTION

Gary A. Jackson, 4565 W. Donges Lane, Milwaukee, Wis. 53223, and Donald R. Jackson, 17625 W. Senlec Lane, Brookfield, Wis. 53005

Filed July 31, 1972, Ser. No. 276,666

Int. Cl.² E02B *3/20*

U.S. Cl. 61—48 **9 Claims**



1. A method of constructing a pile supported pier comprising the steps of sinking a plurality of piles in general alignment, prefabricating a plurality of cross supports with hangers at one end, locating on each of said piles one of the cross members, moving the cross members on the piles to locate the cross members in aligned parallel relation to one another, fixing the aligned cross members to the respective piles in aligned position, and securing a deck assembly to the hangers.

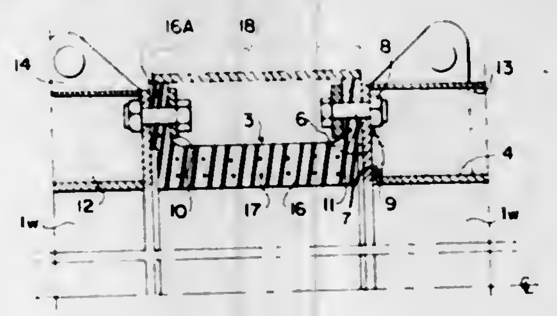
4,003,210
PIPELINE OF ASSEMBLED FIELD UNITS OF PIPE ELEMENTS AND METHOD OF INSTALLING SAME

Theodore Bostroem, 460 Park Road Extension, Middlebury, Conn. 06762

Filed Dec. 31, 1974, Ser. No. 537,643

Int. Cl.² F16L *1/01*

U.S. Cl. 61—105 **6 Claims**



1. A prefabricated field unit of assembled pipe elements comprising

a plurality of assembled pipe elements arranged in longitudinal alignment thereby to form a self-supporting pipeline,
a shell surrounding each pipe element and spaced therefrom, said shell being comprised of top and bottom shell sections welded at their adjoining faces to form an integral shell assembly, said bottom shell section having associated therewith means for supporting said pipe, said shell having an even number of walls which number at least six, and said top and bottom shell sections comprising trough and cover parts each of which has one half of the number of walls of the entire shell; said trough and cover parts being welded at their adjoining ends;
foam plastic material within the space between said pipe and shell for heat insulating the pipe and creating buoyancy of the field unit, and
a flexible joint extending between and fixedly attached to adjoining pipe elements.

4,003,211
METHODS AND APPARATUS FOR CONSTRUCTING TUNNELS

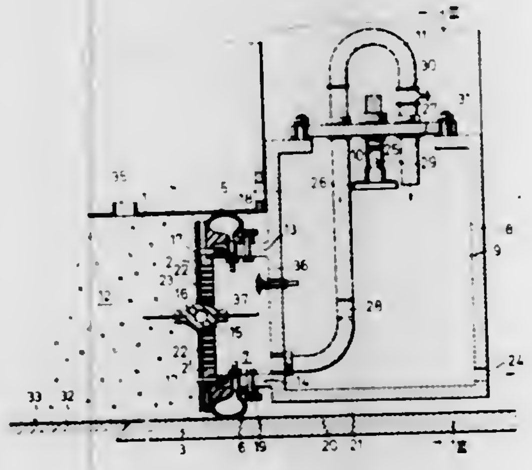
Heinrich Klapdor, Hamburg, and Armin Löbbe, Bergkamen-Oberaden, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Oct. 14, 1975, Ser. No. 622,575

Claims priority, application Germany, Dec. 19, 1974, 2460033

Int. Cl.² E01G *5/08, 5/16*

U.S. Cl. 61—84 **16 Claims**



1. A method of constructing a tunnel comprising operating fluid rams to advance a shield in a manner known per se;

installing a pre-fabricated lining section generally rearwardly of the shield relative to the direction of advancement of the shield, said lining section being spaced from the wall of the tunnel to define a space bounded by filter means;
introducing fluid concrete into said space; and
withdrawing water from the concrete through the filter means by suction acting on the filter means, wherein a thrust ring is utilized as an abutment for the rams and the thrust ring at least partly defines a chamber on the side of the filter means remote from the concrete, the pressure in said chamber being reduced to draw the water through the filter means and into said chamber, and wherein the rams are operated to shift the thrust ring in the direction of advancement after the water has been withdrawn and prior to advancement of the shield.

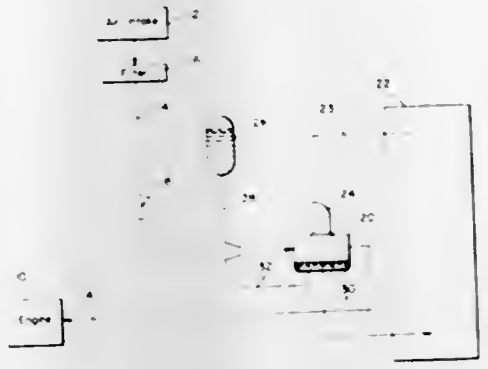
4,003,212
AIR CONDITIONING SYSTEM FOR AIRCRAFT

Robert C. Kinsell, Los Angeles; James C. Noe, Canoga Park, and Carl D. Campbell, Cerritos, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,129

Int. Cl.² F25D *17/06, 17/04;* **B60H** *3/04;* **F25B** *27/00*

U.S. Cl. 62—91 **8 Claims**



1. A method of cooling an enclosure of a vehicle having a propulsion engine intake means for providing air for an engine, and throttling means for reducing the pressure of the air said method comprising the steps of introducing a liquid into the reduced pressure air, passing the air and liquid through one side of a heat exchanger for absorption of heat by vaporization of the liquid, circulating air from the enclosure through an other side of the heat exchanger for cooling, condensing liquid in said other side of the heat exchanger, and transporting said condensed liquid for introduction into said reduced pressure air.

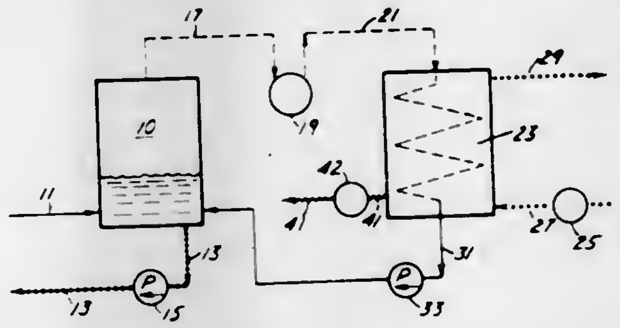
4,003,213
TRIPLE-POINT HEAT PUMP

Robert Bruce Cox, 19 Joan Court, Centerport, N.Y. 11721

Filed Nov. 28, 1975, Ser. No. 636,036

Int. Cl.² B01D *9/04;* **C02B** *1/12;* **F25B** *27/02, 13/00*

U.S. Cl. 62—124 **13 Claims**



1. A heat pump or refrigeration system which comprises: an evaporation chamber; a condenser; means for introducing water or water solution into said evaporation chamber; means for creating a vacuum in said evaporation chamber sufficient to cause a portion of said water or water solution to vaporize and another portion to freeze; means, which may be the same means as is employed for creating said vacuum, for withdrawing and compressing vapor produced within said evaporation chamber and transferring the compressed vapor to said condenser; means for exchanging the heat content of said compressed vapor with a working fluid, thereby condensing said vapor; means for discharging said condensed vapor or returning said condensed vapor to said evaporation chamber and means for continuously removing ice from said evaporation chamber.

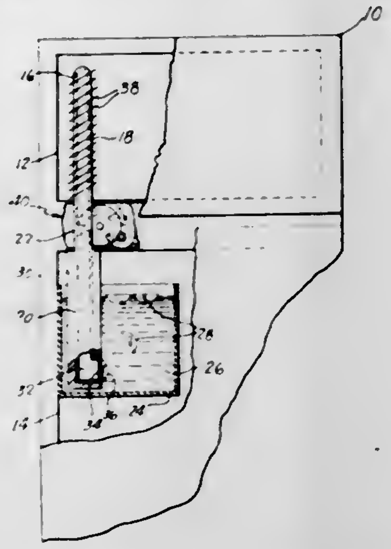
4,003,214
AUTOMATIC ICE MAKER UTILIZING HEAT PIPE

Frank A. Schumacher, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 31, 1975, Ser. No. 645,627

Int. Cl.² F25C *1/08*

U.S. Cl. 62—340 **10 Claims**



1. In a refrigeration apparatus which includes a first compartment maintained at below-freezing temperatures and a second compartment maintained at above-freezing temperatures, an automatic ice maker which comprises:

conduit means extending between and having portions positioned within said first and second compartments;

means for providing water adjacent the portion of said conduit means positioned within said second compartment; and

means positioned within said conduit means for alternately permitting and preventing heat transfer between said portions of said conduit means positioned within said first and second compartments.

4,003,215
ABSORPTION REFRIGERATION SYSTEM

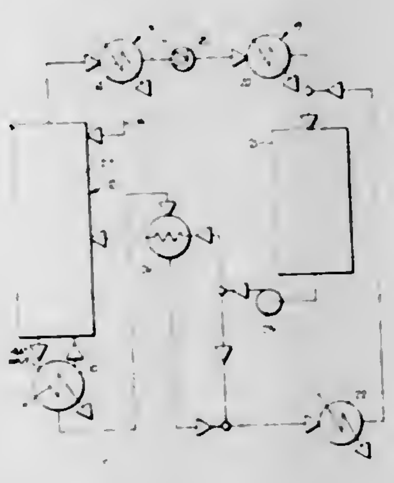
John Robert Roach, Adelaide, Australia, assignor to University of Adelaide, Adelaide, Australia

Filed June 20, 1975, Ser. No. 588,805

Claims priority, application Australia, June 24, 1974, 7945/74

Int. Cl.² F25B *15/00*

U.S. Cl. 62—476 **6 Claims**



1. In an absorption refrigeration system utilizing a pair of fluids, said system comprising:

a distillation column,

a distillation column heat exchanger for introducing heat into the distillation column for distilling one of said fluids from the other said fluid to form a distilled fluid and a distillation residue,

a condenser heat exchanger in fluid flow communication with said distillation column and arranged for condensing of the distilled fluid to produce a condensate,

an expansion valve through which passes said condensate,

an evaporator heat exchanger for evaporation of the condensate,

an absorber and an absorber heat exchanger in fluid flow communication with said evaporator heat exchanger, wherein the evaporated condensate is absorbed into the distillation residue to thereby form a liquid mixture, said absorber heat exchanger being arranged to maintain the vapour pressure in the absorber, below the vapour pressure in the distillation column, and

means to effect re-cycling of said liquid mixture within the system,

the improvement wherein each fluid of said pair of fluids is a fluorocarbon compound having refrigerant properties, said fluids having different boiling points, and the absolute difference between respective boiling points of said fluids, at a given pressure, lies in the range of 30°–60° C,

and the system operates (a) at a temperature for said condenser heat exchanger which is higher than is required when the boiling point difference is other than 30°–60° C and (b) with a grade of heat in said distillation column heat exchanger which is lower than is required when said boiling point difference is other than 30°–60° C.

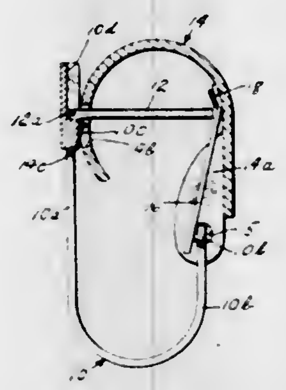
4,003,216
EARRING STRUCTURE

Anthony Robert Cecere, 60 Fox Place, Hicksville, N.Y. 11801, and William McTighe, 220 E. 17th St., New York, N.Y. 10003

Filed Mar. 18, 1976, Ser. No. 667,913

Int. Cl.² A44C *7/00*

U.S. Cl. 63—12 **5 Claims**



1. An earring structure for use with pierced and non-pierced ears comprising a generally U-shaped main body member, a pivotal post rotatably attached to one end of said main body member and a pressure member defining an aperture rotatably attached at the other end of said main body member, said main body member being arranged and adapted to encircle the lower portion of said ear, said one end for rising along one face of said ear and said other end for rising along the other face of said ear, said pivotal post standing up from and generally continuing said one end and said pressure member bearing against said other face when used with a non-pierced ear and said pivotal post extending through said aperture and ear when used with a pierced ear.

4,003,217
EARRING CONSTRUCTION

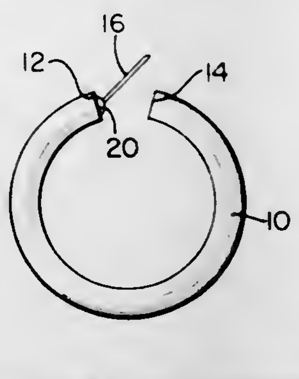
Andrew J. Evans, Greenville, R.I., and Ira Nason, Sharon, Mass., assignors to E. A. Adams & Son, Inc., Pawtucket, R.I.

Filed June 3, 1976, Ser. No. 692,596

Int. Cl.² A44C *7/00*

U.S. Cl. 63—12 **9 Claims**

1. An earring for a pierced ear having spaced aligned ends forming a gap for the insertion of an ear lobe, securing means adapted to pass through the ear lobe opening and bridge said gap to mount the earring on the ear, means for mounting one end of said securing means in one end of said earring, said mounting means permitting universal swiveling movement of said securing means, and means for positioning and for holding a free end of said securing means in the opposite end of said earring after the insertion of said securing means through the ear lobe.



4,003,218
CONSTANT VELOCITY UNIVERSAL JOINT

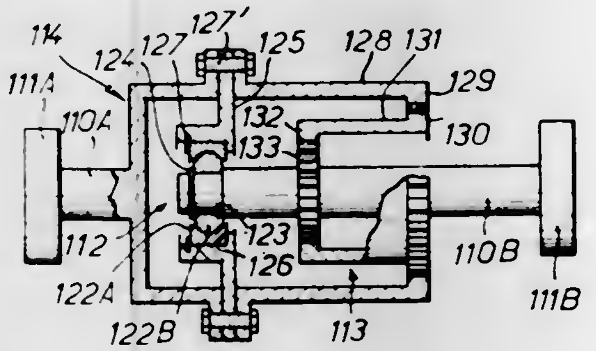
René Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 8, 1975, Ser. No. 566,112

Claims priority, application France, Apr. 17, 1974, 74.13386

Int. Cl.² F16D *3/30*

U.S. Cl. 64—21 **12 Claims**



1. A constant velocity joint for coupling two shafts and for transmitting rotation between the shafts, and enabling independently transmission of axial thrust therebetween and/or slight angular displacements of the shafts relative to their position of axial alignment: comprising, in combination, two stub shafts adapted to be fixed respectively to shafts to be couples, means for transmitting axial thrust between said stub shafts including ball and socket joint means through which said stub shafts effectively bear against each other, and a plurality of cooperating internally and externally toothed gears coupling said stub shafts for rotation and meshing with clearance for enabling slight angular displacements of said stub shafts relative to their axially aligned position, said plurality of gears including, at least, one internally toothed gear mounted for rotation with a first said stub shaft and one externally toothed gear mounted for rotation with the second said stub shaft, thereby providing constant velocity rotation between said stub shafts.

4,003,219
HYDRAULICALLY OPERATED RETRACTABLE SPINDLE

James T. Stull, Jackson Township, Butler County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1975, Ser. No. 570,062

Int. Cl.² F16D *3/06*

U.S. Cl. 64—23 **4 Claims**

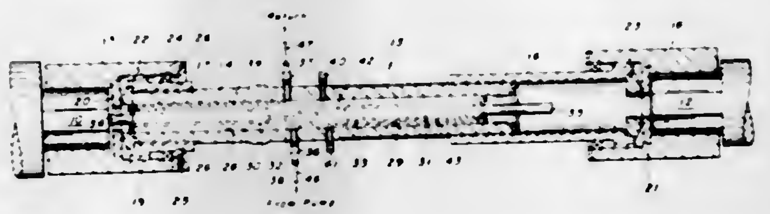
1. The combination, with driven and driving instrumentalities, of a removable spindle connecting said instrumentalities for transmitting rotational movement of said driving instrumentality to said driven instrumentality, said spindle comprising:

a shaft;

first and second hubs mounted on said shaft adjacent opposite ends thereof to rotate therewith, said shaft being axially movable with respect to said second hub;

first and second couplings joining the respective hubs with said driven and driving instrumentalities;

first and second hydraulic cylinders within said shaft near the ends which are adjacent said first and second hubs respectively; and



normally retracted first and second reciprocable pistons and piston rods within the respective cylinders;

said first piston rod bearing against said driven instrumentality for pushing said shaft toward said driving instrumentality when projected from said first cylinder and disengaging said first coupling from said driven instrumentality;

said second piston rod bearing against said driving instrumentality for pushing said shaft toward said driven instrumentality when projected from said second cylinder and re-engaging said first coupling with said driven instrumentality.

4,003,220
KNITTING MACHINE INCLUDING ROTATABLE HOLD DOWN RING

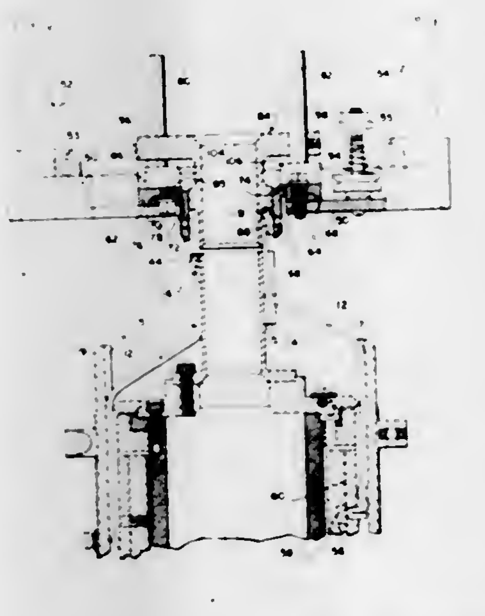
John C. Greczin, Philadelphia, Pa., assignor to Knitting Machinery Corporation of America, Philadelphia, Pa.

Continuation-in-part of Ser. No. 333,969, Feb. 20, 1973, Pat. No. 3,879,961. This application Jan. 20, 1975, Ser. No. 542,613

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² D04B *9/00*

U.S. Cl. 66—9 A **5 Claims**



1. In a circular knitting machine of the type having stationary portions and rotating portions and having a stationary needle bed and knitting needles vertically reciprocal relative to the needle bed, the combination of

A. a yarn guide holder positioned above the needle bed,

1. said yarn guide holder being secured to the rotating portions of the machine and having rotary motion relative to the needle bed;

B. a hold down ring secured to the yarn guide holder and being rotated therewith above the needle bed;
  1. the hold down ring including a needle guide portion which is contacted by the knitting needles as they vertically reciprocate; and

C. attaching means to affix the hold down ring to the yarn guide holder to cause the hold down ring to rotate relative to the needle bed and the knitting needles during all periods of machine operation, whereby the contacts of the knitting needles will cause even wear about the needle guide portion.

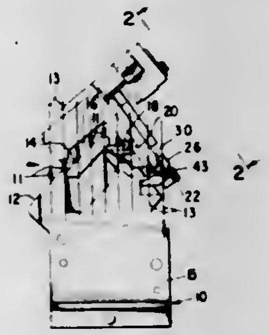
4,003,221
ADJUSTABLE CUSHION CAM FOR A KNITTING MACHINE

Lester Mishcon, and Harry Agulnek, both of Miami Beach, Fla., assignors to The Singer Company, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,339

Int. Cl.^{2} D04B *15/32*

U.S. Cl. 66—57 **4 Claims**



1. In combination with needle controlling camming for a knitting machine, on cam supporting section block means, the camming including an adjustable stitch cam and including a cushion cam to limit the travel of needles drawn by the stitch cam, a (movable) member pivotably mounted in the section block means to position the cushion cam below the stitch cam, and spring means biasing said member into engagement with the stitch cam, said member being movable by the stitch cam when the stitch cam is adjusted in one direction and being movable by the spring means when the stitch cam is adjusted in the opposite direction such that a constant gap is maintained between the stitch and cushion cam in various adjusted positions of the stitch cam.

4,003,222
WARP KNITTING MACHINE FOR PRODUCING LOOPED CLOTH

Roland Wunner, Hauptstrasse 30, Bernstein, Wald, Germany

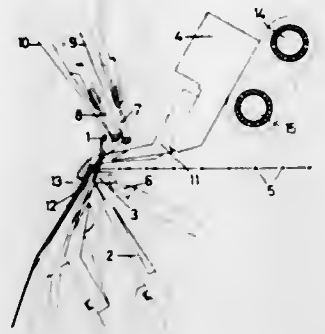
Filed July 21, 1975, Ser. No. 597,901

Claims priority, application Germany, July 23, 1974, 2435312

Int. Cl.^{2} D04B *23/06, 23/08, 23/10, 23/12*

U.S. Cl. 66—84 R **3 Claims**

1. A warp knitting machine for producing looped or ripple-cloth comprising, in combination, a row of vertical needles, a first row of thread guides for supplying warp thread to said needles, a second row of thread guides for supplying pile yarn to said needles, a plurality of trick plates with knock-over edges, means for feeding filler thread to said needles for producing basic fabric, a plurality of parallel filler threads extending over the entire width of the fabric to be produced and being prepared to arrive horizontally at the level of upper edge of said trick plates, a plurality of pole sinkers disposed above and extending over and around the knock-over edges of said trick plates and secured to a bar slidably mounted on bearings, means for controlled reciprocating shifting of said bar in a direction parallel to the filler threads, said pole sinkers being adapted to form loops of the pile yarn to be interconnected with the basic fabric being produced simultaneously therewith, a plurality of filler sinkers extending into the space between said trick plates and said needles and movably mounted below said pole sinkers, and means for imparting to said filler sinkers a substantially rectangular movement consisting of horizontal and vertical sections in timed relationship with the needle action, said filler sinkers being adapted to separate one filler thread at a time and transport it to the front side of said needles along the lower edges of said pole sinkers.



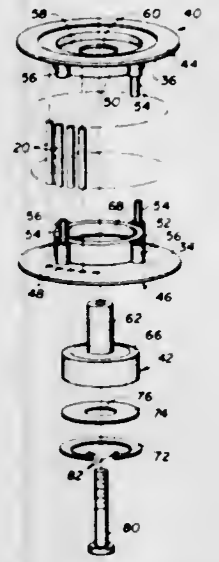
4,003,223
REPLACEMENT KNITTING MACHINE FEED WHEEL

Robert Joseph Vossen, 35 E. Woods Drive, Huntington, N.Y. 11743

Filed Aug. 11, 1975, Ser. No. 603,333

Int. Cl.^{2} D04B *15/48*

U.S. Cl. 66—125 R **2 Claims**



1. An improved knitting machine feed wheel for replacing an embodiment thereof worn out from use in feeding yarn from a supply source to a knitting station of said machine, said replacement feed wheel comprising only a partially complete feed wheel construction consisting of a yarn-supporting body operatively arranged in spanning relation between a cooperating pair of first and second housing members, one said housing member having a centrally located cylindrical wall bounding a bearing compartment sized to receive in seated relation therein a bearing salvaged from said worn out feed wheel, said salvaged bearing being operatively disposed within said bearing compartment to complete said construction of said replacement feed wheel, said cylindrical wall having a groove therein extending substantially the entire circular extent thereof and located on the remote side of said bearing in its said seated position within said bearing compartment, and a flexible C-ring disposed in a snap fit in said groove for holding said bearing in place during subsequent yarn feeding service of said wheel.

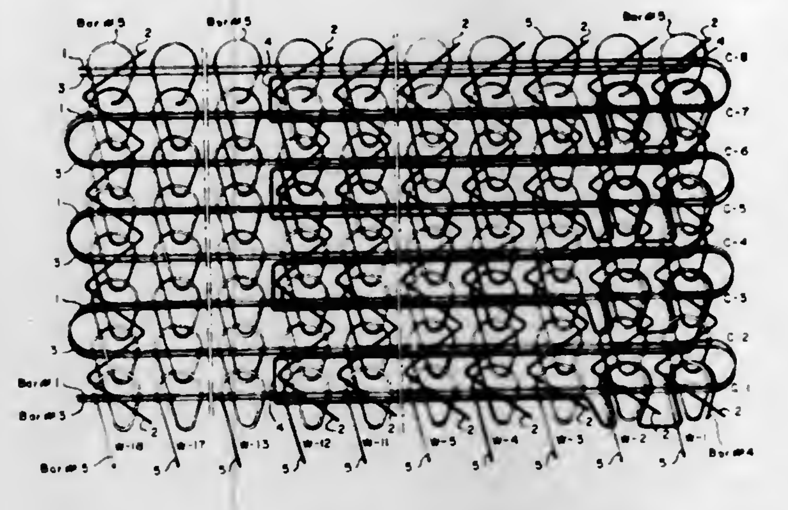
4,003,224
WARP KNIT ELASTIC FABRIC HAVING RAVEL RESISTANT FEATURES

Carl J. Odham, Asheboro, N.C., assignor to Stedman Corporation, Asheboro, N.C.

Filed Apr. 12, 1976, Ser. No. 676,373

Int. Cl.^{2} D04B *7/12, 9/12, 11/08, 23/08*

U.S. Cl. 66—193 **6 Claims**



1. An elastic warp knit fabric comprising a plurality of base yarns each knitted in successive courses to form a plurality of successive closed loops extending in a warp direction and to form a plurality of individual wales including at least one locking wale and at least one intermediate wale, an elastic yarn laid into at least one intermediate wale and at least one locking wale, a first filler yarn extending in a weft direction in each course and contained within the closed loops of adjacent wales to connect adjacent wales together, and a locking yarn knitted to form an open loop in alternate courses in each said locking wale and laid in a weft extending direction in the remaining courses of each said locking wale and having a portion extending in a weft direction along with said first filler yarn in each course and contained within the closed loops of at least one intermediate wale.

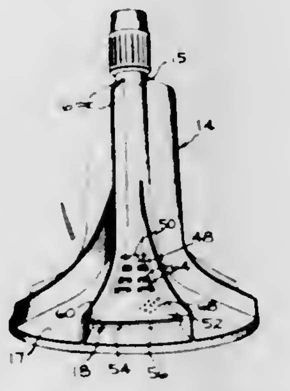
4,003,225
LINT FILTER FOR AUTOMATIC WASHER

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 7, 1976, Ser. No. 646,984

Int. Cl.^{2} D06F *39/10*

U.S. Cl. 68—18 FA **9 Claims**



1. A lint filter agitator assembly adapted to be submerged in a body of washing liquid and oscillated therein to effect a cleansing of fabrics placed within said liquid and entrapment of any lint in the washing liquid, comprising:

a. a driving member,

b. an agitator secured to the driving member having an upper centerpost, a lower flared base portion, at least two agitating vanes carried on the flared base portion for agitating the fabrics within the liquid, and

c. a removable filter member mounted on the exterior of the agitator in the area of the flared base portion and recessed between the agitator vanes, said filter member and agitator forming a chamber therebetween, said filter member having a liquid inlet at the upper end toward the centerpost to allow washing liquid into the chamber, a liquid outlet at the lower end to allow the washing liquid out of the chamber, and lint retaining means for retaining lint in the chamber.

4,003,226
AIR BLAST DUST REMOVING MACHINE

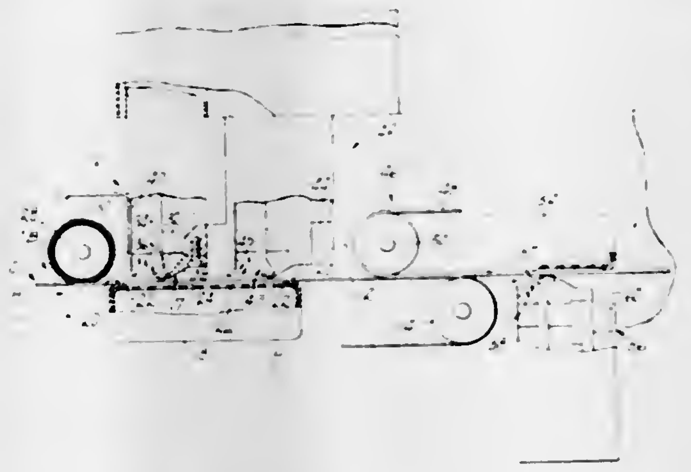
Eric Holdsworth, Bramley, Leeds, England, assignor to USM Corporation, Beverly, Mass.

Filed Apr. 7, 1976, Ser. No. 674,300

Claims priority, application United Kingdom, Apr. 8, 1975, 14254/75

Int. Cl.^{2} C14B *1/00*

U.S. Cl. 69—1 **9 Claims**



1. A machine for removing dust from sheet material, said machine comprising:

a first conveyor having a belt for supporting the sheet material in generally flat condition and for moving the sheet material through said machine;

said belt being permeable to air;

a nozzle device for projecting at least one jet of air against an exposed surface of the sheet material supported by said conveyor belt as the sheet material is carried by said belt through said machine during operation thereof;

said jets being inclined at an obtuse angle to the oncoming exposed surface of the sheet material; and

a suction hold-down means disposed opposite said nozzle device with said conveyor belt disposed between said nozzle device and said hold-down means;

said hold-down means applying suction through said permeable conveyor belt to hold the sheet material in contact with the conveyor belt.

4,003,227
PORTABLE AND DETACHABLE DOUBLE CASEMENT WINDOW OPPOSING TURN LATCH HANDLES LOCK SECURING DEVICE

Joseph Taggart Casey, 308 El Portal, Hillsborough, Calif. 94010

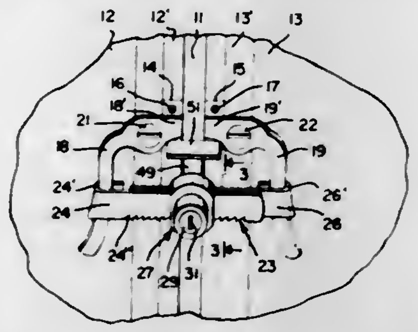
Filed Feb. 2, 1976, Ser. No. 654,473

Int. Cl.^{2} E05B *73/00*

U.S. Cl. 70—14 **7 Claims**

1. A portable and detachable double casement window opposing turn latch handles lock securing device comprising two locking arms adapted to be respectively detachably connected to the respective window turn handles in their down turned latching positions and overlie one another in such positions and a lock mechanism adapted to receive the locking arms in their overlying and adjusted positions within the lock mechanism, said locking arms having ratchet teeth extending along their bottom edges, and said lock mechanism including pawls engagable with ratchet teeth of the arms and operable thereupon from opposite directions to engage respectively the

respective ratchet teeth to lock the locking arms against movement relative to each other, whereby the window handles will be locked in their opposing down turned latching positions against unauthorized turning.



4,003,228

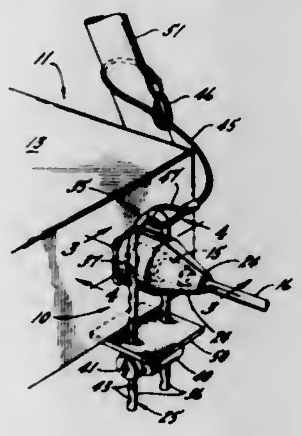
SECURITY APPARATUS FOR VEHICLE COMMUNICATIONS ACCESSORY

James Lee Lievens, 109 Third St., Rustic Acres, Colona, Ill. 61241, and Stanely Clarence De Decker, 24055 80th Ave. North, Port Byron, Ill. 61275

Filed Mar. 23, 1976, Ser. No. 669,512

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 7 Claims



1. Security apparatus for a vehicle communications accessory having a case with top, bottom, side and rear walls and having a connector attached threadably to a complementary fitting projecting rearwardly from said rear wall, said connector being of substantially circular cross-section and having a forwardly facing annular shoulder which is spaced rearwardly from said rear wall when said connector is attached to said fitting, said security apparatus comprising at least two separable blocks each formed with an opening in one side thereof, said blocks being positionable on opposite sides of said connector with the openings in the blocks defining a cavity for receiving said connector, means at the forward end portion of said cavity and defining a rearwardly facing annular shoulder whose smallest diameter is smaller than the largest diameter of said forwardly facing annular shoulder, said rearwardly facing shoulder being disposed between said rear wall and said forwardly facing shoulder and being engageable with the latter to prevent rearward removal of said blocks from said connector, a locking device comprising a substantially U-shaped shackle having legs straddling said blocks and operable to prevent sidewise separation of said blocks, said locking device further comprising a key-operated lock spanning the legs of said shackle and selectively releasable from at least one of said legs to permit removal of said shackle from said blocks, and a flexible line having one end portion captivated by said shackle and having an opposite end portion adapted for attachment to a fixed object.

4,003,229

METHOD FOR COMPENSATING TAIL END

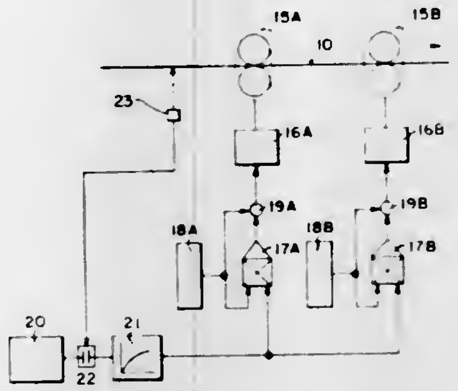
Toshio Harada; Shinichi Nakamata, both of Kisarazu; Shiro Araki; Koei Nakashima, both of Kitakyushu; Hironori Kawasaki, Kimitsu; Kazuo Watanabe, Kitakyushu, and Keiichi Miura, Kobe, all of Japan, assignors to Nippon Steel Corporation and Mitsubishi Electric Corporation, both of Tokyo, Japan

Continuation-in-part of Ser. No. 394-845, Sept. 6, 1973, abandoned. **This application Mar. 26, 1975, Ser. No. 562,027**

Claims priority, application Japan, Sept. 6, 1972, 47-88688

Int. Cl.² B21B *37/00*

U.S. Cl. 72—15 4 Claims



1. A method for compensating for the tail end crop portion when continuously rolling shaped steel sections, said sections including a web section and a flange section, said tail end crop portion lacking said flange section and said rolling being in a tension-free condition using at least two roll stands; comprising the steps of detecting said tail end crop portion, correcting the speed ratio between a preceding roll stand and a succeeding roll stand when the crop portion is introduced into said preceding roll stand and maintaining said correction only while the tail end crop portion passes said preceding roll stand to restore a tension-free condition in the tail end crop portion.

4,003,230

TENSION CONTROL SYSTEM FOR UNIVERSAL MILL

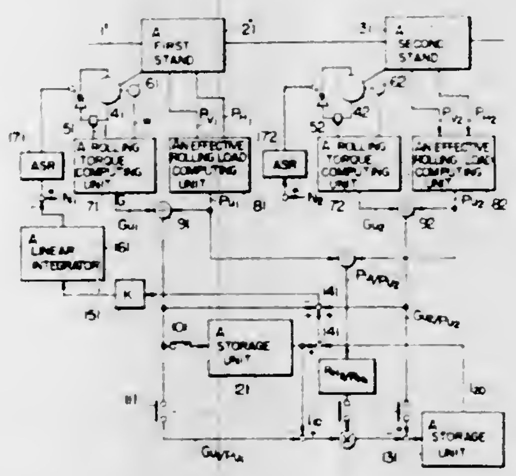
Yasuo Morooka, and Shinya Tanifuji, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 15, 1975, Ser. No. 604,951

Claims priority, application Japan, Aug. 16, 1974, 49-93363

Int. Cl.² B21B *37/08, 37/00*

U.S. Cl. 72—19 14 Claims



1. A tension control system for use in a continuous rolling mill system comprising a plurality of rolling mills each having horizontal and vertical rolls for simultaneously applying rolling loads on the same section of a billet to be rolled, electric motor means for driving said rolls, means for determining the horizontal and vertical rolling loads, means for determining the rolling torques of said electric motor means, and means for controlling the rotational speed of said electric motor means in dependence on the horizontal and vertical rolling loads and rolling torque of said electric motor means.

4,003,231

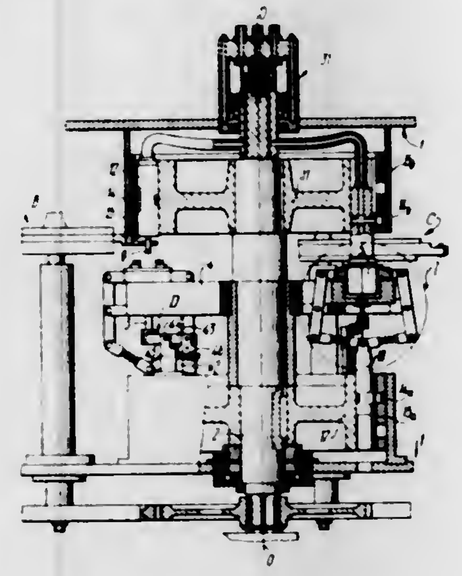
ROTARY MACHINE FOR MANUFACTURING HOLLOW ARTICLES

Viktor Konstantinovich Zhiklenkov, ulitsa 25 Sentyabrya, 54, kv. 26; Viktor Mikhailovich Ilin, ulitsa Rumyantseva, 15, kv. 14, both of Smolensk; Vitaly Matveevich Tanygin, ulitsa Teatralnaya, 3, kv. 66, Klimovsk Moskovskoi oblasti, and July Fedorovich Martynenkov, ulitsa Oktyabrskoi revoljutsii, 7, kv. 92, Smolensk, all of U.S.S.R.

Filed Aug. 18, 1975, Ser. No. 605,675

Int. Cl.² B21D *15/10*

U.S. Cl. 72—59 6 Claims



1. A rotary machine for manufacturing hollow articles, comprising; a framework; a device for loading blanks, mounted on said framework; a device for delivering shaped articles, also mounted on said framework; an article shaping device, mounted on said framework; said article shaping device, said blank loading device and said article delivering device being operatively connected with one another; said article shaping device incorporating a rotor assembly including: a shaft journalled in said framework; a support structure mounted on said shaft; a plurality of female die assemblies supported by said holder structure, each said female die assembly including a plurality of sleeves arranged coaxially and axially spaced from one another and adapted for being driven toward one another in an article shaping operation, each one of said sleeves being made up of two parts, the plane of the division of these parts being along the axis of said female die assembly, the said parts of each said sleeve being adapted to be radially reciprocated to clamp a blank in said female die assembly and to release a shaped article; grooves made in the external surfaces of the bottoms of said sleeves for shaping corrugations in a blank; an axial bore made axially in the bottom of each said sleeve and adapted to accommodate a blank therein; a drum mounted on said shaft of said rotor assembly to one side of said support structure of said female die assemblies; slides mounted in said drum coaxially with the respective ones of said female die assemblies, each said slide being adapted to feed a blank into the axial bores of the bottoms of said sleeves of said respective female die assembly and to effect filling of the internal space of a blank with a liquid medium under pressure, to initiate pre-shaping of the corrugations in the blank; a mandrel mounted in each said slide and adapted to receive a blank thereon; an auxiliary drum mounted on said shaft of said rotor assembly to the side of said support structure, remote from said first-mentioned drum; a plurality of male dies mounted in said auxiliary drum coaxially with the respective ones of said female die assemblies and extending parallel with the axis of said shaft; means for driving said male dies toward said female dies, mounted in said auxiliary drum; means for effecting radial reciprocation of the parts of said sleeves.

4,003,232

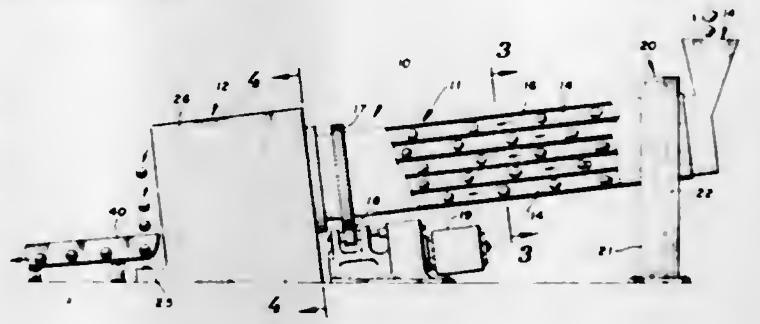
METHOD AND APPARATUS FOR CONTINUALLY FORMING SPHERICAL OBJECTS

Asparough (Oscar) Trendov, 4257 Wooddale Ave. South, Minneapolis, Minn. 55416

Filed Aug. 7, 1975, Ser. No. 602,580

Int. Cl.² B21H *1/14*

U.S. Cl. 72—68 17 Claims



1. A structure for forming substantially spherical objects including:

a. means defining a longitudinally extending axis of rotation;
b. at least one longitudinally extending, generally cylindrical material forming, tubular member having a material receiving end and a material delivery end mounted parallely to said axis of rotation and spaced parallely therefrom;
c. means for rotating said forming member about said axis of rotation;
d. means for introducing a predetermined amount of formable material into said receiving end of said forming member; and,
e. forming means arranged adjacent said delivery end of said forming member to receive an object therefrom.

4,003,233

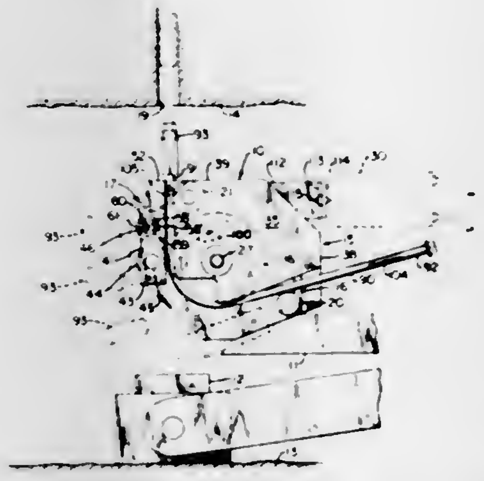
BENDING AND STRAIGHTENING MECHANISM FOR MINE ROOF BOLTS

Ronald R. Stange, Denver, Colo., assignor to Tools for Bending, Inc., Denver, Colo.

Filed Apr. 7, 1975, Ser. No. 565,421

Int. Cl.² B21D *7/04*

U.S. Cl. 72—133 17 Claims



1. Apparatus adapted to successively bend and straighten an elongated bolt shank for insertion in a bolt hole comprising:

a drive roll rotatably mounted on a shaft and having an outer, bolt-engaging peripheral surface including drive means for rotating said drive roll;

a bend arm roller unit rotatably mounted beside said drive roll to follow the rotation of said drive roll, said bend arm roller unit including at least one pinch roller aligned with the bolt-engaging peripheral surface for movement into position to engage a bolt shank disposed for extension tangentially along the bolt-engaging peripheral surface and including a bending roll means disposed radially outwardly of said bolt-engaging peripheral surface;

bend arm drive means engageable with said bend arm roller unit to effect rotation of said bend arm roller unit in an arcuate path following the bolt-engaging peripheral surface of the drive roll whereby to effect initial bending of the leading end of the bolt shank to conform to said arcuate path;

bend arm control means operative to effect radial movement of said bend arm roller unit accomplishing in unison the functions of moving said pinch roller alternately toward and away from the bolt-engaging peripheral surface of said drive roll, moving said bending roll means in like direction parallel to the movement of said pinch roller, and alternately engaging and disengaging said bend arm drive means respectively to and from said bend arm roller unit; and

straightening means at the end of the arcuate path being aligned in a tangential extension of the end of said arcuate path whereby to effect straightening of said bolt shank following its bending along said arcuate path.

4,003,234

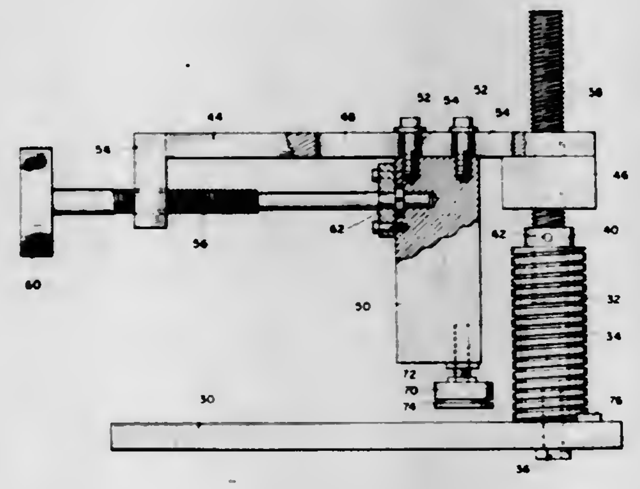
BENDING APPARATUS FOR PERFORATING STRIPS

Clyde W. Thompson, Tulsa, Okla., assignor to Carolea Wheeler, Tulsa, Okla.

Filed May 8, 1975, Ser. No. 575,611

Int. Cl.² B21D *7/024*

U.S. Cl. 72—141 **2 Claims**



1. Apparatus for bending a thin flexible and narrow strip having a flat longitudinally extending base portion and a central longitudinally extending rib projecting upwardly from the base portion at right angles thereto, the upper edge of said rib being sharpened, said strip being of the type adapted to be attached to a printing cylinder and used for perforating or shearing paper sheets being printed, said apparatus being adapted to bend said strip at right angles to the base portion thereof to form a substantially rounded shape for cutting rounded openings in said paper sheets; comprising a vertical cylinder mounted on a supporting means; said cylinder having a helically extending recess therein of a predetermined pitch, said recess extending inwardly into said cylinder a distance slightly less than one-half of the width of the base portion of said strip; a threaded shaft extending coaxially upwardly from said cylinder and having threads thereon of the same pitch as the recess of said cylinder; a horizontal arm rotatably mounted above said cylinder, said arm having a threaded portion threadedly engaging the threads of said threaded shaft; said arm having mounted thereon a slide member adapted to be moved towards and away from said cylinder, a rotatable wheel rotatably mounted in said slide member on the side thereof towards said cylinder, said wheel having an annular recess therein extending inwardly into the wheel a distance slightly less than one-half of the width of the base portion of said strip, the recess in said wheel being in alignment with the recess in said cylinder, means mounted on said arm for moving said slide member towards said cylinder so as to engage said wheel with a strip positioned between said wheel and said cylinder, the sides of the base portion of said strip being received in the opposed recesses in said wheel and said cylinder, whereby, when said arm is rotated, said strip will be bent around said cylinder in the helical recess thereof while the recess in said wheel remains in alignment with the recess in said cylinder.

4,003,235

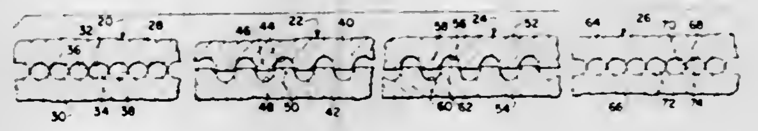
APPARATUS FOR MAKING A MULTIFINGER CONTACT

Stephen Verner Andersen, Burbank, Calif., and Edwin Grant Swick, Bartlett, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 447,612, March 4, 1974, Pat. No. 3,936,624. This application Oct. 1, 1975, Ser. No. 618,597

Int. Cl.² B21D *31/02*

U.S. Cl. 72—326 **6 Claims**



1. An apparatus for forming unitary multifinger electrical contact members including a plurality of punch and die stations each station including a plurality of parallel, narrow, elongate adjacent die cavities adapated to successively deform a strip of conductive material to provide a plurality of independently flexing fingers emanating from an integral base portion, at least two stations including upper and lower tool portions adapted to cooperatively deform the strip of material positioned therebetween, the working face of each tool portion including narrow, elongate, parallel punch members positioned between adjacent die cavities, said die cavities being of continuously decreasing width from the working face to the bottom portion of the cavity wherein elongate fingers may be narrowed by compressing therein, the upper and lower tool faces being arranged so that the punch members of one face are aligned with the die cavities in the opposing face, said at least two stations having their working faces arranged so that the punch and die positions on the working faces of the second of the two stations are transposed from the punch and die positions in the first of the two stations so that elongate portions of the strip may be first deformed from the strip in one direction transverse to the plane of the strip in the first of the two stations and then deformed in the opposite direction transverse to the plane of the strip in the second of the two stations.

4,003,236

PROCESS OF HOT CONTINUOUS ROLLING

André Quehen, Pontoise, France, assignor to SECIM, Courbevoie, France

Filed Feb. 23, 1976, Ser. No. 660,318

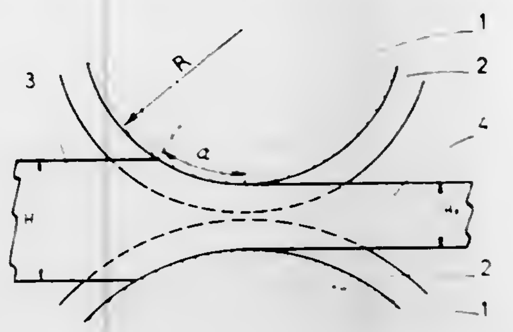
Claims priority, application France, Mar. 19, 1975, 75.08607

Int. Cl.² B21B *1/00*

U.S. Cl. 72—366 **3 Claims**

1. In a process of hot continuous rolling, by a train of two cylinder stands, of an aluminium alloy blank formed by a continuous casting grooved wheel, and at the normal temperature for hot rolling of the alloy, the improvement wherein at least at the first stand the thickness H of the blank is reduced

by passage between the cylinders of the first stand by a value ΔH satisfying the relation $h/a \leq C$, where $h = H - \Delta H/2$ and $a = \leq R\Delta H$, R being the radius of the rolling cylinders and C being a constant depending on the nature of the alloy.



4,003,237

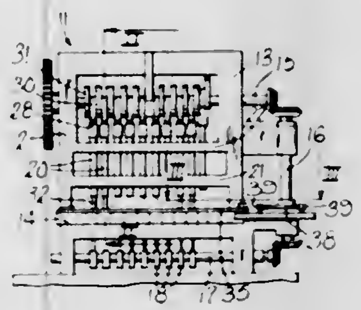
MULTIPLE STATION FORMING PRESS WITH BLANK ACCELERATOR

George F. O'Keefe, Waterbury, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 23, 1975, Ser. No. 625,047

Int. Cl.² B21D *43/05*

U.S. Cl. 72—405 **9 Claims**



1. A machine tool for forming metal articles from blanks cut from a strip of metal fed into the machine, said machine comprising in combination, a frame, a tool set mounted in said frame and including an array of plungers having punches mounted thereon and mating dies adapted to form work pieces fed to said dies, blank cutting means adjacent one end of said array of plungers and dies, transfer means mounted in said frame for sequentially advancing through said array of plungers and dies metal blanks cut by said cutting means, auxiliary blank carrying means supported on said transfer means and movable longitudinally thereof and actuating means adapted to move said blank carrying means relatively to said transfer means.

4,003,238

MECHANISM FOR INSTALLING HOSE BAND CLAMPS

Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

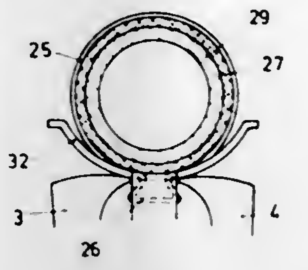
Filed July 8, 1975, Ser. No. 594,001

Claims priority, application Switzerland, July 8, 1974, 9365/74

Int. Cl.² B21D *9/08*

U.S. Cl. 72—410 **25 Claims**

1. A pincer-type mechanism for installing on a tubular member a hose band clamp provided with axial end faces and including at least one ear, which comprises two pincer jaw means movable relative to one another for pressing the roots of the ear against one another, characterized in that the mechanism also includes a spacing means provided with an aperture means for the ear, said spacing means being operable to shield the jaw means with respect to the tubular member to be clamped fast.



4,003,239

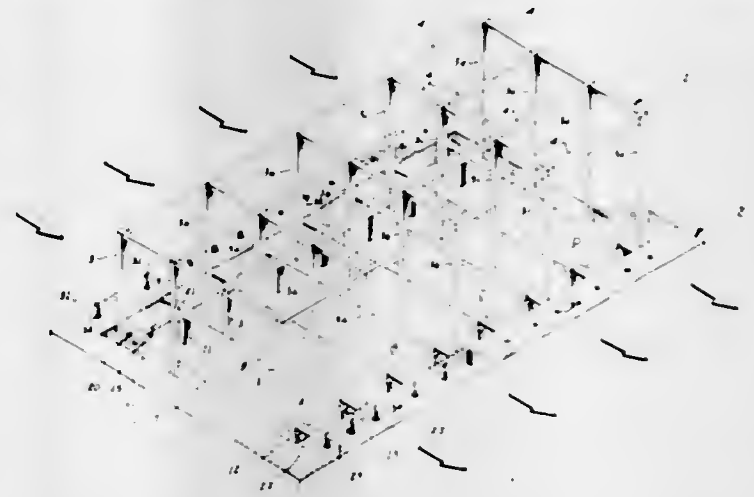
STRUCTURE FOR ACCOMMODATING REALIGNMENT OF DEFORMED VEHICLES

Frank Step, 4410 N. Highway Drive, Tucson, Ariz. 85705

Continuation-in-part of Ser. No. 493,171, July 30, 1974. This application June 30, 1975, Ser. No. 591,607

Int. Cl.² B21D *1/14*

U.S. Cl. 72—457 **2 Claims**



1. An assembly for containing a plurality of vehicles and anchoring vehicle frame and chassis straightening tools, said assembly comprising:

a. a parallel set of a plurality of steel-reinforced cages, platforms and piers disposed within a building;

b. said cages including a superstructure having a plurality of vertically disposed posts and horizontally disposed beams defining a multiple of parallel bays extending to common opposed sides of said superstructure;

c. each bay having an opening at each end thereof for ingress and egress of a vehicle at either of said opposed sides;

d. each juxtaposed pair of bays sharing common vertical posts and horizontal beams;

e. said superstructure being effective to envelop the sides and tops of the vehicles located therein;

f. a parallel pair of said platforms being horizontally disposed within each said bay and extending between each end of the bays;

g. each said pair of platforms being effective to support a vehicle within the respective bay and further effective to allow passage completely through each bay;

h. a pillar located at the ends of each bay to support each platform;

i. a foundation disposed beneath the superstructure for receiving the lower ends of each of said posts and said pillars;

j. a plurality of removable piers wherein each pier extends between the extremity of each platform and said foundation; and k. vehicle frame and chassis straightening tools anchored on said superstructure.

4,003,240

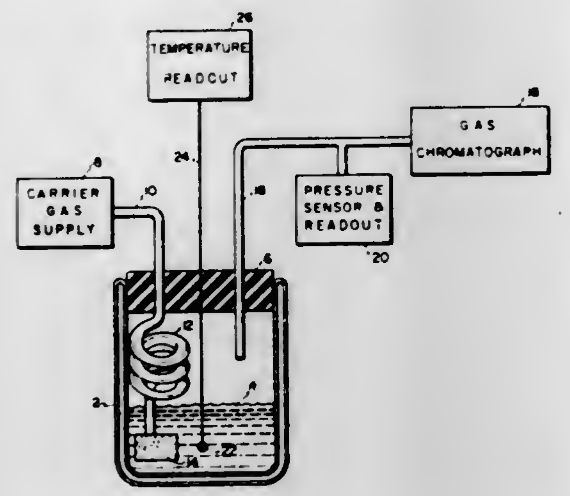
CALIBRATION DEVICE FOR VAPORIZED LIQUIDS

Damien E. Durbin, Missouri City, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 13, 1975, Ser. No. 586,542

Int. Cl.² G01N *31/00*

U.S. Cl. 73—1 G **10 Claims**



1. A vapor phase analyzer system comprising
- thermally insulating means for storing a liquid to be analyzed,
- inlet means for introducing a carrier gas into the liquid to be analyzed in said insulating means,
- vapor phase analyzer means,
- outlet means for applying a saturated carrier gas leaving the liquid to be analyzed to said analyzer means,
- temperature sensor means for measuring the temperature of said liquid to be analyzed within said thermally insulating means, and
- pressure sensor means for measuring the pressure of said saturated carrier gas.

4,003,241

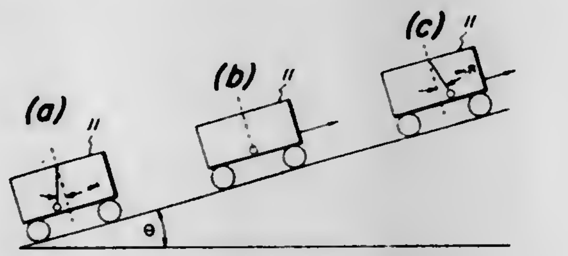
ACCELEROMETER METHOD OF INDICATING ROLLING RESISTANCE OF A VEHICLE

Paul Randolph Thomas, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed July 19, 1974, Ser. No. 490,129

Int. Cl.² G01N *3/56*

U.S. Cl. 73—9 **2 Claims**



1. A method of measuring rolling resistance of a vehicle comprising:
- a. adjustably mounting an accelerometer on a vehicle with its longitudinal axis of sensitivity aligned parallel with the direction of vehicle travel;
- b. connecting a meter to said accelerometer to be responsive to the signal output therefrom;
- c. calibrating said meter while the vehicle is stationary by inclining said accelerometer axis of sensitivity at a preselected small angle from the horizontal and adjusting the meter to read a multiple of the sine value of said angle; and
- d. allowing said vehicle to coast and reading the vehicle coefficient of rolling resistance directly from said meter while the vehicle is accelerating or decelerating.

4,003,242

DEVICE FOR DETERMINING THE MIXING RATIO OF BINARY GASES

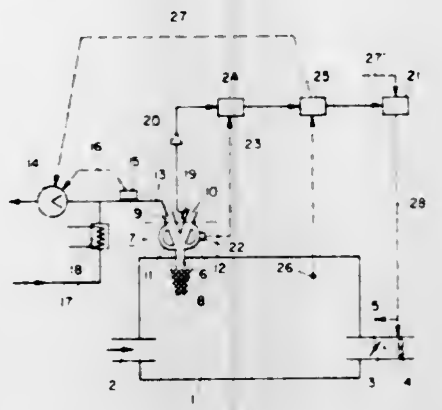
Heinz Houben, Monchengladbach, and Manfred Pabst, Weiden near Cologne, both of Germany, assignors to A. Monforts, Monchengladbach, Germany

Filed July 14, 1975, Ser. No. 595,494

Claims priority, application Germany, July 13, 1974, 2433764

Int. Cl.² G01N *29/02*; F01C *1/04*

U.S. Cl. 73—24 **9 Claims**



1. Device for determining the mixing ratio of binary gases in a mixture thereof by measuring the velocity of sound in the gas mixture, that velocity being determined by the oscillating frequency of a fluidic oscillator comprising a fluidic oscillator tuned to a fundamental frequency (f_0) at a predetermined temperature (T_0) in air, said fluidic oscillator having inlet and outlet means and feedback means connecting said outlet means to said inlet means, means for detecting the oscillating frequency of said fluidic oscillator, which determines the velocity of sound in the gas mixture, and transmitting a signal corresponding thereto, measuring means for measuring absolute gas temperature (T_g) of the gas mixture at a location other than in said feedback means, correction means operatively connected to said means for measuring said absolute gas temperature (T_g) for correcting, by a correction factor proportional to the square root of said absolute gas temperature (T_g), the value of the velocity of sound in the gas mixture determined by the oscillating frequency of said fluidic oscillator and represented by said transmitted signal, measuring means for measuring absolute temperature (T_r) of the gas mixture in said feedback means, correction means operatively connected to said means for measuring said feedback absolute temperature (T_r) for correcting, by a correction factor proportional to the difference between said feedback absolute temperature (T_r) and said predetermined temperature (T_0), the value of the velocity of sound in the gas mixture determined by the oscillating frequency of said fluidic oscillator and represented by said transmitted signal, and pump means for pumping the gas mixture through said fluidic oscillator, said pump means being adjusted to a range of pressures wherein oscillating frequencies produced in said fluidic oscillator and serving to determine the respective velocity of sound in the gas mixture being pumped therethrough are independent of variations in the gas pressure.

4,003,243

METHOD OF ANALYSIS BY LIQUID-PHASE CHROMATOGRAPHY

Gilbert Blu, and Flavien Lazarre, both of Pau, France, assignors to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

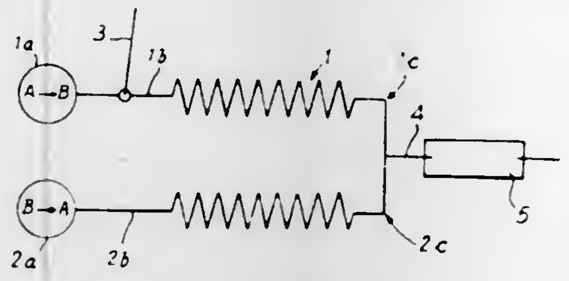
Filed July 15, 1975, Ser. No. 596,073

Claims priority, application France, July 18, 1974, 74.25036

Int. Cl.² G01N *31/08*

U.S. Cl. 73—61.1 C **12 Claims**

1. A method of analysis by liquid-phase chromatography with a pre-selected elution-gradient programme, which comprises the steps of supplying each of two chromatography columns having at least approximately similar porous volumes and permeability, with a mixture of two solvents, while maintaining the concentration of one solvent at the inlet to one column equal at any point in time to the concentration of the other solvent at the inlet to the other column, injecting the product to be analyzed into the inlet of one of the two columns, bringing the fluids leaving both columns together to form a mixture, and analyzing said mixture in a concentration detector.



4,003,244

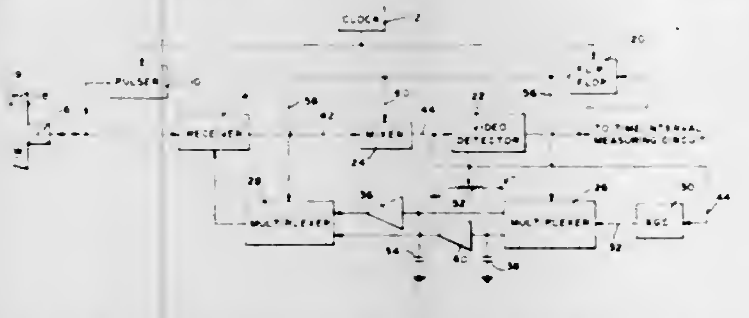
ULTRASONIC PULSE-ECHO THICKNESS MEASURING APPARATUS

Patrick M. O'Brien, Stratford; Richard J. Pittaro, Stamford, and Philip A. Walker, Trumbull, all of Conn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Sept. 30, 1975, Ser. No. 618,073

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.8 R **6 Claims**



1. An electrical circuit for an ultrasonic pulse-echo measuring apparatus comprising:
- means for transmitting an ultrasonic search signal into a workpiece and receiving a first and a second echo responsive signal in response to the transmission of such search signal, said second signal as received being of lower amplitude than said first signal and being phase inverted relative to said first signal;
- receiving means including signal amplifying means coupled for receiving said echo responsive signals and providing said signals after amplification to a time interval measuring circuit, and
- control means include phase inversion means coupled between said receiving means and said time interval measuring circuit for causing, in response to said amplified first echo responsive signal attaining a predetermined amplitude, said receiving means to be conditioned for increased amplification to cause said second echo responsive signal to attain said predetermined amplitude, and causing furthermore said phase inversion means to be conditioned for effecting said second echo responsive signal to be phase inverted with respect to said first echo responsive signal so as to be of the same phase as said first echo responsive signal when provided to said measuring circuit.

4,003,245

METHOD FOR PRESSURE MEASUREMENT

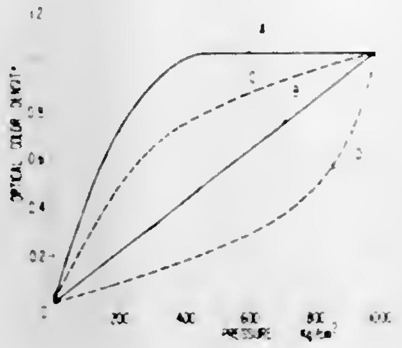
Yasuhiro Ogata, Fugimiya, and Kenji Ariyasu, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Mar. 26, 1975, Ser. No. 562,325

Claims priority, application Japan, Mar. 26, 1974, 49-33789

Int. Cl.² G01L *1/00*

U.S. Cl. 73—88 R **9 Claims**



1. A method for measuring pressures which comprises allowing a material whose pressure is to be measured to press against a recording sheet to form a color image due to the pressure, and evaluating the changes in the optical color density or the color hue of the resulting color image on the recording sheet, said color image formation due to the pressure being effected by contacting a microcapsule layer containing a color former with a color developer layer under pressure and, said recording sheet being a recording unit comprising a color former sheet comprising a support having thereon said microcapsule layer containing said color former and a color developer sheet comprising a support having thereon said color developer layer.

4,003,246

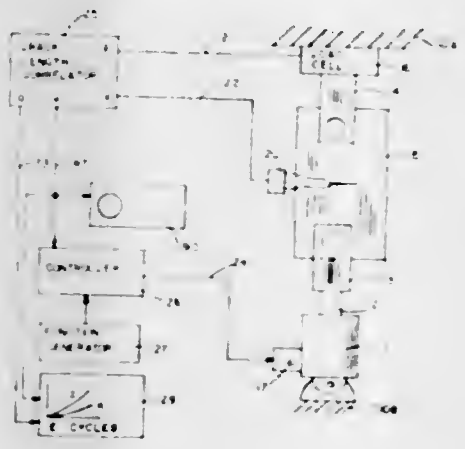
SPECIMEN CRACK STRESS INTENSITY CONTROL LOOP FOR TEST DEVICE

Patrick J. Cain, Eden Prairie, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Aug. 8, 1975, Ser. No. 603,134

Int. Cl.² G01N *3/32*

U.S. Cl. 73—90 **7 Claims**

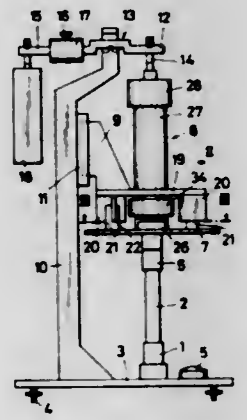


1. A test apparatus for testing tension specimens under cyclic loading, wherein such specimens are caused to crack and crack growth across a width of a specimen is used for a test analysis, the improvement wherein an actuator for loading a specimen to be tested is provided; servo control means for controlling said actuator; means providing a feedback signal substantially proportional to the stress intensity factor at an end of a crack growing in a specimen being tested including transducer means to measure load on a specimen and displacement of a specimen being loaded, means connected to

said transducer means to provide a signal proportional to the length of a crack in a specimen being loaded, means to provide a signal which is a function of the compliance of the specimen, multiplying circuit means to provide an output signal Y which is substantially proportional to a polynomial function of the compliance factor, and further circuit means to provide an output substantially proportional to the quantity $kF\sqrt{a/W}\ Y$, where F is a signal proportional to the load applied to the specimen, a is a signal which is a known function of crack length, w is a signal which is a known function of specimen width and k is a constant; and means to couple said output of said further circuit means to said servo control means.

4,003,247
TORSIONAL OSCILLATION APPARATUS

Kurt Moser, Fribourg, and Beat Hochli, Bern, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland
Filed Oct. 22, 1975, Ser. No. 624,894
Claims priority, application Switzerland, Oct. 31, 1974, 14575/74
Int. Cl.^{2} G01N *3/32*
U.S. Cl. 73—99 8 Claims

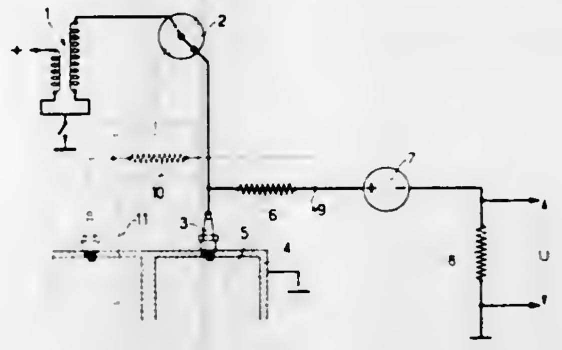


1. A torsional oscillation apparatus, for example for testing plastics, comprising a lower clamp, arranged in torsionally-fast or non-rotating manner, for one end of a test specimen, an upper clamp for the other end of the test specimen, which upper clamp is connected securely to the underside of an oscillatory body which is suspended from a wire or thread which is twistable in a substantially resistance-free manner, a tautening device which exerts, on one of the clamps a force which keeps the test specimen taut, a stimulating device for stimulating torsional oscillations of the torsions pendulum formed by the test specimen and the oscillatory body, and a transducer, cooperating with the oscillatory body, for producing electrical pulses corresponding to the torsional oscillation of the pendulum, characterised in that the wire or thread, adjacent its upper end, extends through an upper eye which is connected securely to the oscillatory body and, directly above the oscillatory body, extends through a lower eye which is connected securely to the upper end of the wire or thread.

4,003,248
FAULTY COMBUSTION DEVICE FOR CONTROLLED IGNITION INTERNAL COMBUSTION ENGINE

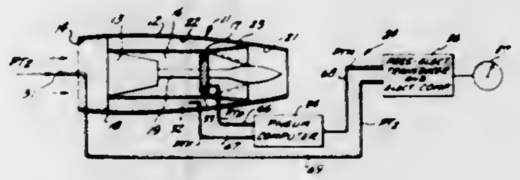
Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France
Filed Feb. 19, 1975, Ser. No. 551,453
Claims priority, application France, Feb. 20, 1974, 74.05778
Int. Cl.^{2} G01M *15/00*
U.S. Cl. 73—116 8 Claims

1. An apparatus for detecting faulty combustion in an internal combustion engine having spark plugs, comprising sensing means for determining whether the gas in the interelectrode space of a spark plug is ionized following the occurrence of each spark of that plug, and means responsive to said sensing means for emitting a malfunction signal when a predetermined minimum number of consecutive sparks occur without said ionization occurring.



4,003,249
THRUST CORRELATED ENGINE PRESSURE RATIO INDICATOR AND METHOD FOR TURBOFAN ENGINES WITH MIXER-TYPE NOZZLES

Jerome R. Laskody, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 29, 1975, Ser. No. 644,895
Int. Cl.^{2} G01M *15/00*
U.S. Cl. 73—117.4 6 Claims



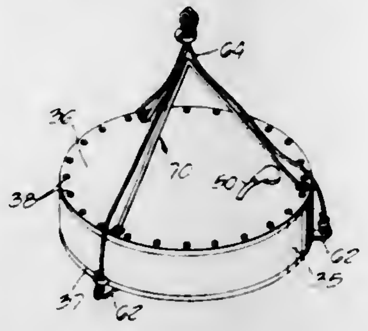
1. Apparatus for measuring net thrust of common nozzle mixed-exhaust turbofan jet engines and the like comprising:

separate first and second input means respectively connected to sense engine fan discharge pressure and engine turbine discharge pressure upstream of an exhaust mixer and output means combining sensed turbine discharge pressure with sensed fan discharge pressure to provide an output response representing a predetermined weighted average of said fan and turbine discharge pressures, and engine pressure ratio computing means having a first input connected to said output means to receive said output response and a second input connected to sense engine inlet pressure for computing the ratio between said output response and said engine inlet pressure and for providing an output signal representative of said ratio.

4,003,250
GEOTHERMAL HEAT FLUX TRANSDUCERS

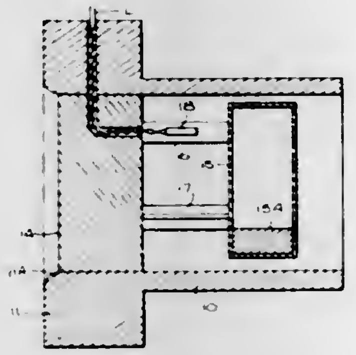
Heinz F. Poppendiek, La Jolla, and Paul T. Meckel, Lakeside, both of Calif., assignors to Thermonetics Corporation, San Diego, Calif.
Continuation of Ser. No. 532,925, Dec. 16, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,532
Int. Cl.^{2} G01K *17/00*
U.S. Cl. 73—190 H 20 Claims

1. In a system in which it is desired to ascertain the flow of heat from a subterranean geothermal heat source wherein the improvement comprises a generally planar geothermal heat transducer structure encompassing a large area through which heat flux from said source flows and a multiplicity of thermal hot junctions and associated cold junctions uniformly disposed in said structure throughout substantially all of said area, said hot and cold junctions being on a mounting structure which has a vertical dimension in the direction of heat flow at least equal to the horizonal width of the structure and companion hot and cold junctions being spaced a distance equal to said vertical dimension, and means surrounding said mounting structure for preventing heat flux fringing to thereby assure parallel heat flux flow lines through said mounting structure, said mounting structure and said preventing means having substantially the same resistance to heat flow.



4,003,251
ACCELERATION-PROOF VORTEX-TYPE FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Filed Mar. 19, 1976, Ser. No. 668,458
Int. Cl.^{2} G01F *1/32*
U.S. Cl. 73—194 VS 7 Claims



1. An acceleration-proof vortex-type flowmeter comprising:

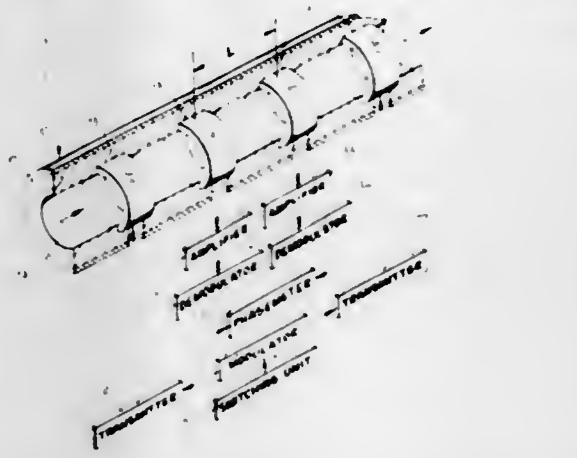
A. a flow tube through which the fluid to be metered is conducted;

B. a vortex-shedding obstacle assembly disposed in said tube, said assembly having a first section fixedly supported across said tube and a second section deflectably suspended from the first section by upper and lower beams secured to the upper and lower end portions of the second section, said upper beam being bendable in an X-plane defined by movement of the deflectable section from side-to-side with respect to its neutral position and being unbendable in a Y-plane defined by movement of the deflectable section up-and-down with respect to its neutral position, said lower beam being unbendable in the X and Y planes, both beams being twistable, the mass of said deflectable section being balanced about said lower beam which acts as a torsion rod fulcrum, whereby vortex-shedding results in fluidic forces which are applied alternately to one side and the other of said deflectable section and produces a torque about the lower beam causing the deflectable section to swing on the lower beam at a frequency depending on the periodicity of said fluidic forces; and

C. means to sense the swing of said deflectable section to provide an output signal reflecting flow rate, said deflectable section being insensitive to acceleration forces applied in the Y-plane, in that both beams are unbendable in this plane, said deflectable section being insensitive to acceleration forces applied in the X-plane in that while the upper beam is bendable in this plane, the lower beam above which the deflectable section is mass-balanced is not bendable in the X-plane and acceleration in the X-plane imposes no net force on the upper beam.

4,003,252
ACOUSTICAL WAVE FLOWMETER

Edward James Dewath, San Francisco, Calif., assignor to The Institutes of Medical Sciences, Calif.
Continuation-in-part of Ser. No. 497,971, Aug. 16, 1974, abandoned. This application July 24, 1975, Ser. No. 599,245
Int. Cl.^{2} G01F *1/66*
U.S. Cl. 73—194 A 20 Claims



1. A fluid flowmeter for measuring the velocity of a moving fluid, said flowmeter comprising:

an enclosed housing having an outer surface, an inner surface, a fluid inlet and a fluid outlet;

a generally cylindrical liner received within said housing and having an inner wall surface provided with first and second recesses spaced along the longitudinal axis of said liner by a predetermined distance and extending in a direction substantially normal to said axis, said liner being fabricated from a material providing acoustical damping and extending between said fluid inlet and said fluid outlet; and

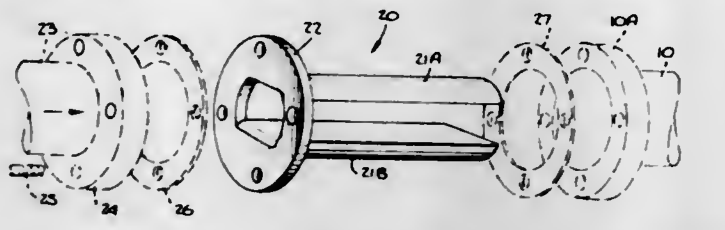
first and second acousto-electric transducers operable in a radial vibration mode and carried by said liner, said transducers each having an outer wall surface received within a different one of said first and second recesses at a position interior to said inner surface of said housing, and an inner wall surface, said transducers each being dimensioned to provide with said inner wall surface of said liner a fluid flow conduit substantially devoid of protuberances and cavities and extending between said fluid inlet and said fluid outlet of said housing; said transducers being capable of generating and sensing compressional waves traveling in said fluid along said flow conduit when operated in said radial vibration mode and being acoustically isolated from said housing by said liner.

4,003,253
MULTI-RANGE VORTEX-SHEDDING FLOWMETER

John S. Yard, Doylestown; Peter J. Herzl, Morrisville, and Daniel Evans, Feasterville, all of Pa., assignors to Fischer & Porter Co., Warminster, Pa.
Filed Sept. 8, 1975, Ser. No. 611,170
Int. Cl.^{2} G01F *1/32*
U.S. Cl. 73—194 VS 6 Claims

1. A replaceable adapter for a vortex-shedding flowmeter provided with a flow tube forming a cylindrical passage through which the fluid to be metered is conducted, said tube having a mounting flange at the inlet thereof, and an obstacle assembly mounted within the tube to create vortices whose

frequency is a function of flow rate, said obstacle assembly including a block mounted cross the tube at right angles to the direction of flow, said adapter comprising a pair of rods disposed longitudinally in said flow tube on opposite sides of said



block to restrict the effective area of said passage, whereby said meter is responsive to flow rates which lie below the normal operating range of the meter, said rods being cantilevered from a support flange lying against said mounting flange.

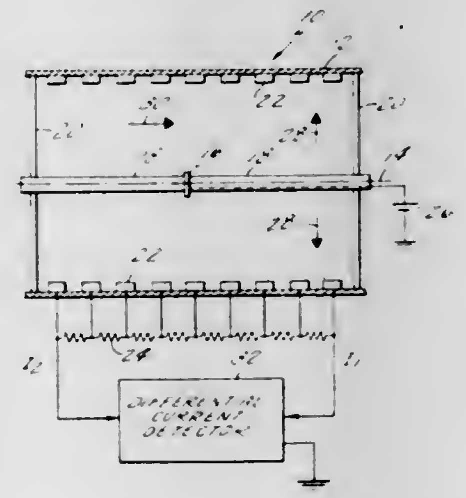
4,003,254
ION COLLECTOR

Robert H. Bullis, Avon, and Walter J. Wiegand, Jr., Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 18, 1975, Ser. No. 605,689

Int. Cl.² G01F *1/56*

U.S. Cl. 73—194 F **6 Claims**



1. In an apparatus for sensing the flow of fluids passing along a flow axis through the apparatus which includes:
- means proximate to the fluid flow for producing ions in the fluid;
- means proximate to the fluid flow for collecting ions, the collection means being separated from the ion production means and extending in the direction of fluid flow; and
- means responsive to the position of impingement of the ions on the collection means to measure the displacement of the ions along the flow axis due to the flow of the fluid along the axis during the ion migration across the flow from the production means to the collection means;
- an improved ion collection means comprising a plurlity of discrete ion collectors arranged adjacent to each other along the flow axis, the collectors being spaced apart physically and connected in series electrically with an electric resistance in the connection between adjacent collectors.

4,003,255
MEASUREMENT AND CONTROL OF FLUID FLOW

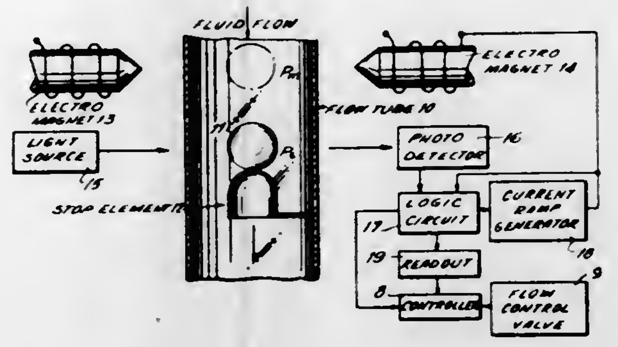
Jordan Spencer, Tenafly, N.J., assignor to Robert I. Pearlman, Elizabeth, N.J., a part interest

Continuation-in-part of Ser. No. 467,264, May 7, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,600

Int. Cl.² G01F *1/28*

U.S. Cl. 73—194 E **17 Claims**

1. Apparatus for measuring flow rates of fluids comprising a conduit, a float element having a magnetic responsive material associated therewith positioned in said conduit, a stop element positioned in said conduit which limits the motion of said float element in the downstream direction, electromagnetic means positioned in an upstream portion about said conduit before said stop element, means for gradually increasing the current to said electromagnetic mean to thus increase the magnetic force of said electromagnetic means so as to move said float element away from said stop element and against the direction of fluid flow, said means for gradually increasing current to said electromagnetic means increasing current in a gradual stepwise manner to accurately measure the magnetic force required for the float to leave the stop element, means for detecting the initial departure of the float element away from the stop, and means for relating fluid flow to the degree of current required to move said float element away from said stop element.



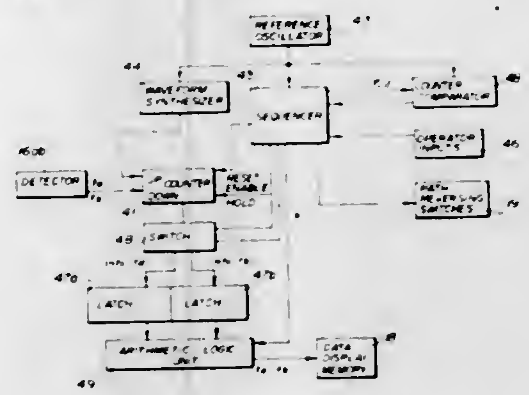
4,003,256
ACOUSTIC OSCILLATOR FLUID VELOCITY MEASURING DEVICE

A. Mark Donelan, and Bryan F. White, both of Burlington, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 17, 1975, Ser. No. 632,802

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **3 Claims**



1. A fluid velocity measuring device comprising:
- a free running continuous wave acoustic oscillator having a first and second acoustic transducer defining an acoustic path within the fluid and switching means coupled to the first and second transducer to periodically reverse the direction of acoustic energy propagation between the transducers, said acoustic path being the frequency determining element of the oscillator;
- means for detecting the output signals of the oscillator as it propagates energy in a first direction in said fluid and in a second direction opposite the said first direction;
- up/down counter means having the down terminal coupled to the oscillator signal detecting means;
- reference oscillator means coupled to the up terminal of the counter;
- switch means for coupling the output of the counter to first and second latching circuit means;
- sequencer means for controlling said switch means to store the count from the counter means in said first latch means when the acoustic energy is propagated in a first direction, and in said second latch means when the acoustic energy is propagated in a second direction; and
- logic means coupled to the first and second latch means to compute the fluid velocity as a function of the difference of the counts stored in said first and second latch means.

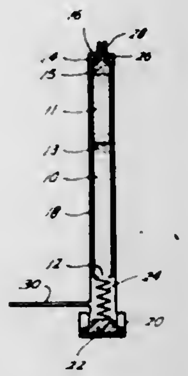
4,003,257
ANALYSIS OF VOLATILE ORGANIC COMPOUNDS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Albert Zlatkis, Houston, Tex.

Filed Mar. 12, 1974, Ser. No. 450,504

Int. Cl.² G01N *31/06, 31/08, 33/02, 33/16*

U.S. Cl. 73—23.1 **36 Claims**



1. In a method of analysis in a gas chromatographic system for volatile organic compounds in a sample, the step of
- remotely and independently of the gas chromatographic system trapping the volatile organic compounds in the sample by adsorbing them on a porous polymer consisting essentially of 2,6-diphenyl-p-phenylene oxide, said polymer having properties of high affinity for organic volatiles being hydrophobic, having temperature stability up to about 400° C., having good desorptivity, and being relatively inert to the sample, whereby such trapped volatile organic compounds are retained; for later chromatographic analysis.

4,003,258
APPARATUS FOR DETECTING THE LEVEL OF A PARTICULATE MATERIAL

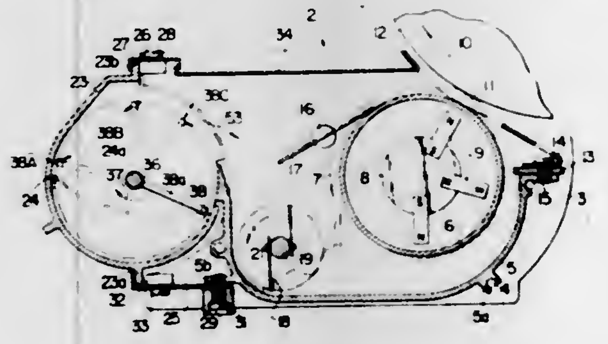
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Aug. 8, 1975, Ser. No. 603,034

Claims priority, application Japan, Aug. 13, 1974, 49-92618

Int. Cl.² G01F *23/00;* **H01H** *36/00*

U.S. Cl. 73—290 R **12 Claims**



1. An apparatus for detecting the level of a particulate material contained in a vessel comprising:
- a. a driven member rotatable about a horizontal axis in said vessel, a material engaging member affixed to said shaft and having a portion extending radially from the axis of rotation of said shaft and being rotatable with said driven member, said material engaging member having its center of gravity at a position based on the axis of rotation of said driven member;
- b. a driving rotary member disposed in spaced aligned relationship to said driven member and being rotatable in a driving condition and being non-rotatable in a detection condition during which time said material engaging member falls by the influence of gravity onto the surface of the material;
- c. a lost motion drive connection between said driven rotary member and said driving rotary member, permitting relative rotation therebetween through a predetermined angle and the driving of said driven member by said driving member; and
- d. means for detecting the angular position of said driven rotary member when said driving member is in a detection condition, at which time said material engagement member rests on the upper surface of the particulate material in the vessel, and in arriving in this position, rotates said driven member through an angle relative to said driving member, in accordance with the level of the material and the movement of said material engagement member under the influence of gravity to the surface of the material.

4,003,259
METHOD AND A DEVICE FOR CAPACITIVE LEVEL MEASUREMENT

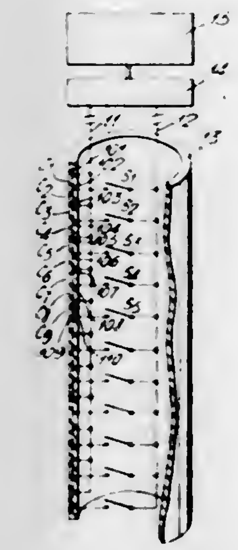
Bjorn Reinhardt Hope, Lommedalen, Norway, assignor to Navaltronic A/S, Oslo, Norway

Filed June 10, 1975, Ser. No. 585,609

Claims priority, application Norway, June 10, 1974, 2093/74

Int. Cl.² G01F *23/26*

U.S. Cl. 73—304 C **25 Claims**



1. A method for capacitive measurement of the level of material, comprising providing at least a pair of vertically-oriented capacitive plates arranged in a position one above the other adjacent said material such that a substantial fringing electric field extends through a predetermined region between adjacent edges of said plates when a voltage is applied between one of said plates and the other of said plates; and sensing differences in the electrical capacity between said plates due to different levels of said material in said region.

4,003,260

APPARATUS FOR TESTING MOLTEN METAL

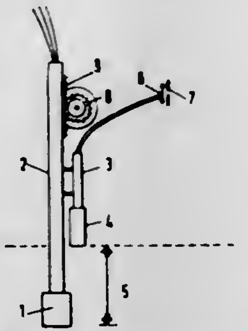
Philippe Felix Catoul, Horion-Hozemont, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Nov. 25, 1974, Ser. No. 526,687

Claims priority, application Belgium, Nov. 27, 1973, 807880

Int. Cl.^{2} G01F *23/00*; G01N *1/10*

U.S. Cl. 73—423 R **5 Claims**



1. An apparatus for testing molten metal by lowering a measuring or sampling probe to a desired depth in the molten metal, the apparatus comprising: a probe; a probe carrier; means for lowering and raising the probe carrier; and a contact detector which emits a pneumatic signal when the detector comes into contact with the molten metal, the detector being fixed on the probe carrier at a distance above the probe and comprises a hollow body of material which burns on contact with molten metal, the pneumatic signal being produced by the pressure created in the hollow body by the gaseous products of combustion of the material.

4,003,261

APPARATUS FOR TESTING MOLTEN METAL

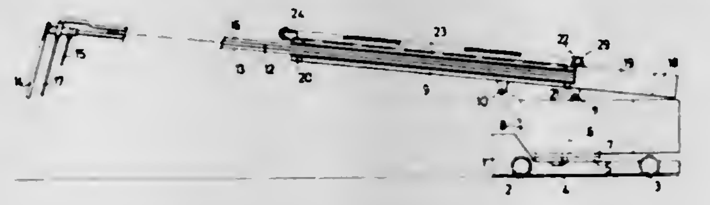
Jean Adolphe Nautet, Liege, and Philippe Felix Catoul, Horion-Hozemont, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Mar. 3, 1976, Ser. No. 663,553

Claims priority, application Belgium, Mar. 7, 1975, 826455

Int. Cl.^{2} G01N *1/12*

U.S. Cl. 73—423 R **7 Claims**



1. In apparatus for testing molten metal by lowering a measuring or sampling probe to a desired depth in the molten metal, the apparatus comprising a probe, an elongate probe-carrier, a support structure on which the probe-carrier is tiltably mounted, and means for lowering and raising the probe-carrier: the improvement that the probe-carrier is telescopic, its length being adjustable between given limits.

4,003,262

APPARATUS FOR MEASURING PRECISE MICRO QUANTITIES OF FLUID SAMPLES

Horace W. Gerarde, deceased, late of Tenafly, N.J., by The Midlantic National Bank Citizens, executor, Englewood, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Dec. 16, 1974, Ser. No. 532,820

Int. Cl.^{2} G01N *1/10*

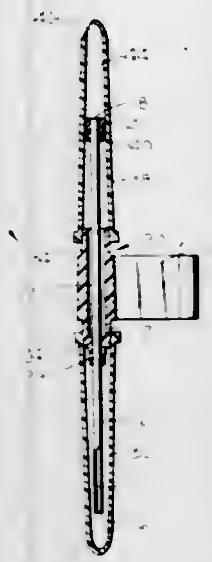
U.S. Cl. 73—425 **3 Claims**

1. An apparatus for measuring and diluting precise quantities of fluid samples comprising:

a precision, self-filling capillary tube having the capability of holding a volume greater than 50 microliters;

a holder having a longitudinally extending bore therethrough, said capillary being mounted in said bore and disposed so that said holder is positioned between the ends of the capillary, said bore providing an interference fit for holding the capillary tube in fixed position in said holder;

a shield removably mounted on the holder and telescopically positioned over one end portion of said capillary tube;



an adaptor mounted on said one end of said capillary tube and having surfaces thereon for making sealing contact with the inner surface of said shield so that the portion of said shield extending above said adaptor forms an overflow chamber;

said shield having a vent formed in the closed end thereof so that the capillary tube is open to atmospheric pressure to permit said fluid samples to fill said tube by capillary action.

4,003,263

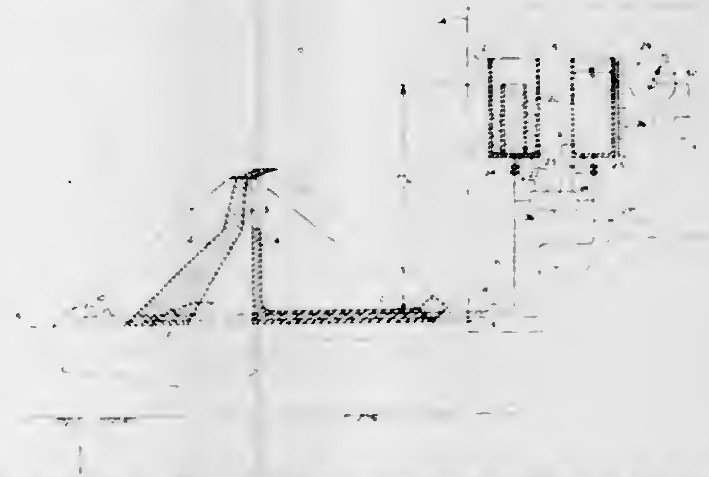
TUBE PROFILE GAGE

John E. O'Rourke, Contra Costa County, Moraga, Calif. 94556

Continuation-in-part of Ser. No. 471,446, May 20, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 649,068

Int. Cl.^{2} G01C *5/04*

U.S. Cl. 73—432 HA **5 Claims**



1. A tube profile gage for measurement of vertical settlement or vertical heave throughout the length of a conduit affixed to, or located within or beneath any civil works, such as structures, dams, or terrestrial formations; including land slides, or subsiding ground surfaces, said gage comprising a measurement traverse of a conduit along the required route of observation for vertical movement of the works, such conduit being of flexible, pressure tight construction, with the ends of the measurement traverse conduit brought to some convenient, accessible terminal location relative to the works, for connection to readout cabinet, with means in the cabinet of flushing and completely filling the said measurement traverse with a light density fluid, with further means of then introducing a heavy density fluid from the cabinet into one end of the measurement traverse, with further means in the cabinet of regulating the rate and duration of advance of the heavy density fluid into the measurement traverse and the light density fluid out of the measurement traverse, with means of determining the distance of travel of the heavy density/light density fluid interface into the measurement traverse, with further means of continuously maintaining a surface level of heavy density fluid in the cabinet at a constant reference elevation irrespective of the amount of heavy density fluid supplied from the cabinet into the measurement traverse, with means of determining the hydrostatic pressure resulting from the vertical position of the heavy density/light density fluid interface with respect to the constant elevation of the said surface of the heavy density fluid in the cabinet, and thereby discovering the true vertical distance between the said fluid interface and the known elevation of the surface of the heavy density fluid in the cabinet, with further means of automatically recording and calibrating the hydrodynamic pressure variation produced by a continuously moving fluid interface, at a recording time rate proportional to the rate of travel of the fluid interface through the measurement traverse, thereby producing the digital data or actual scaled drawing of the existing elevation profile for the measurement traverse, which may be compared with earlier elevation profiles to discern the vertical movement which has occurred in the appurtenant works, to-date.

4,003,264

DEVICE FOR MEASURING AND REGISTERING OF SOUND

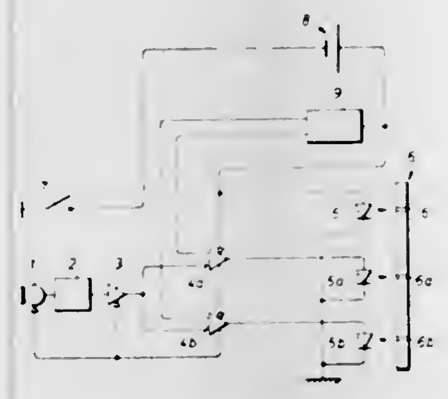
Bengt Erlandsson, Lund; Hakan Hakansson, Staffanstorp; Bengt Salén, Umea; Per Nilsson, Loddekopinge, and Alf Ivarsson, Bjarred, all of Sweden, assignors to Shine Patent AB, Sweden

Filed Oct. 21, 1975, Ser. No. 624,446

Claims priority, application Sweden, Oct. 24, 1974, 7413396

Int. Cl.^{2} G01H *3/12*

U.S. Cl. 73—557 **6 Claims**



1. An audio dosimeter comprising:

a. means for sensing sound and producing an electrical signal having an amplitude which is related to the level of the sensed sound;

b. means including a first comparator for producing a first switching signal as long as the amplitude of said electrical signal exceeds a first predetermined level;

c. means including a second comparator for producing a second switching signal as long as the amplitude of said electrical signal exceeds a second predetermined level which is higher than said first predetermined level;

d. at least two light emitting diodes;

e. means for energizing one said light emitting diodes in response to the presence of said first switching signal so that it produces a light flux of essentially constant intensity regardless of by how much the amplitude of said electrical signal exceeds said first predetermined level;

f. means for energizing the other of said light emitting diodes in response to the presence of said second switching signal so that it produces a light flux of essentially constant intensity regardless of by how much the amplitude of said electrical signal exceeds said second predetermined level; and

g. a single piece of film arranged in light-proof relation to said light emitting diodes for individually and separately recording the light emitted by said light emitting diodes, said film recording light pulses of as short as 0.1 millisecond thereon.

4,003,265

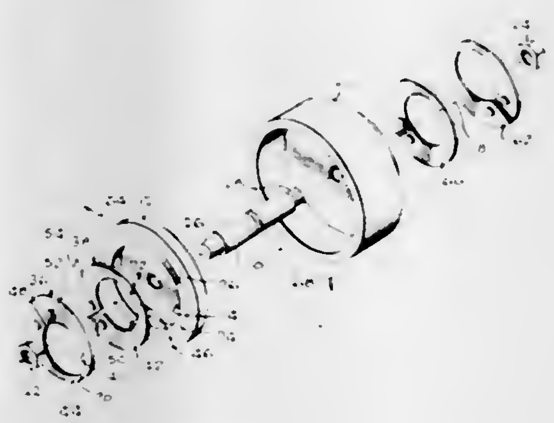
MASS BALANCING SYSTEM FOR ROTATABLE ASSEMBLIES

Robert Jerzy G. Craig, Malibu, and Clifton Temple Council, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed July 9, 1975, Ser. No. 594,460

Int. Cl.^{2} G01C *19/06*

U.S. Cl. 74—5 R **5 Claims**



1. A gyroscope, comprising

a rotor mounted for rotation about axis;

a pot-shaped hysteresis ring support forming part of said rotor;

a stop plate of the rotor accommodated in said hysteresis ring support, said stop plate having a recess defined by radially inwardly oriented surface locations surrounding and facing said axis;

at least two substantially identically shaped balance weights for assembly with said stop plate accommodated within said recess by virtue of frictional engagement of peripheral areas of the balance weights with said radially inwardly oriented surface locations;

each balance weight having an asymmetrical mass distribution with respect to said axis when assembled with said stop plate; and

spring means associated with each balance weight for resiliently urging at least some peripheral areas of each said balance weight outwardly, to thereby removably retain each of the balance weights assembled with said stop plate in any one of a great number of angular orientations rotationally displaced one from the other about said axis.

4,003,266

ACTUATOR FOR PUSHBUTTON TUNER

Shohei Yamagishi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

Filed June 11, 1975, Ser. No. 586,082

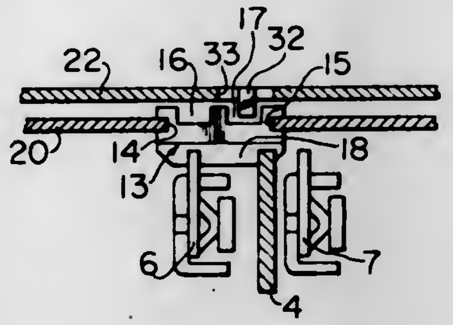
Claims priority, application Japan, Nov. 12, 1974, 49-129570

Int. Cl.^{2} F16H *35/18*

U.S. Cl. 74—10.33 **11 Claims**

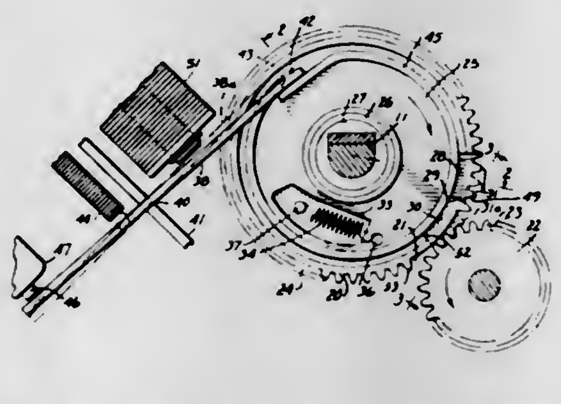
1. An actuator for a pushbutton tuner comprising, a pushbutton slide movable between an inoperative position and an operative position; a pair of parallel tuning slides parallel with said pushbutton slide on opposite sides thereof, an intercon-

necting member disposed extending transversely of said pushbutton slide for selectively, operatively connecting alternatively and alternately the pushbutton slide with either one of the pair of tuning slides for maintaining an operative connection therebetween so that the selected tuning slide can be moved between its inoperative position and its operative position as the pushbutton slide is moved axially; shift means for moving the interconnecting member transversely of the pushbutton slide between a pair of operational positions in order to disconnect the operative connection between the pushbutton slide and a selected tuning slide and to operatively connect the pushbutton slide with the other tuning slide; the shift means including a shift plate movable along a line joining the pair of operational positions of the interconnecting member for actuating the interconnecting member to the operational positions thereof alternately; and guide means on said shift plate for permitting the interconnecting member to be moved together with the pushbutton slide.



4,003,267
CYCLICALLY OPERABLE DRIVE TRANSMISSION

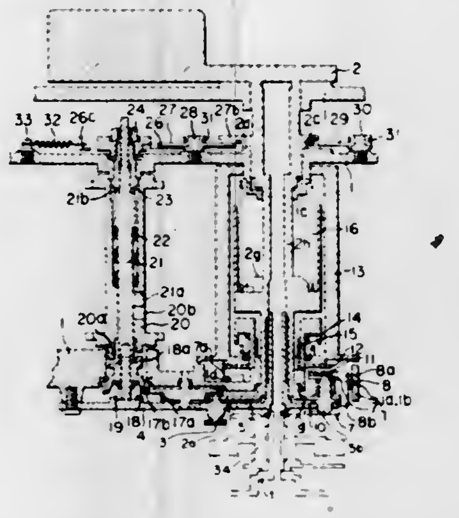
Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.
Filed Feb. 12, 1976, Ser. No. 657,615
Int. Cl.² F16H *27/04, 29/00, 55/04*
U.S. Cl. 74—84 R **7 Claims**



1. A cyclically operable drive transmission comprising
a drive gear,
a first rotatable driven gear,
said first driven gear having a first interrupted gear tooth section,
first maintaining means normally maintaining said first gear in an initial position wherein the interrupted portion of said gear tooth section is opposite said drive gear,
a second driven gear,
said second gear having a second interrupted gear tooth section,
second maintaining means for normally maintaining said second driven gear in an initial position wherein the interrupted portion of said second gear tooth section is opposite said drive gear,
means for urging said first gear relative to said second gear,
means for releasing said first maintaining means whereby to enable said first gear tooth section of said first gear to mesh with said drive gear, and
means operable by said first gear for driving said second gear to mesh said second gear tooth section of said second gear with said drive gear.

4,003,268
FILM WINDING DEVICE FOR PHOTOGRAPHIC CAMERAS

Terushige Shimizu, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Continuation of Ser. No. 480,482, June 18, 1974, abandoned. This application May 23, 1975, Ser. No. 580,522
Int. Cl.² F16H *27/02, 29/02;* **G03B** *1/24, 1/10*
U.S. Cl. 74—126 **11 Claims**



1. A film winding device for photographic cameras, which comprises:
a. a film winding shaft having a gear;
b. a rotary driving member driven by the film winding shaft, and having a gear and an engaging part thereon;
c. a fixed gear to transmit rotational force of said film winding shaft to the rotary driving member; and
d. a sprocket having an engaging member to be engaged with the engaging part of said driving member during winding operation to receive the rotational force of said rotary driving member, the improvement resides in that
the engaging part of said rotary driving member being provided with a rotational angle, until the engaging part becomes engaged with the engaging member of said sprocket, in accordance with the following equations:

$$A = A' \; L \text{ const.} = (S \text{ const.} + \theta + A) \times l/G \text{ const.} \; D = S \text{ const.} + A'$$

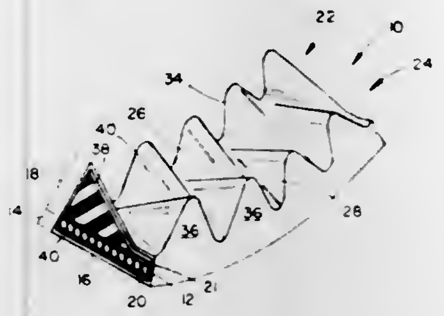
where: L is a definite number of revolution of said film winding shaft; S is a definite number of revolution desired of said sprocket; θ is a reduced number of revolution of said sprocket due to the backlashes among the plurality of gears assembled between said film winding shaft and said driving member; A is a reduced number of revolution of said sprocket due to the distance between the engaging part of said driving member and the engaging part of said sprocket; l/G const. is a gear ratio of said rotary driving member to said film winding shaft; D is a number of revolution of said driving member; and A' is a number of revolution of said rotary driving member, until the driving member becomes engaged with the engaging part of said sprocket.

4,003,269
POWER TRANSMISSION BELT

William M. Haines, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.
Filed Feb. 17, 1976, Ser. No. 658,635
Int. Cl.² F16H *7/00;* **F16G** *5/00, 1/22, 5/10*
U.S. Cl. 74—229 **11 Claims**

1. A power transmission belt having a top, and bottom, and

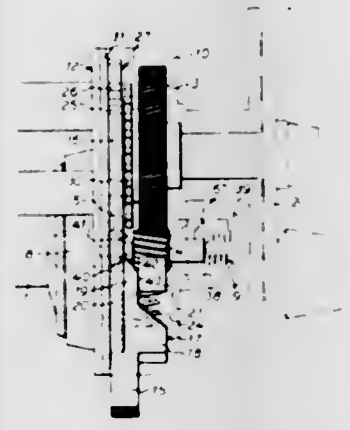
oppositely facing side driving surfaces extending therebetween, said belt comprising:
a tensile member;
a first layer secured to the tensile member and defining the top of the belt;



a second layer secured to the tensile member and defining the bottom of the belt, said second layer comprising two rows of spaced teeth oriented longitudinally in relation to the belt, the teeth of the rows alternately longitudinally spaced from each other, and the teeth having oppositely oriented faces which substantially define the driving surfaces of the belt.

4,003,270
COUPLING MECHANISM WITH MEANS FOR DISENGAGEMENT AND FOR AUTOMATIC ENGAGEMENT OF THE SPOOL IN SPINNING REELS

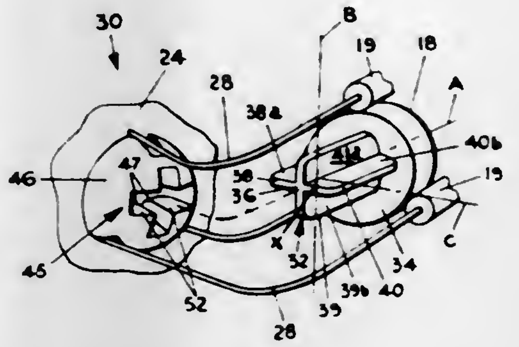
Börje Sigurd Moosberg, Morrum, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden
Filed Oct. 20, 1975, Ser. No. 623,991
Claims priority, application Sweden, Oct. 21, 1974, 7413210
Int. Cl.² F16H *57/00;* **A01K** *89/00*
U.S. Cl. 74—405 **22 Claims**



1. Coupling mechanism in a spinning reel for manual disengagement and automatic engagement of the reel, said mechanism including a coupling member connected to said spool and a unit of assembled parts consisting of a driving coupling member rotatable by means of a crank and a guide means for rotatable and axially shiftable mounting of said driving coupling member which normally enmeshes in driving engagement with the coupling member of said spool and is switchable by means of a manually actuable operating device from this driving engagement by shifting in a direction from said spool against the action of a return spring to a disengagement position in which it is retained by means of a latching device which is releasable by the rotation of said crank for triggering of an automatic re-engagement operation realized by means of said return spring, wherein said spool is, together with its coupling member rotatably journaled in said spinning reel independent of said unit comprising said driving coupling member and said guide means, and wherein said unit is, in the disengagement position of said driving coupling member, supported completely free from contact in relation to the spool and to elements connected to the spool, with said driving coupling member axially directed for shifting to the engagement position.

4,003,271
MIRROR ASSEMBLY

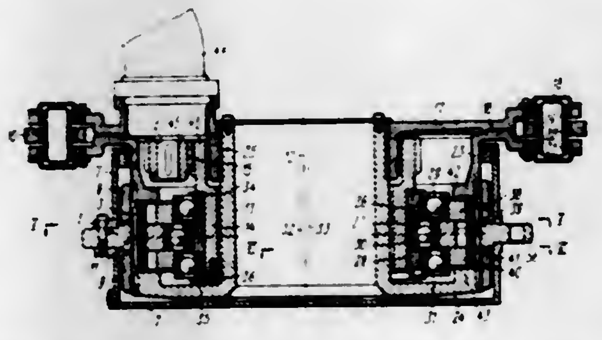
Gerard N. Stelma, Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed Mar. 14, 1975, Ser. No. 558,309
Int. Cl.² F16C *1/12*
U.S. Cl. 74—501 M **23 Claims**



1. In a mirror assembly for vehicles of the type including a base, a mirror unit including a mirror element and a mirror support engaging said base for supporting said mirror element, and means for holding said mirror unit against said base; an improved joint means for pivotally connecting said mirror unit to said base comprising: a curved, concave surface on one of said base and mirror unit; a convex, curved surface mating with said concave surface on the other of said base and mirror unit; socket means in one of said concave and convex surfaces for receiving a projection means; and projection means extending from the other of said concave and convex surfaces for insertion in said socket means; said concave and convex surfaces together supporting and guiding pivotal movement of said mirror unit about a predetermined point and a pair of coplanar, perpendicular axes intersecting at said point; said socket and projections means including adjacent surface means for minimizing rotational movement of said mirror unit about a third, predetermined axis which passes through said point and is generally normal to the plane of said mirror element but allowing pivotal movement of said mirror unit about said point and said pair of coplanar, perpendicular, intersecting axes whereby blurring of images on said mirror element due to vibration is substantially eliminated.

4,003,272
HARMONIC GEAR REDUCTION UNIT

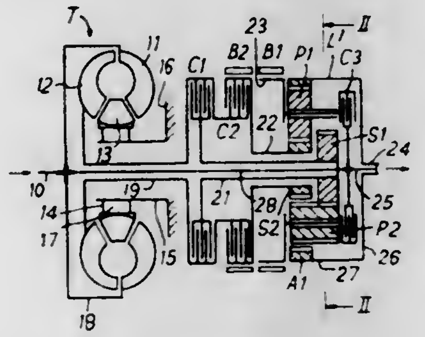
Dmitry Pavlovich Volkov, Kolpachny pereulok, 6, kv. 104; Alexandr Filippovich Krainev, Bratskaya ulitsa 23, korpus 1, kv. 4; Alexandr Alexeevich Stupakov, Rossoshanskaya ulitsa 13, korpus 1, kv. 545, all of Moscow, and Stanislav Vasilievich Bondarenko, ulitsa Schelkovskaya, 12, kv. 80, Moskovskaya oblast, Mytischi, all of U.S.S.R.
Filed Jan. 31, 1975, Ser. No. 545,931
Int. Cl.² F16H *37/00, 1/28*
U.S. Cl. 74—640 **3 Claims**



1. A gear reduction unit comprising: input and output mem-

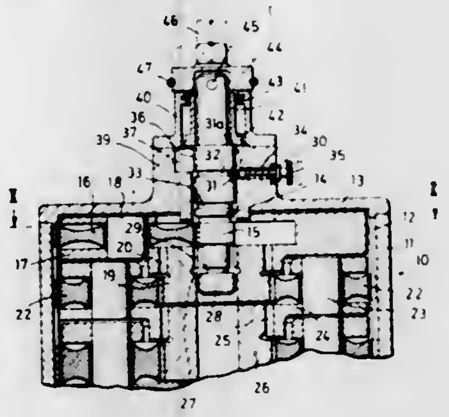
bers; a rigid member in the form of a gear wheel; a flexible member in the form of a thin-walled tube provided with a gear rim; a wave generator connected to said input member of the gear reduction unit; a first coupling connecting one end of said flexible member to said output member of the gear reduction unit; a second coupling arranged symmetrically with respect to said first coupling about the axis of engagement between the teeth of said flexible and rigid members of the gear reduction unit and serving to connect the other end of said flexible member of the gear reduction unit to the output member of the gear reduction unit; a positive connection adapted to connect said other end of the flexible member through said second coupling to said output member of the gear reduction unit; elements arranged in the gear reduction unit in close proximity to said flexible member also symmetrically about the axis of engagement between the teeth of said flexible and rigid members and adapted to impart radially directed deformations from said wave generator to said flexible member so as to ensure engagement of the teeth of said rigid member with those of the flexible member, two flanges pivotally connected to each other and to the output member of the gear reduction unit being arranged coaxially to the flexible member in close proximity ot each other, one of said fanges being connected to the coupling at one end of the flexible member while the other of the flanges is connected to the coupling at other end thereof thereby ensuring uniform distribution of the torque transmitted from the flexible member to the output member between both ends of the flexible member.

4,003,273
MULTI-RATIO TRANSMISSION SYSTEMS
Albert Arthur Miller, Esher, England, assignor to Wilson-Miller & Co. Ltd., Hampton Court, England
Filed Mar. 27, 1975, Ser. No. 562,500
Claims priority, application United Kingdom, Mar. 30, 1974, 14223/74
Int. Cl.² F16H *57/10*
U.S. Cl. 74—767 **8 Claims**



1. A variable speed-ratio power transmission comprising a hydrokinetic torque transmitter whose input member is adapted to be driven by a primer-mover and a planetary gear set disposed coaxially in relation to the torque transmitter and on that side of the latter which is nearer the final output member of the transmission, the said gear set having larger sun pinion and a smaller sun pinion, a planet carrier mounted on bearings coaxially with the said sun pinions and with the torque transmitter and provided with selectively operable braking means, a ring-gear secured to an output member of the transmission for rotation therewith coaxially with the planet carrier and having internal teeth disposed in the same transverse plane as that of the smaller sun pinion, a set of short planet pinions and a set of long planet pinions mounted on bearings in the planet carrier, the short planet pinions each meshing with the smaller sun pinion and with the ring-gear, the long planet pinions each meshing with the larger sun pinion and with one or more of the short planet pinions but not engaging either the ring-gear or the smaller sun pinion, characterised in that the smaller sun pinion is disposed on that side of the larger sun pinion which is nearer to the torque transmitter and is provided with selectively operable braking means whereby it may be arrested to provide the reaction for an overdrive ratio and each sun pinion is provided with independent clutching means whereby either or both sun pinions may be drivably connected to the turbine or output member of the torque-transmitter, and in that the transmission includes further independent clutching means whereby a driving connection may be established between the input member of the torque transmitter and the planet carrier through the medium of a central drive shaft which passes freely through the torque transmitter and through the two sun pinions.

4,003,274
SUN AND PLANET GEAR TRANSMISSION MECHANISM PARTICULARLY FOR POWER WRENCHES
Karl-Richard Hirtsiefer, 5206 Neunkirchen-Kobach, Germany
Filed Apr. 24, 1974, Ser. No. 463,485
Claims priority, application Germany, Apr. 25, 1973, 2320757
Int. Cl.² F16H *57/10*
U.S. Cl. 74—768 **13 Claims**



1. A sun and planet gear transmission mechanism particularly for power wrenches comprising:

a. a power input shaft and at least two successive gear steps including a first gear step and a second gear step disposed within a gear casing,
b. each said first and second gear steps including a sun gear and at least one planet gear,
c. the sun gear of the first gear step being connected to the power input shaft and the sun gear of the second gear steps being in a fixed location within said gear casing,
d. said power input shaft being axially displaceable and said sun gear of the first gear step is disengagable with respect to the appertaining planet gear in said first gear step, and
e. coupling means located at said second gear step is effective to engage the sun gear of said second gear step when said sun gear of the first gear step is disengaged from said planet gear in the first gear step.

4,003,275
WRENCH
Rodney W. Smith, 83353 Spruce Lane, Florence, Oreg. 97439
Filed Feb. 25, 1976, Ser. No. 661,034
Int. Cl.² B25B *17/00*
U.S. Cl. 81—57.29 **1 Claim**

1. A wrench comprising an elongate tubular handle, a housing rigidly secured to one end of said handle, a shaft extending through said handle and having a knob thereon at the end thereof opposite the housing, a bevel gear rigidly secured to the end of said shaft opposite said knob with said bevel gear lying within said housing, a shaft mounted in said housing and extending transversely thereof with its axis perpendicular to the axis of the shaft in said housing, a worm gear journalled on said last named shaft and having a bevel gear secured thereto and in mesh with the bevel gear on said first named shaft, a drive member journalled at one end in said housing on an axis generally perpendicular to said handle and slightly offset from the axis of said handle, said drive member including a spur

gear meshing with said worm gear so as to rotate said drive member on rotation of said worm gear, said drive member including a post mounted centrally thereof to receive a drive socket, said spur gear spaced radially outwardly of said post

and encompassing said post, and means on said post for releasably retaining said socket thereon, said drive member having a central bore extending therethrough and through said post to permit a bolt shaft to extend therethrough when of excessive length

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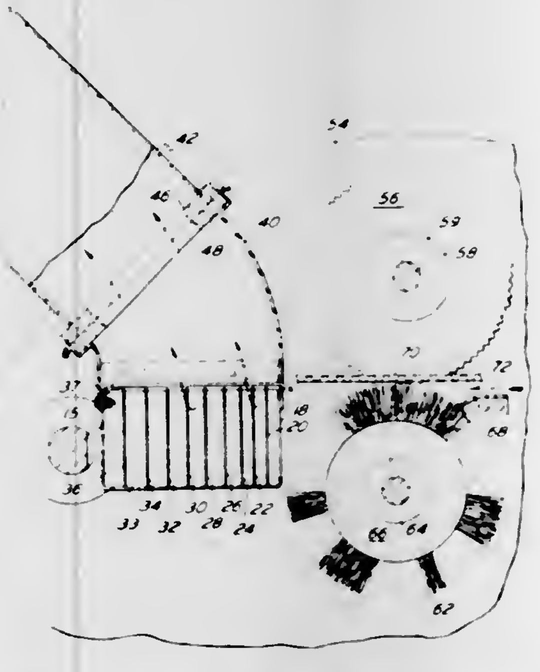
4,003,276
SLITTER AND DUST COLLECTOR THEREFOR
Robert L. Schmitt, Magnolia, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.
Continuation of Ser. No. 510,208, Sept. 30, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 674,017
Int. Cl.² B26D *7/06*
U.S. Cl. 83—100 **11 Claims**



1. A slitter for slitting a web comprising a frame, a shaft rotatably supported by the frame, a plurality of slitting blades connected to the shaft for rotation therewith and being selectively adjustable to various positions along said shaft, motor means for rotatably driving said shaft, a bristle-face anvil roll generally parallel to and directly below said shaft, the bristles of said anvil roll having an interference fit with each of said blades thereabove, a dust collector supported by said frame downstream from said shaft and being generally parallel to said shaft, said dust collector including a housing having top and bottom walls interconnected with a front wall and a rear wall, said front wall having an elongated dust opening below the elevation of and facing the interface between said blades and anvil roll, a plurality of partitions in said housing, said partitions having a straight portion generally parallel to the plane of said opening, said housing having a manifold chamber adjacent one end, the space between said partitions communicating said manifold chamber with said opening in a manner so that the space between adjacent partitions communicates said manifold chamber with only a portion of said opening, and means supporting said dust collector housing from said frame independent of the support of said anvil roll by said frame

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4,003,277
APPARATUS FOR MANIPULATING FILTER ROD SECTIONS OR THE LIKE
Erwin Oesterling, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany
Filed Oct. 9, 1973, Ser. No. 404,604
Claims priority, application Germany, Oct. 13, 1972, 2250267
Int. Cl.² B26D *7/06*, **B65G** *47/26*
U.S. Cl. 83—102 **16 Claims**

1. In an apparatus for manipulating filter rod sections or analogous rod-shaped articles, a combination comprising a first conveyor having a plurality of first receiving means each arranged to transport sideways a group of *n* coaxial articles along a first substantially circular path having a portion extending along a transfer station, said conveyor having a first pitch circle; a second conveyor having *n* annuli of second receiving means each arranged to receive and to transport sideways a single article along a second substantially circular path having a portion extending along said transfer station, said second conveyor having a second pitch circle and the distance between the centers of said pitch circles exceeding the combined length of te radii of said first and second pitch circles, the second receiving means of said annuli being staggered with respect to each other, as considered in the circumferential direction of said second conveyor; means for moving said first conveyor in a first direction; means for moving all of said annuli at the same speed in a second direction counter to said first direction so that the angular positions of said second receiving means with respect to each other remain unchanged; guide means defining at said transfer station a channel extending between said portions of said first and second paths; means for directing groups of articles from successive first receiving means in said portion of said first path into said channel wherein the articles of a group move sideways in a direction from said portion of said first path toward said portion of said

second path; and means for transferring each article of a group in said channel into a second receiving means of a different annulus at timely spaced intervals so that each article of a group in said channel is located in a different portion of said channel when engaged by said transferring means.

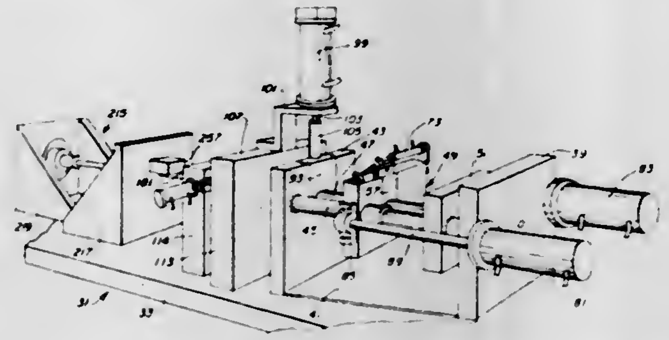
4,003,278
TUBE CUTTING APPARATUS

John Tipton Shields, Jackson, Miss., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Mar. 14, 1975, Ser. No. 558,484

Int. Cl.² B23D *21/14*

U.S. Cl. 83—186 **34 Claims**



1. Apparatus for cutting a tube into desired lengths of tubing comprising:

- cutting dies mounted adjacent the outside of the tube;
- die actuating means to produce relative motion between said dies with respect to the radial and circumferential dimensions of the tube;
- puches located inside of the tube generally opposite said cutting dies;
- restraining means forcibly movable in the tube; and
- punch positioning means insertable through the end of the tube from which the length of tubing is to be cut to force and retain said punches against said restraining means during cutting of the tube, said restraining means having sufficient resistance to movement to maintain said punches between said restraining means and said punch positioning means and in the proper axial positions with respect to said cutting dies during cutting of the tube.

4,003,279
SHEARING TUBE STOCK

Richard Quentin Carmichael, Duxford; Roger George Bonelle, Walsall, and John Edward Hartley, Royston, all of England, assignors to T. I. (Group Services) Limited, Birmingham, England

Filed Apr. 8, 1975, Ser. No. 566,069

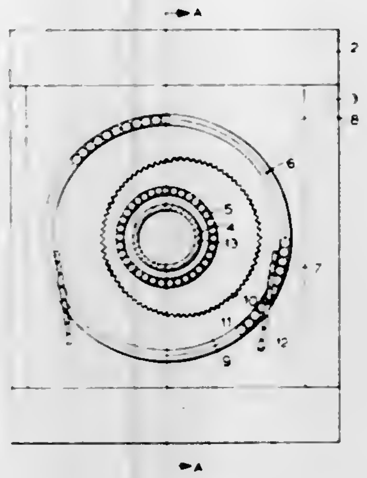
Claims priority, application United Kingdom, Apr. 9, 1974, 15603/74

Int. Cl.² B26D *1/00*

U.S. Cl. 83—199 **5 Claims**

1. The method of shearing elongated stock by use of respective fixed and moveable apertured dies, the apertures of said dies corresponding in size to the stock, said moveable die being rotatably carried on an adjustable eccentric rotatably mounted on a non-rotatable linearly and laterally moveable slide block comprising the steps of presetting with a fixed eccentricity the eccentric on said slide block so that the axis of said moveable die is displaced a preset fixed distance from the axis of said eccentric, aligning the aperture in said moveable die with the aperture in said fixed die by moving said slide block laterally and linearly to a first position at which the axes of the apertures of said dies are coincident, inserting said stock through the aligned apertures of said dies, partially shearing said stock by moving said slide block laterally and linearly to a second position wherein the axis of said moveable die is laterally displaced relative to the axis of said fixed die, and thereafter rotating said eccentric to cause said moveable die to follow an orbital path relative to said fixed die and propagate said shearing around said stock.

4. Apparatus for shearing elongated stock comprising a first fixed apertured die and a second moveable apertured die, the apertures in said dies corresponding in size to stock to be sheared, means for displacing said moveable die laterally and linearly relative to said fixed die comprising a laterally and linearly moveable slide block, an eccentric rotatably mounted on said slide block, said moveable die being rotatably mounted on said eccentric with its axis parallel to the axis of said eccentric, means for adjustably displacing the axis of said moveable die a preset fixed distance laterally of the axis of said eccentric, said slide block being linearly and laterally moveable in a direction normal to all of said axes between a first position in which the axes of said fixed and moveable dies are coincident and a second position in which said axes are relatively laterally displaced, and means for rotating said eccentric on said slide block after said slide block has been moved to its second position to cause said moveable die to follow an orbital path relative to said fixed die.



4,003,280
DRIVE DEVICE FOR WEB CROSSCUTTING APPARATUS

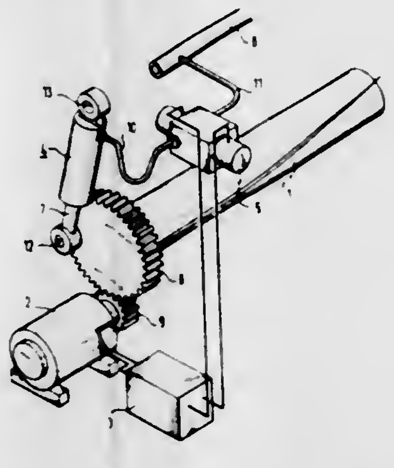
Walter Stuebinger, Nurenberg, Germany, assignor to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft, Munich, Germany

Filed Sept. 19, 1975, Ser. No. 614,846

Claims priority, application Germany, Sept. 30, 1974, 2446723

Int. Cl.² B26D *25/04, 1/56*

U.S. Cl. 83—324 **5 Claims**



1. An apparatus for driving a device to crosscut a continuously moving sheet of material, particularly corrugated cardboard, comprising:

- a drive motor connected with a rotary cutting roller;
- a control device operable on said motor during a revolution of the roller to effect a selectable sectional length of the material and a synchronous cutting speed between the roller and the material; and
- an air cylinder coupled to said roller and said motor and having an enclosed air volume to take up retardation energy by compression of the air volume and yield it by decompression of the air volume, thereby relieving the drive motor.

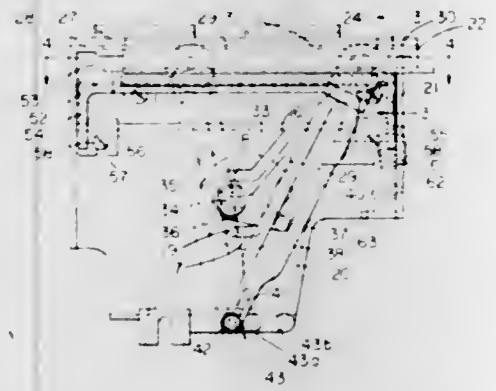
4,003,281
RECORD MATERIAL CUTTING MECHANISM

Sherman S. Kumpf, Dryden, and Robert W. Flood, Interlaken, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed June 10, 1975, Ser. No. 585,726

Int. Cl.² B26D *1/16, 1/20*

U.S. Cl. 83—477.2 **19 Claims**



1. In a data terminal device constructed and arranged to perform recording operations on a record member, a mechanism for severing a record member including:

- a. a slotted supporting surface for supporting a record member in a cutting position;
- b. a ledge support member extending along said supporting surface, said ledge support member having an upstanding guide surface;
- c. a cutting surface extending along said slotted supporting surface and in a direction parallel to said guide surface;
- d. an arm assembly engaging said ledge support member and operable for movement along said ledge support member;
- e. a support member mounted on said arm assembly for movement into engagement with said guide surface and positioned on said ledge support member for supporting said arm assembly for movement along said ledge support member;
- f. a cutting member mounted on said arm assembly for movement into engagement with said cutting surface and positioned within the slot, said cutting member cutting the strip of material when moved along said cutting surface;
- g. resilient means engaging said support member and said cutting member for moving said support member into engagement with said guide surface to guide the arm assembly along said ledge support member and for moving the cutting member into engagement with said cutting surface;
- h. and means for operating said arm assembly during a cutting operation whereby said arm assembly will be guided along the ledge support member to move the cutting wheel along said cutting surface to cut the strip of material.

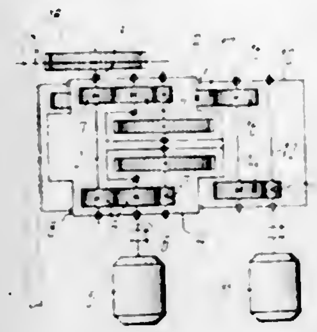
4,003,282
MACHINE FOR THE HOT SHEARING OF ROLLED PRODUCTS

Jury Stepanovich Komissarchuk, B. Cherkizovskaya ulitsa, 3, korpus 4, kv. 88; Nikolai Ivanovich Krylov, 1 Kuzminskaya ulitsa, 25, kv. 26; Boris Vasilievich Popov, Zelenodolskaya ulitsa, 24, kv. 110, and Viktor Davydovich Lurie, 2 Kabelnaya ulitsa, 10, kv. 19, all of Moscow, U.S.S.R.

Filed Jan. 30, 1975, Ser. No. 545,424

Int. Cl.² B23D *19/00;* **B26D** *1/18*

U.S. Cl. 83—490 **10 Claims**



1. A machine for hot shearing rolled products comprising a carrier shaft in the nature of a hollow housing adapted to be mounted for rotation about a carrier axis; a disk shaft mounted on said carrier for rotation about a disk shaft axis, at least a portion of said disk shaft extending beyond said carrier; a serrated disk having a diameter and mounted on said disk shaft portion and adapted to rotate with rotation of the same; means at least partially enclosed in said carrier shaft for imparting rotary motion to said disk shaft and serrated disk; first bearings mounted on said carrier for rotatably supporting said disk shaft; a reducer having a housing, said carrier being mounted for rotation on said reducer housing; means for imparting rotary motion to said carrier through said reducer, said disk shaft being eccentrically spaced from said carrier axis to move said serrated disk along a circular path; a second bearing means having a diameter and mounted on said housing for rotatably supporting said carrier, the distance between said carrier and disk shaft axes being smaller than at least one of said disk and second bearing means diameters, whereby relatively high forces can be applied by said serrated disk to a product to be cut with a relatively small and compact machine.

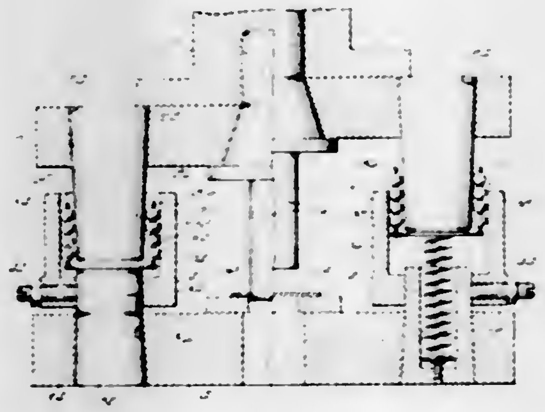
4,003,283
DIE SET WITH TWO-PART LEADER PINS AND BALL BEARING GUIDE

Kasimir Janiszewski, 11908 W. Loomis Road, Franklin, Wis. 53132

Filed July 28, 1975, Ser. No. 599,756

Int. Cl.² B26D *7/00;* **F16C** *19/00*

U.S. Cl. 83—637 **5 Claims**

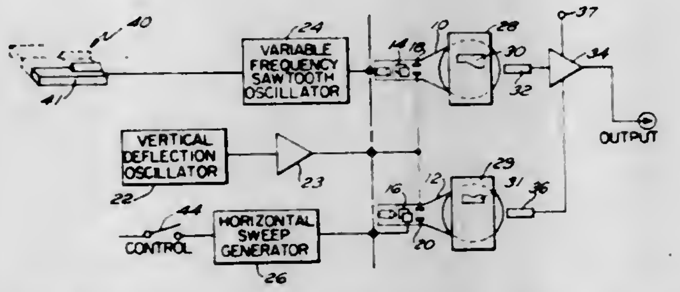


1. In a die set including a punch holder and a die shoe, the improvement comprising an assembly of an upper leader pin portion mounted on said punch holder and having a tapered

surface decreasing in diameter remote from said punch holder, a lower leader pin portion connected to said die shoe, a sleeve arranged around said lower leader pin and having a bore located in the path of travel of said upper leader pin, a ball bearing cage located in said bore and having a throat adapted to receive said upper leader pin tapered portion and guide said punch holder during reciprocal movement of said punch holder toward and away from said die shoe and means for supporting said ball bearing cage in said sleeve, said tapered surface, said sleeve bore and said ball bearing cage being sized to afford a tight shearing fit with the bearing balls pressing into the sleeve with no tolerance to minimize deflection of the punch holder.

4,003,284
ELECTRONIC MUSICAL INSTRUMENT

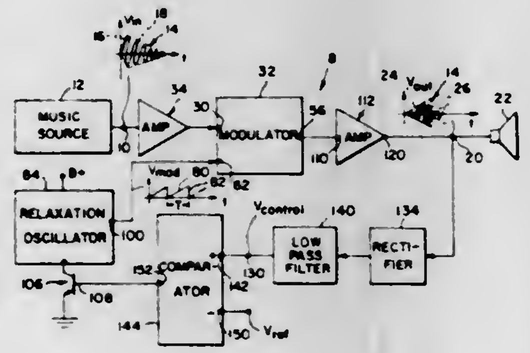
David W. Marsh, II, 105 Sheldon St., Providence, R.I. 02906
Filed Apr. 10, 1975, Ser. No. 566,693
Int. Cl.^{2} G10H *3/06*
U.S. Cl. 84—1.18 **8 Claims**


40
41
24
VARIABLE FREQUENCY SAWTOOTH OSCILLATOR
14
18
10
28
30
32
37
34
OUTPUT
VERTICAL DEFLECTION OSCILLATOR
22
23
44
CONTROL
HORIZONTAL SWEEP GENERATOR
26
16
12
20
29
31
36

1. An apparatus for producing audible tones comprising a pair of electron beam guns having vertical and horizontal deflecting means, the output of the guns energizing a luminous screen means in the deflection path of each gun, a mask having thereon means for graphically depicting an image of a waveform representing a tone, located on the face of said luminous screen means, a mask being in the deflection path of each gun, means associated with each of the guns to vertically scan the luminous screen means, separate means associated with each gun to horizontally scan the face of the luminous screen means, light sensitive devices one each focused on the image generated by each of said masks, each light sensitive device converting the optical image representing a tone into an electrical wave, one light sensitive device having a constant output signal representing a tone, said one device modifying the output of the other devices to produce a particular timbre by varying amplitude of the other tones.

4,003,285
MUSIC SIGNAL CONVERSION APPARATUS

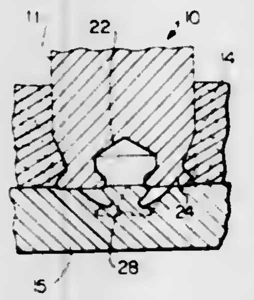
Louis A. Schwartz, 266 E. 211th St., Apt. 26, Bronx, N.Y. 10467
Filed Nov. 10, 1975, Ser. No. 630,744
Int. Cl.^{2} G10H *1/04*
U.S. Cl. 84—1.24 **1 Claim**



1. Apparatus for converting an input music signal composed of sequential note signal envelopes having a relatively rapid rise time and a relatively slow fall time to an output music signal whose sequential note signal envelopes have a relatively slow rise time and a relatively rapid fall time, said apparatus comprising: an input port adapted to be coupled to a source for said input music signal; a relaxation oscillator means for producing an output signal composed of periodic signal elements of generally sawtooth shape in response to the application of electrical power to said oscillator means; each said signal element having an amplitude which increases with time; modulator means having a first input terminal coupled to said input port and having a second input terminal fed by said oscillator means; said modulator means having an output terminal coupled to said output port; electrically actuatable switch means positioned for selectively applying electrical power to said oscillator means; rectifying and low pass filtering means fed from said output port and having an output control signal indicative of the average value of output signal power at said output port; means for comparing said control signal with a predetermined reference signal; said comparing means being coupled to said switch means and being configured for actuating said switch means when said control signal exceeds said predetermined reference signal.

4,003,286
CLINCH TYPE FASTENER

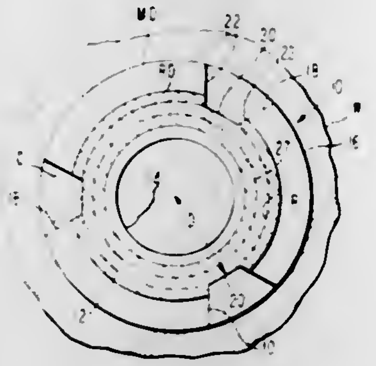
Robert L. Hallock, 7136 NE. 8th Drive, Boca Raton, Fla. 33432
Filed Oct. 23, 1975, Ser. No. 625,349
Int. Cl.^{2} F16B *15/00*
U.S. Cl. 85—31 **2 Claims**



1. In a clinch type fastener for attaching insulating material to thin sheet metal in which the fastener includes a generally cylindrical shank having a driving portion at one end and a penetrating portion at the opposite end, said penetrating portion having a generally frusto-conical exterior wall tapering inwardly toward the axis of said shank and terminating in a relatively blunt end, said penetrating portion having a cavity extending axially inwardly from said blunt end and defining a cavity wall, said penetrating portion having a pair of diametrically opposed slots extending inwardly from said blunt end generally parallel with the axis of said shank, said slots extending from said frusto-conical exterior wall to the cavity wall, the improvement comprising an enlargement located at the base of each slot, each enlargement having at least one portion extending outwardly of said frusto-conical exterior wall and defining stop means to limit penetration of said fastener into said sheet metal, said enlargements being spaced from said blunt end a distance substantially less than the thickness of the sheet metal, the side walls of the cavity adjacent to said slots tapering downwardly and inwardly toward the axis of said shank at an angle of substantially 5°, the side walls of the cavity remote from said slots tapering downwardly and outwardly from the axis of said shank at an angle of substantially 6°, said inwardly and outwardly tapered walls defining a pair of opposed U-shaped members at said blunt end and defining a generally elliptical configuration, and a shallow groove extending inwardly from the blunt end in a location remote from said slots, whereby a driving force applied axially of said shank causes the blunt end of said penetrating portion to penetrate partially through the sheet metal, extrude a pair of bulbous masses into said cavity and cause the inwardly inclined walls of said cavity adjacent to said slots to collapse inwardly about the bulbous masses and firmly attach the fastener to the sheet metal without penetrating entirely therethrough.

4,003,287
INSERT OF THE SELF-TAPPING FLUTED TYPE

Theodore Ziaylek, Jr., Yardley, Pa., assignor to Yardley Products Corporation, Yardley, Pa.
Filed July 8, 1975, Ser. No. 594,160
Int. Cl.^{2} F16B *25/00*
U.S. Cl. 85—47 **6 Claims**



1. A fastener element or insert of the self-tapping type intended for engagement in a recess of a plastic article and having means for mating with a complementary fastener element, comprising: a cylindrical body formed with external threads and with a series of flutes angularly spaced about the circumference of the body, said body having tapered end portions and said flutes merging into said end portions short of the extremities of the body, the relationship of said flutes and threads in the sense of the dimensions thereof being selected such that upon threading of the full length of the insert into a recess the radius of which is less than the radial distance measured between the axis of the body and the point of greatest depth of a flute, chips removed by the insert threads will be trapped and compacted in the flutes to a density substantially duplicative of the density of undisturbed material contiguous to the compacted chips thereby to lock the insert in the recess.

4,003,288
TUBULAR RIVET

Harvey Philip Jeal, Stevenage, England, assignor to Aerpat A.G., Zug, Switzerland
Continuation of Ser. No. 439,030, Feb. 4, 1974, abandoned, which is a division of Ser. No. 260,832, June 8, 1972, abandoned, which is a division of Ser. No. 53,937, July 10, 1970, abandoned. This application Aug. 25, 1975, Ser. No. 607,444
Claims priority, application United Kingdom, July 28, 1969, 37689/69
Int. Cl.^{2} F16B *19/10*
U.S. Cl. 85—77 **10 Claims**

5. A blind rivet for joining two side-by-side metallic sheets having aligned holes of substantially the same diameter therein, comprising an elongated shank, a radially enlarged head at one end of the shank and a bore extending throughout the length of the rivet,

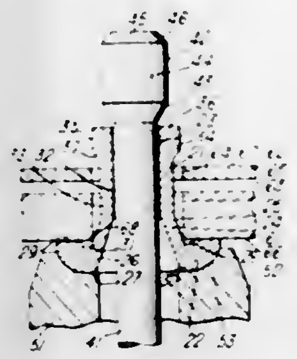
the shank having a tapering portion adjacent the head which tapers outwardly towards the head, a tail portion at the end remote from said head, and a cylindrical intermediate portion between said tail portion and said tapering portion,

the bore in said tail portion and said cylindrical intermediate portion of said shank being of substantially uniform diameter,

the external diameter of the wall of said cylindrical intermediate portion being substantially constant and the external diameter of said tail portion being greater than that of said cylindrical intermediate portion,

the taper of said tapering portion of said shank being both external and internal and such that the wall thickness of said tapering portion is substantially the same as the wall thickness of the cylindrical intermediate portion of said shank, with said bore in said tapering portion progressively increasing in diameter from said cylindrical intermediate portion through said tapering portion and said radially enlarged head, and

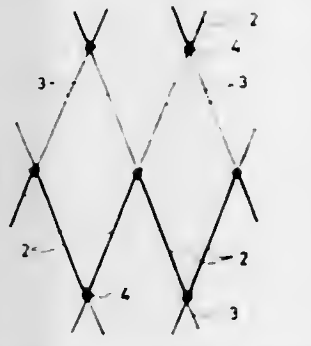
said radially enlarged head of said rivet having an annular recess formed on the side thereof facing toward said shank at the junction thereof with said externally tapered portion of said shank,



whereby blind placing of the rivet through a pair of said metallic sheets having aligned holes which have a greater diameter than the external diameter of said cylindrical intermediate portion of said rivet shank may be accomplished by pulling a mandrel head completely through the bore of the rivet in the direction toward its head thereby to contract the rivet axially and to expand radially at least said shank part of the rivet, the material from the cylindrical intermediate portion of said rivet shank being expanded radially against the walls of said holes in said metallic sheets and pushed along by the mandrel head in its passage through the rivet bore to reduce the size of the tapered bore in the head of the rivet and the material from the tapering portion of said rivet head being expanded into said annular recess to increase the thickness of said tapering portion and thus its strength.

4,003,289
GILL NET

Shigeru Yamashita, Okayama, Japan, assignor to Morishita Fishing Net Manufacturing Co., Ltd., Okayama, Japan
Filed Sept. 30, 1975, Ser. No. 618,145
Claims priority, application Japan, Oct. 4, 1974, 49-120566
Int. Cl.^{2} A01K *69/02*; D04G *1/00*
U.S. Cl. 87—12 **1 Claim**



1. A gill net comprising monofilament zigzag wefts alternating with monofilament zigzag warps, the vertices of the zigzags of said warps forming knots with the adjacent vertices of the zigzags of said wefts, said knots being double English knots and the monofilament of said wefts being of substantially smaller diameter than the monofilaments of said warps.

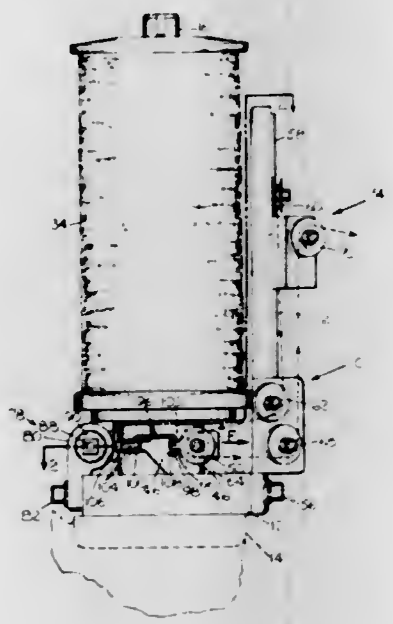
4,003,290
STRAND CARRIER FOR A STRAND FABRICATING MACHINE

Rudolf Herbert Haehnel, and Barry Lee Graeff, both of Reading, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 23, 1976, Ser. No. 679,763

Int. Cl.² D04C *3/14*; F16D *11/06*

U.S. Cl. 87—57 **7 Claims**



1. A strand carrier for a strand fabricating machine comprising:
- a support structure mounted on said machine;
- a shaft mounted on said support structure;
- a hub mounted on said support structure for rotation around said shaft and including means thereon for receiving a bobbin of strand on said shaft in a fixed relationship with said hub for common rotation about said shaft;
- a helical clutch spring having a first end fixedly secured at said support structure, an intermediate portion which is biased to closely encircle an outer cylindrical surface of said hub to restrict rotation of said hub by generation of friction therebetween and a second end which is disposed outwardly of said hub;
- a clutch release sleeve rotatably mounted on said support structure around said clutch spring and said hub, said sleeve being capable of rotation in a first direction to cause a surface portion thereof adjacent said clutch spring to contact and angularly displace said second end of said clutch spring which displacement tends to unwind said clutch spring to reduce said friction on said hub;
- a control lever pivotally mounted on said support structure and having a first section and a second section thereon remote from an axis of rotation of said lever, said first section being adjacent said sleeve and having a strand guide thereon;
- means for connecting said first section of said lever to said sleeve;
- means for biasing said second section of said lever in a direction to cause said first section to rotate said sleeve in an opposite direction from said first direction; and
- means for guiding said strand from said bobbin, to and around said strand guide of said first section, and to work area of said machine, said means for guiding being located with respect to said strand guide to cause said strand to apply a resulting force on said control lever in opposition to said means for biasing.

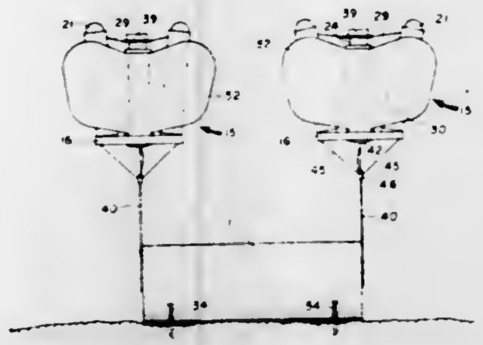
4,003,291
MISSILE LAUNCHING MINE

Oscar R. Vass, Adelphi, Md.; Leslie C. Taylor, Washington, D.C., and Charles A. Lewis, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1964, Ser. No. 369,034

Int. Cl.² F41F *3/10*

U.S. Cl. 89—1.810 **8 Claims**



2. An underwater multiple missile launcher comprising
- a platform,
- a plurality of missile launching tubes disposed at acute angles to a normal to the surface of said platform whereby missiles launched from said tubes will be launched along divergent paths which define a predetermined pattern, said tubes mounted for limited pivotal movement on said platform for compact storage in parallel positions and for movement to the acute angle positions upon deployment of the launcher,
- an initially collapsed inflatable bag secured to said platform between said tubes for pivoting said tubes to their acute angle positions upon inflation thereof and for rendering said platform buoyant,
- a mooring cable attached to said platform, and
- anchor means connected to said mooring cable for holding said platform adjacent the sea bottom.

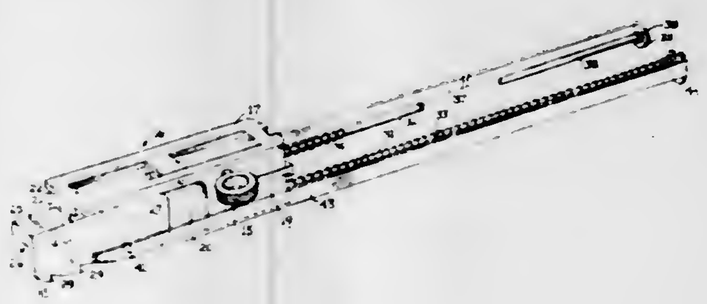
4,003,292
RIFLE

Nicolaos C. Christakos, 2832 N. Austin Ave., Chicago, Ill. 60634

Filed Sept. 12, 1975, Ser. No. 612,868

Int. Cl.² F41C *5/00*

U.S. Cl. 89—145 **5 Claims**



1. A self-cocking rifle having a hollow breech housing comprising a firing chamber having open communication with an elongated barrel, wherein the improvement comprises
- a. a breech block reciprocally movable through the breech housing,
- b. a firing pin and cocking piece carried by said breech block simultaneously and independently reciprocally movable therewith through the breech housing,
- c. independent coil springs for independently moving said breech block and said firing pin and cocking piece in one direction through the breech housing,
- d. means extending into the breech housing and connected to said breech block and to said firing pin and cocking piece, cooperating with said independent coil springs for moving said breech block and said firing pin and cocking piece independently in one direction through the breech housing,
- e. a sear engaging said firing pin and cocking piece when the latter is moved with said breech block in an opposite direction through said breech housing for cocking the same against the action of its coil spring,
- f. a trigger assembly for said rifle adapted to be pivoted about an axis transversely to the direction of movement of said breech block and said firing pin and cocking piece, and
- g. means carried by said trigger assembly for disengaging said sear from said firing pin and cocking piece whereby the latter is moved by its coil spring independently of said breech block in one direction through the breech housing into firing position.

4,003,293
ANTI-RECOIL DEVICE FOR AUTOMATIC WEAPONS

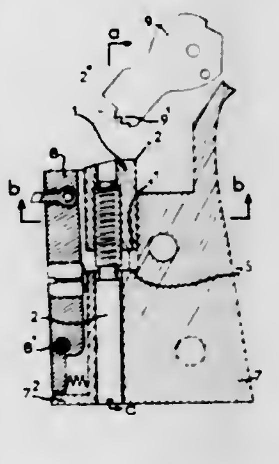
Jose-Maria Uria, 13, rue de Santiaga, and Antoine-Georges Uria, 15, rue de Theatre, both of 64700 Hendaye, Pyrenees Atlantiques, France

Filed Aug. 7, 1974, Ser. No. 496,016

Claims priority, application France, Aug. 10, 1973, 73.29938

Int. Cl.² F41C *27/00*

U.S. Cl. 89—198 **2 Claims**



1. An automatic weapon with a blowback breech block anti-kick buffer device, said weapon comprising a casing, a movable breech block displaceable on said casing, and means for the stoppage of the movable breech block at the end of its rearward strokes, said means including a restoring spring and a movable part whose mass becomes added to that of the breech block and to the force of the restoring spring in order to check the movement of the breech and produce progressive stoppage thereof, said movable part comprising a slideblock slidably constrained in lateral grooves provided in the casing, a threaded rod threaded into the slideblock to guide the same, the threaded rod being freely movable in a seat included in the casing, the slideblock including buffer pistons and springs which effect continuous contact of the pistons with the slideblock and casing and take part in the progressive stoppage, an abutment on said casing, the slideblock being provided with faces coming to rest against the abutment of the casing to limit the movement of the slideblock, a hammer tiltable on the casing, said rod being threadably advancable so that it protrudes from said slideblock and rests on the hammer which tilts horizontally on recoil of the breech block, thus preventing percussion when the weapon is required only to simulate firing for practice.

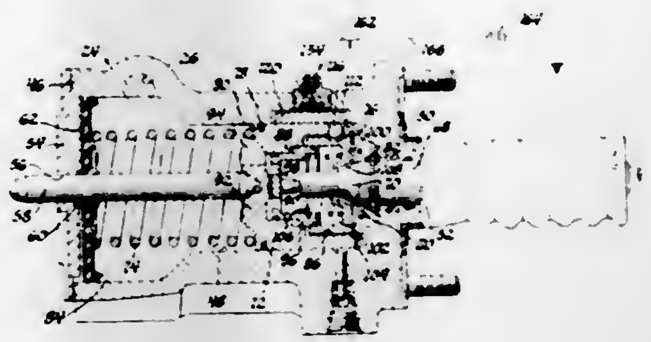
4,003,294
HYDRAULIC POWER MECHANISM WITH CONTROL DEVICE ACTUATOR

Donald L. Parker, Middletown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1976, Ser. No. 681,771

Int. Cl.² F15B *13/02*

U.S. Cl. 91—49 **2 Claims**



1. In a hydraulic power mechanism having a housing, a power cylinder formed in said housing; a power piston reciprocably received in said housing and dividing said power cylinder into a power pressure chamber and an exhaust chamber and having passage means therein connecting said chambers; an open center control valve assembly in said passage means for controlling fluid passage therethrough from said power pressure chamber to said exhaust chamber and including a movable valve, an annular valve seat reciprocably received in a second cylinder defining a portion of said passage means, a reaction member reciprocably received in a third cylinder defining another portion of said passage means and also reciprocably received in a fourth cylinder formed in a part of said annular valve seat, spring means continually urging said reaction piston toward said exhaust chamber and said valve seat toward said power chamber and in valving relation with said valve; and a stop on said power piston normally engaged by said valve seat under influence of said spring means; the improvement comprising:
- an actuating bar mounted in a recess formed in the wall of said housing power cylinder radially outward of said power piston, said bar extending axially at said power cylinder wall for a distance substantially equal to the power stroke of said power piston and continually lying in said power chamber;
- said power piston having a radially extending aperture adjacent the end thereof facing said power chamber and opening into said second cylinder and into said power chamber in radial alignment with said bar,
- a ball-receiving ramped groove in said valve seat in radial and axial alignment with said aperture with the groove ramp extending radially outward and axially toward said power chamber,
- a ball in said aperture and said ramped groove and having a rolling point of contact with said bar in any operational axial position of said piston,
- and radially extending spring loaded means spring loading said bar substantially centrally between the ends thereof to continually urge said bar into engagement with said ball and yieldably permit radially outward movement of said bar caused by radially outward movement of said ball, said spring loaded means when yieldably permitting such movement actuating a control device;
- said ball being moved radially outward by axial movement of said valve seat and said ramped groove relative to said aperture, said axial movement occurring in response to axial engagement and subsequent concurrent movement of said valve and said valve seat relative to said power piston against the force of said spring means.

4,003,295

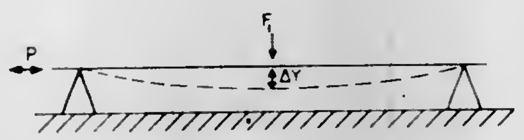
FLUIDIC CAPACITOR FOR TEMPERATURE INDEPENDENT RC TIME CONSTANTS IN LIQUIDS

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1975, Ser. No. 566,850

Int. Cl.² F15C *3/00*

U.S. Cl. 92—1 **9 Claims**



7. A fluidic capacitor for liquid comprising:
a. a chamber having a port for placing said chamber in fluid communication with a working fluid;
b. a piston forming one wall of said chamber;
c. a rigid frame attached to the other walls of said chamber;
d. a flexible beam irrotatably supported at both ends thereof by said rigid frame;
e. means for maintaining said flexible beam at the temperature of said working fluid; and
f. connecting means for transmitting fluid forces acting on said piston into normal forces acting on the center of said beam;

whereby the capacitance varies as the inverse of the working fluid viscosity.

4,003,296

STACKER CRANE CONSTRUCTION

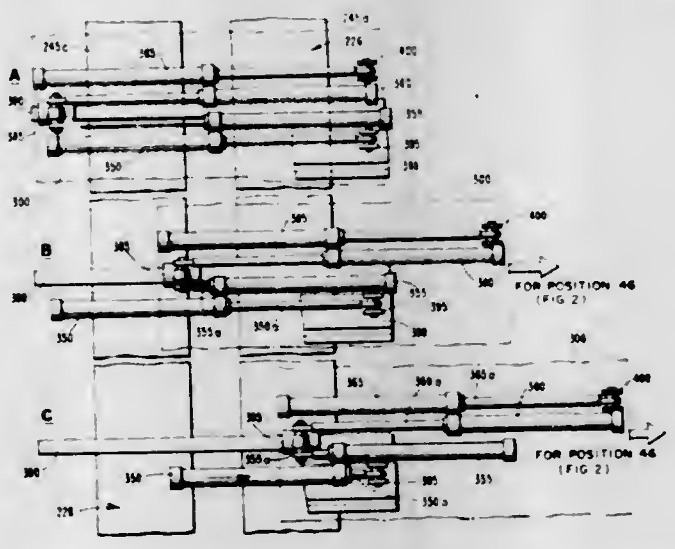
Edward A. Wentz, Gaithersburg, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Division of Ser. No. 314,159, Dec. 11, 1972, Pat. No. 3,934,741, which is a division of Ser. No. 198,917, Nov. 15, 1971, Pat. No. 3,792,758, which is a continuation of Ser. No. 840,667, July 10, 1969, abandoned. This application Mar. 27, 1975, Ser. No. 562,506

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² F01B *15/00*

U.S. Cl. 92—66 **5 Claims**



1. A hydraulic mechanism for driving a member selectively in opposite directions and to either of a pair of positions in either direction comprising a first pair and a second pair of double acting hydraulic cylinders;
each cylinder comprising a housing, and a piston rod extending from a rod end of said housing;
the housings of said first pair of cylinders being secured to each other and the housings of said second pair of cylinders being secured to each other.
means for securing one of the piston rods of said first pair of cylinders to one of the piston rods of said second pair of cylinders;
means for maintaining the other of the piston rods of said first pair stationary;
means for connecting the other of the piston rods of said second pair to said member;
selective pressurization of said first and said second pair of double acting cylinders effecting selective extension or withdrawal positions of respective piston rods effecting motion of said member selectively in either direction to a first or second position.

4,003,297

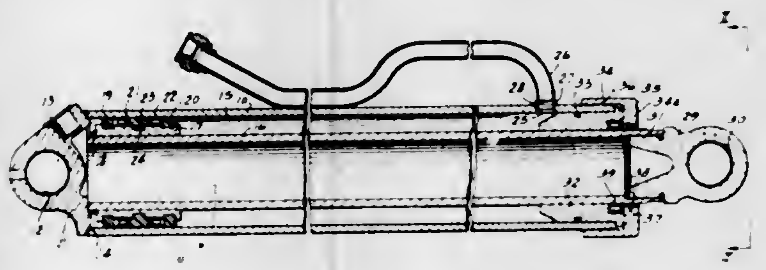
HYDRAULIC CYLINDER

Richard H. Mott, Sioux Falls, S. Dak., assignor to DU-AL Manufacturing Company, Sioux Falls, S. Dak.

Filed Mar. 28, 1975, Ser. No. 563,125

Int. Cl.² F15B *21/04*; **F16J** *15/18, 9/00*

U.S. Cl. 92—78 **9 Claims**



1. A double acting hydraulically powered cylinder and hollow piston rod assembly which comprises an elongated tubular cylinder with first and second ends and a smooth cylindrical inner wall surface between said ends, a first connector secured to and closing the first end of said cylinder having a first fluid port, a hollow tubular elongated piston rod of substantially smaller outer diameter than the inner diameter of said cylinder having first and second ends and being slidable through said second end of said cylinder, said outer diameter of said piston rod being constant along the full length of the rod, a piston sleeve surrounding and seated on the first end of said piston rod along the entire length of the sleeve, a weld bond securing one end of said piston sleeve to said piston rod, a second connector secured to said second end of said piston rod extending beyond the second end of said cylinder, a guide sleeve in said second end of the cylinder between said piston rod and cylinder and slidably supporting said piston rod in the cylinder, said piston sleeve having wear ring grooves therearound adjacent the opposite ends of the sleeve and a backup ring groove therearound between said wear ring grooves, a wear ring mounted in each wear ring groove projecting radially therefrom in bearing engagement with said smooth cylindrical inner wall surface of said cylinder, a backup ring mounted in said backup ring groove and projecting radially therefrom, a seal ring surrounding said piston sleeve on each side of said backup ring between the backup ring and wear rings, and a second fluid port in said cylinder adjacent said guide sleeve communicating with a space between said piston rod and said cylinder, whereby fluid introduced into the first port will be sealed from said space between the piston rod and cylinder and the second port by said piston sleeve and said seal rings around the sleeve to fill and propel the piston rod for moving the second connector away from the first connector while fluid introduced into the second port will fill the space between the piston rod and cylinder and be sealed from the first port and interior of the piston rod by said piston sleeve and said seal rings around said piston sleeve to retract the piston rod into the cylinder and move the second connector toward the first connector.

4,003,298

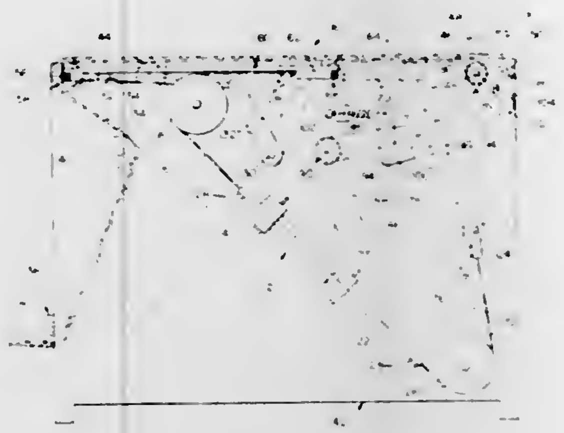
APPARATUS FOR DRIVING MOVING WEBS IN BAG MAKING MACHINES

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co. Inc., Gloucester, Mass.

Continuation of Ser. No. 548,585, Feb. 10, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,814

Int. Cl.² B31B *23/02*

U.S. Cl. 93—33 H **21 Claims**



1. In a machine for discontinuously driving a web moving continuously through the machine, said machine having web pulling means, a web shuttle mounted to said machine for reciprocation toward and away from said web pulling means, said web shuttle adapted to have said web trained thereabout, shuttle drive means for reciprocally moving said web shuttle to alternately take up and pay out said web, and an endless looped belt drivingly interconnecting said web pulling means and said web shuttle so that a portion of said belt associated with said web pulling means can stop and start interdependently with the take-up and pay-out movements of said web shuttle and synchronously with the take-up and pay-out of said web, thereby stopping and starting said web pulling means interdependently with said take-up and pay-out movements, the improvements in which:
said web shuttle comprises a pair of shuttle members, a first said shuttle member positioned upstream and a second said shuttle member positioned downstream relative to the direction of web movement through said machine, each said shuttle member being independently mounted in said machine for reciprocation, a portion of the loop of said belt extending about each said shuttle member, said shuttle drive means being connected to said shuttle members from outside said portions of the loop of said belt extending about said shuttle members, and said drive means synchronously securing said members against said portions of the loop of said belt for reciprocating said shuttle members in unison, thereby stopping and starting said portion of said belt associated with said web pulling means and simultaneously stopping and starting said web.

4,003,299

PACKING SYSTEM

Michael Sternheimer, Pavillonstrasse, Germany, assignor to Astra-Werke GmbH Druck & Verpackung, Saarlouis, Germany

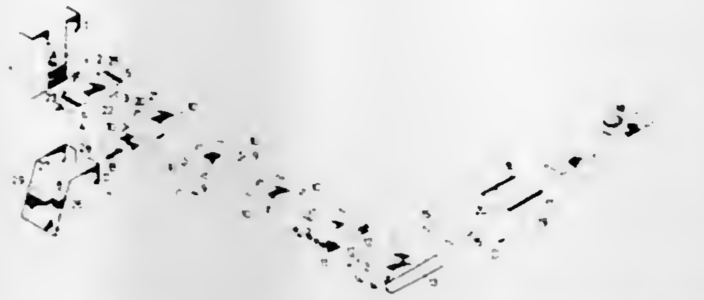
Filed Mar. 27, 1975, Ser. No. 562,558

Claims priority, application Germany, Apr. 18, 1974, 2418694

Int. Cl.² B31B *1/26, 17/00*

U.S. Cl. 93—49 M **12 Claims**

1. A method of making boxes from carton blanks, of the type having either flap tops or push-on lids and which after being formed and covered with paper are incised along edges of the box lid opening, comprising the steps of: adding a substantially quick-settling adhesive to and margins of opposed side flaps of a lid carton blank; positioning a base carton blank in aligned registered disposition beneath the lid carton blank and spaced therefrom a predetermined distance corresponding to the width of the finished box; erecting to a substantially vertical positon side flaps of the base carton blank underlying the lid side flaps carrying adhesive; folding the lid side flaps carrying adhesive to and into pressed engagement with the vertical base side flaps; erecting to a substantially vertical position the remaining side flaps of the base carton blank; adding said adhesive to end margins of the remaining side flaps of the lid carton blank; folding the remaining lid side flaps to and into pressed engagement with the remaining vertical base side flaps, thereby forming a closed box; applying a paper covering to the closed box; and incizing and severing the outer side flaps of the box lid at predetermined locations.



4,003,300

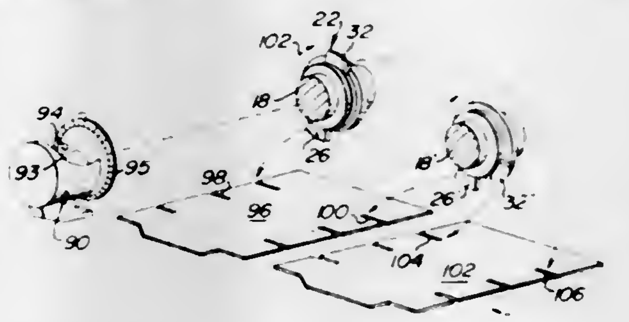
APPARATUS HAVING DUAL SLOTTER SHAFTS

William Grobman, Philadelphia, Pa., assignor to Molins Machine Company, Inc., Camden, N.J.

Continuation-in-part of Ser. No. 504,934, Sept. 11, 1974, Pat. No. 3,954,050. This application Apr. 9, 1976, Ser. No. 675,369

Int. Cl.² B31B *1/22*

U.S. Cl. 93—58.2 R **7 Claims**



1. Apparatus for processing planar box blanks comprising a pair of shafts mounted for rotation about their longitudinal axes, an annular head connected to each shaft for rotation therewith, at least one slotter knife releasably mounted on said head and projecting beyond the periphery of said head, means for releasably locking each knife to its head, motor means for rotating said shafts through a preselected angle, and means for releasing said locking means and retaining said slotter knife stationary so that said shafts may be rotated by the motor means through the preselected angle whereby the position of the slotter knives on the heads may be adjusted to the same or different positions on said shafts depending on whether one or two blanks is to be processed per revolution of the shafts.

4,003,301

VACUUM RELIEF SYSTEM FOR TARPAULIN COVERED HOPPER TRAILERS

Morrison Kal Norton, Woodland, Calif., assignor to Titan Trailer Corporation, Woodland, Calif.

Filed Nov. 10, 1975, Ser. No. 630,336

Int. Cl.² B61D *7/32*

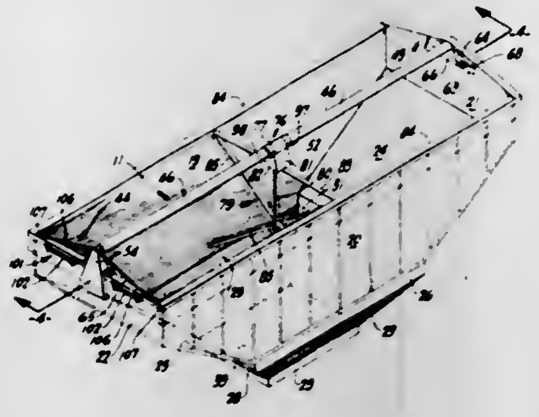
U.S. Cl. 98—13 **10 Claims**

1. Vacuum relief system for hopper trailer having opposing end walls and opposing side walls defining a horizontal upper rim, a bottom including a cargo discharge door, and a tarpaulin covering the trailer hopper and extending around the upper

rim in substantially air tight relation thereto, said system comprising:

a. an elongated hollow tube;

b. means for mounting said tube on the opposing end walls of the hopper at an elevation above the level of the upper rim, said tube extending the entire distance between the end walls and being located below and in supporting relation to the tarpaulin to elevate the same above the level of the upper rim;



c. orifice means mounted on the hopper and connected to said tube for establishing communication between the atmosphere and said tube; and,

d. nozzle means on said tube for venting atmospheric air from said tube to a location below the tarpaulin, said tube being effective to conduct atmospheric air from said orifice means to a space between the tarpaulin and the subjacent contents of the hopper to equalize the air pressures on both sides of the tarpaulin as the contents of the hopper are withdrawn through the cargo discharge door.

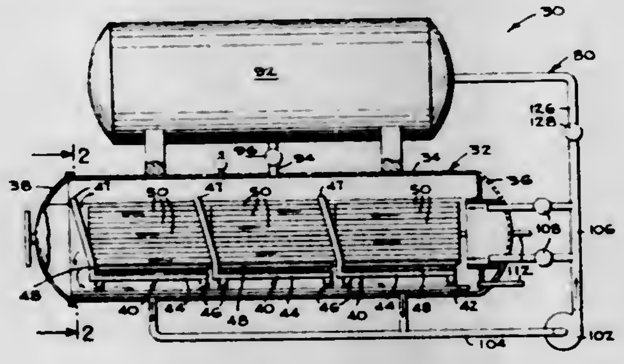
4,003,302
RETORT SYSTEM

Samuel A. Mencacci, San Jose; Jurgen H. Strasser, Mountain View, and Tom Mansfield, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 8, 1974, Ser. No. 522,067

Int. Cl.² A23L *3/02*

U.S. Cl. 99—359 **24 Claims**



1. A retort system for changing the temperature of substantially flat containers having thin flat sidewalls with high heat penetration rates, said system comprising a vessel having an enclosing outer wall and a longitudinal axis, imperforate wall means defining a tunnel disposed within said vessel spaced from at least a portion of said outer wall thereof and having an inlet end and an outlet end for liquid, said imperforate wall means extending between said inlet end and said outlet end to confine the flow of liquid within said tunnel, flow inducing means for moving a heat treatment liquid at a predetermined temperature through said tunnel and past the containers to transfer heat between the containers and the liquid, said flow inducing means thereafter returning the liquid discharged from the tunnel externally of the tunnel between said tunnel and said outer wall of the vessel to the inlet end of the tunnel for recirculation through said tunnel, means for supporting the containers in the tunnel in positions spaced apart in a direction perpendicular to the flow path through the tunnel and so that the flat sidewalls thereof are parallel to the flow direction of the heat treatment liquid, and means for returning the temperature of the liquid to said predetermined temperature as the liquid is moving externally of said tunnel toward said inlet end.

4,003,303
APPARATUS FOR SHELLING AND CLEANING CEREALS

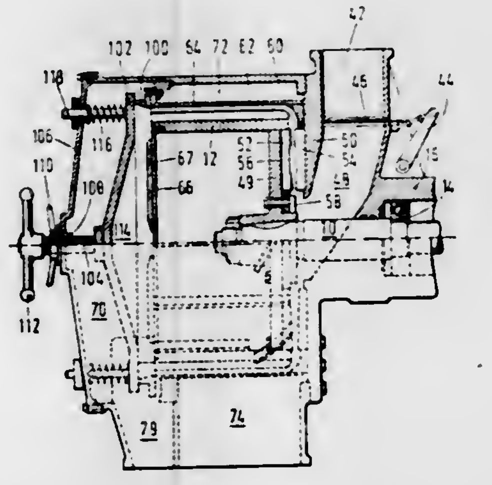
Leslie Palyi, Don Mills, Canada, assignor to Palyi-Hansen International Aps, Copenhagen, Denmark

Filed May 8, 1975, Ser. No. 575,503

Claims priority, application Germany, May 15, 1974, 2423659

Int. Cl.² A23N *5/00;* **B02B** *3/02;* **B07B** *1/20*

U.S. Cl. 99—575 **12 Claims**



1. Apparatus for shelling and cleaning cereals, grain, or the like comprising:

a housing; a horizontal shaft in said housing;

a drum rotatably mounted on said horizontal shaft; said drum having opposite first and second end faces which are closed and having an annular exterior;

a perforated cylinder defined around said horizontal axis and annularly surrounding and spaced from said drum to define an annular axially extending gap between said cylinder and said drum; said perforated cylinder having an exterior side outside said annular axially extending gap;

said housing having an inlet side near said first end face of said drum; an inlet to said housing at said inlet side and communicating into said annular axially extending gap;

said perforated cylinder having an end that is near said drum second end face; an annular lip seal formed on and extending beyond said end of said perforated cylinder; said lip seal being comprised of resilient material;

a cover in said housing and positioned in opposed relationship to said lip seal; means for shifting said cover away from and also toward and into varying degrees of secure engagement with said lip seal.

4,003,304
SCREW PRESS

Rolf Bertil Reinhall, 834 171st Place NE., Bellevue, Wash. 98008

Filed Apr. 14, 1975, Ser. No. 567,862

Claims priority, application Sweden, Apr. 30, 1974, 7405816

Int. Cl.² B30B *9/12*

U.S. Cl. 100—117 **4 Claims**

1. A continuous flow dewatering press for fiber pulp suspension comprising:

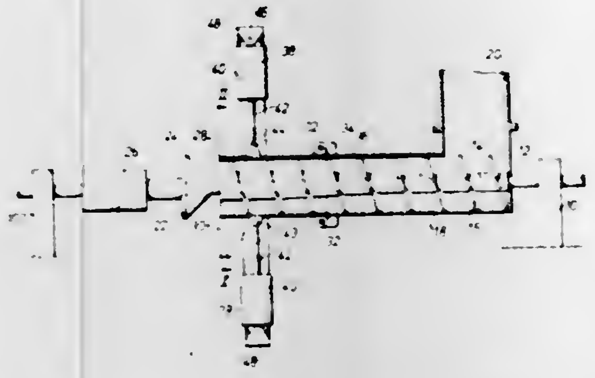
a. an inlet channel for receiving the pulp to be dewatered;

b. a tubular compression casing having an inlet connected to said inlet channel and an outlet at the opposite end thereof;

c. means for advancing the fiber pulp from the inlet end to the outlet while progressively compressing and dewatering the same;

d. a plurality of perforations in the walls of said tubular casing to permit water to drain therefrom as the fiber pulp is advanced therein,

e. adjustable throttling means at the outlet end of said casing for controlling the rate of liquid discharge and to maintain a predetermined pulp concentration in said pulp suspension within said casing;



f. flaps forming a substantially aligned extension of said tubular casing adjacent the outlet thereof and normally enclosing said pulp advancing means thereof,

g. said flaps being hinged to said casing to swing outwardly about an axis perpendicular to the axis of said tubular casing to provide a flared mouth facing said throttling means, and

h. means for exerting a predetermined maximum yielding pressure on said flaps to maintain said flaps substantially aligned with the unhinged portion of said casing until the pressure produced by the compression of the fiber pulp exceeds said predetermined maximum.

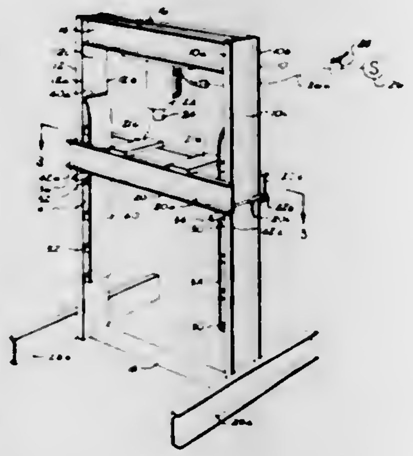
4,003,305
PRESS FRAME

Roy L. King, Rte. 11, Staunton Bridge Road, Greenville, S.C. 29611

Filed Apr. 27, 1976, Ser. No. 680,726

Int. Cl.² B30B *15/06*

U.S. Cl. 100—257 **6 Claims**



1. In a frame for a press machine having a pair of spaced parallel leg members, a cross beam member bridging the ends of said leg members adjacent one of the ends thereof, a second cross beam member bridging the remote ends of said leg members, a press bed carried transversely by said leg members being adjustable in position along the length thereof intermediate said first and second cross beam members, a jack means carried by said first cross beam member having a ram pin movable towards said press bed for engaging a workpiece supported on said bed, the improvement comprising at least one abutment supporting element integrally carried on each of said leg members for supporting an abutment member, said press bed having a lower most edge surface disposed adjacent said leg members for being supported on said abutment members when placed on said supporting elements at a desired position along the length of said leg members, and a bridge member carried by said frame adjacent each said leg member extending over said abutment supporting element to define a space between a respective leg member and bridge member between which said abutment member is retained on said supporting element while providing increased strength to said leg members and frame reducing the tendency of said leg members to bow outwardly under increased stress.

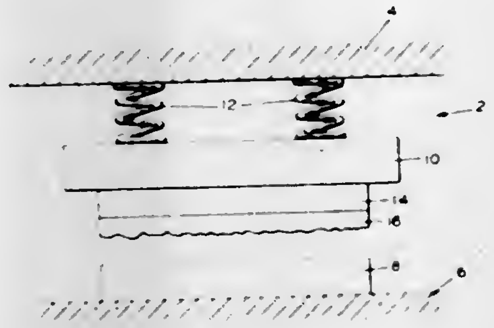
4,003,306
PRESS FOR EMBOSSING CEILING TILE

John R. Garrick; Nathaniel E. Hager, Jr., and Ernest B. Waters, Jr., all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 155,418, June 22, 1971, abandoned. This application July 23, 1973, Ser. No. 381,859

Int. Cl.² B44B *5/02*

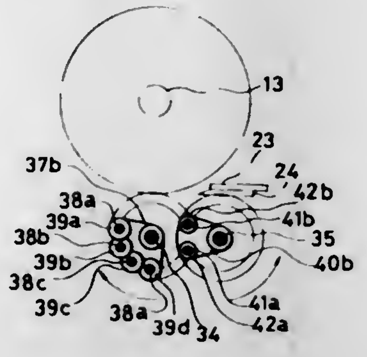
U.S. Cl. 101—27 **2 Claims**



1. An apparatus for rapidly embossing a ceiling panel means made of fibrous material by the use of a cyclically operated punch press having a drive means and having a punching die moved by said drive means and a stationary platen for holding the fibrous product to be embossed, said punching die having a stripper plate, spring means being mounted between said punching die and said stripper plate, a high output heat generating means with temperature control means mounted on the stripper plate, an embossing plate means mounted on the heat generating means to be warmed by said heating generating means and for embossing the fibrous product, said high output heat generating means being capable of supplying heat at such a rate that said embossing plate can deliver a heat flux of at least 10 kilowatts per square foot to the product with the embossing plate maintaining a substantially constant temperature whereby the first part of the downward movement of the punching die to the fibrous material to be embossed will cause the heated embossing plate to engage the product, said springs between the punching die and stripper plate are compressed during the second part of the downward movement of the punching die, then upward movement of the punching die away from the fibrous product will let the spring means expand and result in the embossing plate being held against the product until almost the end of the upward movement of the punching die to result in an extended contact of the embossing die with the product and then with final upward movement of the punching die there is a quick release of the embossing plate from the product.

4,003,307
PRINTER

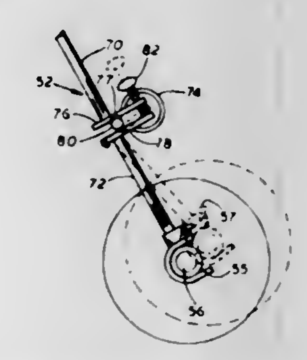
Seizaburo Sano, and Takaaki Kozima, both of Yokohama, Japan, assignors to Amano Corporation, Yokohama, Japan
Filed Oct. 15, 1974, Ser. No. 514,609
Int. Cl.² B41L *47/46*
U.S. Cl. 101—45 **2 Claims**



1. A printing mechanism comprising:
- a. a base;
- b. a plurality of type wheels mounted on said base for rotation about a common first axis in axially juxtaposed relationship, each type wheel having a peripheral face and carrying type on said face thereof;
- c. a support movably mounted on said base;
- d. a printing roll shaft mounted on said support for rotation about a second axis extending in a common direction with said first axis;
- e. mounting means on said shaft;
- f. a plurality of printing rolls secured to said mounting means for rotation about respective third axes parallel to said second axis in angularly offset relationship,
  - 1. said mounting means maintaining fixed, equal distances between said third axes and said second axis,
  - 2. said printing rolls being axially offset from each other and radially aligned with respective ones of said type wheels,
  - 3. each printing roll moving toward and away from an operative position contiguously adjacent the aligned type wheel during rotation of said shaft;
- g. yieldably resilient means biasing said support toward said type wheels;
- h. guide means for guiding a card into a printing position, pressure on respective opposite faces of said card being simultaneously exerted by one of said type wheels and the aligned printing roll in the operative position of said aligned printing roll when said card is in said printing position thereof; and
- i. drive means responsive to movement of said card into said printing position for rotating said shaft.

4,003,308
INK ROLL POSITIONING APPARATUS FOR PRESS

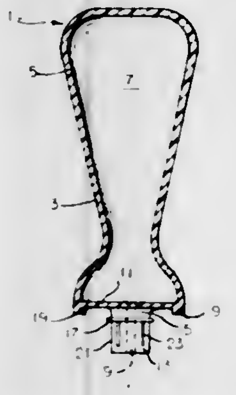
Charles E. Decker, II, Canton, Ohio, assignor to The Dillon Electric & Machine Co., Canton, Ohio
Filed May 7, 1975, Ser. No. 575,410
Int. Cl.² B41F *31/30*
U.S. Cl. 101—351 **5 Claims**



1. In a printing press including a frame means comprising a pair of opposed side plates, a printing cylinder journalled on and extending between said side plates, and an inking roll adjacent said printing cylinder, and characterized by a positioning arm mounted on each side of said plates each engaging an end of said inking roll for pivotal movement thereof towards and away from said printing cylinder, one of said positioning arms having two axially spaced parts, fluid actuated means operatively engaging both of said positioning arms to move said inking roll to and from operative association with said printing cylinder, said fluid actuated means including connection means and a first adjustment means to control the position of said inking roll in relation to said printing cylinder; and said one of said positioning arms includes an arcuately movable second adjustment means connecting said arm parts to adjust the relative arcuate positions of said arm parts and of only one end of said inking roll to move it towards or away from said printing cylinder, said adjustment means being movable in a plane perpendicular to the axis of said printing cylinder.

4,003,309
HAND GRIP UNIT FOR RUBBER STAMPS

Whitney K. Munson, P.O. Box 828, Red Bank, N.J. 07701
Filed Sept. 2, 1975, Ser. No. 609,653
Int. Cl.² B41K *1/56*
U.S. Cl. 101—406 **13 Claims**



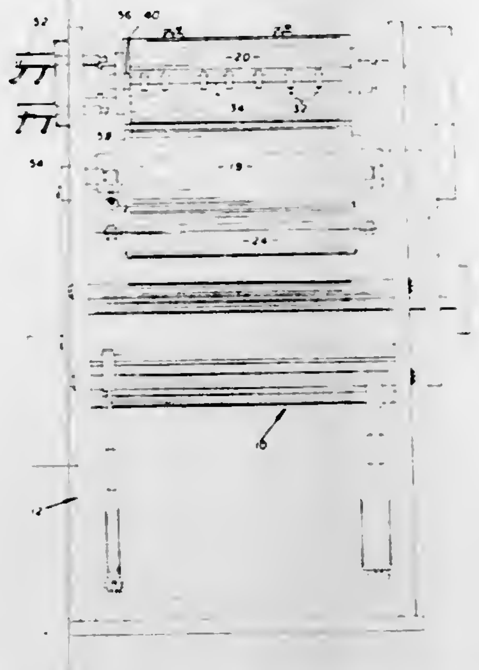
1. A hand grip unit for a stamp comprising a connecting means and a rigid handle portion defined by a hollow portion including a closure for said hollow portion, said closure comprising a flexible membrane being a one piece continium of the handle portion and extending across said closure, said flexible membrane having extending therefrom said connecting means which comprises a connecting stud for connecting the unit to a stamp medium, and means for preventing the handle portion from contacting said stamp, when said handle is connected to said stamp, said flexible membrane being sufficiently flexible to allow said handle portion to flexibly pivot with respect to said stamp during the stamping operation.

4,003,310
CONTROL APPARATUS FOR GRIPPER FINGER SHAFT FOR PRINTING PRESS

Charles E. Decker, II, Canton, Ohio, assignor to The Dillon Electric & Machine Co., Canton, Ohio
Filed May 7, 1975, Ser. No. 575,411
Int. Cl.² B41F *1/30, 21/04*
U.S. Cl. 101—411 **5 Claims**

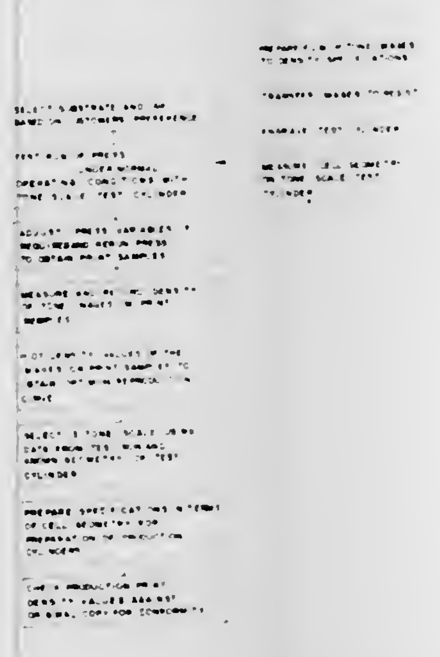
1. In a printing press including a frame, a plate cylinder, a driven impression cylinder having a gripper finger shaft with gripper fingers, a tumbler secured to one end of the gripper finger shaft, the improvement comprising said tumbler having pin receiving recess means on one side thereof at each of its ends, and a pair of fluid actuated cylinders having piston rods operated thereby and extending from said cylinders, said cylinders and piston rods being so positioned adjacent an end

of the impression cylinder as to engage said tumbler when a said piston rod is extended to turn it and its associated shaft through an arc by rotation of said impression roll but with said piston rods turning said tumbler in opposite directions.



4,003,311
GRAVURE PRINTING METHOD

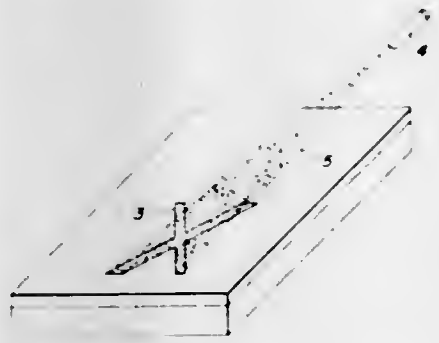
Karl D. Bardin, 100 Water St., Guilford, Conn. 05437
Filed Aug. 13, 1975, Ser. No. 604,221
Int. Cl.² G03F *1/00;* **B41C** *1/02*
U.S. Cl. 101—426 **11 Claims**



1. A method of gravure printing which comprises providing a gravure press with a test cylinder having engraved thereon a tone scale chart comprising a plurality of tone scales each characterized by a plurality of spaced image areas ranging from a deep shadow tone to a light shadow tone with the deep shadow tones differing by a known density increment and the density of the tone image areas in each scale varying by a predetermined density value, the cell geometry of the tone image areas on the tone test cylinder being measured and recorded, operating said press with the test cylinder and a selected substrate and an ink formulation selected according to copy to be reproduced, varying the press operating conditions to obtain the best printed samples of commercially acceptable quality, measuring and recording the density values of the tone image areas on the printed samples obtained and plotting the density values thereof against the density values of the tone chart to determine the tone scale which has points of closest correspondence throughout a range of density values of the corresponding tone scale on the tone scale chart and which will result in optimum reproduction by said press, and setting up a specification in terms of cell geometry, derived from the cell geometry of the corresponding tone scale on the test cylinder, for the deepest shadow, middle and light tone values as measured on the copy, which specifications are to be met in the production of photographic film, image transfer and etching of production cylinders so as to obtain optimum reproduction of the copy on said press.

4,003,312
PREPARING WATERLESS LITHOGRAPHIC PRINTING MASTERS BY INK JET PRINTING

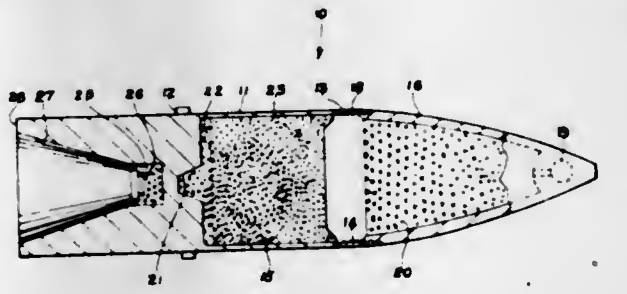
Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 16, 1974, Ser. No. 533,035
Int. Cl.² B41C *1/10;* **G01D** *15/18*
U.S. Cl. 101—466 **1 Claim**



1. A process for preparing a printing master comprising coating a master substrate with a silicone curable to an elastomeric adhesive ink releasing condition, said silicone having reactive pendant groups, selectively imaging the resultant coated substrate by discharging an imaging fluid from an ink jet printing apparatus as droplets by selectively emitting or deflecting said droplets in accordance with an information source wherein the imaging fluid is an ink-accepting material having groups reactive with the silicone pendant groups, curing the silicone to an adhesive ink releasing condition, and grafting the imaging material to said silicone.

4,003,313
PROJECTILE

Walter J. Puchalski, Southampton, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed June 10, 1975, Ser. No. 585,649
Int. Cl.² F42B *13/14, 13/34*
U.S. Cl. 102—66 **3 Claims**



1. A projectile comprising,
- a projectile main body having a forward nose portion secured to said main body, a substantially cylindrical peripheral wall portion, and a rearwardly opening cavity containing a pyrotechnic composition,
- said cavity having a substantially cylindrical sidewall, said cavity sidewall having a diameter substantially smaller than that of said peripheral wall portion, and
- a rearward portion of said projectile having means including

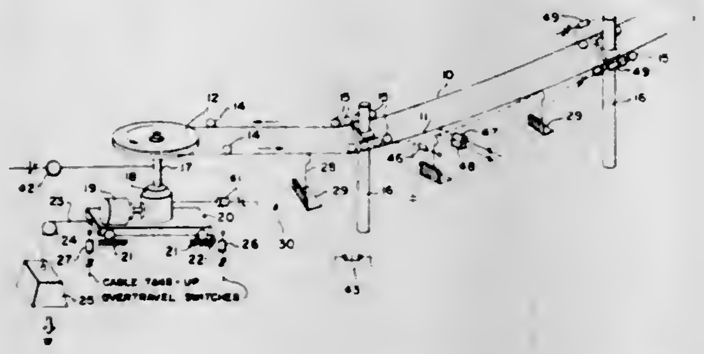
an uninterrupted conical surface for interconnecting the rearmost surfaces of said main body and cavity sidewall, said uninterrupted conical surface defining an empty frusto-conical chamber rearward of said pyrotechnic composition.

4,003,314

SKI LIFT MONITORING

William F. Pearson, 5221 Duvall Drive, Washington, D.C. 20016

Filed Apr. 25, 1975, Ser. No. 571,851
Int. Cl.² B61B *12/06*
U.S. Cl. 104—1 R **17 Claims**



1. A method of monitoring a ski lift having a drive cable transporting a plurality of passenger carrying units along a conveying run where it has a plurality of spaced cable supports at respective fixed locations, comprising the steps of: automatically sensing derailment of said cable from each of the supports along the ski lift and producing an electric signal at each such location indicating cable derailment, with such derailment electric signals differing from each other electrically in a fixed correlation with their respective locations for identification; controlling the starting and stopping of the ski lift with an electrical closed series circuit; transmitting in the closed series circuit all of said electric signals that have different electric identity characteristics to a central location remote from the signal source fixed locations; automatically identifying any one of said electric signals as to its location according to its different electric characteristic; automatically storing the thus identified signal according to its source identity and providing a visual display of the signal source location at said central location.

4,003,315

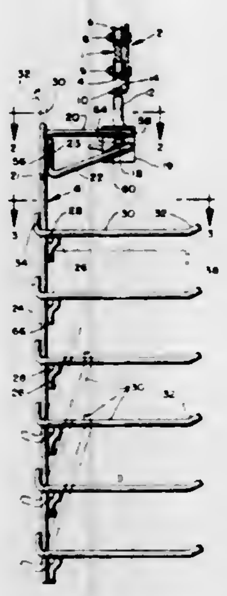
CONVEYOR CARRIAGE AND LADING SUPPORTING RACK

C. Richard Barth, 2908 Rockbrook Drive, Plano, Tex. 75074

Filed June 19, 1975, Ser. No. 588,512
Int. Cl.² B61B *3/00;* **B65G** *17/16, 17/24, 17/34*
U.S. Cl. 104—93 **5 Claims**

1. Apparatus adapted for transfer of products through stages of processing while allowing interim storage of such products including in combination:

a. roller carriage means adapted to depend in a rolling relation from a conveyor track means;
b. a vertical swivel means depending from said roller carriage means and supporting a hook means;
c. a tiered carrier means including a support bar supported in readily removable relation from said hook means;
d. a vertical support means including at least two vertically disposed and laterally spaced apart support members connected to a bracket means extending laterally from said support means into connection with said support bar with said support bar being mounted at substantially the horizontal center of gravity of said tiered carrier means to provide and maintain a substantial vertical posture of said tiered carrier means;
e. a plurality of vertically spaced apart yokes mounted in transversely aligned relation to said vertically disposed support means;
f. a plurality of support shafts each being received in and supported by at least two said transversely aligned yokes;
g. at least two substantially horizontal support members connected to each said shaft to extend transversely from said vertically disposed support means; and
h. said two horizontal support members being also connected to a positioning bias means which engages at least one of said vertical support members to support said horizontal support members in said horizontal position and adapted to allow the combination of said shaft and said horizontal support members to be pivoted upwardly then be readily removed from said tiered carrier such as for cleaning.

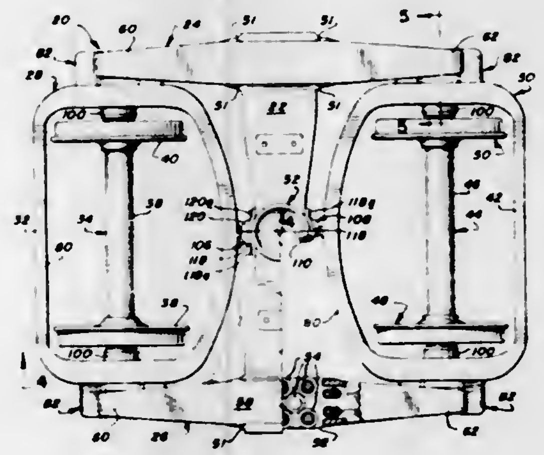


4,003,316

ARTICULATED RAILWAY CAR TRUCKS

Dale E. Monselle, 116 S. 44th St., Omaha, Nebr. 68131

Filed Oct. 23, 1973, Ser. No. 408,469
Int. Cl.² B61F *3/08, 5/12, 5/26, 5/38*
U.S. Cl. 105—167 **32 Claims**



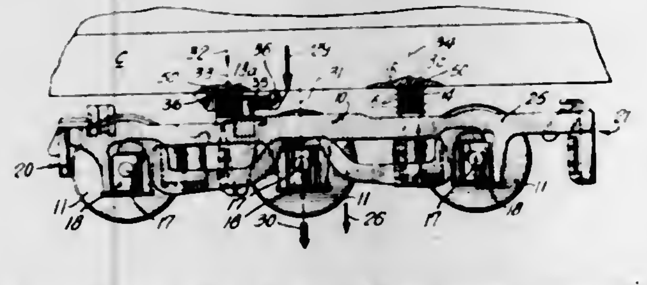
1. A railway truck comprising a truck assembly for supportably engaging a railway vehicle, said assembly including a transverse center structure and rigid side members having portions disposed on opposite sides of each end of said center structure, each of said side member portions being spaced longitudinally of said assembly from said center support structure, a pair of pivot assemblies disposed one on each side of said center structure for supporting said truck assembly, each of said pivot assemblies including a pair of transversely spaced wheels connected by an axle and a wheel holding frame means supported on said axle and extending in underlying relation to said side member portions on the respective side of said center structure, support means positioned between each of said side member portions and the respective underlying wheel holding frame means and including compressive resilient means between and joined to the respective side member portion and the underlying wheel holding frame means for providing cushioned support of said side member portions on said pivot assemblies and permitting relative movement between said side member portions and underlying wheel holding frame means longitudinally and laterally of said truck assembly by resilient deformation of said resilient means, and each of said pivot assemblies being connected to said center structure through a pivot connection spaced from the axis of rotation of the respective pair of wheels and allowing limited pivotal movement in all directions between the respective pivot assembly and said center structure, said pivot assemblies supporting said truck assembly and each having horizontal pivotal movement about the respective pivotal connection to said center structure for automatic steering adjustment of said pivot assemblies relative to said truck assembly by such resilient deformation of said resilient means in response to track curve conditions encountered by said truck whereupon said resilient means provide restoring forces for returning each pivot assembly to a predetermined alignment position relative to said truck assembly.

4,003,317

RESILIENTLY CENTERED RAILWAY TRUCK SUSPENSION

John Henry Parker, 730 St. Aubin, St. Laurent, Quebec, and Frank Thomas McInerney, 190 de Normandie, St. Bruno, Quebec, both of Canada

Continuation-in-part of Ser. No. 269,549, July 7, 1972, abandoned. This application Feb. 27, 1974, Ser. No. 446,393
Int. Cl.² B61F *1/14, 3/06, 5/20, 5/24*
U.S. Cl. 105—184 **1 Claim**



1. A locomotive truck including a secondary suspension for use on a railway three-axle truck frame, each of said three axles being equidistantly spaced from one another and being driven by a respective traction motor mounted on bearings on each axle and additionally supported by said truck frame, said secondary suspension comprising three identical laminated metal and rubber pads of cylindrical shape and circular cross-section positioned between the upper surface of said truck frame and said locomotive chassis, the laminated pads each having substantially zero shear rate horizontally in all directions when subjected to a vertical load by the mass of one end of the locomotive chassis supported thereby two of said pads being positioned forwardly of the central axle of said three axles and to a respective side of the central longitudinal axis of said truck frame, the other pad being positioned on said central longitudinal axis rearwardly of said central axle, said spacing of said pads relative to said central axle being predetermined to apply a resultant force of the mass of one end of said locomotive chassis forwardly of the central axle with all three pads equally loaded by said one end of the locomotive chassis whereby said resultant force will balance the resultant force of the truck sprung masses which is rearwardly of said central axle thereby giving a net resultant rail force substantially at said central axle, approximately two-thirds of the mass of one end of the locomotive chassis being supported on said two pads positioned forwardly of the central axle, said two pads being located approximately one-third the distance from an outboard end of the truck frame, and approximately one-third of the mass of the one end of the locomotive chassis being supported on said other pad positioned rearwardly of the central axle and approximately one-third the distance from an inboard end of the truck frame, the truck frame having a centre pin extending upwardly therefrom to engage the locomotive chassis to provide a traction connection therebetween, said centre pin being located on the truck between the two laminated pads and in longitudinally-spaced relation from the central axle; the centre pin engaging a pair of elastic pads mounted in a support block situated on a lower surface of the locomotive chassis, the two elastic pads extending horizontally between the centre pin and the support block and being positioned so as to transmit the traction forces and provide a lateral restoring force to the locomotive chassis

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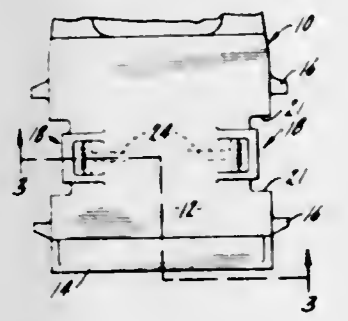
4,003,318

REINFORCED BOLSTER POCKET WALL

Robert L. Bullock, Lombard, and Robert P. Geyer, Palatine, both of Ill., assignors to Standard Car Truck Company, Chicago, Ill.

Filed June 25, 1975, Ser. No. 590,293
Int. Cl.² B61F *5/12, 5/16, 5/24, 5/50*
U.S. Cl. 105—226 **1 Claim**



1. A bolster for use in a stabilized railroad car truck, said bolster having a top wall and stabilizer pockets on each side of each end thereof, each of said pockets including a slanted interior wall, portions of said bolster adjacent said pockets extending above said top wall, and reinforcing means for said bolster pocket slanted interior walls positioned generally at the midpoint of each pocket and generally inside of said bolster, said reinforcing means including a rib behind each pocket and inside of said bolster, said ribs extending generally inwardly from each pocket and generally perpendicular to the longitudinal axis of said bolster, those portions of said bolster which extend above said top wall extending generally toward the longitudinal axis of said bolster for a substantial portion of the distance between said positions to form spaced projections above said bolster top wall, with said reinforcing ribs extending above the area of the bolster top wall and being inside of and integral with said projections and said slanted walls to thereby reinforce said projections against excessive wedging force applied thereto above the area of said bolster top wall.

4,003,319

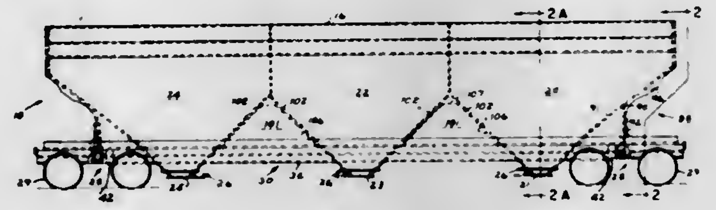
TUBULAR THROUGH SILL RAILWAY HOPPER CAR

George C. Campbell, Overland; James C. Hammonds, and Dallas W. Rollins, both of St. Charles, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 439,781, Feb. 5, 1974, Pat. No. 3,918,370. This application May 27, 1975, Ser. No. 581,100
Int. Cl.² B61D *5/00, 7/00;* **B61F** *1/02, 1/10*
U.S. Cl. 105—248 **15 Claims**

1. A railway hopper car comprising:

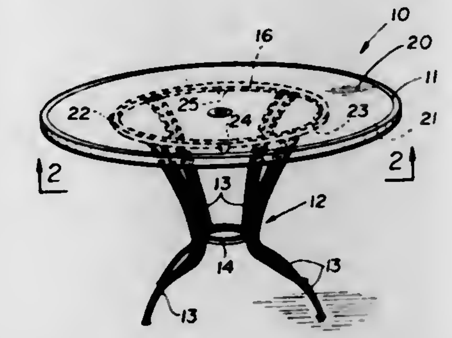
spaced apart sides on opposite sides of said car joining longitudinally extending side sills and top chords; at least one transverse bulkhead joining said sides to define a plurality of hoppers in said car; said hoppers having converging slope sheets extending transversely of the car; the hoppers at opposite ends of the car having end slope sheets; a through sill extending throughout the length of said car; said through sill comprising in cross section an enclosed tube of quadrilateral cross section including an apex extending upwardly into the hoppers to shed the lading; said through sill comprising at opposite end portions thereof end sections each having an end sill welded thereto; each of said end sections having affixed thereto a center plate and a bolster cover plate; said bolster cover plate extending transversely from said end section to each of said side sills and welded thereto; a vertical bolster web joining respectively each of said end sections to one of said end slope sheets; and hopper slope sheet reinforcing structure including generally triangular shaped members attached to said through sill, and attached and supporting said slope sheets.



4,003,320
TABLE ASSEMBLY

Douglas F. Owens, Altoona, and Thomas D. Aders, Birmingham, both of Ala., assignors to Champion International Corporation, Stamford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,977
Int. Cl.² A47B *3/06*
U.S. Cl. 108—157 **7 Claims**

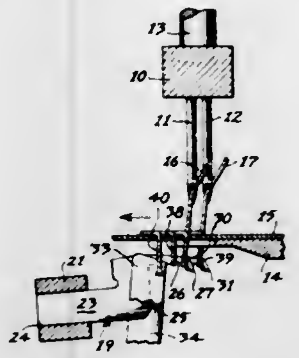


1. A table assembly comprising a top portion, base portion and means for securing said portions together; said bottom portion having a plurality of legs for supporting the table assembly and a circular ring mounted at the top of said plurality of legs, said circular ring having an inner radius measured from the center of said circular ring to the inner peripheral surface of said circular ring, and an outer radius measured from said center of said circular ring to the outer peripheral surface of said circular ring; said top portion having a bottom surface, a plurality of cross braces spaced equiangularly about the center of said bottom surface, and a plurality of clips, one clip being supported by one of said plurality of cross braces, whereby said top portion is assembled to said base portion by sliding the top portion along the circular ring until the clips are in flush engagement therewith, each of said clips including a vertical member extending perpendicular to its respective brace, and two horizontal members extending horizontally from said vertical member, each of said vertical members having an inner surface nearest said circular ring and an outer surface farthest from said circular ring; and one of said clips having an inner surface of its vertical member positioned on its respective cross brace a distance from the center of said bottom surface slightly less than said inner radius of said circular ring.

4,003,321
CUT PILE APPARATUS FOR STAGGERED NEEDLE TUFTING MACHINE

Roy T. Card, Chattanooga, Tenn., assignor to Card & Co., Inc., Chattanooga, Tenn.

Filed June 3, 1974, Ser. No. 475,625
Int. Cl.² D05C *15/12*
U.S. Cl. 112—79 R **6 Claims**

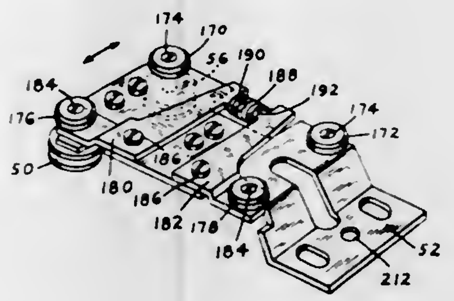


6. A looper assembly for a tufting machine comprising a looper bar, a plurality of loopers, each looper including a body portion and a loop penetrating and seizing bill angularly extending from said body portion and defining a throat therebetween, means for mounting said body portions in said looper bar in a row with all the throats substantially aligned, and the bills on alternate loopers being longer than the bills of the adjacent loopers.

4,003,322
AUTOMATIC SEWING MACHINE

Florian F. Yanikoski, Braintree, Mass., assignor to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 496,749, Aug. 12, 1974, Pat. No. 3,970,016. This application Dec. 23, 1974, Ser. No. 535,874
The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **11 Claims**



1. Work piece holding means for an automatic sewing machine, comprising:

an elongated first arm pivotally connected adjacent one end to the sewing machine;

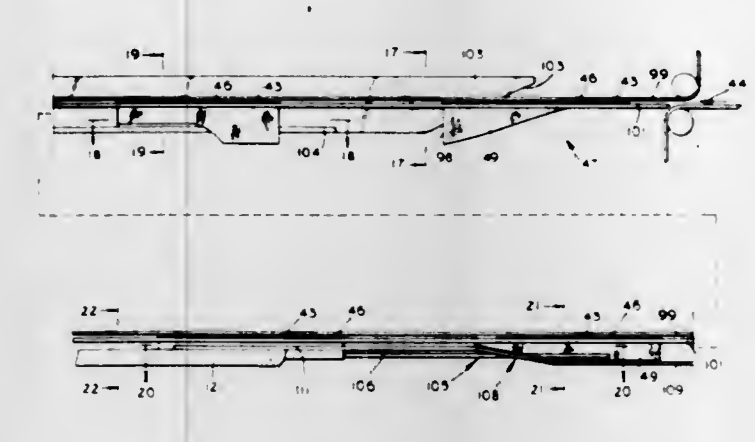
an elongated second arm carried on said first arm and being movable longitudinally with respect to the first arm, said second arm having a work holder adjacent one end for holding the work piece during sewing, said first and second arms having co-operating longitudinally extending flange means and a plurality of rollers said flange means defining a pair of opposed tracks adjacent opposed lateral sides of the arms, said rollers being received in said tracks with a first pair of rollers engaging against longitudinally spaced portions of one of said tracks while being spaced from the other of said tracks, and with a second pair of rollers engaging against longitudinally spaced portions of said other track while being spaced from said one track to provide stability and prevent binding of said arms during movement thereof; and

means for commonly biasing said rollers against opposite tracks.

4,003,323
APPARATUS FOR MANUFACTURING AND STACKING HEMMED FABRIC PIECES

Douglas J. Crawford, Troy; Roger LeMere, Petersberg, and Francis H. Hughes, Troy, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Division of Ser. No. 344,227, March 23, 1973, Pat. No. 3,898,941. This application Apr. 23, 1975, Ser. No. 570,808
Int. Cl.² D05B *35/02*
U.S. Cl. 112—141 **2 Claims**



1. Apparatus for folding sequentially one side margin of a plurality of fabric pieces conveyed along a path defined by a continuously moving conveyor **99** engaging the upper surface of said fabric pieces to form a hem in each of said pieces, each said piece being positioned with said margin projecting to one side of said path, characterized by

a. a horizontal folder plate **101** for engaging the bottom surfaces of said sequentially fed fabric pieces, said folder plate having a folder plate edge **102** defining the first fold position of said hem;

b. a first vertical folder member **103** disposed spaced from and adjacent said folder plate edge, the edge **103**(a) of said first vertical folder member for engaging the advancing leading edge of each side margin of said fabric pieces to form between said folder plate edge and said first vertical folder member a margin flap **49**;

c. a second folder member **104** in said path downstream of said vertical folder member, said second folder member having a vertical portion **104**(b) and a horizontal portion **104**(a) for engaging the leading edge of said advancing margin flap **49** for folding said margin flap **49** toward the bottom surface of said folder plate **101**;

d. a first die plate **106** for engaging the upper surface of said folded advancing margin flap **49**;

e. a second die plate **107** spaced horizontally from said first die plate in said path for engaging the lower surface of said advancing margin flap **49**, said first **106** and second **107** die plates being disposed downstream of said second folder member in said path;

f. said first **106** and second **107** die plates being spaced vertically from each other to accommodate the thickness of said folded margin flap **49** when first engaging said margin flap;

g. the lower engaging surface **114** of said first die plate **106** extending continuously in a single horizontal plane;

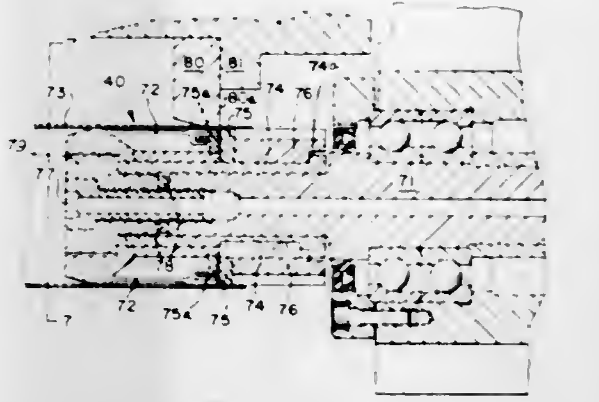
h. the upper engaging surfaces **113** of said second die plate **107** gradually inclined **108** along said path of travel from a first horizontal plane **109** below the plane of the engaging surface **114** of said first die plate **106** to a plane **111** above the engaging surface **114** of said first die plate **106** for folding the edge of said margin flap **49** inwardly of itself to form a second edge hem **51**; and

i. a shaped bar **121** for holding said folded hems in position under each fabric piece prior to sewing.

4,003,324
END TRIMMER

Oliver C. Tate, Darien, and Oliver J. Tysver, Flossmoor, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,177
Int. Cl.² B21D *51/26*
U.S. Cl. 113—7 R **4 Claims**

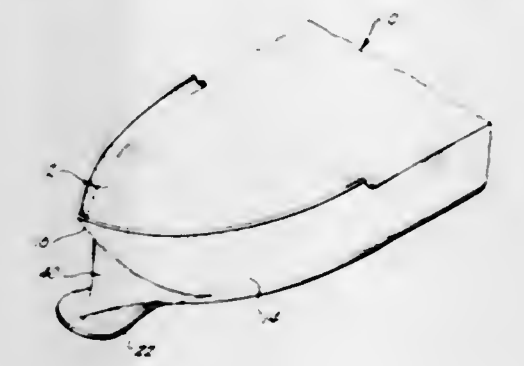


1. A can trimming machine including a stationary frame, a rotatable shaft, a spindle mounted on an end of said shaft for rotation about a longitudinal axis, a ring-shaped replaceable inner knife on said shaft coaxial with said spindle for rotation therewith, a replaceable stationary outer knife removably mounted on the frame in cooperative shearing relation with said inner knife to trim a can body to a predetermined length, said knives being sharpenable with attendant dimensional reduction axially of the shaft, said spindle and said frame having axially immovable counterfacing alignment surfaces thereon, means for reestablishing and maintaining said spindle in a predetermined axial relation to said shaft and said alignment surface on said frame subsequent to variation of the dimensions of said knives, and adjustable means for reestablishing and maintaining the cutting faces of said knives in abutting relation to said alignment surfaces, said spindle being attached to said shaft by a bolt or similar member and said spindle spacing means comprising a precisely dimensioned spacer fitting mounted on said member between said shaft and said spindle, said knife spacing means comprising a collar mounted on said shaft, said collar being axially adjustable relative to said shaft, and said inner knife is sleeveably mounted on said collar and movable with respect thereto.

4,003,325
CARGO VESSEL LOW RESISTANCE BOW

Rudolph A. Allen, 1419 Second West, No. 303, Seattle, Wash. 98119

Filed Mar. 24, 1975, Ser. No. 561,290
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.² B63B *1/00*
U.S. Cl. 114—56 **13 Claims**



1. A vessel hull comprising, in combination with a bow portion thereof including forwardly convergent sides joined to

a bottom, a generally horizontally disposed wave-making plate, of a thickness a small fraction the height of the bow portion positioned generally coplanar with and forwardly of the hull bottom, said plate having a forward edge portion and aft thereof a portion of maximum transverse width several times its thickness and less than the width of the bow portion, behind which portion of maximum width the width of the plate extending aft decreases not less than by about one-fourth the maximum width at a location forwardly of the hull, and strut means joined to the bow portion structurally supporting said plate in said position, said strut means permitting water flowing relatively aft over the plate to diverge outwardly into parallel laminar flow relative to water flowing past the hull portion and downwardly over the width-reducing portion of the plate so as to pass under the hull bottom in parallel laminar flow relative to water flowing past the hull bottom directly.

4,003,326

APPARATUS FOR ASSEMBLING HULL MODULES FOR SHIPBUILDING

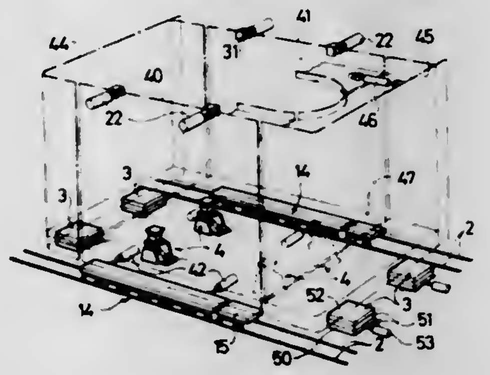
Hideharu Horii, and Tadashi Orimoto, both of Ichiharashi, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1974, Ser. No. 529,072

Claims priority, application Japan, Dec. 5, 1973, 48-138332

Int. Cl.² B63B *3/00*

U.S. Cl. 114—65 R **2 Claims**



1. Apparatus for assembling hull modules for shipbuilding, including upright, longitudinal assemblies, an upright deck assembly and a bottom assembly, comprising opposed cars to support a pair or upright longitudinal assemblies respectively at their bottom portions, said each car having a chassis adapted to be moved in the vertical and horizontal directions, opposed supporting means to support upright deck assembly and bottom assembly respectively and operable to be moved in the vertical and horizontal directions to permit assembly thereof with said longitudinal assemblies, and means to grip upper portions of said longitudinal assemblies and operable to be retracted from the gripping position, each car chassis being supported by a plurality of vertical oil cylinders which are communicated with each other through a common valve which is opened to enable the chassis to float on the oil in the cylinders and to permit tilting of the chassis, and separate oil cylinders to adjust the longitudinal tilt of said chassis and to laterally displace the chassis.

4,003,327

MONOLITHIC SHIP'S BODY OF STEEL CONCRETE OR PRESTRESSED CONCRETE

Ulrich Finsterwalder, Munich, Germany, assignor to Firma Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

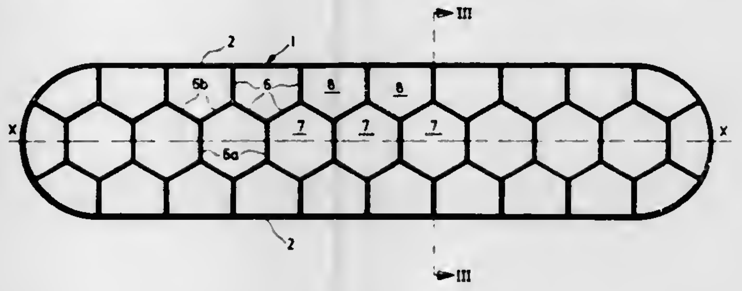
Filed Aug. 21, 1975, Ser. No. 606,483

Claims priority, application Germany, Aug. 29, 1974, 2441376

Int. Cl.² B63B *35/44*

U.S. Cl. 114—65 A **10 Claims**

1. A monolithic ship's body formed of concrete, said body comprising a hull including a bow, a stern, elongated side walls extending between the bow and stern and a bottom interconnecting said bow, stern and side walls, said hull having a longitudinal axis extending from said bow to said stern, a deck spaced above said bottom and interconnecting said bow, stern and side walls, said hull and deck forming an enclosed space, and bulkhead partitions positioned within the enclosed space extending upwardly from said bottom and in combination with said hull dividing the enclosed space into a number of compartments, wherein the improvement comprises that said bulkhead partitions are formed integrally with said hull, said bulkhead partitions are disposed in an hexagonal arrangement forming a grid symmetrically arranged with respect to the longitudinal axis of said hull, said bulkhead partitions comprising first partitions extending perpendicularly to the longitudinal axis of said hull, and second partitions interconnecting said first partitions and extending generally in the direction of the longitudinal axis and disposed at oblique angles to the longitudinal axis, said bottom of said hull in section extending transversely to the longitudinal axis has an undulating curved configuration with the downwardly facing surface thereof having alternating convex and concave portions, said second partitions extending in at least two zig-zag lines between said bow and stern with the downwardly facing surface of said bottom opposite the base of each said zig-zag line at the junction thereof with said bottom having a concave configuration and said first partitions are disposed in at least three laterally spaced apart longitudinally extending rows, each said longitudinally extending row having a centerline disposed in parallel with the longitudinal axis of said hull and the downwardly facing surface of said bottom aligned below each centerline of said longitudinally extending rows having a convex surface.



4,003,328

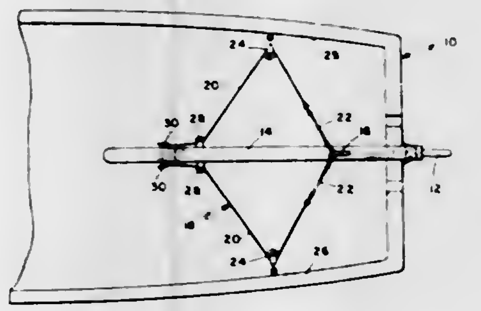
SELF-STEERING APPARATUS FOR SAILBOATS

Daniel P. Feldman, 3677 Baseside Lane, San Diego, Calif. 92109

Filed May 12, 1975, Ser. No. 576,852

Int. Cl.² B63H *25/00*

U.S. Cl. 114—144 R **7 Claims**



1. In a sailboat having, an elongated tiller bar connected to a rudder and pivoted at the aftermost end thereof and extending substantially forward therefrom, a self-steering mechanism comprising:

a. sheave means comprising a pair of sheaves mounted respectively on opposite sides of said sailboat in an area thereof generally laterally aligned with said tiller;

b. line means comprising a pair of length-adjustable lines each:

i. having an aft end attached to an aft portion of said tiller and

ii. passing forwardly through a respective one of said sheaves, and

iii. having a forward end attached to a forward portion of said tiller such that each of said line means together with the portion of the tiller between the points of attachment of said line means substantially define a triangle forward of the pivot point of said tiller;

c. one of said means being resilient to permit said tiller to move when said lines are taut whereby upon water pressure being exerted upon said rudder and said tiller responding thereto a resistance to tiller movement is achieved by the shifting of said line means through said sheaves and the resultant shifting of the triangle defined by said line means and said tiller.

4,003,329

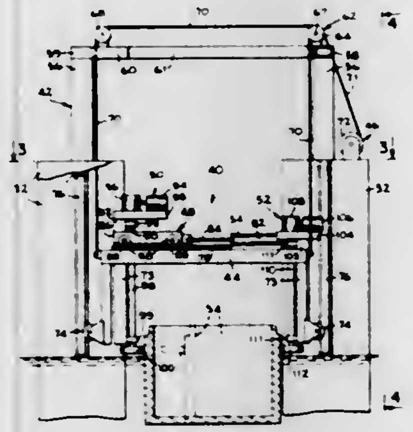
COMBINATION POSITIONING AND PROPELLING APPARATUS FOR BARGES

Horace John Robinson, Dublin, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed July 26, 1973, Ser. No. 382,784

Int. Cl.² B63B *21/56*

U.S. Cl. 114—242 **3 Claims**



1. A combination positioning and propelling mechanism assembly for moving barges through a bulk material loading or unloading facility, the combination comprising:

a. a fixed supporting structure secured to piers on each side of a channel through which the barges pass, the structure having a pair of towers on each side of the channel extending vertically above the barge in the highest position of the barge, a pair of longitudinal beams connecting the top of the pair of towers on each longitudinal side of the channel and a pair of transverse beams spanning the channel and connecting the tops of oppositely positioned towers, the towers, the longitudinal beams and the transverse beams forming a single rigid rectangular supporting structure;

b. a liftable bridge spanning the channel and having a rectangular structural frame supported to move vertically within said fixed supporting structure and to be guided by fixed guide rails attached to the piers from a raised non-operating position above the barge to a lowered operating position;

c. a wire rope hoisting system including a drum shaft assembly having three drums on a common shaft rotatably supported on one longitudinal beam, a pair of spaced wire rope sheaves rotatably supported on the other longitudinal beam, a power driven drum type hoist unit mounted on one pier adjacent one of the towers, four wire rope cables, one end of each cable being secured to a corner of said liftable bridge, two of the cables passing vertically upward and over the sheaves then passing transversely to a first and second drum on the three drum shaft assembly, the other two cables passing vertically upward directly to the first and second drums, a fifth wire rope cable connected to a third drum of the three drum shaft assembly passes to the hoist unit, whereby operation of the hoist unit raises and lowers said bridge;

d. a wheeled carriage operating on a pair of horizontal longitudinally spaced rails mounted on one lateral end of said liftable bridge, said carriage movable transversely of the channel;

e. reciprocable power means mounted on said bridge and connected to said carriage providing linear motion to move said wheeled carriage on the horizontal rails of said bridge transversely of the channel;

f. at least one adjustable propelling mechanism unit mounted on said movable carriage, said propelling mechanism unit comprising an elongated vertical shaft rotatably supported from said carriage and extending below said bridge, a traction wheel mounted on the lower end of the vertical shaft and a first power means attached to said carriage and connected to the vertical shaft to reversibly rotate the shaft and the traction wheel, said propelling mechanism unit being adjustable transversely of the channel for positioning the traction wheel against the vertical side of the barge by moving said carriage; and

g. at least one non-adjustable propelling mechanism unit mounted on the other lateral end of said bridge from said adjustable propelling mechanism, said non-adjustable propelling mechanism comprising an elongated vertical shaft rotatably supported from and extending below said bridge, a traction wheel mounted on the lower end of the vertical shaft, and a second power means to reversibly rotate the shaft and the traction wheel, whereby when said bridge is lowered to bring the traction wheels in position vertically adjacent the upper portion of the barge, and said carriage is moved laterally to bring the traction wheel on said adjustable propelling mechanism unit into contact with the side of the barge, the barge is positioned between said fixed and adjustable propelling mechanism units and rotation of the traction wheels in their proper direction will propel the barge longitudinally in the channel.

4,003,330

MARINE ENGINE MOUNT

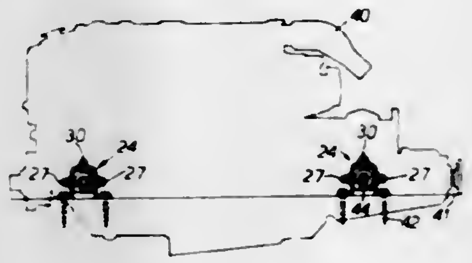
Jack Bernard Spencer Compton, Crawley, England, assignor to Silentbloc Limited, Crawley, England

Filed Oct. 2, 1975, Ser. No. 618,820

Claims priority, application United Kingdom, Oct. 3, 1974, 42962/74

Int. Cl.² B63H *21/30*

U.S. Cl. 115—.5 B **5 Claims**



1. A flexible mounting comprising:
a rigid inner member,
an intermediate flexible layer formed in at least one part and positioned around the inner member,
an outer member surrounding the flexible layer,
a support member which has mounting surfaces which, when the mounting is in use, contact the surface to which the mounting is mounted,
the support member also having opposed parallel walls which extend generally at right angles to the mounting surfaces of the support member, and between which the outer member is located,
and clamping means for clamping the outer member to the

support member at any selected one of various positions which are spaced apart along the parallel walls in the direction at right angles to the mounting surfaces of the support member,

the rigid inner member having a bore which extends generally parallel to the parallel walls and to the mounting surfaces, for receiving a member which is to be supported while allowing rotational adjustment of the member within the bore.

4,003,331
EXHAUST VALVE ASSEMBLY FOR PREVENTING INGRESS OF WATER TO AN OUTBOARD MARINE ENGINE

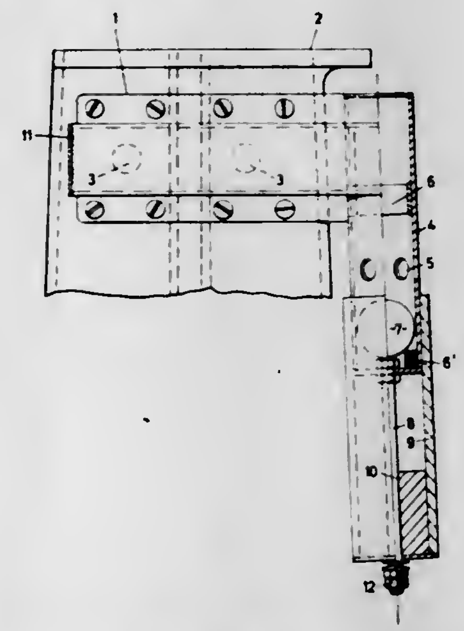
Michael Brian Jervis Brinton, East Cowes, England, assignor to R. N. L. I. (Trading) Limited, England

Filed July 30, 1975, Ser. No. 600,304

Claims priority, application United Kingdom, Aug. 1, 1974, 34031/74

Int. Cl.² B63H *21/32, 21/26*

U.S. Cl. 115—17 **6 Claims**



1. An automatic valve assembly for preventing ingress of water to a gas-flow housing of an outboard marine engine in the event of a capsize, comprising a gas manifold for attachment to said housing and having a gas-flow opening, a gas-flow tube secured to said manifold at the location of said gas-flow opening and having its interior communicating with said gas-flow opening, said gas-flow tube being oriented approximately vertically and having at least one gas-flow port in its tube wall at a location spaced vertically from its communication with said gas-flow opening of said manifold, a movable valve member mounted on said tube and normally resting in a position where said port is unobstructed by it, which valve member is slidable relatively to said tube to a closed position where it obstructs said port if the valve assembly is inverted, and gravity-actuated valve-operating means mounted on said tube to operate said valve member and slide it into the closed position upon inversion of the assembly.

4,003,332
INFORMATION DISPLAY DEVICE

Arthur Berge, Kilian Zollsgatan 5, 217 56 Malmo, Sweden

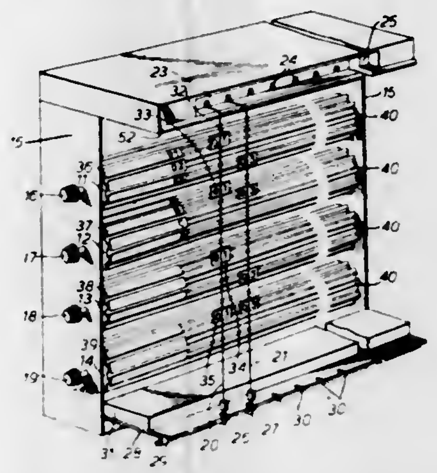
Filed June 25, 1975, Ser. No. 590,131

Claims priority, application Sweden, Dec. 16, 1974, 7415297

Int. Cl.² G09F *11/02*

U.S. Cl. 116—131 **3 Claims**

1. A device for displaying a program and its progress, the program being constituted by respective program factors of at least three groups of different types, of which at least two are distributed on at least two rolls, one of said groups of program factors being common to all the other program factors, said device comprising a plurality of indicator support rolls with axes spaced apart and parallel to each other and lying in the same plane, means for mounting said rolls for selective rotation with respect to one another about their axes, scale means outside the rolls and disposed parallel to the common plane of the axes of the rolls, each of said rolls having a plurality of tracks structurally integral with the rolls and extending parallel to the axes of the rolls, indicator means slidably mounted on the tracks, each of the indicator means having thereon a visible indicium the visible indicium indicating the different types of program factors and indicating the interrelationship between the different types of program factors on each of said rolls, one group of sequentially arranged indicia indicating the program factor common to the other program factors, said sequentially arranged indicia being associated with said scale means and the visible indicium indicating the different types of other program factors being in alignment with respective ones of the sequentially arranged indicia on one of the indicator support rolls, said scale means comprising a plurality of spaced parallel elongated indexing members that lie in a common plane parallel to but spaced from the plane of said axes, said indexing members being perpendicular to said axes.



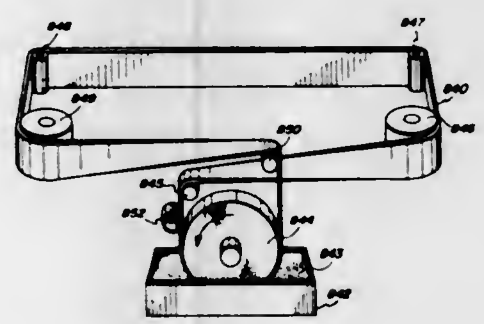
4,003,333
DEVELOPMENT SYSTEM

Roger H. Eichorn, deceased, late of Webster, N.Y., by Lincoln First Bank of Rochester, executor, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,337

Int. Cl.² G03G *13/08*

U.S. Cl. 118—653 **1 Claim**



1. Apparatus for transporting particulate development material from a container to a remote location comprising:

a. a rotatable electrically grounded drum member adapted to be at least partially submerged in the particulate material in the container;

b. means to rotate said drum member;

c. an electrically insulating belt member in the form of a moebius strip wrapped partially around said drum member, said belt member comprising:

a layer of electrically conductive material on the drum member contacting side of said belt member;

a layer of electrically insulating material contacting one surface of the layer of electrically conductive material;

an electrically continuous screen pattern of electrically conductive material contacting the free surface of said layer of electrically insulating material;

d. rotatable guide means supporting the remainder of said belt member in a plane substantially parallel to the axis of said drum member, whereby one surface of said belt member never contacts said drum member or said guide means; and

e. charging means adjacent said drum member for placing a substantially uniform electrostatic charge upon said belt member.

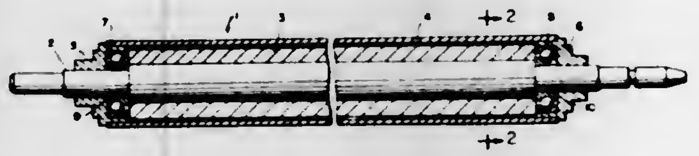
4,003,334
DEVELOPER ROLLER FOR ELECTROSTATIC COPIER

Abe Samuels, Chicago, and Roger Wiggerman, McHenry, both of Ill., assignors to Speed-O-Print Business Machines Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 630,790, Nov. 11, 1975. This application Dec. 22, 1975, Ser. No. 643,012

Int. Cl.² G03G *15/09*

U.S. Cl. 118—658 **10 Claims**



1. In an electrostatic photocopy machine, wherein a single component magnetic toner material is collected on the surface of a developer roller from a source of said material and transferred to electrically charged image areas on the surface of a copy sheet moving in a plane adjacent thereto, an improved developer roller construction which comprises a shaft mounted for rotation, an axially extending magnetic core surrounding said shaft and divided into axially extending segments, wherein adjacent segments have opposite polarity, and producing a uniform magnetic field, and an outer shell surrounding said magnetic core in spacial relation thereto, said shell and core being rotatable relative to each other thereby to collect uniformly the single component toner material on the surface of said shell during rotation of one of said shell or core, said shell being electrically non-conductive, thereby to resist attack by chemicals in said toner which tend to create imperfections in the surface of said shell which cause poor reproduction of copies.

4,003,335
DEVELOPING MATERIAL APPLICATOR

Takaji Kurita, Kawachinagano, and Takao Fujiwara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1975, Ser. No. 572,292

Claims priority, application Japan, May 21, 1974, 49-57540

Int. Cl.² G03G *15/09*

U.S. Cl. 118—658 **7 Claims**

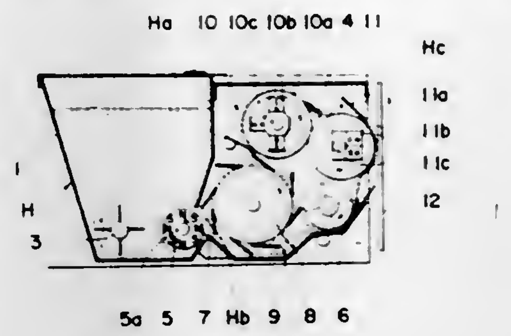
1. An apparatus for use in a photo-electrostatic copying machine for delivering toner particles carried by magnetizable carrier beads to develop an electrostatic latent image formed on an image-receiving surface, said apparatus comprising:

first compartment means within said copying machine for containing therein only said toner particles;

second compartment means adjacent said first compartment means for containing a mixture of said toner particles and said carrier beads therein, said compartment having a first opening into said first compartment means and a second opening adjacent said image receiving surface;

applicator means within said second compartment means adjacent said second opening for developing the electrostatic latent image formed on said image receiving surface; and

a rotatable replenishing means between said first opening and said applicator means for removing said toner particles from said first compartment means and contacting said toner particles with said carrier beads contained in said second compartment means, for delivering said toner particles and carrier beads to said applicator means, and for recirculating said carrier beads within said second compartment means to said toner particles coming from said first compartment means after said toner particles and carrier beads are delivered to said applicator means.



4,003,336
DEVICE FOR THE MAGNETIC ORIENTATION OF MAGNETIC RECORDING MEDIA

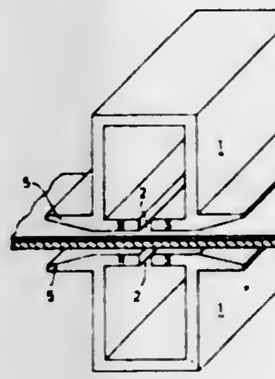
Eberhard Koester, Frankenthal; Paul Deigner, Weisenheim; Roland Falk, Achern; Karl Uhl, Frankenthal, and Dieter Schaefer, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 13, 1975, Ser. No. 604,129

Claims priority, application Germany, Aug. 27, 1974, 2440920

Int. Cl.² B05C *11/00*

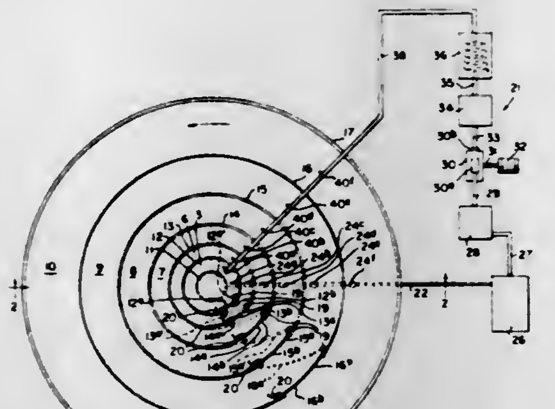
U.S. Cl. 118—640 **2 Claims**



1. A device for magnetically orienting anisotropic magnetic particles in magnetic recording media consisting of a non-magnetic base and a magnetic coating containing the said particles dispersed in a solidified non-magnetic organic binder, the base carrying the fluid dispersion of the said particles in the said binder being passed through a magnetic field, such device comprising:

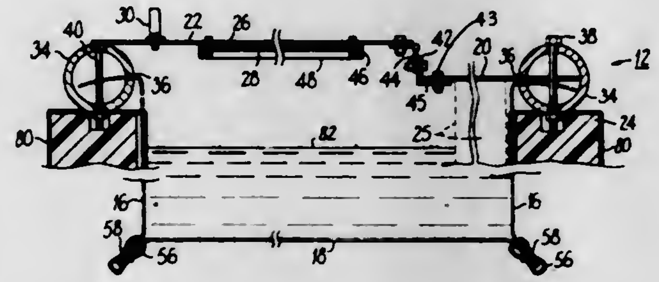
two magnetic circuits having one air gap each, the air gaps of both circuits being parallel to and opposite each other and being arranged in parallel planes on either side of said base and symmetrically with respect to the plane of the magnetic coating, the direction of the lines of magnetic force in the air gaps of both circuits running in the same direction as the direction of motion of the base and parallel thereto, the edges of said magnetic circuits adjacent to the base carrying the fluid dispersion being provided with screening elements whose distance from each other increases as the screening elements extend away from the edges of the magnetic circuits.

4,003,337
FISH GROWING TANK AND METHOD
Kerry Lamar Moore, 2215 Ann, Monroe, La. 71201
Filed Oct. 23, 1974, Ser. No. 517,033
Int. Cl.² A01K *61/00*
U.S. Cl. 119—3 **2 Claims**



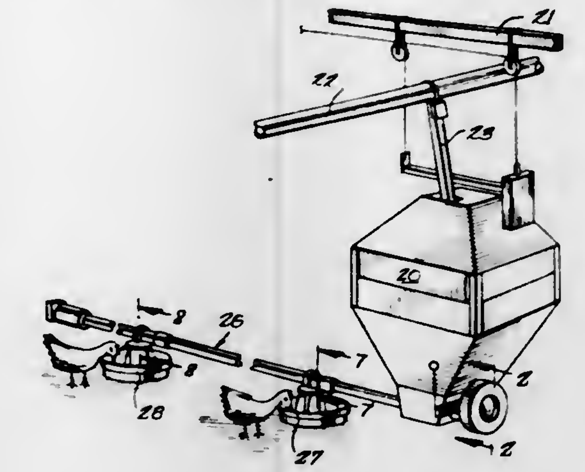
1. Apparatus for raising aquatic life forms comprising: a tank; a plurality of concentric tank walls of progressively larger radius in said tank forming annular compartments of increasing volume, said tank walls inwardly of the outer wall, each having an opening formed therein to allow movement of aquatic life forms between the compartments; a plurality of doors; means pivotally securing a door over each of said openings; said means arranged such that each door pivots inwardly of each compartment to form a transverse barrier between adjacent tank walls. ,

4,003,338
AQUATIC ANIMAL CAGE AND FABRICATION METHOD
Gregor N. Neff, Dobbs Ferry, N.Y., and Paul C. Barrett, Homestead, Fla., assignors to Gregor N. Neff, Dobbs Ferry, N.Y.
Filed Jan. 29, 1975, Ser. No. 545,149
Int. Cl.² A01K *63/00*
U.S. Cl. 119—3 **20 Claims**



1. A cage for aquatic animals, said cage comprising an upper peripheral frame including an elongated netting support member having a re-entrant cross-sectional shape and a longitudinally extending gap formed therein, said gap opening towards the interior of said frame, netting material forming a basket depending from said frame, said netting material having upper edges and said upper edges extending laterally outwardly of the remainder of the netting material into said gap with said remainder of the netting material extending downwardly from said upper edges and gap at substantially right angles to the plane of the gap, clamping means extending through said support member and said upper edges of said netting material generally transversely of the plane of said gap for clamping the edges of the support member at said gap upon, and holding, said upper edges of said netting, and floatation means secured to said upper frame to float said cage upon a body of water with said basket immersed in the water.

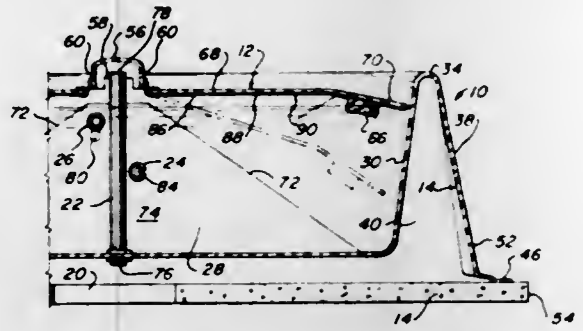
4,003,339
METHOD AND APPARATUS FOR DELIVERING LARGE QUANTITIES OF FEED AND THE LIKE
Eldon Hostetler, Middlebury, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.
Filed Nov. 6, 1972, Ser. No. 303,977
Int. Cl.² A01K *5/02*
U.S. Cl. 119—52 AF **2 Claims**



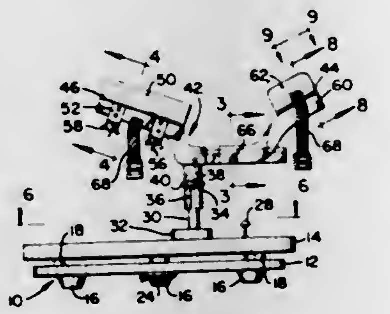
1. A poultry feeder comprising a high capacity conveyor extending from a source of supply of mixed poultry feed to a plurality of spaced apart feeding stations of simultaneously delivering generally uniform quantities and mixtures of said feed to said plurality of feed stations, said conveyor including an elongated generally horizontally disposed hollow tube having a predetermined internal diameter, said tube having a plurality of spaced outlet holes disposed in a helical array therealong and respectively associated with successive feeding stations, said holes being arranged so that the helical array starts adjacent said source of feed supply and at one side of the tube as viewed from an end of the conveyor remote from said source of supply and finishes generally at the bottom of the tube, all of said holes between the start and the finish of said array being substantially at said one side of the tube and means for imparting to the feed mixture a generally helical rolling and mixing motion extending generally circumferentially in a direction extending from said one tube side toward the bottom around and longitudinally of the tube and thereby substantially simultaneously projecting generally uniform quantities of the feed through all of the outlet holes, said means comprising an extended pitch centerless auger rotatably disposed in said tube and having a diameter substantially the same as said internal diameter, and drive means connected with the auger for rotating the auger at a speed for obtaining said rolling and mixing motion of the feed, said tube having a nominal diameter of about one and one-half inches, said centerless auger having a nominal pitch of about two and one quarter inches, and said drive means having an output driving said auger at about 354 r.p.m.

4,003,340
STOCK WATERING TROUGH AND STEPPED BASE THEREFOR
James H. Kuzara; Norman L. Feck, and Vincent P. Johnston, all of Sheridan, Wyo., assignors to J-K Mfg. Co., Inc., Sheridan, Wyo.
Filed Mar. 31, 1975, Ser. No. 558,971
Int. Cl.² A01K *7/00*
U.S. Cl. 119—73 **7 Claims**

1. A stock watering trough comprising: upstanding side and end walls cooperating with one another and with a bottom wall to define an open-topped reservoir; lid-supporting means bridging the side walls intermediate the end walls; means for filling and for draining said reservoir located therein beneath the lid-supporting means; lid-forming means hingedly attached to said lid-supporting means for tiltable movement between a closed horizontally-disposed position covering the open top of said reservoir and an open position depressed down into the latter, said lid-forming means in open position cooperating with said side and bottom walls to define a barrier effective to deny a drinking animal access to said means for filling and draining said reservoir; and, submersible float means fastened to the underside of said lid-forming means effective to normally maintain the latter in closed position when said reservoir is full.



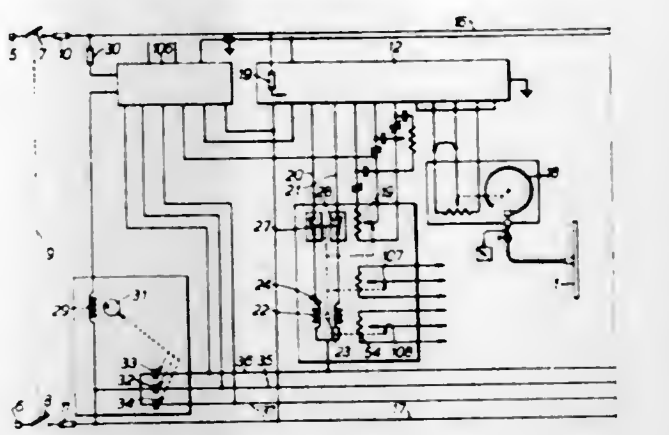
4,003,341
GROOMING STAND FOR PETS
Francis A. La Croix, 436 Pearl St., Marine City, Mich. 48039
Filed July 3, 1975, Ser. No. 593,033
Int. Cl.² A61D *3/00*
U.S. Cl. 119—103 **2 Claims**

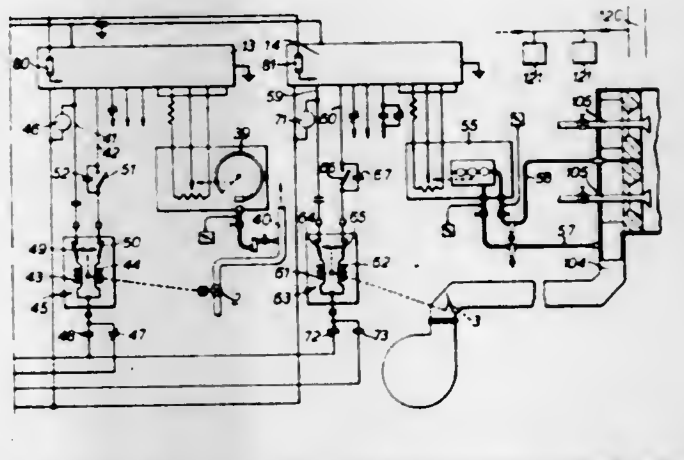


1. A grooming stand for pets comprising a stationary base, a series of balls rollably mounted in the upper side of the stationary base, a table rotatably supported on the balls, an annular array of openings in the upper side of the stationary base, a spring loaded locking pin in the rotatable table for selective engagement in the annular array of openings in the stationary base, a vertically adjustable upright support on the rotatable table, and a cradle on the upright support for holdably receiving a pet.

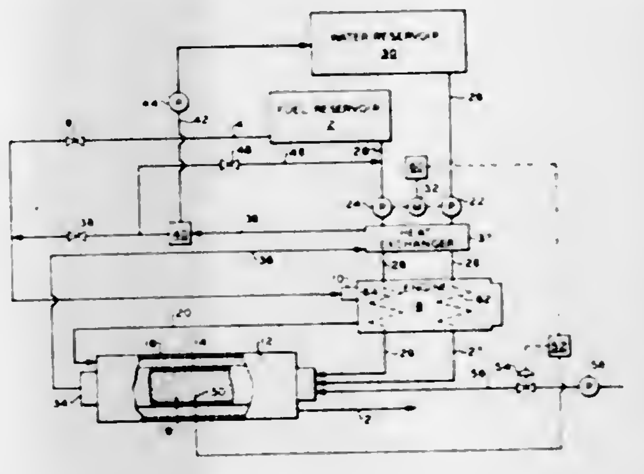
4,003,342
AUTOMATIC CONTROL SYSTEM
Stanley Cyril Hodgson, London, England, assignor to Tank Sapp (UK) Ltd., London, England
Filed Mar. 27, 1975, Ser. No. 562,990
Claims priority, application United Kingdom, Mar. 29, 1974, 14091/74
Int. Cl.² F23N *3/00*
U.S. Cl. 122—448 R **13 Claims**

1. An automatic control system for controlling a first variable quantity which depends on second and third variable quantities, including means for setting a set value of the first quantity, means for measuring the actual value of the first quantity, a comparator for comparing the actual value of the first quantity with the set value, means for setting a set value of the second quantity, means for measuring the actual value of the second quantity, means for setting a set value of the third quantity, means for measuring the actual value of the third quantity, individual controls for each of the second and third quantities for adjusting them to accord with the respective differences between their actual values and their set values, and a control responsive to a difference between the set and actual value of the first quantity for modifying the set values of the second and third quantities, which responsive control includes a timer motor, and respective on/off switch means between the timer motor and each of the setting means for the second and third quantities.





4,003,343
METHOD AND APPARATUS FOR MAINTAINING THE OPERATING TEMPERATURE IN A DEVICE FOR REDUCING ENGINE EXHAUST POLLUTANTS
Roy C. Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 4, 1975, Ser. No. 565,088
Int. Cl.² F02C *43/08*
U.S. Cl. 123—3 **8 Claims**

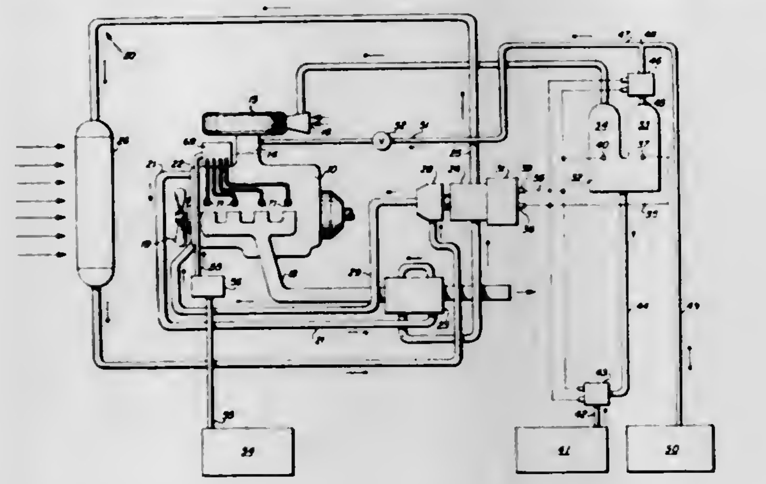


1. In a method for operating an engine with reduced pollutants in the exhaust of said engine in which water and a liquid hydrocarbon fuel for an engine are passed through a catalytic bed, increasing the temperature of the material in contact with the catalytic bed by indirect heat exchange with the exhaust from the engine, steam reforming the fuel, and thereafter passing the reformed fuel to the engine for operating the engine the improvement of

1. passing water and liquid hydrocarbon fuel in indirect heat exchange with the block of the operating engine and then
2. passing said water and hydrocarbon fuel through said catalytic bed.

4,003,344
FUEL REGENERATED NON-POLLUTING INTERNAL COMBUSTION ENGINE

Curtis E. Bradley, 4517 Calle Vengura, Phoenix, Ariz. 85018
Division of Ser. No. 456,974, April 1, 1974, Pat. No. 3,939,806. This application Oct. 6, 1975, Ser. No. 620,022
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **5 Claims**

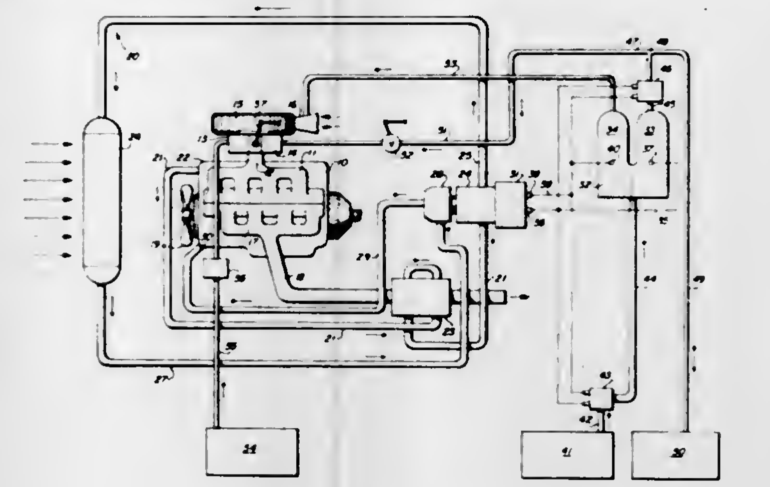


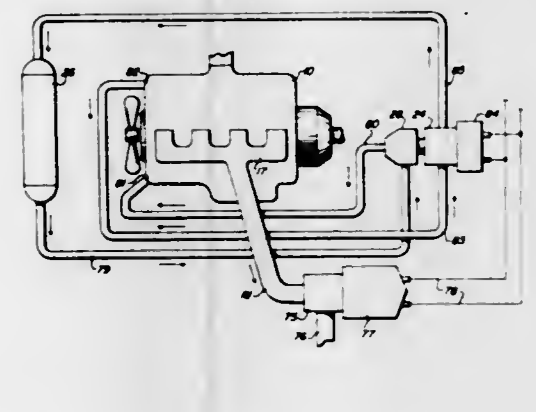
1. In an internal combustion engine of the diesel type,
a. an engine block having a plurality of combustion chambers;
b. an exhaust pipe extending from said block;
c. a closed system for a working fluid including a pump for circulating the working fluid through the system, a turbine which is operated by the working fluid when in a gaseous state and a condenser for returning the working fluid from a gaseous state to a liquid;
d. a heat exchanger disposed about said exhaust pipe and through which said closed system passes to derive heat from the exhaust pipe and heat the working fluid;
e. a generator driven by said turbine to produce a DC electric current;
f. an electrolysis cell containing water and connected to said generator so that the DC current therefrom decomposes the water into oxygen and hydrogen;
g. a water tank for supplying water to said electrolysis cell;
h. a hydrogen carburetor on said engine block for delivering hydrogen to said combustion chambers;
i. a conduit extending from said electrolysis cell to said hydrogen carburetor which conveys hydrogen from the cell to the carburetor;
j. a fuel tank for a hydrocarbon fuel, and
k. fuel injectors on said engine block communicating with said combustion chambers and connected to the hydrocarbon fuel tank.

4,003,345
FUEL REGENERATED NON-POLLUTING INTERNAL COMBUSTION ENGINE

Curtis E. Bradley, 4517 Calle Vengura, Phoenix, Ariz. 85018
Division of Ser. No. 456,974, April 1, 1974, Pat. No. 3,939,806. This application Oct. 6, 1975, Ser. No. 620,023
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **2 Claims**

1. In an internal combustion engine,
a. an engine block;
b. an exhaust pipe extending from said block;
c. a turbo-generator comprising a turbine communicating with said exhaust pipe to be powered by exhaust gases emanating from said exhaust pipe and a generator driven by said turbine and producing a DC current;
d. an electrolysis cell containing water and connected to said generator so that the DC current therefrom decomposes the water into oxygen and hydrogen;
e. a water tank for supplying water to said electrolysis cell;
f. a hydrogen carburetor on a engine block for delivering hydrogen to a combustion chamber in said block;
g. conduit extending from said electrolysis cell to said hydrogen carburetor which conveys hydrogen from the cell to the carburetor;
h. a hydrocarbon fuel carburetor on said engine block and connected to said hydrocarbon fuel tank, and
i. linkage connected to said carburetors and operable to vary the ratio of hydrogen and hydrocarbon fuel which is introduced into the combustion chamber of said engine block.



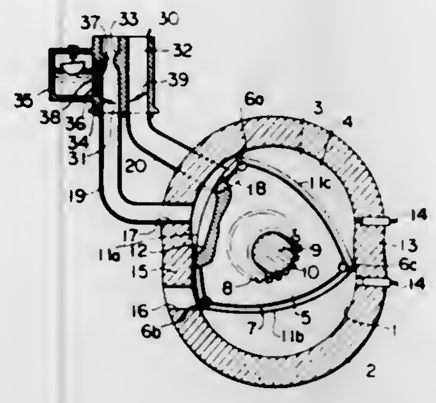


4,003,346
ROTARY PISTON INTERNAL COMBUSTION ENGINE

Toshiyuki Kohno, Toyoake, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Oct. 15, 1974, Ser. No. 514,906
Claims priority, application Japan, June 24, 1974, 49-71426; July 11, 1974, 49-78721
Int. Cl.² F02B *53/04*
U.S. Cl. 123—8.13 **6 Claims**

1. A rotary engine comprising, in combination, a rotor housing defining interiorly thereof a rotor chamber enclosed by a trochoidally shaped peripheral wall and a pair of side walls, a rotor mounted for rotation in a given direction within said rotor chamber, said peripheral wall including a pair of short-axis portions each having a leading end taken in a direction forwardly of rotor rotation, a peripheral port extending through one of said short-axis portions at the leading end thereof and opening into said rotor chamber through said peripheral wall, a side port opening into said rotor chamber through one of said side walls, said rotor operating to open and close said side port and said peripheral port during rotation thereof, said side port being located proximate said peripheral port forwardly thereof taken in the direction of rotor rotation with said side port being arranged relative to said

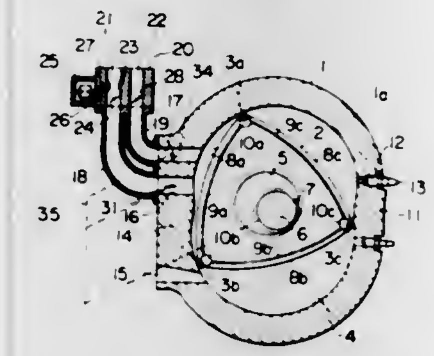
peripheral port to remain open for a period of time after closing of said peripheral port during rotation of said rotor.



means for delivering a fuel mixture into said rotor chamber through said peripheral port and means for delivering air into said rotor chamber through said side port.

4,003,347
ROTARY PISTON ENGINE

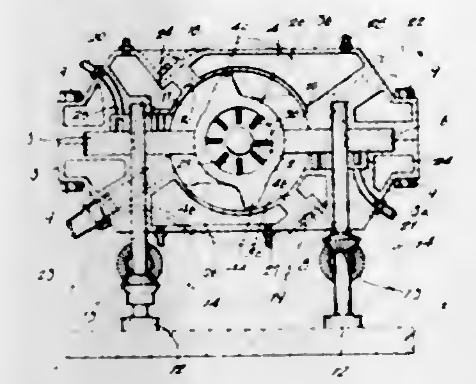
Yoshio Sasaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Feb. 28, 1975, Ser. No. 554,106
Claims priority, application Japan, Sept. 26, 1974, 49-109985
Int. Cl.² F02B *53/06*
U.S. Cl. 123—8.13 **7 Claims**



1. A rotary engine comprising a rotor housing defining interiorly thereof a rotor chamber bounded by a trochoidally-shaped inner peripheral wall of said housing, a rotor mounted for rotation in a given direction within said rotor chamber, said inner peripheral wall including a pair of minor axis portions and defining together with said rotor a plurality of combustion chambers therebetween, a first port and a second port both opening into said rotor chamber through one of said minor axis portions closely adjacent each other but spaced apart in the direction of rotor rotation, said second port being located forwardly of said first port relative to said given direction of rotor rotation, means for delivering a first flowing fluid consisting of a rich fuel mixture into said rotor chamber through said first port, means for delivering into said rotor chamber through said second port a second flowing fluid which is leaner than said first fluid, first valve means arranged to open and close fluid flow through said first port, second valve means arranged to open and close fluid flow through said second port, and means for controlling operation of said first and said second valve means to effect delivery into said combustion chambers of said first and second fluids in relationship to the rotation of said rotor to introduce said first fluid into a leading end portion of each of said combustion chambers taken relative to the direction of rotation of said rotor and to introduce said second fluid into a trailing end portion of each of said combustion chambers.

4,003,348
ROTARY INTERNAL COMBUSTION ENGINE

Yukimasa Suzuki, 357, Kawawa-cho, Hamamatsu, Shizuoka, and Rikuro Arai, Room No. 3, Kojimaso, 20-8, Minami-Yahata 3 chome, Ichikawa, Chiba, both of Japan
Filed Dec. 23, 1974, Ser. No. 535,712
Claims priority, application Japan, Dec. 28, 1973, 49-4105
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.31 **7 Claims**



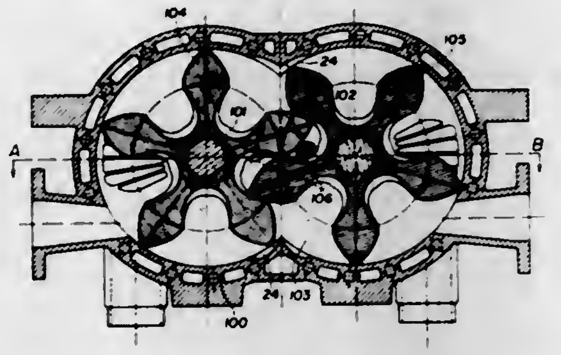
1. A rotary motor device comprising a casing having an internal substantially cylindrical cavity, a rotor within said casing cavity having a shaft extending coaxially therewith and mounted for rotation therein, said rotor having at least two, similarly formed, twisted and sloping recesses therein separated from each other by wall portions which extend substantially to the surface of the casing cavity, at least two disc members mounted for rotation in said casing about axes normal to the axis of said rotor and each positioned so as to project partially into the casing cavity at annularly spaced areas thereof, the peripheries of said disc members being largely circular but cut away at one side to provide a propeller-like twisted and sloped face whereby to enter and leave the ends of the twisted and sloping recesses of said rotor as the rotor and disc members are simultaneously rotated at predetermined synchronized speeds, means for synchronizing the rotation of said disc members with the rotation of said rotor, each of said disk members having a shaft for rotatably supporting the same, said shafts extending normal to the axis of rotation of the rotor shaft, said casing including at least one fuel-feeding passage for feeding fuel to the rotor recesses, said passage being situated adjacent one of the disk members and including a duct extending from outside the casing past the shaft of its nearest disk member and opening into the cavity of said casing, valve means on the shaft of said nearest disk member for rotation therewith and extending into the gas-feeding passage, said valve means being constructed for connecting and disconnecting the duct to the opening into the casing cavity upon rotation of said shaft, at least one ignition plug mounted in said casing with the end thereof adjacent to, but recessed from the periphery of the cylindrical cavity.

4,003,349
ROTARY PISTON ENGINE

Leopold v. Habsburg-Lothringen, Gabelsbergerstr. 15, 8000 Munich 2, Germany
Filed Sept. 4, 1975, Ser. No. 610,300
Claims priority, application Germany, Sept 18, 1974, 2444482; Oct. 3, 1974, 2447249
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.47 **10 Claims**

1. In a rotary piston engine of the type including a housing defining a pair of parallel, intersecting cylinders and having a precompression region in the vicinity of said intersecting cylinders, and a pair of rotors affixed to parallel shafts extending coaxially in said cylinders, each rotor having a plurality of cycloidal lobes, the rotors being positioned, so that their lobes intermesh to form chambers of variable volume operating as compression and expansion zones; the improvement comprising pressure compensation recesses in the cylinder walls in the

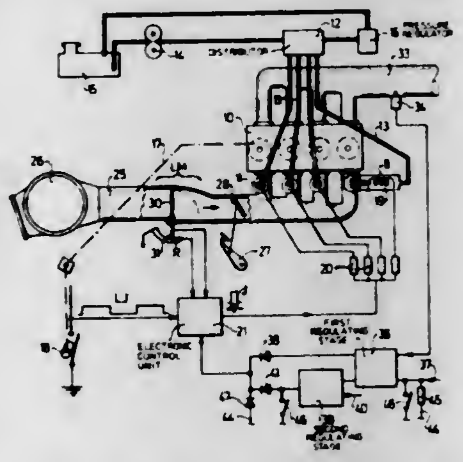
regions of the intersection of the intersecting cylinders, said pressure compensating recesses being arranged to be effective



in said compression zone and in said expansion zone, and a fuel injection port in said housing in the precompression region thereof.

4,003,350
FUEL INJECTION SYSTEM

Hermann Eisele, Vaihingen; Otto Glöckler, Renningen, and Rudolf Schwammle, Korntal, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Sept. 18, 1975, Ser. No. 614,768
Claims priority, application Germany, Oct. 10, 1974, 2448306
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **7 Claims**

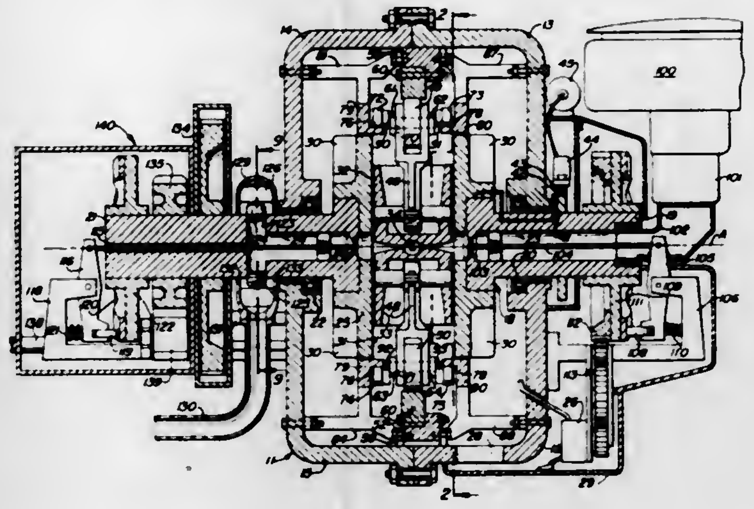


1. In a fuel injection system for an internal combustion engine having integral action regulation for influencing the fuel-air mixture supplied to the engine, and an oxygen sensor disposed in the exhaust gas flow from the engine and producing an output voltage indicative of the oxygen content of the exhaust gas, the improvement comprising:

a. a first regulating stage to which a nominal voltage is applied, said first regulating stage being connected to the oxygen sensor for receiving the output voltage of the oxygen sensor, and for producing an output voltage which is a function of both the nominal voltage and the output voltage of the oxygen sensor;
b. a second regulating stage to which a nominal voltage is applied, said second regulating stage being connected to the first regulating stage for receiving the output voltage of the first regulating stage, and for producing an output voltage which is a function of both the nominal voltage applied to the second regulating stage and the output voltage of the first regulating stage;
c. means for superimposing the output voltages of the first and second regulating stages;
d. an electronic control unit connected to the means for superimposing the output voltages of the first and second regulating stages for receiving the superimposed voltages as an input; and
e. adjustable means connected to the electronic control unit for receiving the output voltage from the electronic control unit and varying thereby the fuel quantity injected and consequently the fuel-air mixture, wherein the regulating range and regulating time constant of the first regulating stage is lower than the regulating range and regulating time constant of the second regulating stage.

4,003,351
ROTARY ENGINE

William E. Gunther, 2200 High St., Apt. 868, Cuyahoga Falls, Ohio 44221
Filed June 2, 1975, Ser. No. 582,648
Int. Cl.² F02B *57/00*
U.S. Cl. 123—44 R **14 Claims**

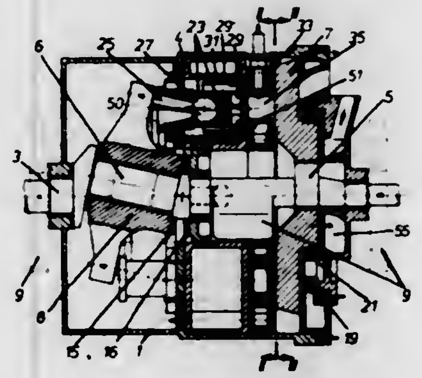


1. A rotary engine comprising:
a housing;
a central power shaft establishing an axis through said housing and having first and second sections, each of said sections rotatably mounted in said housing;
a rotating block connected between said first and second sections of said central power shaft;
at least one cylinder within said rotating block;
at least two pistons mounted within said rotating block communicating with said cylinder such that upon ignition said pistons are urged radially outwardly from the axis of said central power shaft;
piston rods connected to said pistons;
means for transmitting the radially outward movement of said pistons to said rotating block thereby imparting a rotational movement thereto including;
 a cycle cam circumscribing said rotating block;
 cycle cam followers carried by said piston rods and engaging said cycle cam;
 actuator arms connecting said cam followers to said rotating block;
 at least one retention cam mounted within said housing and concentric with said power shaft;
 a retention cam follower for each said piston;
 a lever arm connecting said retention cam follower to said rotating block;
 means for biasing said lever arm with respect to said actuator arm whereby said cycle cam follower is maintained against said cycle cam at all times;
a fuel intake system;
an exhaust system; and,
an ignition system.

13. A rotary engine comprising:
a housing;
a central power shaft establishing an axis through said housing and having first and second sections, each of said sections rotatably mounted in said housing;
a rotating block connected between said first and second sections of said central power shaft;
at least one cylinder within said rotating block;
at least two pistons mounted within said rotating block communicating with said cylinder such that upon ignition said pistons are urged radially outward from the axis of said central power shaft;
piston rods connected to said pistons;
means for transmitting the radially outward movement of said pistons to said rotating block thereby imparting a rotational movement thereto;
a fuel intake system;
an exhaust system; and,
an ignition system including:
 means for generating a spark;
 an ignition plug;
 a housing carried by said rotating block for said plug having a removable cap in electrical contact with said plug;
 a radially extending disc nonrotatably mounted on said power shaft and in electrical contact with said plug;
 a radially extending disc nonrotatably mounted on said power shaft and in electrical contact with said means for generating a spark; and,
 an insulated ignition conductor means carried by said power shaft in electrical contact with said radially extending disc and said cap for transmitting a spark from said means for generating to said ignition plug.

4,003,352
LONGITUDINAL-STROKE INTERNAL COMBUSTION ENGINES

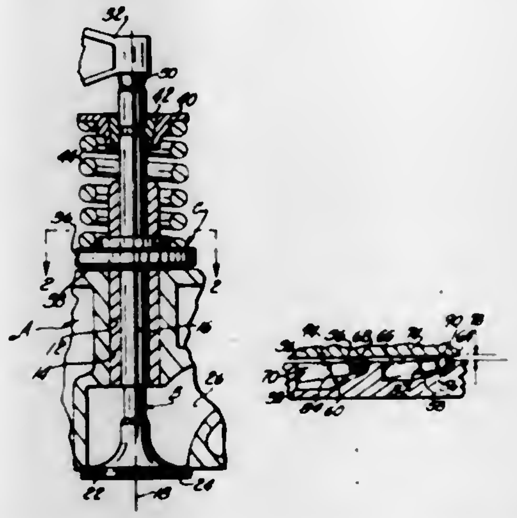
Nikolaj Wladimir Rogojew, Schoenburgstr. 42/6, 1040 Vienna, Austria
Filed Dec. 5, 1974, Ser. No. 529,828
Claims priority, application Austria, Dec. 12, 1973, 10160/73
Int. Cl.² F02B *57/04*
U.S. Cl. 123—58 B **18 Claims**



1. In an internal combustion engine having a housing with which externally accessible suction and exhaust ports are associated, a crankshaft supported in the housing for rotation about a first axis, a cylinder block having an odd number of cylinders distributed around the first axis, the cylinders respectively containing pistons reciprocable along a second axis parallel to the first axis, means connected to the crankshaft for operating the pistons, means carried by the crankshaft for successively effecting communication between the suction and exhaust ports and successive ones of the cylinders, the communication effecting means comprising, in combination, a first apertured member having a plurality of gas exchange channels therethrough corresponding to and in fixed communication with the respective cylinders in the cylinder block, each gas exchange channel terminating at a planar first face of the first apertured member remote from the cylinder block, a second apertured member having a planar second face parallel to and engageable with the first face of the first apertured member, the second apertured member having a plurality of suction and exhaust channels for providing communication between the second face and the suction and exhaust ports, means for supporting one of the first and second apertured members about the first axis, means supporting the other one of the first and second apertured members for rotation about a third axis parallel to the first axis, and gear means cooperatively disposed on the housing and on said other apertured member for orbiting said other apertured member about the first axis as it rotates about the third axis, the improvement in which both the suction and exhaust ports terminate in at least one plane parallel to and spaced from the second face, and in which the second apertured member comprises at least one third planar face parallel to and engageable with the terminating plane of the suction and exhaust ports, each third face being parallel to and axially spaced from the second face, the suction and exhaust channels extending through the second apertured member between the respective second and third faces thereof.

4,003,353
VALVE ROTATOR

Max J. Tauschek, South Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio
Filed Apr. 23, 1975, Ser. No. 570,637
Int. Cl.² F01L *1/26*
U.S. Cl. 123—90.23 **20 Claims**



1. A mechanism for converting axial motion of an elongated stem in a guide member into rotational motion of the stem comprising; first and second parts mounted coaxially on said stem for movement toward and away from one another in axial directions along a longitudinal axis and for rotational movement relative to one another about said axis in opposite rotational directions, said stem being rotatable in response to rotation of one of said parts and the other of said parts being fixed against axial and rotational movement relative to said longitudinal axis, rotation imparting means positioned between said parts for imparting a predetermined angular degree of relative rotation to said parts in one of said rotational directions in response to axial movement therebetween in one of said axial directions and for imparting a different angular degree of relative rotation to said parts in the other of said rotational directions in response to axial movement therebetween in the other of said axial directions.

4,003,354
MEANS AND METHOD FOR CONTROLLING THE OCCURRENCE AND THE DURATION OF TIME INTERVALS DURING WHICH SPARKS ARE PROVIDED IN A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Robert E. Canup, Chester, Va., assignor to Texaco Inc., New York, N.Y.
Filed Dec. 19, 1974, Ser. No. 534,254
Int. Cl.² F02P *5/08*
U.S. Cl. 123—117 R **9 Claims**

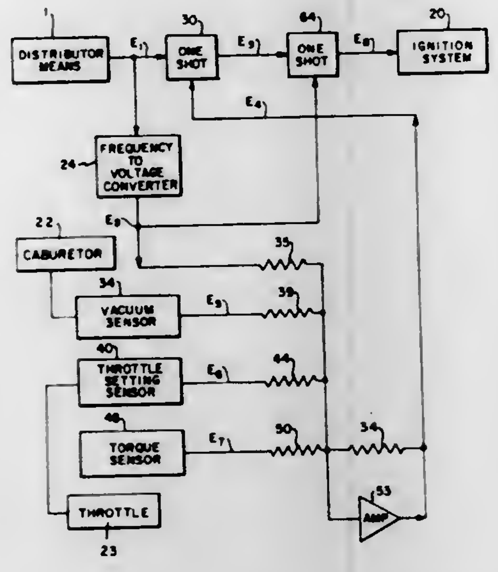
1. In a multicylinder internal combustion engine having a crankshaft, a system for controlling the occurrence and duration of time intervals during which sparks are provided in said engine, comprising
 pulse source means for providing pulses having a repetition rate corresponding to the rotational speed of the crank shaft being driven by the internal combustion engine,
 frequency-to-voltage converter means connected to the

pulse source means for providing a voltage whose amplitude corresponds to the repetition rate of the pulses from the pulse source means,

a plurality of sensing means for sensing different operating parameters associated with the internal combustion engine,

control signal means connected to all the sensing means and to the converter means for providing a control signal in accordance with the signals from the sensing means and the voltage from the converter means,

first pulse signal means connected to the distributor means and to the control signal means for providing a first pulse signal in accordance with the pulses from the distributor means and the control signal, the widths of the pulses in the first pulse signal control the times of occurrence of the spark time intervals,



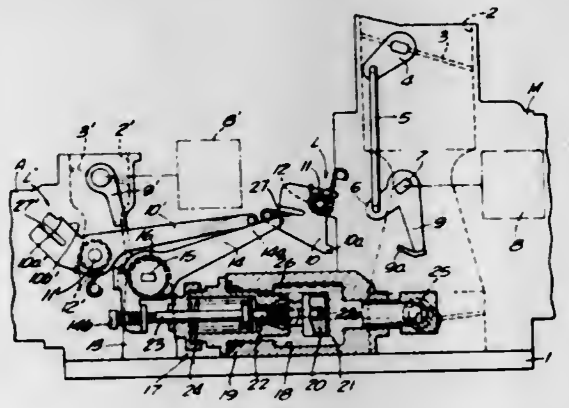
second pulse signal means connected to the first pulse signal means and to the converter means for providing a second pulse signal in accordance with the first pulse signal and the widths of the pulses in the second pulse signal control the durations of the spark time intervals, and the voltages from the converter means, and

means connected to the second pulse signal means for providing sparks to cylinders in the engine in a predetermined manner in accordance with the second pulse signal.

4,003,355
CARBURETOR CHOKE VALVE CONTROL DEVICE

Takashi Kamezaki, and Masahiko Iiyama, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1975, Ser. No. 593,009
Claims priority, application Japan, July 5, 1974, 49-76484
Int. Cl.² F02M *1/10*
U.S. Cl. 123—119 F **6 Claims**

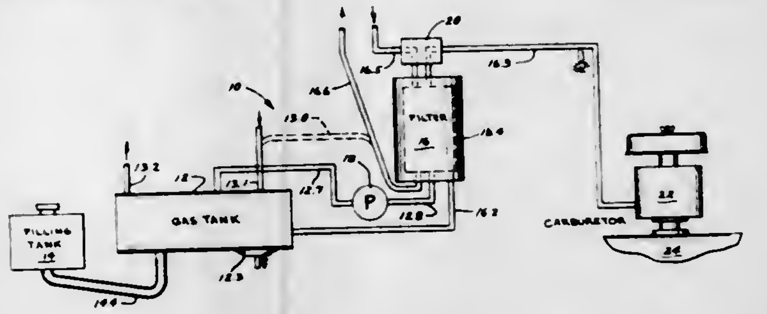


1. For use with an internal combustion piston engine in which each cylinder is provided with a combustion chamber, a choke valve assembly comprising, in combination: a carburetor for supplying an air-fuel mixture to the combustion chambers, said carburetor having a choke valve and an arm connected to operate the choke valve, a thermo-responsive device for operating said choke valve, a locking element having a shoulder, said shoulder adapted to engage the arm to lock said choke valve in open position, a relatively weak spring acting to move said locking element toward an operative position in which said shoulder engages said arm, a bell crank having a first end operatively connected to the locking element and a second end, a relatively strong spring acting on said bell crank to move said locking element against said weak spring to an inoperative position in which said locking element disengages said arm, an engine temperature responsive device operatively connected to the second end of said bell crank, so that when engine temperature is high said device turns said bell crank against said relatively strong spring whereby said shoulder is moved to the operative position.

4,003,356
VAPORIZED FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Harry E. Naylor, Minneapolis, Minn., assignor to Harry E. Naylor, Minneapolis, Minn.; Flora L. Naylor, Belle Vernon, Pa.; John L. Naylor, East Chicago, Ind.; Joseph Naylor, Belle Vernon, Pa.; Lucille E. Hannan, Clairton, Pa.; Eliza M. Naylor, Belle Vernon, Pa. and Daniel Hannan, Clairton, Pa.

Filed Mar. 12, 1975, Ser. No. 557,774
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 E **13 Claims**



1. Gasoline delivery apparatus for delivering vaporized gasoline free from air and gasoline droplets to an internal combustion engine, comprising a gasoline receptacle; filler means for maintaining the receptacle free of air while permitting the addition of gasoline to the receptacle and maintaining within the receptacle a vapor space above the liquid gasoline level; a heater for heating the gasoline within the receptacle and having an expanded surface extending upwardly into the vapor space; a pump communicating with the vapor space in the receptacle for producing a vacuum in the latter to urge evaporation of gasoline from the expanded surface, and to compress the gasoline vapors; a filter communicating with the high pressure side of the pump to remove gasoline droplets from the vapors compressed by the pump; and means for conveying the filtered gasoline vapors to an internal combustion engine; the gasoline receptacle, pump and filter being sealed from contact with the atmosphere, whereby the gas vapors so delivered are air-free.

4,003,357
CARBURETION SYSTEM FOR INTERNAL COMBUSTION MOTOR

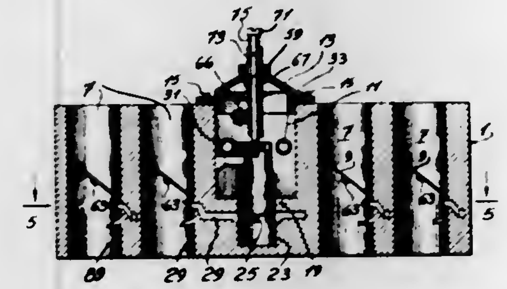
Istvan Furucz, 3964 Saint-Denis, Montreal, Quebec, Canada

Filed Jan. 21, 1975, Ser. No. 542,858
Claims priority, application Canada, Jan. 22, 1974, 190804
Int. Cl.² F02M *11/00*
U.S. Cl. 123—127 **19 Claims**

1. Carburetion system for internal combustion motor having a predetermined number of motor cylinders, said system comprising:

A. a carburetor comprising:
   a. a body provided with a number of carburetion chambers which is equal to the number of motor cylinders of the motor to which said body is intended, said body being provided with a motor fuel reservoir, each chamber having means for controlling admission of air therein;
   b. a primary circuit individually feeding each carburetion chamber from said reservoir;
   c. a control mechanism connecting said means for controlling admission of air and feed of said primary circuit to provide a constant volume ratio of a mixture comprising motor fuel and air which is formed in the carburetion chamber; and
   d. a secondary circuit, which is independent from said carburetion chamber, said secondary circuit adapted to directly feed said motor cylinder with an excess of motor fuel from said reservoir;

B. a heat exchanger connected to said carburetor and comprising:
   a. a body provided with a number of independent heat exchange compartments which is equal to the number of carburetion chambers, each compartment being connected to one said chamber so that the mixture carried out in one chamber flows directly into an appropriate compartment;
   b. means to bring combustion gases from said motor around said compartments in order to evaporate the fuel of the mixture which flows therein;
   c. a secondary circuit, which is independent from said compartments and is connected to the secondary circuit of said carburetor for directly feeding said motor cylinders with an excess of fuel;
   d. an admission block connected to said body of said heat exchanger comprising independent admission chambers each being connected to one of said compartments, each chamber being provided with means connecting said chamber also with one of said motor cylinders as well as with said secondary circuit of said heat exchanger in order to enable feeding of each motor cylinder with a mixture of motor fuel and air and with an excess of motor fuel.

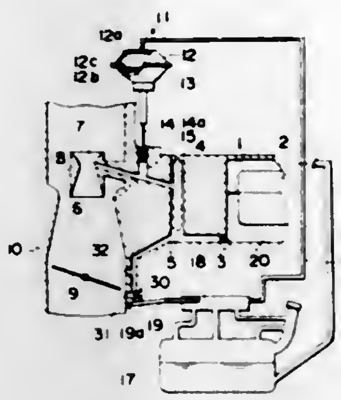


4,003,358
CONTROL SYSTEM FOR CONTROLLING AN AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINE

Yasuo Tatsutomi, and Toru Maeda, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Aug. 27, 1974, Ser. No. 501,197
Int. Cl.² F02M *37/02*
U.S. Cl. 123—136 **8 Claims**

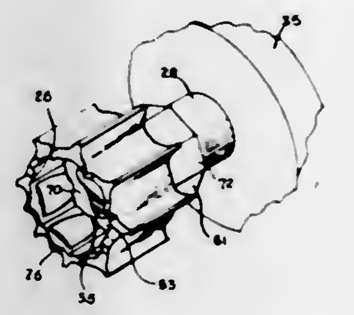
1. In combination, an internal combustion engine having at least one combustion chamber and an intake conduit means communicating between a source of air and said one combustion chamber, and having a throttle valve in said intake conduit means; a fuel tank means having a space in which fuel which has vaporized can collect, and fuel supply means having fuel passage means connected to said fuel tank for receiving fuel from said fuel tank and connected to said intake conduit means or the combustion chamber for feeding fuel in response to the engine operating condition; and a fuel control system comprising: vapor discharge means connected between said intake conduit means downstream of said throttle valve and said space in said fuel tank means for supplying vaporized fuel from said space directly to said intake conduit means; control passage means; and a diaphragm valve assembly having a diaphragm member defining first and second working chambers, said first chamber being in communication with one of the ends of said control passage means, the other end of said control passage means being in communication with the space in said fuel tank, said second chamber being in communication with the atmosphere, and a valving rod having one end connected to said diaphragm member and the other end situated in said fuel passage means, said valving rod being movable by movement of said diaphragm when the pressure inside said first chamber exceeds a predetermined value for controlling the flow in said fuel passage means.



4,003,359
FLUX WHEEL FOR BREAKERLESS DISTRIBUTOR RETROFIT

Bill J. Hays, 15112 Adams St., Midway City, Calif. 92655

Filed Feb. 11, 1974, Ser. No. 441,651
Int. Cl.² F02P *1/00*
U.S. Cl. 123—146.5 A **11 Claims**



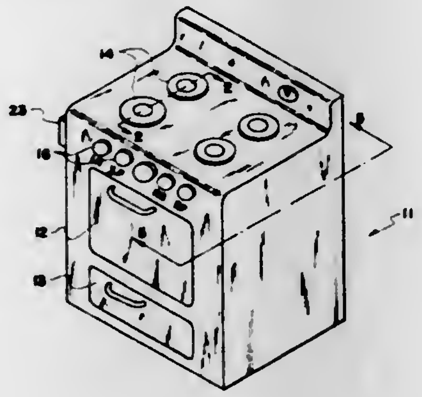
1. In a distributor of an internal combustion engine having multiple combustion chambers, which distributor receives a distributor shaft bearing a cam having a number of lobes evenly spaced thereon corresponding to the number of said combustion chambers, a breaker plate mounted beneath said cam and rotatable about said distributor shaft and supporting an induced voltage coil and magnetic assembly, the improvement which comprises:

a pulse wheel comprising a one-piece, integral, generally cylindrical body of a ferro-magnetic metal having an axial through opening with a polygonal cross-section and interior side walls generally conforming to the exterior surfaces of said cam; a plurality, corresponding in number to the number of lobes of said cam, of upstanding axial ribs equally spaced about the periphery of said wheel; and retaining means for securely supporting said wheel on said cam in the form of a continuous wedge-shaped inward protrusion integral with and substantially coextensive with at least one of said interior side walls rigidly secured to and carried on said cam with said wedge-shaped protrusion being press-fitted into binding engagement with and broached by the exterior side surfaces of said cam.

4,003,360
ELECTRIC IGNITION SYSTEM

Charles D. Branson, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 20, 1975, Ser. No. 633,732
Int. Cl.² F23Q *7/12*
U.S. Cl. 126—39 E **9 Claims**



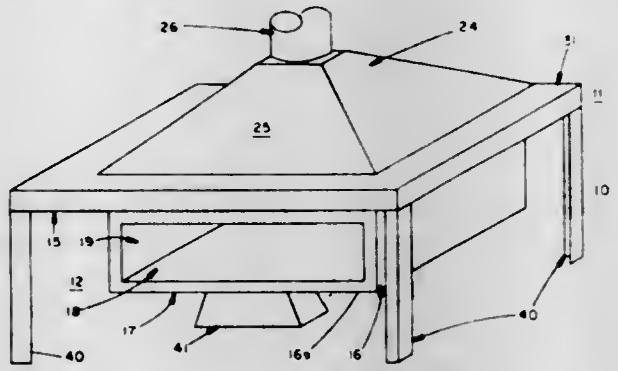
1. In an electric ignition system for a gas cooking range having electrically conductive side and interior walls and including at least one burner, a gas control valve for regulating the flow of gaseous fuel to said burner, and an electric resistance igniter positioned to ignite said gaseous fuel at said burner when energized, the improvement comprising:

circuit means operated by said valve means for simultaneously energizing said igniter when said control valve is turned on, said circuit means providing two electrically conductive paths connected to said igniter, a portion of one of said electrically conductive paths including the walls of said range.

4,003,361
FIREPLACE ASSEMBLY WITH VARIABLE APPEARANCE

Keith M. Schutt, 1330 E. Rand Road, Des Plaines, Ill. 60016

Filed Apr. 5, 1974, Ser. No. 458,082
Int. Cl.² F24B *1/18*
U.S. Cl. 126—120 **5 Claims**

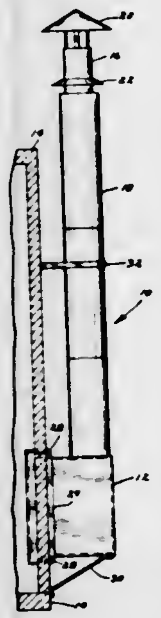


1. A free standing fireplace assembly of a mantel member and a fire box member said mantel member being adapted for joining with the firebox member and interchangeable with mantel members of different design configurations whereby different mantel members may be interchangeably joined with one firebox member to create a variety of different appearances for the assembly, wherein the mantel member comprises a slab-like configuration having a slot which extends through the mantel member from the top surface to the bottom surface and opens to the rear of the mantel member and which receives a mating portion of the firebox member and thereby locks the firebox member and mantel member together as a unitary assembly and wherein the firebox member comprises downwardly extending, interconnected closure panels joined together at a lower portion thereof by a bottom closure panel to define an interior fire chamber and which has a shelf extension at the upper portion thereof extending horizontally outwardly from and around the perimeter of the firebox member said shelf extension being the mating portion received by sliding action into and within the slot of the mantel member said mantel member having a supporting collar positioned at a lower position of the slot and extending horizontally inwardly and about the perimeter of the slot and housed within an open groove formed within the bottom surface of the mantel member and adjacent and about the slot, said groove having a depth sufficient so that the bottom surface of the collar member is flush with the adjacent bottom surface of the mantel member wherein the shelf extension of the firebox slidably rests upon the supporting collar of the mantel member in a supporting arrangement when the mantel member and firebox member are joined together as a unitary assembly, said mantel member is joined with support means which extend downwardly from the mantel member and rest upon a bearing surface so as to support both the mantel member and the firebox member when joined therewith as a unitary assembly.

4,003,362
FIREPLACE

Joseph H. Lener, Rte. 2, Box 252, Grantsburg, Wis. 54840

Filed June 19, 1975, Ser. No. 588,188
Int. Cl.² F24B *7/02*
U.S. Cl. 126—121 **8 Claims**

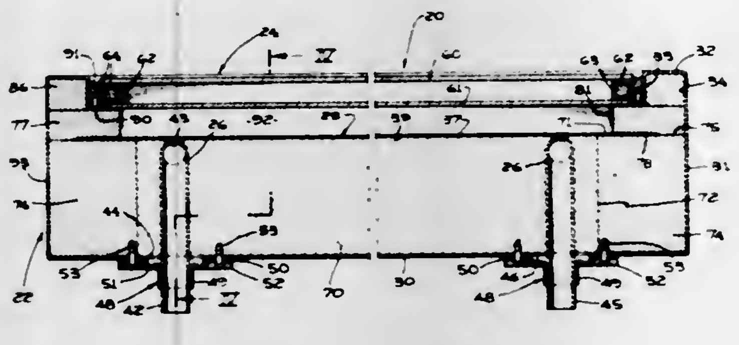


1. A heating unit assembly for use in a closed structure having at least one upright wall provided with an opening therethrough, said heating unit assembly including a heating unit mounted in said opening and having a vertical heating unit face plate inside of said closed structure, said heating unit also including a firebox extending outwardly from said closed structure wall, said firebox being open to the interior of said closed structure through said heating unit face plate, and including a substantially horizontal upper wall, an open top stack providing a flue open to an upper portion of said firebox and extending vertically upward from said upper firebox wall to position outside of said closed structure and in spaced relation to said upright structure wall, a first casing means in surrounding, spaced relation to said firebox and in integral sealing relation to said heating unit face plate to provide an inner passageway between said firebox and said first casing means, a second casing means in surrounding, spaced relation to said first casing means and in sealing relation to said heating unit face plate to provide an outer passageway between said first and second casing means, an open top stack casing in surrounding spaced, concentric relation to the outside of said stack and open to position outside said structure, said stack casing being mounted on an upper portion of said second casing means so that the space between said stack and said stack casing is open to and forms a part of said outer passageway, there being a cooling air inlet through a bottom portion of said second casing means from outside said closed structure to said outer passageway, there being a heating air inlet conduit through said second casing means and open through a bottom portion of said first casing means from outside said closed structure to the inner passageway, and there being at least one heating air outlet provided through said heating unit face plate and opening from an upper portion of the inner passageway to the interior of said closed structure.

4,003,363
SOLAR PANEL CONSTRUCTION

Abraham Grossman, 9339 Rhea Ave., Northridge, Calif. 91325

Filed June 10, 1974, Ser. No. 477,811
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **14 Claims**



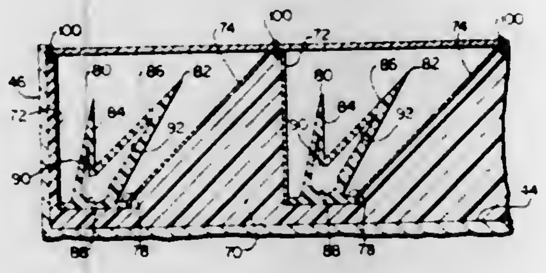
1. A solar panel construction comprising:

a receptacle having a bottom wall, an upstanding peripheral wall, and a top opening defined by said peripheral wall,
a solar collector plate supported below said top opeining;
said plate having tubular means in heat transmitting relation thereto for circulation of a fluid;
said tubular means having inlet and outlet means;
an energy transmitting means spaced above said collector plate in said top opening;
and means for yieldably mounting and maintaining said plate and energy transmitting means in sealed assembly with respect to said receptacle whereby differential expansion and contraction are compensated without impairing said sealed relation,
said mounting means including air permeable means.

4,003,364
SOLAR HEATING SYSTEM

Carl E. Balkus, Jr., 147 Deepwood Drive, Amston, Conn. 06231

Filed Feb. 26, 1975, Ser. No. 553,222
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **18 Claims**



1. A solar heating panel comprising:

a. a generally horizontally extending base,
b. a plurality of generally vertically extending reflective surfaces supported by said base,
c. a plurality of inclined reflective surfaces extending downwardly between said vertical surfaces and also supported by said base,
d. said reflective surfaces defining generally trapezoidally shaped upwardly open cavities therebetween which cavities are wider at their open tops than at their bottoms, and
e. fluid conduits at the bottoms of said cavities extending longitudinally of said cavities and also supported on said base,
f. said conduits each including at least one upwardly projecting fin oriented at an angle between said generally vertical reflective surface and said inclined reflective surface said conduit fabricated from and extruded plastic material, said fin integrally formed therein, and integrally formed flanges in said conduit for attaching said plastic conduit to said base and to absorb solar radiation reaching the bottom of its associated cavity.

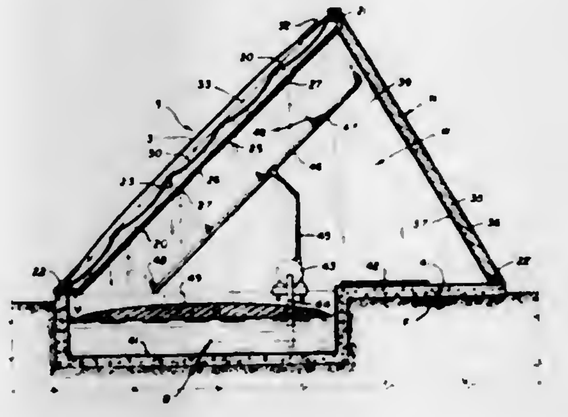
9. A solar heating panel comprising:

a. a generally horizontally extending base,
b. a plurality of generally vertically extending reflective surfaces supported by said base,
c. a plurality of inclined reflective surfaces extending downwardly between said vertical surfaces and also supported by said base,
d. said reflective surfaces defining generally trapezoidally shaped upwardly open cavities therebetween which cavities are wider at their open tops than at their bottoms, and
e. fluid conduits at the bottoms of said cavities extending longitudinally of said cavities and also supported on said base,
f. said conduits each including at least one upwardly projecting fin oriented at an angle between said generally vertical reflective surface and said inclined reflective surface and each said conduit fabricated from an extruded plastic material, and wherein said conduit has a fluid opening so defined that a portion of said opening extends upwardly into said fin and said fin having a generally triangular cross sectional shape such that one fin surface faces one of said reflective surfaces and the other fin surface is generally parallel to the other of said reflective surfaces.

4,003,365
STRUCTURE FOR COLLECTING SOLAR ENERGY

James B. Wiegand, Longmont, and John M. Freeman, Jr., Denver, both of Colo., assignors to Solar Energy Research Corporation, Denver, Colo.

Filed Sept. 23, 1974, Ser. No. 508,527
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**



1. Apparatus for collecting solar energy to heat a liquid, said apparatus comprising, in combination:

a. an enclosed structure having a solar wall angled upwardly from the horizontal at one side of the structure at an inclination exceeding 20° and oriented to receive solar energy;
b. a solar energy transmission sheet forming the outer face of the solar wall;
c. a solar energy absorbing sheet forming the inner face of the solar wall and being spaced from the transmission sheet a distance sufficient to provide an insulting air

space between the sheets, with the outward surface of the solar energy absorbing sheet facing the transmission sheet to receive and absorb solar energy transmitted therethrough and to be heated thereby and with the inward surface of the solar energy absorbing sheet facing the interior of the structure;

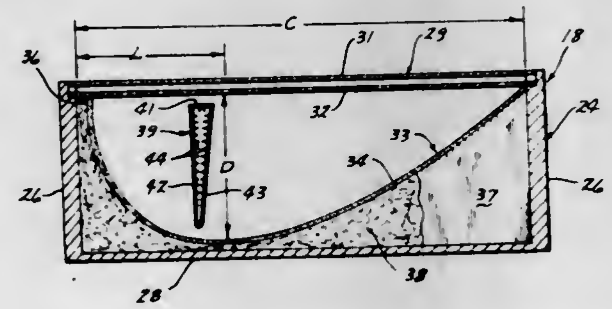
d. a pressurized liquid distribution system within the structure, including nozzles spaced from the solar wall and oriented to spray liquid across the space within the structure against substantially the entire inward surface of the solar energy absorbing sheet to wet this surface and thereby effect a transfer of heat from the solar energy absorbing sheet to the liquid sprayed thereon; and

e. a liquid reception basin within the structure below the heat absorption wall to receive liquid flowing from and off the solar energy absorbing sheet.

4,003,366

SOLAR HEAT COLLECTOR MODULE

Daniel J. Lightfoot, 415 N. Main St., Sigourney, Iowa 52591
Filed Dec. 11, 1975, Ser. No. 639,847
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A fixed position concentrating solar heat collector module for radiantly absorbing solar heat including:

a. an elongated housing having a transparent top wall,

b. a reflector of a concavo-convex hyperbolic shape having a concave reflecting surface,

c. said reflector positioned within and extended longitudinally of said housing with the concave reflecting surface thereof faced upwardly,

d. means in said housing for thermally insulating the convex surface of said reflector, and

e. a heat collector tube of an elongated triangular shape in transverse cross section longitudinally mounted within the lateral confines of the arc of said reflector having a base wall thereof positioned upwardly and one side wall thereof arranged substantially perpendicular to a chord extended between the extremities of the arc of said reflector and having a vertical dimension substantially equal to the maximum lateral dimension of the reflector.

4,003,367

STORAGE TYPE SOLAR WATER HEATER

Ilmar Velkko Wikholm, R.R. 2, Whitby, Ontario, Canada
Filed Dec. 15, 1975, Ser. No. 640,426
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **19 Claims**

1. A solar water heater comprising:

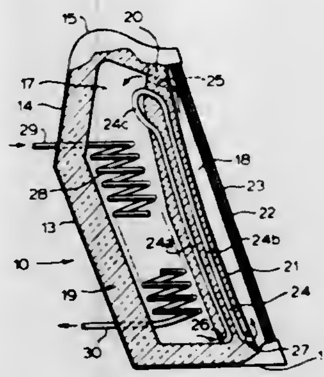
a unitary housing structure providing a liquid-filled thermal storage compartment and a liquid-filled heating compartment,

said housing structure providing a thermally insulating enclosure for said storage compartment, said thermally insulating enclosure including a base portion and a frontal wall portion extending upwardly therefrom,

a heat transmitting window peripherally sealed to said housing structure, the window being spaced from an exterior surface of said frontal wall portion and defining therewith said heating compartment, and

means defining a recirculation path for liquid extending downwardly through said storage compartment and upwardly through said heating compartment, said path defining means including:

means defining a first liquid flow passage extending through said frontal wall portion between a lower end of the portion of said circulation path extending through said storage compartment and a lower end of the portion of said circulation path extending through said heating compartment, said first liquid flow passage providing first and second duct portions extending upwardly within the insulation of the frontal wall portion from said lower ends, and an intermediate duct portion interconnecting said first and second duct portions,



means defining a second liquid flow passage extending through said frontal wall portion between an upper end of the portion of said circulation path extending through said heating compartment and an upper end of the portion of said circulation path extending through said storage compartment,

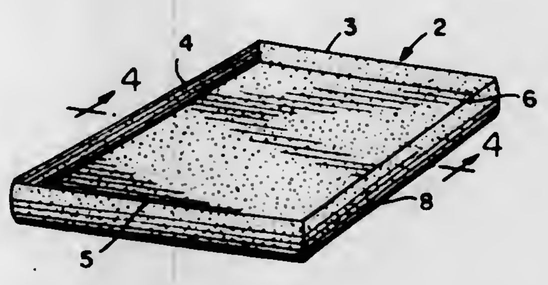
said recirculation path constituting a thermosiphon responsive to absorption of solar radiation transmitted via said window into the heating compartment, and

heating means in thermal contact with said intermediate duct portion of the first liquid flow passage for inhibiting reverse flow of liquid when the liquid in the heating compartment is cooler than the liquid in the storage compartment.

4,003,368

ARTICLE TRANSPARENT TO MICROWAVES AND PROCESS FOR MAKING SAME

John M. Maxel, St. Charles, Ill., assignor to Armco Steel Corporation, Middletown, Ohio
Filed June 27, 1974, Ser. No. 483,794
Int. Cl.^{2} C08F *43/08*
U.S. Cl. 126—390 **4 Claims**

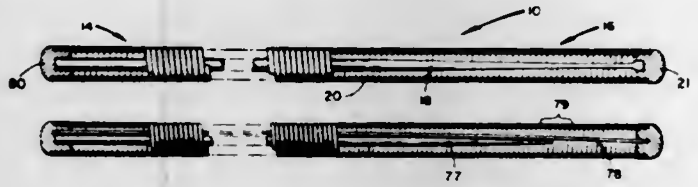


1. A molded burn-resistant article, for use in microwave ovens transparent to microwaves of 1915 to 2450 megahertz, said article having a maximum dielectric constant not greater than 5, having chemical resistance unaffected by detergents, having high abrasion resistance, and being essentially unbreakable under ordinary usage conditions in microwave ovens, and being obtained by molding a sheet molding composition consisting essentially of a mixture of an unsaturated cross linkable polyester of a dicarboxy acid and a dihydric alcohol, a cross linking inhibitor, a chemically inert powdered filler, a thermoplastic polymer, a cross linking monomer capable of cross linking with said polyester to form a thermosetting resin, cut bundles of glass filaments, a catalyst for the cross linking reactant, a thickening agent, and a mold release ingredient, said sheet molding composition containing 5% to 35% by weight of cut bundles of glass filaments ¼ inch to 3 inches long, between solid smooth heated dies at pressures and temperatures sufficiently high to cause cross linking between said polyester and said cross linking monomer.

4,003,369

ANGIOGRAPHIC GUIDEWIRE WITH SAFETY CORE WIRE

Marlin S. Heilman, Gibsonia, and Seid W. Waddell, Tarentum, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.
Filed Apr. 22, 1975, Ser. No. 570,999
Int. Cl.^{2} A61B *5/02*
U.S. Cl. 128—2 M **10 Claims**

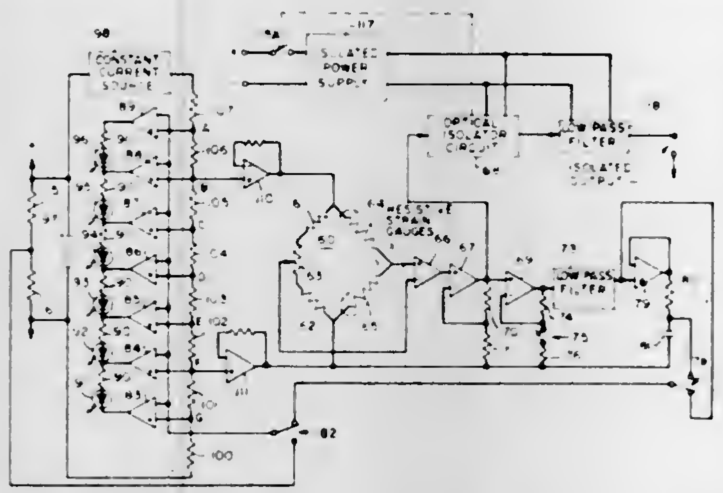


1. A guidewire adapted to guide a catheter into the body of a patient, the guidewire comprising: an elongated outer casing defined by an elongated rectangular flatwire having a width dimension and a height dimension less than said width dimension and having been wound into a coil spring wherein the surface of said outer casing is defined by consecutive coils of contacting widths; and a coating of coating material completely encasing the the flatwire which defines the coils of the coil spring; wherein said flatwire is coated prior to being wound.

4,003,370

BLOOD PRESSURE MONITOR SYSTEM AND METHOD

Tuncay Emil, Fountain Valley, and Kenneth Elmer Stack, Laguna Hills, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 14, 1975, Ser. No. 622,209
Int. Cl.^{2} A61B *5/02*
U.S. Cl. 128—2.05 D **15 Claims**

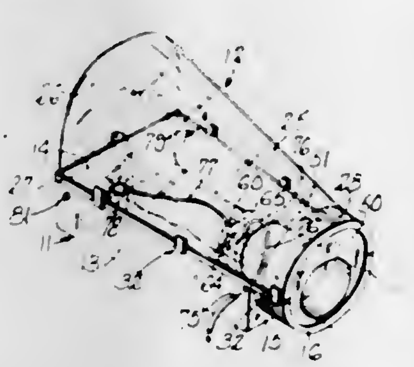


1. Apparatus for measuring blood pressure comprising: transducer means sensing blood pressure for generating a signal representative of instantaneous pressure; reference voltage source means for generating a plurality of reference signals of progressively increasing magnitude; a plurality of light-emitting circuit means connected in series; and a plurality of comparator circuit means, each having an output connected to a junction between adjacent ones of said light-emitting circuit means, each comparator circuit means further having a first input connected to an associated reference signal of said reference voltage source means, and a second input receiving said signal representative of instantaneous pressure; whereby all comparator circuits having their first inputs at a higher potential than their associated reference voltages will have their outputs at a first level, and all comparator circuits having their signal inputs at a lower potential than their associated reference voltages will have their outputs at a second level, and one light-emitting circuit means will be energized and representative of the sensed pressure.

4,003,371

LOW PRESSURE HYPERBARIC CHAMBER

Boguslav H. Fischer, 251 E. 32nd St., New York, N.Y. 10016
Continuation-in-part of Ser. No. 549,608, Feb. 13, 1975, abandoned. This application Jan. 28, 1976, Ser. No. 653,199
Int. Cl.^{2} A61M *13/00*
U.S. Cl. 128—184 **8 Claims**

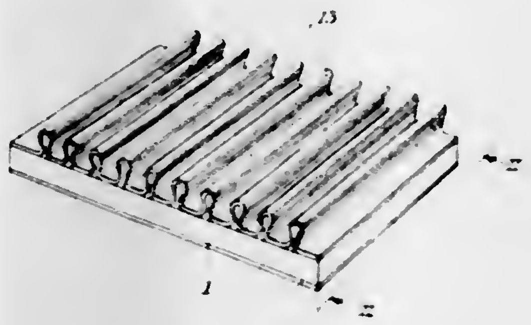


5. A low pressure hyperbaric chamber for treatment of a part of a patient's body comprising, an elongated enclosure having a closed end and an entrance end, said enclosure including separable lower and upper portions, means for releasably holding said portions in sealing engagement, a gas supply passage and a gas exit passage, the entrance end being adapted to permit introduction of said body part into the enclosure and being provided with a tubular sleeve of foldable material mounted at one end in said entrance end, the other end of the sleeve projecting freely into the chamber, an inflatable strap containing at least one gas passageway provided with a gas inlet, said strap being attached adjacent one of its ends to the sleeve adjacent said other end of the sleeve, the gas supply passage being connected to said gas inlet, a humidifier, and means connecting the gas supply passage to said humidifier.

4,003,372

FOOT WASHING AND MASSAGING DEVICE

Carl J. Willoby, Lompoc, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Oct. 6, 1975, Ser. No. 619,639
Int. Cl.^{2} A61H *1/02*
U.S. Cl. 128—25 B **5 Claims**

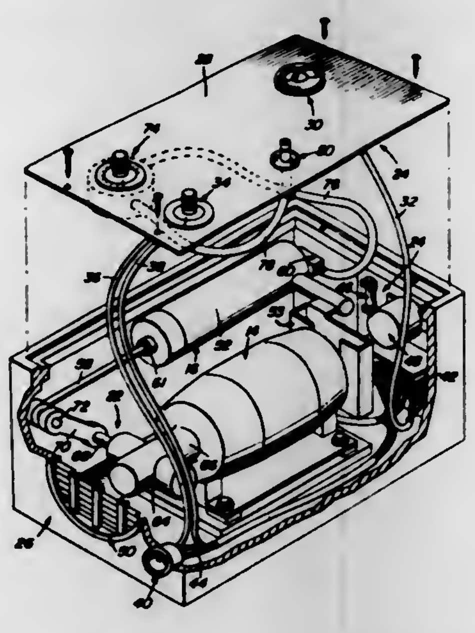


1. A foot washing and massaging device, comprising

a substantially plate-like base member of water-impervious material having spaced opposite parallel substantially planar surfaces;

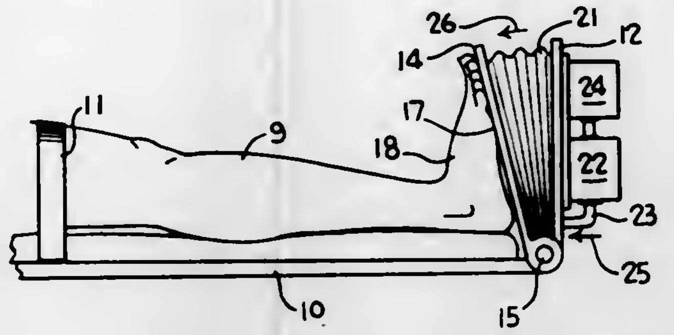
a plurality of suction cups affixed to one of the surfaces of the base member for releasably securing the base member in position on a supporting surface; and a sheet of pliable, resilient water-impervious material affixed to the other of the surfaces of the base member in substantially undulating configuration in a manner whereby when the device is positioned in a shower or tub and the feet of a user are rubbed on the sheet of resilient material said feet are washed and massaged simultaneously.

4,003,373
VARIABLE PULSATING VACUUM DEVICE
Peter N. Spello, P.O. Box 5857, Sherman Oaks, Calif. 91403
Filed June 23, 1975, Ser. No. 589,453
Int. Cl.² A61H *1/00*
U.S. Cl. 128—40 **9 Claims**



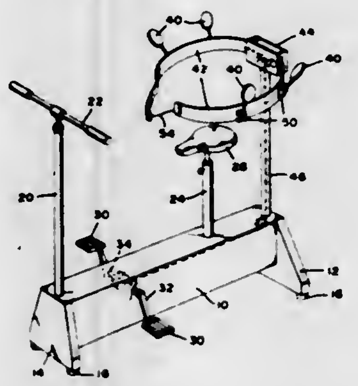
1. A variable pulsating vacuum pneumatic device, comprising, in combination:
- a. a frame;
- b. a motor mounted on the frame;
- c. a vacuum pump mounted on the frame and connected to an applicator arrangeable in contact with facial and neck tissues to be treated;
- d. transmission means for connecting the motor to the vacuum pump; and
- e. control means for regulating the pulse rate of the vacuum pump as a function of the speed of the motor, the vacuum pump including, in combination:
  1. a cylinder pivotally mounted on the frame;
  2. a piston reciprocally disposed in the cylinder;
  3. a piston rod having an end connected to the piston and extending outwardly from the cylinder, the piston rod having another end disposed outside the cylinder and spaced from the one end, the another end being connected to the transmission means, the motor including a shaft rotatable about an axis, and the transmission means including a right-angle drive having an input and output 90 degrees apart and mounted on the motor shaft by the input for actuation by the motor shaft, the cylinder and piston rod of the pump being arranged substantially parallel to the axis of rotation of the motor shaft, the output of the right-angle drive including an output shaft, and a crank connected at spaced points pivotally to the another end of the piston rod and affixed to the output shaft of the drive for rotation by the latter, the rotary motion of the crank being converted to a reciprocating movement of the piston rod.

4,003,374
METHODS AND APPARATUSES FOR THE PREVENTION OF VENOUS THROMBOSIS
Benjamin Mizrachy, 202 South St., Middletown, N.Y. 10940
Filed Nov. 18, 1975, Ser. No. 633,030
Int. Cl.² A61H *7/00*
U.S. Cl. 128—48 **19 Claims**



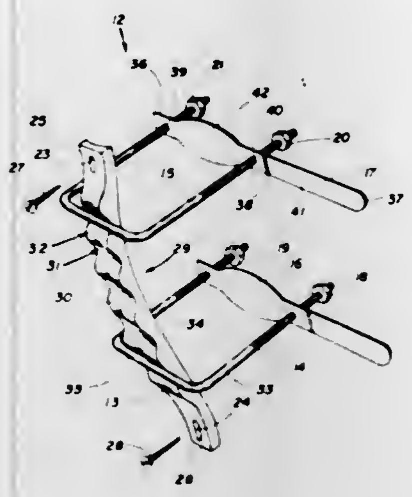
1. A method of reducing the risk of incurring venous thrombosis in the legs of operative, bedridden and post-operative patients, comprising the steps of:
- A. supporting the legs of the patient so as to allow for dorsiflexing of at least one foot of the patient, while the patient is anesthetized during surgery,
- B. anesthetizing the patient for the purpose of performing surgery upon the patient; and
- C. periodically dorsiflexing at least one foot of said patient while so anesthetized during surgery, so as to cause calf muscles of the associated leg to move and prevent stasis of blood in said leg, whereby the risk of incurring venous thrombosis is reduced in said patient.

4,003,375
EXERCISE AND MASSAGING APPARATUS
Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn. 06830
Filed Nov. 17, 1975, Ser. No. 632,239
Int. Cl.² A61H *23/00*
U.S. Cl. 128—54 **11 Claims**



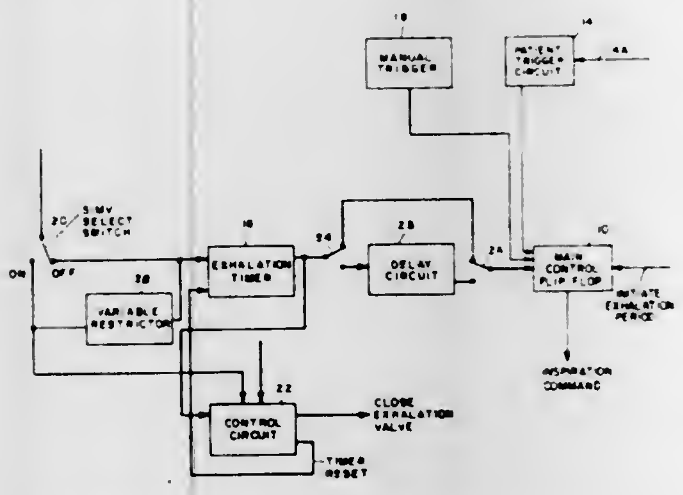
1. An exercise and massaging apparatus comprising:
- a stationary support;
- motive means in the form of pedal means mounted to said support;
- a belt adapted to be secured to a person, said belt including a plurality of movable striking elements, and
- coupling means coupling said pedal means to said striking elements for causing responsive to the operation of said pedal means said striking elements to periodically undergo motion for striking the person.

4,003,376
APPARATUS FOR STRAIGHTENING THE SPINAL COLUMN
Douglas William McKay, Washington, D.C.; Teddy L. Bolinger, and Norman L. Emerick, both of Warsaw, Ind., assignors to Bio-Dynamics, Inc., Indianapolis, Ind.
Filed Aug. 25, 1975, Ser. No. 607,108
Int. Cl.² A61F *5/00*
U.S. Cl. 128—69 **11 Claims**



1. A device for straightening the spinal column comprising:
- an elongated first member with length insertable forwardly of and adjacent the spinal column so as to extend lengthwise along said spinal column;
- first means operable to attach said member to said spinal column limiting relative motion between said member and said spinal column; and,
- second means extendable from said member around said spinal column and back to said member being operable to force said spinal column to contact said member along said length of said member straightening said spinal column.

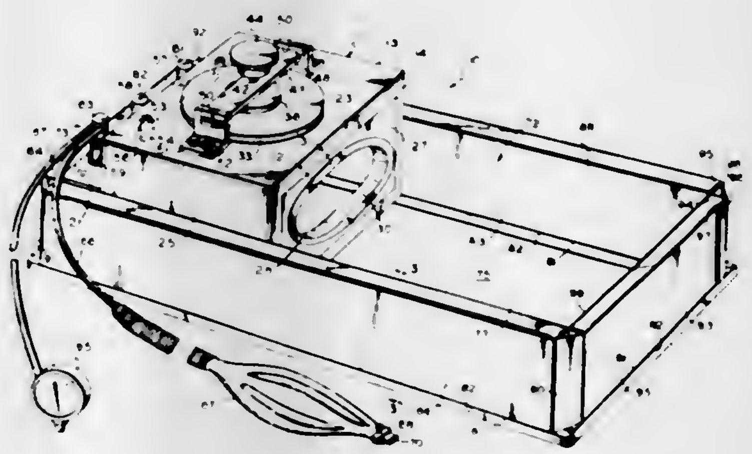
4,003,377
PATIENT VENTILATOR
William R. Dahl, Littleton, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.
Filed Aug. 21, 1975, Ser. No. 606,644
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **4 Claims**



1. In a patient ventilator including a device for supplying air to a patient through a ventilating hose, a conduit through which the patient may exhale, and circuitry for controlling the breathing of a patient and for assisting the voluntary breathing of a patient, an improvement comprising:

means for initiating an inspiration half-cycle of a breathing period during which air is supplied to a patient through a ventilating hose; means for initiating an exhalation half-cycle of a breathing period during which the patient may exhale through a conduit; a patient trigger circuit means for sensing an inhalation attempt by the patient, said patient trigger circuit having an output coupled to actuate said inspiration initiating means; timer means having an output for providing a trigger signal at the end of a predetermined period; delay circuit means coupled between said timer means output and an input to said inspiration initiating means for actuating the latter, unless previously actuated by said patient trigger means, after a delay period responsive to said timer means trigger signal; means for selectively opening and closing the exhalation conduit; and control circuit means having an input coupled to said timer means output, having a first output coupled to actuate said conduit opening and closing means for closing said conduit during inspiration half-cycles initiated immediately subsequent to the generation of trigger signals by said timer means, and for opening said conduit during all other portions of said breathing periods, and said control circuit means having a second output coupled to said timer means for resetting said timer means when said immediately subsequent inspiratory half-cycles are initiated, wherein the patient's voluntary breathing is interrupted intermittently in response to said predetermined timing period, whereafter a mandatory inspiration half-cycle is applied as a result of the said closing of the exhalation conduit, said mandatory inspiration half-cycle being synchronized with the patient's voluntary inhalation in response to said patient trigger means.

4,003,378
TRANSPORT AND LIFE-SUPPORT SYSTEM FOR INFANTS
Donald E. Pickering, 890 Mill St., Suite 400, Reno, Nev. 89502
Filed Oct. 18, 1974, Ser. No. 516,119
Int. Cl.² A61M *16/02*
U.S. Cl. 128—204 **14 Claims**



1. A life-support hood for an infant comprising:
- a bottom;
- a rigid transparent top;
- a plurality of rigid transparent sides, one of said sides being provided with a body entrance opening therein, said opening being adapted to receive the head, shoulders, arms and chest of an infant within said hood with the rest of the body of said infant extending outside said hood;
- sealing means within said opening for adhesively attaching and sealing said chest of said infant to said one side of said hood to selectively create a gas-tight enclosure;
- a first port for introducing air and oxygen into said hood; and
- a second port for regulating the pressure of said air and oxygen within said hood, such that the gas pressure within said hood can be maintained at levels above ambient atmospheric pressure for providing continuous positive airway pressure in said infant.

4,003,379

APPARATUS AND METHOD FOR IMPLANTED SELF-POWERED MEDICATION DISPENSING

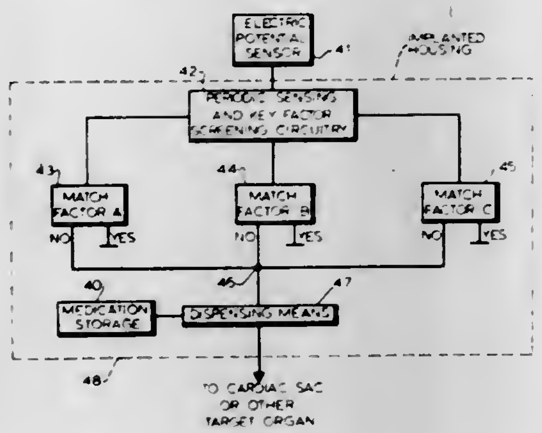
Everett H. Ellinwood, Jr., 3519 Tonbridge Way, Durham, N.C. 27707

Division of Ser. No. 463,262, April 23, 1974, Pat. No. 3,923,060. This application Sept. 24, 1975, Ser. No. 616,294

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.² A61M *5/00, 7/00*

U.S. Cl. 128—260 **22 Claims**



1. A self-contained and powered implant apparatus adapted to be totally received within a selected animal body, including human, for periodically dispensing selected medication therein while leaving the body ambulatory at all times, comprising:

a. a unitary housing adapted to be completely implanted and secured within and to the body at a selected site and having therein various compartments enclosed by said housing and adapted for mounting a medication storage member, a micro size power source, miniaturized electro-mechanical driving and dispensing means adapted to being powered by such source for dispensing medication from such storage member and electrical means for connecting the driving means to the source so as to operate the dispensing means on a schedule according to the needs of said body for medication;

b. a storage member mounted within the implanted housing for storing selected medication to be dispensed in selected quantities;

c. a micro size power source mounted within the implanted housing and secured proximate said storage member and having a useful working life in terms of at least several days;

d. miniaturized electro-mechanical driving means mounted within the implanted housing selectively connected to and powered by said source;

e. miniaturized dispensing means mounted within the implanted housing and having a retractable flexible walled container means with an inlet connected to receive medication from said storage member and connected for being powered by said driving means and when so powered and when expanded, receiving from said storage member through said inlet and into said container means successive measured quantities of selected said medication and having an outlet means for enabling discharge of such medication from said container means through the wall of the implanted housing and into said body during compression of said container means; and

f. electrical means mounted within the implanted housing for providing an electrical connection between said power source and said driving means for driving, energizing and actuating said dispensing means including said container means on a controlled schedule in coordination with the medical needs of the body.

4,003,380

BIPOLAR COAGULATION INSTRUMENT

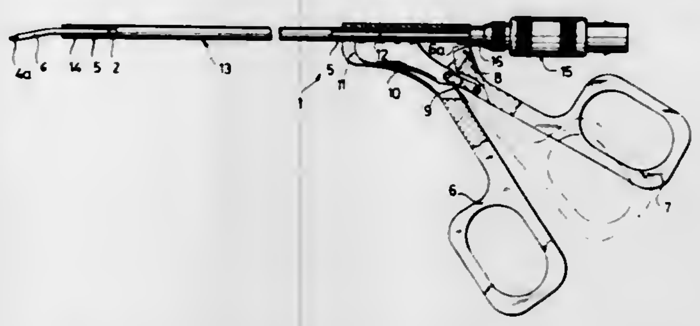
Peter Wien, Freiburg, Germany, assignor to F.L. Fisher, Freiburg, Germany

Filed Aug. 29, 1975, Ser. No. 609,052

Claims priority, application Germany, Sept. 5, 1974, 2442605

Int. Cl.² A61B *17/40;* **A61N** *3/06*

U.S. Cl. 128—303.17 **17 Claims**



1. A bipolar microcoagulation instrument comprising, in combination, a pair of microcoagulation electrodes having spread-apart ends subjected to a biasing force tending to maintain the ends spread apart; means for connecting the electrodes to the terminals of a high-frequency voltage source; an outer tube surrounding the microcoagulation electrodes, the spread-apart ends of the electrodes projecting outwards from inside the outer tube, and the outer tube being shiftable relative to the electrodes at least against the ends of the electrodes and at least partly over the ends of the electrodes to press together the ends of the electrodes; activating means including handles for thusly shifting the outer tube; and means for rotating the electrodes relative to the outer tube and the handles of the activating means.

4,003,381

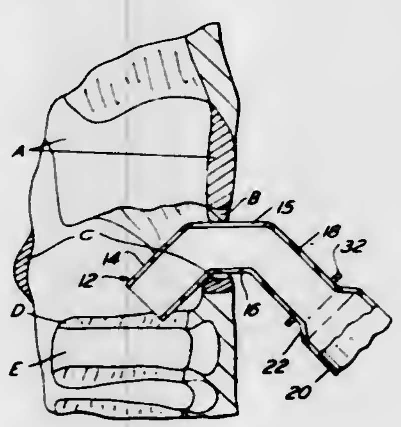
CRICOTHYROSTOMY INSTRUMENT

Max I. Gilbert, 9612 N. Military Trail, Palm Beach Gardens, Fla. 33407

Division of Ser. No. 483,727, July 3, 1974, Pat. No. 3,906,956. This application Apr. 30, 1975, Ser. No. 573,223

Int. Cl.² A61B *17/24*

U.S. Cl. 128—305.3 **4 Claims**



1. A laryngeal-tracheal tube comprising:

a first linear segment suitable for introduction through an incision into a patient's tracheal passage;

a second linear segment angulated to said first segment, said first and second segments subtending an obtuse angle; and

a third linear segment angulated to said second segment, said third and second segments subtending an obtuse angle, whereby said first segment and said third segment from an angle of approximately 90° with respect to each other and said third segment being suitable for positioning to extend through the incision in the patient's laryngeal-tracheal region whereby said first segment of said laryngeal-tracheal tube may be inserted through said incision and said second and third segments may be incrementally successively advanced to where said third segment is positioned so as to extend through said incision.

4,003,382

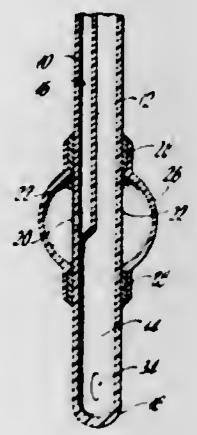
RETENTION CATHETER AND METHOD OF MANUFACTURE

Denis G. Dyke, Fords, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed July 25, 1975, Ser. No. 599,293

Int. Cl.² A61M *25/00*

U.S. Cl. 128—349 B **11 Claims**



1. A retention catheter comprising:

a. an elongated flexible thermoplastic tube having a distal end and a proximal end and having a drainage lumen and an inflation lumen defined by the walls of said tube and extending from said proximal end to near said distal end, said inflation lumen terminating in an inflation port in the wall of the tube near the distal end thereof, said drainage lumen terminating in a drainage port in the wall of the tube intermediate said inflation port and said distal end, and

b. a cylindrical thermosetting polyurethane balloon sleeve encircling a longitudinal section of said tube containing said inflation port and having end margins sealed to said tube on either side of said inflation port.

4,003,383

APPARATUS FOR LOCALLY IRRADIATING A PART OF A LIVING BODY

Gernot Klaus Brück, Hermann-Pfaume-Str. 6, Cologne, Germany

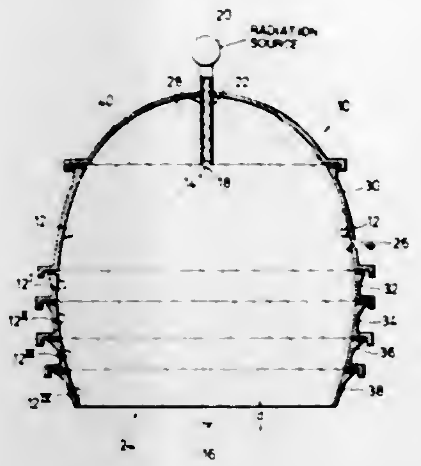
Filed Nov. 3, 1975, Ser. No. 628,546

Claims priority, application Germany, Nov. 4, 1974, 2452227

Int. Cl.² A61N *5/04*

U.S. Cl. 128—404 **16 Claims**

1. Apparatus for locally irradiating a part of a living body, the apparatus comprising means for emitting radiation from a point, a casing surrounding said radiation emission point, said casing being positionable above a body in the region of the part requiring treatment, and having an interior provided with a surface capable of reflecting radiation from said emission point, said surface being greater than half an ellipsoid, said emission point being within said casing arranged at a first focus point of said ellipsoid whereby said part to be irradiated is positionable at the second focus point of said ellipsoid outside said casing to receive focused radiation reflected from said surface.



4,003,384

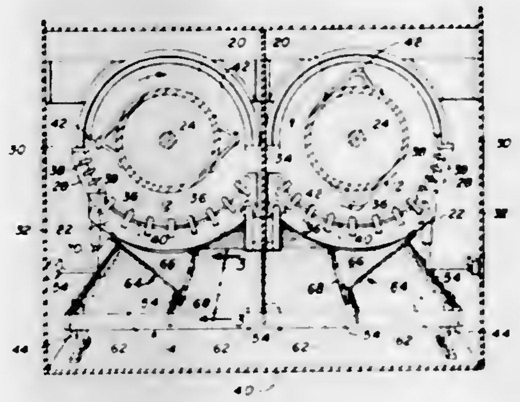
GRAIN DISTRIBUTION MEANS FOR ROTARY COMBINE

John J. Komancheck, New Holland, and Robert R. Todd, Leola, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 29, 1976, Ser. No. 671,648

Int. Cl.² A01F *7/00*

U.S. Cl. 130—27 T **12 Claims**



1. A mobile combine having threshing means carried thereby and comprising rotor and cooperating concave means, means on the forward end of the combine operable to feed material to said threshing means, a grain pan supported upon said combine below said threshing means to receive threshed crop material from said threshing means, sieve means supported within said combine rearwardly of said grain pan to receive threshed crop material from said grain pan and operable to separate desired crop material from chaff and other waste material, movable means in said combine supporting said grain pan and sieve means for fore-and-aft reciprocation within said combine to effect such separation, and power means operable to actuate said threshing means and reciprocate said grain pan and sieve means as aforesaid; the improvement comprising at least one angularly disposed deflector member fixed to said grain pan and reciprocable therewith, said deflector member respectively extending downward and inward toward said grain pan from the side edge thereof below said concave means and operable to deflect crop material discharged from said concave toward the center of said grain pan and thereby minimize tendencies for crop material to gravitate to the side of the grain pan.

4,003,385
METHOD AND MACHINE FOR MAKING CIGARETTES OR THE LIKE

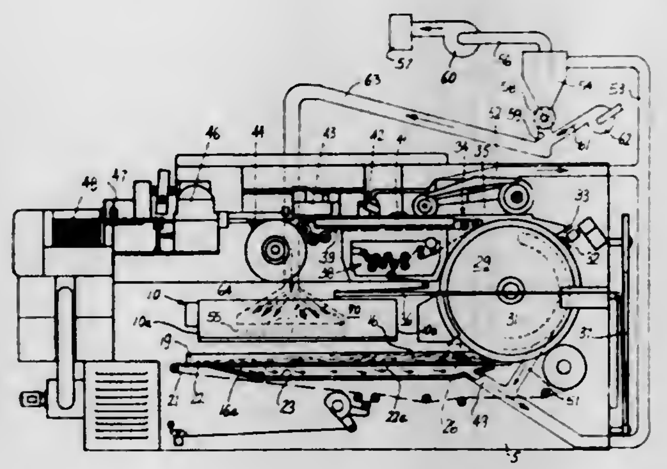
Klaus Adebahr, Hamburg, and Jurgen Gomann, Dassendorf, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Feb. 11, 1976, Ser. No. 657,239

Claims priority, application Germany, Feb. 18, 1974, 2506839

Int. Cl.² A24C *5/18*

U.S. Cl. 131—84 B **22 Claims**



1. A method of making a continuous tobacco filler stream, comprising the steps of accumulating and maintaining — in a first portion of a predetermined path — a supply of tobacco which contains relatively large particles and relatively small particles including short tobacco and smaller and larger particles of tobacco dust; withdrawing from said supply a continuous layer of tobacco and transporting said layer along a second portion of said path; showering the tobacco of said layer into an elongated stream building zone constituting a third portion of said path to thereby convert said layer into said filler stream; conveying said filler stream lengthwise along said third and thereupon along a fourth portion of said path; conveying at least one suction air stream across at least one of said portions of said path whereby at least some relatively small particles of tobacco become segregated from the remaining particles and leave said one portion with said air stream; separating at least some relatively small particles from said air stream; and introducing the thus separated relatively small particles directly into at least one selected portion of said path.

4,003,386
DEVICE FOR SECURING TIPS TO ROD-SHAPED ARTICLES SUCH AS CIGARETTES

Hubert Bald, and Helmut Demny, both of Gevelsberg, Germany, assignors to Maschinenfabrik Alfred Schmermund, Gevelsberg, Germany

Filed Apr. 14, 1975, Ser. No. 567,966

Claims priority, application Austria, Apr. 19, 1974, 3294/74

Int. Cl.² A24C *5/58*

U.S. Cl. 131—94 **20 Claims**

1. A device for securing tips to rod-shaped articles, comprising in combination:-

a frame;

a carrier drum rotatably mounted on said frame and adapted to carry a plurality of assemblies each comprising a tip component and two axially aligned rod-shaped articles disposed to abut against respective end surfaces of said tip component;

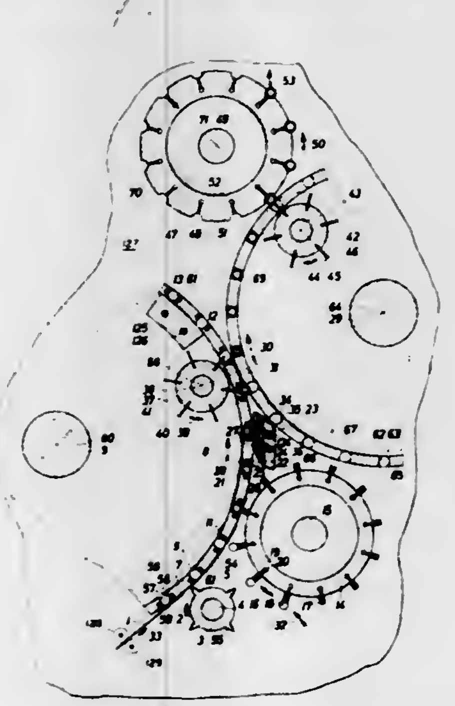
a grooved drum rotatably mounted on said frame and provided with a plurality of recess defining means disposed at intervals around the periphery of said grooved drum, each recess defining means defining a respective axially extending recess in the periphery of said grooved drum;

feeder means for feeding successive connecting sheets each provided with adhesive material on one surface thereof towards the peripheral surface of said grooved drum, each said connecting sheet being fed to overlie a respective one of said recesses with said one surface thereof facing outwardly of said grooved drum and with a portion of said connecting sheet, extending from a leading extremity of said recess on rotation of said drum, being longer than a portion of said connecting sheet extending from a trailing extremity of said recess;

urging means provided on said carrier drum to urge said assemblies carried by said carrier drum into said recesses in said grooved drum, whereby on said assembly being urged into the respective one of said recesses, said connecting sheet is partially wrapped around the periphery of said assembly and a free end portion of said connecting sheet is left outside of said recess at said leading extremity thereof;

vacuum means within said drum for initially holding said free end portion of said connecting sheet against the surface of said drum,

guide means mounted on said frame in juxtaposed relationship with the periphery of said grooved drum,



means for terminating the operation of said vacuum means before said free end portion reaches said guide means during the rotation of said drum, whereby said free end portion is released to extend outwardly from the surface of said drum, a stationary guide member provided on said guide means and disposed in a path traversed by said free end portion on rotation of said grooved drum, whereby said outwardly extending free end portion of said partially wrapped connecting sheet is deflected by said guide member whilst said assembly remains in said recess to cause said one surface of said free end portion to be disposed in mutually facing relatonship with said peripheral surface of said grooved drum;

ejector means operatively associated with said grooved drum to eject said partially wrapped assemblies from said recesses; and

further carrier means displaceable in co-ordination with the rotation of said grooved drum and provided with a plurality of further recess defining means each defining a recess adapted to receive said partially wrapped assemblies ejected by said ejector means from said grooved drum, said further recess defining means being adapted to act on said free end portion of said connecting sheet to complete the wrapping of said connecting sheet around the periphery of said assembly.

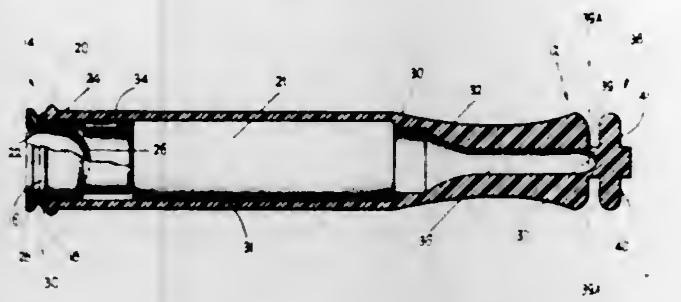
4,003,387
CIGARETTE FILTER HOLDER

Jerome J. Goldstein, Denver, Colo., assignor to Aquafilter Corporation, Farmington Hills, Mich.

Continuation of Ser. No. 536,880, Dec. 27, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,630

Int. Cl.² A24F *13/02*

U.S. Cl. 131—173 **4 Claims**



1. A disposable cigarette holder construction comprising:

an elongated plastic cigarette holder having an opening at one end shaped to receive the tip of a cigarette,

a removable cap extending over said opening,

said holder also having a passage extending from said opening to the other end of said holder,

a fluid containing member positioned in said passage, and

a removable plug integrally formed with said holder removably closing said passage at said other end,

said other end of said holder including means defining an end surface extending normal to the axis of the holder, wherein said integrally formed removable plug comprises a member extending from the other end of said holder and integrally formed with said holder along an annular segment having a thickness less than adjacent portions of said plug and holder, with said segment lying coplanar with said end surface, defining the end of said passage and adapted upon removal to provide an opening to said passage through said other end, said annular segment, when removed, defines an annular surface that is flush with the end surface surrounding the annular surface,

said plug extending lengthwise of said holder with wings projecting outwardly therefrom to provide finger grips for twisting said plug,

said passage terminating in an end with progressively smaller radii defining the end surface thereof and extending into the plug a slight distance which is less than the distance between the end surface of said holder and a center line of said wings which is normal to the axis of said holder.

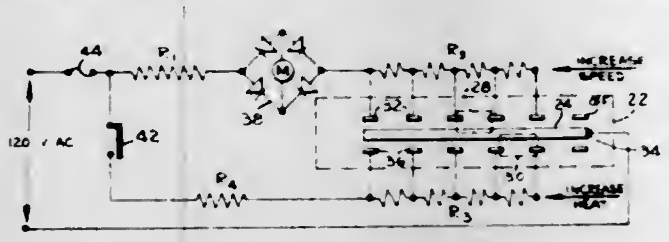
4,003,388
HAIR DRYER VARIABLE CONTROL

Esko J. Nopanen, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Apr. 1, 1976, Ser. No. 672,611

Int. Cl.² A45D *20/00*

U.S. Cl. 132—9 **8 Claims**



1. In a hair dryer having an electric selectively variable motor driven fan, plural wattage heaters disposed in the fan stream for selectively heating the air, and thermostat means sensing air temperature to shut off the dryer on over-temperature condition, the improvement in a combination switch and sliding contact variable control for heat and speed comprising,

an elongated continuous bus bar connected to one side of the line,

a plurality of discrete fixed spaced contacts connected to the other side of the line with each contact connected to change resistance in the circuit,

sliding contact means connecting said bar and spaced contacts to complete the circuit,

said sliding means being sized to bridge at least two spaced contacts as it moves along said bar for a smooth continuous adjustment of resistance in the circuit as the movable contact slides from one end of the continuous bar to the other.

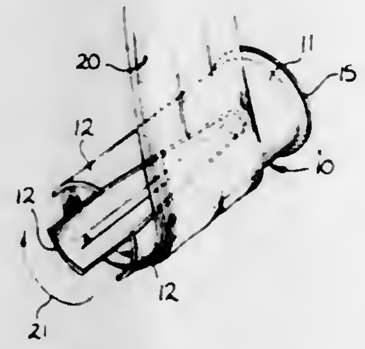
4,003,389
HAIR CURLING APPARATUS

Eric L. Waite, 14808 Clark St., Van Nuys, Calif. 91411, and Mary I. Waite, 14101 Ventura Blvd., Sherman Oaks, Calif. 91403

Continuation-in-part of Ser. No. 405,886, Oct. 12, 1973, Pat. No. 3,939,852. This application Dec. 18, 1975, Ser. No. 641,890

Int. Cl.² A45P *2/00*

U.S. Cl. 132—40 **9 Claims**



1. A hair curling apparatus comprising:

a. a cylindrical base;

b. a plurality of uniformly disposed extension members longitudinally depending from said cylindrical base and defining a substantially cylindrical cavity, each of said extension members being defined by a pair of lateral edges and a terminus in axial opposition to said cylindrical base, the lateral edges of adjacent pairs of extension members converging to an apex which is in the vicinity of said cylindrical base; and

c. a circular flange integral with said cylindrical base, the interface intermediate said circular flange and said cylindrical base being a continuous curved surface.

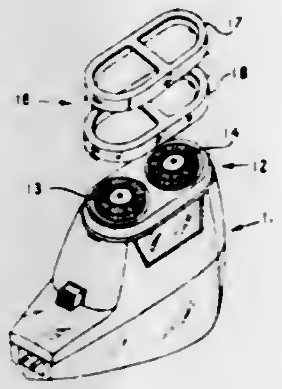
4,003,390
HAIR CUTTING GUIDE FOR ELECTRIC RAZOR

Edward A. Solie, 5484 Ranchito Way, Santa Rosa, Calif. 95401

Filed Sept. 8, 1975, Ser. No. 611,505

Int. Cl.² A45D *24/36*

U.S. Cl. 132—45 R **5 Claims**



1. Guide means for an electric razor comprising at least one guide member having means defining an apertured upper surface with a depending frame thereabout dimensioned to fit

upon the head of an electric razor and having clip means on said frame for removably engaging said element with the head of an electric razor about blades thereof to dispose said apertured upper surface in predetermined spaced relation above said blades, and said frame having indentations located in line with said clip means adapting said guide member for engagement with another guide member atop same.

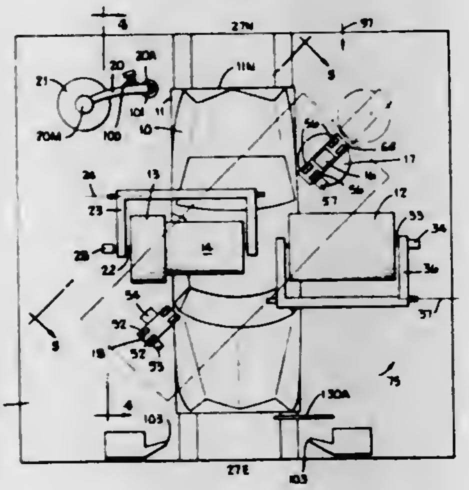
4,003,391
TURNTABLE CAR WASHING METHOD USING POWER RUBBING DEVICES

Judson L. Smith, 3714 S. Juniper St., Tempe, Ariz. 85281

Continuation of Ser. No. 450,997, March 14, 1974, abandoned, which is a division of Ser. No. 188,292, Oct. 12, 1971, Pat. No. 3,797,059. This application Nov. 28, 1975, Ser. No. 635,944

Int. Cl.² B08B *1/04*

U.S. Cl. 134—6 **5 Claims**



1. A method of cleaning a vehicle and comprising the steps of:

moving a passenger carrier vehicle through an entrance into a position adjacent an array of rubbing devices;

moving said devices in contact with surfaces of the vehicle and power driving said devices while in contact with said surfaces and thereby power rubbing said surfaces; and

rotating the vehicle in the array to move different surfaces of said vehicle into contact with said rubbing devices; and

applying one of said devices to passenger compartment roof and windows of the vehicle and driving the one device in a uniform direction with respect to said entrance while rotating the vehicle to thereby obtain various directions of rubbing action against large percentages of the roof and window area of the vehicle.

4,003,392
PROCESS AND APPARATUS FOR CLEANING MOS-LSI DIE

Robert L. Schaefer, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 29, 1976, Ser. No. 653,571

Int. Cl.² B08B *30/00*

U.S. Cl. 134—30 **12 Claims**

1. A process for cleaning the surface of MOS-LSI die, said process comprising the steps of:

installing said die in a manifold fixture;

spraying alcohol over the die surfaces,

flushing the surfaces of said die with deionized water;

scrubbing the surfaces of said die;

mounting a nozzle assembly adjacent said manifold fixture;

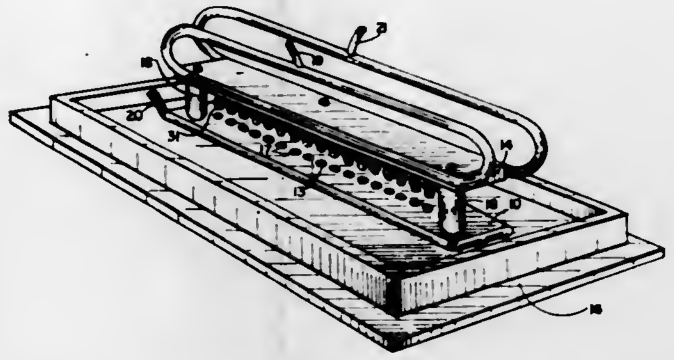
directing pressurized jets of deionized water and pressurized jets of alcohol on said die surfaces from said nozzle assembly; and

drying said die surfaces with streams of dry gas.

7. Apparatus for cleaning MOS-LSI die chips comprising:

manifold fixture means for securing a plurality of die chips;

said manifold fixture means including a plurality of cavities therein for securing cavity inserts of variable sizes and having small apertures that align with similar apertures in said cavities leading to a vacuum source for securing said die chips in said cavity inserts;



multi-nozzle assembly means associated with said manifold fixture for directing pressurized fluid onto said die chips; and

cleaning tank means for supporting said manifold fixture and said multi-nozzle assembly.

4,003,393
GEL-LIKE COMPOSITION FOR USE AS A PIG IN A PIPELINE

William Jaggard, and Allen A. Scales, both of Calgary, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 14, 1973, Ser. No. 332,324

Int. Cl.² B08B *9/04*

U.S. Cl. 137—15 **5 Claims**

1. A method of removing residual fluids and solids from a pipeline which comprises:

a. as an initial step treating the inner surface of the pipeline to remove solid and semi-solid deposits therefrom;

b. introducing into said pipeline a gel-like mass composed of an organic liquid which is gelled with a gelling quantity of a metal salt of an aliphatic substituted orthophosphate ester, and

c. moving said gel-like mass through said pipeline under pumping pressure which forms said gel-like mass into a self-sustaining body having its peripheral surfaces contiguous with the inner surfaces of the pipeline to remove residual liquids and solids therefrom.

4,003,394
DISC VALVE WITH IMPROVED SEAL RING

Horst Adams, Bochum, Germany, assignor to Panamera, A.G., Chur, Switzerland

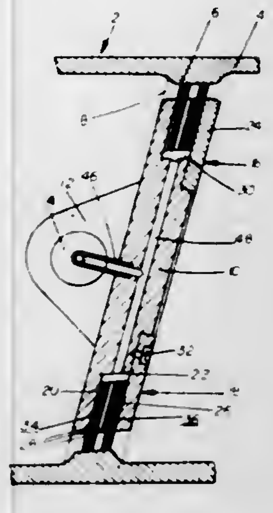
Filed Sept. 9, 1975, Ser. No. 611,764

Claims priority, application Germany, Sept. 12, 1974, 2443723; July 23, 1975, 2532879

Int. Cl.² F16K *1/22*

U.S. Cl. 137—15 **17 Claims**

1. A valve disc for a butterfly valve having a tubular housing through which a material flows, and a valve seat defined on an interior surface of the housing, the disc comprising a main body and shaft means rigidly secured to the body for rotatably mounting the disc to a bearing in the housing so that the disc can be tilted between a closed position in which a periphery of the body is proximate the seat and an open position in which the disc is substantially parallel to an axis through the housing, the body including in a side thereof a recess extending to a periphery of the disc and at least one seal ring positioned in the recess, the seal ring having an outer diameter larger than the periphery of the body and an inner diameter larger than an inner diameter of the recess so that the seal ring can slide relative to the body when positioned in the recess, a locking ring engaging a side of the seal ring facing away from the body, and means securely tightening the locking ring against the seal ring to lock the seal ring relative to the body and prevent relative movements therebetween, whereby the seal ring can be centered relative to the valve seat by first releasing the locking means, thereafter closing the disc to engage a periphery of the seal ring with the valve seat, and thereafter tightening the locking means.



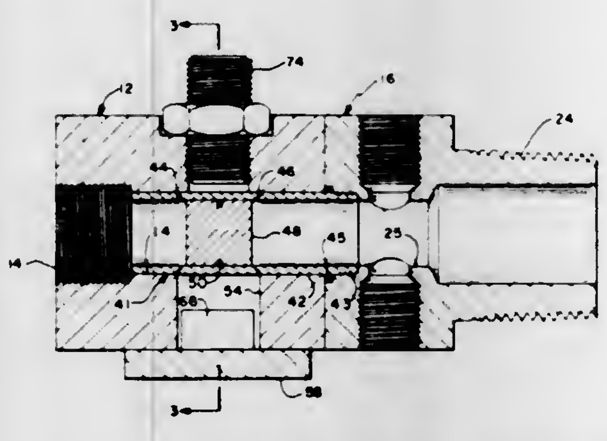
4,003,395
QUICK-OPENING VALVE OPERATED BY EXPLOSIVE CHARGE

Maurice Eugene Tyler, Orinda, Calif., assignor to Systron Donner Corporation, Berkeley, Calif.

Filed July 28, 1975, Ser. No. 599,866

Int. Cl.² F16K *13/06;* A62C *37/06*

U.S. Cl. 137—68 A **3 Claims**



1. In a system for distributing a fluid under pressure, the combination of a valve body having a cylindrical cavity with an inlet, an outlet and a passageway between the inlet and outlet, distributor means for directing fluid from the outlet to one or more end use locations, a cylindrical flow-blocking member removably mounted within the cavity, said member having a uniform outside diameter commensurate with the inside diameter of the cavity, said member including an imperforate plug and a pair of tubular ends extending axially from the plug, means for detachably and slidably mounting the tubular ends in the passageway for forming a continuation thereof, means forming a pair of axially spaced-apart weakened zones which extend circumferentially around the cylindrical member adjacent respective ends of the plug, charge means mounted in the body for applying an exploding gas directly against the outer surface portion of the flow-blocking member adjacent the plug whereby said outer surface portion and plug shear at weakened zones and separate from the member to form a slug portion which moves along an ejection path which is substantially orthogonal with said passageway whereby after said separation the passageway through the valve body is substantially unobstructed for easy removal of the remaining parts of the flow-blocking member and for replacement of a complete flow-blocking member, deflector means for deflecting the slug portion along a second path inclined from the ejection path for absorbing kinetic energy of the moving slug portion, and means forming a chamber within the valve body in alignment with said second path for receiving said slug portion and holding the latter substantially clear of the passageway whereby flow is established along the passageway to said outlet.

4,003,396
PROPORTIONAL CONTROL CLOSED CIRCUIT GAS ADMISSION SYSTEM

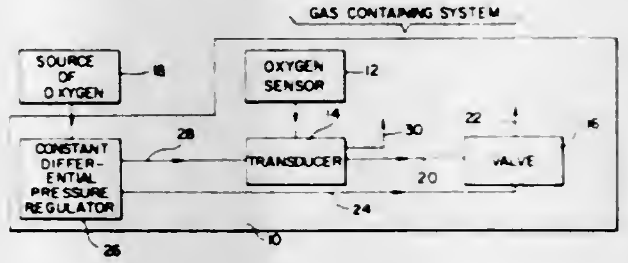
Lewis W. Fleischmann, 8502 Allenswood Road, Randallstown, Md. 21133

Division of Ser. No. 278,725, Aug. 8, 1972, Pat. No. 3,861,412. This application Nov. 21, 1974, Ser. No. 526,057

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² A62B *7/02;* F16K *31/12*

U.S. Cl. 137—83 **5 Claims**



1. Apparatus for controlling partial pressure of a controlled gas in a gas -containing system, which comprises nozzle means for producing a jet of gas, means for providing a substantially constant pressure drop through said nozzle means irrespective of the pressure at the output of said nozzle means, means for variably interposing a surface into said jet of gas, sensor means responsive to said partial pressure in said system for adjusting said interposing means, means responsive to said jet for producing an output which varies with said interposing of said surface into said jet, and means responsive to said output for controlling the admission of controlled gas to said system.

4,003,397
DUAL COAXIAL BIDIRECTIONAL VALVES AND FILTER ASSEMBLIES AND HYDROSTAT SYSTEMS CONTAINING THE SAME

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

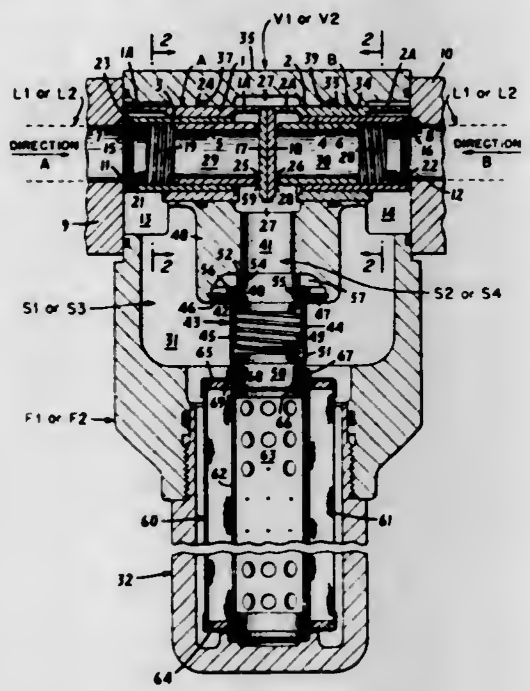
Division of Ser. No. 519,732, Oct. 31, 1974, Pat. No. 3,985,652, which is a continuation-in-part of Ser. No. 356,231, May 1, 1973, Pat. No. 3,908,693. This application May 16, 1975, Ser. No. 578,432

Int. Cl.² F16K *15/00*

U.S. Cl. 137—493.9 **13 Claims**

1. A dual coaxial valve responsive to fluid pressure arising from flow of fluid in either direction through one fluid line to direct flow in the same direction in another fluid line, comprising, in combination, a tubular valve housing, first and second valves in the housing, each having first and second coaxial inner and outer tubular valve elements, nested concentrically and separately reciprocable within the valve housing towards and away from first and second valve seats, respectively, between closed and open positions, to close and open first and second flow passages, respectively; one of the first and second valve elements of each valve controlling flow in one direction through one flow passage and the other valve elements of each valve controlling flow in another direction through the other flow passage; bias means urging the valve elements in one direction; and a fluid-pressure-receiving surface operatively connected to each valve element, urging the first valve element in a first direction with respect to its valve seat, and the

second valve element in a second direction with respect to its valve seat; the biasing force of the bias means being adjusted to resist movement of each valve element in said direction with respect to its valve seat under differential fluid pressure arising from flow from one direction and applied to the fluid-pressure receiving surface and the valve element moving in said direction with respect to its valve seat and opening when flow begins from that direction, one of the valve elements of the first valve and one of the valve elements of the second valve being responsive to fluid pressure arising from flow in one direction from one side of the valve, and the other of the valve elements of the first valve and the other of the valve elements of the second valve being responsive to fluid pressure arising from flow in another direction from the other side of the valve, so that the valve is arranged to move in one direction between open and closed positions in response to fluid pressure arising from flow and applied from either direction of flow, and to direct flow entering the valve from the one fluid line from either direction to one of the first and second flow passages, and to direct flow leaving the valve via the other of the flow passages to the one fluid line for flow in either direction, while proceeding in the same direction through the fluid lines in fluid flow connection with the first and second flow passages.



4,003,398
PRESSURE LIMITER DEVICE

Francois Duveau, 74 Rue de Normandie, Courbevoie, France (92400)

Filed Mar. 17, 1975, Ser. No. 558,957

Claims priority, application France, Jan. 21, 1974, 74.09653

Int. Cl.^{2} F16K *15/14*

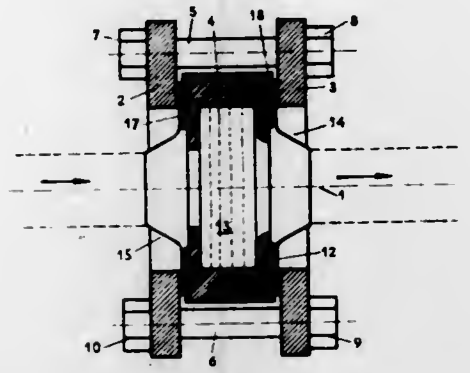
U.S. Cl. 137—512 **12 Claims**

1. A fluid pressure limiting device comprising: an elastically-operable obturator, said obturator including:

a plurality of valve members formed of elastomeric material and having at least one slit formed therein, said valve members being serially arranged and having opposed facing surfaces, said valve member slits defining normally closed pressure responsive valves; and

a shim comprised of a material having a low coefficient of friction interposed between and in contact with the facing surfaces of each pair of adjacent elastomeric valve members, said shim having an opening formed therein, the opening in said shim defining a permanently open fluid flow passage, said shim determining the spacing between pairs of adjacent elastomeric valve members and facilitating relative sliding motion between contacting surfaces of said shim and valve members; and

means for assembling said valve members and shim in a stack whereby a sliding action of facing surfaces of said valve members during pressure introduced distortion thereof may occur.



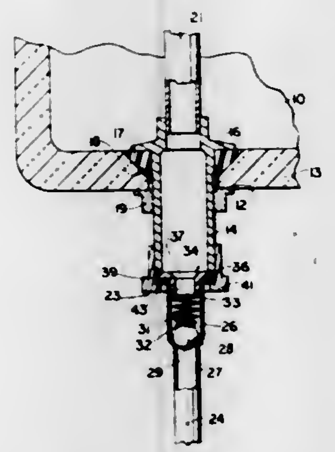
4,003,399
ANTI-SYPHON DEVICE FOR A WATER SUPPLY LINE

Edward J. Fischer, 630 Queen City Ave., Crescent Springs, Ky. 41011

Filed Feb. 25, 1975, Ser. No. 552,934

Int. Cl.^{2} F16K *15/04*; E03D *11/00*

U.S. Cl. 137—592 **4 Claims**



1. In combination with a toilet tank having an opening in a bottom wall thereof, a tubular inlet fitting mounted in the opening and having a lower portion extending downwardly from the bottom wall, a one-piece water supply line underlying the inlet fitting, the water supply line including a main portion, a head portion of enlarged diameter, and an outwardly extending flange at an upper end of the head portion, a washer member forming a seal between the flange of the water supply line and the lower portion of the inlet fitting, the washer member having a portion extending inwardly of the head portion, a lower end section of the head portion of the water supply line extending downwardly and inwardly to the main portion of the water supply line to form a valve seat at the lower end of the head portion, a valve member inside the head portion engageable with the valve seat to form a seal therewith, a compression spring mounted in the head portion and bearing on the valve member and on the inwardly extending portion of the washer member to urge the valve member to closed position, and means mounted on the lower portion of the inlet fitting and bearing on the flange of the water supply line to hold the water supply line and the washer member in assembled relation on the lower portion of the inlet fitting.

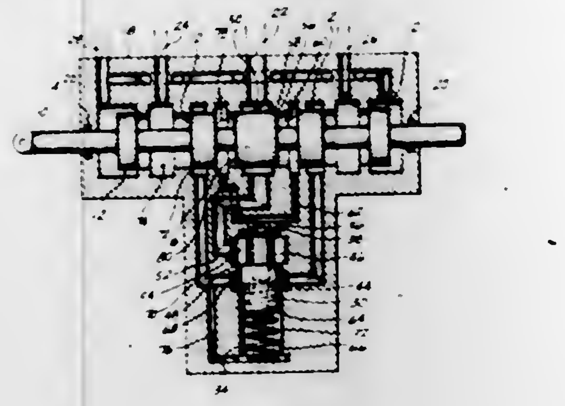
4,003,400
SELF-DEPRESSURIZING METERING VALVE

Bernus G. Turner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1975, Ser. No. 565,901

Int. Cl.^{2} F16H *11/00*

U.S. Cl. 137—596 **2 Claims**



1. A self-depressurizing hydraulic control valve comprising in combination.

a valve body having a plurality of passageways disposed therein, a supply port for receiving high pressure hydraulic fluid and a cylinder port for delivering a metered flow of said fluid;

a metering valve disposed within a main valve cavity within said valve body for controlling the flow of hydraulic fluid through at least one of said passageways;

a metering land located on said metering valve and having a metering edge,

a hydraulically-actuated shutoff valve located in a shutoff valve chamber within said valve body responsive to the rate of said flow for depressurizing the metering edge when the flow rate is reduced to a preselected value, such shutoff valve further having a centrally located orifice permitting the restricted flow of hyraulic fluid therethrough;

means for biasing said shutoff valve toward a closed position; and

means for arming said shutoff valve.

4,003,401
LIQUID OUTLET VALVE

Rolf A. Häring, 86a Hauptstrasse, 4148 Pfeffingen, Switzerland

Filed Mar. 17, 1975, Ser. No. 559,260

Claims priority, application Switzerland, Mar. 28, 1974, 4345/74

Int. Cl.^{2} F16K *31/58*

U.S. Cl. 137—599.2 **7 Claims**

1. A liquid outlet valve connectable to the outlet of a pipe and comprising:

a. a throughhole member having an entry opening, a first outlet opening, a straight-through main passage between said entry opening and said first outlet opening, a second outlet opening and a lateral secondary passage branching off from said main passage and leading to said second outlet opening;

b. a sleeve member surrounding the lower half of said throughhole member, and having annular flange means projecting inwardly outside said first outlet opening of said main passage;

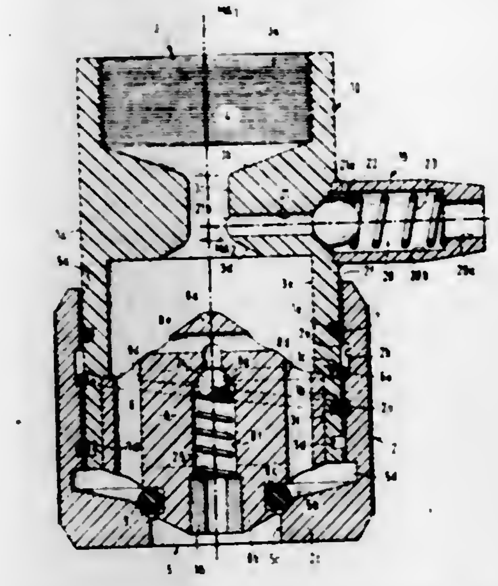
c. sealing means adapted for closing off said first outlet opening when being urged into sealing engagement with said flange means and with the lower part of said sleeve member outside the latter opening; and

d. connecting means for movably connecting said sleeve member with said throughhole member, said connecting means serving to adjust the position of said sleeve member and throughhole member relative to one another, thereby controlling the amount of liquid flowing through said main passage;

e. said throughhole member and said sleeve member having cylindrical surfaces opposite one another and helical grooves of equal pitch but different depth in said cylindrical surfaces to accomodate said connecting means;

f. and said connecting means being a coil spring having the same pitch as said grooves, the thickness of the wire of which coil spring is equal to approximately twice the depth of the flatter one of said two grooves, and further having a bias in radial direction relative to the helix described by said grooves which bias is directed into the flatter one of said grooves;

g. the helical groove located in the inner cylindrical surface of said cap merging at the groove end away from said outlet opening with an annular groove in said inner cap surface which latter annular groove is wider in axial direction than said helical groove.



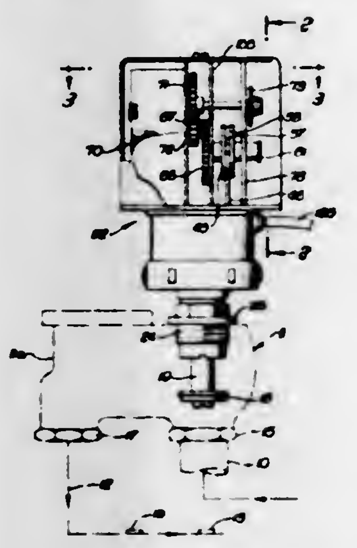
4,003,402
BATTERY OPERATED, FLUID PRESSURE RESPONSIVE VALVE CONTROLLER

Robert F. Corliss, Hacienda Heights, and Frank Wilkinson, Monrovia, both of Calif., assignors to Tyme Valve Corporation, Cerritos, Calif.

Division of Ser. No. 386,395, Aug. 7, 1973, Pat. No. 3,921,667, which is a continuation-in-part of Ser. No. 216,397, Jan. 10, 1972, abandoned. This application Oct. 6, 1975, Ser. No. 620,103

Int. Cl.^{2} F16K *31/36*

U.S. Cl. 137—624.18 **12 Claims**



1. For use in a pressurized liquid supply system including valve bodies through which water flow is to be controlled, the combination comprising

a. a master control unit including a first valving means projecting for installation and movement in a first of said bodies to control water flow to at least one outlet in the system, and first control means adapted to be mounted on said first body and operable to cycle the movement of said first valving means at predetermined time intervals, and

b. an auxiliary control unit including second valving means projecting for installation and movement in a second of said bodies to control water flow to at least another outlet in the system, and second control means adapted to be mounted on said body and operatively connected to said first control means to cycle the movement of said second valving means in response to said operation of the first control means,

c. said first and second control means respectively including first and second actuator pistons each carried to receive application of system water pressure, the first control means being operable to bleed water pressure supplied to the first piston at times when the first piston is cycled to open the first valving means, and the second control means being operable in response to a change in said bleeding of water pressure supplied to the first piston to in turn bleed water pressure supplied to the second piston, for effecting cycling of the second piston to open the second valving means.

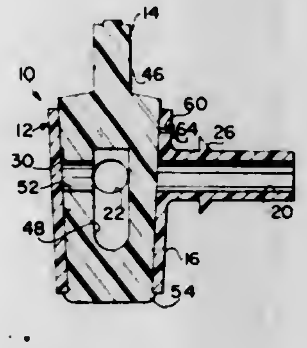
4,003,403
STOPCOCK

John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,906

Int. Cl.² F16K *5/02*

U.S. Cl. 137—625.41 10 Claims



1. A stopcock comprising:

a. a body having a bore extending axially therethrough, first, second and third passageways extending transversely through said body and intersecting said bore, said second and third passageways being axially spaced from said first passageway, and each of said passageways being angularly spaced from said other passageways about the periphery of said bore;

b. a stem mounted for rotation within said bore, said stem having a side wall, a first end wall, a second end wall spaced axially from said first end wall, a handle on one of said end walls, an axially elongated slot extending radially partially through said stem and intersecting said side wall, and first and second ports, each of said ports being angularly spaced from the intersection of said slot and said side wall about the periphery of the stem, said first and second ports also being angularly and axially spaced apart, and said ports intersecting said slot at the interior of said stem, the axial length of said slot being greater than the axial spacing between said first and said second and third passageways:

said stem being rotatable between a first position wherein said first and second passageways are in fluid flow communication through said slot and said first port and wherein said third passageway is obturated and a second position therein said first and third passageways are in fluid flow communication through said slot and said second port and wherein said second passageway is obturated; and

said stem also being rotatable into a third position wherein said first passageway is obturated, said third position lying angularly between said first and said second positions.

4,003,404
SERVO STEERING SYSTEM FOR VEHICLES, ESPECIALLY MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

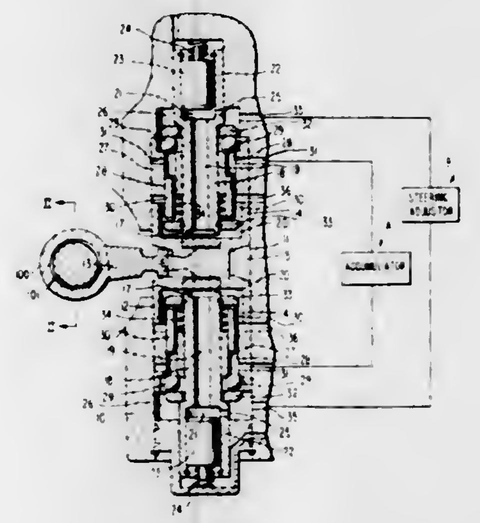
Filed Jan. 11, 1974, Ser. No. 432,594

Claims priority, application Germany, Jan. 12, 1973, 2301415

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B62D *5/08*

U.S. Cl. 137—627.5 12 Claims



1. A servo-steering system for vehicles in which a steering nut is movable on a steering spindle, and in which adjusting means are coordinated to the steering nut which are acted upon by a pressure medium, whose pressure is controllable by a control means in dependence on the deflection of the steering nut, characterized in that a high pressure accumulator means serves as pressure medium source, said control means being provided with space means conducting the working pressure, the inflow of the pressure medium to said space means being substantially completely interrupted by said control means in the normal position of the steering nut, the steering nut engages with a finger into a guide sleeve means which is located in a bore provided in a portion of the control means between two control piston means, and valve closure plate means in said guide sleeve means which are spaced at a slight distance from the end faces of the control piston means forming valve seats for the valve closure plate means, one control sleeve means each is fixedly arranged in the bore of the portion of said control means on both sides of the guide sleeve means, said control sleeve means accommodating centrally thereof the control piston means and at the end face thereof an inlet valve means leading to said space means conducting the working pressure, several similar axially parallel bores are provided in each control sleeve means, which are connected with the inlet from the accumulator means, said last-mentioned bores being closed in the direction toward the working space means by first valve means and receiving compensating piston means in the direction toward the guide sleeve means, and at least the compensating piston means being supported at abutment means fixedly arranged on the control piston means.

4,003,405
APPARATUS FOR REGULATING THE FLOW RATE OF A FLUID

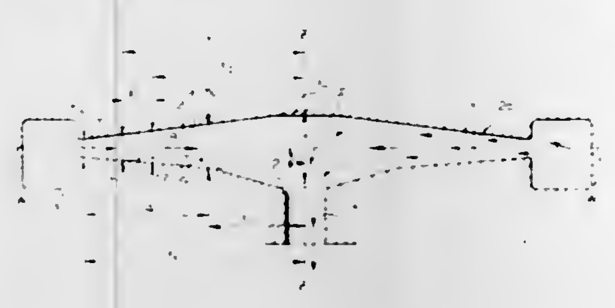
William F. Hayes; John W. Tanney, both of Ottawa, and Helen G. Tucker, Orleans, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 1, 1976, Ser. No. 662,842

Claims priority, application Canada, Mar. 26, 1975, 223118

Int. Cl.² F15D *1/00, 1/02, 1/04, 1/06*

U.S. Cl. 138—40 14 Claims



1. Apparatus for regulating the flow rate of a fluid, comprising:

a. a casing having, when the apparatus is regulating the flow rate of a fluid, a fluid passage which is symmetrical about an axis and is annular shaped when viewed in the direction of the said axis and has a geometry such that any sectional area of the fluid passage which is symmetrical about the said axis and is normal to the mean direction for the flow of fluid therein forms a curved surface within the range of the curved surface of a frustrum of a cone and the curved surface of a circular cyliner, a fluid inlet cavity in the casing, for connection to a source of pressurized fluid, the fluid inlet cavity being coaxial with the annular shaped fluid passage and forming a substantially unobstructed flow path for fluid to the whole of a peripheral inlet area to the annular shaped fluid passage, and fluid outlet means coaxial with the annular shaped fluid passage and spaced radially from the fluid inlet cavity, the fluid outlet means being for the escape of fluid from the fluid passage and forming a substantially unobstructed flow path, from the whole of a peripheral outlet area of the annular shaped fluid passage, for fluid which has flown through the annular shaped fluid passage from the fluid inlet cavity, and wherein,

b. when the apparatus is regulating the flow rate of a fluid, the flow of fluid along the whole length of the fluid passage, and in the mean direction of fluid flow therein, is laminar as evidenced by the fluid passage geometry conforming with the relationships in the following equations designated (1) to (8):

i. for a fluid, having the characteristics of a substantially incompressible, substantially Newtonian fluid, flowing through the fluid passage, if the fluid passage is divided into incremental portions for which the centerline of the fluid passage generally in the mean direction of the fluid flow may be assumed to be substantially straight, then the fluid static pressure drop $(p_2 - p_1)$ in each incremental portion conforms with the following relationship in consistent units:

$$(p_1 - p_2) = \frac{-1.21G^2}{g(2\pi)^2(\sin\theta)^2\rho}(A) + \frac{6\mu G(B)}{\pi\rho(\sin\theta)} \qquad (1)$$

where A and B are geometric parameters of the incremental portion under consideration and are defined, in consistent units, by the reltionships:

$$A = \frac{k(\sin\theta)}{x^3} .2 \quad \frac{1}{r_2} - \frac{1}{r_1} .2 + \frac{(\sin\theta)^2}{2x^2}$$

$$.2 \quad \frac{1}{(r_2)^2} - \frac{1}{(r_1)^2} .2 + \frac{k^2}{x^2} .2 \quad \frac{1}{h_2} - \frac{1}{h_1} .2$$

-continued

$$+ \frac{k^2}{2x^2} .2 \quad \frac{1}{(h_2)^2} - \frac{1}{(h_1)^2} .2 \qquad (2)$$

$$B = \frac{1}{x^3} \ln .2 \quad \frac{r_2}{r_1} .2 - \frac{1}{x^3} \ln .2 \quad \frac{h_2}{h_1} .2$$

$$+ \frac{1}{x^2} .2 \quad \frac{1}{h_2} - \frac{1}{h_1} .2$$

$$+ \frac{1}{2x} .2 \quad \frac{1}{(h_2)^2} - \frac{1}{(h_1)^2} .2 \qquad (3)$$

$$\text{where } k = \frac{\sin\theta(h_1 - h_2)}{(r_2 - r_1)} \qquad (4)$$

$$\text{and } x = h_2 k \frac{r_2}{\sin\theta} \qquad (5)$$

and where

r_1 = the radius, of that incremental portion at which p_1 occurs and where the radius is measured from the said axis of symmetry of the fluid passage to a first limit of the centerline of that incremental portion of the fluid passage in the mean direction of flow therealong,

r_2 = the radius of that incremental portion at which p_2 occurs and where the radius is measured from the said axis of symmetry of the fluid passage to a second limit of the centerline of that incremental portion of the fluid passage in the mean direction of fluid flow therealong and downstream of the first limit,

h_1 = the lesser dimension of that incremental portion, transverse to the mean direction of flow of fluid therethrough, at the radius r_1,

h_2 = the lesser dimension of that incremental portion, transverse to the mean direction of flow of fluid therethrough, at the radius r_2,

θ = the slope of the centerline of that incremental portion in the mean direction of fluid flow relative to the said axis of symmetry of the fluid passage, and is in the range greater than 0° and less than 180°,

k = mean slope of one boundary wall of that incremental portion relative to the opposite boundary wall thereto,

x = equivalent height of that incremental portion at the said axis of symmetry of the fluid passage as indicated by projecting the mean slope of each of the fluid passage boundary walls of that incremental portion to the said axis of symmetry,

G = mass flow rate of fluid flowing along the fluid passage,

ρ = density of fluid flowing along the fluid passage,

μ = absolute viscosity of fluid flowing along the fluid passage, and

g = acceleration due to gravity, and

ii. for a fluid, having the characteristics of a substantially compressible, substantially Newtonian fluid, flowing through the fluid passage, if the fluid passage is divided into incremental portions for which the centerline of the fluid passage generally in the mean direction of fluid flow may be assumed to be substantially straight, and where the fluid static pressure in each incremental portion, at any point on the said centerline of the fluid passage in the mean direction of flow of fluid therethrough, is a substantially linear function of the radial distance from the said axis of symmetry of the fluid passage to that point on the said centerline of the fluid passage, then the following relationship exists in consistent units for each incremental portion:

$$\frac{RT}{4}[(p_2)^2 - (p_1)^2][(r_2)^2(r_1)^2]$$

$$= \frac{1.21(GRT)^2}{g(2\pi)^2} .2 \quad C + \frac{1}{x^2} \ln .2 \quad \frac{p_2}{p_1} .2 \quad .2$$

$$+ \frac{6\mu G(RT)^2(\sin\theta)(D)}{\pi} \qquad (6)$$

where C and D are geometric parameters of the inremental portion under consideration and are defined, in consistent units, by the relationships:

$$C = \frac{1}{x^2} \ln ,2 \quad \frac{r_2}{r_1} \quad ,2 - \frac{2}{x^2} \ln ,2 \quad \frac{h_2}{h_1} \quad ,2$$
$$+ \frac{2}{x} ,2 \quad \frac{1}{h_2} - \frac{1}{h_1} \quad ,2 - \frac{1}{2} ,2 \quad \frac{1}{(h_2)^2} - \frac{1}{(h_1)^2} \quad ,2 \qquad (7)$$
$$D = \frac{x}{2k^2} ,2 \quad \frac{1}{(h_2)^2} - \frac{1}{(h_1)^2} \quad ,2$$
$$- \frac{1}{k^2} ,2 \quad \frac{1}{h_2} - \frac{1}{h_1} \quad ,2 \qquad (8)$$

and where similar symbols in the relationships (6), (7) and (8) are as previously defined for the relationships (1), (2) (3), (4) and (5) and where

ln = hyperbolic or natural logarithm,

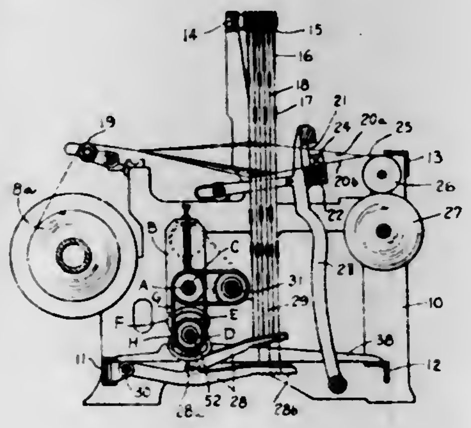
T = the absolute temperature of fluid flowing along the fluid passage, which with the fluid passages according to the present invention has been found to remain substantially constant along the whole length of the fluid passage, and

R = a constant for the substantially compressible fluid flowing along the fluid passage and is in accordance with the relationship p/p_r = R.T. where

p = the absolute static pressure of the fluid at any position along the fluid passage,

p_r = the density of the substantially compressible fluid at the position along the fluid passage where the absolute static pressure p is defined.

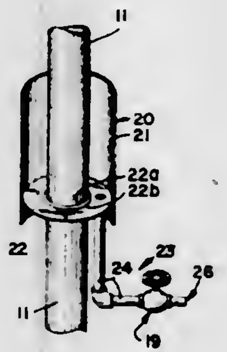
4,003,406
CAM LOOM APPARATUS AND METHOD
Edward E. Byrd, 109 Sylvan Road, Greenwood, S.C. 29646
Filed May 27, 1975, Ser. No. 581,105
Int. Cl.² D03C *5/00*
U.S. Cl. 139—80 **14 Claims**



1. For use in a loom having a plurality of harnesses and a plurality of treadles carried longitudinally of the loom beneath the harnesses and connected to respective harnesses for raising and lowering selected harnesses to form sheds, the improvement including:
- a driven rotatable shaft;
- means mounting said rotatable shaft for rotation at a predetermined speed transversely of said treadles;
- a plurality of first sprockets carried on said rotatable shaft in fixed relation thereto so as to be rotated thereby;
- a fixed shaft carried adjacent said treadles in alignment with said rotatable shaft;
- a plurality of second sprockets carried on said fixed shaft in rotatable relation thereto so as to be rotated thereon in alignment with said first sprockets;
- a plurality of cams carried on said fixed shaft in rotatable relation thereto adjacent respective second sprockets and in operating relation to respective treadles;
- a plurality of chains driven by respective first sprockets carried by said second sprockets; and
- co-acting means carried by respective chains and by respective second sprockets intermittently connecting respective cams in driving relation to said chain in predetermined sequence;

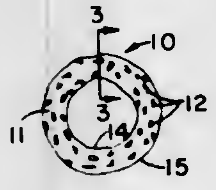
whereby said cams move intermittently to impart intermittent movement to respective treadles in predetermined sequence.

4,003,407
DRIP-PREVENTING CONDENSATION SHROUD USABLE WITH WATER HEATERS
John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.
Filed Sept. 20, 1974, Ser. No. 507,921
Int. Cl.² F16L *55/24*
U.S. Cl. 138—103 **2 Claims**



2. A shroud assembly positionable around the inlet pipe of a water heater to retard the formation and dripping of condensate on the inlet pipe, comprising:
- a. A sleeve positionable around an inlet pipe;
- b. attachment means for securing said sleeve to an inlet pipe, said attachment means including a resilient gripping element supported by said sleeve and forcibly abutable against an inlet pipe which may be inserted within said sleeve to hold said sleeve to an inlet pipe by frictional force;
- c. spacing means for positioning said sleeve in a generally vertical orientation about an inlet pipe to allow for the free convection of air between said sleeve and an inlet pipe which may be positioned within the sleeve;
- d. said spacing means containing an opening to allow for the free convection of air between said sleeve and an inlet pipe about which said sleeve may be positioned; and
- e. a selectively controllable drain valve attached to said spacing means for draining from said spacing means any accumulated condensate which may form within said sleeve, said drain valve being controllably movable from a closed to an open position.

4,003,408
UNDERGROUND IRRIGATION POROUS PIPE
James E. Turner, Southlake, Tex., assignor to George C. Ballas, trustee, Houston, Tex.
Filed Feb. 26, 1974, Ser. No. 445,866
Int. Cl.² F16L *11/04*
U.S. Cl. 138—118 **7 Claims**



1. Irrigation conduit means comprising:
- a substantially flexible tubular member formed of a plurality of random sized, random shaped, and random spaced, elastomer bodies, and
- a polyethylene binder mix intermixed with said bodies to provide a porous sidewall having a labyrinthine network of irregularly shaped and sized channel-like apertures closely spaced at random along its length and about its circumference

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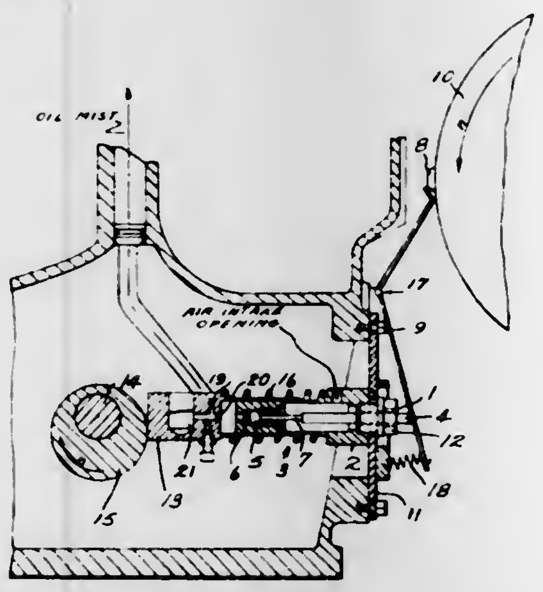
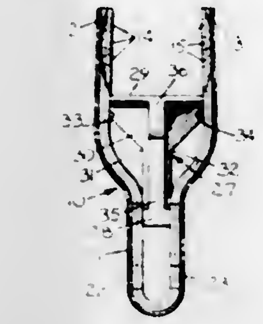
4,003,409
ARRANGEMENT FOR OIL SPRAY PUMPS
Günter Steffens, Viersen, Germany, assignor to Cramer-Halstrup & Schrunder, Viersen-Helenabrunn, Germany
Filed Feb. 5, 1976, Ser. No. 655,375
Claims priority, application Germany, Feb. 17, 1975, 2506633
Int. Cl.² D03J *1/00*
U.S. Cl. 139—1 R **3 Claims**



1. An oil spraying pump adapted for use with a weaving machine, comprising:
- a fixed piston provided with an axially oriented bore-hole which communicates with atmosphere;
- a movable cylinder within which said piston is located, said bore-hole opening into the interior of said cylinder,
- means for normally sealing said bore-hole;
- a follower element located within said bore-hole and having a portion projecting from an end of the piston remote from the cylinder;
- means engaging the projecting portion of said follower to periodically displace the follower thereby moving the sealing means from its sealing relationship with the bore-hole whereby the interior of the cylinder is vented to atmosphere;
- means for supplying oil to the interior of the cylinder;
- a discharge opening from the cylinder interior; and
- means for moving said cylinder axially with respect to the piston whereby when said bore-hole is sealed and said cylinder moves towards the piston, air within the cylinder interior is compressed to force oil in a mist from said discharge opening.

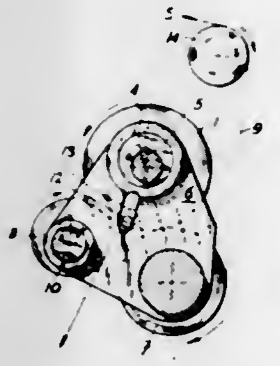
4,003,410
SHUTTLE SPRING STABILIZER
Harrison N. Thibault, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 18, 1976, Ser. No. 667,896
Int. Cl.² D03J *5/16*
U.S. Cl. 139—207 **3 Claims**

1. A stabilizer for a shuttle spring of the type having a U-shaped shank portion with opposed laterally flexible spring steel gripping jaws for releasably holding a weft bobbin therebetween, said stabilizer comprising:
- a. a body portion;
- b. a rib member (28) forming one end of said body portion having a lateral dimension of a width to be rigidly held by the shank portion;
- c. means interconnected with and spaced from said rib member defining the opposite end (29) of said body portion having a lateral dimension of greater width than said rib member; and
- d. stop surfaces (33–34) defining the sides of said opposite



end of said body portion for engaging the gripping jaws at locations intermediate their ends and the shank portion during bobbin replenishment to prevent inward flexing thereof beyond a predetermined position.

4,003,411
DEVICE FOR WITHDRAWING FABRICS FROM LOOMS
Václav Hšsek, Trebechovice pod Orebem, Czechoslovakia, assignor to Elitex, Zavody textilniho strojlrenstvi generalni reditalstvi, Liberec, Czechoslovakia
Filed May 13, 1974, Ser. No. 469,454
Claims priority, application Czechoslovakia, May 24, 1973, 3742/73
Int. Cl.² D03D *49/20*
U.S. Cl. 139—308 **2 Claims**

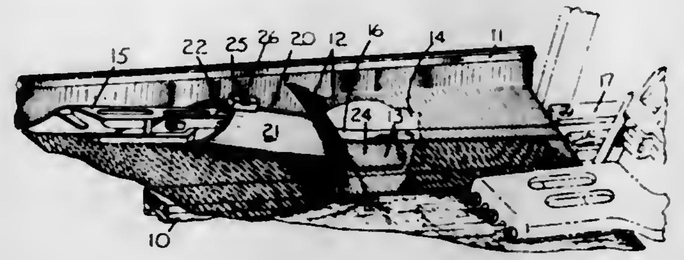


1. In a device for withdrawing fabric having a hauling beam journalled for rotation, first and second pressure beams cooperable with the hauling beam, and means including a first eccentric carried on the journals of the hauling beam for supporting one of the pressure beams, the improvement wherein the supporting means comprises a bracket carried by the first eccentric and exhibiting first and second spaced apertures and in which the improvement further comprises, in combination, means supporting the first one of the pressure beams within the first aperture of the bracket, a second eccentric carried in the second aperture of the bracket, and means for supporting the second one of the pressure beams on the second eccentric.

4,003,412
WEFT CARRIER POSITIONING DEVICE
Richard L. Volpe, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Sept. 23, 1975, Ser. No. 615,996
Int. Cl.² D03D *47/00*
U.S. Cl. 139—449 **3 Claims**

1. A device for selectively guiding a weft carrier to an accessible position outside a warp shed in looms of the type in which opposed carriers attached to flexible tapes insert weft yarn from a stationary source of supply within sheds formed by warp threads, said device comprising:
- a. means defining an elongated hollow body insertable for a portion of its length between an adjacent pair of warp threads of the upper warp sheet;

b. a camming means forming one end of said elongated hollow body for displacing warp threads of the upper warp sheet during insertion of said hollow body; and



c. means extending from said one end of said elongated hollow body for locating the latter in operative association with a plurality of warp threads of the lower warp sheet and in the pathway of the weft carrier.

4,003,413

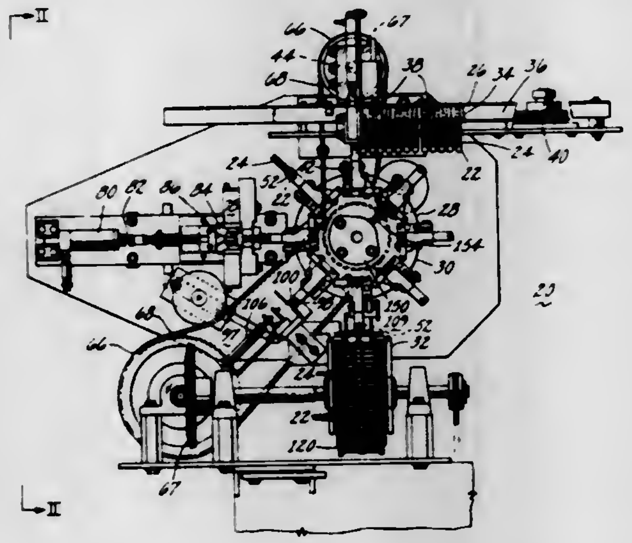
MACHINES FOR REFORMING AND REPACKAGING COMPONENTS

Waldo B. Hanson, Rowley; Ralph A. Morrison, Topsfield, and Armand L. Tardiff, Salem, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 1, 1975, Ser. No. 600,963

Int. Cl.² B21F *45/00*

U.S. Cl. 140—1 **14 Claims**



1. A machine for processing components having generally parallel leads extending from one side of their bodies, respectively, comprising:
  - conveyor means movable from a loading station, through successive processing stations, to an unloading zone;
  - uniformly spaced lead grippers mounted on said conveyor means for controlling portions of the leads adjacent to their respective bodies;
  - means on at least one subsequent station for cooperating with said grippers to bend the distal ends of said leads carried thereby into coaxial relation with one another and substantially at right angles with respect to their proximal ends which comprise said components' standoff lengths;
  - a lead taping mechanism, and means for transferring the successive formed components from the conveyor grippers with their coaxial lead portions in position to be taped by the lead taping mechanism.

4,003,414

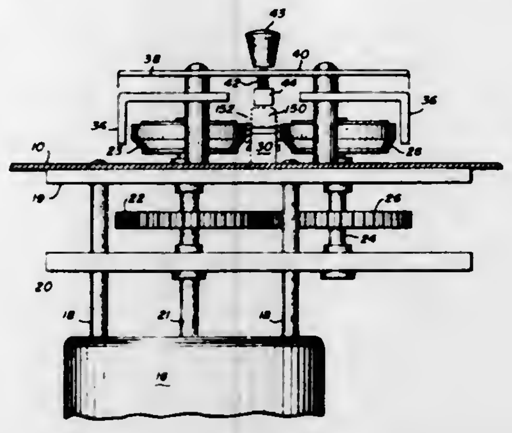
DIP LEAD FORMER

Dewey D. Halligan, 6251 Empress Court, San Jose, Calif. 95129

Filed Feb. 20, 1976, Ser. No. 659,766

Int. Cl.² B21F *1/02*

U.S. Cl. 140—1 **11 Claims**



1. Apparatus for forming the leads of Dual-Inline-Packaged (DIP) electronics devices comprising:
  - a cabinet;
  - a motor contained within said cabinet;
  - an elongated rail means affixed to said cabinet and providing a track over which DIP devices may slide, said rail means having side walls which serve as a form against which the leads of said DIP devices may be deformed;
  - a pair of resilient forming rollers disposed one on each side of said rail means for engaging the leads of DIP devices sliding along said rail means and pressing the leads against said side walls;
  - means driveably connecting said motor to said rollers; and
  - guide means disposed above said rail means and spaced therefrom sufficient to permit a DIP device to pass therebetween.

4,003,415

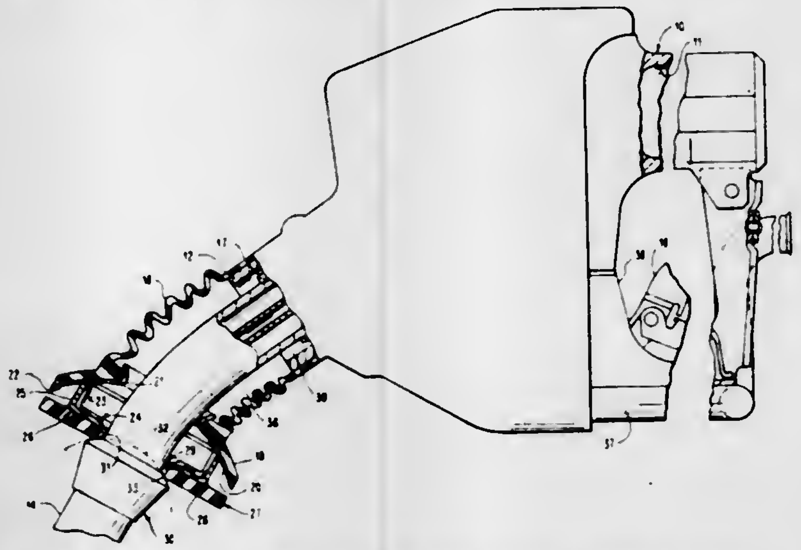
LIQUID DISPENSING NOZZLE HAVING VAPOR RECOVERY AND SEALING ARRANGEMENT

Donald A. Lasater, Fairfield, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed May 29, 1975, Ser. No. 581,718

Int. Cl.² B67C *3/34;* **B65B** *31/06*

U.S. Cl. 141—59 **30 Claims**



1. A liquid dispensing nozzle having a body, a spout extending from said body and having its free end for disposition in an opening of a fill pipe of a vehicle tank or the like, means to return vapor from the tank being filled, said vapor return means having sealing means associated therewith to form a seal between the fill pipe opening and said vapor return means when said spout is disposed in the fill pipe, said sealing means having a sealing edge thereon, said sealing edge having an arcuate perimeter, means continuously urging said sealing means toward the free end of said spout, said spout having means disposed thereon between the free end of said spout and said sealing edge of said sealing means, said disposed means having a sealing edge engaging surface on its end adjacent said sealing edge of said sealing means, said sealing edge engaging surface having a section which is curved to have an arcuate perimeter complementary to the arcuate perimeter of said sealing edge and located on said disposed means to engage said sealing edge of said sealing means over essentially the entire perimeter of said sealing edge irrespective of the angular relation of said sealing edge of said sealing means to the longitudinal axis of said spout to form an essentially leakproof seal therebetween when said spout is not disposed in the fill pipe to seal said vapor return means from the atmosphere, and said sealing edge of said sealing means being removed from engagement with said curved sealing edge engaging surface of said disposed means while remaining in sealing engagement with a surface around the fill pipe opening when said spout is inserted in the fill pipe by compression of said urging means to cause communication between said vapor return means and the tank being filled.

4,003,416

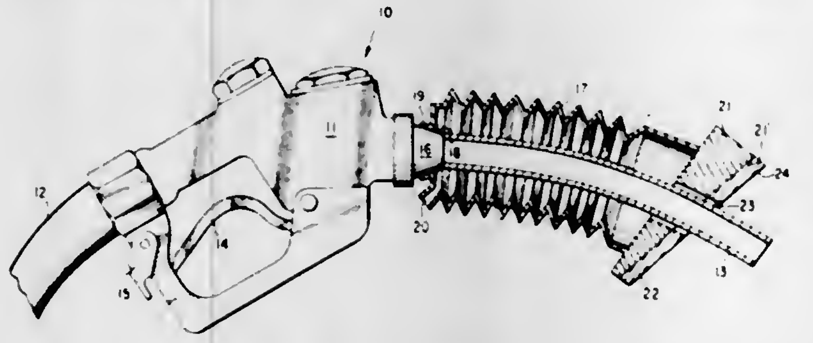
LIQUID-DISPENSING NOZZLE ASSEMBLY

Bernard E. Weidenaar, Hacienda Heights, Calif.; Frederick L. Voelz, Orland Park; James J. Simnick, Riverdale, both of Ill., and Peter P. Moskovich, Jr., Gary, Ind., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 468,787, May 9, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,879

Int. Cl.² B65B *3/04*

U.S. Cl. 141—392 **13 Claims**



1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:
  1. a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;
  2. a vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said nozzle is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing, or in proximity thereto, a sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said sealant means; and
  3. means for allowing removal of vapor from said chamber; the improvement comprising said sealant means comprising a compressible cellular plastic material obtained from a fluorine-containing elastomer, said material having:
     - a. a plurality of cells present as part of its structure;
     - b. compressibility under normal nozzle loads of the material in contact with the outer surface of the receiver inlet in the range of from about 5 to about 85% of that part of the material's original preload volume;
     - c. substantial resistance to the liquid dispensed and vapor being removed; and
     - d. the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

4,003,417

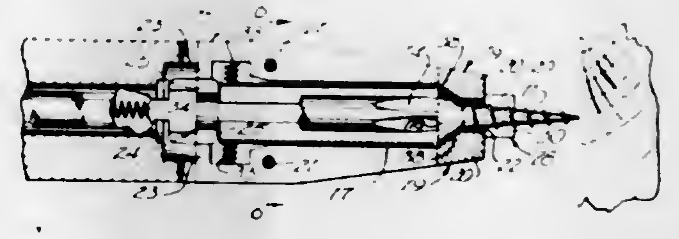
SELF LOCKING AND UNLOCKING CLAMP FOR AUTOMATIC FASTENER DRIVING TOOLS

Leroy Cornwell, E. 6105 Mansfield, Spokane, Wash. 99211

Filed July 28, 1975, Ser. No. 599,674

Int. Cl.² B25B *23/10*

U.S. Cl. 144—32 R **8 Claims**



1. A self locking and unlocking fastener clamp assembly for automatic fastener driving tools, comprising:
  - a fastener receiving head adapted to be mounted to a forward end of an automatic fastener driving tool;
  - chuck means mounted to said fastener receiving head and movable thereon between (a) a first position for engaging and securely holding a fastener to be operated on by the driving tool and (b) a second position for releasing the fastener following operation of the driving tool,
  - locking means for locking the chuck means in said first position;
  - trigger means associated with said locking means for unlocking the chuck means from the first position; and
  - fastener release means responsive to forward movement of the fastener along its center axis relative to said chuck means for spreading said chuck means when unlocked from said first position to said second position to release the fastener held thereby;
  - said chuck means comprising:
  - a pair of jaw members pivotably mounted to said fastener receiving head on opposite sides of said fastener receiving head;
  - facing jaw surfaces at forward ends of said jaw members;
  - facing locking dogs at rearward ends of said jaw members for operative engagement with said locking means;
  - said jaw surfaces and locking dogs being spaced longitudinally on opposite sides of the pivot axes of said jaw members; and
  - biasing means interconnecting said jaw members and said fastener receiving housing for normally urging said jaw surfaces together .

4,003,418

COMBINATION TOOL

Allan Andersson, Kjellbergsgatan 6, 41132 Goteborg, Sweden

Filed Sept. 12, 1975, Ser. No. 612,722

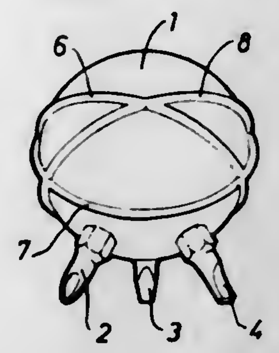
Claims priority, application Sweden, Sept. 16, 1974, 7411615

Int. Cl.² B25B *15/02*

U.S. Cl. 145—50 C **2 Claims**

1. A combination tool comprising a ball-shaped handle member and at least three substantially straight work-engag-

ing members projecting substantially radially from said ball-shaped handle member, the tips of said work-engaging members defining a plane spaced from the surface of said handle member.



4,003,419

TIRE FILLED WITH LUBRICANT COATED CELLULAR PARTICLES

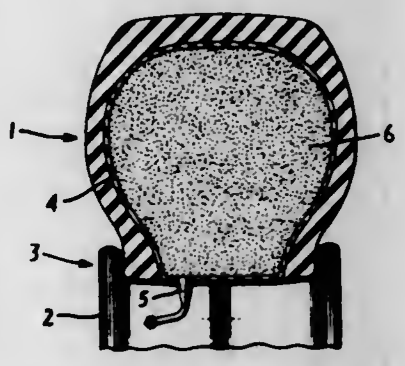
Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Dec. 23, 1974, Ser. No. 535,699

Claims priority, application France, Dec. 21, 1973, 73.46442

Int. Cl.² B60C *17/00, 21/08, 1/00*

U.S. Cl. 152—312 **24 Claims**



1. A tire mounted on a wheel rim so as to form a tire cavity which can be inflated with a gas under pressure, characterized by the fact that the tire cavity is filled at least partially with solid light-weight discrete particles of cellular material having a very low apparent density of less than about 100 g./dm³ but resistant to stresses due to tire travel, said particles bearing a lubricant which is inert with respect to the materials present in the tire cavity, thus, the particles are free to move relative to one another, with low friction and low generation of heat when they have to cushion the tire after a puncture of the tire cavity and plug the puncture hole.

4,003,420

TIRE WITH SIDEWALL COMPOSITION

Paul H. Sandstrom, Tallmadge, and Joginder Lal, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 19, 1975, Ser. No. 642,274

Int. Cl.² C08F *15/06;* **C08G** *20/20*

U.S. Cl. 152—355 **13 Claims**

1. A pneumatic rubber tire which comprises a generally toroidal shaped carcass with a circumferential tread, shaped beads and connecting sidewall portions extending between said tread and beads and having adhered to said sidewall portion an adherent, covulcanized outer rubbery sidewall layer extending from the general area of said bead portion towards said tread, where said rubbery sidewall layer is an elastomeric composition comprised of (A) 20–40 phr rubbery EPDM, (B) 2–20 phr of a rubbery polymer prepared from at least one C_4-C_{10} α-olefin interpolymerized with at least one C_5-C_{30} nonconjugated polyene containing 2 or more carbon to carbon bonds, and (C) 55–78 phr of high unsaturation rubbers comprised of 30 to 80 weight percent natural rubber.

4,003,421

VEHICLE WHEELS

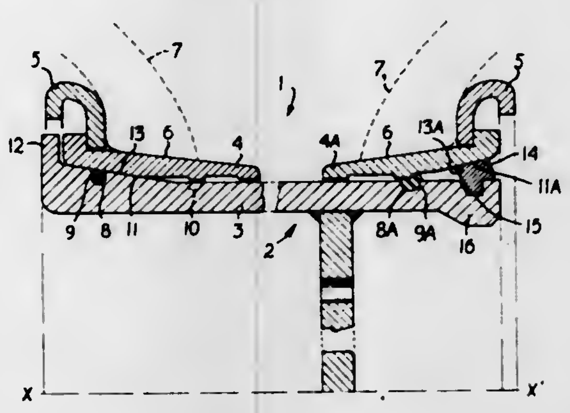
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Nov. 26, 1975, Ser. No. 635,307

Claims priority, application France, Dec. 3, 1974, 74.40197

Int. Cl.² B60C *5/16*

U.S. Cl. 152—409 **2 Claims**



1. Rim for tubeless tires having a rim base with two grooves each supporting an elastic annular sealing element, two conical rings with corresponding flanges and two locking devices for said conical rings, one of said devices being formed by a conical bearing surface forming a thickening of increasing diameter firmly connected with the rim base and by a bearing surface of suitable conicity on the corresponding conical ring, said rim being characterized by the fact that one of the elastic annular sealing elements is housed in a groove located intermediately in the conical bearing surface of the locking device forming a thickening of increasing diameter which is firmly connected with the rim base.

4,003,422

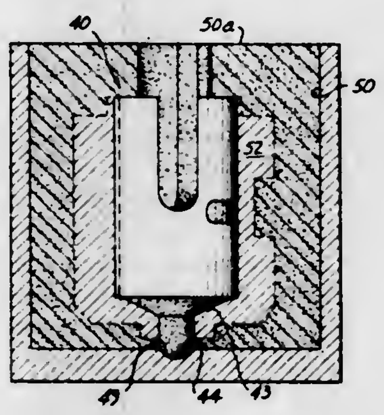
PROCESS FOR MAKING A COMPOSITE CYLINDER HEAD ASSEMBLY

Buford J. Schramm, 1330 E. Fremont Drive, Tempe, Ariz. 85281, and Robert G. Everts, 2118 E. Birchwood Ave., Mesa, Ariz. 85204

Filed Apr. 21, 1975, Ser. No. 570,032

Int. Cl.² B22C *9/10;* **B22D** *19/08*

U.S. Cl. 164—9 **1 Claim**



1. A process for making a composite cylinder head assembly comprising:

a. forming a cylinder liner sleeve with a circularly cylindrical bore and a plurality of ports extending between an inner wall and an outer wall thereof;

b. forming a core of reducible material filling said bore, and at least some of said ports, and including at least one body lying against the outer wall and overlaying at least one of said ports, said core being continuous and unitary, and adapted to exclude molten casting metal from the volume it occupies, said core and sleeve comprising an intermediate structure;

c. placing said intermediate structure in a mold, said mold having an inside contour shaped to form a cylinder head surrounding said intermediate structure;

d. filling the spacing between the intermediate structure and mold with molten metal, cooling the metal and removing the mold; and

e. reducing the core and removing the material, whereby to form a cylinder head assembly with a clear bore, open ports, and at least one passage communicating with a port and extending axially alongside the outer wall of the sleeve.

4,003,423

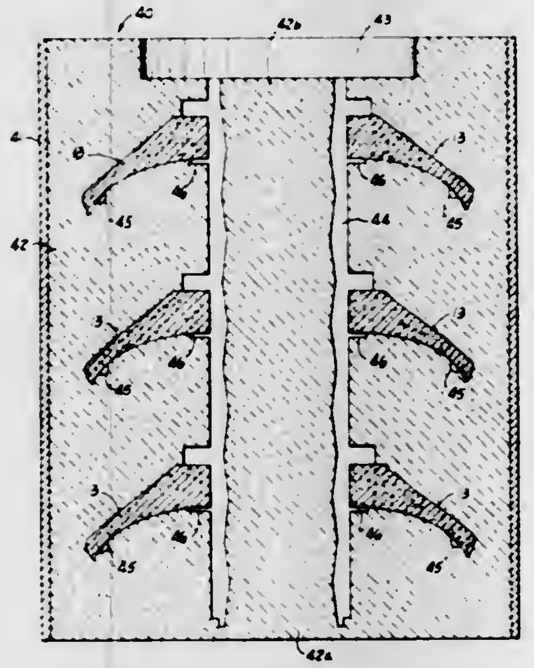
METHODS AND MEANS FOR MAKING DENTAL CASTINGS AND THE LIKE

Tadaomi J. Shikinai, Tokyo, Japan, and Robert A. Horton, Chesterland, Ohio, assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Filed June 9, 1975, Ser. No. 585,068

Int. Cl.² B22C *9/02, 7/04, 7/00*

U.S. Cl. 164—34 **14 Claims**



1. A method of making a plurality of dental castings in a single mold by the lost pattern process of investment casting comprising the steps of:

a. fitting together in end-to-end relation a plurality of annular segments so as to form a cylindrical support member having outwardly extending, spaced protrusions,

b. forming patterns of dental castings on refractory casts of anatomical form,

c. placing said casts on said protrusions,

d. connecting said patterns to said support member to provide gating structure,

e. forming a mold around said casts, patterns, gating structure and support member,

f. thereafter removing said patterns, gating structure and support member from the mold, and

g. filling the mold with metal to form dental castings on said refractory casts.

4,003,424

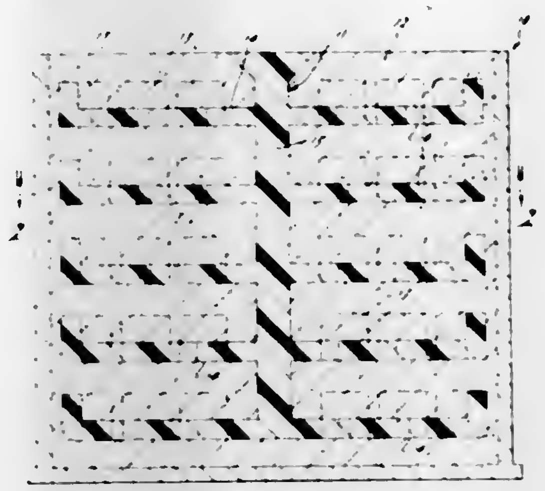
METHOD OF MAKING DUCTILE IRON TREATING AGENTS

Adolf Hetke, Livonia; Prem P. Mohla, Plymouth, and Robert J. Warrick, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 10, 1975, Ser. No. 630,569

Int. Cl.² B22C *9/04;* **B22D** *21/00, 25/02*

U.S. Cl. 164—34 **5 Claims**



1. A method of making a metal treating agent casting, comprising:

a. providing a fugitive pattern for sand casting comprised entirely of a material effective to be gasified upon contact by the molten treating agent, said pattern being configured to define a block having a constant erodible interface with molten metal to be treated and having a volume/surface ratio no greater than 1.5,

b. suspending one or more of said patterns in a molding flask and introducing vibrated selected heat absorbing unbonded particles therearound, said particles being selected from the group consisting of silica sand, zircon sand, chromite sand, carbon sand, and steel shot, and

c. introducing a molten treating agent to displace each of said patterns and allowing said treating agent to solidify at rates to avoid noticeable segregation in the resulting casting greater than 0.75% by weight.

4,003,425

METHOD OF AND MEANS FOR OBTAINING WHITE CAST IRON

William Robert Middleton, Harrogate, England, assignor to The British Cast Iron Research Assoc., Birmingham, England

Filed Feb. 10, 1976, Ser. No. 656,961

Claims priority, application United Kingdom, Feb. 11, 1975, 5699/75

Int. Cl.² B22D *27/18, 27/20*

U.S. Cl. 164—58 **10 Claims**

1. A method of making an iron casting containing at least a region of white iron comprising pouring molten iron into a mold having an internal surface of which at least a portion has first been coated with a material containing a white-iron-promoting material selected from the class consisting of tellurium and bismuth and compounds thereof and containing in addition a substance which contains water in a loosely chemically combined form, said water being bound sufficiently tightly to withstand drying of said mold but being liberated at the temperature of the molten iron.

7. A mold for making an iron casting containing at least a region of white iron, said mold comprising a body defining a mold cavity, at least a portion of the surface of said cavity being coated with a material containing a white-iron-promoting material selected from the class consisting of tellurium and bismuth and compounds thereof and containing in addition a substance which contains water in chemically loosely com-

bined form, said water being bound sufficiently tightly to withstand drying of said mold but being such as to be liberated at the temperature of the molten iron.

4,003,426

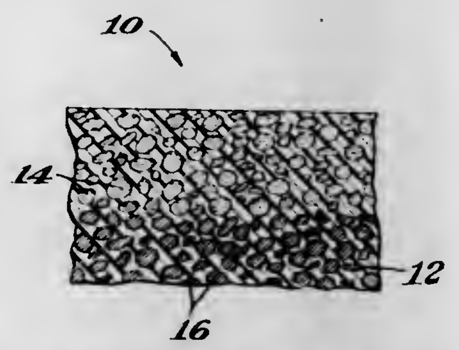
HEAT OR THERMAL ENERGY STORAGE STRUCTURE

John S. Best, Freeport, and William J. McMillan, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1975, Ser. No. 575,558

Int. Cl.² F24D *5/10;* F28D *13/00;* C09K *5/00*

U.S. Cl. 165—53 **14 Claims**



1. A heat or thermal energy storage structure comprising a crosslinked polymeric resinous matrix having a plurality of substantially unconnected small closed cavities disposed therein and a heat sink material encapsulated within said cavities, said heat sink material having a relatively large latent heat capacity at its melting and freezing phase change which supplies heat to or removes heat from said storage structure.

4,003,427

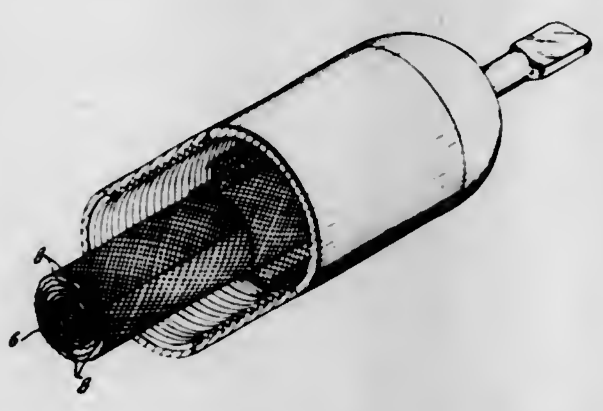
HEAT PIPE FABRICATION

Sidney Leinoff, Plainview; Frederick Edelstein, Hauppauge, and Walter Combs, Freeport, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,923

Int. Cl.² F28D *15/00*

U.S. Cl. 165—105 **4 Claims**



1. In a heat pipe having a closed casing, a wall capillary with a vaporizable liquid carried therein, and an axially disposed artery, the improvement which comprises a spirally wound supported artery having at least two wire mesh layers, said wire mesh layers being arranged so that the warp and weave of said wire mesh are at about a 45° angle with respect to the longitudinal axis of said artery, said wire mesh layers being spaced from one another by a plurality of strips of wire mesh spacers that are arranged so that the warp and weave of said strips of wire mesh spacers are substantially parallel to the warp and weave of the wire mesh of said spirally wound supported artery.

4,003,428

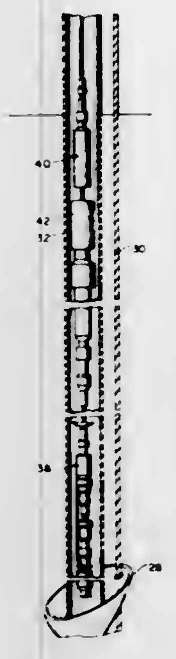
APPARATUS AND METHOD FOR UNDERWATER PUMP INSTALLATION

James N. Zehren, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Sept. 19, 1975, Ser. No. 615,100

Int. Cl.² E21B *7/12*

U.S. Cl. 166—.5 **21 Claims**



1. Underwater wellhead apparatus comprising a tube having means for supporting the same upright above and in communication with a well bore extending below a body of water, means including a pump assembly suspension head for suspending a submergible pump assembly in said tube at an operating position, a housing adjacent to said tube and having its interior isolated from said body of water, and means in said housing for locking said suspension head in said tube.

4,003,429

APPARATUS FOR LOADING GAS-CONVEYED PARTICULATE SOLIDS INTO A BOREHOLE

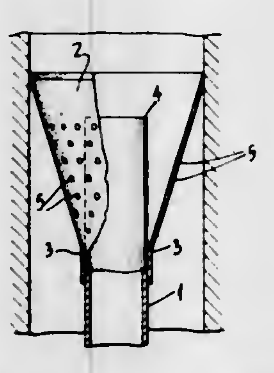
David Gilbert Hay, Balaclava, and Richard Fox, Rosanna, both of Australia, assignors to ICI Australia Limited, Australia

Continuation of Ser. No. 383,551, July 30, 1973, abandoned. This application June 12, 1975, Ser. No. 586,341

Claims priority, application Australia, Aug. 17, 1972, 127/72

Int. Cl.² E02D *7/24;* E21B *43/08*

U.S. Cl. 166—51 **4 Claims**



1. A device for loading gas conveyed particulate solid into a borehole partially filled with liquid comprising a tube for conveying said solid, mantle means for separating said solid from said liquid and said gas, said mantle means being resistant to inversion and mounted adjacent the discharge end of said tube and coaxially therewith wherein said mantle means further includes perforated and unperforated portions and said mounting is such that said perforated portion is in contact with said tube and said unperforated portion is in contact with said borehole and at least a part of said perforated portion having perforations of a size in a mesh range of from 300 to 3000 mesh per square inch and wherein the unperforated portion of said mantle means comprises a truncated cone and the perforated portion of said mantle means comprises a cylinder having perforations therein wherein the cylinder is secured to the tube adjacent the end thereof and the truncated cone is attached to the cylinder so that said liquid and said gas pass out of the borehole through said cylinder.

4,003,430

APPARATUS FOR THE REPLACEMENT OF SEALS IN A WELL RAM TYPE BLOW OUT PREVENTER

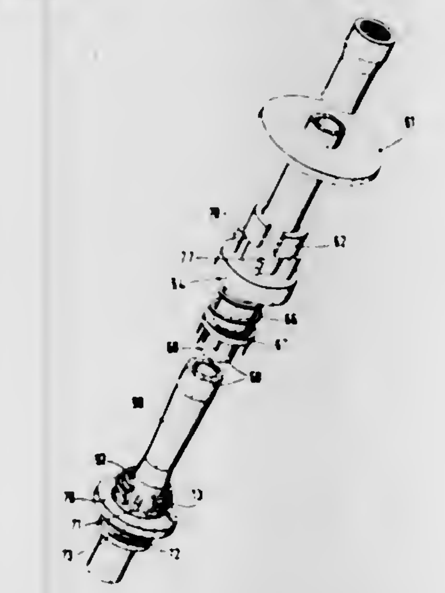
David A. Carnahan, Garricks House, Hampton Court Road, Hampton, Middlesex, England

Filed Dec. 26, 1974, Ser. No. 536,312

Claims priority, application United Kingdom, Jan. 2, 1974, 134/74

Int. Cl.² E21B *33/06*

U.S. Cl. 166—85 **10 Claims**



1. Apparatus to be suspended from the lower end of a drill pipe string for indexing and mounting a blow out preventer receiving shoe on a blow out preventer ram, such apparatus comprising an installation body adapted to be secured to the lower end of the drill pipe string, means for supporting a replacement shoe in a predetermined position on the body, means carried by the installatin body for indexing the shoe support means relative to a drill pipe ram grip during used of the apparatus by being received between the ends of the rams of a partly open drill pipe grip, and means for engaging the replacement shoe with a blow out preventer ram.

4,003,431

PROCESS OF CEMENTING WELLS

Rudolf J. Novotny, and Charles L. Smith, both of Arlington, Tex., assignors to Byron Jackson, Inc., Long Beach, Calif.

Filed Sept. 20, 1972, Ser. No. 290,610

Int. Cl.² E21B *33/13*

U.S. Cl. 166—250 **8 Claims**

1. A method of cementing at a given location in a well which comprises: introducing a stream of water into a first mixing zone at a controlled rate, concurrently introducing a stream of cement-modifying additive into said first mixing zone at a controlled rate, commingling said stream of water and said stream of additive in said first mixing zone to form an additive-water mixture, flowing a stream of said additive-water mixture to a second mixing zone, introducing said stream of additive-water mixture into said second mixing zone at a controlled rate, concurrently introducing a stream of dry cement ingredients into said second mixing zone at a controlled rate, mixing said stream of additive-water mixture with said stream of cement ingredients in said second mixing zone to form a primary cement slurry, withdrawing a stream of sample of said additive-water mixture from the stream thereof flowing from said first mixing zone to said second mixing zone, continuously determining the concentration of said additive in said stream of sample, controlling the rate at which said stream of cement-modifying additive is introduced into said first mixing zone responsive to said continuously determined concentration, introducing a stream of said primary cement slurry into a cement slurry blending zone and thoroughly mixing said slurry therein to provide a reservoir of blended cement slurry, continuously measuring the concentration of dry cement ingredients in said blended cement slurry, controlling the rate at which said stream of dry cement ingredients is introduced into said second mixing zone responsive to said continuously measured concentration of dry cement ingredients, pumping said blended cement slurry from said cement slurry blending zone into said given location, and allowing said cement slurry to set in said given location.

4,003,432

METHOD OF RECOVERY OF BITUMEN FROM TAR SAND FORMATIONS

Peter L. Paull, Weston, and Fontaine C. Armistead, Darien, both of Conn., assignors to Texaco Development Corporation, New York, N.Y.

Filed May 16, 1975, Ser. No. 578,243

Int. Cl.² E21B *43/22, 43/24, 43/26*

U.S. Cl. 166—271 **12 Claims**

1. A method for fracturing a tar sand formation penetrated by an injection well and a production well consisting of

a. forcing a first fluid down the injection well under sufficient pressure to fracture the formation between the injection well and the production well and

b circulating a second fluid in the fracture between the injection well and the production well at a temperature below the original temperature of the tar sand formation.

4,003,433

METHOD FOR CUTTING PIPE

Mack Goins, 577 Contour Dr., Lake Charles, La. 70601

Division of Ser. No. 521,473, Nov. 6, 1974, Pat. No. 3,902,070. This application May 12, 1975, Ser. No. 576,727

Int. Cl.² E21B *29/00*

U.S. Cl. 166—298 **7 Claims**

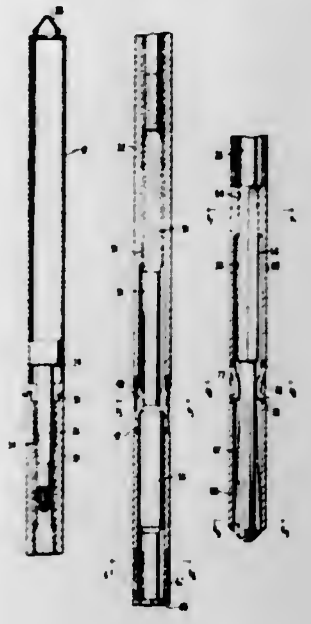
1. A method for cutting a pipe internally comprising:

providing a pipe cutter including an elongated sleeve having a lower, rotatable section and an upper, enclosed, cylinder section housing a piston, said sleeve carrying movable gripping jaws at the central portion thereof, and a cutting tool at the lower rotatable section, said sleeve also carry-

ing a shaft axially movable therein, the upper end thereof coupled to said piston;

disposing said pipe cutter within a pipe to be cut;

displacing said shaft in an axial direction relative to said sleeve by displacing said piston within said cylinder;



displacing said gripping jaws and said cutting tool outwardly laterally in response to axial movement of said shaft to grip the interior pipe wall and engage said wall, respectively, as said piston is displaced within said cylinder; and

rotating the lower section of said sleeve and said cutting tool relative to the upper portion of said sleeve in response to axial displacement of said shaft to cut said pipe.

4,003,434

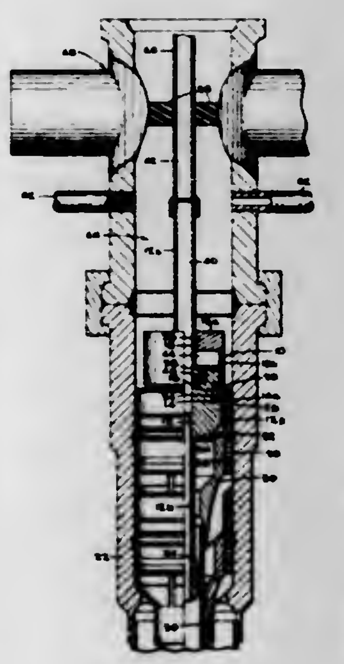
METHOD AND APPARATUS FOR RUNNING, OPERATING, AND RETRIEVING SUBSEA WELL EQUIPMENT

Michael R. Garrett, and Michael J. Krenek, both of Houston, Tex., assignors to FMC Corporation, San Jose, Calif.

Filed July 25, 1975, Ser. No. 599,141

Int. Cl.^{2} E21B *23/00, 23/04*

U.S. Cl. 166—315 **8 Claims**



1. A method of releasing a running and retrieving tool connected to a pipe string from a well tool located in a well below a blowout preventer system, said well having a wellhead and at least one choke and kill line extending from said wellhead to a control station, comprising

a. closing the blowout preventer system around the pipe string,

b. conducting hydraulic pressure through the choke and kill line into the well to pressurize the well annulus below the blowout preventer system, and

c. exerting the choke and kill line hydraulic pressure in the well annulus against pressure-responsive means on the running and retrieving tool to disengage said means from said well tool, thereby releasing said running and retrieving tool from said well tool for withdrawal by said pipe string from said well.

4. A hydraulically actuated running and retrieving tool for use in running and retrieving well tools into and from a remotely located wellhead, said running and retrieving tool comprising

a. a body,

b. means on the body for attaching the tool to a drill pipe string, and

c. means on the body for releasably connecting the running and retrieving tool to a well tool, said connecting means comprising external piston means mounted on the exterior of said body and linearly movable with respect thereto in response to external exertion of hydraulic pressure thereon, whereby exertion of said external hydraulic pressure actuates said external piston means and releases said running and retrieving tool from said well tool.

4,003,435

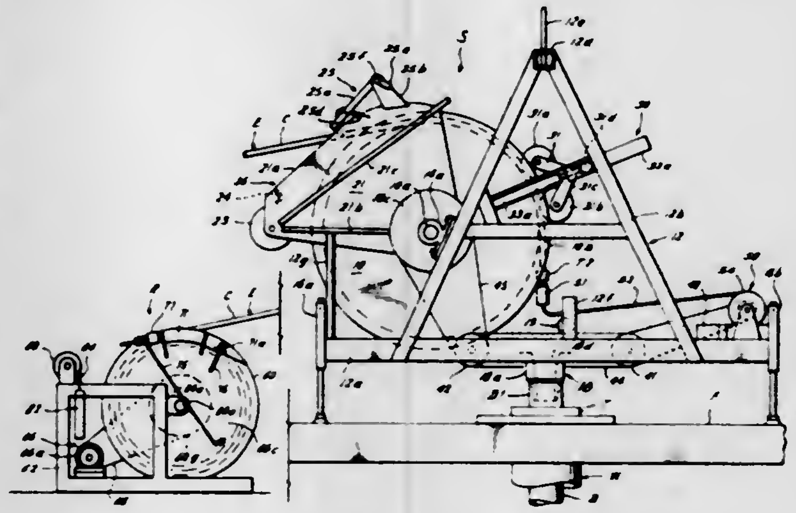
METHOD AND APPARATUS FOR DEPLOYMENT AND RETRIEVAL OF FIXED LENGTHS OF ELECTRICAL CABLE INTO AND FROM A WELL BORE

Roy H. Cullen; Joshua M. Jackson; Jim Witovek, Jr., and Terry V. Jones, all of Houston, Tex., assignors to General Electric Company, by said Joshua M. Jackson and Jim Witovek, Jr.

Filed Oct. 9, 1975, Ser. No. 621,131

Int. Cl.^{2} E21B *23/00, 19/08*

U.S. Cl. 166—315 **20 Claims**



1. An apparatus for handling fixed lengths of one or more sections of electrical cable having substantially rigid terminal electrical connectors at the end of each cable conductor section for the deployment and retrieval of the entire fixed length of the cable section into and from a well bore, said apparatus comprising, in combination:

a rig floor assembly adapted for positioning over the well bore including means for substantially tangentially feeding and withdrawing the entire length of each electrical cable section into and from the well bore, and means for preventing excessive bending of one of the cable terminal connectors and the cable conductor at an interface between the conductor and the connector of each cable section with the electrical cable being fed into or withdrawn from the well bore; and

an apparatus for supplying and receiving a fixed length of at least one electrical cable section to and from said rig floor assembly for said feeding and withdrawing into and from the well bore, said apparatus including a reel for winding and unwinding the section of electrical cable having means for preventing excessive bending of at least one of the terminal connectors and the cable conductor of the cable section at an interface between said conductor and said terminal connector with said section of cable being wound or unwound to or from said reel.

14. A method for alternately installing and removing into and from a well bore an entire fixed length of one or more sections of an electrical cable having substantially rigid terminal connectors at the ends of each cable conductor section to transport electrical energy between the surface and a subsurface location in the well bore, said method comprising:

alternately feeding or withdrawing the entire fixed length of a section of electrical cable into and from the well bore from or to a location remote to the well bore; and

supporting and arcuately moving one of the rigid cable terminal connectors while preventing excessive bending of said supported rigid terminal connector and the electrical cable conductor at an interface between the conductor and supported connector with the section of electrical cable being substantially disposed within the well bore during said feeding or withdrawing of the cable into or from the well bore.

4,003,436

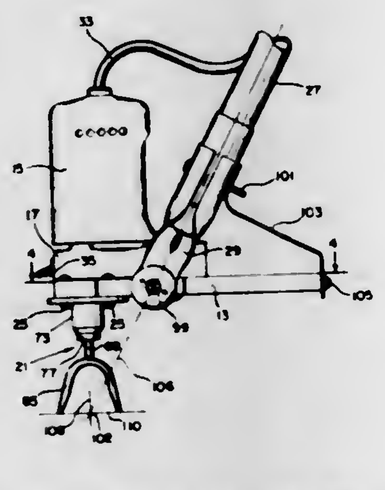
OSCILLATORY CULTIVATOR

Philip C. Foster, and Bert E. Forsman, both of Seattle, Wash., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 15, 1973, Ser. No. 388,498

Int. Cl.^{2} A01B *33/06*

U.S. Cl. 172—41 **1 Claim**



1. A portable, power operated cultivator comprising a frame, a motor mounted on said frame substantially centrally of its width, said motor having a vertically disposed, rotatable output shaft, a pair of cultivator tines suspended from said frame for oscillation about generally vertical axes, one on either side of said motor, gear train means interconnecting said motor output shaft and said oscillating tines, said gear train means including a pair of oppositely rotating gear elements, each of said gear elements including a drive means eccentrically disposed relative to the axis of said gear element, a pair of means each including a connecting rod engaged with one of said eccentric drive means and also connected to a respective one of said cultivator tines, said connecting rods being substantially symmetrical with respect to a midplane of said frame and operating substantially in opposite directions to one another, whereby the forces developed by said cultivator are substantially equal and opposite to one another thereby cancelling each other and minimizing vibrational forces arising therein.

4,003,437

SOIL CULTIVATING IMPLEMENTS

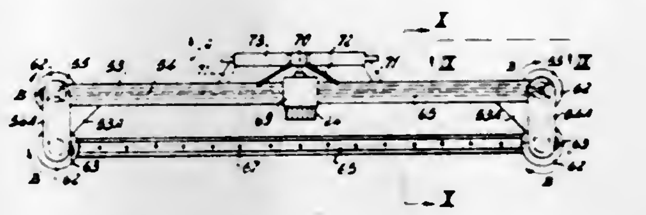
Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Division of Ser. No. 56,048, June 24, 1970, abandoned. This application July 13, 1972, Ser. No. 271,512

Claims priority, application Netherlands, Mar. 30, 1967, 6704508

Int. Cl.^{2} A01B *33/02*

U.S. Cl. 172—59 **3 Claims**



1. A harrow having a frame with coupling means for attachment to a prime mover, and at least one movable tined member mounted on said frame to the rear of said coupling means with respect to the direction of travel of the harrow, said tined member being movable in horizontal directions about substantially vertical axes, driving means supported on said frame and connected adjacent at least one end of said tined member to move same and crumble soil during operation, said tined member comprising a substantially horizontal elongated support, which extends approximately perpendicular to the direction of travel of the harrow and tine means being secured to said support, a soil contacting elongated element being interconnected to said tined member and mounted for horizontal movement with said tined member, said element extending substantially parallel to and being located beneath said support, said elongated element being provided with at least one inclined edge and including spring means biasing said soil contacting element towards the ground.

4,003,438

CULTIVATOR

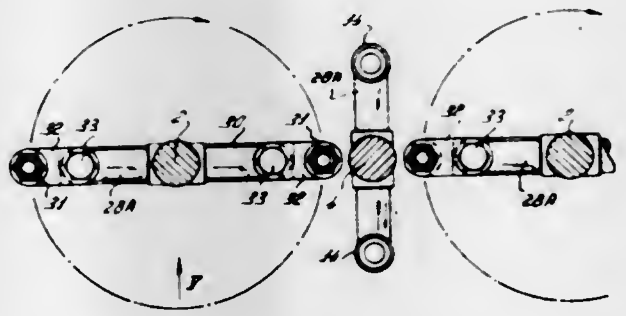
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Feb. 13, 1975, Ser. No. 549,531

Claims priority, application Netherlands, Feb. 15, 1974, 7402069

Int. Cl.^{2} A01B *33/06, 33/16*

U.S. Cl. 172—59 **10 Claims**



1. A cultivator implement comprising a plurality of soil-working members positioned side by side in a row that extends transverse to the normal direction of travel of the implement, each soil-working member being rotatable about a respective upwardly extending shaft means mounted on an elongated frame portion, said soil-working members being arranged in two groups and a first group being located on a lateral side of the center of said frame portion opposite from a second group, a drive transmission being connected to the shaft means of said soil-working members to rotate all of the members of said first group in the same direction and in a direction opposite to the direction of rotation of all members of said second group, said drive transmission comprising at least one neighboring driving shaft interposed between the shaft means of adjacent

soil-working members of both groups, said soil-working members each having downwardly extending soil-displacing elements positioned to work soil across the width of said row, each soil-working member comprising at least one soil-displacing element having a lower tip that is spaced from the respective shaft means and positioned to trace a substantially circular path having a diameter substantially twice the perpendicular distance between the shaft means of that soil-working member and the axis of rotation of the neighboring interposed driving shaft.

4,003,439
ROTARY HARROWS

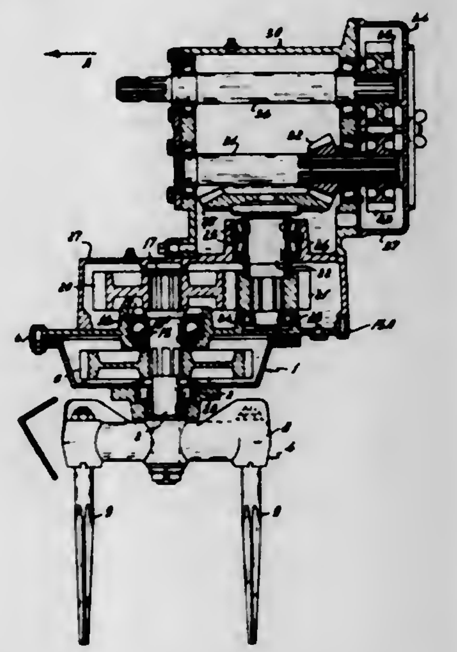
Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Filed May 2, 1975, Ser. No. 574,098

Claims priority, application Netherlands, May 7, 1974, 7406084

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **11 Claims**



9. A rotary harrow attachment for connection to a prime mover, comprising a frame and a plurality of soil working members rotatably mounted on a portion of said frame, said soil working members being mounted side-by-side in a row on upwardly extending shafts that are drivenly interconnected in a first drive supported by said frame portion, a second drive being operatively connected to said first drive through a third drive and the latter being a speed reducing transmission assembly of gears, means for connecting said second drive to a power take off of a prime mover, said third drive comprising a first rotary toothed pinion which engages a second rotary toothed pinion of that drive and the latter being located above intermeshing pinion gears of said first drive, said first rotary toothed pinion being rotatable about an axis that is substantially parallel to the axes of rotation of said soil working members, said second drive comprising transmission members in a gear box and said first drive including intermeshing pinions housed within said frame portion, the transmission members in said gear box comprising perpendicularly interconnected gears and said first rotary toothed pinion being located below those transmission members, said gear box comprising a change-speed gear assembly, whereby alternative speeds of rotation of said soil working members can be attained in response to an unchanged input speed of rotation of the power take off.

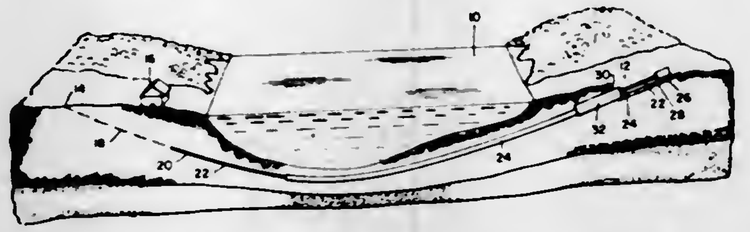
4,003,440
APPARATUS AND PROCESS FOR DRILLING UNDERGROUND ARCUATE PATHS UTILIZING DIRECTIONAL DRILL AND FOLLOWING LINER

Martin D. Cherrington, Carmichael, Calif., assignor to Tidril Corporation, Sacramento, Calif.

Filed Sept. 17, 1974, Ser. No. 506,920

Int. Cl.² E21B *7/04*

U.S. Cl. 175—61 **13 Claims**



1. A method for drilling along an inverted underground arcuate path beneath an obstacle from a first position at or near ground level on one side of the obstacle to a second position at or near ground level on the other side thereof, said method comprising the steps of providing a pilot drill string of a first diameter; providing a directional drill head having at least one cutting drill bit at the leading end of said pilot drill string; crowding and directing said drill string into the ground from said first position on said one side of the obstacle and along said inverted arcuate path and simultaneously powering said drill bit to drill a pilot hole directionally along said path; providing a following liner of second and larger diameter mounted circumferentially about said drill string, the inside diameter of said following liner exceeding the outside diameter of said drill string; and thrusting said liner independently of said drill string into the ground in circumscribing relationship to follow said drill string and not direct said drill string to advance said liner about said drill string along the inverted arcuate path for a length less than the penetration of said pilot string into the ground.

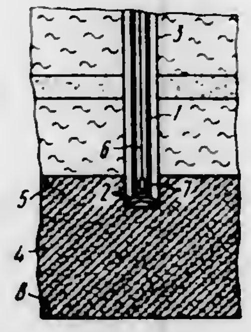
4,003,441
METHOD OF OPENING CARBON-BEARING BEDS WITH PRODUCTION WELLS FOR UNDERGROUND GASIFICATION

Efim Lvovich Lokshin, ulitsa Zheleznodorozhnaya, 30, kv. 30, Zagorsk Moskovskoi oblasti; Alfei Fedorovich Volk, ulitsa Kropotkinskaya, 40, kv. 14, and Anatoly Antonovich Starinsky, 1 Golutvinsky pereulok, 21, kv. 29, both of Moscow, all of U.S.S.R.

Filed Apr. 22, 1975, Ser. No. 570,494

Int. Cl.² E21B *21/00, 33/14, 47/04*

U.S. Cl. 175—71 **6 Claims**



1. A method of opening carbon-bearing beds with production wells for underground gasification which includes the drilling of a production well until the top of a bed is opened, ceasing said drilling on entering the upper layer of said bed, determining the depths of both the top and bottom of said bed, resuming said drilling of said bed so as to leave a pillar portion of said carbon-bearing bed at a depth where the possibility of communication between the adjacent wells by means of a fluid is assured through the body of said bed, when said production well is completed with a cemented casing string down to the top of said pillar portion, cementing a string of casing in said well to the top of said pillar portion and drilling said pillar portion left between the shoe of casing pipe string and the bottom of said bed.

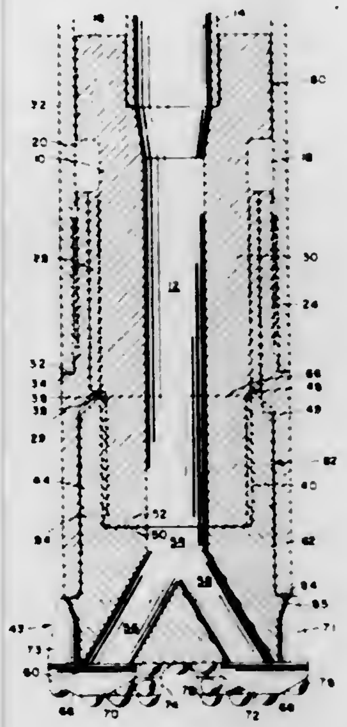
4,003,442
DETACHABLE DRILL BIT FOR IMPACT DRILLING

Ross Bassinger, San Antonio, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Oct. 6, 1975, Ser. No. 619,931

Int. Cl.² E21C *13/00*

U.S. Cl. 175—410 **9 Claims**



1. A drilling bit for use in a percussion drilling tool having a casing, a driver sub, and an anvil member slidably positioned in said sub; said bit having an external cutting surface, a circumferential shoulder, and a sliding surface extending from said shoulder for telescopic continuous engagement with said driver sub, and means on said bit spaced from said shoulder for releasably connecting said bit to said anvil member and located entirely within said driver sub during normal operation of said drilling tool so that bending moments are transmitted through said sliding surface to said driver sub.

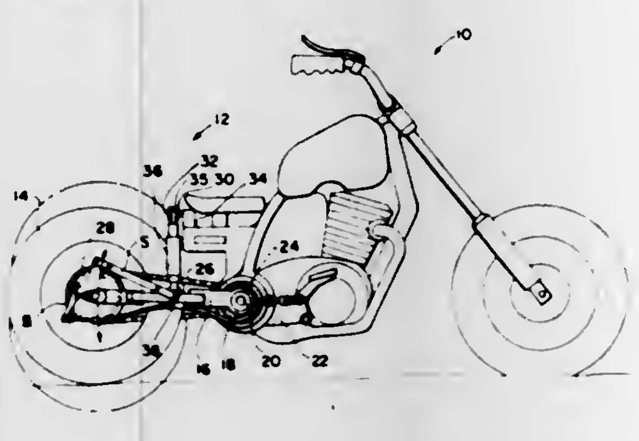
4,003,443
MULTIPLE WHEEL MOTORCYCLE SUSPENSION AND DRIVE SYSTEM

Gordon Neal Boughers, Dublin Road, Street, Md. 21154

Filed July 31, 1975, Ser. No. 600,591

Int. Cl.² B62K *25/00;* **B60G** *19/00*

U.S. Cl. 180—27 **9 Claims**



1. In a motorcycle having a frame, a steerable front wheel, first and second laterally related rear wheels having respective axles, a wheel suspension system connecting all said wheels with the frame, an engine, and means connecting the engine with the rear wheels, the improvement comprising: the connecting means including: a driveshaft transversely journaled in the frame, means for rotating all said rear wheels in response to driveshaft rotation, the driveshaft having a differential therein responsive to the means for rotating the driveshaft whereby each rear wheel can be rotated relative to the other said rear wheel, the suspension system including means pivotally supporting each rear wheel independently about the driveshaft axis, the wheel suspension system including a transverse arm having first and second ends and a pivotal connection to the frame intermediate said ends, first and second dashpot members, each dashpot member having connection at the upper end thereof with a respective end of said transverse arm, and each dashpot member having a pivotal connection at the lower end thereof with a respective means for supporting a rear wheel.

4,003,444
CONSTRUCTION FOR UNITING THE BRAKE CASE COVER, REAR WHEEL AXLE CASE AND TERMINAL SPEED REDUCTION UNIT CASE OF TRACTOR

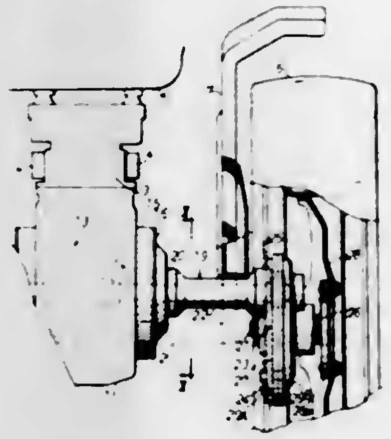
Kazunari Nobutomo, Soja; Seiiti Ikegami, Osaka; Masahide Osujo, Osaka; Yoshinobu Murayama, Osaka; Takaho Omura, Osaka, and Sinzi Kawakami, Soja, all of Japan, assignors to Kuboto Tekko Co., Ltd., Osaka, Japan

Filed Oct. 3, 1975, Ser. No. 619,492

Claims priority, application Japan, Mar. 4, 1975, 50-27508; Apr. 3, 1975, 50-40856; Apr. 3, 1975, 50-40857; Mar. 20, 1975, 50-38909

Int. Cl.² B60K *17/00*

U.S. Cl. 180—75 **5 Claims**



1. A construction for uniting a brake case cover, a rear wheel axle case and a terminal speed reduction unit case in a tractor comprising a sheet metal brake cover case having a precisely circular hole and fixed to each side of a tractor main body to cover brake means, a rear wheel axle case for housing a differential yoke shaft which case is made of sheet metal and has precisely circular enlarged tubular portions at its opposite ends and a flat tubular intermediate portion of a reduced diameter for mounting a fender thereon, and a sheet metal case composed of a pair of inner and outer segments for housing the terminal speed reduction unit and having an upper portion for supporting the outer end of the differential yoke shaft and a lower portion for supporting a rear wheel axle, the inner end enlarged tubular portion of the rear wheel axle case being fitted in the hole of the brake case cover and welded to the hole-defining periphery of the brake case cover, the outer end enlarged tubular portion of the rear wheel axle case being fitted in the yoke shaft supporting upper portion of the terminal speed reduction unit case and welded to the inner periphery of the upper portion, the intermediate portion of the rear axle case being substantially flexible to absorb concentric loads on the weld joints.

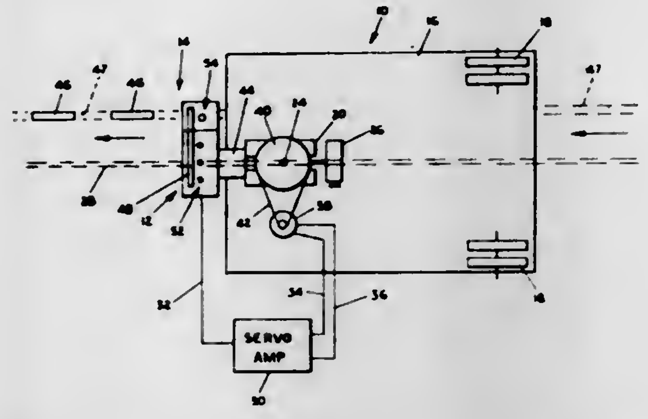
4,003,445
CODE CIRCUITRY FOR A VEHICLE GUIDANCE MECHANISM

Carl De Bruine, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 12, 1976, Ser. No. 657,447

Int. Cl.² B62D *1/28*

U.S. Cl. 180—98 18 Claims



1. In a vehicle guidance mechanism for guiding a vehicle along a guide line by means of guide line radiation received from the guide line, code circuit means for automatically controlling the operation of the vehicle along the guide line comprising:

code marker means positioned alongside the guide line at predetermined positions along the guide line where control functions are desired, the code marker means being positioned in a code marker path alongside the guide line, the code marker means being formed such that code marker radiation representing a code marker signal is transmitted from the code marker means at least at a specified time when the vehicle is in position to sense said marker radiation, the intensity of the code marker radiation having a predetermined relationship to the intensity of the radiation from the guide line adjacent to it;

sensor circuit means in the vehicle for sensing and continuously comparing the intensity of radiation received from the code marker path and guide line as the vehicle moves along the guide line and generating a code signal when the intensity of the radiation from the code marker path increases to a predetermined proportion of the intensity of the guide line radiation that is indicative of the presence of a code marker in the code marker path; and

control means for controlling the operation of the vehicle in a predetermined manner in response to code signals generated by the sensor circuit means.

13. Code circuit means for automatically controlling the operation of a vehicle along a predetermined guide path comprising:

at least one code marker of a predetermined length positioned adjacent the guide path, said code marker transmitting a code marker signal indicative of the position of the code marker;

code sensor means mounted in the vehicle so as to receive the code marker signal from the code marker as the sensor means passes the code marker, the code marker signal being received for a period of time representative of the time it takes for the sensor means to pass the code marker, said code sensor means generating a code signal at an output thereof while the code marker signal is being sensed;

delay circuit means connected to the output of the code sensor means, said delay circuit means blocking the transmission of said code signal unless the duration of the code signal is sufficient to indicate the presence of a code marker of at least said predetermined length at least when the vehicle is traveling at a predetermined speed past the code marker; and

control circuit means responsive to said code signal for controlling the operation of the vehicle in a predetermined manner.

4,003,446
SERVO-STEERING CONTROL SYSTEMS FOR VEHICLES

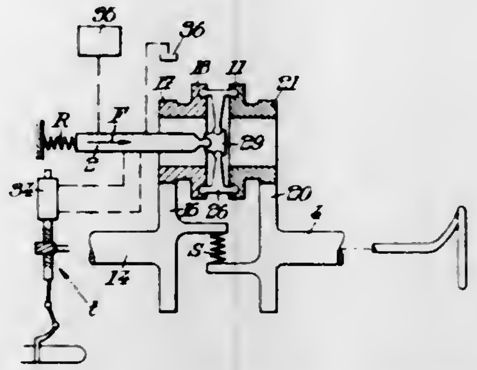
Jacques Fleury, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed May 9, 1975, Ser. No. 576,210

Claims priority, application France, May 16, 1974, 74.017072

Int. Cl.² B62D *5/08*

U.S. Cl. 180—132 10 Claims



1. A servo-steering control means for a vehicle comprising

a jack operatively connected to operate a steering mechanism;

a source of fluid under pressure in communication with the jack;

a slide valve operatively connected to the sources of fluid to the jack to control the supply of said fluid under pressure to the jack, said slide valve controlled by means responsive to angular displacement between a driving shaft and a second shaft connected to the steering mechanism, said two shafts being mechanically connected through a lost motion connection permitting limited relative angular displacement between said shafts,

the said means for controlling the slide valve including two rotary members rotatable about a common geometric axis and being respectively driven by drive means having the same ratio, one of said drive means connected to the driving shaft and the other to the second shaft, and means connected between said rotary members and said valve member to convert relative rotation between said rotary members into translational movement of said slide valve,

said servo-steering control further including spring means operatively connected to the slide valve to exert an axial force on said slide valve,

elastic means disposed between the drive shaft and said second shaft to resist relative angular displacement of said shafts,

the tension of said spring means and elastic means being adapted to maintain the slide valve in a neutral position when the relative rotation between the two shafts is substantially zero.

4,003,447
HYDRAULICALLY POWERED STEERING SYSTEM FOR A VEHICLE HAVING MULTIPLE STEERABLE WHEELS

Paul P. Weyer, Enumclaw, Wash., assignor to CTEC Corporation, Bellevue, Wash.

Filed June 19, 1975, Ser. No. 588,422

Int. Cl.² B62D *5/08*

U.S. Cl. 180—140 12 Claims

1. A hydraulic steering system mounted on a vehicle frame comprising:

a steerable member associated with said vehicle frame for rotational movement relative to said vehicle frame and a wheel supporting member affixed to and extending downwardly from said steerable member,

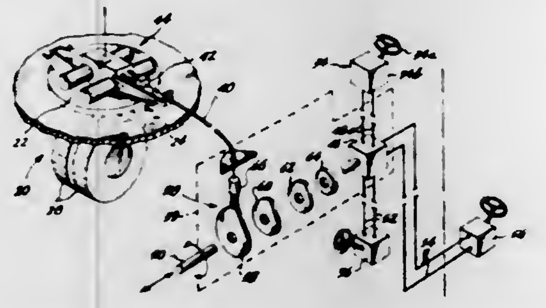
a shaft affixed to and extending upwardly from said steerable member and being rotatable with said steerable member,

a housing mounted on said shaft, said shaft being rotatable within said housing,

reversible hydraulic motor means operably coupled to said steerable member to bidirectionally rotate said steerable member relative to said housing,

an actuator means responsive to an operator command for actuating a hydraulic control valve,

said hydraulic control valve including a body and a control member for controlling the flow of hydraulic fluid to said motor means, said control member having a neutral position relative to said body in which the flow of hydraulic fluid to the motor means is controlled to prevent said motor means from rotating said steerable member, said control member being so constructed to be responsive to movement of said actuator means on said vehicle to move said control member relative to said valve body in a first direction away from said neutral position to control the flow of fluid to said motor means, thereby causing the motor means to rotate said steerable member in a first direction,



feedback means mounting said valve body on said housing and coupling said valve body to said shaft for moving said valve body in said first direction relative to said control member in response to rotation of said steerable member by said motor means, thereby returning said control member to its neutral position, and

means on said housing for connecting said housing to said vehicle frame to prevent rotational movement of said housing relative to said frame while allowing said housing to move when said shaft moves transversely to the rotational axis of said shaft.

4,003,448
JET CATCHERS

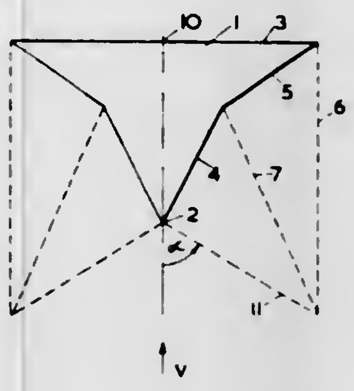
Lionel Fitzroy East, and Kenneth George Winter, both of Bedford, England, assignors to National Research Development Corporation, London, England

Filed Feb. 4, 1975, Ser. No. 547,097

Claims priority, application United Kingdom, Feb. 7, 1974, 5766/74

Int. Cl.² E04B *1/99*

U.S. Cl. 181—33 HE 14 Claims



1. A jet catcher for use in an unenclosed gaseous jet stream comprising a base member having a central axis; said base member including a top portion, a bottom portion located in a downstream direction from the top portion when said central axis is disposed substantially parallel to the direction of flow of said unenclosed gaseous jet stream, and sides diverging outwardly from the central axis as they join the top portion to said bottom portion; and a plurality of porous screens extending from upstream of the base member to positions along said sides with each screen extending at an angle with respect to said central axis, said angle of each screen and said central axis decreasing successively in said downstream direction so that on passage through each screen the portion of the jet stream caught by the jet catcher will be deflected outwardly away from said central axis.

4,003,449
PLANAR DIAPHRAGM

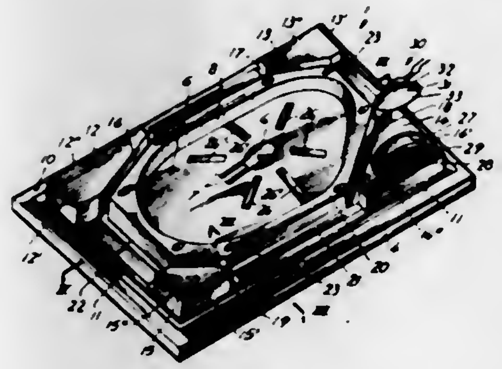
Jose Juan Bertagni, San Martin de Tours 2918 6° piso, Buenos Aires, Argentina

Filed Nov. 26, 1975, Ser. No. 635,288

Claims priority, application United Kingdom, Nov. 28, 1974, 51617/74

Int. Cl.² G10K *13/00;* H04R *7/00*

U.S. Cl. 181—173 6 Claims



1. In a substantially planar diaphragm for use in an electroacoustic transducer, a plate-like member made of cellular plastics material, said plate-like member having a substantially flat front face and a rear face, a marginal portion circumscribing an asymmetrically shaped portion on the rear face, said marginal portion being subdivided into an outer edge portion of less thickness —with regard to said front face— than the remainder of said marginal portion and spaced apart therefrom through an endless channel portion of still smaller thickness —with regard to said front face— than said edge portion and which endless channel portion defines a pivotal connection and a bar for the progress of vibrations which may be produced at the asymmetrically shaped portion as well as at predetermined zones of said remainder of said marginal portion, said remainder of said marginal portion being subdivided by further channelled portions to define an endless marginal portion directly surrounding said asymmetrically shaped portion and a plurality of intermediate marginal portions, said endless marginal portion having anchored therein at least one insert member of different density than the density of said endless marginal portion.

4,003,450
SMALL STRUCTURAL BUILDING COMPONENT

Walter Löhl, Heilbronn, Germany, assignor to Kenngott GmbH & Co. KG, Germany

Filed Apr. 23, 1975, Ser. No. 570,775

Claims priority, application Germany, Apr. 25, 1974, 2419949

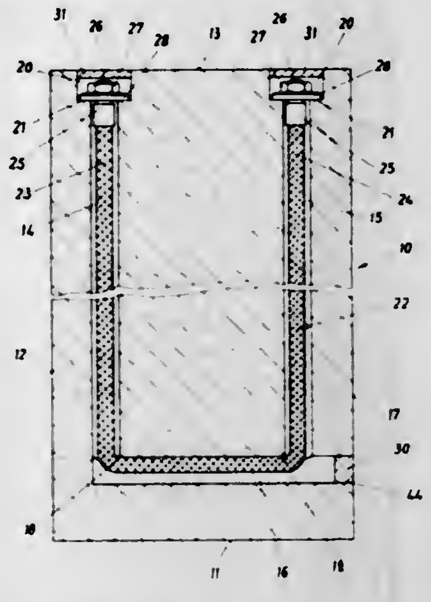
Int. Cl.² E04F *11/14*

U.S. Cl. 182—194 27 Claims

1. A building component, comprising:

a block of natural rock material presenting a styled appearance on substantially all surfaces thereof, and having two longitudinal bores, each extending into said material and through the same adjacent and along one side of the block, and a transverse bore extending through said material adjacent and along an end of the block and interconnecting the longitudinal bores; and

elongate reinforcing means extending though the longitudinal and transverse bores and anchored to the natural rock material of the block for compressing the material to close hairline cracks of the material and for thereby reinforcing the block to enable it to be used as a load-bearing, structural element, while not interfering with its presenting its styled appearance.



4,003,451

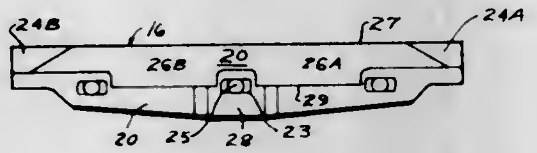
LOW NOISE BRAKE SHOE FOR TRACK RETARDER

Harold Franklin Torok, Chattanooga, Tenn., assignor to QIV Incorporated, Chattanooga, Tenn.

Filed June 30, 1975, Ser. No. 591,288

Int. Cl.² B61K *7/04*

U.S. Cl. 188—62 **10 Claims**



1. A brake shoe for track retarder apparatus comprising:
a. An elongated member that may be suitably attached to a jaw in a track retarder apparatus, and
b. A continuous braking surface included in the elongated member, the braking surface comprising a series of discrete variable widths along the length of the member having a first and a second edge, the first edge lying in a common plane, the second edge lying in stepped planes parallel to said common plane wherein said discrete variable widths reduce noise generation in the track retarder apparatus.

4,003,452

BRAKE SEAL

Bernard F. Kupfert, Peoria, and Richard L. Augustine, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

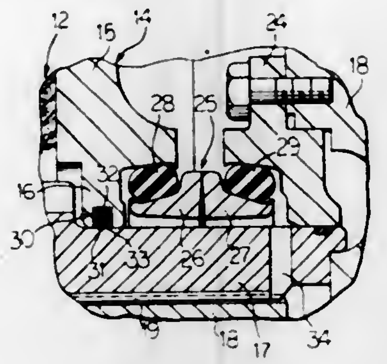
Filed June 10, 1976, Ser. No. 694,630

Int. Cl.² F16D *65/853*

U.S. Cl. 188—71.6 **12 Claims**

1. In a disc brake assembly having means defining a brake chamber provided with pressurized cooling oil, a brake housing, means defining a differential chamber provided with lubricating oil, a rotatable hub, and an annular face seal for sealing the hub to the brake housing against loss of the cooling oil, the improvement comprising:

sealing means for sealing the hub to the brake housing inwardly of the face seal; and



means for conducting lubricating oil from said differential chamber to said face seal for maintaining a preselected lubrication and cooling of said face seal.

4,003,453

SLIDING CALIPER DISC BRAKE

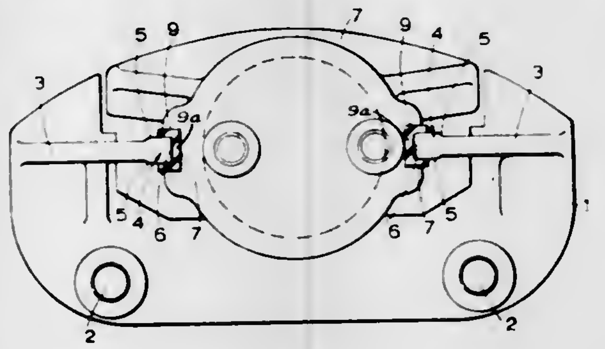
Christopher Neil Mathias, Henley-in-Arden, England, assignor to Girling Limited, Birmingham, England

Filed June 11, 1975, Ser. No. 586,021

Claims priority, application United Kingdom, June 19, 1974, 27086/74

Int. Cl.² F16D *55/18*

U.S. Cl. 188—72.4 **6 Claims**



1. A vehicle disc brake comprising a carrier, a rotatable disc, a caliper straddling a portion of a peripheral edge of said disc and slidably mounted on said carrier for movement in a direction substantially parallel to the axis of said disc, first and second friction pad assemblies for engagement with opposite faces of said disc located in said caliper, actuating means incorporated in said caliper for applying said first friction pad assembly directly to one face of said disc, said second friction pad assembly being applied to the opposite face of said disc by the reaction on said caliper which causes said caliper to move in an axial direction with respect to said carrier, and spaced arms incorporated in said carrier and extending axially in a direction away from said disc, said spaced arms providing a pair of spaced parallel guides, a pair of axially extending guides on said caliper complementary to and co-operating slidably with said guides on said arms, wherein said guides of one of said pairs are constituted by recessed walls defining grooves having opposed open mouths and said guides of the other of said pairs are constituted by tongues for reception in said grooves with gaps defined between said walls and portions of said tongues received within said grooves, dimensions of said gaps at least in a generally circumferential direction being such that an engagement of one of said tongues with said wall of said groove in which it is received is sufficient to provide a clearance between the other of said tongues and said open mouth of that groove to permit said caliper to be removed from said brake, and slippers are removably located in said gaps between said guides of both co-operating pairs to retain said caliper against movement with respect to said carrier in both radial and circumferential directions, said slippers being axially slidable out of said gaps whereafter said caliper can be removed from said brake in a generally radial direction.

4,003,454

SHOCK ABSORBER

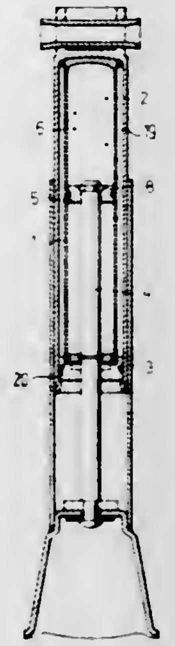
Felix Wössner, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed Apr. 30, 1975, Ser. No. 573,330

Claims priority, application Germany, May 9, 1974, 2422479

Int. Cl.² B60R *19/06*

U.S. Cl. 188—322 **5 Claims**



1. An impact shock absorber comprising:
a. a cylinder part;
b. a piston glidingly mounted in said cylinder part and held in a rest position under a yielding force;
c. a piston rod part having an inner end in said cylinder part and extending outside said cylinder part;
d. first connecting means for connecting one of said parts to a body element of a car;
e. second connecting means for connecting the other part to a bumper element of said car, whereby the shock absorber may mount said bumper element on said body element for relative movement in respect thereto under an impact acting on said bumper element and causing the piston rod part to move in the cylinder part; and
f. third connecting means connecting said inner end to a portion of said piston, said portion being weakened at the point of connection to break when said impact exceeds a predetermined maximum force, said yielding force resisting movement of said piston by said piston rod part under said impact.

4,003,455

BAG CONVERTIBLE INTO A PORTABLE SEAT

Gaetano Cortese, Via Ada Negri 9, 20032 Cormono (Milan), Italy

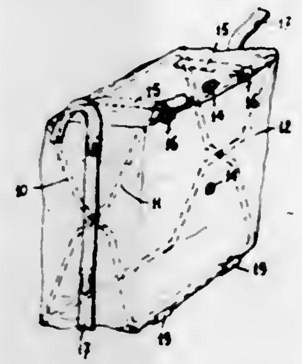
Filed June 4, 1975, Ser. No. 584,019

Claims priority, application Italy, June 18, 1974, 21416/74[U]

Int. Cl.² A45C *9/00*

U.S. Cl. 190—8 **6 Claims**

1. A bag convertible into a seat comprising two similar quadrangular frames having each a first pair of parallel normally horizontally extending frame portions and a second pair of parallel frame portions normal to said first frame portions and integrally connecting said first pair at opposite ends, the second pair of frame portions of one frame crossing the second pair of the other frame and are pivotally connected to the latter midway between opposite ends thereof, said frames being movable between a closed position in which said first frame portions of one frame are closely adjacent to said first frame portions of the other frame, and a spread-apart position; tear resistant, flexible material encompassing said frames to form a bag having an open end and including a flap extending over the open end and downwardly over a front portion of the bag, when said frames are in said closed position, said flap



having a free edge located closely adjacent one of said first frame portions when said frames are in said spread-apart position; and at least one hook connected to the inner face of said flap adjacent said free edge and engageable with said one first frame portion in the spread-apart position of the frames so that said flap is held in taught condition over the wide-opened end of the bag to form a seating surface.

4,003,456

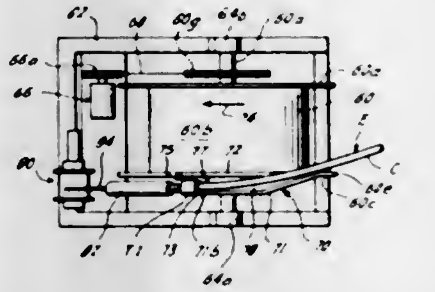
ELECTRICAL CABLE REELING APPARATUS

Roy H. Cullen; Joshua M. Jackson, and Terry V. Jones, all of Houston, Tex., assignors to General Electric Company, by said Joshua M. Jackson and said Terry V. Jones

Filed Oct. 9, 1975, Ser. No. 621,111

Int. Cl.² H02G *11/02*

U.S. Cl. 191—12.4 **9 Claims**



1. An apparatus for receiving, storing, and supplying a fixed length of an electrical cable section having substantially rigid terminal connectors at each end thereof, said apparatus comprising:
a reel adapted for rotation with a section of electrical cable being helically wound on or unwound from said reel; and
releasable securing means for securing one of the electrical cable terminal connectors with the reel for rotation therewith while the cable is wound on or unwound from the reel and for releasing a secured connector from the reel to thereby release the entire length of the cable from the reel upon unwinding.

4,003,457

CLUTCH HAVING OVERSIZED ROLLERS

Arvid Dahlstrom, Chicago, Ill., assignor to Dahltron Corporation, Oakbrook, Ill.

Filed Feb. 10, 1975, Ser. No. 548,598

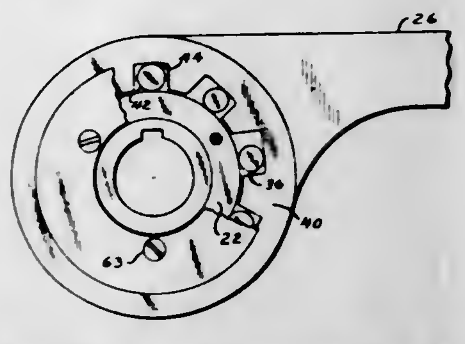
Int. Cl.² F16D *41/06*

U.S. Cl. 192—45 **13 Claims**

1. A clutch comprising:
a clutching member having a central aperture and channel means disposed therein;

a clutched member disposed within said aperture and spaced apart from said clutching member;

clutch means disposed co-axially in said aperture between said clutching member and said clutched member, said clutch means including a plurality of force-transmitting rollers surrounding said clutched member and roller means larger in diameter than the force-transmitting rollers being disposed around said clutched member to support said clutching member on said clutched member independently of said force-transmitting rollers for rotation; and

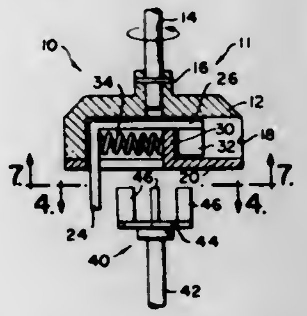


said channel means comprising a series of transversely extending channels for carrying said force-transmitting rollers and a series of rectangular slots for carrying said roller means.

4,003,458
FAIL SAFE CENTRIFUGAL CLUTCH

James K. O'Steen, Olney, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 31, 1975, Ser. No. 600,660
Int. Cl.² F16D *43/14*
U.S. Cl. 192—105 BB **8 Claims**



1. A fail-safe, velocity-discriminating centrifugal clutch comprising:

a driving assembly coupled to a rotary input shaft;

a biased means in said driving assembly displaceable from a non-motion-transmitting position to a motion-transmitting position at rotational speeds above a predetermined threshold value, said means having a motion-transmitting engagement portion extending from said assembly parallel to said input shaft;

a driven assembly operatively positioned adjacent to said driving assembly and coupled to a rotary output shaft;

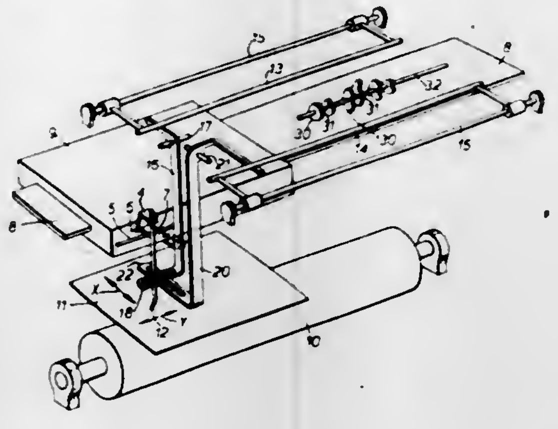
a ratchet wheel secured to the output shaft; and

a plurality of upstanding planar elements peripherally positioned on said ratchet wheel and oriented parallel to said rotary input and output shafts for driving contact by the motion-transmitting engagement portion of said biased means in the motion transmitting position of said means to transmit motion from the driving assembly to the driven assembly.

4,003,459
WRITING MACHINES

Robert Adolphus Guy Moffatt, 9 Rodfords Mead, Hengrove, Bristol, England

Filed Nov. 26, 1974, Ser. No. 527,276
Claims priority, application United Kingdom, Nov. 28, 1973, 55182/73
Int. Cl.² B41J *3/06*
U.S. Cl. 197—1 R **2 Claims**



1. A writing machine including a writing instrument, means for moving said instrument longitudinally in relation to a writing surface, and mounting means permitting movement of said instrument in two orthogonal directions, a plurality of mechanical memory stores for controlling the movements of said instrument in said two orthogonal directions, each said memory store comprising first and second cooperating cam elements, all of the first cam elements of said memory stores being mounted for simultaneous rotation on a common drive shaft, and all of said second cam elements being independently movable relative to each other, motion transmitting means operatively connecting each of said second cam elements to said instruments, said transmitting means including an actuating rail extending parallel to the longitudinal movement of said instrument, and means for moving said rail in a direction transverse to its length, and a plurality of manual keys each operatively associated respectively with one of said pairs of cooperating cam elements and acting selectively to connect said cam elements with said instrument, said actuating rail being pivotally mounted for rocking movement about an offset axis parallel to the length of said rail, each of said second cam elements comprising a step-down mechanical transmission such that the movement of said rail is less than the corresponding movement of the respective first cam elements, the motion transmitting means connected between said rail and said instrument comprising a step-up mechanical transmission which provides increased movement of said instrument in relation to the movement of said rail.

4,003,460
TYPE RIBBON DESKEWING MEANS FOR A TYPE RIBBON FEED APPARATUS

Darby A. Gray, Norman, and Roger L. Hall, Bethany, both of Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 21, 1974, Ser. No. 481,738
Int. Cl.² B41J *35/04, 35/12*
U.S. Cl. 197—170 **6 Claims**

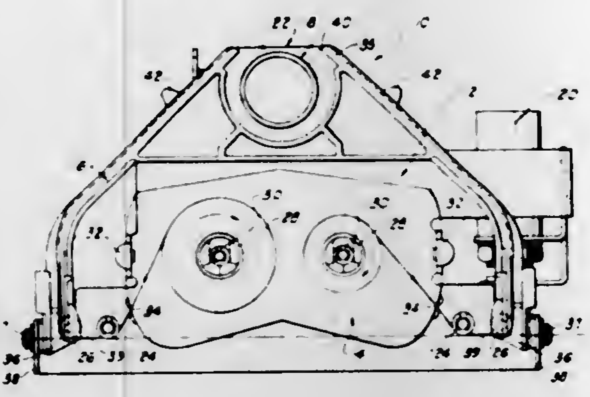
1. In a ribbon feed apparatus having a base plate, a ribbon, type ribbon spools, drive means for engaging the ribbon spools for winding the ribbon from one ribbon spool to the other ribbon spool, the improvement comprising:

a ribbon guide for receiving the ribbon from one ribbon spool, guiding the ribbon through a print position, and returning the ribbon to the other ribbon spool, said ribbon guide comprising a center portion and two end portions, said center portion being adjacent to the print position for guiding the ribbon in front thereof, and said end portions being pivotally attached to the base plate,

said ribbon guide furthermore including an axis of rotation through said end portions;

ribbon guide lift means attached to the ribbon guide and the base plate for changing the position of the ribbon as the ribbon passes through the print position; and

ribbon deskewing means for preventing the ribbon from skewing as the ribbon is wound on the ribbon spool, said ribbon deskewing means comprising:



pivot guides attached to said end portions of said ribbon guide and rotatable thereon, said pivot guides guiding the ribbon onto and off of the ribbon guide;

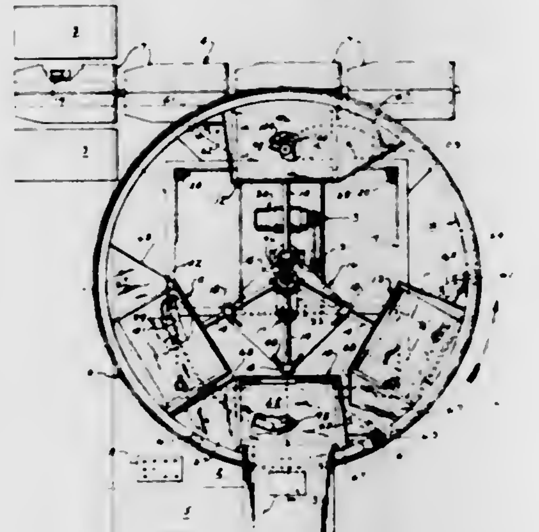
stationary guides disposed between the type ribbon spools and said pivot guides, said stationary guides guiding the ribbon onto and off of the ribbon spools; and

said axis of rotation of said ribbon guide being concentric with the center line of the ribbon portion positioned between said pivot guides and said stationary guides.

4,003,461
ROTARY LOADING APPARATUS

Richard L. Speaker, and David W. Wolbrink, both of Hartford, Wis., assignors to Speaker Motion Systems, Inc., Germantown, Wis.

Filed Apr. 15, 1974, Ser. No. 460,950
Int. Cl.² B65G *21/12*
U.S. Cl. 198—597 **32 Claims**

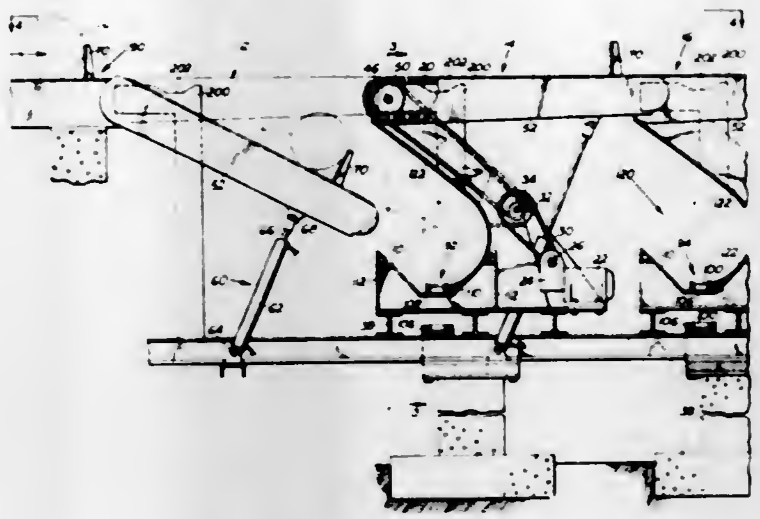


1. In rotary transfer apparatus having at least one arm member having a rotating pivot support and mounted for rotation about a first axis, a load supporting unit secured to the arm member, a rotating drive means having a second axis parallel with and spaced from the first axis, coupling means connected to said drive means and movably connected to said arm member and moving along said arm member as the arm member rotates to continuously vary the drive connection along the length of the arm member and thereby continuously control of the velocity of the load supporting structure while moving the load supporting structure in a predetermined circular path.

4,003,462
LOG SORTING SYSTEM

Lynn F. Perrott, 15928 NE. Rose Parkway, Portland, Oreg. 97230

Filed Feb. 6, 1976, Ser. No. 655,826.
Int. Cl.² B65G *37/00*
U.S. Cl. 198—369 **15 Claims**



1. A sorting system for logs and like elongated objects, comprising:

a. a plurality of longitudinally aligned, transversely articulated sorting conveyor means arranged to convey elongated objects disposed crosswise thereof,

b. drive means engaging the plurality of sorting conveyor means for moving them in an outfeed direction,

c. power means engaging each sorting conveyor means for moving the latter between a conveying position aligned with the other conveyor means and a discharge position tilted downward toward its outfeed end,

d. stop means mounted on the outfeed end of each articulated sorting conveyor means movable between an extended position above the conveyor means for abutment by an object thereon and a retracted position out of abutment by an object thereon,

e. actuator means engaging the stop means for moving the latter from said retracted position to said extended position when said sorting conveyor means is being tilted to said discharge position,

f. a plurality of transfer conveyor means associated one with with each articulated sorting conveyor means and each having an infeed end registering with the sorting conveyor means in the discharge position of the latter, the transfer conveyor means extending laterally of its associated sorting conveyor means,

g. drive means engaging the plurality of transfer conveyor means for moving them in an outfeed direction, and

h. collector means adjacent the outfeed end of each transfer conveyor means for receiving objects discharged therefrom.

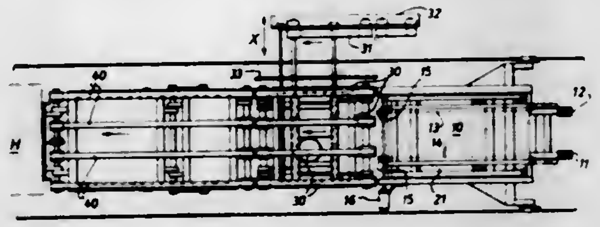
4,003,463
APPARATUS FOR TRANSPORTING BUNDLES OF FLAT ARTICLES

Barrie Holt, Poynton, and Jeremy Peter Barlow, Northwich, both of England, assignors to Henry Simon Limited, Stockport, England

Filed June 5, 1975, Ser. No. 583,890
Claims priority, application United Kingdom, Jan. 8, 1974, 25560/74
Int. Cl.² B65G *47/24*
U.S. Cl. 198—374 **3 Claims**

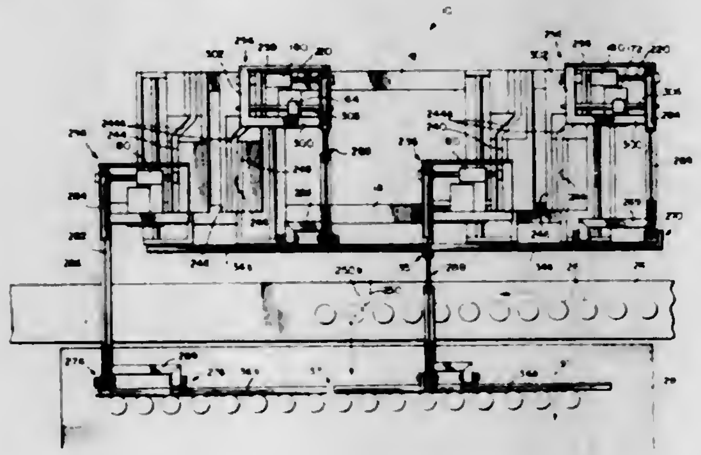
1. Apparatus for feeding rectangular blanks of corrugated paper board comprising a first conveyor belt having a forward end disposed for delivery of blanks in predetermined forwardly falling orientation to a box making machine or the like and means for driving said belt, a second conveyor belt transversely spaced from and parallel with said first conveyor belt and adjacently arranged at a lower level and means for driving

said second conveyor belt in the same direction as and at a higher speed than said first conveyor belt, means for delivering a stack of said blanks onto said first conveyor belt in such manner that the blanks are supported on only one edge on and extend substantially vertically transversely of said first conveyor belt with said edge extending outwardly to overlie said second conveyor belt but out of contact therewith, whereby selected groups of blanks on said first conveyor belt may be pivoted from engagement therewith into edge engagement with said second conveyor belt whereby said selected groups may be caused to fall backwardly upon delivery and are thus inverted relative to the blanks remaining in engagement with said first conveyor belt.



4,003,464
DOUBLE ARM PUSH BAR STACKER

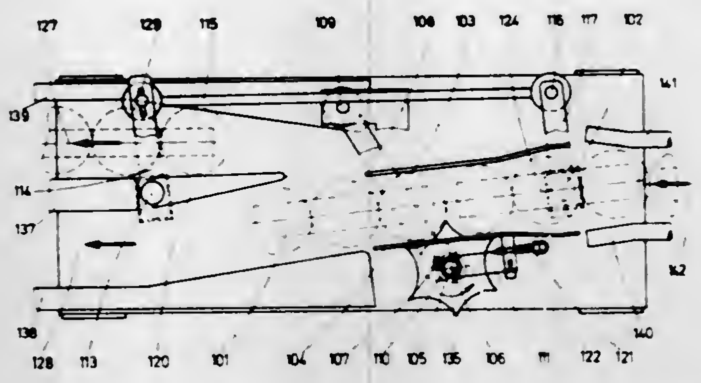
Anthony T. Zappia, Indianapolis, Ind., assignor to Ball Brothers Service Corporation, Muncie, Ind.
Filed Apr. 1, 1975, Ser. No. 564,103
Int. Cl.² B65G *47/26*
U.S. Cl. 198—430 **19 Claims**



1. A stacker-pusher comprising frame means, a pair of parallel bars extending longitudinally and horizontally along said frame means, said bars having the same general length, said bars being movable alternately through the same general path including a transverse horizontal stroke perpendicular to the direction of extension of said bars, and said bars remaining parallel to each other as they move through said path, in which the improvement comprises means for mounting said bar for such movement and means for driving said bars, said mounting means including, for each said bar, a carriage reciprocably movable in the direction of said transverse horizontal stroke, a first arm mounted on said carriage for pivotal movement at its proximal end about a horizontal axis parallel to said bars, a second arm mounted on the distal end of said first arm for pivotal movement about a horizontal axis parallel to the last said axis, said second arm extending downwardly to provide a lower end to which said bar is attached, and said drive means including, for each said bar, a pair of rotor means journal mounted for rotation about horizontally extending axes parallel to said bars and spaced apart in the direction of said stroke, endless means trained about said rotor means, means for providing a driving connection between said endless means and said carriage associated with said bar and between said endless means and said first arm pivoted on said carriage, whereby movement of said endless means about said rotor means reciprocates said carriage and raises and lowers said first arm, and said drive means being synchronized such that said bars alternately move through said path at the same frequency and speed.

4,003,465
APPARATUS FOR DISTRIBUTING ARTICLES CONVEYED IN A ROW AMONG A PLURALITY OF PATHS OF TRAVEL

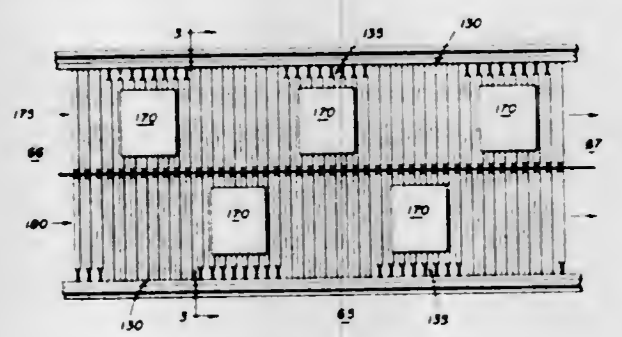
Everhard Bauer, 479 Paderborn, Hudeweg 2, Germany
Filed Nov. 22, 1974, Ser. No. 526,115
Claims priority, application Germany, Nov. 26, 1973, 2358771; Jan. 17, 1974, 2402145; July 26, 1974, 2436151
Int. Cl.² B65G *47/28*
U.S. Cl. 198—442 **6 Claims**



1. Apparatus for distributing articles conveyed in a single row at a receiving station into a plurality of juxtaposed rows at a downstream delivery station, comprising means defining at said delivery station a plurality of juxtaposed delivery tracks for said articles with mouths facing said receiving station, gate means defining a passageway for said articles with an inlet adjacent said receiving station and an outlet pointing in the downstream direction, said gate means being mounted for pivotal motion about an axis at said inlet whereby said outlet can be oscillated, and drive means operable by said articles passing through said passageway for effecting pivotal motion of said gate means, said drive means comprising a wheel mounted on said gate means for pivotal motion in unison therewith and for independent rotation, teeth on the periphery of said wheel projecting into said passageway for engagement by said articles whereby said wheel is rotated by said articles, and a lever eccentrically pivoted to said wheel by one end pivoted to a fixed frame by the other end whereby said wheel and gate means are pivoted once to and fro during each complete turn of said wheel.

4,003,466
CONVEYOR FOR STAGGERING ADJACENT LANES OF PRODUCT

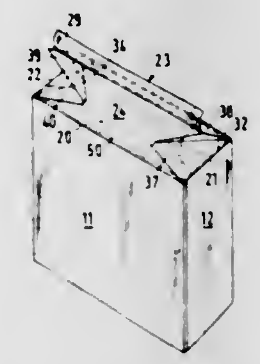
William R. Muth, Westmont; Stephen J. Pawela, Wood Dale, and Richard G. Wood, Blue Island, all of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.
Filed May 9, 1975, Ser. No. 575,935
Int. Cl.² B65G *47/26*
U.S. Cl. 198—452 **8 Claims**



1. Apparatus for staggering product delivered to multiple adjacent product lanes, said apparatus comprising a plurality of longitudinally extending product lanes each comprised of groups of rotatable product carrying supports and groups of rotatable product positioning supports forming an endless conveyor having an infeed end and an outfeed end, said conveyor including a plurality of transversely extending rods each carrying a product carrying support and a product positioning support, each group of product carrying supports being transversely aligned with at least one group of product positioning supports, and mechanism for rotating said product positioning supports to position product onto an adjacent group of product carrying supports, whereby product fed onto a group of said product positioning supports is transported thereby to an adjacent group of product carrying supports for transport thereon to said outfeed end and product fed onto a group of said product carrying supports is transported thereon to said outfeed end, said product carrying supports delivering product to said outfeed end sequentially from each product lane.

4,003,467
PACK CONSISTING OF A FOLDABLE BLANK, MORE PARTICULARLY A CIGARETTE PACK AND A DEVICE FOR CLOSING THE SAME

Heinz Focke, and Kurt Liedtke, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Aller, Germany
Filed Feb. 19, 1975, Ser. No. 551,451
Claims priority, application Germany, Feb. 19, 1974, 2407766
Int. Cl.² B65D *85/10*
U.S. Cl. 206—273 **18 Claims**

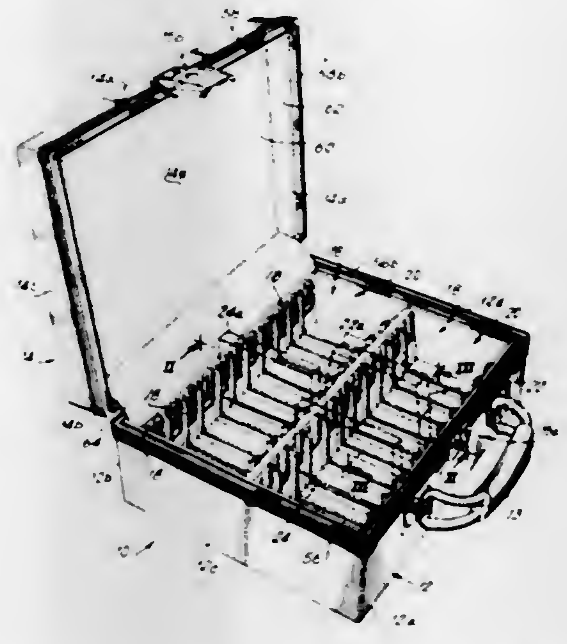


1. A pack for cigarettes or the like formed from a foldable blank of compound foil material wherein the blank has a front wall, a back wall, two side walls, front end flaps attached to the front wall, back end flaps attached to the back wall, and side end flaps attached to the side walls wherein the front, back and side walls are folded to enclose four sides of the contents, at least one of the front and rear end flaps are folded to contact the ends of the contents, the side end flaps are folded along generally diagonal fold lines to form generally triangular gussets, said gussets having longitudinal free edges which are staggered in a gradation of thickness with respect to each other and to the fold line of the flap folded against the contents and the remaining flap is folded over the entire end of the pack and the free edge is sealed across its entire width to hermetically seal the end of the pack.

4,003,468
CASE AND INSERT FOR DIFFERENTLY SIZED MAGNETIC TAPE ENCLOSURES

Joseph L. Berkman, 48 Country Road, Mamaroneck, N.Y. 10543
Continuation-in-part of Ser. No. 382,302, July 25, 1973, Pat. No. 3,889,817. This application Mar. 24, 1975, Ser. No. 561,315
Int. Cl.² B65D *85/30, 85/62, 85/67, 5/50*
U.S. Cl. 206—387 **20 Claims**

1. In combination with a carrying case having a housing or receptacle, at least one insert for said casing being of the type for interchangeably receiving and storing two differently sized magnetic tape enclosures having generally rectangular configurations, the first enclosure having a smaller width and a greater thickness than the corresponding dimensions of the second enclosure, and having a height greater than the height of the second enclosure; said insert comprising a plurality of tandem storage compartments each of which is adapted to interchangeably receive a first or a second dimensioned magnetic tape enclosure, each compartment being generally rectangular in configuration and bounded on two sides by two substantially parallel wall portions spaced from each other a first predetermined distance approximately equal to the width of the first enclosure to securely receive the same therebetween and a further wall portion substantially normal to said parallel wall portions, each compartment being open on the side thereof opposite said further wall portion for receiving the enclosures; and guide means at least partially bounding said wall portions of each compartment to define a space having a thickness equal to a second predetermined distance approximately equal to the thickness of the first enclosure for guiding the first enclosures into said compartments and preventing the first enclosures from moving therein, an elongate rectangular recess provided in at least one of said spaced parallel wall portions of each compartment which opens at said compartment open end and is spaced from said further wall portions so as to form a depth limiting shoulder adapted to maintain at least a portion of said second enclosure projecting above said parallel wall portions upon full insertion of said second enclosure into said compartment, each recess forming retaining wall portions which define a space having a width greater than said first predetermined distance and a thickness smaller than said second predetermined distance suitable for securely receiving a second enclosure to thereby prevent movements of a second enclosure within said compartments, whereby the manual gripping of any second enclosure is facilitated by said depth limiting shoulder, and whereby each compartment can interchangeably receive either a first or a second enclosure and maintain each securely therein by insertion through an associated compartment open end and respective cooperation with either said guide means or said retaining wall portions of said recesses.

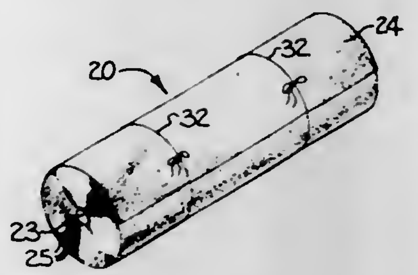


4,003,469
CONVOLUTE FOAM PACKAGE

Allan Cameron Findlay, Davidson, N.C., assignor to Reeves Brothers Inc., New York, N.Y.
Filed Jan. 29, 1976, Ser. No. 653,488
Int. Cl.² B65D *85/672*
U.S. Cl. 206—410 **6 Claims**

1. A highly compact convolute package of flexible foam sheet material, said package being characterized by substantially uniform layer to layer compression within predeter-

mined limits consistent with the desired compression of the overall package and without detrimental over-compression of any layers, and by substantial self-restraint against circumferential expansion to facilitate handling and unwinding thereof, and the sheet material thereof being characterized by substantial dimensional stability in the length and width directions so as to permit use of the sheet material, for example, immediately upon the subsequent unwinding thereof in the formation of components of predetermined size, said package having a predetermined length of highly compressible, flexible foam

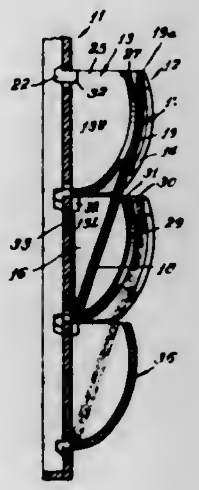


sheet material arranged in a plurality of convolute layers, said layers being substantially wrinkle-free, and having a width dimension closely corresponding to the width of the sheet material in unwound non-compacted form, the thickness of said layers being substantially uniform from layer to layer within said predetermined limits and being substantially less than three-quarters of the thickness of the non-compacted sheet material and the volume of said package being substantially less than nine-sixteenths the volume the package would occupy in a non-compacted, convolutely wound form.

4,003,470
PAINT CHIP DISPLAY STRUCTURE

Joseph S. Lagorio, Arlington Heights, and Marvin G. Kuhlman, Desplaines, both of Ill., assignors to National Creative Merchandising Corporation, Arlington Heights, Ill.

Filed Mar. 15, 1976, Ser. No. 666,773
Int. Cl.² A63F *1/10*
U.S. Cl. 211—50 19 Claims



1. A paint chip display structure comprising:

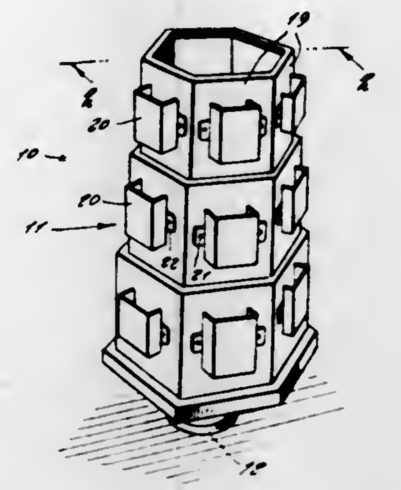
a plurality of pocket members arranged to define a series of vertically spaced forwardly and upwardly opening pockets; and

edge retainer means on said pocket members for receiving the side edges of a paint chip extending upwardly from a subjacent pocket wth the lower portion of the paint chip removably carried by the subjacent pocket member and the upper portion of the paint chip releasably retained by said edge retainer means to be exposed forwardly of the pocket member overlying the subjacent pocket member for receiving from forwardly and upwardly thereof.

4,003,471
REVOLVING MESSAGE HOLDER

Elinor S. Alfano, 13833 Samoa Road, San Leandro, Calif. 94577

Filed Dec. 29, 1975, Ser. No. 644,973
Int. Cl.² A47F *7/00*
U.S. Cl. 211—56 1 Claim

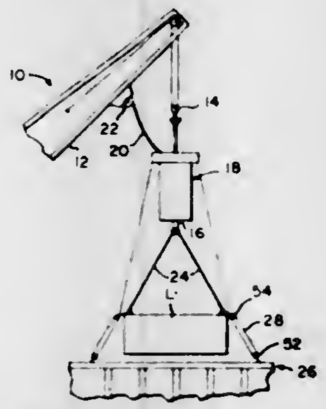


1. In a revolving message holder, a combination of a stationary stand, and a rotatable rack, supported upon said stand, said stand including a base having a thrust bearing upon which as platform is rotatably carried, said platform carrying said rack, said rack being comprised of a plurality of frames stacked one upon another, each of said frames having a plurality of panels arranged in a circle, an outer side of each said panel having a message box attached thereto, each said message box being open at its upper end for placement of messages thereinto, said box being vertically slideable within a slot of said frame panel, an upwardly, forwardly, arcuate plate secured upon a front side of said frame panel, a vertically slideable tray within said box, said tray resting upon one end of a lever, which at its other end is pivotable about a bearing secured to the front side of said frame panel, and the underside of said box bearing against the underside of said lever in the vicinity of said pivot.

4,003,472
CRANE HOOK HEAVE COMPENSATOR AND METHOD OF TRANSFERRING LOADS

Thomas J. Reynolds, Lake Stevens, and James P. Blanchet, Arlington, both of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Nov. 10, 1975, Ser. No. 630,359
Int. Cl.² B66C *23/52*
U.S. Cl. 212—3 12 Claims



1. In a load handling system for moving a heavy load between two platforms, at least one of which is floating and subject to heaving motion relative to the other,

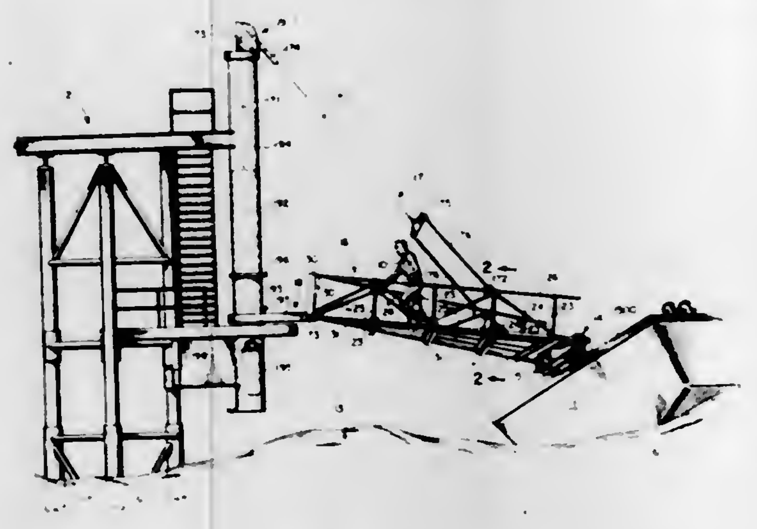
a heave compensator including cylinder means and piston means slidably mounted thereon and including a piston rod, one of said means being adapted to be connected to the load hook of a crane on one such platform and the other to a load to be lowered onto the other such platform, and

snubber means carried by said other means of the heave compensator and being adapted to be connected to said other platform and to the load for resisting upward movement of the load relative to such other platform.

4,003,473
COMBINED MARINE RAMP TRANSFER AND MOORING SYSTEM

William J. Ryan, Loreauville, La., assignor to Ryan Ramp, Inc., Harahan, La.

Filed Aug. 30, 1974, Ser. No. 501,991
Int. Cl.² B63B *21/00*
U.S. Cl. 214—14 36 Claims



1. A marine ramp transfer system, wherein personnel and/or material are to be transferred between two relatively moving objects, such as for example a marine vessel and a fixed structure or another vessel at sea, capable of use in both calm and rough weather conditions, comprising the following mechanical elements:

elongated ramp means of significant width being at least connectable between said relatively moving objects for supporting the personnel or material during the transfer between the objects and for producing a gradual transition for the personnel or material in the amount of relative motion between the objects being accomodated, said ramp means including -

at least two opposed, at least relatively stiff, longitudinal stringer members separated from each other in a lateral direction a significant distance and extending the length of said ramp means, said stringer members being rigid when in use;

at least two lateral means connected across said stringer members for supporting a deck surface; and

deck surface means connected between said stringer members and supported by said lateral means for providing a support surface on which the personnel or material are transferred;

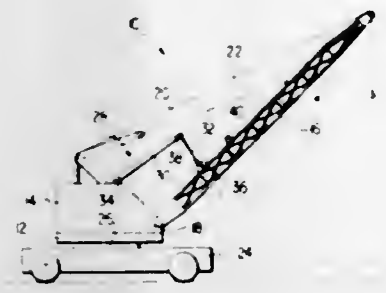
said stringer members being substantially fixed in separation distance between each other but movable with respect to each other in a longitudinal, "vertical" plane, and the ends of each said lateral means with each said deck surface area being independently rotatable or otherwise moveable about a longitudinal axis in their respective connections to said stringer members, whereby said ramp means is flexible along its length in a lateral plane; and

two, separate ramp connection means each for connecting a respective end of said ramp means through said stringer members to one of the relatively moving objects for causing its respective end of the ramp means to assume a lateral direction the same alignment as that of the major "horizontal" plane of the object, the lateral alignment of at least one of which objects is changing with respect to the other in their relative movement; whereby said ramp means through its flexible structure and its end connections gradualize the relative motion between the objects in a directly proportional manner.

4,003,474
CRANE BOOM STOP ARRANGEMENT

Ralph Mooney, 3100 Eldogor Lane, New Castle, Pa. 16105

Filed May 5, 1975, Ser. No. 574,575
Int. Cl.² B66C *23/06*
U.S. Cl. 212—59 A 1 Claim

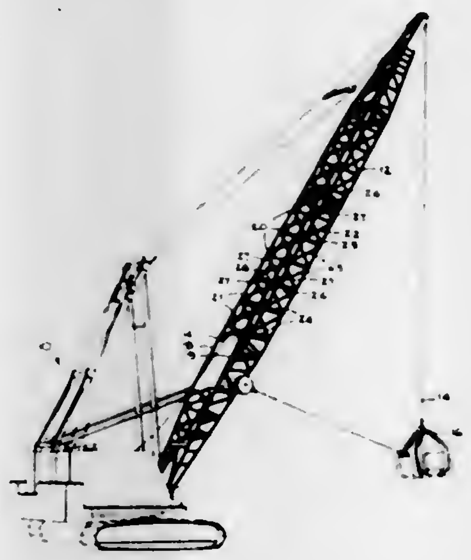


1. In a crane having a frame, an elongated boom pivotally connected to said frame for movement in a vertical plane, and a boom stop arrangement comprised of a compression strut pivotally connected at one of its ends to said frame at a point remote from the boom pivotal connection and a link strut pivotally connected to the other end of said compression strut and to said boom, the improvement wherein said compression strut comprises an extensible member having first and second sections in telescoping relation to one another, the arrangement being such that said compression strut is fully retracted throughout the operating range of boom movement and extends as said boom is moved below the lower limit of said operating range, the improvement being further characterized in that said first section of said compression strut is pivotally connected to said frame and a connector member is provided pivotally connecting said second section of said compression strut to said link strut, said first section having an end portion abutting said connector member when the angle of elevation of said boom is within said operating range.

4,003,475
CRANE BOOM LATTICE AND HOIST LINE PROTECTION ASSEMBLY

Charles A. Brolin, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 27, 1974, Ser. No. 527,562
Int. Cl.² B66C *23/62*
U.S. Cl. 212—144 2 Claims



1. In a crane having a boom, a hoist line extending along said boom thereadjacent, said boom including spaced transverse elongate lattice members vulnerable to damage by impacting movement of the hoist line thereagainst,

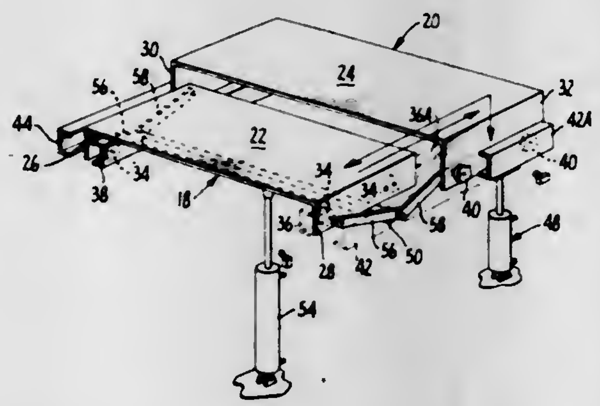
the improvement therein comprising a lattice and hoist line protection assembly mounted upon each said vulnerable lattice member.

said protection assembly including an elongate rigid connector disposed parallel to each said lattice member and extending longitudinally thereof,
said rigid connector having a bottom wall, spaced side walls extending from said bottom wall and defining a longitudinal receiving slot, spaced legs depending from said bottom wall along the length thereof, means connecting said legs to said lattice member, thereby reinforcing said lattice member against bending forces, and,
a strip of expendable cushioning material slidably received in said slot, said strip including a head portion, a mounting base portion retainably received within and substantially filling said slot to be contiguous with said bottom wall of said rigid connector and connected through said slot to said head portion, said head portion being positioned between said connector and said hoist line, said head portion having a width greater than said slot and at least as great as said bottom wall thereby to form a replaceable shock-absorbing cushion to receive wear from said hoist line.

4,003,476
PRESS LOADER

Ben G. Laskey, Redwood City, Calif., assignor to Benruth Engineering & Manufacturing Company, Inc., Redwood City, Calif.

Filed Nov. 21, 1975, Ser. No. 634,026
Int. Cl.² B65G *47/74*
U.S. Cl. 214—1 BB **5 Claims**



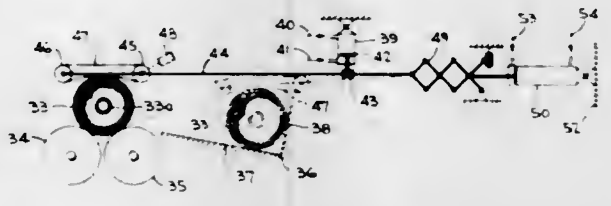
1. A press loader comprising in combination:
a. a first table having long flanges at both ends thereof,
b. a second table having short flanges at both ends thereof,
c. means associated with said long and short flanges for mounting both tables for simultaneous reciprocating motion on parallel tracks whereby both tables can slide back and forth in overlapping relationship,
d. a loading station at one end of said tracks and a press operation station at the opposite end of said tracks,
e. means for moving one table to said loading station and the other table to said press operation station and means for reversing the positions of said tables.

4,003,477
REWINDING MACHINE HAVING A ROLL TRANSFER APPARATUS

Dietmar Kroppenstedt, Griesheim, Germany, assignor to Maschinenfabrik Goebel, GmbH, Germany

Filed Dec. 17, 1974, Ser. No. 533,625
Claims priority, application Germany, Dec. 21, 1973, 2363861
Int. Cl.² B65G *3/00*
U.S. Cl. 214—1 QB **8 Claims**

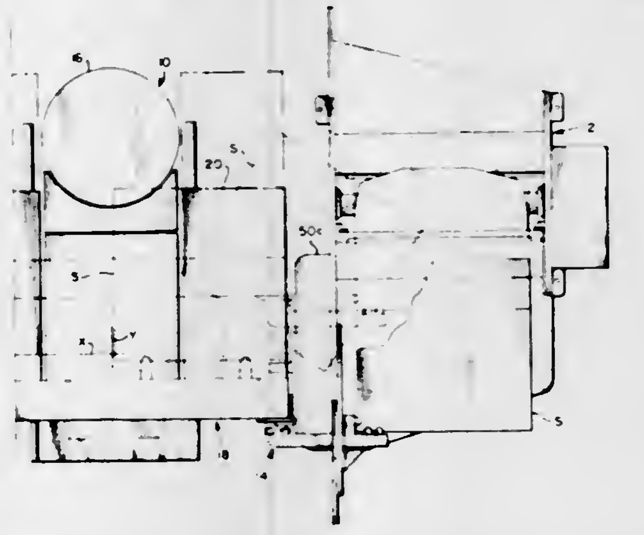
1. An apparatus for transferring a roll of wound material from a winding location to a storage location in such a manner so as to preserve the geometrical shape of the roll by preventing funnel formation of individual wound layers of the roll, the apparatus comprising:
means for applying pressure against the circumference of the roll, said means for applying pressure including a movable belt and means for urging said belt into contact with the surface of the outer layer of the roll, said means for urging said movable belt incluing a rotatable member and means for pressing said rotatable member towards the circumference of the roll;
and means for rolling the roll at a predetermined speed from the winding location to the storage location while maintaining pressure against the roll so as to prevent any distortion in the geometrical shape of the roll, said means for rolling the roll includes a support rod connected to said member and means for moving said support rod in a direction from the winding location toward the storage location so as to cause the simultaneous movement of said member in such direction thereby, in turn, causing the corresponding rolling of the roll.



4,003,478
SHEET TRANSFER MECHANISM

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., City of Industry, Calif.

Division of Ser. No. 393,891, Sept. 4, 1973, Pat. No. 3,898,904. This application Mar. 6, 1975, Ser. No. 555,831
Int. Cl.² B26D *7/06*
U.S. Cl. 214—1 BB **3 Claims**



1. A transfer arm mechanism for moving sheets of self form-sustaining material from a first machine in which a sheet is movable in a Y axis direction to a second machine comprising a base, means for supporting the base on the first machine at a location on the first machine adjacent to the second machine, a transfer arm pivotally mounted on said base, a sheet clamp on said transfer arm, means for pivoting said transfer arm between a first position on said base of said first machine and a second position on said base and extending over said second machine for passing a sheet from the first machine to the second machine, and releasable means for accurately locating the transfer arm on said base in said first position so that the sheet can be accurately engaged relative to the first machine and for accurately locating the transfer arm in said second location on said base and relative to said second machine so that the sheet can be accurately located on the second machine when carried to the second machine, said first machine including numerically controlled sheet positioning means for reciprocably positioning a sheet on said first machine in the Y axis and said base being connected to said reciprocable sheet positioning means at a location adjacent said second machine, whereby accurate movement of said transfer arm along said second machine is obtained by said reciprocable sheet positioning means of said first machine

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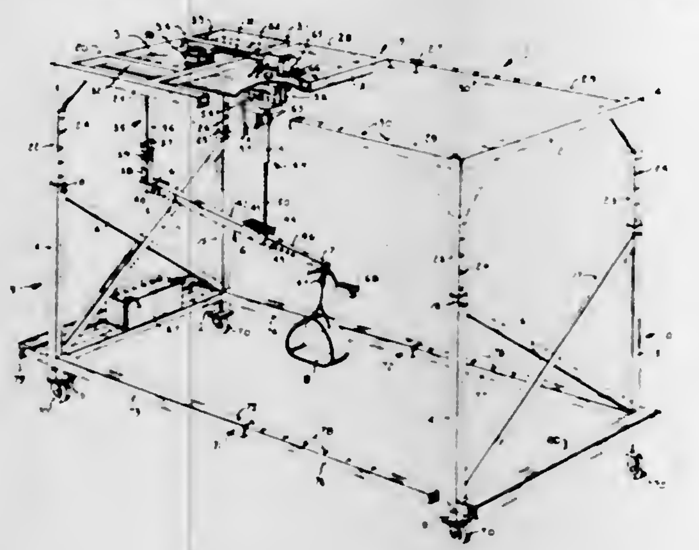
4,003,479
HOIST AND TRANSPORTING APPARATUS

William J. Reyer, 1312 Polk St., Box 103, Topeka, Kans. 66612

Filed June 4, 1975, Ser. No. 583,624
Int. Cl.² B25J *3/00*
U.S. Cl. 214—1 D **9 Claims**



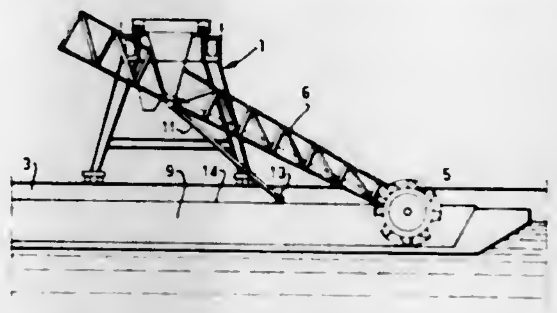
1. A hoist and transporting apparatus for moving disabled persons as between a bed and chair comprising:
a. a frame structure having a support deck in an elevated position for use over a disabled person support, said frame structure including a plurality of generally upright legs operatively supporting said support deck,
b. a mounting member in depending relation to said support deck and rotatably carried thereby for rotation about a vertical axis, said mounting member having an elongate arm depending therefrom in spaced relation to said vertical axis, said arm having a lower end spaced below the mounting member and above a person to be moved;
c. an elongate boom having one end portion pivotally mounted on said arm adjacent the lower end thereof for up and down movement, said boom extending from said arm beyond said vertical axis and having a free end portion movable to a position generally over a person to be moved;
d. means connected to said boom free end portion and having a body support member for receiving a person;
e. powered means operatively connected to said mounting member and said boom in spaced relation to the pivoted end thereof for selectively moving said boom to raise and lower a person received by the body supporting member; and
f. powered means operatively connected to said frame structure and said mounting member for selectively rotating said mounting member relative to said support deck and move the boom and the body supporting member about said vertical axis.

4,003,480
APPARATUS FOR LOADING SHIPS OR BARGES

Michel Metrier, 20, Parc de Bearn, Saint Cloud, France (92210)

Filed Dec. 23, 1975, Ser. No. 643,924
Claims priority, application France, Dec. 24, 1974, 74.42669
Int. Cl.² B65G *67/58*
U.S. Cl. 214—14 **3 Claims**

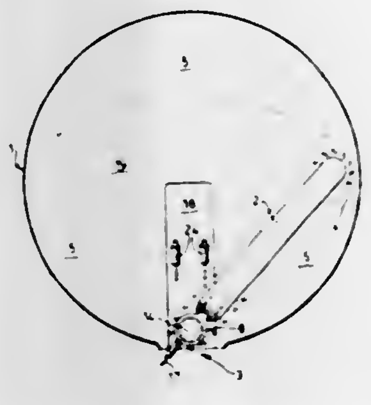
1. An apparatus for unloading marine or fluvial transport cargo vessels, of the type constituted by endless pick-up means, such as bucket wheels, a gantry, a jib articulated on said gantry and supporting the pick-up means for outwardly evacuating the bulk material unloaded from the floating vessel by the pick-up means, wherein said apparatus comprises:
driving means adapted to move the gantry along the vessel so as to unload successively the whole length of the vessel,
a sensor member mounted on the gantry for determining the position in height of the vessel in the course of unloading with respect to the gantry;
gantry control means permanently the information from said sensor member concerning the position in height of the vessel during unloading.
manually operable means adapted to inform said gantry control means as to the characteristic data of the vessel such as the depth of hold thereof;
said gantry control means being able to integrate these data, according to a determined program, in order to control the angular positioning of the jib which supports the endless pick-up means, thereby making it possible to cut into the surface of the material to be unloaded,
said sensor member being constituted by a rod articulated at a first end thereof on the gantry as to be angularly movable with respect to the gantry, said rod being displaceable with the gantry with respect to the vessel, the second end of said rod resting freely by gravity on a ledge of the vessel, said rod following substantially the same direction with respect to the jib and being of such a length as to rest on said edge of the vessel substantially along the length of the vessel where said pick-up means are in operation.



4,003,481
BOTTOM UNLOADER FOR A STORAGE CONTAINER

Sidney Ernest Proctor, High Wycombe, England, assignor to Austin Hoy and Company Limited, High Wycombe, England

Filed Apr. 11, 1975, Ser. No. 567,431
Claims priority, application United Kingdom, Apr. 17, 1974, 16866/74
Int. Cl.² B65G *65/42*
U.S. Cl. 214—17 DA **5 Claims**



1. A bottom unloader for a storage silo comprising a sweep arm conveyor carrying an endless cutting and conveying chain, an unloader frame arranged below the sweep arm and for reception in a radial trough in the base of the silo, a pivotal

mounting for the sweep arm, the pivotal mounting comprising a bearing ring fixed to the sweep arm and which is rotatably mounted on a spigot provided on the unloader frame, drive means for the sweep arm conveyor chain and which is co-axial with the pivotal mounting, and a pair of fluid actuated rams mounted below the sweep arm on the unloader frame and connected to the bearing ring to cause swinging of the sweep arm about the spigot, whereby the sweep arm can be pivoted adjacent to the silo wall and can be swung across the base of the silo to cut and remove material therefrom.

4,003,482

SAFETY DEVICE FOR A CRANE

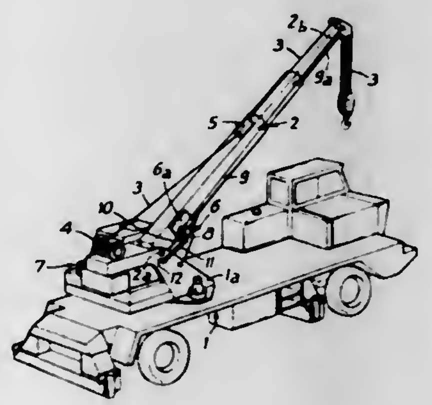
Bernard J. Cheze, Montceau-les-Mines, France, assignor to Societe Anonyme dite: Potain Poclain Materiel, Montceau-les-Mines, Saone et Loire, France

Continuation-in-part of Ser. No. 416,848, Nov. 19, 1973, abandoned. This application Nov. 19, 1975, Ser. No. 633,600

Claims priority, application France, Nov. 27, 1972, 72.42099

Int. Cl.² B66C *13/48*

U.S. Cl. 212—39 6 Claims



1. A safety device for a crane having a chassis, and an extensible jib pivotally mounted on said chassis for pivotal movement in a vertical plane, said crane including means on the jib for raising and lowering a load, said device comprising means for producing a first signal indicative of the actual load in any configuration of said jib with respect to the chassis of the crane, means for producing a second signal proportional to the critical load above which the crane may tilt at substantially every position which can be assumed by said jib with respect to said chassis, said second signal producing means comprising at least one sensor means operatively connected to said jib for following the movement of the point at which the load is applied to the crane and assuming positions representative of that point corresponding respectively to the instantaneous vertical angular position and extension of the jib, at least one flat surface comprising a plurality of conductive flat zones of predetermined configuration, each of which is at a different predetermined electrical potential representative of different critical loads for the crane, said sensor means being in permanent electrical contact with said flat surface to produce said second signal from the flat zone it is in contact with at any given instant, said flat zones forming a network of critical isocharge surfaces each of which has a predetermined configuration selected in accordance with their predetermined electrical potential to apply to said sensor means a signal which is proportional to the critical load for the crane at each possible position of the jib, and means operatively connected to said first and second signal producing means for comparing said first and second signals and producing a third signal when said first signal is greater than said second signal whereby said third signal provides an indication that the actual load on the crane is greater than the permissible critical load for the instantaneous position of the crane's jib.

4,003,483

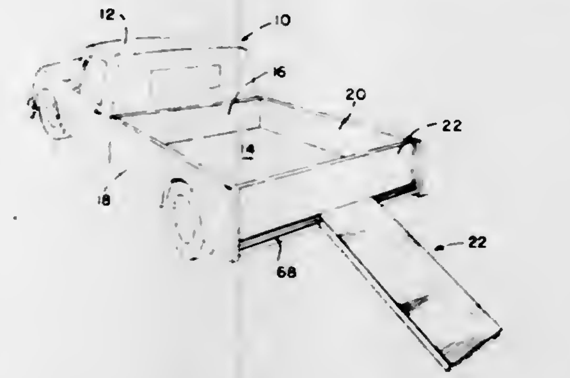
COMBINATION TAILGATE AND LOADING RAMP

Loyd R. Fulton, 24222 54th West, Mountlake Terrace, Wash. 98043

Filed July 14, 1975, Ser. No. 595,735

Int. Cl.² B65G *67/02*

U.S. Cl. 214—85 12 Claims



1. A combination tailgate and loading ramp for a truck having a substantially flat bed, said combination comprising:

fastening means mounted closely behind the rear edge of the truck bed beneath the surface of said bed; and

a panel having a width substantially equal to the width of said bed, said panel including releasable securing means on one longitudinal edge and one transverse edge thereof, one of said securing means pivotally connected to said fastening means at the corner of said panel common to said longitudinal and transverse edges such that said panel may be rotated between a position where said longitudinal edge is connected to said fastening means to form a tailgate enclosing the rear of said bed, and a position where said transverse edge is connected to said fastening means to form a loading ramp with said transverse edge flushly meeting the surface of said bed.

4,003,484

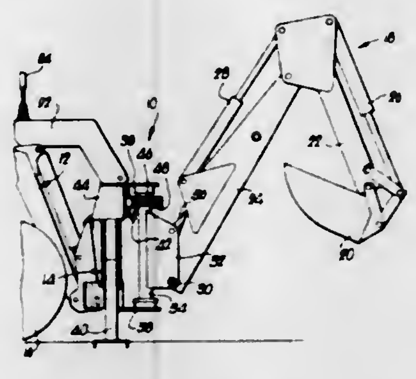
SWING MECHANISM FOR IMPLEMENT BOOM

Joel Flynn Jones, and Thomas Earl Spain, both of Claremore, Okla., assignors to Hesston Corporation, Hesston, Kans.

Filed Feb. 28, 1975, Ser. No. 554,174

Int. Cl.² B66F *9/00*

U.S. Cl. 214—138 E 8 Claims



1. In an implement having a frame and a boom journaled on the frame, mechanism for swinging said boom relative to the frame comprising:

a pair of spaced-apart members secured to said boom on its axis of swinging movement,

each of said members having an outer periphery concentric with said axis;

a bar shiftably mounted on said frame for reciprocation transversely of said axis;

a first flexible drive element interconnecting the periphery of one of said members and one end of said bar;

a second flexible drive element interconnecting the periphery of the other of said members and the opposite end of said bar,

said members being engaged by said elements from opposite directions; and

a single, double-acting power device only between said frame and the bar for reciprocating the latter to swing the boom,

said frame including an upright, apertured plate having a track for the bar on the one side thereof facing the boom, said power device located on the opposite side of said plate and being coupled with said bar through the aperture in said plate.

4,003,485

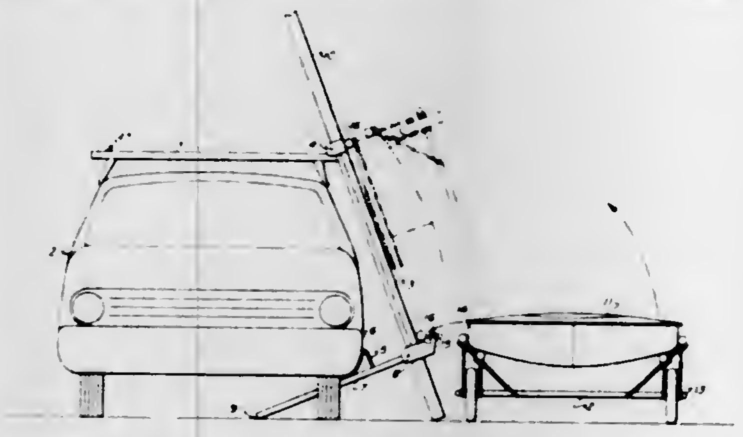
VEHICLE-TOP LOADER

Nelson Weeks Edgerton, 1112 Middle Road, Martinsville, N.J. 08836

Filed July 17, 1975, Ser. No. 596,733

Int. Cl.² B60P *3/10*; B60R *9/04*

U.S. Cl. 214—450 2 Claims



1. A vehicle-top loader and carrier comprising:

a rack adapted to be supported on the top of said vehicle;

a carriage adapted to cooperate with said rack to enable rotation from an inclined loading position alongside said vehicle to the level of said rack and subsequent horizontal movement across said rack to the travelling position above said vehicle, said carriage being adapted to support a boat; and

a lever comprising the mast of said boat extendably attached to said carriage to enable withdrawal of said lever in a direction away from said vehicle thereby providing increased leverage to raise said carriage to said rack level.

4,003,486

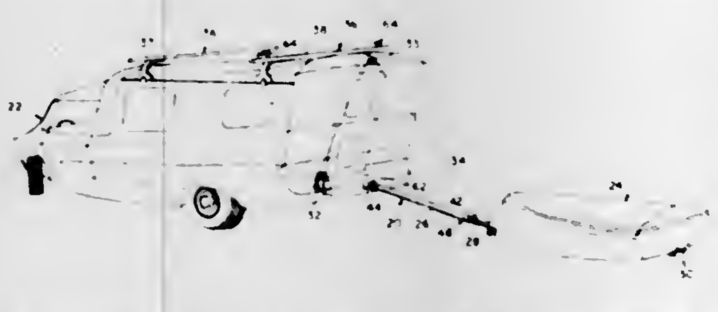
APPARATUS FOR LOADING AND UNLOADING A BOAT ONTO A MOTOR VEHICLE

Clifford L. Shoemaker, 20632 3rd Ave. S., Seattle, Wash. 98148

Filed Aug. 11, 1975, Ser. No. 600,617

Int. Cl.² B60P *3/10*

U.S. Cl. 214—450 11 Claims



1. A loading device, to be mounted on the rear bumper of an automobile or other carrier vehicle, for raising a boat from ground level and positioning it on a rack on the roof of said vehicle, operable by one person without requiring him to manually lift or support the weight of the boat, comprising:

a. a telescoping support beam, adjustable in length, lockable at a fixed, pre-selected length and pivotally connected at one end to the rear structure of a carrier vehicle;

b. a bracket, to be attached to a boat stern to accept the extended end of the telescoping support beam at a pivotal connection;

c. a bracket, to be attached to a boat bow to accept the extended end of the telescoping support beam at a pivotal connection, and

d. a winch and its associated pulleys and pull rope to raise the boat as it is restrained and partially supported by the telescoping support beam.

4,003,487

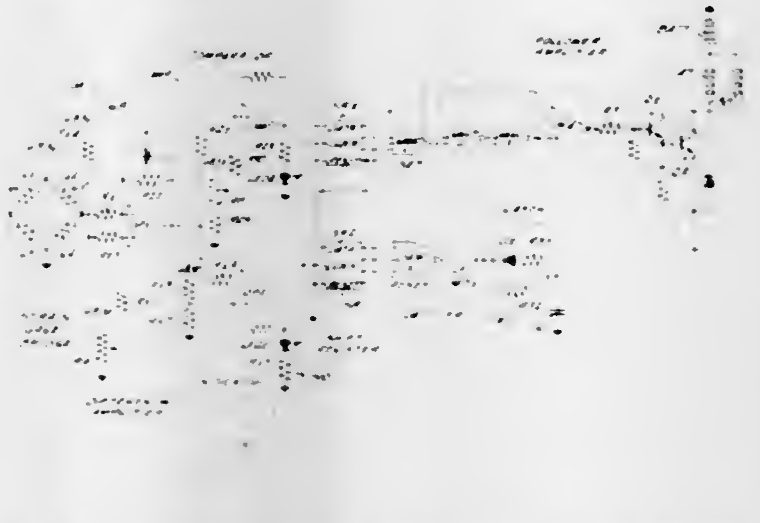
TRUCK OVERLOAD PROTECTIVE SYSTEM HAVING TRIP SIGNAL SAMPLING MEANS

Terry R. Downing, Hazel Crest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 3, 1975, Ser. No. 564,720

Int. Cl.² B65E *47/00*

U.S. Cl. 214—673 21 Claims



21. An overload protective system for a vehicle having a frame and a lift mechanism including a shiftable load support for raising and lowering loads and including a load carrying member and power means applied to said frame for operating said lift mechanism to shift said load support on said vehicle, said load carrying member being subjected to the force exerted by said power means and resisting the tilting moment acting on said vehicle as a result of the position of said load support on said vehicle, strain gage sensor means attached to said member for sensing the mechanical strain in said load carrying member and generating a strain signal whose magnitude is a function of said mechanical strain, comparator means for deriving a trip signal when said strain signal reaches a predetermined magnitude indicating that said lift mechanism is overloaded, sampling means for repetitively sampling the output of said comparator means over a time interval and for deriving a disable signal output only when said trip signal is present for a predetermined time interval, and means responsive to said disable signal output for preventing said power means for operating said lift mechanism in a load raising direction.

4,003,488

TEAR OPEN BOTTLE CAP

Thomas G. Moller, Rahway, N.J., assignor to American Flange & Manufacturing Co., Inc., Linden, N.J.

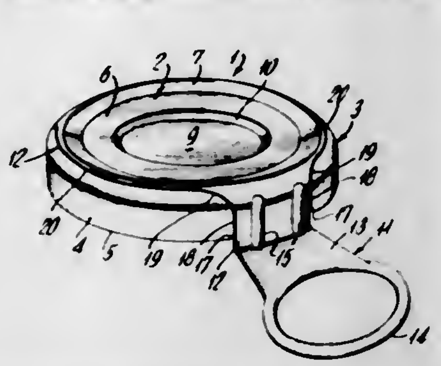
Continuation-in-part of Ser. No. 581,881, May 29, 1975. This application Mar. 15, 1976, Ser. No. 667,266

Int. Cl.² B65D *41/42*

U.S. Cl. 215—254 5 Claims

1. A lightweight metal tear-off cap comprising a circular top panel surrounded by a cylindrical skirt terminating in a lowermost free edge, a radiused juncture portion connecting said top panel and said skirt, a gripping ear formed as an integral part of said skirt extending from said free edge, a tearing zone commencing at said skirt free edge adjacent said gripping ear and extending upwardly across said skirt and blending into a circular path lying within said radiused juncture portion, said tearing zone extending rearwardly from said gripping ear to at

least partially surround said cap top panel and a sealing gasket adhesively affixed to said cap interior disposed radially inwardly of said tearing zone along said path whereby tearing along said exposed tearing zone independently of said gasket causes the major portion of said cap top panel to be separated from said cap skirt upon opening.



4,003,489

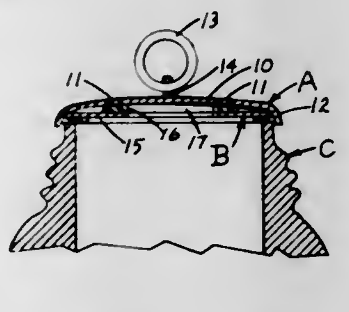
VALVED CANNING LID

Harold J. Bingaman, 6309 Pentz-Magalia Highway, Paradise, Calif. 95969

Filed Oct. 24, 1975, Ser. No. 625,376

Int. Cl.² B65D *51/16*

U.S. Cl. 215—260 **2 Claims**



1. A canning jar sealer lid incorporating a mechanical relief valve and a means for operating the relief valve manually when said lid is secured to a jar with a conventional screw band, comprising: a sectional lid circular in shape, the lid having two sections including a flexible external sealer cap and a rigid internal sealer disc, the cap having a pull ring affixed by a pivot hinge and centered in the upper surface of the cap, this center pull ring surrounded by a circle of small openings cut through the cap material with the outer edge of the cap flanged downward to form a retaining rim containing an area slightly larger than the total circumference of the disc, the disc having a single aperture through the center with a gasket adhered around the aperture on the upper surface of the disc and a gasket adhered on the lower surface of the disc adjacent the outer circumference of the disc, the upper gasket around the disc aperture being in the same circular position as the holes through the cap, the two sections designed to cojoin into a single sealer lid.

4,003,490

PROCESS AND APPARATUS FOR THE MANUFACTURE OF WHITE CHEESE OR YOGHURT

Bernadette Corbic nee Busnel, Carrieres-sur-Seine, France, assignor to Societe: Toscara Anstalt, Vaduz, Liechtenstein

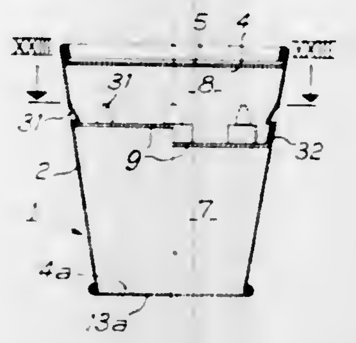
Filed Dec. 23, 1974, Ser. No. 535,843

Claims priority, application France, Jan. 9, 1974, 74.00718; Apr. 10, 1974, 74.12664

Int. Cl.² B65D *85/00;* **B01D** *43/00*

U.S. Cl. 220—22.3 **10 Claims**

1. A container for use in the manufacture of white cheese or yoghurt, which comprises a container having a side wall defining a sealable filling opening through which a coagulatable milk composition may be introduced into the container, a sealable removal opening, and first and second communicating chambers in the container respectively located adjacent said filling and sealing openings, and a divider having an edge at least partly engaging the side wall of the container and dividing the container into the two chambers, the edge of the divider having a predetermined configuration selected to cooperate with the side wall of the container to define passages therebetween providing communication between said chambers, of a predetermined size to prevent coagulated milk composition from passing therethrough; seal means for sealing the filling opening of the container after a milk composition has been introduced into the container in an amount at most equal to the volume of the first chamber, whereby said container may be placed in an orientation such that all the milk composition therein accumulates and remains in the first chamber until the milk composition has coagulated, and the volumes of said first and second chambers being respectively selected such that said second chamber is able to contain at least a greater part of the liquid or serum in the coagulated milk composition formed in the first chamber when the orientation of the container is changed, after coagulation of the milk composition in the first chamber, to permit said serum to drain from the caogulated milk composition and flow through said passages into said second chamber.



4,003,491

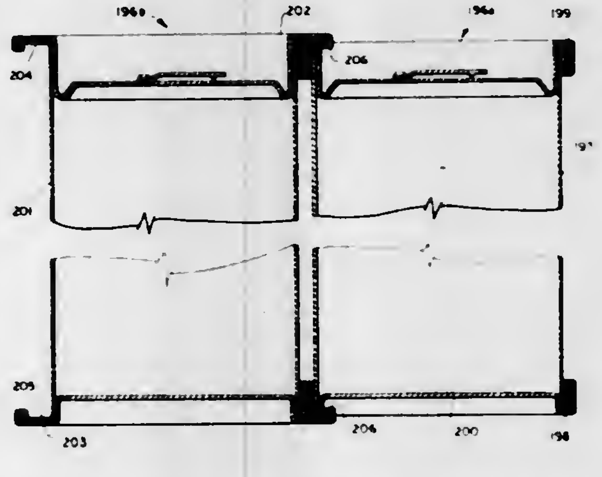
SYSTEM OF INTERCONNECTING CONTAINERS

Robert A. Wells, 4450 Harris Trail NW., Atlanta, Ga. 30327, and Carl J. Strobe, 2831 Orchard Knob, Atlanta, Ga. 30309

Division of Ser. No. 477,821, June 10, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 630,988

Int. Cl.² B65D *21/02*

U.S. Cl. 220—23.4 **6 Claims**



1. Container apparatus with mutually engagable structure which maintains filled beverage containers in side-by-side connection, comprising:

- a pair of closed containers each of which has a generally cylindrical body portion terminated at each end by a closure member;
- first attachment means integrally associated with one of said ends of one said container and extending laterally outwardly from said cylindrical body portion
- second attachment means integrally associated with said other container in peripheral surrounding relation therewith and presenting an engagement portion facing laterally outwardly from said cylindrical body portion of said other container;
- one of said attachment means defining a circumferential channel which extends longitudinally a distance along the body portion of the corresponding container; and
- the other of said attachment means having a configuration which is complementary to said channel and which is laterally retained within said channel for snap-out removal thereform, to selectively retain said pair of containers in lateral connection relations.

4,003,492

CONTAINER BODY SIDE SEAM CONSTRUCTION

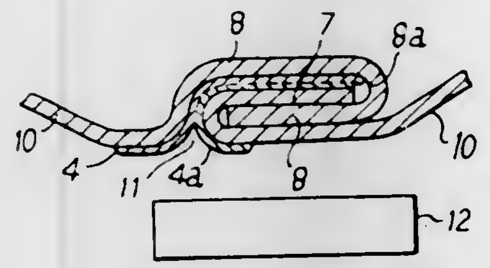
John Beveridge, Uxbridge; Thomas Roderick Harries Davies, Pinner; Fred Fidler, Cuffley, and Maurice Frank Ring, Epsom, all of England, assignors to Metal Box Limited, Reading, England

Filed Nov. 14, 1974, Ser. No. 523,928

Claims priority, application United Kingdom, Nov. 28, 1973, 55171/73

Int. Cl.² B65D *7/38*

U.S. Cl. 220—62 **4 Claims**



4. A body blank for a tubular container body which comprises sheet material having opposite edges and opposite sides, oppositely facing and inter-engageable hook portions formed along said opposite edges thereof, and adhesive strips attached to said sheet material along the said opposite edges thereof, all of said adhesive strips being on a single one only of said material sides for bonding together to form a seal between said hook portions when inter-engaged to form a container body

4,003,493

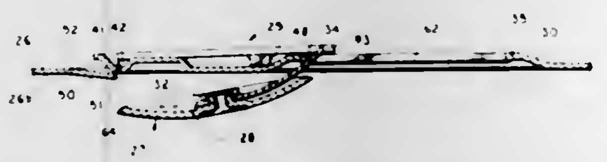
EASY-OPEN CONTAINER WITH NONDETACHABLE OPENING MEMBER

Robert A. Wells, 4450 Harris Trail NW., and Carl J. Strobe, 2831 Orchard Knob, both of Atlanta, Ga. 30327

Continuation-in-part of Ser. No. 580,624, May 27, 1975. This application Dec. 9, 1975, Ser. No. 639,167

Int. Cl.² B65D *41/32*

U.S. Cl. 220—267 **24 Claims**



1. An easy opening container, comprising:

- a container wall having an outer surface and an inner surface;
- an openable member defined in said wall by a selectably separable region;
- an opening tab member secured to the outer surface of said openable member and having means which overlies at least a portion of said separable region,
- said opening tab member having means to transmit force to said wall in the vicinity of said separable region to fracture said separable region when force is applied to said opening tab member in a direction toward said wall, and
- said overlying means being configured to allow said openable member to move a predetermined limited distance inwardly from said wall when said separable region becomes separated, and being movable with said opening tab member along said outer surface of said wall to displace said openable member along said inner surface of said wall.

4,003,494

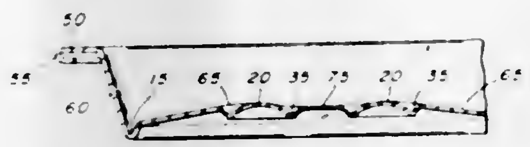
SHEET METAL CONTAINER COMPONENT

George L. Smith, New Kensington, and Milton L. Stineman, Shelocta, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 14, 1976, Ser. No. 648,904

Int. Cl.² B65D *17/00*

U.S. Cl. 220—268 **11 Claims**



1. A sheet metal container component having a generally planar wall comprising.

- at least two inwardly displaceable, adjacently disposed, substantially rigid opening panels, each of said opening panels having a frangible web therearound defining a locus of separation of said opening panel from said wall, and
- integral deflectable portions projecting outwardly from the general plane of said wall with said opening panels located therein and said deflectable portions having a common surface between said opening panels to provide a raised bridge of metal separating the opening panels to facilitate initiation of fracture of the web around each opening panel

4,003,495

CAN COVER OPENABLE BY A SPOON OR THE LIKE

Frederick Gerard Joseph Grise, Osterville, and Walter Carl Lovell, Wilbraham, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 26, 1976, Ser. No. 680,578

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **12 Claims**

1. A sheet metal can end comprising a relatively liftable panel defined by a tear line, the panel including and encompassing a tongue-like closure portion openable by relative depression, the closure portion being defined at least in part by an arcuate weakening line characterized by at least a mid-portion thereof being fractured but integral with the panel, said mid-portion being spaced inwardly from said tear line by a lip substantially coplanar with the panel and the lip tapering narrower adjacent said mid-portion of the weakening line than at other portions thereof.

4,003,496

END CLOSURE FOR CONTAINER

Obert M. Ostrem, Westmont; Donald F. Kulikowski, Oak Forest, and Sam C. Pulciani, Norridge, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

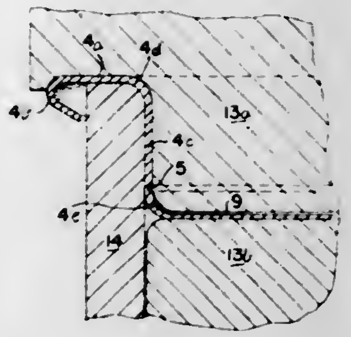
Filed Feb. 17, 1976, Ser. No. 658,446

Int. Cl.² B65D *41/32*

U.S. Cl. 220—270 **1 Claim**

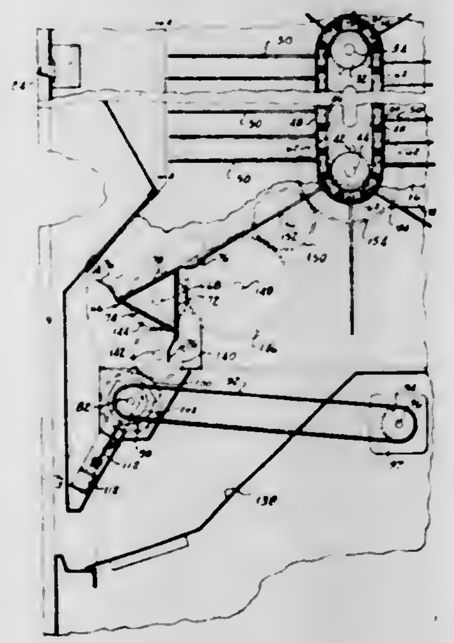
1. An improved end panel for an easy-opening end closure of the full opening type comprising a central web, and a peripheral portion, said peripheral portion including a substantially axial chuckwall for placement in close association with the sidewall of a can or similar container, the improvement comprising a scoreline disposed in the outer surface of said

chuckwall and formed and arranged to provide a removable flap which upon opening leaves a severed sharp edge on the chuckwall offset from the inner surface of said chuckwall toward the container sidewall subsequent to opening of the closure in a downwardly axial position.



4,003,497
DELIVERY SYSTEM FOR FIFO MERCHANDISING MACHINE

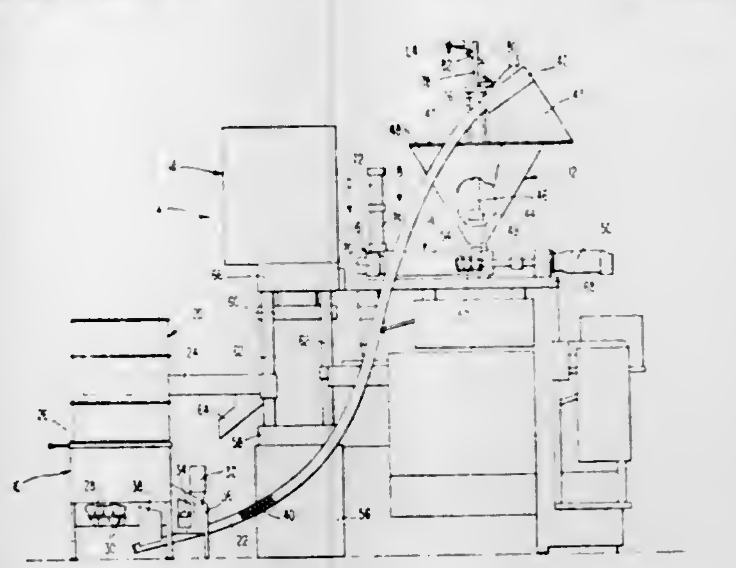
Albert Kurimsky, Dover, N.J., assignor to Rowe International Inc., Whippany, N.J.
Continuation of Ser. No. 210,380, Dec. 21, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,327
Int. Cl.^{2} G07F *11/82*
U.S. Cl. 221—84 **15 Claims**



1. In a merchandising machine, apparatus including a frame, an escrow member having an article receiving surface, a shelf having an article supporting surface, means including first and second shafts respectively mounting said escrow member and said shelf for movement between first positions at which said surfaces cooperate to support an article of merchandise and second positions at which said article is released, a gear train comprising first and second gears carried respectively by said first and second shafts for connecting said shafts, said gear train adapted to be driven concomitantly to drive said shafts in opposite directions, and means responsive to operation of said machine for driving said gear train to move said escrow member from its first position to its second position, the gear ratio provided by said gear train being such that the shelf moves from its first to its second position as said operation responsive means drives said gear train.

4,003,498
METHOD AND APPARATUS FOR CONTROLLED FEEDING OF FRICTION MATERIAL

Edward Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.
Division of Ser. No. 633,054, Nov. 18, 1975. This application Dec. 5, 1975, Ser. No. 637,914
Int. Cl.^{2} B29F *3/02*; B29C *3/00*
U.S. Cl. 222—1 **14 Claims**

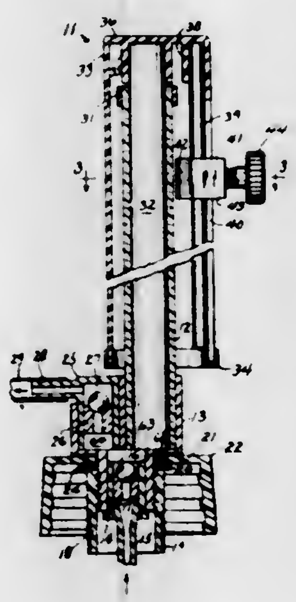


8. A method for feeding high bulk friction materials and the like into contact with a rotating plasticizing screw comprising the steps of:

a. forcing material from a storage hopper through an orifice and into contact with said screw;
b. timing at least a portion of the preceding step (a);
c. transporting material from a supply container, remote from said screw, to said storage hopper; and
d. regulating the transport of material performed in preceding step (c) whenever the timed portion of step (a) timed in step (h) exceeds a first predetermined time period.

4,003,499
PRECISION LIQUID DISPENSING DEVICE

Justin Joel Shapiro; Marion Henrietta Shapiro, both of Berkeley, and John W. G. Chin, Richmond, all of Calif., assignors to Justin Joel Shapiro, Berkeley, Calif.
Filed May 26, 1976, Ser. No. 690,274
Int. Cl.^{2} B67D *5/22*
U.S. Cl. 222—50 **10 Claims**

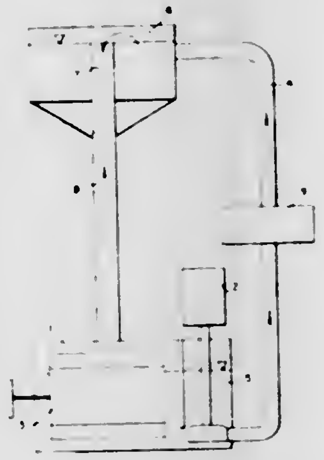


1. A burette device comprising a vertical cylindrical barrel provided at its top end with an outwardly projecting stop element, a dispensing plunger slidably and sealingly received in said barrel, a volumetric scale on said barrel, a guard shield

secured to the top end of said plunger and surrounding said barrel, said guard shield being formed with a window aperture exposing said volumetric scale, a depending vertical rod in the guard shield secured to the top portion of said guard shield and depending adjacent said window aperture, an indicator element adjustably mounted on said vertical rod and having a portion thereof transversely overlying said scale and located beneath said stop element so as to engage therewith to limit upward extension of said plunger, a valve assembly including an intake conduit provided with suction check valve means and an outlet conduit having discharge check valve means, means communicatively connecting said valve assembly with the bottom end of said barrel, and means to mount said valve assembly on a closure element of a liquid container with said intake conduit projecting downwardly therefrom.

4,003,500
METERING DEVICE

Eberhard Schornig, Bleidenstadt, Germany, assignor to Hoechst Aktiengesellschaft, Germany
Continuation of Ser. No. 213,041, Dec. 28, 1971, abandoned. This application Apr. 18, 1975, Ser. No. 569,500
Claims priority, application Germany, Dec. 31, 1970, 2064709
Int. Cl.^{2} B67D *5/56*
U.S. Cl. 222—133 **5 Claims**



1. A developing apparatus for use in a copier operating on the electrostatic imaging principle, which apparatus comprises means defining a developer flow path including pump means for circulating, around the path, a developer fluid composed of a high-resistance liquid phase with a finely-divided solid toner phase dispersed therein, of which solid toner phase the developer fluid is depleted during operation,

metering means comprising a plurality of chambers for containing a solids toner concentrate for replenishing the developer,

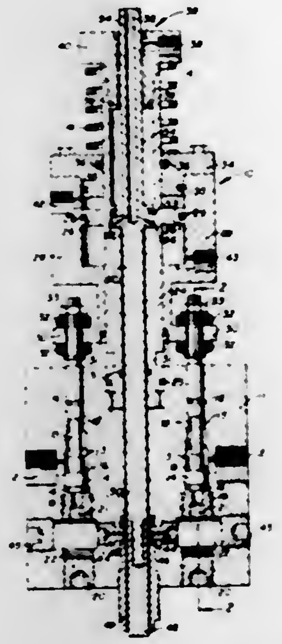
means whereby in a fluid-tight manner each chamber can be consecutively introduced, when desired, as a section of said path, thereby entering the contents of any introduced chamber into a developer fluid,

and filling means mounted above the metering means for filling said chambers with said solids toner concentrate.

4,003,501
FLUID IMPINGEMENT MIXING APPARATUS

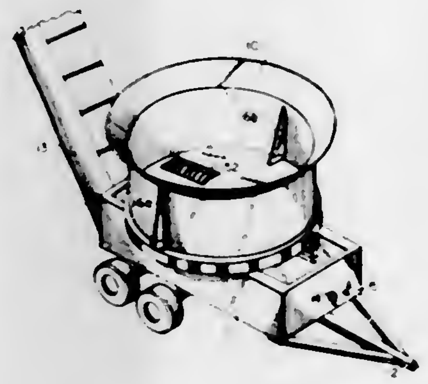
Dario J. Ramazzotti, Tallmadge, and Geza A. Thiry, Ravenna, both of Ohio, assignors to McNeil Corporation, Akron, Ohio
Filed Mar. 12, 1975, Ser. No. 557,574
Int. Cl.^{2} B67D *5/60*
U.S. Cl. 222—135 **8 Claims**

1. Apparatus for mixing a plurality of fluids and thereafter dispensing the same comprising a fluid mixing chamber with at least one separate opening therein from which the fluids are dispensed; at least two nozzle means for emitting fluid to said mixing chamber; a fluid input chamber communicating with each said nozzle means; means to provide fluid under pressure to each said input chamber; said means to provide fluid under pressure including fluid input means, valve means, and means to operate said valve means from a closed to open position, said valve means communicating with said fluid input means and each said input chamber such that when said valve means is in an open position fluid is permitted to flow from said input means to each said input chamber; said means to operate said valve means including a fluid actuated cylinder having a stationary piston and piston rod and movable cylinder housing, said cylinder housing being connected to said valve means to open and close the same; and means to prevent said nozzle means from emitting fluid to said mixing chamber until after each input chamber receives fluid under pressure.



4,003,502
ADJUSTABLE SWEEPING APPARATUS FOR FEED GRINDERS AND THE LIKE

Ernest A. Barcell, Lafayette, Colo., assignor to Easy Engineering Corporation, Broomfield, Colo.
Continuation-in-part of Ser. No. 539,821, Jan. 9, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,264
Int. Cl.^{2} B65G *65/48*
U.S. Cl. 222—168 **6 Claims**



1. In a container apparatus having moving sidewalls for urging materials into an aperture, an improvement, comprising:

plate means,

means for attaching moving said plate means to the sidewalls of the container apparatus, and

means selectably moving said plate means between at least a first location wherein said plate means is extended into the container for sweeping over the aperture in response to movement of the sidewall and a second location wherein said plate means is substantially withdrawn from the interior of the container, whereby said plate means when in said first location will augment urging of material within the container towards the aperture but will not interfere with loading of the container when in said second location.

4,003,503

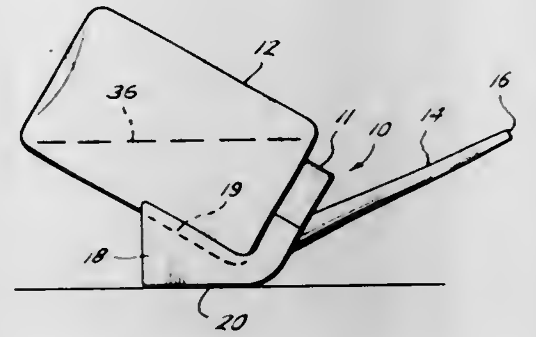
DISPENSING DEVICE FOR HIGHLY VISCOUS LIQUIDS SUPPORTED IN INCLINED POSITION

George E. Aldridge, Lakehills, Tex., assignor to ACCC, Inc., San Antonio, Tex.

Filed Dec. 11, 1974, Ser. No. 531,468

Int. Cl.^{2} B65D *41/04*

U.S. Cl. 222—173 2 Claims



1. In combination with a container adapted to carry a relatively highly viscous liquid, a cap adapted to be secured to said container in a liquid-tight seal, a nozzle on said cap, means on said cap adapted to maintain said container in normally downwardly inclined condition with said cap positioned downwardly, said nozzle extending angularly upward from said cap with respect to the longitudinal axis of said container in downwardly inclined condition, said nozzle terminating upwardly in proximity to the horizontal plane of a predetermined liquid level in said container in normally downwardly inclined condition.

4,003,504

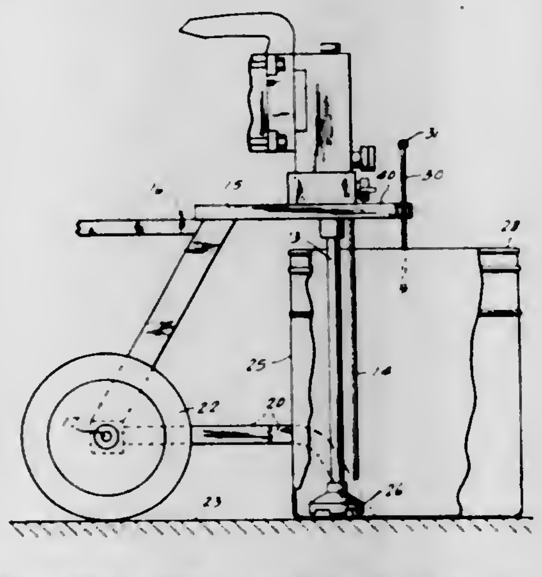
PUMP FRAME

Gerald William Johnson, Minneapolis, and Robert David Lerum, Crystal, both of Minn., assignors to Spray Tech Corporation, Minneapolis, Minn.

Filed Apr. 21, 1975, Ser. No. 569,888

Int. Cl.^{2} B62B *1/06;* **F04B** *21/00*

U.S. Cl. 222—178 5 Claims



1. A tiltable easily transported wheeled frame for supporting a pump with an intake extending into a removable bail equipped container for material to be pumped wherein the frame may be tilted to swing the intake into bailed container resting on the ground and the bail of the container easily attached to the frame to swingably suspend the container from the frame and avoid spillage of the material therein when the frame is transported which comprises, a pair of laterally spaced wheels, a frame supported on said wheels having forwardly projecting legs adapted to rest on the ground to cooperate with the wheels for holding the frame in an upright position, a pump support means above said legs, and a handle extending rearwardly beyond said wheels adapted to be manually depressed to tilt the frame about the wheels and lift the legs off the ground and pushed or pulled for rotating the wheels to transport the tilted frame, a bail suspension device on said frame forwardly of said wheels adapted to receive the bail of a container therearound and having spaced means underlying the bail with outwardly opening grooves at opposite ends of the device with their bottoms spaced apart a sufficient distance to engage the both sides of the bail in spaced relation from the apex thereof intermediate the pivoted ends of the bails and the apex of the bail and positioned at an elevation on the frame to accommodate the bailed container to be suspended therefrom to rest on the ground when said legs of the frame are on the ground and to lift the container off of the ground for transport with the frame when the handle of the frame is depressed to lift the legs off of the ground, and said suspension device cooperating with said frame to accommodate swinging of a bailed container suspended from said device to avoid tilting of the container to a spilling position when the frame is tilted for transportation.

4,003,505

RELIEF VENT FOR PRESSURIZED CANS

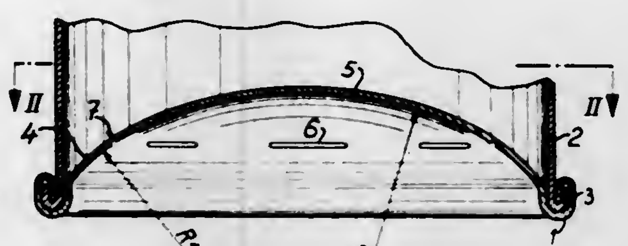
Jean Hardt, Benken, Switzerland, assignor to Aluminium Suisse S.A., Switzerland

Continuation-in-part of Ser. No. 460,193, April 11, 1974, abandoned, which is a continuation of Ser. No. 264,964, June 21, 1972, abandoned. This application Dec. 23, 1975, Ser. No. 643,767

Claims priority, application Switzerland, June 23, 1971, 9163/71; Japan, June 5, 1972, 47-8258

Int. Cl.^{2} B65D *83/14*

U.S. Cl. 222—397 15 Claims



1. A packaging can for pressurized products such as aerosols, comprising a tubular body having closed opposite ends, one of said ends having a dished portion dished inwardly toward the interior of said tubular body and having a generally circular central area deformable outwardly in an axial direction when a predetermined internal pressure is exceeded in said body, said end having a multiplicity of elongated discrete scores corresponding to tearable areas of reduced cross section of a material defining said end, said scores each having a major length component intermediate opposite end portions disposed tangential to the boundary of said circular central area and said material being weakened in said areas of reduced cross section and enabled to progressively tear when the central area is deformed outwardly, said scores being disposed in a circular configuration spaced from each other in a circumferential direction in said circular configuration with the end portions thereof in positions to avoid propagation of tearing from one score to another and each having a length of major component thereof to facilitate outward deforming of said circular central area, whereby when said predetermined internal pressure is exceeded said central area deforms outwardly and at least one of said areas of reduced cross section progressively tears without propagation of tears between the areas and without rupture of said central area thereby relieving the internal pressure progressively.

4,003,506

CASTER WITH ROTATING CLOSURE

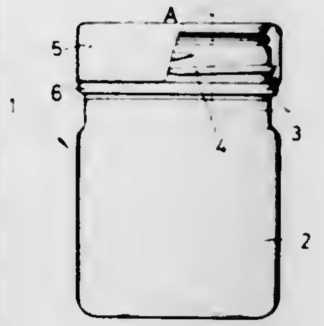
Dieter Fuchs, 19 Westring, Dissen T. W., Germany 4503

Filed June 2, 1975, Ser. No. 582,609

Claims priority, application Germany, June 7, 1974, 2427478

Int. Cl.^{2} A47G *19/24*

U.S. Cl. 222—555 7 Claims



1. A caster for pulverulent, granular or lumpy substances such as spices, the caster comprising in combination:

a hollow body defining a storage chamber and at an outlet end thereof having a generally cylindrical wall portion defining a

cavity of circular cross-sections;

recess means provided in said generally cylindrical wall portion to at least partially encompass said cavity;

a cap insert made of synthetic material and comprising a resilient portion latchably engaging said recess means to retain said cap insert on said body, a hollow cylindrical portion of said cap insert having an external diameter slightly smaller than the diameter of said cylindrical portion so that a clearance is present between them and being received in said cavity, and a perforate plate portion extending at said outlet across the interior of said hollow cylindrical portion and being perforate in at least one of a plurality of spaced regions thereof;

a cover slide carried by said cap insert and rotatably mounted in the interior of said hollow cylindrical portion thereof, said cover slide comprising a plate portion having an aperture therein and slidably contacting said perforate plate portion of said cap insert, and a collar portion having wall members each extending substantially perpendicularly of said apertured plate portion to define therebetween a passage communicating with said aperture in said apertured plate portion, and

a lid member adapted to be detachably mounted to said generally cylindrical wall portion of said hollow body to extend across said cavity and having an internal surface which, when said lid member is mounted on said body, is adapted to contact both said cap insert and end faces of said wall members remote from said apertured plate portion.

4,003,507

NIGHT FIGHTER HOLSTER

Richard F. Elton, 2908 Roanoke Ave., Kettering, Ohio 45419

Filed Nov. 24, 1975, Ser. No. 634,650

Int. Cl.^{2} F41C *33/04*

U.S. Cl. 224—2 B 7 Claims

1. A holster for activating light-activatable luminous material on the rear surfaces of the front and rear sights of a gun while it is holstered therein without revealing the position of the wearer during said activation comprising:

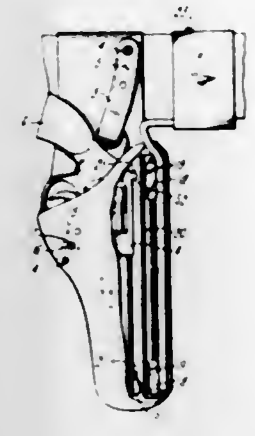
a receptacle well portion to house said gun, said well having a portion suitable for securing to a wearer's belt or harness;

a gun-restraining strap, one portion of which is secured to said well and another portion of which is fastenable to the outer surface of said well.

at least one light source positioned within the interior of said well for activating said luminous material;

a portable electrical power source operatively connected to said light source to provide the power for illuminating said light source;

an activator switch on the exterior surface of said holster well and;



means connecting said activator switch to both said electrical power source and said light source, whereby upon fastening said holster strap to said holster well said switch is off and said light source is out and upon unfastening said strap from said well said switch activates said light turning it on and causing it to illuminate thereby causing activation of said luminous material within the confines of the interior of said holster well to an extent sufficient to permit illumination thereof in total darkness.

4,003,508

CYCLE PACK

Karl S. Hoops, Box 305 Rte. 6, Idaho Falls, Idaho 83401

Continuation of Ser. No. 410,204, Oct. 26, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,087

Int. Cl.^{2} B62J *7/04*

U.S. Cl. 224—32 R 1 Claim

1. A convertible pack for use as a back pack and on a cycle with an inverted V-shaped sissy bar having a pair of inclined arms which may be readily connected to and removed from said sissy bar comprising:

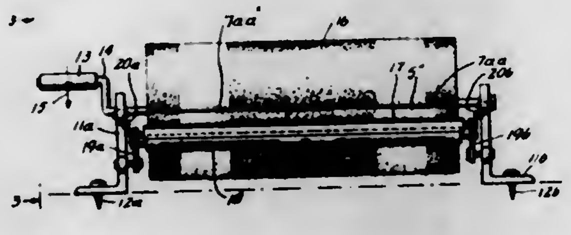
an enclosed container having a top, a bottom, a front wall, a rear wall and two side walls; and

a resilient, inverted V-shaped sleeve, open at its top and bottom, the edges of said sleeve being inclined at the same angle as the arms of said sissy bar, and spaced apart a distance such that said sleeve is stretched as it slides downwardly over said sissy bar, and carried by said front wall for sliding downwardly over said sissy bar a distance proportional to the loaded weight of said pack and for resiliently gripping the inclined arms of said sissy bar with a force proportional to the loaded weight of said pack, thereby simultaneously supporting the weight of said pack and stabilizing said pack to reduce lateral sway thereof.

4,003,509
DISPOSABLE BATH TOWEL AND DISPENSING DEVICE

George L. Camarero, 3304 93rd St., Jackson Heights, N.Y. 11372

Filed July 10, 1975, Ser. No. 594,949
Int. Cl.² B26F *3/02*
U.S. Cl. 225—23 **1 Claim**



1. A disposable bath towel combination comprising in combination: a sheet of fibrous paper of a predetermined elongated length characterized by a predetermined high degree of absorbency for water, having imprinted thereon at least one face thereof bath towel-simulated border edging extending transversely along an axis of a width thereof at at-least each of two opposite ends of the elongated length of the sheet, adapted thereby as a bath or beach towel of a disposable nature, the absorbent fibers being substantially felted to said face, said face having imprinted thereon a predetermined bath towel multicolored zone extending axially in parallel along said elongated length adapted such that appearance thereof corresponds to a fabric cloth material bath towel of conventional cloth nature, and a series of said sheet in end-to-end relationship linked detachably by scored tear-lines between adjacent ones of towel-simulated border of serially consecutive sheets, and adapted for feeding said series a feed means mounting the series, the feed means being for facilitating an advancing and tearing-off one at a time of said sheet from the series, the series being lengthwise-axis rolled into a roll, the feed means being un-rollable of a roll of the series mounted thereon, the feed means comprising two spaced-apart pivotably mounted support arms substantially in parallel at opposite ends of a roll of a width of said series, with a roller mounted adjacent said roll, on and extending between the support arms at points intermediate lengths of the support arms, and with a knife-edge structure biased against said one face; and the roll being positioned mounted revolvably adapted for a cranking of the series beneath said roller to thereby unroll the series to a tear-point of the scored tear-lines, said feed means further including lever structure mounted and adapted to revolve the roll beneath the roller and the knife-edge structure, the roller and the knife-edge structure being in substantially parallel and side-by-side relationship to one-another such that the sheet next-occuring to be next torn-away is held flushly against lower layers therebeneath sheets of the roll when the knife-edge structure is biased against the scored tear-lines of a hanging terminal sheet ready to be torn from the roll, and the feed means further including spring structure mounted and adapted to pivotably bias the support arms and the roller and the knife-edge structure inwardly toward the roll, and said lever structure including a crank mounted and adapted for revolving said roll.

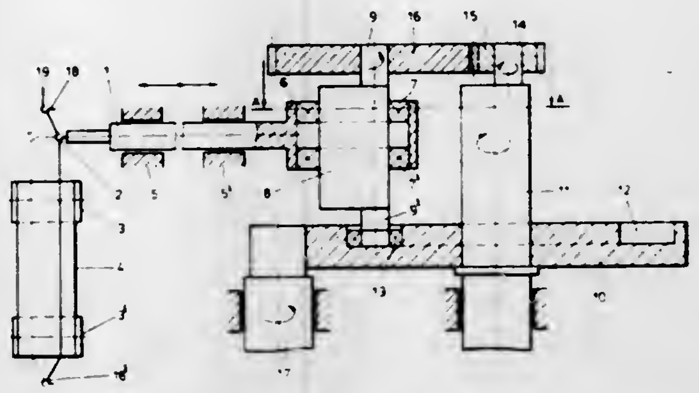
4,003,510
PROCESS AND APPARATUS FOR EXTENDING THE LIFE OF THE BELT OF A DELIVERY DEVICE FOR TEXTILE FILAMENTS

Albert Rebsamen, Wilen, and Franz Xaver Scherrer, Lichtensteig, both of Switzerland, assignors to Heberlein & Co. AG, Wattwil, Switzerland

Filed July 24, 1975, Ser. No. 598,817

Claims priority, application Switzerland, Aug. 28, 1974, 11703/74

Int. Cl.² B65H *51/14, 54/32*
U.S. Cl. 226—1 **7 Claims**

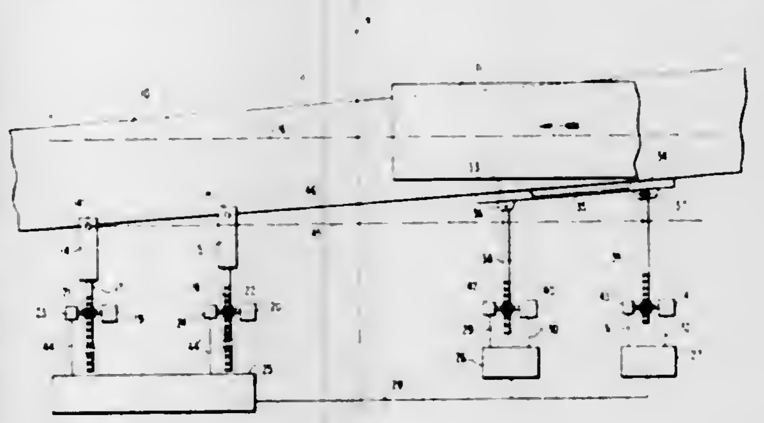


7. A process for extending the life duration of a circulating delivery belt having a surface for receiving thereon a stream of textile filaments and carrying said filaments longitudinally of said belt, said process comprising imparting to said stream immediately, prior to reaching said belt, to-and- fro transverse movements having a basic uniform component of reciprocation and an additional uniform component of reciprocation superposed on said basic component so that the points of reversal of said to-and-fro movement are distributed across said belt, the number of said points of reversal being greater than would be available from either of said components alone, said process further comprising imparting to said belt a period of circulation which is different from the period of said basic component of reciprocation.

4,003,511
METHOD AND APPARATUS FOR ALIGNING STRIP END PORTIONS IN A CONTINUOUS STRIP OPERATION

Crayton H. Schwestka, Michigan City, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,170
Int. Cl.² B65H *25/26*
U.S. Cl. 226—3 **8 Claims**



5. In continuous strip handling utilizing apparatus having a longitudinal center line in the direction of strip movement through the apparatus where a longitudinal portion of the trailing end portion of a first strip is aligned with a longitudinal portion of the leading end portion of a second strip prior to the step of welding the strip end portions together, the method comprising

sensing the position of one side edge of the first strip trailing end portion at a first point along the length of the first strip,

sensing the position of the one side edge of the first strip trailing end portion at a second point along the length of the first strip spaced from the first point in the direction of movement of the strip through the equipment,

generating a signal indicative of the distance between the second point and said center line and of the angle, if any, a first vertical reference plane passing through the second point and the first point makes with a second vertical reference plane parallel to the longitudinal center line of the apparatus and passing through the second point,

providing first and second strip engaging elements disposed along the length of one side edge of the second strip leading end portion,

providing actuating means for moving the strip engaging elements toward and away from the second strip,

moving the first strip engaging element actuating means toward or away from the second strip along a first path an extension of the first path intersecting the second reference plane at a third point located in the second reference plane at a first predetermined distance from the second point in the direction opposite to movement of the strip through the equipment,

moving the second strip engaging element actuating means toward or away from the second strip along a second path, an extension of the second path intersecting the second reference plane at a fourth point located in the second reference plane at a predetermined distance greater than the first predetermined distance from the second point in the direction opposite to movement of the strip through the equipment, and

utilizing the generated signal for controlling movement of the strip engaging element actuating means to dispose the strip engaging elements in the first reference plane, or in a plane parallel to the first reference plane if the width of the second strip is different from that of the first strip, whereby the second strip leading end portion one side edge can be brought into registry with the strip engaging elements of the strip positioning member for aligning the longitudinal center line of the second strip leading end portion with the longitudinal center line of the first strip trailing end portion.

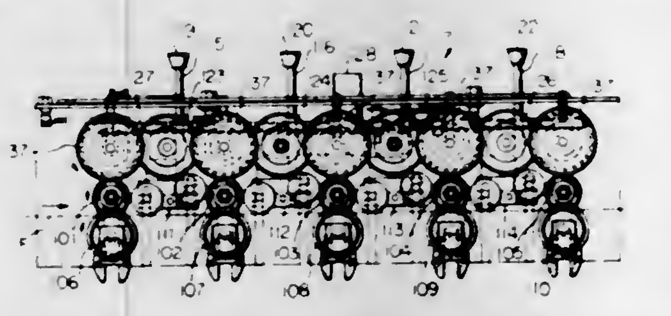
4,003,512
APPARATUS FOR SEQUENTIALLY AND SIMULTANEOUSLY DRIVING PLURAL PAIRS OF FEED ROLLERS

Ikuji Mori, 26-6, Unoki 3-chome, Ota, Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 505,099

Claims priority, application Japan, Sept. 29, 1973, 48-109532

Int. Cl.² B65H *17/22*
U.S. Cl. 226—188 **3 Claims**



1. A draped film loop forming device for use in automatic elongated film developing apparatus, comprising: a plurality of paired film feed rollers located along a predetermined film passage; a roller gear mounted on one of said paired rollers; one film feed roller driving gear provided for each of said roller gears for engagement therewith; one set of transmission gears provided for each of said feed roller driving gears for engagement therewith; one clutch means provided for each set of said feed roller driving gear and transmission gear for connecting the same integrally with each other; driving means for driving said transmission gears; and a clutch operating mechanism for controlling and switching the mode of operation of said plurality of paired film feed rollers between a simultaneous drive mode where all of said plurality of paired film feed rollers are rotated simultaneously at a uniform speed and a sequential drive mode where each pair of said plurality of paired film feed rollers are rotated sequentially from the preceding pair at predetermined time intervals.

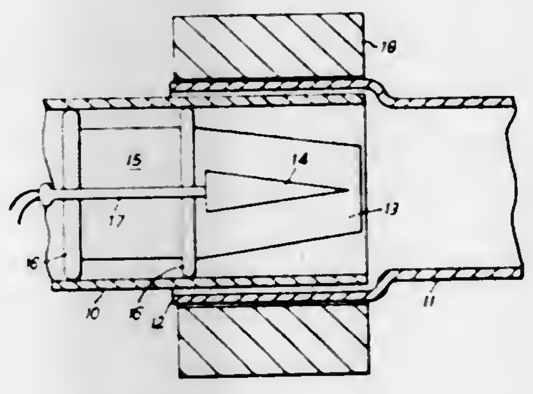
4,003,513
EXPLOSIVE WELDING

Michael Dickenson Chadwick, Newcastle-upon-Tyne, England, assignor to International Research & Development Company Limited, Newcastle-upon-Tyne, England

Filed Aug. 25, 1975, Ser. No. 607,670

Claims priority, application United Kingdom, Aug. 28, 1974, 37642/74

Int. Cl.² B23K *19/00*
U.S. Cl. 228—107 **10 Claims**



1. A method of explosively welding a metal pipe to a metal member having a bore to receive said pipe comprising the steps of

- i. disposing said pipe in said bore with a clearance between the outer surface of the said pipe and the wall of said bore,
- ii. locating within said pipe an impactor comprising a body of impacting medium containing an explosive charge, the surface of said body at least in the region surrounding the explosive charge being spaced from the inner surface of the pipe, and
- iii. detonating the explosive charge and thereby
- iv. imparting a high velocity to the impacting medium before it strikes the inner surface of the pipe,
- v. the impact of said impacting medium on the pipe accelerating the wall of the pipe to a velocity such that it is welded to the wall of the said bore.

4,003,514
FROZEN FOOD TRAY

Earl J. Graser, Monroe, La.; assignor to Olinkraft, Inc., West Monroe, La.

Filed Jan. 21, 1976, Ser. No. 651,093
Int. Cl.² B65D *5/22*
U.S. Cl. 229—34 HW **1 Claim**

1. A tray for storing and reheating food comprising

a centrally located base portion having a pair of sides and a pair of ends;

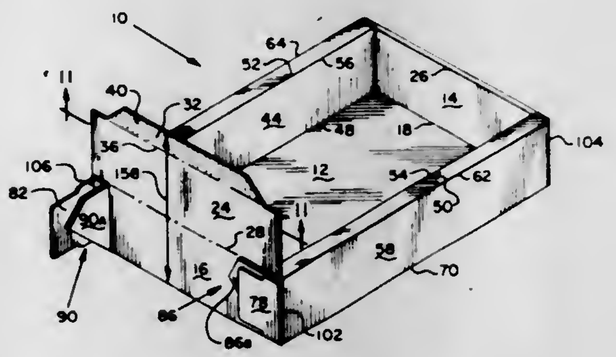
opposing inner and outer side-wall panels;

said side-wall panels connected therebetween by a rim portion to form spaced apart hollow side walls formed on each side of said base portion

said inner side-wall panels being hingedly connected and perpendicular to said base portion;

said inner side-wall panels having hingedly connected

thereto said rim portion which lies parallel to said base portion;
said rim portion having hingedly connected thereto said outer side-wall panels on the side opposite said inner side-wall panels;
said outer side-wall panels having hingedly connected on the outer edge thereof an elongate flap;
said elongate flap being adhesively secured to the underside of said base portion;
opposing inner and outer end-wall panels formed on each end of said base portion;
said inner end-wall panels being hingedly connected and perperdicular to said base portion;
said outer end-wall panels being hingedly connected to said inner end-wall panels;
said outer end-wall panels having hingedly connected on the outer edge thereof a narrow flap;
said narrow flap being adhesively secured to the underside of said base portion;



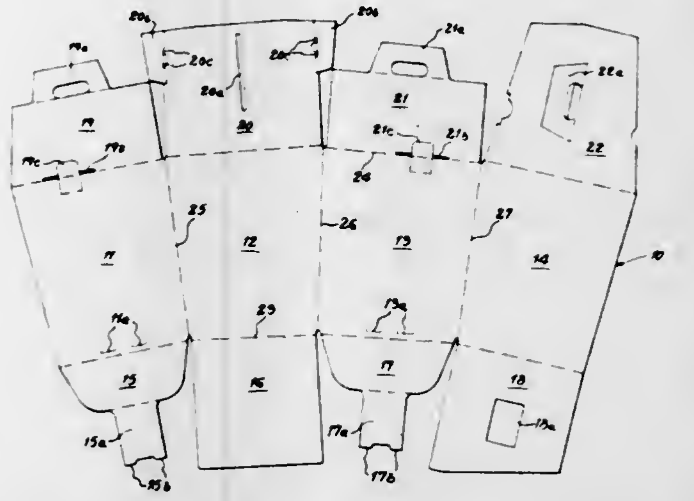
corner web-like folds hingedly connected and positioned between said inner side-wall panels and said inner end-wall panels;
said corner folds having a scoreline in the central portion thereof for folding the interior surfaces of the corner folds against each other;
securing flaps formed on said outer side-wall panels;
said securing flaps being folded over and disaposed adjacent said corner folds;
interior and exterior portions of said tray being formed from foil laminated paperboard;
a separate one-piece lid being adhesively secured to the package;
said lid having a generally triangular-shaped, reverse cut tear-out portion, and
said tear-out portion having a partially glued protuberance at one end thereof.

4,003,515
HANDLE CONTAINER

Artie Steele, Hampton, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 5, 1976, Ser. No. 646,485
Int. Cl.² B65D *5/02, 5/46*
U.S. Cl. 229—52 B **4 Claims**

1. A four-sided handle container having a bottom and a top closure, said top closure comprising:
a closure flap secured to each side along a hinge line so that the four said flaps can be folded into overlapping horizontal positions to close the container;
the opposite first and second said flaps having first and second handle members secured respectively to such flaps along first and second parallel hinge lines, the said parallel hinge lines and first and second handle members being positioned so that the handle members can be folded normal to the closed flaps into superimposed relationship;
the third said flap having a third handle member secured to such flap along a third hinge line normal to the said first and second parallel hinge lines of the first and second flaps, said third flap having a first slot adjacent the third hinge line, said third hinge line, first slot and third handle member being positioned so that the third flap can be folded into superimposed relationship over the first and second flaps, the superimposed first and second handle members can be inserted through the said first slot, and the third handle member can be folded normal to the first, second and third flaps with the first, second and third handle members in superimposed relationship;
the fourth said flap having a second slot parallel to the first slot, said second slot being positioned so that the fourth flap can be folded into superimposed relationship over the third flap and the first, second and third superimposed handle members can be inserted through the second slot;

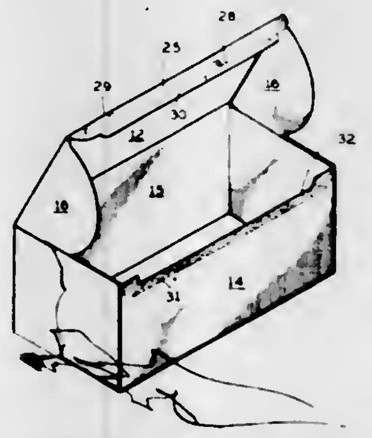


means for securing the said flaps in closed position comprising:
a tab secured to each outer corner of the fourth said flap along a tab hinge line parallel to the said second slot; and
tab slots cut out of the first and second said flaps along the hinge lines securing such flaps to the sides, said slots being of a size to receive the said tabs;
the said tabs and tab slots being positioned so that, when the flaps are folded into closed position, the said tabs can be inserted into the said tab slots to lock the flaps into closed position.

4,003,516
ICE CREAM CARTON

H. Fred Commerford, Orinda; Arthur C. Dreshfield, Lafayette, both of Calif., and Thomas J. Sellors, Waukegan, Ill., assignors to Potlatch Corporation, San Francisco, Calif.

Filed July 9, 1975, Ser. No. 594,328
Int. Cl.² B65D *5/54*
U.S. Cl. 229—51 SC **5 Claims**



1. A half-gallon carton comprising, in combination,
top and bottom panels having a length to width ratio of approximately two to one, or more,
front and rear panels having a length to height ratio of at least two to one,
front opening and reclosure means comprising less than 10 percent of the perimeter dimension of said carton taken around its width and height,
opposed closure flaps at each end which together substantially cover the end of the tubular interior defined by the top, bottom, front and rear panels,
the whole defining a carton having a perimeter dimension taken around its width and height of less than about 15.7 inches, and produced from a blank which is less than about 15.7 inches long at any point across its width

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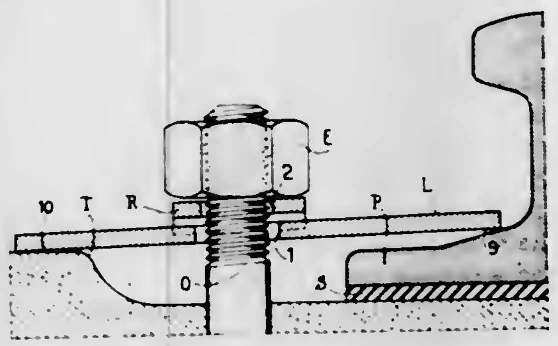
4,003,517
ELASTICALLY YIELDABLE RAIL FASTENER

Michel Duchemin, Lambres-les-Doual, France, assignor to Ressorts du Nord S.A., Paris, France

Filed Apr. 14, 1975, Ser. No. 567,530
Claims priority, application France, Apr. 19, 1974, 74.13725; Apr. 19, 1974, 74.13726
Int. Cl.² E01B *9/30*
U.S. Cl. 238—349 **10 Claims**



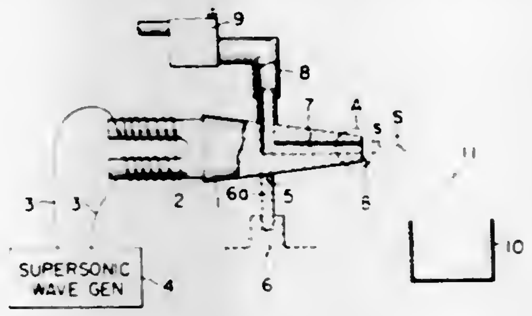
1. An elastically yieldable fastener structure for a railway rail comprising at least one main bending strip defining an aperture for the passage of clamping means for the fastener structure and extending in a first general direction and having lateral edges extending substantially in said first direction, an elastically yieldable means which extends in a second general direction substantially perpendicular to said first direction and is curved in said second direction and has a concavity directed toward the main strip and has two end portions which are respectively in bearing relation to said edges of the main strip so that when a clamping force is exerted on the yieldable means by said clamping means the yieldable means transmits said clamping force to the strip in the region of said end portions and relieves the strip of said clamping force in the region of said aperture.

4,003,518
METHOD AND DEVICE FOR CONTROLLING COMBUSTION IN LIQUID FUEL BURNER UTILIZING ULTRASONIC WAVE TRANSDUCER

Makoto Hori, Nara; Nerumitu Rokudo, and Toshiyuki Ishiguro, both of Yamato-Koriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 283,200, Aug. 23, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,002
Claims priority, application Japan, Aug. 25, 1971, 46-65323; Apr. 25, 1972, 47-41982
Int. Cl.² B05B *3/14, 17/06*
U.S. Cl. 239—4 **3 Claims**

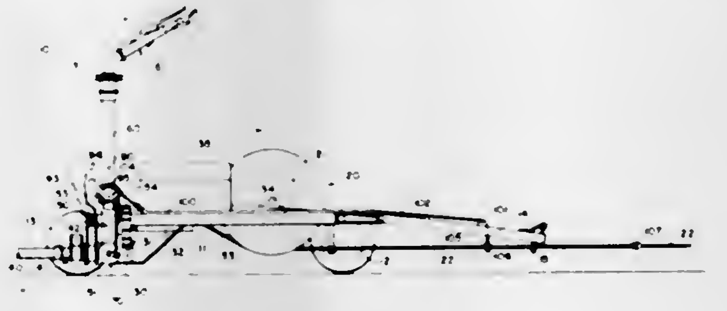
1. A method for controlling the combustion in a liquid fuel burner of the type utilizing a liquid fuel atomizer comprising a hollow horn which is oscillated at an ultrasonic frequency and includes a nozzle, said method comprising the step of supplying kerosene to a nozzle having a ratio of the area of the end surface of said nozzle to the area of the nozzle opening of 4.5 to 9, thereby controlling the liquid fuel atomization conditions.



4,003,519
TRAVELING IRRIGATION SPRINKLER

Frederick V. Kruse, Kilbourne, and Deane O. Behrends, Havana, both of Ill., assignors to AG-Rain Incorporated, Havana, Ill.

Filed Apr. 8, 1976, Ser. No. 675,169
Int. Cl.² B05B *3/18*
U.S. Cl. 239—183 **12 Claims**



1. An irrigation apparatus, comprising:
a. a frame supported on wheels with selected ones of the wheels being steerable to guide the movement of the apparatus;
b. a winch carried on the frame and including a rotatably mounted cable drum and a cable, the cable having one portion secured to the drum and another portion extensible forwardly of the apparatus to define a path of travel to be followed by the apparatus;
c. steering means carried on the frame for steering the apparatus along a path defined by a forwardly extending portion of the cable;
d. water inlet means adapted for connection to a source of pressurized irrigation water;
e. water sprinkler means for distributing irrigation water in a predetermined manner about the apparatus;
f. a water powered radial inflow turbine including housing structure having inlet and outlet portions, a drive shaft journaled by the housing structure, and a vaned runner carried on the drive shaft for rotation therewith, the drive shaft being drivingly connected to the cable drum to rotate the cable drum and reel in the forwardly extending cable portion in response to a supply of pressurized water to the turbine;
g. flow control means communicating the inlet means, the sprinkler means and the turbine, and including a member which is movable to control the proportion of pressurized water which is supplied directly to the sprinkler means and which passes through the turbine before being supplied to the sprinkler means;
h. the housing inlet portion defining an inlet scroll for admitting water at substantially uniform velocity to the periphery of the vaned runner, the inlet scroll having an inlet chamber which diminishes in cross-section as it extends circumferentially around the vaned runner.

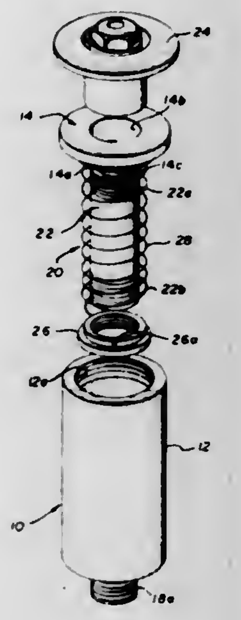
4,003,520
LAWN SPRINKLER WITH REPLACEABLE SPRINKLER ASSEMBLY

Gordon Keith Bailey, Pompano Beach, Fla., assignor to Plastic Industries, Inc., Pompano Beach, Fla.

Filed June 18, 1975, Ser. No. 587,959

Int. Cl.² B05B *15/10, 1/00*

U.S. Cl. 239—205 **4 Claims**



1. A lawn sprinkler which may be disassembled for replacement of the sprinkler assembly to accommodate changes in surrounding soil or grass level, comprising:

a sprinkler body having a substantially cylindrical shape, the upper end thereof being opened, an inlet at the bottom end thereof for receiving water into said sprinkler body from an underground supply of water under pressure, and a closure member removably connected to the upper end of said sprinkler body and including a central passageway,

a sprinkler assembly mounted for movement relative to said sprinkler body between a retracted position and an extended position including a longitudinally extending pipe for the passage of water therethrough, said pipe being arranged to slidably extend through said central passageway so that the upper end is outside of said sprinkler body, a sprinkler head removably connected to the upper end of said pipe, a base member connected to the lower end of said pipe and responsive to water received under pressure through said inlet to actuate said sprinkler assembly from said retracted position to said extended position, whereby water is forced through said pipe and is dispersed by said sprinkler head,

a coil spring mounted on said pipe and operatively connected thereto to be compressed when said sprinkler assembly is actuated to said extended position, and to be expanded for urging said sprinkler assembly from said extended position to said retracted position upon the discontinuation of water pressure, and

said sprinkler assembly and coil spring being so constructed that they are slidably removable as a unit and in a single operation from the upper end of said sprinkler body for replacement thereof with different length pipes to accommodate changes in surrounding soil or grass level requiring only the removal of said closure member from the upper end of said sprinkler body which is accomplished manually and without any tools while said sprinkler body remains connected to said underground water supply.

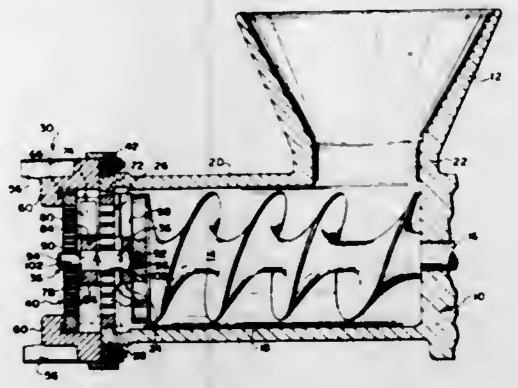
4,003,521
DUAL-PHASE MEAT GRINDER ADAPTER

Charles W. Hess, Schiller Park, Ill., assignor to Speco, Inc., Schiller Park, Ill.

Filed May 27, 1975, Ser. No. 581,275

Int. Cl.² B02C *18/30*

U.S. Cl. 241—82.4 **3 Claims**



1. The combination with a meat grinder of the type which includes an elongated generally cylindrical grinder casing defining therein for the rearward passage of meat pieces to be ground a longitudinally extending cylindrical feed channel of uniform diameter from end to end and with its rear end open, and having on its rear rim portion an external screw thread, and also includes a rotary meat-impelling worm extending lengthwise through the feed channel, of a dual-phase adapter secured removably to said rear rim portion of the grinder casing and comprising a generally ring-shaped, one-piece adapter body positioned normally adjacent to and in coaxial relation with the rear end of the feed channel and having in its front end region a coaxial counterbore defining a cylindrical internal side surface and a flat inwardly extending annular shoulder, said side surface having an internal screw thread normally threadedly received over said external screw thread on the rear rim portion of the grinder casing, and said flat inwardly extending annular shoulder normally being in direct contact with the end face of said rear rim portion of the grinder casing, said ring-shaped, one-piece adapter body having on its rear end region an internal, flange-like, inturned seating rim the inner surface of which is flat and annular and is at all times spaced a fixed distance from said annular shoulder due to the one-piece character of the adapter body, a pilot shaft normally positioned in coaxial relation at the rear end region of the grinder casing, having its front end connected fixedly to the rear end of the worm, and comprising a non-circular cutter-impelling inner section and a reduced cylindrical outer pilot section, a fixed primary perforated breaker plate fitting slidably within and extending across said rear rim region of the grinder casing and embodying in its central portion a circular hole through which the cutter-impelling inner section of the pilot shaft extends loosely and rotatably, a fixed secondary perforated breaker plate fitting slidably within and extending across the central region of the adapter body, spaced rearwards from the primary breaker plate, having its peripheral portion seated directly against the inner surface of said inturned seating flange, and having in the central portion thereof a circular pilot hole in which said outer pilot section of the pilot shaft is journalled, a primary cutter assembly positioned within said rear rim region of the grinder casing, fitting directly against the front surface of the primary breaker plate, and having in the central portion thereof a non-circular opening through which the cutter-impelling section of the pilot shaft extends driveably, a dual edge secondary cutter assembly interposed between the two breaker plates and having a central non-circular opening through which said cutter-impelling inner section of the pilot shaft extends driveably, said secondary cutter assembly having a front knife edge in direct shearing contact with the rear face of the primary breaker plate and a rear knife edge in direct shearing relation with the front face of the secondary breaker plate and serving when in its operative position to maintain the two breaker plates at all times in fixed spaced apart relation, said front end region of the body being provided with a series of circumferentially spaced notch-like recesses which interrupt said internal screw thread and have open outer and inner sides, clamping inserts slidably mounted in said recesses and having internal screw thread segments which, in effect, constitute continuations of said internal screw thread in the front end region of the body, reaction plates secured fixedly to the outer periphery of the adapter body, projecting across the outer sides of said notch-like recesses, and having internally threaded holes extending through their central portions, and clamping screws extending through and threadedly received in said internally threaded holes in said reaction members, having their inner ends in abutment with the outer portions of the clamping inserts, and adapted when tightened to force said clamping inserts radially inwardly within the body in order slightly laterally to misalign their internal screw thread segments and the interrupted internal screw thread on the body and thus increase the mating pressure between said internal screw thread segments and the internal interrupted screw thread to such an extent as to cause the body to be firmly secured against rotation relatively to the grinder casing, said ring-shaped, one-piece adapter body having but the one aforementioned screw thread and being adapted when removed as a unit from the rear rim region of the grinder casing by a single unscrewing action after prior unscrewing of the aforesaid clamping screws to expose the two breaker plates and said secondary cutter assembly for removal purposes.

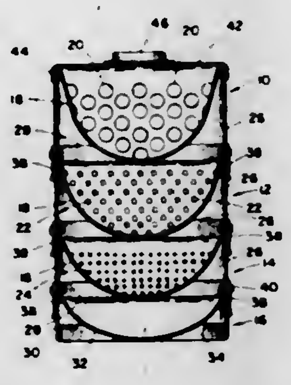
4,003,522
COLANDER SYSTEM FOR BAKERY PRODUCTS USE

Betty J. Buckley, 662 Linden Ave., York, Pa. 17404

Filed Dec. 12, 1975, Ser. No. 640,014

Int. Cl.² B02C *19/08*

U.S. Cl. 241—95 **6 Claims**



1. A colander system for converting stale bakery products and the like into useful comminuted products, said system comprising in combination a series of colanders of similar diameter and having open tops and concave bottoms having a plurality of openings in at least the normally lower part of each concave bottom, said openings in the different colanders respectively being of different sizes, said colanders having means operable to effect stacking the same one above the other when in use and the colander having the largest openings being uppermost and successive lower colanders each having smaller openings than the one above, a receptacle for comminuted products positioned beneath the lowermost colander in use, and a pestle operable to engage pieces of bakery products in the uppermost colander and comminute said products for passage through the openings in said uppermost colander and successively through the openings in the lower colanders and thereby selectively classify the products as to size or to permit engagement thereof by said pestle as desired when upper colanders are removed to expose the lower colanders.

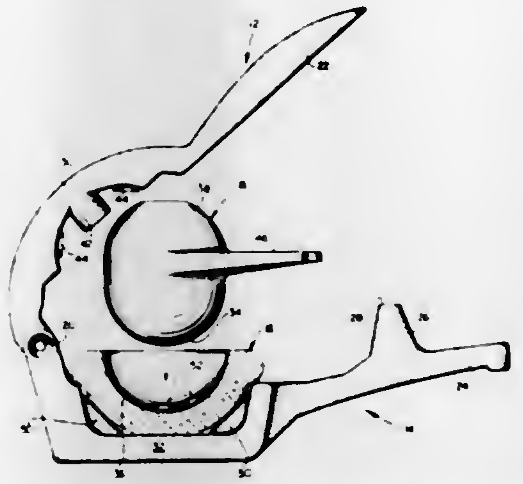
4,003,523
PORTABLE PILL GRINDER

Harry S. Doolittle, 19 Concord Lane, Wallingford, Conn. 06492

Continuation-in-part of Ser. No. 509,421, Sept. 26, 1974, abandoned, which is a continuation of Ser. No. 353,939, April 24, 1973, abandoned. This application July 23, 1975, Ser. No. 598,431

Int. Cl.² B02C *19/08*

U.S. Cl. 241—169.2 **17 Claims**



1. A portable pill crushing and grinding device comprising cooperating mortar and pestle units and manually operable clamping handles for applying pill crushing pressure to said units, said mortar and pestle units respectively having concave and convex pill crushing and grinding surfaces of a smooth, hard and impervious material, said surfaces being complementary and relatively rotatable about a common axis, said mortar being removable from said handles and at least one of said units having a manually engageable rotating handle for effecting such relative rotation, and said one unit being connected with an associated one of said clamping handles for relative rotation whereby said clamping and rotating handles may be grasped respectively in one and opposite hands and simultaneously squeezed together and swung back and forth respectively to apply crushing and grinding pressures on one or more pills disposed between said complementary mortar and pestle surfaces.

4,003,524
CROSS-WINDING MACHINE

James Dove Wilford Taylor, Gorebrook Works, Pink Bank Lane, Longsight, Manchester, and Stephen Temple, Bar Hill, Cambridge, both of England

Filed Nov. 29, 1974, Ser. No. 528,100

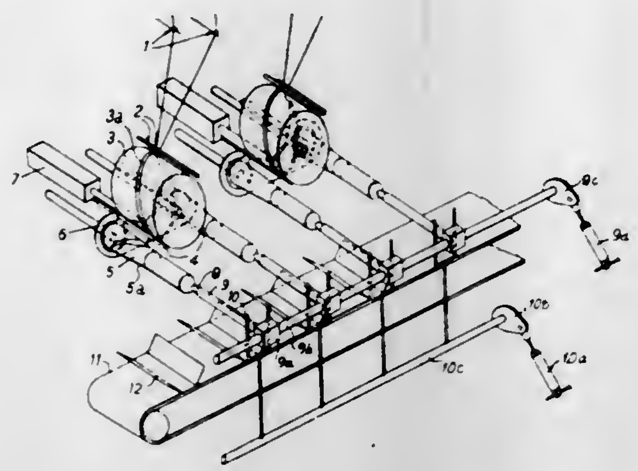
Claims priority, application United Kingdom, Dec. 4, 1973, 56190/73

Int. Cl.² B65H *54/02, 54/06*

U.S. Cl. 242—18 R **25 Claims**

1. A cross-winding machine, comprising a winding mandrel, means for continuously rotating the mandrel whilst cross-wound packages are successively formed thereon, a package support extending in alignment with the mandrel to receive wound packages therefrom, package doffing means having a package doffing member and reciprocable means for moving said member, upon completion of winding on the mandrel of a first wound package, alongside the mandrel first from a retracted position remote from the package support to a position in which rotation of said first wound package at mandrel speed is maintained until a predetermined part of the winding of a second package has been effected on the mandrel and

then to a position in which said first wound package is transferred to the package support, and, thread severing means



operable to cut thread between the mandrel and the package support.

4,003,525

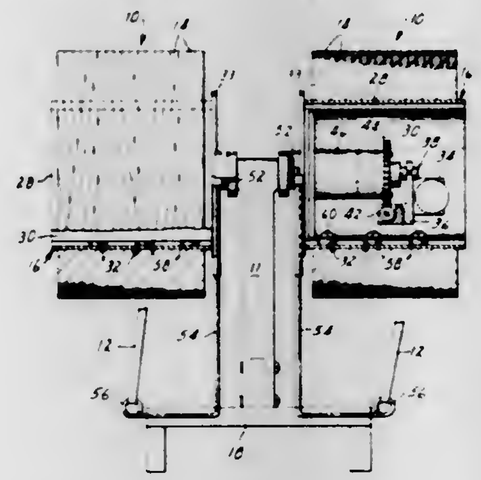
STRIP MATERIAL UNWINDING DEVICE

Richard T. Podvin, Fridley, and Thomas F. Look, New Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 14, 1975, Ser. No. 595,397

Int. Cl.² B65H *17/02, 23/20, 75/02*

U.S. Cl. 242—55 **5 Claims**



1. A device adapted for supporting a high inertia spool of stretchable strip material being withdrawn at varying rates by a strip applicating machine said spool comprising a core having a central opening and a peripheral surface around which said strip material is wound, said device comprising:

- a frame;
- a hub mounted on said frame for rotation about an axis, said hub being adapted for coaxially receiving a said core with at least a portion of said hub in the central opening of said core;
- means on said peripheral surface for releasably engaging the core of a said spool positioned on said hub to cause rotation of the spool with said hub, said means comprising a plurality of circumferentially and axially spaced radially projecting button-like projections, each of said projections comprising a resilient washer of frictional material and an attaching screw positioned generally centrally of said resilient washer adjusted to centrally compress said washer, the peripheral surface defined by said washers being adapted to frictionally receive the inner surface of a said core;
- a variable speed motor mounted on said frame;
- means for providing driving engagement between said motor and said hub;
- power adjustment means adapted to be energized by an external conventional source of power and electrically coupled to said motor for adjusting the power supplied to said motor at power settings between no power and full power to vary the speed of rotation of said hub; and
- tension sensing means adapted for sensing the tension in a said length of strip material between a said roll of strip material and a said applicating machine and coupled to said power adjustment means for activating said power adjustment means in direct proportion to the tension in the strip material;
- said means for providing driving engagement between said motor and said hub comprising means for braking inertial rotation of said hub upon a decrease in the amount of power supplied to said motor by said power adjustment means.

4,003,526

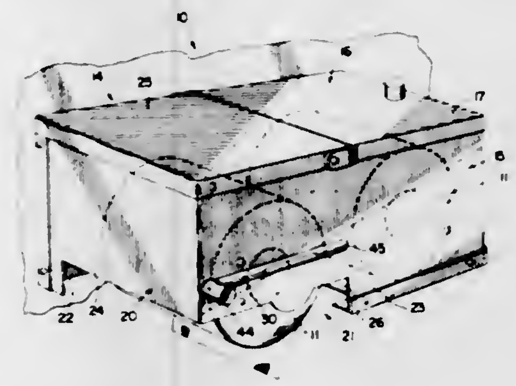
DISPENSER FOR ROLLS OF FLEXIBLE SHEET MATERIAL

Clarence H. Fishburn, 1642 Woodcrest Drive, Wooster, Ohio 44691

Filed Nov. 24, 1975, Ser. No. 634,639

Int. Cl.² A47K *10/22*

U.S. Cl. 242—55.3 **4 Claims**



1. A dispenser for multiple rolls of flexible sheet material with a housing having a storage chamber and a dispensing chamber interconnected by a roll handling mechanism:

- said roll handling mechanism comprising opposed projecting and retractable lugs carried by and slidable within dual longitudinal tracks and including dual upper and lower actuator elements coacting with detent elements and dual drive pins confined within angular slots defining inclined cam surfaces in a base element carrying each said lug;
- each said upper actuator element being an elongated component with a medial portion having a transverse notch to captivate a lug base element and permit a "lost motion" projection and retraction movement of a lug, there being above each transverse notch dual elongate slots for receiving and guiding said dual drive pins, the length of said slots being such as to permit a "relative motion" of said upper and lower actuator elements, said upper actuator elements being coupled together for unitary movement by a cross bar, said cross bar carrying an actuating knob;
- each said lower actuator element being an elongated component with a medial portion having a transverse notch to receive a lug base element and having a length such as to permit a "relative motion" of a lug during movement of said upper and lower actuator elements, each notch carrying said dual drive pins, said lower actuator elements being coupled together for unitary movement by a cross bar;
- said detent elements being carried by a lower actuator element and projecting through an elongate slot in an upper actuator element to engage with detent holes in a longitudinal track.

4,003,527

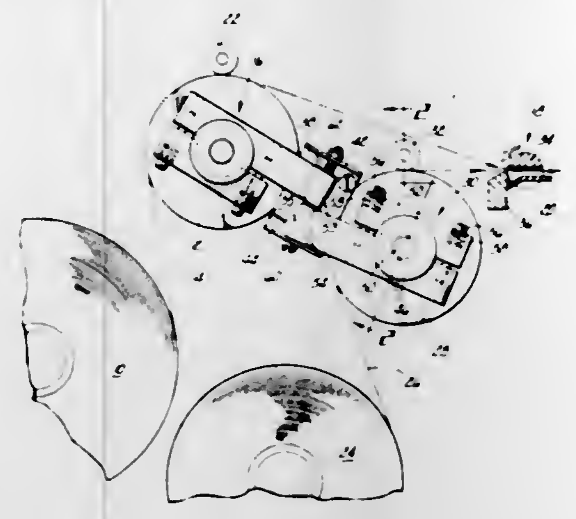
CONTROL MEANS FOR ROLL SHEET FEEDER

John Jacob Schulze, Prospect Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Oct. 1, 1975, Ser. No. 619,145

Int. Cl.² B65H *19/08, 19/20, 17/42*

U.S. Cl. 242—58 **5 Claims**



1. In combination with an apparatus for selectively feeding a web from either one of a pair of web rolls to a work station, a control means for partially withdrawing from the work station the web last fed thereto, comprising.

a first and second rotatable member each associated with one of the webs, said members adapted to be selectively driven in a forward direction for advancing a web to the work station and a reverse direction for withdrawing a web from the work station;

- a first and a second brake means mounted on the first and the second members respectively, and conditionable between a driving position for rotation with the members and a release position for non-rotation relative to the members;
- said first brake means co-acting with the second brake means for rotating the second brake means and the second member in the reverse direction in response to the first member being driven in the forward direction, and
- stop means for conditioning the first brake means to the release position in response to the second member being rotated through a predetermined angular distance and the second brake means being arrested by the stop means.

4,003,528

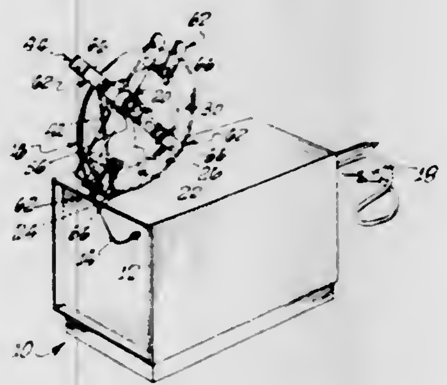
MOUNTING AND BRAKING APPARATUS FOR COILED WELDING WIRE

Joe L. Booze, 185 E. Benwood St., Covina, Calif. 91722

Filed Dec. 31, 1975, Ser. No. 645,821

Int. Cl.² B65H *17/52*

U.S. Cl. 242—106 **6 Claims**



1. In combination with a mounting and braking apparatus of the type wherein a coil of welding wire is mounted on a rotating reel, and wherein the wire is fed therefrom at a controlled rate of speed into an electric welding machine for operation therewith, the improvement which comprises:

- a mounting bracket for attachment to said welding machine, having a base member and an integrally formed upright leg member provided with an opening therein;
- a spindle disposed within said leg member and received through said opening therein;
- fastening means to secure said spindle to said leg member;
- insulating means disposed between said leg member, said spindle, and said fastening means;
- a hub member received over for rotation about said spindle, said hub having said reel secured thereto for controlled rotation therewith;
- bearing means interdisposed between said hub member and said spindle, whereby said hub rotates with said bearing means; and
- an adjusting means in abutting engagement with said bearing means, whereby a varying linear force is applied to said bearing means to cause a controlled binding within said bearing means, thereby regulating the rotational speed of said reel and linear movement of said welding wire

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4,003,529

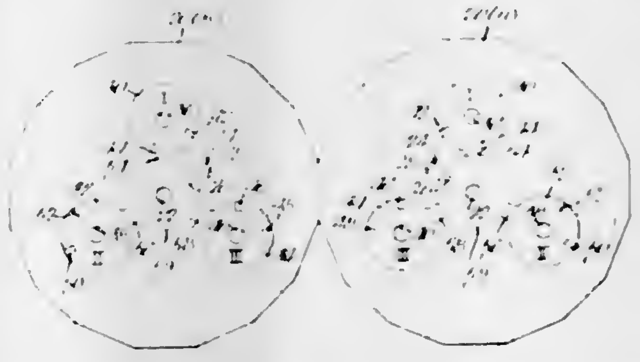
REEL AND BLANK THEREFOR

Paul R. Nigro, Chicago, Ill., assignor to Royal Continental Box Company, Cicero, Ill.

Filed Apr. 4, 1975, Ser. No. 565,218

Int. Cl.² B65H *75/14*

U.S. Cl. 242—118.8 **33 Claims**



1. A reel of the type having a generally cylindrical core and a head at each end thereof and assembled from a pair of generally planar blanks

- said blanks defining said reel heads, and
- a core disposed between said heads along the axis of said reel;
- said core formed by at least one core member at least partially severed from one of said blanks at a location radially offset from the axis thereof and displaced from its offset location to its axial core forming position.

4,003,530

PNEUMATIC COURIER DISCHARGE UNIT

Orin H. Davis, 6620 N. 16th Drive, Phoenix, Ariz. 85015

Filed Aug. 13, 1975, Ser. No. 604,302

Int. Cl.² B65G *51/30*

U.S. Cl. 243—20 **5 Claims**

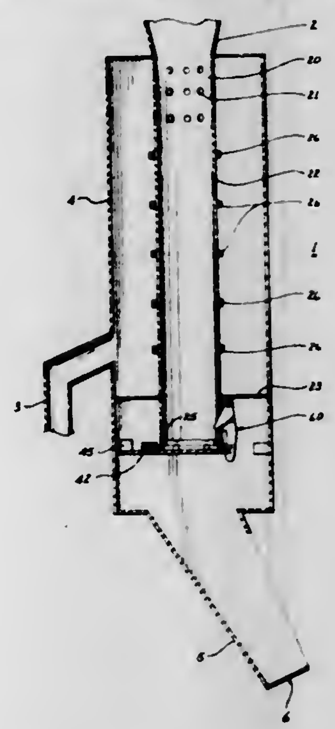
1. In a pneumatic courier system, a courier discharge unit for receiving couriers from a courier conveying conduit within the system and directing the couriers into a shoe, said courier discharge unit comprising.

- a. a housing having an input conduit and an outlet for accommodating passage of couriers therethrough;
- b. a conduit section disposed within said housing and interconnecting said input conduit and said courier outlet for transporting the couriers from said input conduit to said courier outlet;

c. a pivotable plate latchable to a first position for sealing said courier outlet to define a closed end cavity within said conduit section and operable to a second position to permit discharge of couriers through said courier outlet into the shoe, said plate including a counterweight for biasing said plate to said first position;

d. a necked length of said input conduit to reduce the diameter thereof, said conduit section being of a diameter equivalent to the reduced diameter of said input conduit, for restricting air blowby intermediate the courier and the wall of said conduit section and establishing an air pressure buildup intermediate said plate and the approaching end of the courier;

e. latch means responsive to travel of a courier in proximity thereto for releasing said plate from said first position, said latch means comprising: a depending pivotable latch having a lip for engaging said plate and maintaining said plate adjacent said courier outlet; and a lobe extending from said latch into said conduit section for urging pivotal movement of said latch upon passage of a courier therepast;



f. a plurality of apertures disposed within said conduit section for directing a flow of air from said input conduit into an envelope defined by said housing and said conduit section; and

g. an outlet conduit for exhausting the flow of air entering the envelope within said housing;

whereby, the momentum of a courier entering said courier discharge unit is retarded by an air pressure buildup within said conduit section prior to discharge of the courier through said courier outlet into the shoe while retaining the integrity of the flow of air through the pneumatic courier system.

4,003,531
REVERSE FLOW REACTION CONTROL SYSTEM

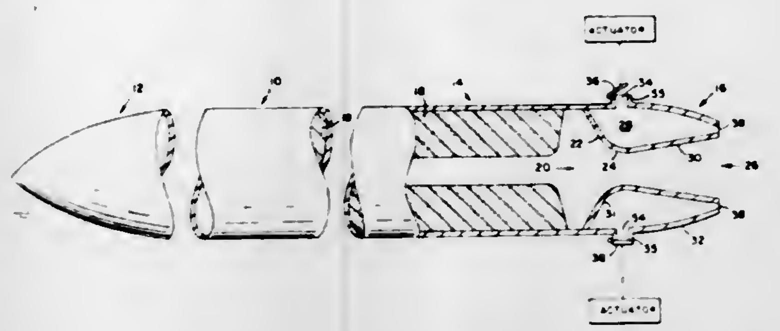
Robert H. Fink, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 6, 1975, Ser. No. 574,974
Int. Cl.² F42B *15/18*
U.S. Cl. 244—3.22 **1 Claim**

1. A directional control system for maintaining a missile on a launch predetermined path comprising:

a. a body having forward, intermediate, and aft sections, said intermediate section enclosing a propellant and said aft section enclosing a nozzle in communication with said propellant;

b. an annulus chamber carried in said aft section around said nozzle means for creating a vacuum in said chamber comprising an opening at the aft most end thereof whereby the kinetic energy of the burning propellant exhaust gases pump a vacuum in said annulus chamber, said annulus chamber having openings at predetermined positions around the periphery thereof for communication of said chamber with the atmosphere;



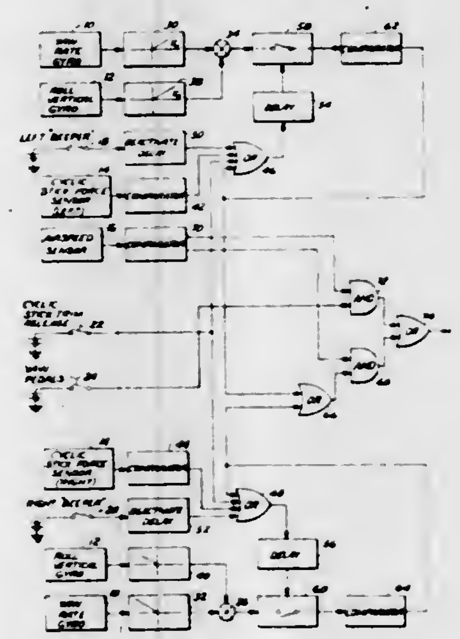
c. closure means in each said opening; and,

d. activating means for moving said closure means to selectively open said openings, whereby responsive to opening of said annulus chamber at said predetermined positions air is directed into said vacuum chamber at said predetermined position to create a control force on said missile.

4,003,532
HEADING HOLD LOGIC

Don L. Adams, Sr., Fairfield, and Raymond G. Johnson, Jr., Milford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,590
Int. Cl.² B64C *11/34*; G05D *1/08*
U.S. Cl. 244—17.13 **13 Claims**



1. In an aircraft automatic flight control system, the flight control system having a yaw channel with the capability of automatically holding the aircraft on a desired heading, the flight control system receiving aircraft status input information commensurate with attitude, speed and rate of change of heading and the yaw channel generating and applying control signals to an actuator coupled to a device for varying the heading of the aircraft in order to maintain the desired heading, the flight control system further having means for interrupting the heading hold functional mode of operation of the yaw channel, the improvement comprising:

means responsive to information commensurate with the status of the aircraft with respect to at least a first axis for generating a first deviation signal when the aircraft deviates from the desired relationship to the said axis;

means responsive to a manually produced input for generating a first enabling signal;

means responsive to information commensurate with the airspeed of the aircraft for generating a second enabling signal, said second enabling signal being indicative of the aircraft traveling at a forward speed in excess of a predetermined minimum;

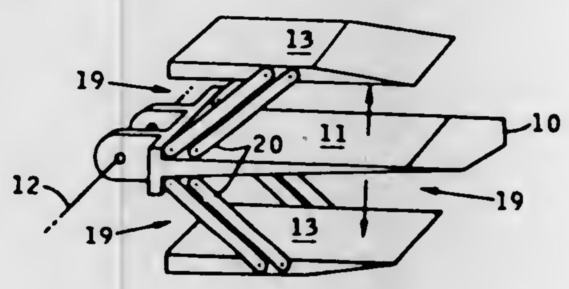
means responsive to said first deviation signal and said first enabling signal for generating a first heading hold interrupt command signal indicative of deviation of the aircraft from the desired relationship to said axis in excess of a predetermined magnitude; and

means responsive to said first interrupt command signal and said second enabling signal for transmitting said first interrupt command signal to the flight control system yaw channel heading hold function interrupt means to cause automatic discontinuance of the heading hold mode of automatic control.

4,003,533
COMBINATION AIRBRAKE AND PITCH CONTROL DEVICE

Glenn T. Carter, and Thomas F. Paniszczyn, both of Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Division of Ser. No. 402,540, Oct. 1, 1973, Pat. No. 3,942,746, which is a continuation-in-part of Ser. No. 212,180, Dec. 27, 1971, abandoned. This application Feb. 5, 1976, Ser. No. 655,585
Int. Cl.² B64C *9/32*
U.S. Cl. 244—42 D **2 Claims**



1. A combination airbrake and pitch control device having both airbrakes and pitch and trim control surfaces for forming the trailing edge portion of an aircraft fuselage afterbody section and useable selectively to provide auxiliary pitch and trim control with minimal fuselage wake drag and buffeting or for airbraking or both which comprises:

an auxiliary elevator means having external control surfaces thereon and adapted to be pivotably attached to an airfoil-configured afterbody section of an aircraft fuselage so as to form a hinged trailing edge portion thereof aerodynamically and structurally continuous with said airfoil-configured afterbody section to provide auxiliary pitch and trim control for the aircraft;

a pair of upper and lower airbrake panels adapted to fit flat-like against the external control surfaces of said elevator means in close covering relation thereto when in retracted position and to be moved away from the elevator means control surfaces during deployment to airbraking position,

outer directed surfaces of said airbrake panels when fully retracted forming at least a portion of the upper and lower pitch and trim control surfaces for said pitch control device in continuation of the airfoil-configured fuselage afterbody at the trailing edge portion thereof;

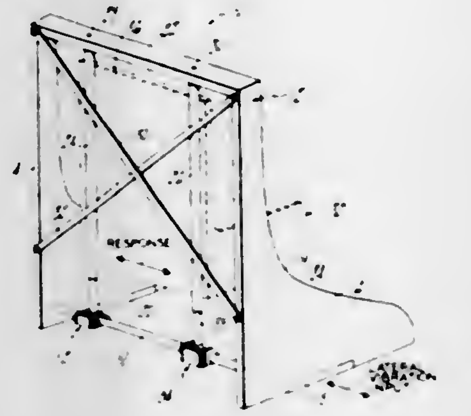
linkage means operatively connected with said airbrake panels for moving the panels parallel to said external control surfaces between positions substantially against said surfaces and positions off of said surfaces to create airflow passages between the panels and the elevator means; and

said elevator means and airbrake panels operatively connected for pivotal movement together as a unit to provide effective auxiliary pitch control for an aircraft when the airbrake panels are against said control surfaces and when the panels are moved off of the control surfaces into the airstream at the trailing edge portion of said fuselage afterbody.

4,003,534
PILOT SEAT WITH LATERAL VIBRATION ISOLATION

Irwin J. Kenigsberg, Trumbull; William A. Girvan, Stratford, and Jerome T. L. Abbe, Derby, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 5, 1975, Ser. No. 628,872
Int. Cl.² B64D *25/04*
U.S. Cl. 244—122 R **13 Claims**



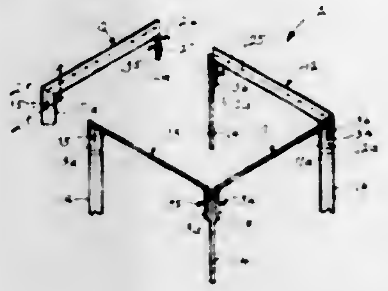
10. A pilot seat adapted to be used in aircraft such as helicopters including:

1. a frame member adapted to be supported from the craft floor and including two side members and a top member extending therebetween in spaced relation to the floor,
2. at least two seat support members suspended vertically downwardly from said frame top member and extending parallel to the side members,
3. a seat pan connected to and supported from said support members, and
4. means connecting the bottom ends of said support members to said seat frame so that longitudinal loads are imparted to said seat frame, and so that limited relative lateral motion is permitted between said support members and said seat frame, and further so that said support members and said seat frame are structurally joined laterally when the relative lateral motion therebetween exceeds a preselected minimum.

4,003,535
MODULAR FURNITURE

Carmelito B. Tianchon, 4769 Guadalcanal St., Sta. Mesa, Manila, Philippines

Filed Sept. 29, 1975, Ser. No. 617,610
Claims priority, application Philippines, July 10, 1975, 17367
Int. Cl.² F16M *11/16*; A47B *57/08*
U.S. Cl. 248—188 **7 Claims**

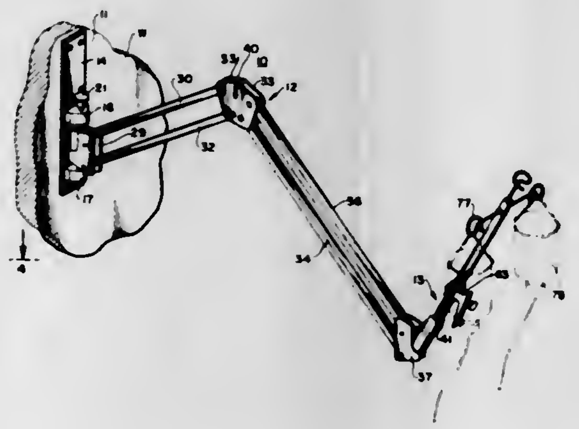


1. A modular multi-purpose furniture framework comprising four identical inverted U-shaped frame members each of which includes an elongated cross member and a pair of depending end members having oppositely bevelled faces, said

cross member and each of said end members being comprised of elongated flat boards with each of said end members being connected to the cross member by means of bevelled mitered finger joints, four elongated leg members having parallel flat faces with each of said leg members being secured between opposed surfaces of adjacent end members whereby said cross members will define a rectangular frame having a depending leg member at each corner.

4,003,536
INTRAVENOUS BOTTLE SUPPORT ARM

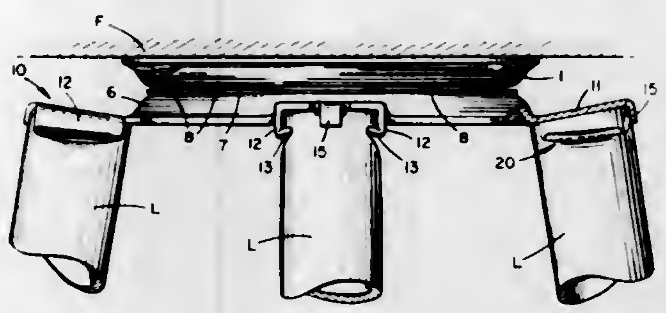
Michael Sekerich, Spring Valley, N.Y., assignor to Grant Hardware Company, West Nyack, N.Y.
Continuation of Ser. No. 359,270, May 11, 1973, abandoned. This application June 27, 1975, Ser. No. 590,925
Int. Cl.² F16M *13/00*
U.S. Cl. 248—280 **7 Claims**



1. A support device comprising a wall mounting bracket, a horizontal linear extension linkage supported at its proximate end in said wall mounting bracket for swinging about a vertical axis and having a distal end restricted to a linear horizontal movement between a retracted position adjacent said proximate end and an extended position remote from said proximate end, said linkage comprising a pair of end to end proximate and distal parallelogram linkages, means connecting said parallelogram linkages at their adjacent upper ends, said parallelogram linkages depending from said connecting means and means coupling said parallelogram linkages to restrict the parallelogram linkages to similar corresponding opposite movements, said parallelogram linkages being in vertical juxtaposition with said connecting means being uppermost when said extension linkage is fully retracted, a support arm mounted to the bottom distal end of said distal parallelogram linkage and extending upwardly therefrom and being angularly adjustable about a horizontal axis transverse to the direction of extension of said extension linkage proximate to the inner end of said arm and independently of the extended position of said horizontal linear extension linkage, said arm being juxtapositioned to said distal parallelogram linkage when said extension linkage is fully retracted and said arm is adjusted to a fully retracted vertical position, spring means resiliently urging said support arm to a vertical position, means on said support arm releasably locking said support arm in a preselected angular position, said locking means comprises a vertical plate mounted at said linkage distal end and having an arcuate indexing edge coaxial with said support arm horizontal adjustment axis and a locking element mounted on and swingable with said support arm and selectively adjustable into and out of locked engagement with said indexing edge, and a bottle support member located on said support arm proximate its outer end.

4,003,537
MOUNTINGS FOR TUBULAR METAL LEGS

Melvin Mutchnik, 5804 Gist Ave., Baltimore, Md. 21215
Filed Jan. 19, 1976, Ser. No. 650,354
Int. Cl.² F16M *13/00*
U.S. Cl. 248—425 **11 Claims**



1. In a mounting for a tubular metal supporting leg to the underside of a furniture unit,

a. bracket supporting means affixed to the underside of the furniture unit for detachable connection with said leg, comprising a sheet metal supporting plate with a pair of integral spaced arms extending downwardly from opposite sides of said plate for a short depth, and spaced from each other a distance slightly greater than the diameter of the leg at its upper end,

b. a narrow rigid flange extending inwardly from the free edge of each arm at an acute angle to the latter,

c. said leg adapted for slidable engagement with said bracket support and having upwardly directed slots spanning opposed parallel chords of said tubular leg, below the upper edge thereof, a distance corresponding to said short depth, with the upper end of said leg adapted to contact said supporting plate, said slots being disposed at opposite circumferential portions of said tubular leg to form a pair of coupling lips, each with a convexly-shaped boundary at each of said portions adjacent to an intended deformation in the leg below said lip and bounded by the slot inwardly of said lip, and each lip engaging one of said flanges at a re-entrant angle to attain an interlocking and secure engagement therebetween in a direction transverse to the initial relative reciprocable movement incident to the sliding of each lip into interengagement with its respective flange.

4,003,538
ARTICLE HOLDING DEVICE

Bruce J. Frye, 13601 69th Ave. N., R.R. No. 2, Osseo, Minn. 55369
Filed Sept. 2, 1975, Ser. No. 609,499
Int. Cl.² A44B *21/00;* **C09J** *7/02;* **B32B** *27/08, 27/30*
U.S. Cl. 248—467 **7 Claims**

1. A separable article holding device, having in combination
a body portion comprising a resilient central layer conforming to a wall surface under pressure,
a flap portion integral with said layer and depending therefrom,
a thin non-stretchable layer of material overlying each side of central layer and adhering thereto,
one of said overlying layers having an adhesive coated outer surface,
a protective layer overlying said adhesive coated surface, and
an article holding means carried by said body portion.

6. An article-holding device comprising
a resilient central layer conforming to a wall surface under pressure,
a thin non-stretchable layer of material overlying each side of said central layer and adhering thereto,
an adhesive coating carried by an outer surface of one of said overlying layers,
a protective strip overlying said adhesive coating, and
an article-holding means comprising a hook carried by said central layer.

7. An article-holding device, having in combination
a central layer of material of sufficient resilience to conform to a wall surface under pressure,
a flap portion integral with said layer and depending therefrom,
a thin non-stretchable layer of material overlying each side of said central layer and adhering thereto, and
an adhesive coating carried on the outer surface of each of said overlying layers,
whereby one of said overlying layers is securable to a supporting surface and the other of said overlying layers forms an article-holding means.

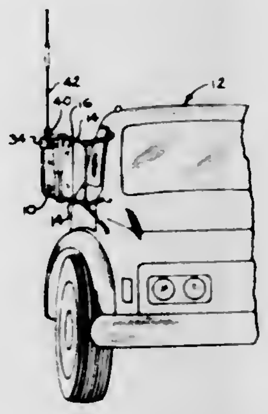
4,003,539
WALL HANGING DEVICE

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035
Filed Jan. 26, 1976, Ser. No. 652,503
Int. Cl.² F16M *13/00*
U.S. Cl. 248—489 **4 Claims**

1. A device for hanging objects from a wall comprising a centrally-apertured, generally flat first part and a relatively elongated, flat second part, said second part having one end folded on itself about a discrete radius of curvature to provide a looped end portion, said first part being mounted within said looped end, said looped end portion being equipped with integral, laterally extending integral tabs folded on themselves and clinchingly embracing said second part to frictionally contact said second part immediately adjacent said looped end portion to stabilize said looped end portion against opening, said second part having at least one opening to accept means to secure said second member to a flat surface.

4,003,540
AERIAL MOUNT

Herbert H. Hawks, Syracuse, Ind., assignor to Nite Hawk Enterprises, Inc., Syracuse, Ind.
Filed Oct. 31, 1975, Ser. No. 627,592
Int. Cl.² F16M *13/00*
U.S. Cl. 248—539 **4 Claims**



1. A detachable aerial mount for snap-on attachment to structure of a motor vehicle such as the external rear view mirror brackets, comprising a pair of telescoping members adapted to be mounted in vertical arrangement and having clasp means at the remote ends thereof, spring means urging said telescoping members together so that said clasp means can clamp said structure therebetween in response to the urging of said spring means, and an aerial mounting bracket on the upper one of said telescoping members on which an aerial can be mounted, said mounting bracket including a plate closing the upper end of said upper telescoping member and extending laterally therefrom and having a return-bent portion from its outer end which defines a closed loop below the plate on the side of said upper telescoping member, said plate having an aperture therein for mounting an aerial receptacle thereon within the confines of said loop.

4,003,541
PORTABLE DECKING FORM

John E. Lanier, 495 S. Atlantic Ave., Cocoa Beach, Fla. 32931
Filed May 20, 1974, Ser. No. 471,315
Int. Cl.² E04G *11/38*
U.S. Cl. 249—18 **18 Claims**

1. A unitary portable decking form having a continuous upper surface for the support of a monolithic slab of poured concrete during setting thereof, for use in conjunction with a plurality of other like units for the formation of a monolithic roof structure for a plurality of modular building units separated by vertical support walls, the unitary portable decking form comprising:

A. a gridlike network of interconnecting structural support members, the top surfaces of all the support members being substantially level and coplanar;

B. first ground-engaging support means for the gridlike network and operatively connected thereto, the first ground-engaging support means comprising movable means connected to the bottom portion thereof to permit movement of the portable decking form over a horizontal surface;

C. second ground-engaging support means for the gridlike network and operatively connected thereto, the second ground-engaging support means comprising vertically adjustable elevating means secured to the bottom portion thereof and serving to raise and lower the support network between a first lower position, wherein the gridlike network is supported by the first ground-engaging support means and in which the decking form can be moved, and a second, raised position, wherein the gridlike network is supported by the second ground-engaging means in a stationary manner and the first support means is lifted from the support surface, said second ground-engaging support means further comprising a vertically extending girder movably connected at its upper portion to the gridlike network so as to permit moving the second ground-engaging support means out of contact with the ground, when the decking means is supported by the first ground-engaging means, the vertical girder of the second ground-engaging support means being a substantially hollow member, and the vertically adjustable elevating means comprising a hollow lower member telescopically interfitted, and relatively slidable, with the lower portion of the girder, and a jacking means having a base and a movable column means extending therefrom, the base being connected to one of the girder and the hollow lower member and the column means being connected to the other; and

D. a substantially flat, thin plate resting upon and supported by the upper surfaces of the gridlike network and providing a continuous, flat and level, upper surface for supporting wet concrete.

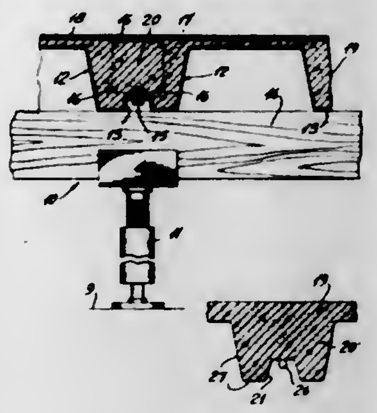
4,003,542
FORM PANS FOR CONSTRUCTING RIBBED SLAB STRUCTURES

Issie M. Beer, 7514 Gueiph Road, Cote St. Luc, Quebec, and Zenon A. Zelinski, 3170 Place de Ramezay, Montreal, Quebec, Canada

Filed Sept. 22, 1975, Ser. No. 615,213

Int. Cl.² E04G *11/40*

U.S. Cl. 249—31 **20 Claims**



1. A form pan for use in a form structure, said pan comprising a unitary shell having a top wall, opposed elongated side walls and end walls; a peripheral flange formed about a free end of said side and end walls, said flange having a load supporting section extending outwardly from said side and end walls and a connection section extending from said load supporting section to permit interlocking with an adjacent pan, said connection section is elevated from said load supporting section in a direction toward said top wall and spaced from said side and end walls for the formation of a recessed joint in a rib of a concrete structure formed between adjacent pans.

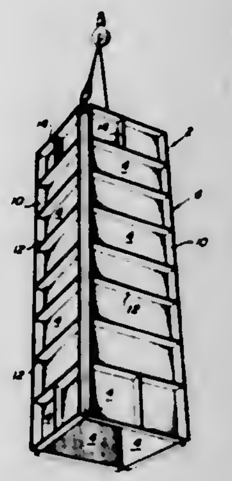
4,003,543
COLUMN LIFT BRACKET

Max Doubleday, Hackensack, N.J., and Douglas M. Demarest, Port Washington, N.Y., assignors to Harsco Corporation, Harrisburg, Pa.

Filed July 14, 1975, Ser. No. 595,482

Int. Cl.² E04G *13/02, 17/00*

U.S. Cl. 249—48 **2 Claims**



1. A corner bracket for a concrete column mold comprising:

a. an angle iron bar having a pair of legs;

b. each of said legs having a plurality of slots which align with similar slots on the other of said legs;

c. a lifting connection at the upper most end of said angle iron bar for lifting a completed column and

d. said lifting connection including said upper most ends of said angle iron bar being in contact in a flattened area to receive a hoist line coupling.

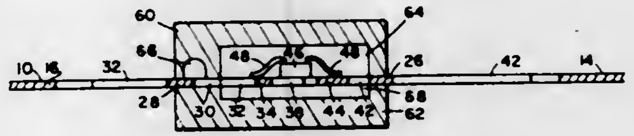
4,003,544
GATELESS INJECTION MOLD FOR ENCAPSULATING SEMICONDUCTOR DEVICES

Thomas G. Bliven, Scottsdale, and John R. Hugill, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 388,620, June 11, 1973, abandoned, which is a division of Ser. No. 79,601, Oct. 9, 1970, Pat. No. 3,753,634. This application Mar. 24, 1975, Ser. No. 561,203

Int. Cl.² B29C *6/00*

U.S. Cl. 249—95 **4 Claims**



1. In a gateless mold having a plurality of cavities therein, each for reception of an electrical unit attached to a frame member in order that such unit can be plastic encapsulated in said cavities, said mold having a runner groove adjacent such cavities for receiving liquid plastic that is introduced under pressure into said mold and into said cavities from the runner groove in a controlled manner through a gate opening of a predetermined size, said mold itself having no such gate opening of a predetermined size extending from said runner groove to each said cavity to provide for such introduction of plastic under pressure into each cavity, said gateless mold comprising at least two parts to be closed together for a molding operation and being adapted to have a frame member having gates therein positioned between said two parts when the mold is closed for a molding operation with said frame member adapted to fit over the mold runner groove and each cavity in a position such that the flow of liquid plastic passes from said runner groove to said cavities through said frame member gates.

4,003,545
CORE MEANS HAVING A RUBBER LINER

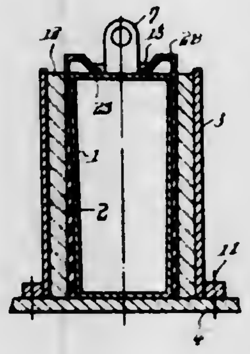
Minoru Tanaka, 148 Nemoto, Matsudo, Chiba, Japan

Filed Sept. 13, 1974, Ser. No. 505,922

Claims priority, application Japan, Sept. 21, 1973, 48-105876

Int. Cl.² B28B *7/36*

U.S. Cl. 249—112 **2 Claims**



1. A core device used in a moulding flask for making prefabricated concrete product, said device comprising

a hollow tubular member formed from a rigid material and having an outer surface,

a thin layer of rubber freely laid over the outer surface of said hollow tubular member,

said thin layer of rubber having an outer surface for engaging and retaining concrete mixture poured into said moulding flask,

said outer surface of the hollow tubular member being a truncated conical surface diverging toward the upper end of the tubular member,

said thin layer of rubber having an inside surface which is a truncated conical surface diverging toward the upper end of the tubular member so as to mate with the outer surface of the hollow tubular member, and

further said thin layer being secured at its upper edge portion to the top of the tubular member and having a bent portion protruding above the upper end of the tubular member, extending radially inwardly, and sloping downwardly to the upper edge portion of the thin layer of rubber.

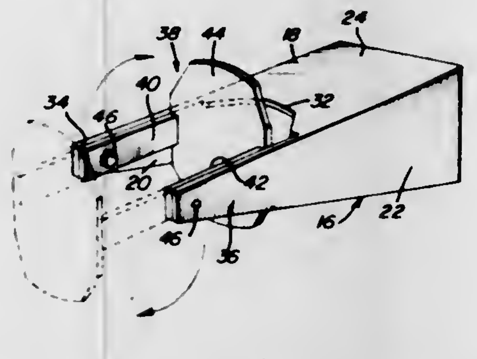
4,003,546
CONVERTIBLE WALER BRACE

Calvin R. Johnson, 2711 Winston Ave., Las Cruces, N. Mex. 88001

Filed Aug. 6, 1975, Ser. No. 602,304

Int. Cl.² E04G *17/04*

U.S. Cl. 249—219 W **8 Claims**



1. A convertible waler brace, said brace comprising an elongated horizontal brace member having one inner end adapted to abut the exterior surface of a form wall, said brace member including means defining a generally horizontal support portion extending along its upper portion, and upstanding waler retaining means supported from said brace member extending transversely of said brace member and projecting above said horizontal support portion, said waler retaining means and said horizontal brace member including co-acting means mounting said waler retaining means for shifting between predetermined first and second waler retaining positions spaced different distances from said one end of said brace member, said waler retaining means being pivotally supported from said brace member for angular displacement between said first and second waler retaining positions about a horizontal transverse axis.

4,003,547
VALVE OPERATOR

Francis H. Snyder, Newton, and Francis H. Snyder, Jr., Brookfield, both of Conn., assignors to Lone Star Industries, Inc., Greenwich, Conn.

Continuation of Ser. No. 266,231, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 170,088, Aug. 9, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,637

Int. Cl.² F16K *31/16;* **F15B** *15/26*

U.S. Cl. 251—31 **22 Claims**

1. A fast operator for operating a movable element, said operator comprising:

operator means connectible to said movable element;

pneumatically powered actuator means connected to said operator means for moving said operator means rapidly in one direction;

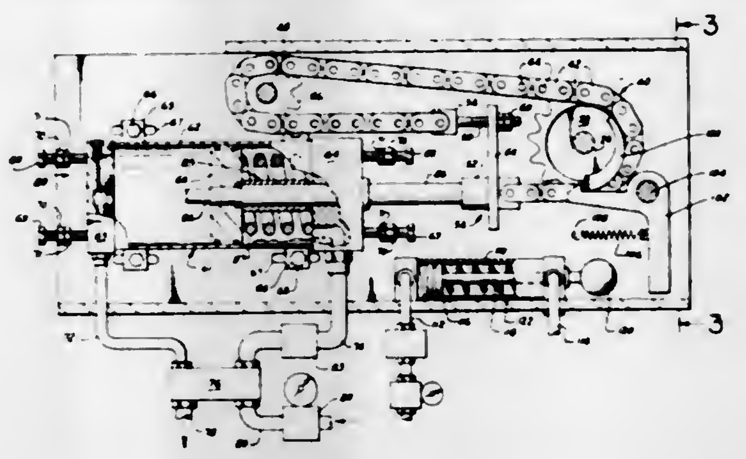
fluid conduit means for admitting compressed pneumatic pressurizing fluid to said actuator means for powering said actuator means;

restraining means for preventing movement of said actuator means and said operator means in said one direction during and after admission of said compressed pneumatic pressurizing fluid, to place and maintain said actuator means in a fully pressurized cocked condition until released; and

release means unaffected by the admission of said pneumatic pressurizing fluid to said actuator means co-acting with said restraining means and selectively operable to essentially instantaneously release said restraining means,

release of said restraining means permitting said compressed pressurizing fluid to expand and rapidly move said actuator means to thereby impart rapid movement in said one direction to said operator means, and

valve means operable to vent said pneumatic pressurizing fluid from said actuator means after each actuation thereof, whereby said actuator means may be easily returned to its original position without overcoming the opposing force of said pressurizing fluid.



4,003,548
HIGH-PRESSURE VALVE WITH BALANCED INTERNAL COMPONENTS

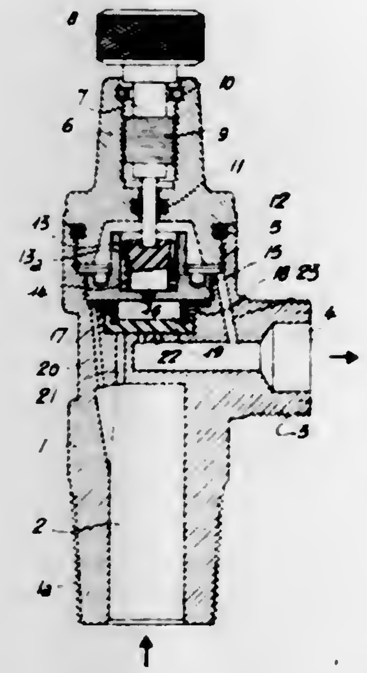
Giuseppe Stradella, and Umberto Stradella, both of 13, Via Roma, Genova, Italy

Filed Nov. 4, 1975, Ser. No. 628,788

Claims priority, application Italy, Nov. 15, 1974, 13049/74; Mar. 26, 1975, 12531/75

Int. Cl.² F16K *31/385*

U.S. Cl. 251—45 **6 Claims**



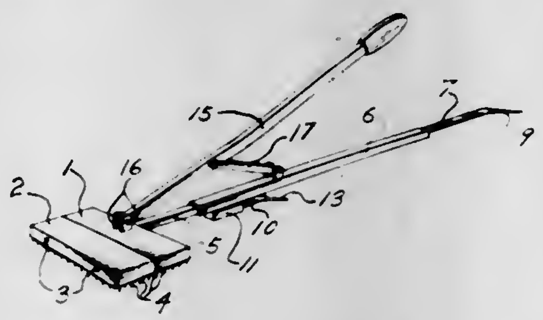
1. A high-pressure valve with balanced internal components, particularly sensitive and operable with little effort, designed for use on compressed gas bottles or the like, and comprising an elongated main body having a lower inlet for connection with the bottle and an outlet for connection with a dispensing device; a cup-shaped member in said main body portion; a chamber in said main body beneath said cup-shaped member and having a planar bottom surface, a valve diaphragm mounted in said chamber on said planar surface for

movement between a normal position wherein the diaphragm lies against the planar surface and a raised position wherein the underside of the diaphragm rises above the planar surface, a lock ring between said cup-shaped member and said diaphragm and bearing against said diaphragm to hold said diaphragm in place, said lock ring having a first section of one diameter and a second section of reduced diameter, said second section having a plurality of radially extending bores therethrough communicating with said chamber, first conduit means establishing communication between said inlet and the underside of said diaphragm, second conduit means for establishing communication between said outlet and the underside of said diaphragm and third conduit means establishing communication between said inlet and said radial bores; a control stem mounted for axial rotation in said main body and terminating at least adjacent to said cup-shaped member and an auxiliary valve member carried by the bottom of the stem and axially movable in said cup-shaped member between open and closed positions; and passage means, controlled by said auxiliary valve member, for establishing communication between said chamber and said outlet when said auxiliary valve is in the open position; said diaphragm being operable, when said valve is installed in a compressed gas bottle, to remain in its normal position against said planar surface when the auxiliary valve is in the closed position and to move to its raised position when the auxiliary valve is in the open position, whereby when the diaphragm is in the raised position, gas is dispensed from the inlet to the outlet via said first and second conduit means.

4,003,549

CARPET STRETCHER TOOL

Fernand Sergerie, 629 Dieppe St., Timmins, Ontario, Canada
Filed Apr. 9, 1975, Ser. No. 566,250
Claims priority, application Canada, Apr. 19, 1974, 197862
Int. Cl.² A47G *27/04*
U.S. Cl. 254—62 **5 Claims**

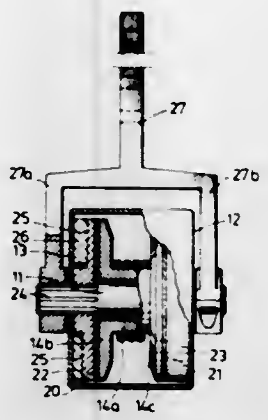


1. A carpet stretcher tool comprising a pad-like head having several pointed needles projecting downwardly and adapted to engage a carpet, a rod secured to said head, projecting endwise away from the latter on one side thereof, a tubular arm telescopically receiving said rod at its inner end, a first needle bar secured to the outer end of said tubular arm and having a pointed free end portion downwardly inclined in a direction away from said head, a tube section hinged to said tubular arm at a point intermediate the ends of said tubular arm about a hinge axis parallel to the longitudinal axis of said tubular arm for pivotal movement between an upper inoperative position alongside said tubular arm and a lower operative position underneath said tubular arm, a second needle bar secured to said tube section and having a pointed free end portion downwardly inclined in a direction away from said head in the lower operative position of said tube section, and manually-operated toggle lever means connected to said head and tubular arm to displace said head away from said tubular arm, while being guided by said rod sliding in said tubular arm, said needle bars selectively adapted to pierce a carpet and the underlying floor to act as a reaction point for stretching said carpet away from said point by means of said carpet-engaging needles.

4,003,550

DEVICE IN ROPE HOISTS FOR LIMITING SPEED WHEN LOWERING A LOAD

Eric Brodin, 44, Blvd. d'Italie, Monte Carlo, Monaco
Filed July 14, 1975, Ser. No. 595,724
Claims priority, application Sweden, July 18, 1974, 7409420
Int. Cl.² B66D *5/00*
U.S. Cl. 254—151 **9 Claims**



1. A device in rope hoists for limiting speed when a lowering a load, comprising a rotatable drum around which the rope is to be wound at least one turn; a shaft, said drum being rotatably mounted on said shaft a first friction surface on at least one end side of said drum; a second friction surface, unrotatable in relation to said shaft; means for moving said first and second friction surfaces into engagement with each other automatically in response to the load, so that the friction force between said friction surfaces is proportional to the weight of the load to be conveyed; said second friction surface being a disc parallel with the frictional end side of said drum and said disc being shiftably but unrotatably mounted on said shaft; a casing in which said drum shaft is pivotably mounted; a spring-biased arm rigidly attached to said drum shaft and arranged to carry the load, so that said drum shaft is turned when the arm is turned due to the load and said friction disc on the side facing away from said drum being provided with at least one helical surface extending over an angle which is at least as great as the turning angle of said drum shaft; and a fixed abutment arranged to engage with said helical surface so that said disc is shifted towards said drum for increasing engagement with said drum friction surface when said arm is turned on being loaded.

4,003,551

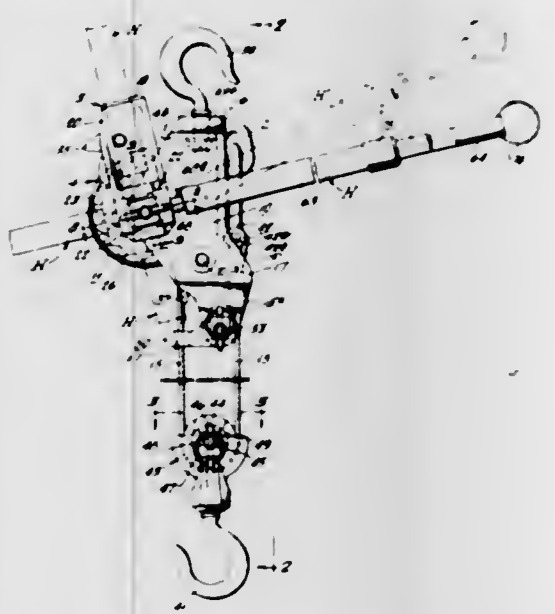
WINCH-HOIST

Bernard E. Wallace, Exton, Pa., assignor to B. E. Wallace Products Corporation, Malvern, Pa.
Continuation of Ser. No. 453,919, March 22, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,262
Int. Cl.² B66D *1/00*
U.S. Cl. 254—169 **18 Claims**

1. Winch-hoist apparatus, comprising: a frame having anchor means adjacent one end thereof; a drum rotably mounted on said frame; generally U-shaped lever means having a pair of arms between which said drum and frame are received, said arms being pivotally connected to said frame for swinging movements of said lever means about the rotational axis of said drum; ratchet and pawl mechanism responsive to swinging movements of said lever means to effect rotation of said drum in one direction, or, alternately, to permit controlled rotation of said drum in the opposite direction when under load; a cable; means coupling one end portion of the cable to the drum to accommodate reeling and unreeling of the cable under the control of such swinging movements of said lever means, and with freedom for release and replacement of the cable in the field, said coupling means including a pair of cable-containing tubular passages, spaced axially along the drum, each passage extending from the drum surface into the

drum in a direction transverse the drum axis, and at least one passage extending completely through said drum, the construction and arrangement being such that the cable has spaced portions disposed within said passages, the portion in said one passage extending completely through said drum, and a snubbing portion, intermediate said spaced portions, wrapped generally helically about said drum to snub and thus anchor the cable thereon, and the construction further including cable securement means associated with at least one of said passages and bearing against the side of cable disposed within that passage; a load-carrying assembly disposed to depend from a loop of the cable when the apparatus is in use under a doubled, basic, rigging condition; a load-bearing means adjacent an end of the cable and adapted to provide for such looping of said cable and consequent multiplication of the lifting force; and support means to which said load-bearing means may be releasably secured, said support means being carried by said frame in the region of that end of said frame which cooperates with said anchor means, whereby the distance between said anchor means and the specified load-carrying assembly is minimized when the apparatus is in use under said doubled rigging condition.

6. A winch-hoist, comprising: an elongated frame having a major central axis and anchor means adjacent one end of said frame and generally on said major axis; a cable-carrying drum rotatably mounted on said frame with its rotational axis spaced-away from said one end of said frame, and disposed laterally of said major axis; generally U-shaped lever means having a pair of arms between which said drum is received, said arms being pivotally connected to said frame, and extending laterally away from one side of said frame, for swinging movements of said lever means about the rotational axis of said drum, ratchet and pawl mechanism responsive to swinging movements of said lever means to effect incremental rotation of said drum in one direction or, alternatively, to permit controlled incremental rotation of said drum in the opposite direction when under load; said drum having means for attachment of a snubbing end portion of a cable, the major portion of the cable being subject to reeling and unreeling with respect to said drum; load-bearing means adjacent the other end of the cable when the apparatus is in use under at least one normal, basic, rigging condition; and a support with which said last means is alternatively cooperative so as to provide for looping of the cable and consequent multiplication of the lifting force, the looped cable extending from said drum closely along one side of said major axis and then returning closely along the other side of said major axis toward said one end of said frame, said support being located at and secured to a side of said frame opposite to said one side, in a position for releasable securement of said load-bearing means to said frame in the region of that end of said frame immediately adjacent to said anchor means, and above the cable-supporting surface of said drum.

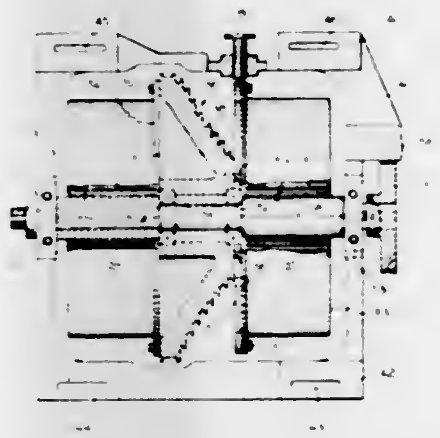


14. In a winch-hoist of the type including a supporting frame, a drum rotatably mounted on said frame, lever means pivotably connected to said frame for swinging movements about the rotational axis of said drum, and ratchet and pawl mechanism responsive to swinging movements of said lever means to rotate said drum and alternatively to control opposite rotation thereof, whereby to reel and unreel cable associated with the drum, the improvements which comprise: means for anchoring one end section of a cable to the drum, with freedom for release and replacement of such cable, said last means including a pair of passages for receiving cable, said passages being spaced axially along the drum and each passage extending from the drum surface into the drum in a direction transverse the drum axis; the construction and arrangement being such that an end section of a cable anchored to the drum is passed through one of said passages leaving a portion of said section within said passage, and an intermediate anchoring portion of said section is wrapped generally helically about said drum to provide a capstan or snubbing effect, and the final end portion of said section is inserted in the other of said passages.

4,003,552

COUNTERPOISING LOAD SUPPORT APPARATUS AND METHOD

Valentine S. Sobolewski, Muskego, Wis., assignor to General Electric Company, Schenectady, N.Y.
Filed May 5, 1975, Ser. No. 574,581
Int. Cl.² B66C *23/72*
U.S. Cl. 254—178 **17 Claims**



1. A counterpoise assembly for supporting a load, said assembly including in combination.

- torsion spring means having a first anchored end and a second end,
- rotatably mounted cam means to which said second end of said spring means is connected and having an axially extending spiral groove of continuously varying radius,
- a load supporting cable arranged for being wound on and unwound from said cam means and having a first end for connection to said cam means and a second end for connection to a load that is movable between an initial distance from said cam means and a predetermined distance more remote from said cam means while being counterpoised by said torsion spring, and
- said cam means including attachment means for establishing an initial tangent point for said cable on said spiral groove to support a first load in a counterpoised state throughout the distance between said initial and more remote distance wherein the turns versus torque characteristic of said spring means comes within its useful range, said attachment means including means for reestablishing said initial tangent point as required to support loads differing from said first load so that said turns versus torque characteristic of said spring means may remain within said useful range.

15. A method of conditioning load supporting apparatus to provide counterpoised support for a selected load weight in a

permissible range of load weights acceptable respectively by said apparatus for being moved vertically over a substantially the same distance, wherein said apparatus includes a generally axially tapered cam having in its periphery a spiral cable groove of continuously changing radius extending from its small radius end to its large radius end and with an annular excess cable storage portion of substantially constant radius adjacent said spiral groove at the large radius end of said cam, and said cam is journaled for rotation and coupled with a counterpoising torsion spring, and the cable used is long enough to extend over the entire active length of said spiral groove when accommodating the heaviest load in said range, said method comprising the steps of:

relieving the load from said cable and reducing the torque on said spring,

winding one end of said cable in said storage portion selectively from zero to as many turns as will permit said cable to be wound in said spiral groove until it reaches a point of tangency with said groove from which said cable extends to said load where the intended stress in the cable due to the selected load acting over the radius of said cam at said point will be substantially equal to the torque of said spring means at the beginning of the useful range of said spring means in its torque versus spring turns characteristic,

attaching said one end of said cable to said cam, and

winding said spring until its torque is substantially the torque which it has at the beginning of its useful range.

4,003,553

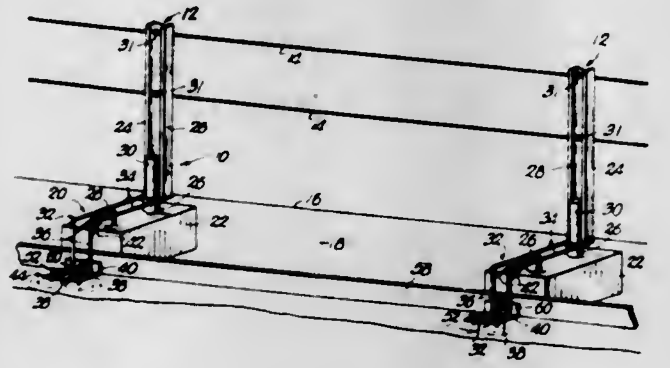
GUARDRAIL POST ASSEMBLY

Paul L. Morris, Kansas City, Mo., assignor to Sellers & Marquis Roofing Company; A. J. Shirk Roofing Company, Inc.; Western Roofing Company, Incorporated and Quality Roofing Company, Incorporated, all of Kansas City, Mo.

Filed Nov. 14, 1975, Ser. No. 631,918

Int. Cl.² E04H *17/14*

U.S. Cl. 256—59 **6 Claims**



1. A guardrail post, comprising:

a post assembly including a movable base comprising a block formed of concrete adapted for shiftable positioning on a support surface, a pair of spaced, post member-receiving pipe members secured to said block and extending upwardly from the upper surface thereof, and an upright post member mounted on said base and received by one of said pipe members; and

means for preventing tipping of said post assembly, including

brace means secured to said post assembly and extending to a point adjacent said support surface, said brace means comprising a pair of spaced, adjacent, generally parallel metallic members each secured to said pipe members and having depending sections extending towards said support surface, with apertured bracket means interconnecting said depending sections adjacent said support surface;

hold-down means temporarily secured to said support surface adjacent said point thereon and comprising a pair of adjacent stick clips each having an upright extension thereon, said extension being received within respective apertures in said bracket means; and

means operatively coupling said brace means and hold-down means for preventing tipping of said guardrail post, said coupling means comprising a clip secured to said bracket means adjacent each of said extension-receiving apertures for releasably holding the extensions therein.

4,003,554

EQUIPMENT FOR HEATING POLAR POLYMERS TO THE TEMPERATURE AT WHICH THEY BECOME PLASTIC

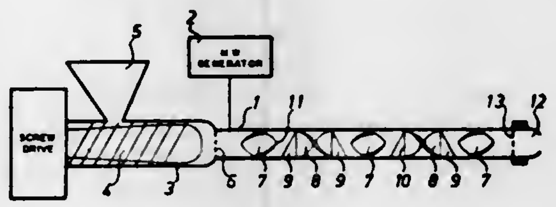
Jean Chauffoureaux, Bierges, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Feb. 12, 1975, Ser. No. 549,209

Claims priority, application Luxembourg, Mar. 4, 1974, 69549

Int. Cl.² B01F *15/00*; H05B *9/06*

U.S. Cl. 259—4 AC **13 Claims**



1. Equipment for heating polar polymers to the temperature at which they become plastic, characterised in that it comprises a microwave generator, a tubular component acting as a waveguide in conjunction with the generator, means for supplying the tubular component with the polar polymer and for causing the latter to travel through the tubular component, and at least one static malaxating device positioned inside the tubular component for malaxating the polar polymer which prevents uneven heating thereof without significant pertubation of the microwaves.

4,003,555

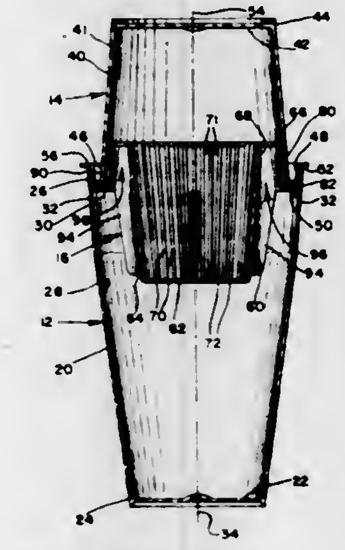
DRINK SHAKER

William M. Swartz, 1430 W. Wrightwood Ave., Chicago, Ill. 60614

Filed Nov. 6, 1975, Ser. No. 629,375

Int. Cl.² A47J *43/27*

U.S. Cl. 259—54 **7 Claims**



4. A drink shaker comprising:

a first cupped container,

a second cupped container,

said containers each defining a circumambient side closed at one end of same and open at the other end of same,

a basket member defining a circumambient side wall having one end of same open and the other end of same closed by a foraminous panel portion,

means for supporting said basket member within and on said first container in a predetermined operative position therein with the basket member other end directed toward said first container closed end,

said basket member being formed to be freely receivable within said first container to its said operative position,

said basket member open end being formed for removable plug type slip fit entry into and frictional securement to said second container open end,

and said open ends of said containers being formed for removable liquid sealing plug type slip fit and frictional securement of one of said container open ends within the other container open end,

said basket member side wall being foraminously formed for free passage of liquid therethrough,

whereby liquids and solids to be mixed may be applied to the shaker by disposing the liquids in said first container and the solids in the basket member, with the basket member being disposed in said operative position thereof in the first container on said support means with said basket member other end directed toward said first container closed end, and said second container being pressed into said frictional securement with said first container and said basket member, and on shaking the shaker longitudinally thereof, the liquid passes through the basket panel portion and side wall to admix with the solids in the basket member from both sides of said basket member,

and whereby on separation of said second container from said first container, said basket member remains with said second container to free said first container open end of said basket member, and when said second container is disposed in an upright position, drippings from said basket member drain into said second container.

4,003,556

FLAME-CUTTING MACHINE

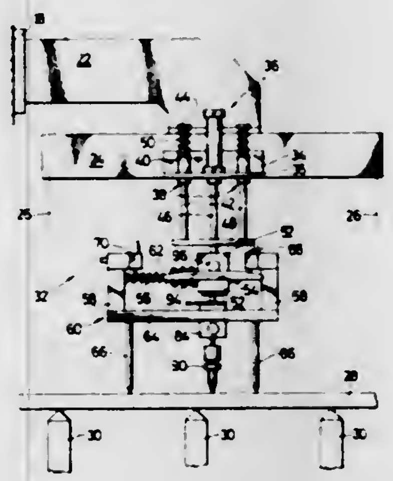
Georg Roeder, Frankfurt am Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Sept. 9, 1975, Ser. No. 611,636

Claims priority, application Germany, Oct. 2, 1974, 2447035

Int. Cl.² B23K *7/02, 7/10*

U.S. Cl. 266—48 **15 Claims**



1. In a flame cutting machine for welding seam preparation comprising a traveling carriage provided with a transverse track, at least one torch carriage with at least one torch unit arranged movably on the transverse track with at least one cutting torch, and a scrap cutting arrangement with at least one scrap cutting torch, the improvement comprising said scrap cutting arrangement being mounted directly on said torch unit and movable therewith, said scrap cutting arrangement being further provided with means to move said scrap cutting torch relative to said torch unit, whereby the speed at which said scrap cutting torch is moved is directly proportional to the speed at which said cutting torch moves.

3. In a flame cutting machine for welding seam preparation, comprising a traveling carriage provided with a transverse track and of at least one torch carriage with at least one torch unit arranged movably on the transverse track with at least one cutting torch as well as with a scrap cutting arrangement, the improvement comprising said scrap cutting arrangement being mounted directly on said torch unit, said scrap cutting arrangement being activated in accordance with the movement of said flame cutting machine, said scrap cutting arrangement being arranged on a carrier held by said torch carriage at the end of which said cutting torch is mounted for said welding seam preparation, said scrap cutting arrangement having a frame attachable on a workpiece and a scrap-cutting torch being arranged movably in said frame.

4,003,557

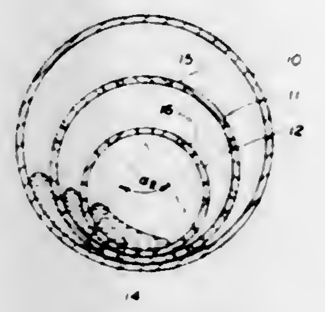
DEVICE FOR THE CEMENTATION OF METALS BY LIQUID AMALGAMS

Michal Babinsky, Ziar nad Hronom, Czechoslovakia, assignor to Zavod Slovenskeho narodneho povstania, narodny podnik, Ziar nad Hronom, Czechoslovakia

Continuation-in-part of Ser. No. 223,521, Feb. 4, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,618

Int. Cl.² C22B *11/04*

U.S. Cl. 266—169 **9 Claims**



1. Cementation apparatus in which the improvement comprises an outer hollow cylinder, at least two inner cylinders freely mounted for rotation in said outer cylinder, said inner cylinders having decreasing diameters, each smaller diameter cylinder being placed within the next larger diameter cylinder and freely mounted for rotation therein, a solution of noble metal in the region between said inner and outer cylinders, and an amalgam of an alkaline metal in said region whereby rotation of said outer cylinder will rotate said inner cylinders to cause said amalgam and said solution to coat the walls of said inner and outer cylinders.

3. Cementation apparatus comprising an outer cylinder, a plurality of perforated inner cylinders of decreasing diameter, each inner cylinder being positioned for free rotation inside the next larger diameter cylinder, a solution of a noble metal having impurities and an amalgam of an alkaline metal in said cylinders sufficient in volume to cover a portion of the inner surface of the smallest inner cylinder.

4,003,558

SUPPORTING STRUCTURE FOR BLAST FURNACES

Harold B. Elsasser, Mount Lebanon Township, Allegheny County; James F. Gunion, McCandless Township, Allegheny County; Melvin L. Huerter, and Andrew L. Poulos, both of Upper St. Clair Township, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

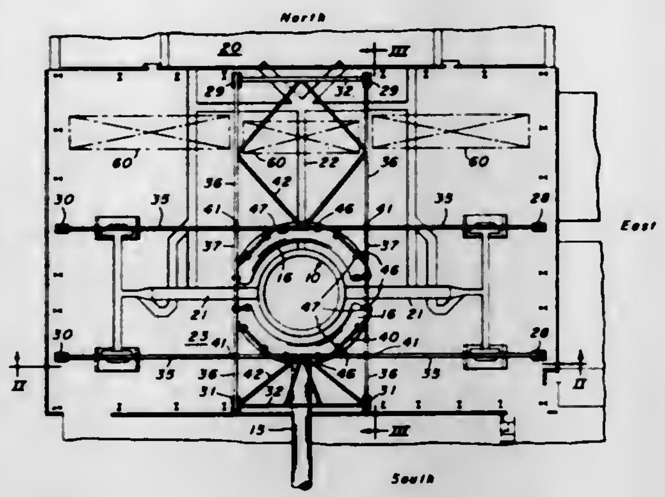
Filed Apr. 7, 1976, Ser. No. 674,353

Int. Cl.² C21B *7/00*

U.S. Cl. 266—198 **10 Claims**

1. The combination, with a blast furnace which includes a mantle and a stack supported on said mantle, of an improved supporting structure for said mantle and said stack, said structure comprising a plurality of columns spaced a substantial distance from said furnaces and arranged in a pattern therearound, trusses supported on said columns and spanning the

spaces therebetween outside said furnace, a pair of girders supported on certain of said columns and spanning the spaces therebetween beneath said trusses, a frame carried by said girders surrounding said furnace above said mantle, tension members connecting said trusses and said frame, and hangers suspended from said frame and connected to said mantle.



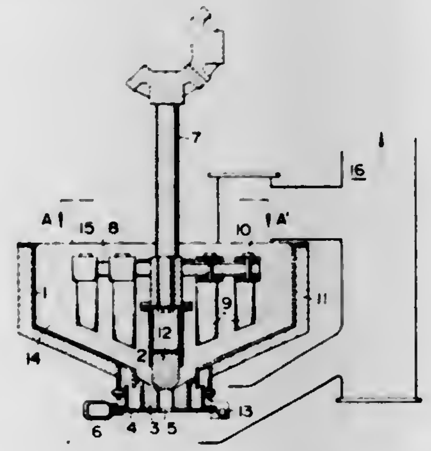
4,003,559
APPARATUS FOR RECOVERY OF METALLIC ZINC FROM DROSS

Kiyoharu Kuwano, Tamano, and Yukio Kanbara, Shimonoseki, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,173

Int. Cl.² C22B ***9/02***

U.S. Cl. 266—204 **7 Claims**



1. Apparatus for recovering metallic zinc from dross discharged from a zinc melting furnace, comprising:

a. a saucer-like container for receiving dross, said container having a generally truncated conical bottom with an opening through the truncated apex;
b. a vertical rotary shaft extending into said container;
c. a plurality of agitating scraper plates attached to said rotary shaft so as to rotate therewith within said container and separate metallic zinc from the dross;
d. a plug having a hollow, cylindrical shape inserted into the opening through the bottom of the container;
e. attachment means to attach said plug to the bottom of the container such that it may be removed from the opening to allow drainage of the secondary dross, from which the zinc has been removed, from the container;
f. a rotor attached to the lowermost end of said rotary shaft, the lowermost portion of the rotor and the uppermost portion of said plug defining a slight aperture so as to allow only the passage of separated zinc between the rotor and the plug and, subsequently, through the hollow plug.
g. wherein the scraper plates provide a clearance sufficient to form a thick insulating and protective layer of dross along the wall of the container between the wall of the container and each scraper plate whereby said insulating and protective layer of dross, formed at said wall, prevents corrosion of said wall by the molten metallic zinc and maintains the temperature of the dross within the separator.

4,003,560
GAS-TREATMENT PLANT FOR MOLTEN METAL

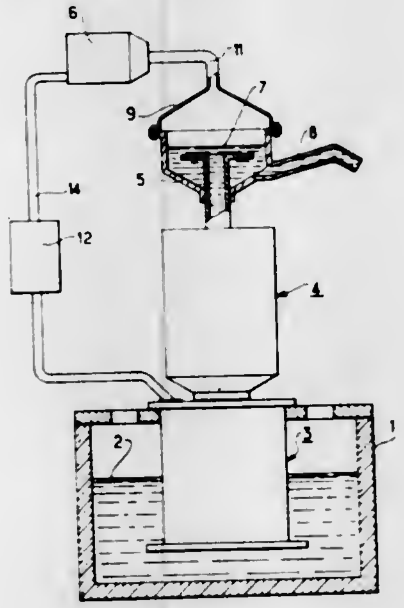
Henri Carbonnel, Antony, France, assignor to Groupement pour les Activities Atomiques et Advancees "GAAA", Le Plessis Robinson, France

Filed May 12, 1976, Ser. No. 685,609

Claims priority, application France, May 27, 1975, 75.16422

Int. Cl.² C22B ***21/06***

U.S. Cl. 266—217 **9 Claims**



1. Gas-treatment plant for molten metal comprising a gas-treatment device in the form of an electromagnetic pump having a pipe of porous material forming a bore surrounded by a metal tube and sealed thereto to form a chamber around the porous material, means connecting said chamber to a source of pressurized gas for treating molten metal, a decanting and degassing tank, and an intermediate electromagnetic pump overlying said gas-treatment device and connecting the gas-treatment device to said decanting and degassing tank, and said gas-treatment device being immersible in molten metal whereby; in operation, molten metal passes through the gas-treatment device to the intermediate pump and thence to the decanting and degassing tank.

4,003,561
POURING OF METALS

Joseph William Cudby, Sheffield, England, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1974, Ser. No. 524,916

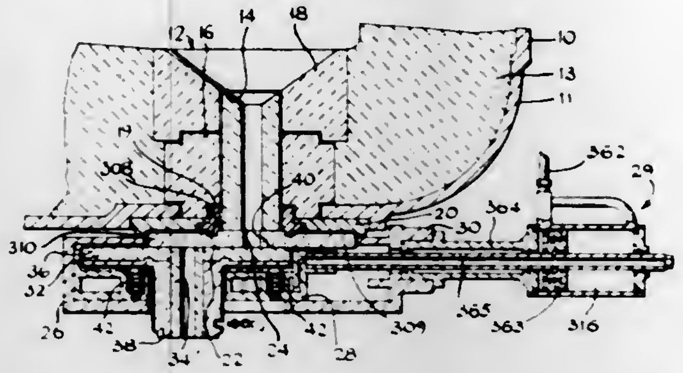
Claims priority, application United Kingdom, Nov. 23, 1973, 54418/73

Int. Cl.² F16K ***51/00***

U.S. Cl. 266—220 **3 Claims**

1. In a slidable gate member for controlling flow of liquid metal through an outlet in the bottom wall of a vessel, said member comprising:

metal encased superposed upper and lower refractory rings having an orifice;
the refractory of said upper ring being abrasion resistant for sliding contact with a plate thereabove;
the refractory of said lower ring being of low conductivity;
a nozzle depending from said plate and having a passage extending from said orifice;
the improvement in which said nozzle comprises:
an annular member of low-conductivity permeable refractory material extending from said lower ring;
a metal casing enclosing the outer circumference of said annular member;
a sleeve of highly erosion resistant permeable refractory inside said annular member and having a bore which defines said passage;



an inlet connected with said annular member and extending through said casing for introducing gas to said sleeve and through the permeable refractory thereof to said bore throughout the length of said sleeve to form a separating film between the metal being poured and the inside surface of said sleeve; and
means forming a seal at the lower surface of said annular member to prevent escape of gas.

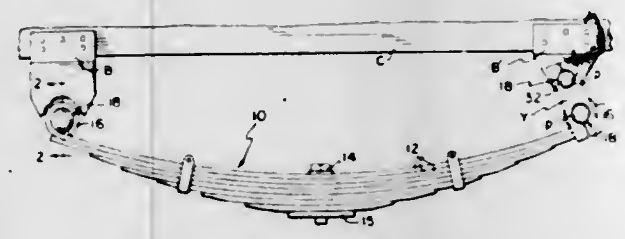
4,003,562
LUBRICATED SPRING BEARING UNIT

Terrence S. Kaiser, Owosso, and William A. Miller, Reese, both of Mich., assignors to V. W. Kaiser Engineering, Inc., Millington, Mich.

Filed Oct. 23, 1973, Ser. No. 408,813

Int. Cl.² F16C ***11/12, 33/74;*** **F16F** ***1/28;*** **F16J** ***15/34***

U.S. Cl. 267—54 R **12 Claims**



1. A bearing unit, comprising; a cylindrical shell receiving and having a bearing pin journalled therewithin, an enlarged diameter end portion within one end of said shell having a resilient annular seal received and retained therewithin for sealing engagement with the bearing pin, means for admitting lubricant internally of said seal retaining end portion, retaining rings means separably carried in said enlarged diameter end portion outboard of said seal for axially retaining said seal in said shell and in sealing engagement about the pin, and said ring means being formed to provide a gap between enclosing ends for the passage of lubricant under said seal and therethrough in the flushing and repacking of the unit with lubricant under pressure.

4,003,563
SPRING ASSEMBLY AND ELEMENTS

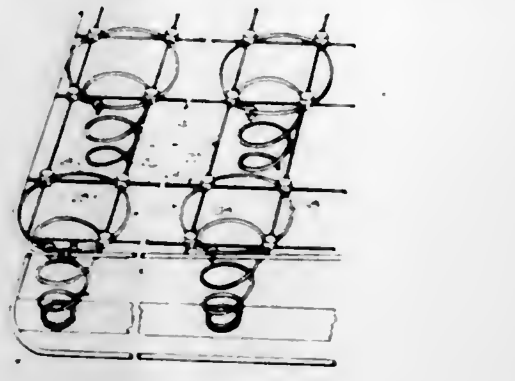
George E. Taylor, Wood Dale, Ill., assignor to Nachman Corporation, Des Plaines, Ill.

Filed Sept. 4, 1975, Ser. No. 610,106

Int. Cl.² F16F ***3/02;*** **A47C** ***23/02***

U.S. Cl. 267—100 **14 Claims**

1. In a spring assembly having a grid formed of a plurality of parallel spaced wires extending in one direction and crisscrossing with a plurality of parallel spaced wires extending in a crosswise direction with the wires closely adjacent one another at their respective cross-over points, and a plurality of spring members having terminal portions and means connecting the terminal portions of the spring members to the grid at cross-over points, the improvement wherein the said means comprises a plastic member which completely encloses the adjacent wires of the grid at cross-over points to fix the wires at the cross-over points, and a groove extending continuously across a portion of the plastic member above the wires and an entrant slot extending from the surface of the plastic member to the groove for guiding the terminal portion of the spring member into gripping relation within the groove.



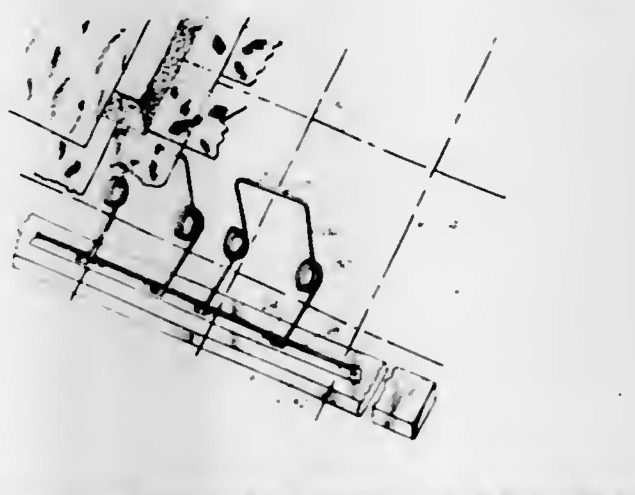
4,003,564
MEANS MOUNTING TORSION SPRINGS

George E. Taylor, Wood Dale, Ill., assignor to Nachman Corporation, Des Plaines, Ill.

Filed Sept. 4, 1975, Ser. No. 610,108

Int. Cl.² F16F ***3/02***

U.S. Cl. 267—108 **5 Claims**



1. In a torsion spring assembly, a torsion spring formed of spring wire having a pair of U-shaped members angularly disposed relative to each other and integrally joined at their inner ends by looped portions and means mounting a plurality of said U-shaped members in longitudinally spaced relation onto a support comprising an elongate strip, a lengthwise extending bore within said strip having a cross section dimensioned to receive the bail portion of said U-shaped members, a slot extending from the upper surface of the strip to the bore with the portion of the slot adjacent the bore having a width less than the cross section of the wire of the bail portion whereby the bail portion can be inserted through the slot into the bore and is retained within said bore when in the assembled relation, spaced pairs of cutouts extending crosswise through the bore and the cutout in each pair being spaced longitudinally by an amount corresponding to the spaced relation between the arms of the U-shaped member whereby the arms are crosswise aligned with said cutout portions when the bail portion is in position of assembly within the bore, and means for securing the strip to a support.

4,003,565

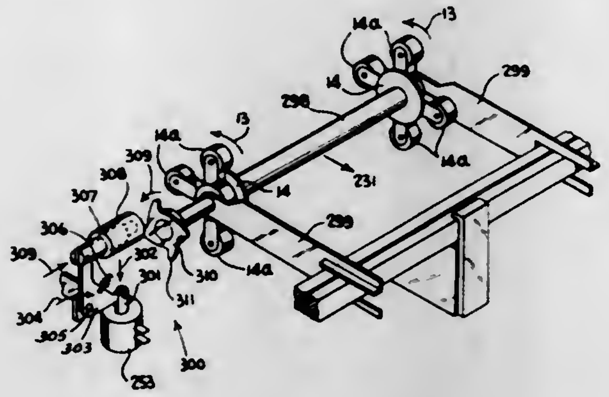
DISENGAGING APPARATUS FOR A COLLATOR

Robert E. Mersereau, Stamford, and Michael A. Brown, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 20, 1975, Ser. No. 623,609

Int. Cl.² B65H *29/045*

U.S. Cl. 270—58 **10 Claims**



1. A rotary drum collator, comprising:

a rotatable drum having a plurality of pockets for storing quantities of sheet material to be collated into stacks, said pockets being angularly arranged about the drum;

a rotatable spider mechanism disposed adjacent said drum for rotating in synchronism with the drum to remove the sheet material from the pockets of said drum, said spider mechanism being movable from a first sheet removing position to a second non-removing sheet position;

disengaging means disposed adjacent said spider mechanism for movably engaging with said spider mechanism for causing said spider mechanism to move from said first sheet removing position to said second non-removing sheet position with respect to said drum; and

sensing means disposed adjacent said drum for sensing a sheet feeding malfunction, said sensing means being coupled to said disengaging means for causing said disengaging means to move into engaging contact with said rotating spider mechanism for moving said spider mechanism from said first sheet removing position to said second non-removing sheet position in response to the sensing of a sheet feeding malfunction.

4,003,566

ROTARY COLLATOR SYSTEM HAVING A CYCLE/STOP OPERATIONAL MODE

Michael A. Brown, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 20, 1975, Ser. No. 623,625

Int. Cl.² B65H *39/045*

U.S. Cl. 270—58 **6 Claims**

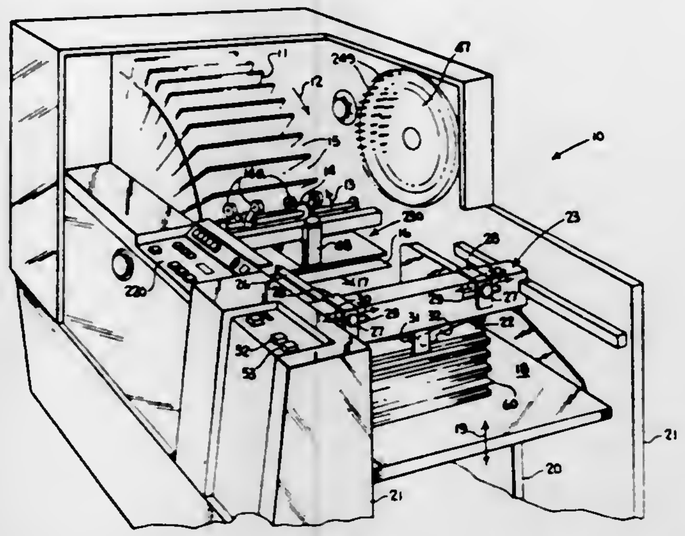
1. A rotary drum collator system for operating in a cycle stop mode, comprisng:

a rotatable drum having a plurality of pockets for storing quantities of sheet material to be collated into stacks, said pockets being angularly arranged about the drum;

rotatable withdrawing means disposed adjacent said drum for removing the sheet material from the pockets of said drum;

sensing means operatively disposed adjacent said drum for detecting a sheet feeding malfunction; and

cycling means operatively connected to said drum for cyclically rotating said drum through at least one complete revolution during normal operation, and through a partial revolution when a sheet feeding malfunction is detected, said sensing means being operatively coupled to said cycling means for actuating said cycling means to continue to rotate said drum in a controlled manner through a partial revolution and then stop the drum in response to the detection of a sheet feeding malfunction, said cycling means including rotation control means for providing a controlled amount of drum rotation required for a partial revolution of said drum, said cycling means preventing said withdrawing means from removing sheet material from said pockets during said controlled partial revolution of said drum, whereby a pocket of said drum adjacent the withdrawing means at the time said malfunction occured will be rotated to an accessible position for inspection and otherwise correction of said malfunction.



4,003,567

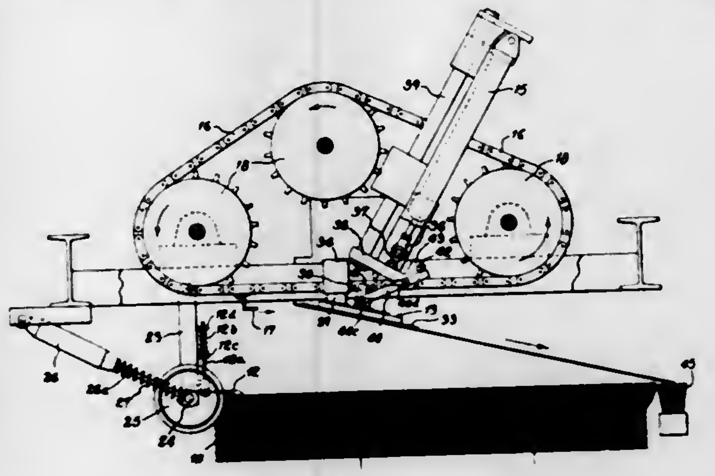
SHEET PICK-UP AND FEEDER

Emil J. Berger, Jr., Hatfield, Pa., and John M. Mitchard, Cherry Hill, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Apr. 7, 1976, Ser. No. 674,591

Int. Cl.² B65H *3/08*

U.S. Cl. 271—12 **6 Claims**



1. Apparatus for picking up a single sheet of semi-rigid material from the top of a stack of such sheets and transporting the sheet in a forward direction away from the stack comprising:

a support for the stack of sheets having lifting means;

hold-down means to maintain a downward force against the top of the stack at the back edge of the stack;

a pick-up shoe having a seal around the outer periphery of the shoe to maintain a vacuum within the seal;

the said shoe being positioned and adapted under vacuum to pick up the back end of the top sheet of the stack;

means for applying a vacuum through the said shoe;

raising and lowering means for the said shoe;

linkage between the said raising and lowering means and the said shoe, the said linkage, when the vacuum means and raising means are activated, imparting an initial sliding movement of the shoe and top sheet along the top of the stack to release the said top sheet from the hold-down means and then raising the back edge of the top sheet;

flexible projections along the front edge of the stack to prevent forward motion of the subsequent sheets in the stack; and

means moving forward above the stack to engage the raised back edge of the said top sheet;

whereby the said top sheet will be transported away from the said stack.

4,003,568

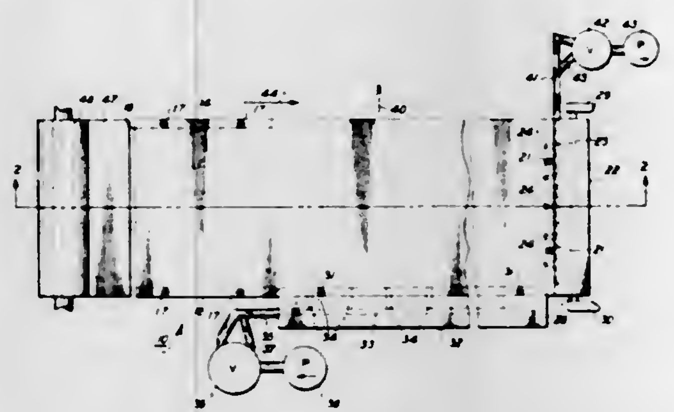
FLUID CONVEYER

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1975, Ser. No. 638,589

Int. Cl.² B65H *5/00*

U.S. Cl. 271—225 **11 Claims**



1. Apparatus for transporting and cooling toner bearing sheets discharged from a fuser, comprising:

a. a structure having a pair of superposed sheet passageways, the entrance to the passageways being located at one end of the structure;

b. means for alternately feeding successive sheets from the fuser into said passageways; and,

c. fluidic means for moving fed sheets toward the other end of the structure and thereafter in a transverse direction out of the structure.

4,003,569

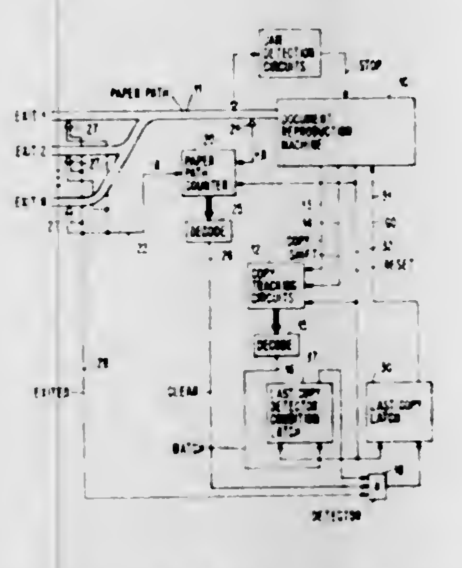
LAST COPY DETECTION

Donald Richard Andrews, and Ralph Joseph Leclere, both of Boulder County, Ohio, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,251

Int. Cl.² B65H *7/02*

U.S. Cl. 271—259 **15 Claims**



1. The method of indicating a last one of a successive train of articles being transported along a path from a receiving portion to a given exit location from a given entrance location, the steps of:

indicating a desired article transport status signifying approaching an end of a train of articles;

indicating that a predetermined portion including said receiving portion but excluding said exit location of said path is clear of said articles;

detecting and indicating that an article has exited from said path at said given exit location; and

combining all of said indications to signify a last one article has exited said path.

4,003,570

CONVEYOR FOR TRANSFER SHEET FIXING APPARATUS

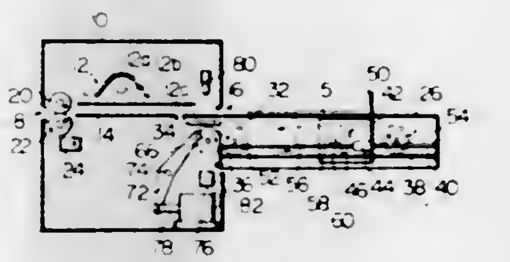
Masanori Yamanaka, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,987

Claims priority, application Japan, July 19, 1974, 49-82941

Int. Cl.² B65H *7/02*

U.S. Cl. 271—265 **13 Claims**



1. In a transfer sheet fixing apparatus having a housing provided with an inlet opening, the combination therewith of a transfer sheet conveyor comprising;

a table mounted adjacent to the inlet opening and having a longitudinal slot formed therethrough longitudinally aligned with the inlet opening;

a pusher member extending through the slot; and

drive means including a belt and pulley assembly supported by the table for reciprocally moving the pusher member, the belt and pulley assembly comprising an endless belt arranged parallel to the slot and connected to the pusher member, two pulleys training the belt thereanround and having the same radius, a first gear fixed for rotation with one of the pulleys, and a second gear rotatably supported by the housing and meshing with the first gear.

4,003,571

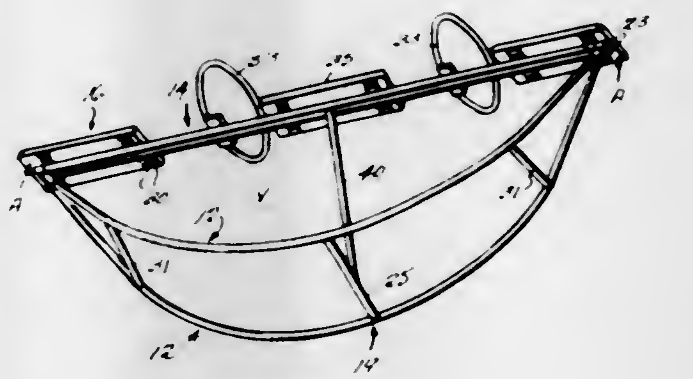
ROCKING DEVICE

William U. Nipper, Jr., Swainsboro, Ga., assignor to Karrh & Malone, Swainsboro, Ga.

Filed Mar. 15, 1976, Ser. No. 667,192

Int. Cl.² A63G *11/00*

U.S. Cl. 272—56 **2 Claims**



1. A rocking device comprising

a. a pair of metal rod rockers, each rocker having a pair of free ends, and each rocker being curved between the free ends thereof;

b. means for attaching said free ends of said rockers to each other so that the rockers abut at the free ends thereof to provide free ends sets, but so that they are widely spaced from each other at middle portions thereof remote from said free ends thereof, said attaching means including a metal rod support member extending between said rockers at the middle, most widely spaced, portions thereof and attached to said rockers,

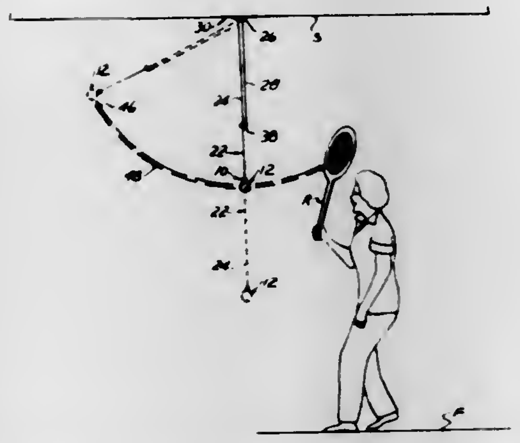
c. a pair of metal rod cross members extending between the end sets of said rockers and connected to said rockers, said metal rod cross members in abutting engagement substantially along the entire length thereof, and said cross members and said rockers defining an interior volume of said rocking device, said cross members having free ends thereof extending past the point of connection of the rocker end sets with said cross members, said free ends providing stops for limiting the angle through which the rocking device may rock by abutting the surface on which said rocking device is rocking, and a metal rod support member extending downwardly from a middle portion of said cross members to said support member extending between said rockers,

d. a pair of end seat means attached atop said cross members, each end seat means extending from substantially one set of free ends of said rockers toward the other set of free ends of said rockers so that an individual sitting on an end seat will normally have his feet disposed within the volume defined by said rockers and said cross members, said end seat means having an outer end area thereof overlapping said cross members a sufficient amount to allow an individual to place his fingers underneath said seat means and grasp said seat means, but not of sufficient overlapping amount so that an individual's fingers will be pinched between said seat means and the surface on which said rocking device is rocking, said cross members ends always abutting said surface before the outer ends of said end seat means, and stopping further movement of said end seat means toward said surface,

e. a middle seat disposed between said end seats and attached to said cross members, and

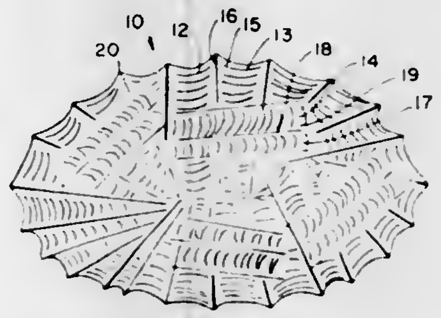
f. feet rest means extending between said rockers at positions wherein an individual sitting on an end seat may readily place his feet thereon with his toes generally disposed within the volume defined by said rockers and said cross members.

4,003,572
HOME TENNIS PRACTICE CONTRIVANCE
Louis A. Harvey, 15107 Ilene, Detroit, Mich. 48238
Filed Apr. 28, 1975, Ser. No. 572,621
Int. Cl.² A63B *61/00*
U.S. Cl. 273—29 A **1 Claim**



1. A home-tennis practice contrivance comprising
an elongated flexible substantially inextensible filamentary suspension member having a main suspension portion with a pivot portion at its upper end adapted to be connected to an overhead support and having a reversely-directed surplus portion depending from said pivot portion,
an inflatable and deflatable toy-balloon-like bag of elastomeric material having a tubular inflation neck portion projecting upward therefrom and adapted to be constricted in air-retaining relationship to said bag and connected to the lower end of said main suspension portion of said suspension member,
said bag when inflated being of spheroidal shape and of substantially the size of a conventional tennis ball,
said bag when deflated being of limply-drooping vertically-elongated shape,
said bag in response to impact with a tennis racquet travelling upon a forward flight at relatively high speed and upon a return flight at a greatly retarded speed in response to the decelerating effect of air resistance upon the bag. ;
and an attachment device connected to said pivot portion of said suspension member and having an adhesive layer thereon adapted to be adhesively secured to the overhead support,
said reversely-directed surplus portion having a suspension member length adjuster consisting of a cord-retaining slider containing an aperture and connected to the lower end of said surplus portion and slidably engaging and encircling said main suspension portion.

4,003,573
AMUSEMENT BALL FOR BOUNCING
Edward A. Craig, Jr., 2696 Kenwyck Drive, Troy, Mich. 48084
Filed Jan. 2, 1976, Ser. No. 645,959
Int. Cl.² A63B *37/12, 43/00*
U.S. Cl. 273—58 K **2 Claims**

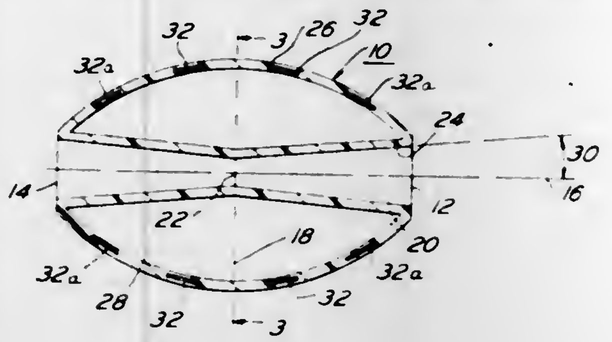


1. A ball fabricated of an elastomeric material for the purpose of throwing for bouncing, the surface of said ball being entirely covered with a plurality of elongated ridges and grooves which extend in a multiplicity of different directions, the peak of each ridge defining a line of substantial length which, when the ball is thrown and strikes a hard surface, will dictate the direction of bounce of the ball, said peaks being relatively sharp, said peaks being spaced apart a distance such that when the ball is thrown against a hard surface one of the ridges will make line contact with the surface and the direction of bounce of the ball will be unpredictable.

4,003,574
GAME BALL
Richard A. MacDonald, Delhaven; James A. MacDonald, Villas, both of N.J., and Joseph J. Andrews, Philadelphia, Pa., assignors to Thingamajig Corporation, Vineland, N.J.
Continuation-in-part of Ser. No. 354,935, April 27, 1973, Pat. No. 3,884,466. This application Mar. 4, 1975, Ser. No. 555,245
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.² A63B *41/00*
U.S. Cl. 273—65 EC **10 Claims**

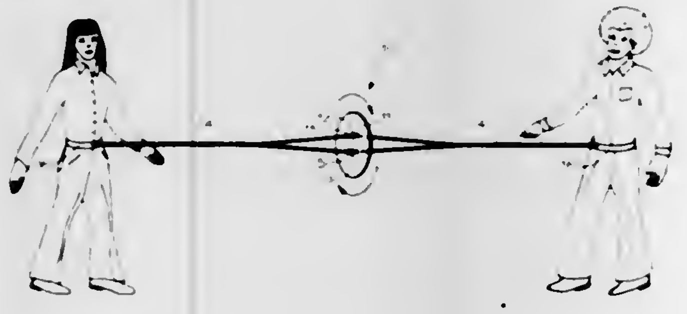
1. A football adapted to be manually thrown through the

air, having an oblate spheroid contour being substantially symmetrical about a major and a minor axis of said oblate spheroid contour, said football having a through nozzle passage formed about said major axis, said through nozzle passage being symmetrical in cross-sectional area about said



minor axis to provide maximum cross-sectional nozzle passage area at opposing longitudinal ends of said football and continuously decreasing to a minimum cross-sectional nozzle passage area at substantially a mid-point region between said opposing ends.

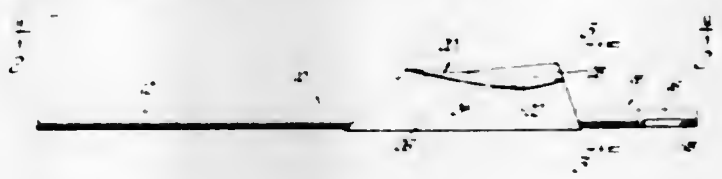
4,003,575
AMUSEMENT AND EXERCISE DEVICE
James D. Hobbs, 1337 79th St., Apt. 2, Newport News, Va. 23605
Filed Oct. 31, 1975, Ser. No. 627,795
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 A **1 Claim**



1. An amusement and exercise device comprising:
a. a relatively thin, circular disc member having two apertures annularly disposed and circumferentially equally spaced about the center of said disc;
b. a cord member having a pair of opposed strands forming a closed loop and centrally mounting said disc member with each said strand passing through a respective one of said apertures; and
c. a pair of hollow tubular hand grip members slidably mounted on the respective remote ends of said strands enabling respective outer end loop portions to be formed for selective securement around body portions of the user of the device or alternatively around a belt worn by the user.

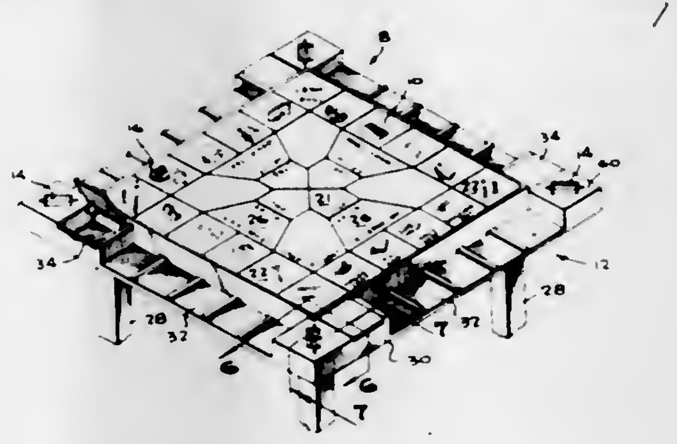
4,003,576
ARROW
Richard F. Carella, 35572 Strathcona Drive, Mount Clemens, Mich. 48043
Filed Oct. 1, 1973, Ser. No. 402,303
Int. Cl.² F41B *5/02*
U.S. Cl. 273—106.5 C **24 Claims**

1. An arrow comprising a shaft with a forward end and rearward end, vane means extending along said shaft adjacent said rearward end, said vane means including first and second vanes spaced from said shaft and on the same side of said shaft, said first vane being disposed to angle downwardly from front to rear relative to said shaft and said second vane being disposed to angle upwardly from front to rear relative to said



shaft, said vanes being substantially coextensive with one another longitudinally of said shaft.

4,003,577
GAME APPARATUS
Joseph P. Bolach, 1596 Sanford, Muskegon, Mich. 49441
Filed Feb. 21, 1975, Ser. No. 551,844
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 C **5 Claims**

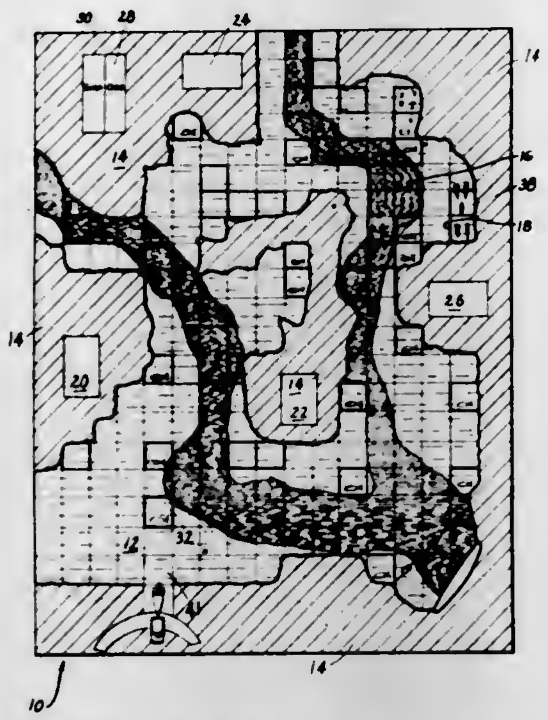


2. A game apparatus comprising a game board having a plurality of sequentially arranged stations constituting a playing path around the periphery of the game board with each of said stations identified by a different particular category of good, a plurality of player starting positions in the center of the game board, and directive stations intermediate each start position and at least one of the sequentially arranged stations, a plurality of position markers for movement by the players along the playing path, said directive stations causing a player to move to a particular station on the periphery of the game board when a position marker lands on a directive station, a plurality of game cards each identifiable with the indicia corresponding to one of said categories of goods on said stations on the playing path, a chance device which may be utilized by a player to determine the number of moves to make in a particular turn and an open storage compartment adjacent each sequentially arranged station around the periphery of the game board to hold the game cards whereby the player first collecting a card for each station wins the game.

4,003,578
BASS ANGLERS FISHING CLASSIC GAME
Mark A. Jones, 823 N. Winston, Tulsa, Okla. 74115
Filed May 2, 1975, Ser. No. 573,964
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AC **5 Claims**

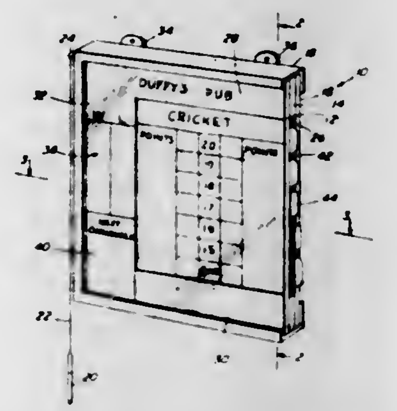
1. A fishing tournament game comprising a game board having a fishing area representation on one face thereof to provide a playing surface, said fishing area representation comprising land areas and water areas, grid means provided at least on the water areas to define a plurality of playing squares, a first plurality of said playing squares being provided with instructions indicating a given size fish by weight and for loosely receiving a token of the same thereon, each of said fish tokens being of a size to fit with one of said first playing squares and being sufficient in number to fill all of the first playing squares at the start of the game, a second plurality of

said playing squares being provided with indicia relating to a selection of chance conditions, a plurality of chance cards provided in combination with said playing board and cooperating with said second plurality of playing squares and having information thereon for providing random instructions for the



playing of the game, a plurality of fish size indication cards provided in combination with the board and corresponding with the information on the chance cards, individual playing token means provided for each player of the game, and at least one die provided for determining the moves of each playing token across the grid.

4,003,579
DART GAME SCOREBOARD
Raymond R. Miscavage, Somerville, Mass., assignor to John T. McDonnell, Somerville, Mass., a part interest
Filed July 7, 1975, Ser. No. 593,266
Int. Cl.² F41J *3/02*
U.S. Cl. 273—148 R **4 Claims**



1. A scoreboard for dart games or the like, comprising,

a. a rectangular front wall of hard transparent material and substantially constant thickness providing a writing surface on the outer face thereof,

b. a C-shaped core of substantially constant thickness mounted to the inner face of said front wall in superimposed relation thereto, the dimensions of said core generally corresponding with those of said front wall,

c. said core being formed with a rectangular reentrant open area along one side edge thereof and bearing on the front face thereof permanent dart scoring indicia visible through said front wall and an area for temporarily recording dart game results,

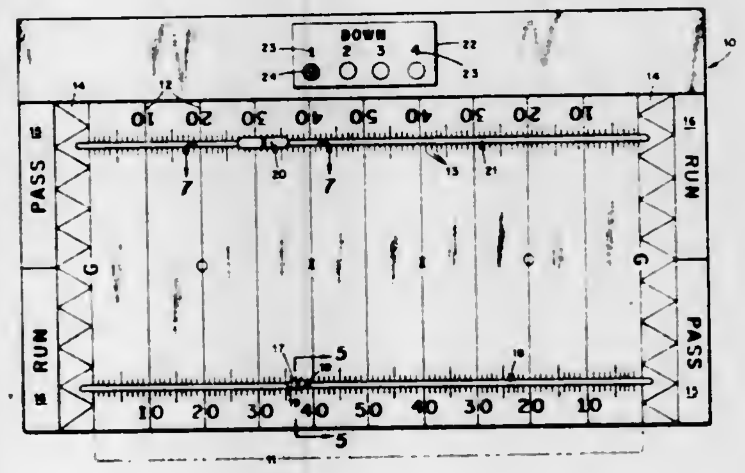
d. a rectangular rear wall of substantially constant thickness coextensive with said front wall and mounted to the rear face of said core,

e. means connecting said front wall, said core and said rear wall to form a board having an opening in one side edge thereof, and,

f. a plurality of reprinted rectangular scoring cards removably mounted in said opening, each of a size generally corresponding in size and shape with said opening and each bearing a unique dart game scoring format for different dart games and areas visible through said front wall for recording dart game scores,

g. each of said cards being formed with a tab along a side edge thereof for extending from said opening, said tabs being offset with respect to one another and of a length to extend visibly beyond the side edge of said front wall, said tabs being provided with indicia on the forward facing surfaces thereof related to the scoring formats on the associated cards.

4,003,580
FOOTBALL GAME
John M. Haffey, Jr., 101 Oklahoma Ave., Oak Ridge, Tenn. 37830
Filed Sept. 17, 1975, Ser. No. 614,187
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 CF **16 Claims**



1. A simulated football game comprising:

a. a simulated football playing field including yard line and play selection indicia,

b. means for an offensive and a defensive player to indicate his choice of a play,

c. means for achieving secrecy in play selection by said offensive player,

d. means for representing the position of a ball on the simulated playing field,

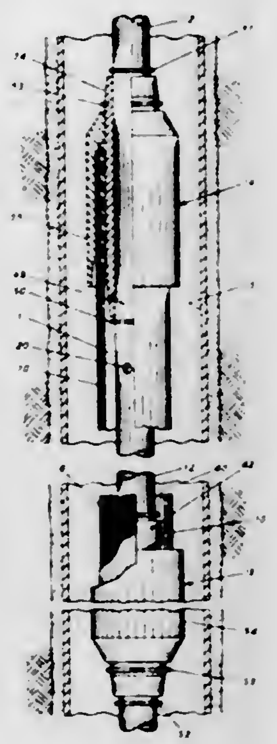
e. means for indicating the yard line on the simulated playing field which must be achieved in order to accomplish a first down,

f. down indicating means,

g. a multiplicity of offensive play designation down cards having a plurality of play situations disposed thereon, and

h. a multiplicity of kick cards having a plurality of kicking situations disposed thereon.

4,003,581
FIELD DRESSABLE INFLATABLE PACKER
Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 367,602, June 6, 1973, and a continuation-in-part of Ser. No. 423,593, Dec. 10, 1973. This application Jan. 2, 1974, Ser. No. 430,326
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² F16J *15/46*
U.S. Cl. 277—34.6 **3 Claims**



1. A field dressable inflatable packer comprising an inner tubing section, an elongated resilient sleeve element positioned over said tubing section and forming an annular chamber with said tubing section, said sleeve element comprising an elongated cured rubber tube having incorporated by curing therein at least one circumferential layer formed of from 20 to 40 per inch spaced apart stretchable nylon cord members having a diameter between about 0.002 and 0.005 of an inch and extending only longitudinally over the entire length of said rubber tube and in substantially parallel relationship with the longitudinal axis of said rubber tube and further characterized by the absence of any such cord member in said rubber tube transverse to said longitudinal axis of said rubber tube, clamp means slideably positioned on said tubing section connecting the ends of said sleeve element in fluidtight relationship with said tubing section, removable constraining means for constraining said clamp means in a predeterminable position on said tubing section and port means in said tubing section for injecting fluid into said annular chamber for inflating said sleeve element.

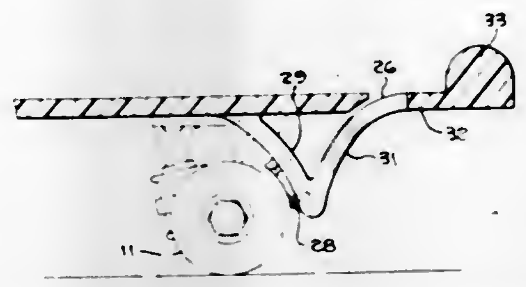
4,003,582
SKATE BOARD WHEEL BRAKE ASSEMBLY
Jeffrey A. Maurer, 3100 Cavendish Drive, Los Angeles, Calif. 90064
Filed Nov. 13, 1975, Ser. No. 631,713
Int. Cl.² A63C *17/14*
U.S. Cl. 280—11.2 **3 Claims**

1. A skate board wheel brake assembly for providing a braking force to the rear wheels of a skate board comprising:

a resilient brake arm molded to be integral with said skate board, said brake arm including a first portion formed to be in close proximity to said rear wheels of said skate board,

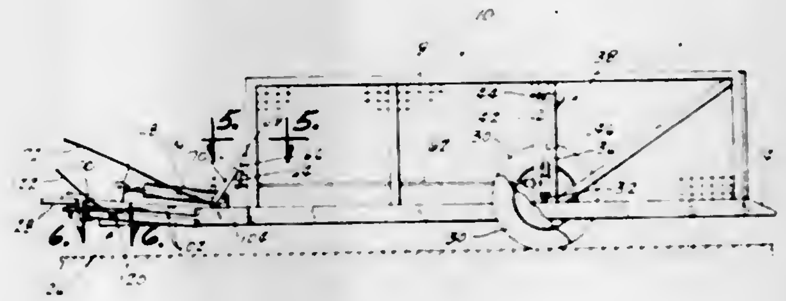
brake shoe means mounted on said first portion of said resilient brake arm adjacent said rear wheels, and

said brake arm further including a second extended portion having brake depressor means formed at the end thereof,



whereby the depression of said brake depressor means urges said first portion toward said rear wheels to thereby urge said brake shoe means into contact with said rear wheels to thereby provide braking force to said rear wheels.

4,003,583
TRAILER HAVING A VERTICALLY ADJUSTABLE BED
Ned L. Stanzel, R.R. 3, Sac City, Iowa 50582
Filed Aug. 18, 1975, Ser. No. 605,340
Int. Cl.² B62D *61/12*
U.S. Cl. 280—43.22 **6 Claims**



1. A trailer having a vertically adjustable bed comprising,

a bed having forward and rearward ends and having a frame and a forwardly extending tongue connected to said frame,

ground-engaging wheels disposed on opposite sides of said bed rearwardly of the forward end thereof, and said wheels each having transversly inwardly extending axles,

a pair of upstanding posts, one on each opposite side of said bed connected to said frame, said posts including side walls defining a hollow enclosure and one of said side walls including an elongated slot through which said axles extend, each of said axles including a block integrally secured thereto and positioned in said enclosure and said block having a configuration for matingly engaging the side walls of said enclosure to prevent all lateral movement of said block in said enclosure,

a locking pin is horizontally movably carried on each of said posts for selectively engaging said block to lock said axle to said post,

an actuating means extending to the front of said bed from said locking pins and said pins being spring loaded to a normal locked position,

a vertically positioned hydraulic cylinder positioned in and connected to each post and extending downwardly into engagement with said adjacent blocks,

control means for extending and contracting said cylinders for raising and lowering the rear end of said bed relative to the ground, and

power means operatively connected to said bed at the forward end thereof for raising and lowering the forward end thereof such that said bed may be raised and lowered to positions parallel to the ground.

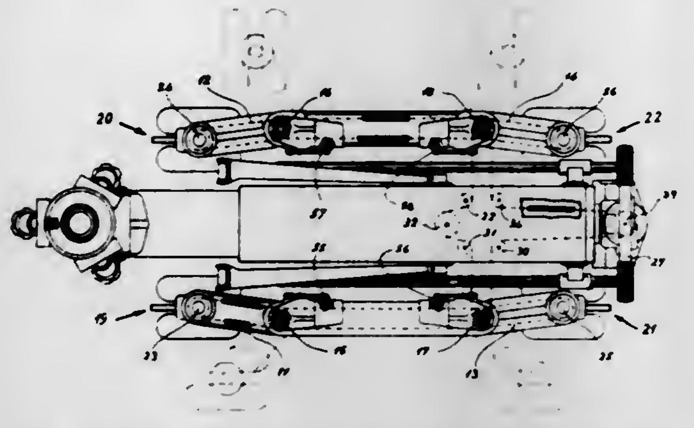
4,003,584
DOLLY WITH ARTICULATED AND STEERABLE WHEELS

Sante Zelli, Via della Pace 24, Rome, Italy

Continuation-in-part of Ser. No. 502,764, Sept. 3, 1974, Pat. No. 3,915,429. This application Aug. 14, 1975, Ser. No. 604,628

Int. Cl.² B62D *7/06*

U.S. Cl. 280—91 **13 Claims**



13. Trolley with articulated and steerable wheels according to claim 10, characterised by the fact that the said joint which may be disconnected between the said cam (70) and the said first sprocket (29) is controlled by a lever (72) having two positions; this lever in one position engages the connection thus rendering the sprocket (29) integral with the cam (70), and in the second position disengages the sprocket (29) from the cam (70).

4,003,585
LOGGING TRUCK TRIPPING MECHANISM

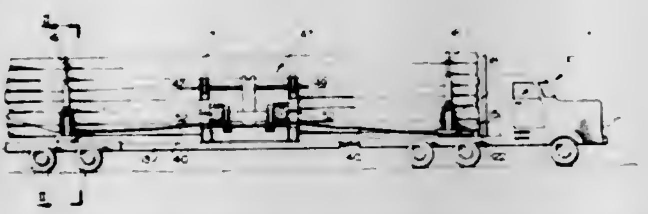
Gordon B. Richards, Box 1750, Station A, Prince George, British Columbia, Canada

Filed June 23, 1975, Ser. No. 589,076

Claims priority, application Canada, Apr. 7, 1975, 223981

Int. Cl.² B62D *63/08*

U.S. Cl. 280—145 **15 Claims**



1. A device for pulling a trip cable in order to trip a lever, said device comprising spool means for storing said cable in a wound condition, means for winding said cable on said spool means, means for temporarily gripping said cable when one end of said cable is connected to said lever and said cable is being pulled to trip said lever, means for pulling said cable with said gripping means a distance sufficient to trip said lever and disconnect said one end of said cable from said lever, wherein said winding means winds said cable onto said spool means when said one end is disconnected from said lever.

4,003,586
SWAY RESISTING STRUCTURE FOR TRAILERS

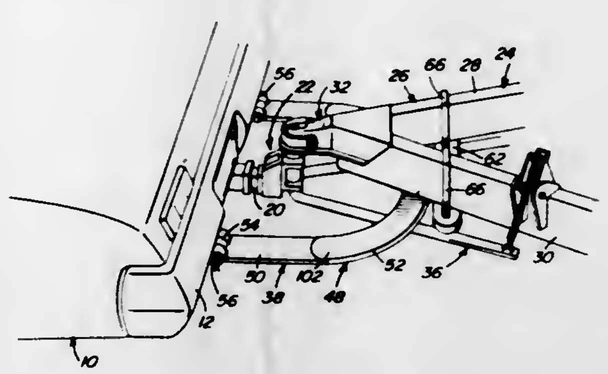
Jack R. Luck, Mentor, Ohio, assignor to Mentor Products, Inc., Mentor, Ohio

Filed Nov. 21, 1975, Ser. No. 634,268

Int. Cl.² B60D *1/16*

U.S. Cl. 280—446 B **6 Claims**

1. In combination with a towing vehicle and a trailer coupled to said vehicle for trailing therebehind and angular displacement relative to said vehicle about an upstanding axis, first generally horizontally disposed friction surface structure supported from said vehicle and extending rearwardly of said axis, second friction surface structure supported from said trailer rearwardly of said axis and frictionally engaged with said first friction surface structure frictionally resisting angular displacement of said trailer relative to said vehicle about said axis, said first friction surface structure including a rear portion generally semicircular in plan shape and positioned with its center of curvature generally coinciding with said upstanding axis, said first friction surface structure comprising a horizontally disposed forwardly opening U-shaped frame, the free ends of said frame being attached to said vehicle and the closed rear end of said frame comprising said rear portion and being of substantially constant radius of curvature with its center of curvature at least generally coinciding with said upstanding axis, said second friction surface structure comprising a clamp assembly mounted on said trailer and including relatively adjustable upper and lower downwardly and upwardly facing friction surfaces between which said closed end of said frame is received, the ends of said frame being pivotally supported from the rear of said vehicle for oscillation about aligned horizontal transverse axes, said aligned axes being spaced slightly forward of said upstanding axis.



4,003,587
SAFETY BINDING FOR SKI BOOTS

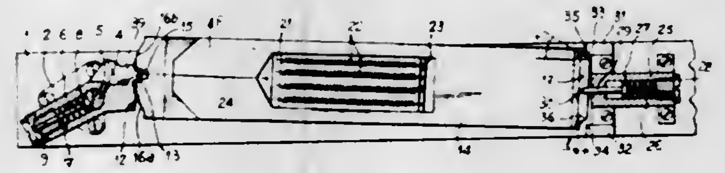
Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed July 3, 1975, Ser. No. 593,056

Claims priority, application France, July 3, 1974, 74.23190

Int. Cl.² A63C *9/081*

U.S. Cl. 280—637 **25 Claims**



1. In combination, a ski and a safety binding device for a ski boot, said device comprising: a ski boot element; a first mobile holding element mounted on said ski for retaining one end of said ski boot element said first holding element being laterally pivotable; a second holding element for retaining the other end of said ski boot element; connecting means permanently attaching said ski boot element to said ski, through said first holding element, whereby, when the safety binding device releases, although said ski boot element may move away from the ski, it will still remain attached thereto; said connecting means including resilient means; said ski boot element and said first holding element each including contacting cooperating profile means, said profile means being adapted to increase the tension of said resilient means of said connecting means when said first holding element moves laterally under the action of said ski boot element whereby said ski boot element is returned in alignment with said first holding element when the lateral load is insufficient to release the binding device.

4,003,588
INFLATABLE PROTECTOR BAG OR VEHICLE SAFETY DEVICE

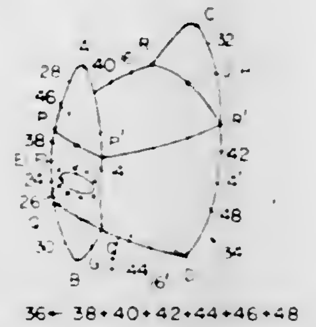
Takashi Oka, Tokyo; Syuichi Suzuki; Hilokazu Mitsuhashi, both of Yokohama, and Hiroshi Iwasaki, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd. and Ikeda Bussan Company, Limited, both of Japan

Filed June 26, 1975, Ser. No. 590,496

Claims priority, application Japan, July 2, 1974, 49-75563

Int. Cl.² B60R *21/08*

U.S. Cl. 280—743 **6 Claims**



1. An inflatable protector bag of a vehicle safety device for protecting a vehicle occupant during a collision of the vehicle, formed of a yielding and gas-impermeable material and having a collapsed inoperative condition and an expanded and unloaded operative condition having, when unloaded, a generally hexahedral configuration which consists of a first rectangular sheet section having first and second pairs of parallel sides, a second rectangular sheet section substantially normal to said first rectangular sheet section and having first and second pairs of parallel sides,.one of the first pair of parallel sides of the second rectangular sheet section being common to one side of the first of parallel sides of said first rectangular sheet sections, a first substantially isosceles triangular sheet section opposite to said first rectangular sheet section and having a base common to the other side of said first pair of parallel sides of said second rectangular sheet section and substantially equilateral sides meeting at a vertex, a second substantially isosceles triangular sheet section opposite to said second rectangular sheet section and having a base common to the other side of said first pair of parallel sides of said first rectangular sheet section and substantially equilateral sides meeting each other at said vertex, and first and second substantially congruent, scalene quadrilateral sheet sections which are opposite to each other and which have respective first sides common to said second pair of parallel sides of said fir t rectangular sheet section, respective second sides common to said second pair of parallel sides of said second rectangular sheet section, respective third sides common to said equilateral sides of said first triangular sheet section and meeting each other at said vertex, and respective fourth sides common to said equilateral sides of said second triangular sheet section and meeting each other at said vertex.

4,003,589
CARBONLESS COPYING PAPER

Akio Konishi, Machida; Masaaki Takahashi; Fumihiro Kimura, both of Tokyo, and Takehisa Toguchi, Akishima, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 160,533, July 7, 1971, Pat. No. 3,806,463. This application Oct. 4, 1973, Ser. No. 403,513

Claims priority, application Japan, July 11, 1970, 45-60473; Sept. 2, 1970, 45-76524; Sept. 2, 1970, 45-76525; Apr. 20, 1971, 46-24938; Apr. 20, 1971, 46-24939; Apr. 20, 1971, 46-29440; Apr. 20, 1971, 46-24941; Apr. 20, 1971, 46-24942; Apr. 20, 1971, 46-24943; Apr. 20, 1971, 46-24944

Int. Cl.² B41L *1/36*

U.S. Cl. 282—27.5 **3 Claims**

1. In a carbonless copying paper comprising paper coated with microcapsules containing a dye solution which is composed of a solvent, a dye and a mineral oil, the improvement comprising a dye solution including:

a. 100 parts of solvent comprising one or more alkyl naphthalenes selected from the group consisting of methyl propyl naphthalene, dimethyl propyl naphthalene and dipropyl naphthalene;
b. 0.5–15 parts of a dye which gives color under acidic conditions; and
c. 0–100 parts of mineral oil.

4,003,590
FLUID-TIGHT FLANGE COUPLING AND METHOD OF MAKING THE SAME

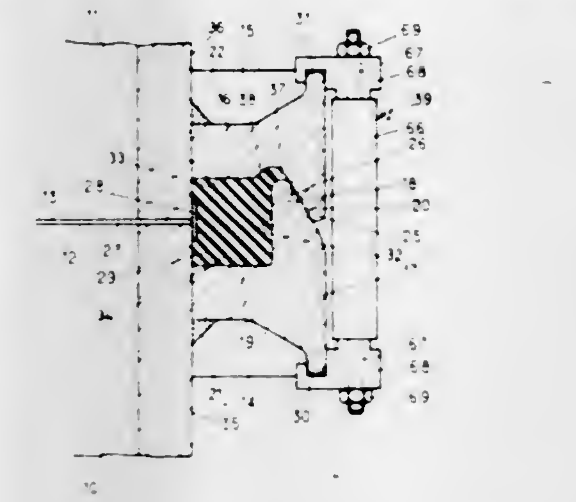
Walter Hefel, In der Halde, Berlingen (Thurgau), Switzerland

Filed Nov. 22, 1974, Ser. No. 526,368

Claims priority, application Switzerland, Nov. 23, 1973, 16516/73

Int. Cl.² F16L *17/06*

U.S. Cl. 285—336 **10 Claims**



1. A sealed joint, comprising a pair of tubular hollow elements having adjacent open ends which together define a gap; a pair of annular flanges applied about the outer surfaces of said tubular hollow elements, each of said flanges being formed from a profiled strand whereby each of said flanges is bent about the outer surface of a different one of said tubular hollow elements, said one flange being shaped so as to conform to the contour of the outer surface of the respective tubular hollow element and said flanges having abutting contact surfaces, at least one of said flanges being provided with an annular recess which, together with the other flange and the outer surfaces of said ends of said tubular hollow elements, defines an annular space in the region of said open ends which extends across said gap; a compressible sealing element in said annular space positioned outwardly of and extending across said gap and covering said ends of said tubular hollow elements, said sealing element being in compression due to the proximity of said flanges to one another, and said sealing element abutting the outer surfaces of said tubular hollow elements and exerting pressure on the same and at said gap from outwardly thereof to thereby prevent the passage of fluid through said gap; and means for disengaging and engaging said flanges.

4,003,591

PLASTIC SOCKET MADE OF FIBRE REINFORCED THERMOSETTING RESIN MATERIAL

Gerrit Schuldink, Ommen, Netherlands, assignor to Industriele Onderneming Wavin N.V., Netherlands

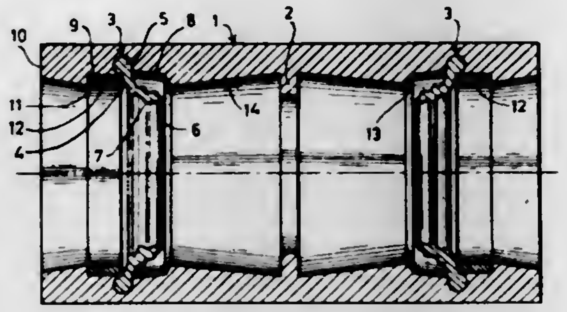
Filed Dec. 8, 1972, Ser. No. 313,280

Claims priority, application Netherlands, Dec. 14, 1971, 7117092

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² F16L *17/02*

U.S. Cl. 285—110 **8 Claims**



1. A socket of fibre reinforced thermosetting resin comprising: at least one inner push edge; annular grooves each situated in the vicinity of a respective free end of the socket for receiving sealing means; first recesses each opening into a respective one of said grooves and extending in the direction of said push edge, the inner diameter of said first recess being greater than the smallest inner diameter of said free end of the socket; two retaining rings; second recesses each opening into a respective one of said grooves and accommodating a corresponding one of said retaining rings, and each said second recess extending in the direction of said free end and having an inner diameter sufficiently large so as to accommodate the inner diameter of said corresponding retaining ring, the inner diameter of said corresponding retaining ring being at least equal to the smallest inner diameter of the socket adjacent the end of said second recess closest to said free end of the socket; the inner diameter of the socket starting from a position near the end of said first recess increases gradually in the direction of said push edge so as to form a further recess having a truncated conical shape; and a conical entrance provided within the socket between said second recess and said free end of the socket.

4,003,592

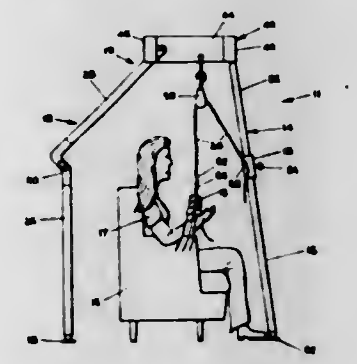
MACRAME ASSEMBLY HOLDER

Dave W. Schreves, 2145 Emerald, NE., Grand Rapids, Mich. 49505

Filed Feb. 17, 1976, Ser. No. 658,294

Int. Cl.² B65H *69/04*

U.S. Cl. 289—18 **10 Claims**



1. A macrame assembly holder for hanging a macrame assembly at a variety of adjustable vertical positions while a person works on the macrame, said macrame assembly holder comprising:

a frame including a plurality of upwardly extending legs that are interconnected at upper portions thereof, the frame being sufficiently high to permit a person to sit under the frame; and

suspension means for hanging the macrame assembly from the frame, said suspension means being adjustable to vary the vertical position of the macrame assembly with respect to the frame.

4,003,593

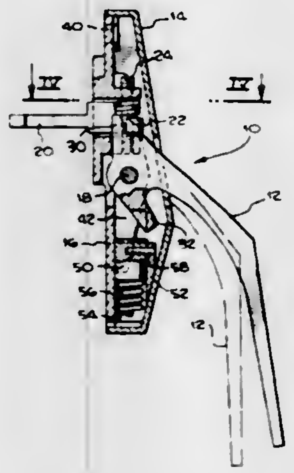
PUSH DOOR-LATCH OPENER

Herbert Wilzig, 1809 S. Stearns, Los Angeles, Calif. 90035, and Charles J. Schuessler, 1340 E. Ruddock, Covina, Calif. 91722

Filed Feb. 23, 1976, Ser. No. 660,245

Int. Cl.² E05F *15/20*

U.S. Cl. 292—92 **2 Claims**



1. A push door-latch opener having mounting means for attaching said door-latch opener to a door, comprising:

horizontal pivoting means attached to said mounting means;

vertical pivoting means attached to said mounting means, said vertical pivoting means being positioned above said horizontal pivoting means;

a horizontal bell crank pivoted about said vertical pivoting means, having a first arm projecting into the plane of the door and a second arm being substantially parallel to the plane of the door;

biasing means for biasing said bell crank in a direction so that the second arm is biased in the direction of the first arm;

a downwardly-directed push handle pivoted about said horizontal pivoting means, said push handle being biased to a first out position and being adapted to be pushed to a second in position; said push handle having above the horizontal pivoting means an upwardly-directed projection which engages the inner surface of the second arm of said bell crank so that when the push handle is pushed, the projection turns the second arm away from the door and simultaneously turns the first arm, thereby operating a latching mechanism, and said push handle further includes, below said horizontal pivoting means, a downwardly-directed, laterally-extending projection which is spaced from the mounting means when the push handle is in the out position;

a push handle blocking member;

a housing attached to said mounting means below said downwardly-directed projection, said housing containing said blocking member;

biasing means for biasing said blocking member upwardly; and

restraining means for restraining the upward movement of said blocking member and adapted to yield at a high temperature, thereby releasing said blocking member upwardly so as to engage the inner surface of said downwardly-directed projection and thereby prevent the inward movement of the push handle.

4,003,594

HYDRAULIC SHOCK ABSORBING BUMPER MOUNTING ARRANGEMENT

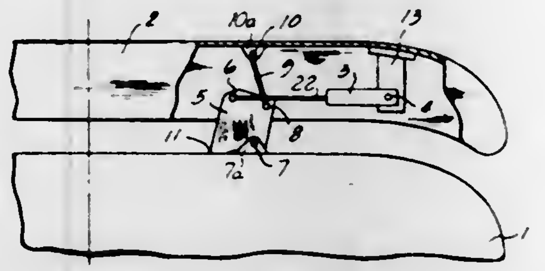
Nils Christian Tommeraas, Lunders vei 16, 2830 Raufoss, Norway

Filed Mar. 7, 1975, Ser. No. 556,386

Claims priority, application Norway, Mar. 7, 1974, 800/74

Int. Cl.² B60R *19/06, 21/14, 27/00;* **B61F** *19/04*

U.S. Cl. 293—84 **9 Claims**



1. A mounting assembly for connecting an end portion of a channel-shaped bumper member in limited spaced relation to a vehicle member and adapted for cushioning impacts against the bumper member, said assembly including a telescopic hydraulic shock absorber comprising a cylinder having one attachment end and a piston rod projecting from the opposite end, spring means associated with the shock absorber to restore the shock absorber to uncompressed initial position after compression thereof with the piston rod projecting beyond said opposite end, and wherein the improvements comprise:

a bracket on said vehicle member projecting toward said bumper member;

a bracket on said bumper member projecting toward said vehicle member;

at least portions of the brackets being in spaced general alignment opposite each other in generally the direction of the longitudinal axis of the member;

means pivotally connecting said one end of the shock absorber to one of said members in a fixed position in the space between said members and substantially spaced from said brackets;

said shock absorber in its uncompressed condition and in the neutral condition of the mounting assembly being disposed on an axis extending transversely and normal to the longitudinal axis of the vehicle member and with the extended end of the piston rod disposed in said space between the members and offset toward the bumper member from said bracket mounted on the vehicle member;

a main pivot element located in said space between the members and pivotally connected at one point thereof to one of said brackets;

means establishing a pivotal connection between said pivot element and the other said bracket at another point on said pivot element;

means pivotally connecting said extended end of said piston rod to a third point on said pivot element;

means associated with said pivot element to prevent pivotal movement thereof in one direction from neutral position;

said means pivotally connecting said piston rod to said pivot member being positioned to resist pivotal movement of the pivot element caused by impact on said bumper member and thereby to effect cushioning of the force of said impact by operation of said shock absorber;

and most of said assembly including at least a substantial portion of said pivot member and a substantial portion of said shock absorber being concealed in the channel of said bumper member whereby the overall length of the vehicle including the bumper member is adapted to be maintained within narrow limits.

9. A mounting assembly for connecting an end portion of a channel-shaped bumper member in limited spaced relation to a vehicle member and adapted for cushioning impacts against the bumper member, said assembly including a telescopic hydraulic shock absorber comprising a cylinder having one attachment end and a piston rod projecting from the opposite end, spring means associated with the shock absorber to restore the shock absorber to uncompressed initial position after compression thereof with the piston rod projecting beyond said opposite end, and wherein the improvements comprise:

means pivotally connecting one end of the shock absorber to one of said members;

said shock absorber being disposed transversely and normal to the longitudinal axis of the vehicle when in uncompressed condition;

separate brackets one of which is mounted on one of said members and the other of which is mounted on the other of said members;

a main pivot element pivotally connected at one point thereof to one of said brackets;

means establishing a pivotal connection between said pivot element and the other of said brackets at another point on said pivot element;

means pivotally connecting said extended end of piston rod to a third point on said pivot element;

means associated with said pivot element to prevvent pivotal movement thereof in one direction from neutral position;

said means pivotally connecting said piston rod to said pivot element being positioned to resist pivotal movement of the pivot element caused by impact on said bumper member and thereby to effect cushioning of the force of such impact by operation of said shock absorber;

the bracket on the vehicle being L-shaped and said main pivot element being connected to the shorter leg of the L-shaped bracket;

the longer leg of said L-shaped bracket being attached to the vehicle by a bolt;

and a spring around the shank of said bolt, whereby said bracket is tiltable against the action of said spring about a fulcrum provided by the bend connecting the legs of the bracket;

and most of the assembly being concealed in the channel of said bumper member whereby the overall length of the vehicle including the bumper member is adapted to be maintained within narrow limits.

4,003,595

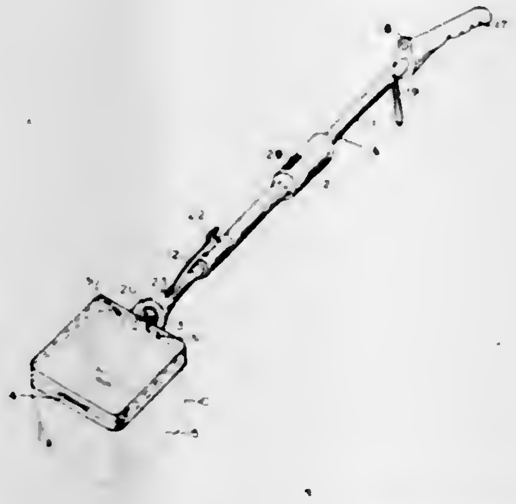
SANITARY WASTE RECEIVER

Joseph D. Fano, 85-17 150th St., Jamaica, N.Y. 11435, and Fu Hwa, 82-78 167th St., Jamaica, N.Y. 11432

Filed Nov. 10, 1975, Ser. No. 630,171

Int. Cl.² A01K *29/00*

U.S. Cl. 294—19 R **6 Claims**



1. A portable sanitation device comprising a foldable container having upper edges, a hollow rod, a serrated draw band engaging the edges of said container, a draw band locking

plate and means carried by said rod and connected with said draw band, said means being movable upon said rod and moving said draw band from a position in which it maintains the edges of said container open to a position in which it closes and locks said edges.

4,003,596

CAMPER KIT

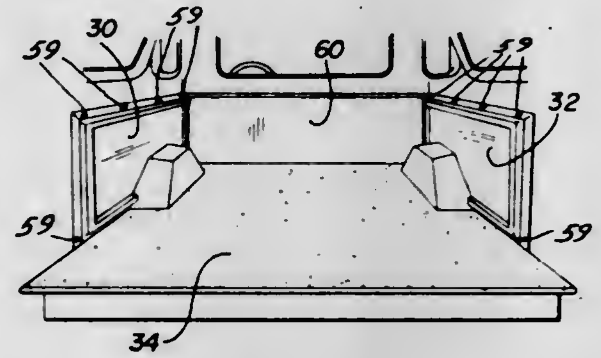
Robert H. Robertson, Dallas, Tex., assignor to Ronbil Industries, Inc., Mesquite, Tex.

Continuation of Ser. No. 377,316, July 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,540, May 18, 1972, Pat. No. 3,751,103. This application Mar. 21, 1975, Ser. No. 560,327

The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl.² B60P *3/38*

U.S. Cl. 296—23 R **3 Claims**



1. An assembly for installation in a pickup having a camper cover comprising:

a floor covering dimensioned to fit the bottom of a pickup bed;

first and second elongated rigid side panels dimensioned to cover the interior sides of the pickup bed wherein each of said panels include an integral enclosure for receiving and covering the wheel well covers of the pickup bed, such that said side panels are independent relative to said floor covering;

means for attaching said side panels to the interior sides of the pickup bed adjacent the edges of said floor covering on the bottom of the pickup bed, such that the bottom edges of said panels exert a sufficient force on the marginal edges of said floor covering to hold said floor covering in place;

a plurality of cushions dimensioned for being selectively arranged on said floor covering as a couch and as a bed, said cushions including first and second generally rectangular cushions having lengths generally equal to the distance between said side panels for being disposed between said side panels and stacked one upon the other for use as a couch seat;

a third generally rectangular cushion having a length generally equal to the distance between said side panels for being vertically positioned against the bulkhead of the pickup to serve as a couch back in conjunction with said first and second cushions; and

said cushions having widths dimensioned to be disposed on said floor covering between said side panels in a side by side relationship to form a bed.

4,003,597

VEHICLE SUN BLINDNESS ELIMINATOR

Jerry Doyal Acuff, 11741 Saticoy, No. 18, North Hollywood, Calif. 91605

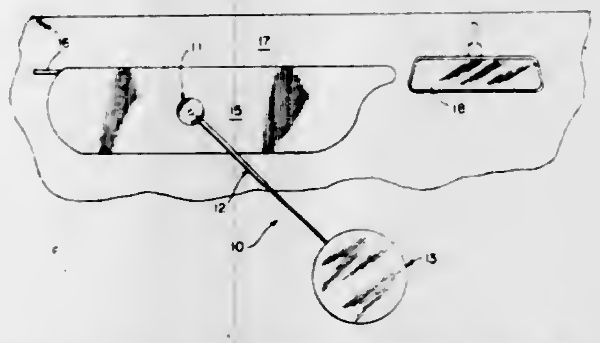
Filed Aug. 25, 1975, Ser. No. 607,668

Int. Cl.² B60J *3/00*

U.S. Cl. 296—97 C **1 Claim**

1. A vehicle sun blindness eliminator device comprising, in combination:

a swivel base adapted to be affixed to a conventional sun visor of a vehicle, a telescopic support rod having one end affixed to the swivel base with the rod extending radially outwardly therefrom, a flat circular disc manufactured of translucid or translucent material and affixed to the opposite end of the support rod, the swivel base consisting of a platform having a flat bottom surface and a flat top surface, a swivel member having a flat bottom surface and a curved exterior top surface, a shaft extending normal to the platform top surface and projecting outwardly from the central portion thereof, a socket defined centrally of said swivel member bottom surface for receiving the shaft therein when the swivel member bottom surface is disposed parallel to the platform top surface and spaced slightly therefrom, the telescopic rod comprising a first member and a second member, the first member being of an elongated hollow open ended cylindrical tube having one end secured to the swivel member with the first member extending radially outwardly therefrom and terminating at a free end, and a second member being of a solid elongated cylindrical rod having one end telescopically received in the free end of the first member and having the opposite end extending outwardly therefrom and being affixed to the disc member with the second member extending radially outwardly relative to said disc member, said disc member having a flat circular configuration with a flat top surface, a flat bottom surface, and a circular peripheral edge surface, the back surface of the disc member being affixed at its periphery to the adjacent terminal end of the second member of the telescopic support rod; and



an even coating of pressure sensitive adhesive applied to the platform bottom surface for use in attaching said swivel base to the point of mounting on a conventional sun visor of a vehicle.

4,003,598

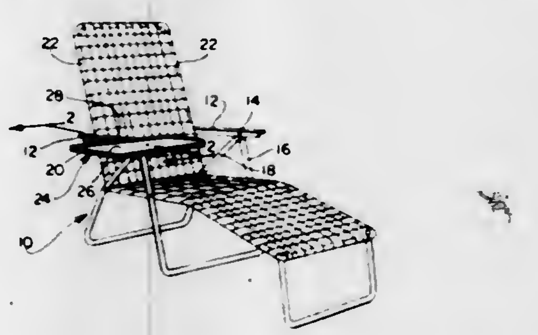
CHAIR MOUNTED TRAY

Thurman A. Glaze, Tampa, Fla., assignor to Grace M. Masiello, Largo, Fla., a part interest

Filed June 6, 1975, Ser. No. 584,280

Int. Cl.² A47C *7/62*

U.S. Cl. 297—194 **9 Claims**



1. An assembly for mounting a tray alongside a chair, or the like, comprising means for mounting the tray for free generally horizontal sliding movement to and fro along a side of the chair and for generally horizontal swinging movement between positions generally alongside the chair and generally in front of the chair, and said means comprising cooperating parts including a track and a slide releasably interlocked for relative rotation and for relative sliding movement in the direction of the track, said track including a body having a groove defined by an inner face and a pair of opposed flanges spaced apart to define a gap therebetween, said pair of flanges being spaced outwardly from said inner face, said slide including a first generally cylindrical portion extending through said gap, and a second generally cylindrical portion larger than said first portion and said gap and received in said groove, when the slide and track are operatively assembled, and opposite faces of said second portion of said slide being in engagement with adjacent ones of said inner face and said flanges of said groove and cooperatively sized for retaining said tray substantially horizontally disposed during such generally horizontal sliding and swinging movement of the tray, means for operatively connecting one of said parts to the chair, and means for operatively connecting the other of said parts to the tray.

4,003,599

SAFETY HEAD-REST

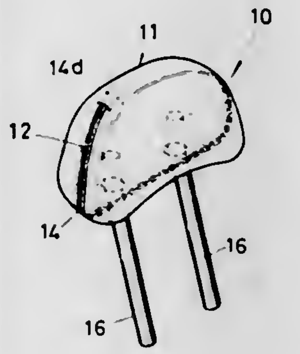
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1976, Ser. No. 651,438

Claims priority, application Japan, Jan. 27, 1975, 50-12741[U]

Int. Cl.² A61G *15/00*

U.S. Cl. 297—220 **4 Claims**



1. In a safety head-rest having a filling core and a generally vertical, elongated support member supporting the filling core at its upper end, and wherein said head-rest is particularly adapted to engage and project vertically above an automobile or like seat;

a. a generally bag-shaped hollow body having two substantially identical portions split along the periphery of the body to define a peripheral opening therebetween, and an elongated connecting portion, along a minor portion of the periphery of the body, connecting said two split portions at their upper portions to interrupt said peripheral opening, one of said two split portions having an aperture formed through its lower portion in closely spaced relation to said peripheral opening for receiving the support member therethrough, said connecting portion serving as an axis of fold about which one of the split portions can be folded upon the other to facilitate insertion of the filling core into the body; and

b. a slide fastener having a slider, opposed stringers, and end stops, said opposed stringers being secured to the marginal edges along the complete length of said peripheral opening, said slider being movable along the said opposed stringers to close said peripheral opening.

4,003,600

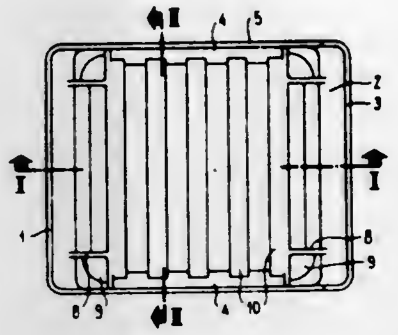
UPHOLSTERED FURNITURE

Dieter Horn, Backnanger Str. 40, D-7062 Rudersberg, Germany

Filed Oct. 1, 1975, Ser. No. 618,342

Int. Cl.² A47C *7/02*

U.S. Cl. 297—454 **23 Claims**



1. A chair or couch with upholstery, which is in a supporting relationship with a spring base, comprising a rigid frame, whose surface is spanned by at least one spring element, with both the rigid frame and the spring element(s) comprising a foamed plastic, in which frame and spring elements are fabricated as one piece, of the same material, in one step in a mould.

4,003,601

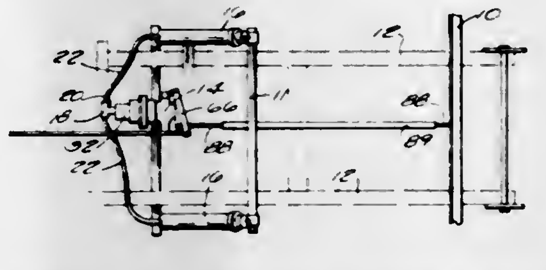
SAFETY APPARATUS FOR HYDRAULIC VALVES IN DUMP BODY MECHANISM

Ronald B. Gerding, New Berlin, Wis., assignor to The Heil Co., Milwaukee, Wis.

Filed Jan. 28, 1976, Ser. No. 653,171

Int. Cl.² B60P *1/28*

U.S. Cl. 298—22 C **14 Claims**



1. In a dump body mechanism having a frame, having a tiltable dump body mounted thereon, and having means including a hydraulic cylinder for raising and lowering the body, there being a hydraulic circuit for said cylinder including a hydraulic pump and a return line, and there being a valve in said circuit for controlling the flow of hydraulic fluid into and out of said hydraulic cylinder, said valve including a valve body and a shiftable control member, and said hydraulic circuit having a "raise" condition in which hydraulic fluid is directed into said hydraulic cylinder to raise the dump body, having a "neutral" condition in which the hydraulic fluid is locked within said hydraulic cylinder, and having a "lower" condition for exhausting hydraulic fluid from said hydraulic cylinder to said return line during gravity lowering of the body, and there being an elongated force-transmitting member connected at one end to said dump body, the improvement comprising first and second lever arms pivotally mounted adjacent to said shiftable valve control member, manually operable means connected to said first lever arm, and said second lever arm being connected to said dump body through said elongated force-transmitting member, a first abutment means on said second lever arm positioned to engage said first lever arm after said second lever arm has been pivotally moved a predetermined distance to automatically switch said hydraulic circuit from its "raise" condition to its "neutral" condition after said dump body has reached its uppermost position, and second abutment means positioned

to limit further movement of said second lever arm whereby an inadvertent force on said elongated force-transmitting member will not cause unexpected lowering of the dump body, said second abutment means being positioned to avoid interference with the movement of said first lever arm in a dump body lowering direction.

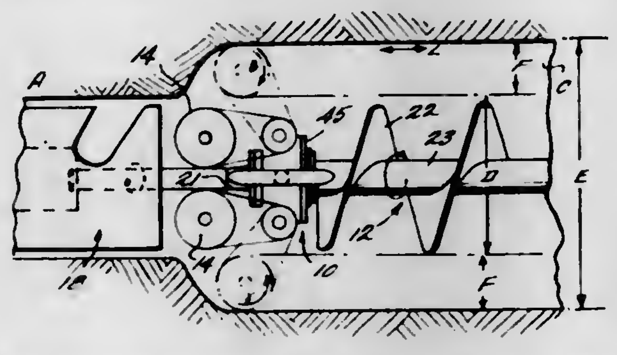
4,003,602
METHOD AND APPARATUS FOR IN-CUTTING AND OUT-CUTTING DURING COAL MINING

James Conley Justice, and Frank A. Delli-Gatti, Jr., both of Beckley, W. Va., assignors to Coaltex, Incorporated, Beckley, W. Va.

Filed Jan. 16, 1976, Ser. No. 649,579

Int. Cl.² E21C *27/22, 41/00*

U.S. Cl. 299—18 **14 Claims**



13. A method of increasing the recovery material from the area of a pre-existing generally horizontal generally circular in-cross-section bore of a diameter D in a coal seam or the like utilizing a mining machine having out-cutting means associated therewith which are movable from a first generally inoperative position to a second generally operative position, said method comprising the steps of

a. inserting the mining machine into the pre-existing bore from an exterior area, and reboring the pre-existing bore during in-movement of the mining machine,

b. continuously conveying the cut coal or the like from the bore to the exterior area during in-movement of the mining machine,

c. moving the mining machine out-cutting means from the first position to the second position thereof and maintaining said means in the second position thereof during out-cutting,

d. withdrawing the mining machine from the pre-existing bore to enlarge the pre-existing bore to a bore having a generally rectangular configuration having at least one side thereof having a dimension greater than D, out-cutting taking place during withdrawal, and

e. continuously conveying cut coal or the like from the bore during out-cutting.

4,003,603
IMPACT MEANS FOR RIPPER

Orrin A. Stemler, East Peoria, and Delwin E. Cobb, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1975, Ser. No. 636,784

Int. Cl.² A01B *35/00*

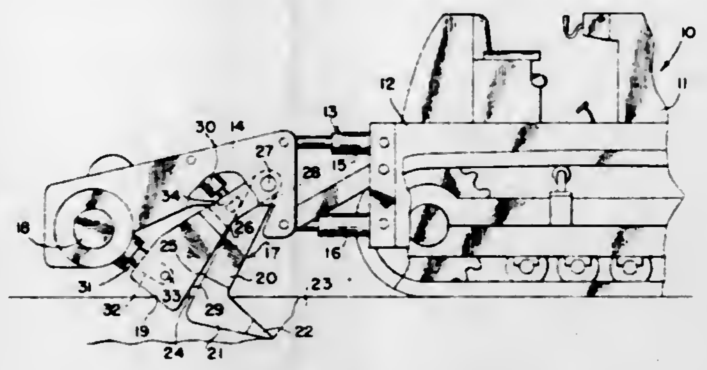
U.S. Cl. 299—37 **12 Claims**

1. In an earth working apparatus having a support, a ripper defining a resiliently deflectible shank and a tooth at one end of the shank, and an impact member having an inner mounting portion and an outer impacting portion, the improvement comprising:

pivot means for pivotally mounting the ripper shank to the support for pivoting about a single pivot axis;

pivot means for pivotally mounting the impact member mounting portion to the support for pivoting about a single pivot axis with said impacting portion defining a contact surface engaging said shank at an inner portion in an undeflected condition of said shank and defining therewith an outwardly widening gap; and

impact force means for urging the impact member outwardly of said inner portion toward said shank with said tooth engaging earth to be loosened to cause said shank to be deflected into progressively increased gap-closing facial engagement with said contact surface in transferring an impact force from said force means through said deflectible portion to said tooth.



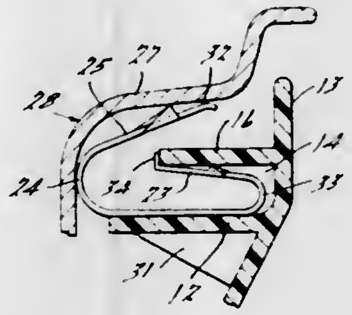
4,003,604
COVER RETENTION SYSTEM

James Connell, 5017 Dianna Drive, Bloomfield Hills, Mich. 48013

Filed Oct. 14, 1975, Ser. No. 622,047

Int. Cl.² B60B *7/04*

U.S. Cl. 301—37 CD **1 Claim**



1. In a cover secured by clips to a vehicle wheel, said cover having spaced flanges on its inner periphery extending inwardly from an outer wall, said clip being made from a spring strip having a first reversely bent portion forming a securing body which extends between said flanges, a sharp struck-out tang on the upper portion of the body engaging the underside of the top flange for cutting thereinto and retaining the clip body between the flanges, the end portion of the clip extending from between the flanges being reversely bent thereover to form an arm portion disposed at an angle, said bend abutting said wheel, an outwardly projecting cutting tang on said arm portion engaging the undersurface of a flange on the wheel, and a right-angle bend at the end of said body providing a flange which engages the inner edge of the top flange to space said first reversely bent portion at the end of the body a predetermined distance from the outer wall between the flanges.

4,003,605
FLUID PRESSURE BRAKING SYSTEM WITH LIMITING VALVE FOR ANTI-COMPOUNDING AND FAIL-SAFE STANDBY VALVE

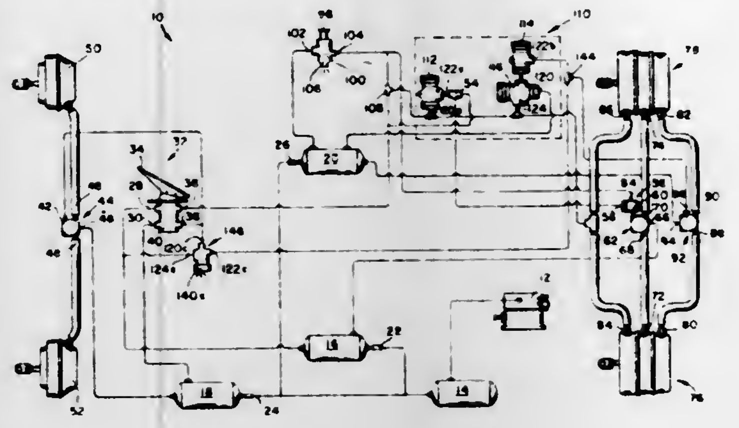
Richard C. Fannin, Elyria, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed Nov. 28, 1975, Ser. No. 636,384

Int. Cl.² B60T *13/22*

U.S. Cl. 303—6 M **11 Claims**

4. In a vehicle fluid pressure braking system, a brake actuator having a service port connected to a fluid pressure source when a service brake application is effected and fluid pressure responsive parking means for holding the actuator in a brake-applied condition when a parking application is effected, and limiting valve means limiting fluid pressure communication to said service port upon actuation of said parking means, said limiting valve means being responsive to fluid pressure communication to said parking means to permit substantially uninhibited fluid communication to said service port when the parking means is released and to limit communication to said service port when the parking means is actuated, said limiting valve means including an inlet port communicated to said fluid pressure source, an outlet port controlling communication to said service port, and a control port, said limiting valve means being responsive to the fluid pressure level at said control port to establish a fluid pressure level at the outlet port less than the fluid pressure level at the inlet port.



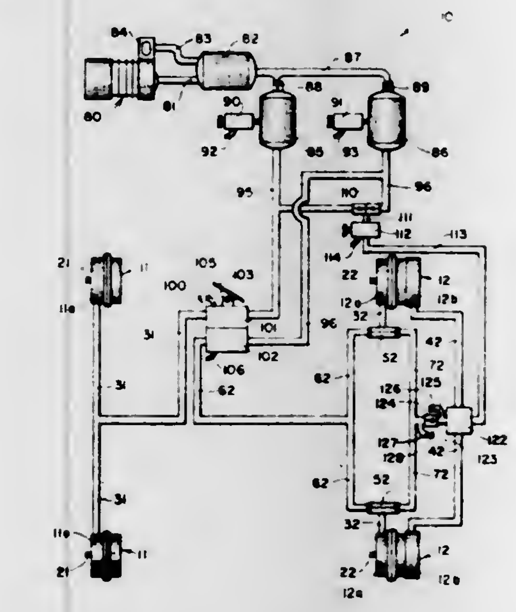
4,003,606
BRAKE SYSTEM

Ronald S. Plantan, Wickliffe, Ohio, assignor to White Motor Corporation, Cleveland, Ohio

Filed Oct. 6, 1975, Ser. No. 620,069

Int. Cl.² B60T *13/36*

U.S. Cl. 303—9 **17 Claims**



1. A vehicle brake system, comprising:

a. a service brake subsystem;

b. a spring brake subsystem; and,

c. a valve connected to both subsystems for selectively transferring pressurized fluid from said spring brake subsystem into said service brake subsystem to actuate at least a portion of the service brake subsystem.

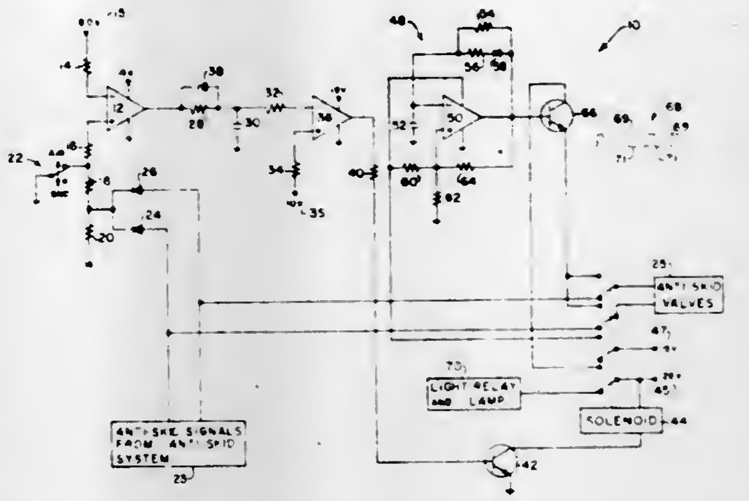
4,003,607
FAILURE WARNING AND SHUT-OFF FOR ANTI-SKID SYSTEM

James R. Haney, Uniontown, and Edgar J. Ruof, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 24, 1976, Ser. No. 669,944

Int. Cl.² B60T *8/00*

U.S. Cl. 303—92 **12 Claims**



1. In a brake system for a wheeled vehicle having anti-skid circuitry associated with the wheels thereof for producing and applying anti-skid signals indicative of skidding activity of the wheels to anti-skid valves, the improvement comprising:

- first circuit means connected to the anti-skid circuitry for receiving the anti-skid signals and producing a first signal if the anti-skid signals exceed a predetermined level;
- second circuit means connected to said first circuit means and controlled by said first signal for inhibiting the application of the anti-skid signals to the anti-skid valves; and
- third circuit means connected to and controlled by said second circuit means for applying a pulsating signal to the anti-skid valves upon the inhibiting of the application of the anti-skid signals thereto.

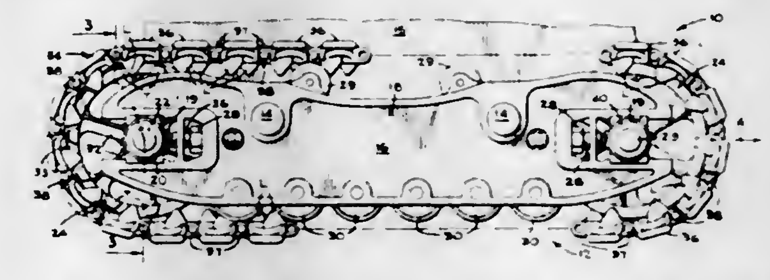
4,003,608
CRAWLER DRIVE SYSTEM

Robert M. Carter, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed July 2, 1975, Ser. No. 592,568

Int. Cl.² B62D *55/08*

U.S. Cl. 305—57 **8 Claims**



1. A crawler drive system for a machine having an endless longitudinally extending crawler track of shoes pivotally connected on lateral axes and having a pair of spaced sprockets lying in a common longitudinal plane to receive said track, each shoe having a pair of lugs, the lugs of each pair being on opposite sides of said common plane and having rear faces spaced apart in the longitudinal direction, the sprockets having a plurality of pairs of teeth, the teeth of each pair being on opposite sides of said common plane and positioned between the lugs of two adjacent shoes, the lugs and teeth on one side of said common plane defining one row of alternate teeth and lugs, and the teeth and lugs on the opposite side of said common plane defining another row of alternate teeth and lugs, the improvement wherein the longitudinal distance between

the rear faces of the two lugs on one of said shoes is greater than the distance between the forward faces of the two sprocket teeth immediately behind said lugs so that only the rear lug of the shoe will be engaged by a sprocket tooth in driving engagement at a time.

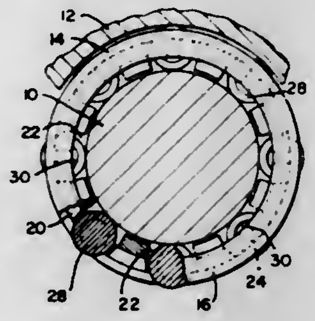
4,003,609
BEARING CAGE AND ROLLER ASSEMBLY

Joseph Aloysius Juhas, Litchfield, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Mar. 25, 1976, Ser. No. 670,357

Int. Cl.^{2} F16C *33/38*

U.S. Cl. 308—217 **6 Claims**



1. A bearing cage and roller assembly comprising: a pair of axially separated end rims; a plurality of circumferentially separated axial crossbars interconnecting the end rims to form roller pockets; at least one pair of oppositely facing short projections extending from the rims into each roller pocket with the axial distance between projections being less than the roller length and with the projections and end rims being sufficiently resilient to permit the placement of rollers having openings in their axial ends into the pocket by inserting one end of the roller in the pocket with the projection extending from one rim received within the opening at that end of the roller and installing the other end of the roller over the projection extending from the other end rim by snapping the roller over said projections; and at least one roller in each of several of the pockets, said roller having openings in its axial ends into which the projections of the end rims extend.

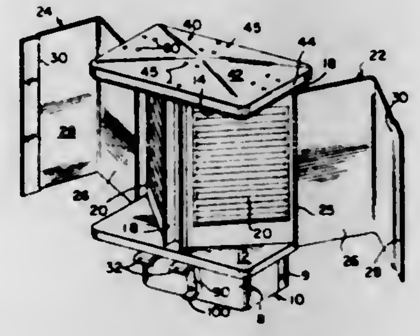
4,003,610
TERMINAL HOUSING

Harold M. Main, Muncie, Ind., assignor to General Cable Corporation, Greenwich, Conn.

Filed Feb. 18, 1975, Ser. No. 550,296

Int. Cl.^{2} A47B *81/00*

U.S. Cl. 312—100 **4 Claims**



1. A terminal housing comprising

frame structure including top and bottom structure and corner members extending therebetween at the rear corners of the housing, said structure leaving the front and sides of the housing substantially open, and including means to mount one or more terminal panels between the top and bottom frame structure and extending generally forward in a horizontally arched configuration from the rear corner members so as to present the front faces of the panels toward the front and sides of the housing,

doors hinged to said frame structure adjacent said rear corner members, said doors having a closed position in which they extend forward from said corner members across the open sides and front of the housing to form a peripherally continuous front and side enclosure between the top and bottom frame structure to cover the exposed front faces of the terminal panels, said doors being movable outward to expose substantially the entire front face area of the panels for service access,

a cap overlying said top frame structure and having a top closure wall and a depending peripheral flange,

spring means acting between said top frame structure and said cap and normally supporting the cap in a raised position in which its peripheral flange clears the tops of the doors to permit the doors to be opened to expose the terminal panels,

said cap being movable downward from said raised position, against the force of the springs, to a lowered closure position in which its peripheral flange overlaps the tops of the closed doors to secure the same in closed position and close the top of the housing against the weather,

guide means for guiding the cap for movement between said raised and lowered positions,

actuating means connected to the cap for moving the same from its spring-supported raised position to its closure position, said actuating means including a lever which moves past dead center against the force of said spring means so as to secure the cap in its lowered closure position.

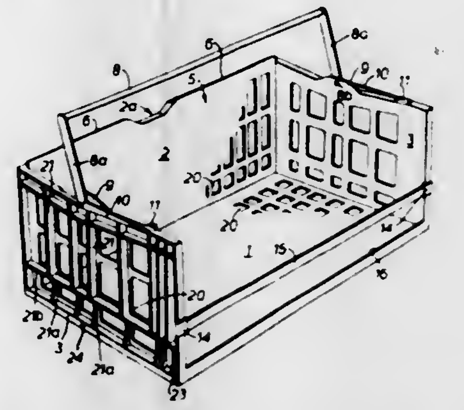
4,003,611
CONTAINERS

Barrie Smith, Northampton, England, assignor to J. Lyons & Company Limited, London, England

Filed Feb. 3, 1975, Ser. No. 546,307

Int. Cl.^{2} B65D *25/28, 21/00;* **220** *94 R*

U.S. Cl. 312—244 **9 Claims**



1. A container having a base, a pair of opposed side walls, a rear wall, the top and front of said container being open, a reinforcing member movable between an operative position extending between said opposed side walls adjacent said front for maintaining the spacing of said opposed side walls and an inoperative position adjacent said rear wall, said reinforcing member being of generally U-shaped configuration, means provided for mounting said reinforcing member for pivotal movement between its operative and inoperative positions, and projecting means extending from the upper edge of said rear wall and a recess in the underside of said base for receiving the projecting means on the rear wall of a like container on which said one container is stacked, said reinforcing member being located behind said projecting means on said rear wall when in its inoperative position.

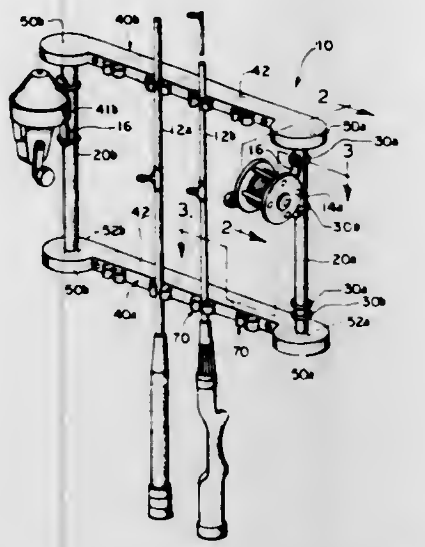
4,003,612
FISHING TACKLE RACK

Robert F. Munsell, 516 W. Jackson Blvd., Ste. 508, Chicago, Ill. 60606

Filed Jan. 16, 1976, Ser. No. 649,655

Int. Cl.^{2} A47F *7/00*

U.S. Cl. 312—245 **1 Claim**



1. A fishing tackle rack for releasably securing fishing reels and poles thereon, comprising:

at least one column for supporting fishing reels, the column having a fishing reel attachment area provided with an outer perimeter against which the yoke of the fishing reel may be releasably secured;

at least two rings composed of resilient material and movable along the perimeter of the column, the rings further having an inside diameter substantially equivalent to the outside diameter of the column and adapted to be stretched to accomodate the yoke of the fishing reel;

whereby the two rings releasably secure the reel to the column by slipping the rings over end portions of the yoke of the fishing reel;

two bases having recessed areas into which the end portions of the column are engageable; and

at least one clamp rigidly attached on a side of each base adjacent the engagement of the column to the base, the clamp being adapted to receive and retain a fishing pole.

4,003,613
APPLIANCE CONTROL CONSOLE STRUCTURE

John G. Oakley, Coloma, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 17, 1976, Ser. No. 667,904

Int. Cl.^{2} A47B *77/08*

U.S. Cl. 312—293 **16 Claims**

1. Control console structure for use with an appliance having a mounting portion, said console structure comprising:

a pair of end cap assemblies each assembly including a first member, a second member, and locking means for locking said first and second members together;

means for securing said end cap assemblies to the appliance mounting portion in spaced relationship to each other; and

wall means extending between said spaced end cap assemblies for mounting and enclosing appliance control means, said wall means including a cover means having opposite ends mounted to said spaced end cap assemblies.

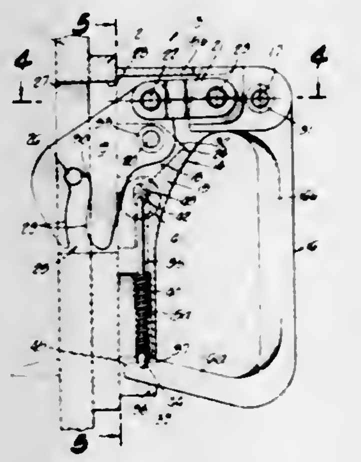
4,003,614
DRAWER HANDLE WITH LOCKING MECHANISM

Larry A. Geer, Upland, and Ralph L. Sheffer, Arcadia, both of Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.

Filed June 12, 1975, Ser. No. 586,290

Int. Cl.^{2} A47B *95/02;* **E05C** *19/10*

U.S. Cl. 312—320 **13 Claims**



1. A drawer handle with releasable drawer locking means, comprising:

a. a body structure adapted for surface mounting in an upright position on a front member of a drawer;

b. elongated handle means pivoted at one end on said body structure at a position outwardly spaced from said front member for selective swinging movements of its other end to a position of engagement with said body and to a position outwardly spaced from said body, the lower end of the handle being rearwardly angularly extended towards the body;

c. a hook member pivoted on said body at a position outwardly spaced from said front member for swinging movements between locking and non-locking positions, said hook extending rearwardly through said front member for engagement with a keeper;

d. means operatively connecting said hook with said handle, whereby swinging movements of the handle will be imparted to said hook; and

e. spring detent means releasably engageable with said lower end of the handle in said position of engagement with said body.

4,003,615
COATED CARBON ELECTRODE HAVING AN INNER COATING OF LOW RESISTANCE MATERIAL

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,162

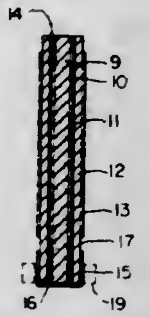
Claims priority, application Japan, Feb. 3, 1975, 50-14693

Int. Cl.^{2} H05B *31/10*

U.S. Cl. 314—60 **10 Claims**

1. A carbon electrode for use in an arc lamp used for determining light fastness, said carbon electrode comprising:

a round central core portion comprised of a mixture of:
  light emitting materials,
  stabilizer material, and
  graphite;
a first coating of low resistance electrically conductive material covering the outside, but not the ends, of said central core portion;
a second coating of adhesive and graphite surrounding said first coating;
a cylindrical carbon tube with said first and second coated central portion inserted, dried, and adhered thereinto;

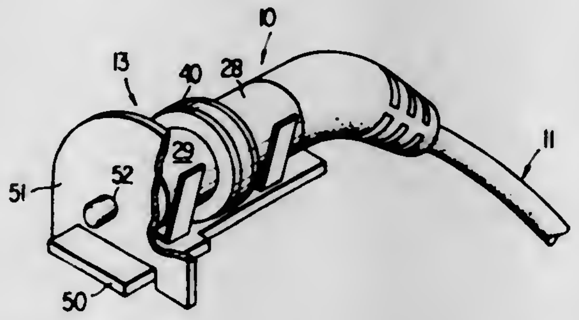


a third protective coating surrounding the outside of said cylindrical carbon cylinder above the bottom of said carbon cylinder and beneath the top end of said carbon cylinder; and
a fourth metallic coating covering the bottom end of said first and second coated central core and said carbon tube and surrounding the outside base of said cylindrical carbon tube, spaced from said third coating, electrically connected to said first coating and having a higher electrical resistance than said first coating.

4,003,616
SWIVELLING ELECTRICAL CONNECTOR

William E. Springer, Stratford, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,455
Int. Cl.^{2} H01R *39/00*
U.S. Cl. 339—8 R **13 Claims**

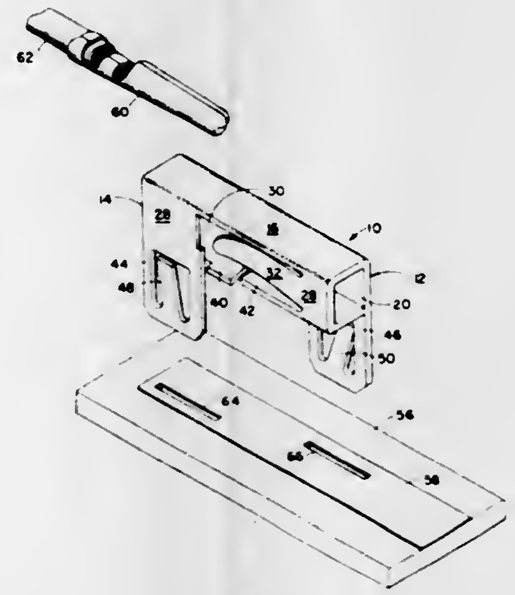


1. An electrical connector for an appliance having a housing wherein the connector couples the appliance to a power cord having three conductors therein, said connector comprising:
a. a plug, said plug comprising:
an insulating body having a plug contact-supporting portion and a cord-engaging portion, wherein said plug contact-supporting portion is cylindrical in cross-section, and said cord-engaging portion has a section extending plug contact-supporting portion;
a first plug contact supported by said plug contact-supporting portion and axially aligned therewith, wherein said first contact is connected to a first conductor of the power cord;
a second plug contact circumferentially supported by said plug contact-supporting portion and connected to a second conductor of said power cord;
a third plug contact circumferentially supported on said plug contact-supporting portion and axially spaced from said second contact in the direction of said power cord, wherein a third conductor of said power cord is connected thereto, and
shoulder means formed on said plug for retaining said plug in said housing:
b. a socket formed in one end of said housing for rotatably receiving said plug, said socket comprising socket contacts slidably engaging said plug contacts to allow rotation of said plug relative to said socket and said housing, while maintaining electrical connections therebetween, and
annular shoulder means within said socket and registering with said shoulder means on said plug for retaining said plug within said socket and said housing.

4,003,617
SOLDERLESS ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT

Roman J. Witek, Jr., Gilbraltar, and Stephen J. Grebik, Roseville, both of Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Mar. 17, 1976, Ser. No. 667,794
Int. Cl.^{2} H01R *9/12*
U.S. Cl. 339—17 C **3 Claims**

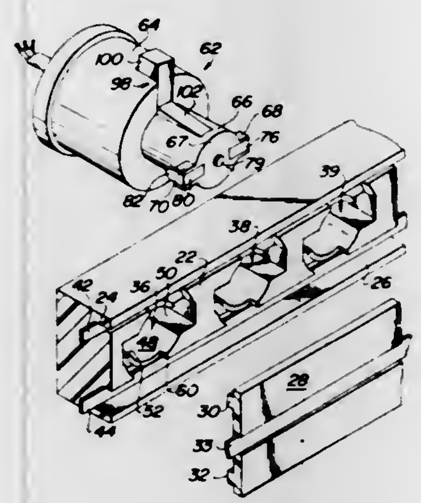


1. A sheet metal pin receptacle of one-piece stamped and formed construction for mounting on a printed circuit board, said receptacle comprising:
a body member for receiving a pin terminal provided with substantially parallel depending mounting lugs adapted for insertion in openings in a printed circuit board;
said body member including pressure contact means for making electrical contact to said pin terminal;
the portion of said body between said parallel depending mounting lugs comprising first and second wall portions at opposite ends of the body member;
each of said first and second wall portions including a resilient lateral extension extending toward each other, said lateral extensions being inclined outwardly in opposite transverse directions so as to provide oppositely disposed, outwardly facing longitudinal edges for engagement with a conductor on a printed circuit board;
said mounting lugs including a tang lanced therefrom for securing said body member to a printed circuit board.

4,003,618
MULTIPLE SOCKET STRIP

Donald J. Booty, 513 Durham Drive, Frankfort, Ill. 60423

Filed Aug. 14, 1975, Ser. No. 604,585
Int. Cl.^{2} H01R *13/46, 33/46*
U.S. Cl. 339—22 R **14 Claims**

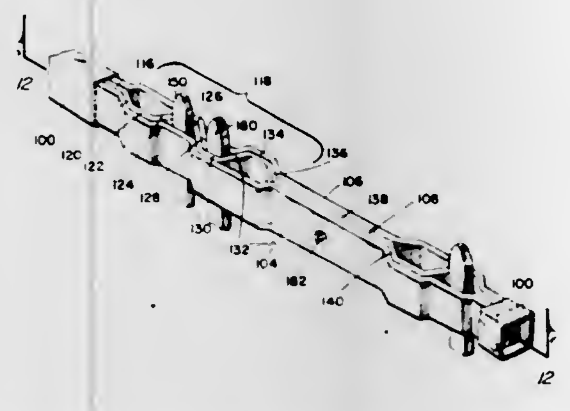


1. A multiple socket strip comprising an elongated body having a plurality of discrete socket holes extending from front to back at spaced locations therealong, first and second spaced elongated conductors, the back of said body having spaced grooves each containing one of said conductors, said grooves being on opposite sides of said holes and spaced therefrom, said body having two channels providing communication between each groove and each hole, a rear cover overlying said back of said body to conceal said elongated conductors and to close off the back end of said holes, means on said body for coupling an electrical potential to said elongated conductors, whereby a plug may be inserted into said holes and can be electrically coupled to said conductors after rotation of the plug about its longitudinal axis.

4,003,619
BUS CONNECTORS

Walter A. Smith, 3607 Sausalito, Los Alamitos, Calif. 90720

Continuation-in-part of Ser. No. 432,708, Jan. 11, 1974, abandoned. This application Apr. 4, 1975, Ser. No. 565,228
Int. Cl.^{2} H01R *9/00*
U.S. Cl. 339—22 B **8 Claims**

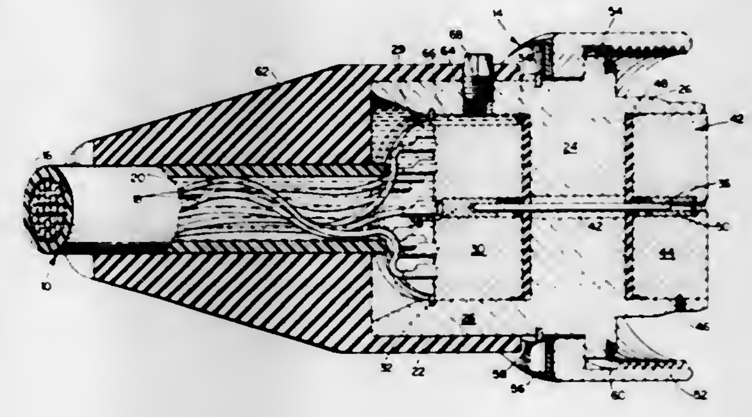


1. A bus bar for making connection to connectors which are arranged in a line comprising, in combination:
at least three bars extending side by side such that a first outer bar and a second outer bar lie on opposite sides of a middle bar;
said middle bar being formed at a region along its length such that it meanders to one side and then to the other side of a plane lying between said first and second bars; and
compression means for compressing said bars toward one another, said compression means comprising a sheath encompassing said bars.

4,003,620
PRESSURE COMPENSATED MARINE ELECTRICAL CABLE APPARATUS

Donald G. O'Brien, Wayland, and Edward R. Walker, Natick, both of Mass., assignors to D. G. O'Brien, Inc., Framingham, Mass.

Filed Oct. 12, 1970, Ser. No. 79,781
Int. Cl.^{2} H01R *13/52*
U.S. Cl. 339—29 R **16 Claims**



1. Pressure compensated electrical cable apparatus comprising
A. a liquid-impervious hollow tubular cable jacket extending between first and second ends thereof and flexing radially in accordance with changes in the environmental pressure to diminish the pressure differential across the walls thereof,
B. at least one individually-insulated electrical cable conductor within said jacket extending between said first and second ends,
C. first and second cable terminations, each of which is secured to said cable jacket at the same-numbered end thereof with a liquid-impervious and pressure-withstanding seal between the environment and said jacket interior, and further has an electrical connector conductor connected with said cable conductor within said jacket, and
D. electrically insulative and relatively incompressible fluid filling the interior of said cable jacket.

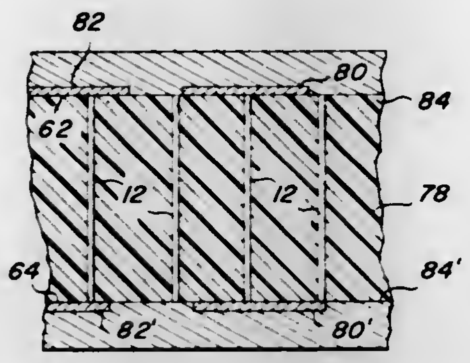
4,003,621
ELECTRICAL CONNECTOR EMPLOYING CONDUCTIVE RECTILINEAR ELEMENTS

Richard W. Lamp, Mendham, N.J., assignor to Technical Wire Products, Inc., Cranford, N.J.

Filed June 16, 1975, Ser. No. 587,062
Int. Cl.^{2} H01R *13/48*
U.S. Cl. 339—59 M **8 Claims**

1. Means for interconnecting electrically conductive areas of a first of at least two spaced-apart surfaces with corresponding electrically conductive areas of a second of the at least two spaced-apart surfaces comprising a combination of
a resilient, electrically non-conductive sheet of elastomer having a first face and a second face substantially parallel to the first face, and
a plurality of from 2,500 to 40,000 electrically conductive linear elements, the linear elements being distributed

substantially evenly throughout said sheet of elastomer and bonded to the elastomer, the linear elements rectilinearly extending from the first face to the second face, the linear elements each being a foil-wrapped textile strand.



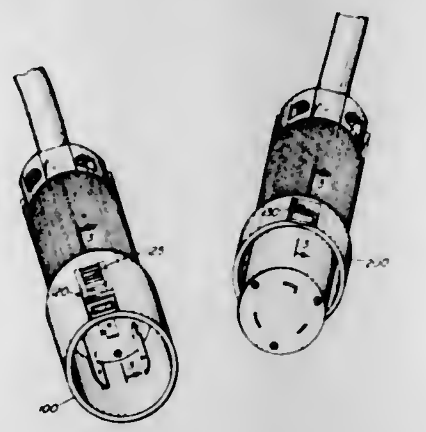
4,003,622
LOCKING SHROUD FOR ELECTRICAL CONNECTOR

Albert J. Gartland, Jr., Trumbull, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Feb. 17, 1976, Ser. No. 658,778

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 P **10 Claims**



1. A two-part electrical connector, comprising:
- a plug unit having a plurality of male electrical contacts extending from a front face thereof;
- a socket unit adapted for mating with said plug unit, said socket unit having a front face with slots therein and a plurality of female electrical contacts beneath said slots to receive the male electrical contacts when the units are mated;
- said socket unit including means for locking said plug and socket units against axial disengagement when the mated units are rotated with respect to one another;
- a generally cylindrical plug shroud element mounted coaxially on said plug unit;
- a generally cylindrical socket shroud element mounted coaxially on said socket unit and conforming circumferentially with said plug shroud element; and
- manually actuable means mounted in one of said shroud elements and moveable to engage the other of said shroud elements to prevent relative rotation as between said plug and socket units on their common axis.

4,003,623
WIRE SECURING MEMBER WITH VARYING SERRATIONS

Charles Edward Reynolds, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

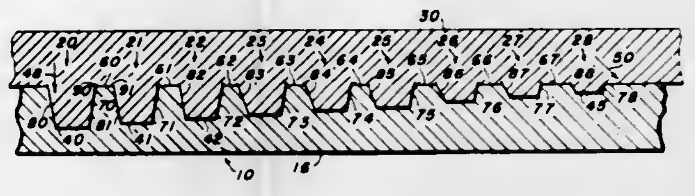
Continuation-in-part of Ser. No. 505,423, Sept. 12, 1974, abandoned. This application Sept. 12, 1975, Ser. No. 665,894

Int. Cl.² H01R *11/20*

U.S. Cl. 339—97 C **20 Claims**

1. A wire securing member for crimping about at least one wire, having a plurality of wire engaging serrations thereupon, comprising:

floors between adjacent serrations, each floor of progressively decreasing depth from the adjacent floor; and walls defining said serrations of progressively increasing angle in the direction which said floors become of decreasing depth, and of constant angle in another direction.



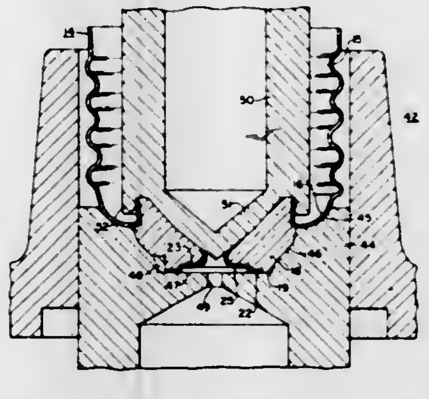
4,003,624
SNAG-PROOF ELECTRIC LAMP BASE HAVING A SINGLE END-CONTACT COMPONENT

Chrisman O. Smith, Paris, Tex., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 199,760, Nov. 17, 1971, abandoned, which is a continuation of Ser. No. 742,417, July 3, 1968, abandoned. This application Sept. 19, 1975, Ser. No. 614,816

Int. Cl.² H01J *5/56*

U.S. Cl. 339—146 **6 Claims**



1. As a new article of manufacture that can be handled en masse without causing the articles to snag and damage one another, a base component for an electric lamp or similar device comprising, in combination;
- a metal shell,
- a molded insulator that is integral with and extends beyond an end of said shell and is terminated by an end face that has an outer peripheral rim,
- said insulator having a shallow centrally-located depression in its end face and an aperture that extends through said insulator and merges with said depression, and
- a sheet metal eyelet that is embedded in and is thus an integral part of said insulator,
- said eyelet having a deformable plate-like contactor portion at one end that is disposed on the end face of said insulator and within the shallow depression thereat so that the peripheral edges of said contactor portion are protectively recessed behind the adjacent peripheral rim of said insulator that surrounds said depression,
- said eyelet being located in the aperture in said insulator and defining a lead-wire passageway that extends from the outer surface of the contactor portion of said eyelet to the interior of said metal shell, and
- the outer peripheral rim of said insulator having a plurality of spaced indents therein that merge with said depression and together therewith define a plurality of ledges that are substantially flush with the outer surface of the contactor portion of said eyelet.

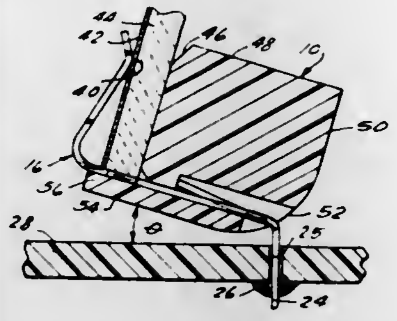
4,003,625
ELECTRICAL CONNECTOR FOR DATA DISPLAY

Daniel Peter Vladic, Berwyn, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 18, 1975, Ser. No. 569,496

Int. Cl.² H05K *1/07*

U.S. Cl. 339—176 MP **4 Claims**



1. An electrical connector for receiving and mounting a circuit board at an angle with respect to a mounting board having mounting holes therein, said connector comprising: an elongate connector insert of dielectric material having a plurality of passageways
- extending transversely therethrough and spaced along said insert;
- a plurality of electrical contacts mounted in respective ones of said passageways, each of said contacts including a first end portion extending from said insert to be received in and secured at a respective mounting board hole, and a resilient second portion extending from said insert and directed to clampingly engage and press a circuit board against a side of said insert generally perpendicular to the longitudinal direction of said passageways, said second portion including a circuit board contact portion for electrically contacting a circuit on the circuit board;
- said insert including support means coextensive with a section of said second portion to prevent bending of said second portion during insertion of a circuit board; and
- means on said insert permitting bending of said contact first portions and pivoting of said insert to a predetermined angle with respect to the mounting board after securement of said contact first portions to place the circuit board in a desired position.

4,003,626
DISTORTION CORRECTION APPARATUS FOR ELECTRO-OPTICAL REFLECTORS WHICH SCAN BEAMS TO PRODUCE IMAGES

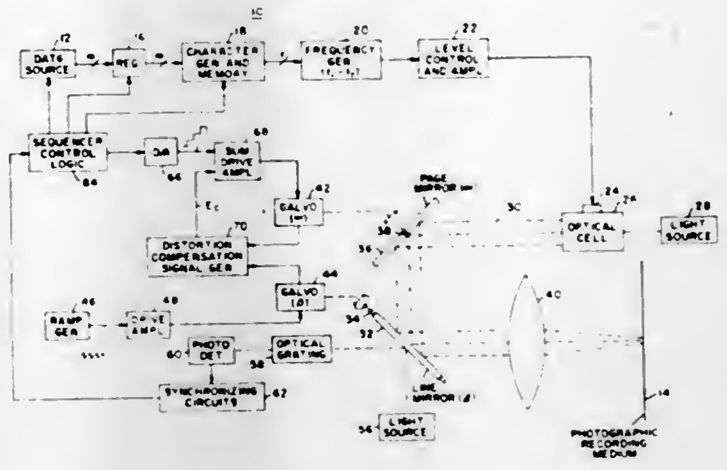
Robert V. Reinke, Penfield; John E. Newton, and Robert L. Reifsteck, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 479,382, June 14, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,245

Int. Cl.² G02B *27/17*

U.S. Cl. 350—6 **4 Claims**

1. In apparatus for correcting pin cushion distortion in a pattern formed in a plane which distortion occurs when light beams are scanned in two directions which are perpendicular to each other by first and second mirrors respectively rotatable about separate axes to thereby trace successive lines of said pattern in said plane, the improvement comprising:
- a. means responsive to the angular displacement of said first mirror which scans said beam along said lines for providing a first signal proportional to the tangent of the angular displacement of said first mirror about its axis, such first signal representing the position of said beam in said pattern in a first of said two directions;
- b. means responsive to the angular displacement of said second mirror which scans said beam along a path between said successive lines for providing a second signal proportional to the tangent of the angular displacement of said second mirror about its axis, such second signal representing the position of said beam in said pattern in a second of said two directions; and



- c. means responsive to said first and second signals for modifying the angular displacement of said second mirror in accordance with the position of said beam in said pattern to correct said distortion.

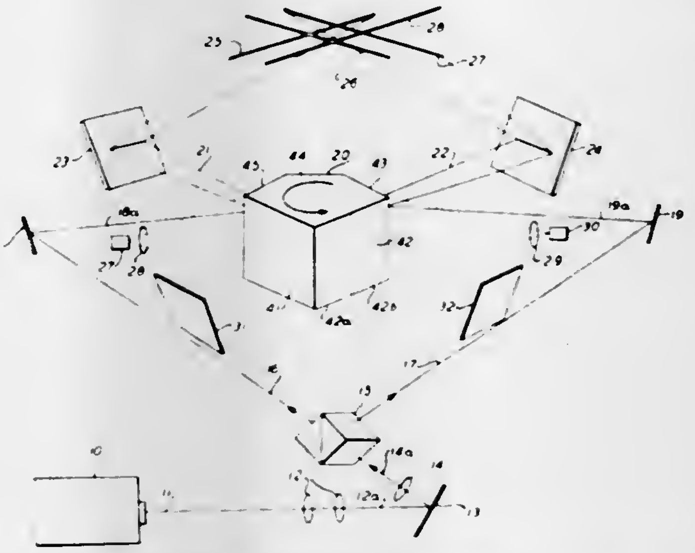
4,003,627
POS OPTICAL SCANNING STATION WITH SLOTTED PLANAR PLATE

Paul S. Wu, Randolph, and Dominick S. Fazio, Whippany, both of N.J., assignors to Litton Business Systems, Inc., Pine Brook, N.J.

Filed May 2, 1975, Ser. No. 574,140

Int. Cl.² G02B *27/17, 5/00*

U.S. Cl. 350—7 **7 Claims**



1. An optical scanning station comprising:
- means for generating a predetermined scanning pattern along a given plane; and
- a member embodying said scanning pattern in the form of open slots substantially coincident with said given plane;
- said scanning pattern comprising at least one pair of overlapping cross-shaped traces;
- said member comprising a planar plate containing the outline of said pattern in the form of slots;
- said plate being movably mounted relative to an associated housing.

4,003,628
COARSE FOCUS MECHANISM FOR MICROSCOPES

Nathaniel Halperin, San Antonio, Tex., assignor to Zale Corporation, Dallas, Tex.

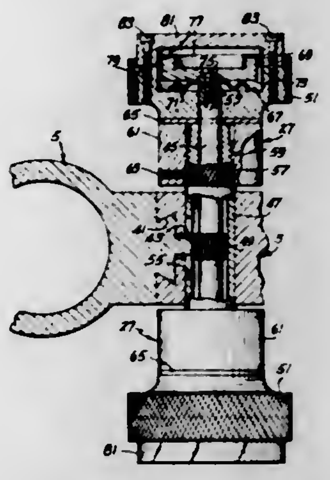
Filed Nov. 10, 1975, Ser. No. 630,216

Int. Cl.² G02B *7/04, 21/00, 21/26*

U.S. Cl. 350—77 **11 Claims**

1. A coarse focus mechanism for a microscope having a

frame and cooperating optical and stage members carried by the frame, with at least one of the members being movable relative to the other member, which mechansim comprises, in combination:
  a. a pinion shaft for moving the movable member,
  b. a knob carried by the pinion shaft for rotating the pinion shaft in clockwise and counter-clockwise directions about its longitudinal axis,
  c. an abutment carried by the pinion shaft adjacent one side of the knob for frictional engagement therewith wherein



  the abutment is laterally adjustable along the longitudinal axis of the pinion shaft, and
  d. a variable slip clutch means carried by the pinion shaft adjacent the opposite side of the knob for pressing the knob against the abutment to thereby impart a predetermined amount of frictional resistance to the knob to permit rotation of the pinion shaft when the knob is rotated such that free rotation of the knob, independent of the pinion shaft, is realized when resistance to rotation of the pinion shaft exceeds the predetermined amount of frictional resistance.

4,003,629

COUPLING DEVICE FOR LIGHT WAVES

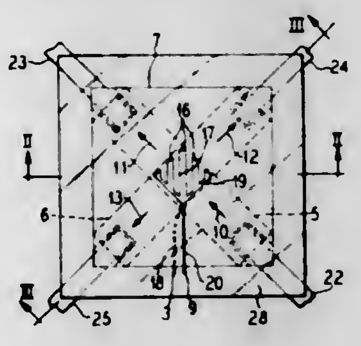
Peter Baues, Krailling; Hans Mahlein, Munich; Gerhard Winzer, Munich, and Achim Reichelt, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 16, 1975, Ser. No. 596,520

Claims priority, application Germany, July 17, 1974, 2434443

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **11 Claims**



1. A device for coupling light waves from one waveguide to another comprising in combination
  A. two elongated waveguides,
    1. each one comprised of an electro-optical crystal and adapted for the travel of predetermined light waves along a predetermined direction therein extending longitudinally therethrough,
    2. the index of refraction of one of said waveguides being n_1, the index of refraction of the other of said waveguides being n_2,
  B. said waveguides being interrelated by having
    1. n_1 greater than n_2 when said waveguides are both in an electric field free state,
    2. n_1 less than n_2 when said waveguides are both in an electric field of predetermined strength,
    3. spatial variations of n_1 and n_2, when said waveguides are both in an electric field of predetermined strength,
  C. said waveguides being spatially oriented in adjacent relationship to one another with
    1. said predetermined direction of one said waveguide extending across said predetermined direction of the other said waveguide, and
    2. a zone of intersection defined between said waveguides,
  D. a pair of electrode constructions, each one being comprised of
    1. a plurality of spaced, parallel electrically conductive grating members,
    2. an electrically conductive leader member,
    3. electrical interconnection means joining each of said grating members to said leader member,
  E. each one of said electrode constructions being spatially oriented
    1. adjacent a different one of said waveguides with said intersection zone therebetween,
    2. with the grating members thereof in spaced, parallel relationship to the grating members of the other thereof,
  F. dielectric insulation means interposed between each of said electrical constructions and its adjacent said waveguide, each said insulation means having an index of refraction which is substantially lower than each of n_1 and n_2 when said insulation means is either in an electric field free state or in said electric field, and
  G. substrate means adapted to support said waveguides, said electrode constructions, and said insulation means.

4,003,630

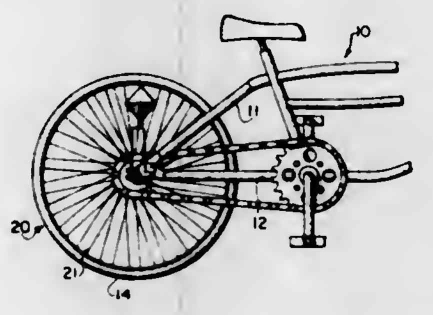
BICYCLE SAFETY REFLECTOR

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Oct. 11, 1974, Ser. No. 514,270

Int. Cl.² G02B *5/12*

U.S. Cl. 350—99 **14 Claims**



1. A safety reflector device for a bicycle having spoked wheels, said safety reflector device comprising:
  a shaft member;
  a reflective member mounted on a first end of said shaft member for revolving rotation thereon through a full 360°; and
  means for mounting said shaft member in a position adjacent to a side of a wheel of a bicycle with the reflective member on said shaft member positioned adjacent the side of said wheel such that a revolving wheel engages said reflective member to effect rotation of said reflective member about said shaft member through 360° so that opposite edges of said reflective member are alternately brought into contact with the spokes of the wheel thereby providing 360° visibility of the reflective member, said mounting means comprising means for mounting the other end of said shaft at least in proximity to the rotational axis of said wheel so that said shaft member extends radially outwardly from said rotational axis.

4,003,631

DEVICE FOR BLOCKING A LASER BEAM

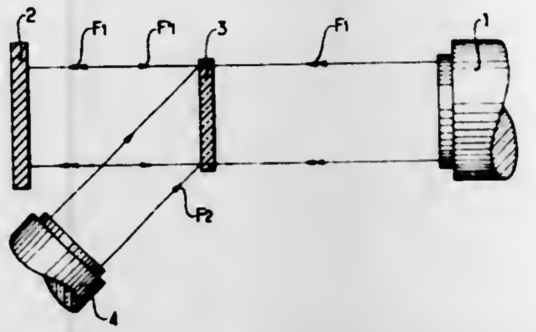
Jean-Pierre Biet, Verrieres le Buisson, and Michel Duchet, Briis Sous Forges, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed June 5, 1975, Ser. No. 584,227

Claims priority, application France, June 21, 1974, 74.21625; Sept. 30, 1974, 74.32861

Int. Cl.² G02F *1/16*

U.S. Cl. 350—160 R **14 Claims**



1. In a laser apparatus including a laser generator for emitting a laser beam along an optical axis in a forward direction to a target which reflects the beam in the reverse direction along the axis back to the laser generator, the improvement comprising:
  a. a plate made of a semi-conductive substance positioned on the axis between the laser generator and the target and having opposite parallel first and second faces, said plate being positioned so that said faces are sequentially crossed by the emitted laser beam, said plate being transparent to the emitted beam; and
  b. means for rendering said plate opaque to the reflected beam, said rendering means comprising means for generating charge carriers on one of the plate faces after the plate is crossed by the emitted beam and before the reflected beam reaches the plate in the reverse direction, thereby blocking transmission of the reflected beam through the plate and preventing the laser generator from being damaged by the reflected beam.

4,003,632

OPTOELECTRONIC SEMICONDUCTOR DEVICE

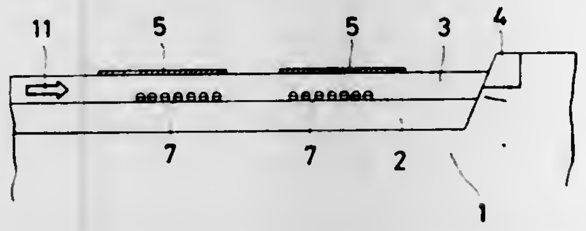
Yoshio Komiya; Eiichi Suzuki, both of Tanashi, and Yasuo Tarui, Higashi-Kurume, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 26, 1975, Ser. No. 562,134

Claims priority, application Japan, Apr. 3, 1974, 49-36888

Int. Cl.² G02F *1/20;* **G02B** *5/14;* **H01L** *33/00*

U.S. Cl. 350—160 R **12 Claims**



1. An optoelectronic semiconductor device comprising:
  a semiconductor substrate;
  a first insulating layer covering the major surface of said semiconductor substrate;
  a second insulating layer of Ta_2O_5 lying on said first insulating layer, said second insulating layer having a higher refractive index than said first insulating layer and constituting an optical waveguide together therewith;
  an electrode provided at a desired position on said second insulating layer;
  charge-storing means in said second insulating layer below said electrode for storing electric charge as nonvolatilizably memorized information;
  whereby portions of said second insulating layer other than the portion positioned under said electrode are capable of transmitting without substantial loss coherent guided light having an energy lower than that corresponding to the energy band gap of said second insulating layer, and an interaction is caused between the electric charge stored by said charge-storing means and said guided light passing therethrough, said interaction causing a change of the state of electric charge stored by said charge-storing means and causing said light to be modulated by absorption and phase change.

4,003,633

COLOR DISPLAY DEVICE

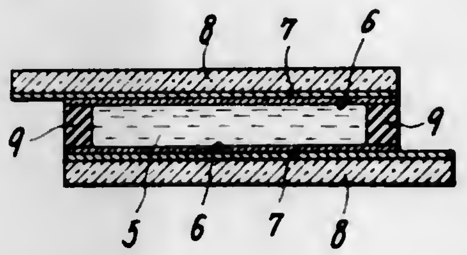
Akio Yamashita, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 19, 1975, Ser. No. 633,395

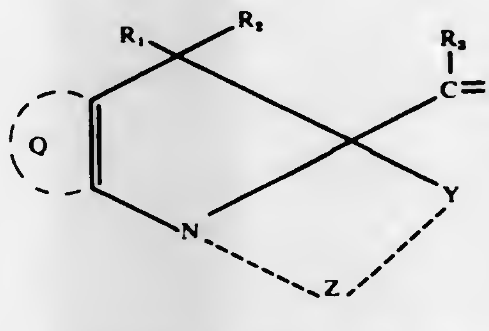
Claims priority, application Japan, Nov. 26, 1974, 49-136783

Int. Cl.² G02F *1/13;* **C09K** *3/34*

U.S. Cl. 350—160 LC **7 Claims**

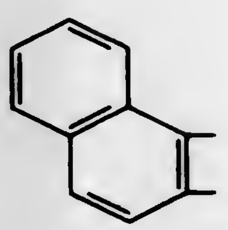


1. A color display device comprising a pair of electrodes which are disposed with a specified space therebetween, at least one of said electrodes being transparent, and a solution filled in the space,
  wherein the improvement is that the solution includes a liquid crystal and dissolved therein a styryl-like color-changing dye represented by the chemical formula:

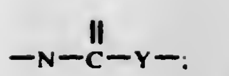


(I)

wherein Q represents a benzene ring with or without substituted radicals or Q represents

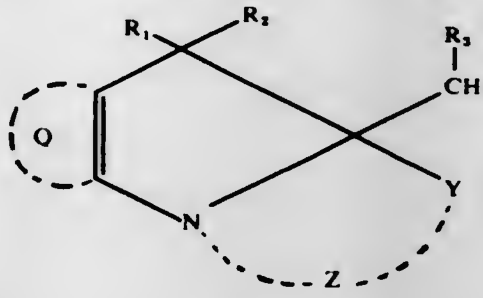


R_1 and R_2 represent a member selected from the group consisting of lower alkyl radicals, hydroxy-alkyl radicals and alkoxy-alkyl radicals; R_3 represents a member selected from the group consisting of hydrogen, alkyl radicals, alkoxy-radicals, halogen, a nitrile radical, aromatic radicals and phenoxy radicals, Y represents a member selected from the group consisting of oxygen and sulfur; Z represents an unsubstituted or alkyl substituted alkylene radical of 2 to 4 carbon atoms which alkylene radical forms a ring structure together with



$$-N-\overset{\|}{C}-Y-;$$

and A represents the radical formed when said dye is produced by a condensation reaction of the methyl radical or methylene radical in the 2- position of a precursor indoline derivative represented by the formula:



(II)

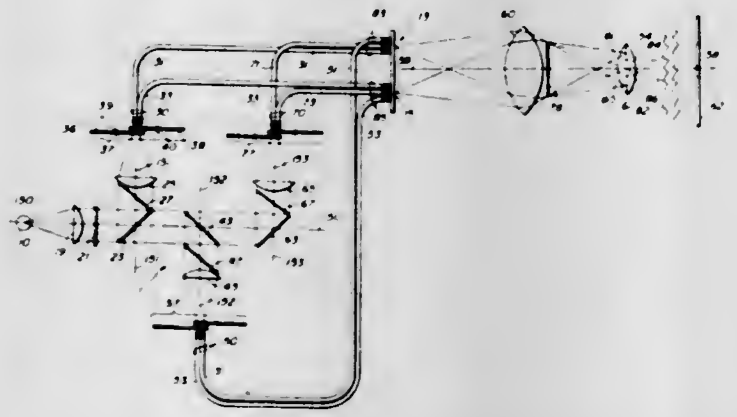
where Q, R₁, R₂, R₃, Y and Z are defined as in formula (I) above with a member selected from the group consisting of aromatic aldehydes, heterocyclic aldehydes, aromatic nitroso compounds and heterocyclic nitroso compounds.

4,003,634

OPTICAL CONTROL ASSEMBLY FOR A COLOR DESIGN VIEWER

Michael Graser, Jr., Bedford, and Vincent Francis Bilotta, Norwood, both of Mass., assignors to Technical Operations Incorporated, Boston, Mass.

Filed Aug. 12, 1974, Ser. No. 496,634
Int. Cl.² G02B *27/14, 27/38*
U.S. Cl. 350—162 SF **13 Claims**



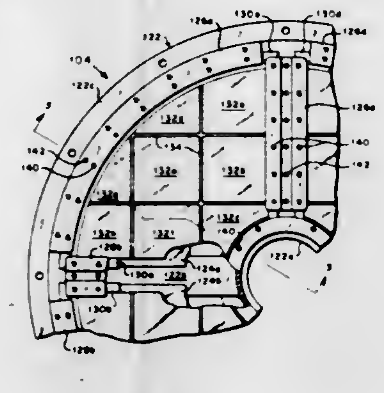
1. An optical apparatus incorporating a plurality of cooperating subsystems for providing with each subsystem a plurality of spectrally-unique light components from a source of light having spectral bandwidth encompassing all of said components, comprising means to direct light from such a source when present in a principal path that is unique to one only of said subsystems to a plurality of spectral selection means arranged sequentially in said principal path for deriving said components from said source of light, and means to direct each component substantially perpendicularly away from said principal path on a unique path that is substantially normal to said principal path and is separated from the paths of the remaining components, each of said subsystems having three spectral components, the unique paths of the first and third components along said principal path extending in a first direction, and the unique path of the component that is between said first and third extending in a second direction that is substantially perpendicular to said first direction, said subsystems being arrayed about the location of said source when present so that their respective principal paths extend radially in different directions from said location substantially perpendicular to an axis passing through said location, the unique paths of the first and third components in each said subsystem being oriented substantially parallel to said axis.

4,003,635

MOSAIC INTERFERENCE FILTER

Walter H. Ottersberg, Floral Park; Michael T. Rubertone, New Hyde Park, and Tarald H. Oigarden, Cold Spring Harbor, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1968, Ser. No. 717,489
Int. Cl.² G02B *5/28*
U.S. Cl. 350—166 **4 Claims**



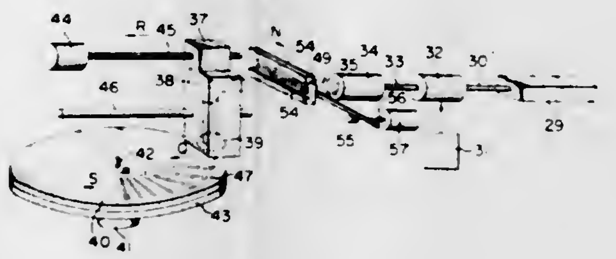
1. An optical filter comprising:
- a plurality of filter segments of substantially the same filter characteristics in abutting relationship secured to a substrate and forming a mosaic pattern on said substrate with the space between said segments sealed with an opaque material, for providing a narrow band interference filter with a high percentage of transmission at a selected wavelength; and
- a supporting structure to which said substrate is secured by a substantially compressional force.

4,003,636

LINEAR IMAGE FORMING APPARATUS

Takeshi Goshima, Tokyo, and Kiyonobu Endo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1974, Ser. No. 531,877
Claims priority, application Japan, Dec. 19, 1973, 48-143212
Int. Cl.² G02B *5/18*
U.S. Cl. 350—162 R **3 Claims**



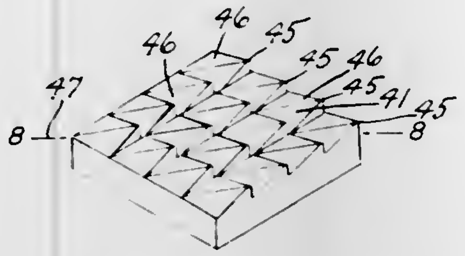
1. A linear image forming apparatus, comprising in combination:
- a beam generator to generate a light beam;
- a filter provided with a plurality of rectangular slits for diffracting said light beam from said beam generator thereby providing partial expansion thereof, said slits being arranged in parallel to each other to permit the light beam from said beam generator to pass therethrough in rectangular form, the width of each said slit being made different from the others, and the space interval between the adjacent slits also being different; and
- a converging lens to irradiate the beam passed through said plurality of slits in said filter and to converge the irradiated beam, thereby forming a linear image on the focal plane of the lens.

4,003,637

FOCUSING SCREEN FOR REFLEX CAMERAS HAVING INTEGRAL RANGE FINDER MEANS

Seiichi Masuoka, Tokyo, Japan, assignor to A. I. C. Photo, Inc., Carle Place, N.Y.

Filed June 11, 1975, Ser. No. 586,142
Claims priority, application Japan, Oct. 23, 1974, 49-122264
Int. Cl.² G02B *5/04;* **G03B** *13/28*
U.S. Cl. 350—286 **3 Claims**



1. An improved range finder type focusing screen for reflex camera comprising: a generally planar translucent member forming the body of said screen, said member having upper and lower surfaces; one of said surfaces defining a generally centrally disposed first area having a peripheral border, and a second area surrounding said first area and having a second peripheral border; said first area having a first plurality of microprisms formed on said surface, and oriented to refract light rays falling thereon along an axis substantially perpendicular to the plane of said translucent member in a first direction having a first vector component lying in said plane; said second area having a second plurality of microprisms oriented to refract light rays falling thereon along axes substantially perpendicular to said last mentioned plane in a second direction having a second vector component equal in magnitude to said first vector component and lying in said plane and extending in a direction opposite that of said first vector component; whereby portions of an out-of-focus image cast upon said first and second areas will appear mutually displaced along an axis parallel to that of said first and second vector components, and blurred to a degree depending upon the distance said portions are mutually displaced.

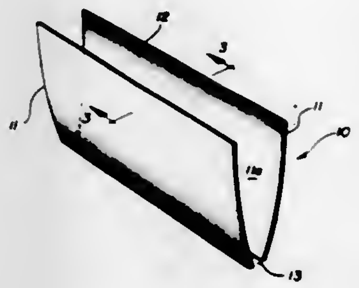
4,003,638

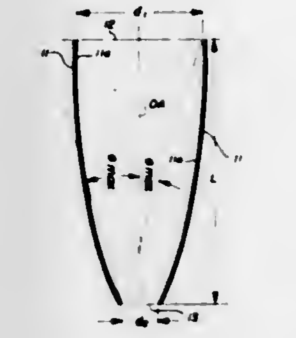
RADIANT ENERGY COLLECTION

Roland Winston, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Continuation of Ser. No. 429,161, Dec. 28, 1973, Pat. No. 3,923,381. This application Sept. 15, 1975, Ser. No. 613,577
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.² G02B *5/10*
U.S. Cl. 350—293 **7 Claims**

1. Solar energy collection and utilization apparatus, said apparatus comprising:
- a concentrator element means for collecting and concentrating solar energy including,
- a pair of longitudinally extending substantially parallel walls having substantially concavely sloping opposing inner solar energy reflective surfaces, the upper edges of said surfaces defining solar energy inlet means,
  - said concentrator element having an optical axis determinable by reference to distances separating opposing upper reflecting surface edges,
  - said concentrator element further having a field of acceptance for solar energy and an angular acceptance including a maximum angle of acceptance within said field, determinable at said energy inlet and with respect to said optical axis; and
- solar energy trap means operatively associated with said concentrator element reflecting surfaces for receiving solar energy concentrated by said surfaces,
- the profile curve of at least a portion of each said concavely sloping reflecting surface being shaped to substantially assume the maximum possible slope consistent with reflecting the maximum angle solar energy rays which enter the concentrator energy inlet means within said field of acceptance onto said solar energy trap means, and wherein





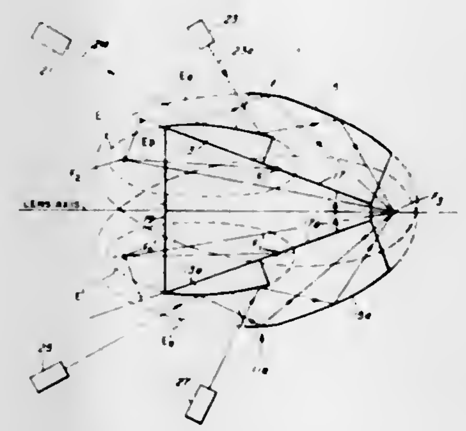
- the dimensions of said energy inlet and said profile curve of said reflecting surfaces are such that said field of acceptance is cápable of including an arc segment of coordinates equal to those described by the apparent motion of the sun within at least one hour before and after reaching zenith point at solstice.

4,003,639

CATOPTRIC LENS ARRANGEMENT

Philip J. McFarland, Lynnfield, and Werner R. Rambauske, Carlisle, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 268,270, July 3, 1972, abandoned. This application July 3, 1975, Ser. No. 592,832
Int. Cl.² G02B *5/10*
U.S. Cl. 350—294 **3 Claims**



1. In a catoptric arrangement for combining optical energy from a plurality of sources, the improvement comprising:
- a. at least a first and a second plurality of mirror assemblies disposed about a common axis, each one of such assemblies including a convex entrance mirror and a concave secondary mirror for focusing optical energy at a focal point; and
- b. common mounting means for all of the convex entrance mirrors and all of the concave secondary mirrors, such

mounting means being formed to support the first plurality of mirror assemblies at a first distance from the common axis and to support the second plurality of mirror assemblies at a second distance from the lens axis.

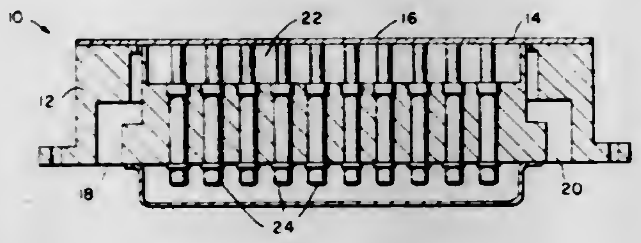
4,003,640
ELECTRO-HYDRAULIC DRIVER FOR DEFORMABLE FACE PLATE

Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 23, 1975, Ser. No. 589,510

Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **4 Claims**



1. In combination:
a body;
a plurality of electro-hydraulic-mechanical actuators, each of said actuators having a housing, and each of said actuators having an electro-mechanical device, a mechanical-hydraulic valve, a hydraulic-mechanical piston and a spring each mounted with respect to said body;
each said electro-mechanical device being mounted between said body and said valve so that upon electrical actuation of said electro-mechanical device, said electro-mechanical device moves a portion of said valve to control hydraulic flow through said valve to control hydraulic pressure on said piston, said piston being connected to said spring and said spring being connected to said body so that upon change in hydraulic pressure on said piston, said piston moves with respect to said body by resilient deflection of said spring; and
a face plate mounted with respect to said body, each of said pistons engaging with said face plate to deflect said face plate so that the shape of said face plate is controlled by electric signals to said electro-mechanical devices.

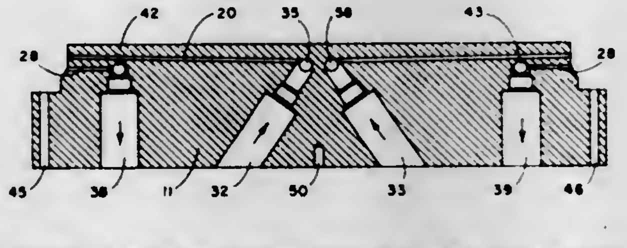
4,003,641
LOW DISTORTION HIGH ENERGY LASER MIRROR

Theodore A. Heinz, Moorpark, Calif., and Charlton Dunn, III, Berwyn, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1975, Ser. No. 598,978

Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **6 Claims**



1. A mirror having a cooled face for high energy reflection comprising:
a mirror substrate in substantially rectangular block form;
a plurality of coolant slots disposed in parallel relationship in the surface of said substrate designated as the major surface;
a common inlet conduit on one side of said substrate at one of the ends of said slots and means connecting alternate ones of said slots to said conduit;
a common outlet conduit on said one side of said substrate and means connecting the other ones of said slots to said outlet conduit;
an outlet conduit on the other side of said substrate at the other ends of said slots and means connecting said alternate ones of said slots thereto;
an inlet conduit on said other side of said substrate and means connecting the remaining ones of said slots to said inlet conduit;
inlet and outlet coolant ports in the surface of said substrate opposite said slots;
at least two inlet manifolds in said substrate and means connecting said inlet manifolds to respective ones of said inlet conduits;
at least two outlet manifolds in said block and means connecting said outlet manifolds to respective ones of said outlet conduits;
means in said block connecting said inlet and outlet manifolds to respective ones of said inlet and outlet ports;
a supply of coolant and means connecting said supply to said inlet ports; and
a mirror surface formed across and made integral with said major surface of said substrate,
whereby said mirror surface may be cooled by counter flow of coolant in adjacent slots across said major surface thereof and said substrate may be cooled by counter flow of coolant through said means connecting said conduits, manifolds and ports therein.

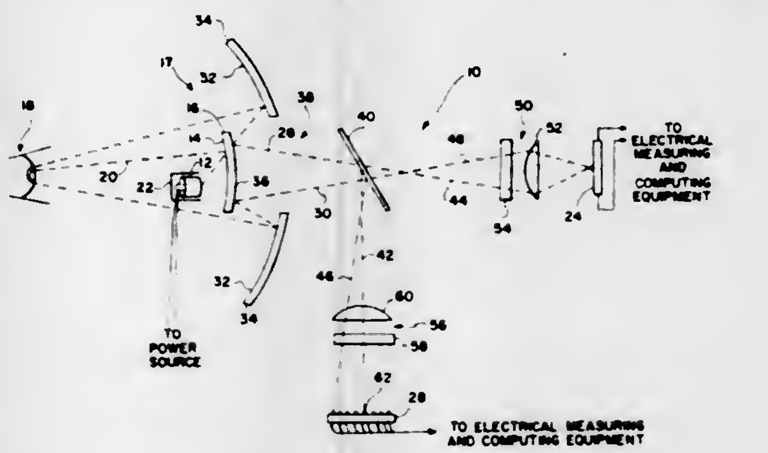
4,003,642
OPTICALLY INTEGRATING OCULOMETER

Arthur W. Vogeley, Yorktown, Va., assignor to Bio-Systems Research Inc., Yorktown, Va.

Filed Apr. 22, 1975, Ser. No. 570,853

Int. Cl.² A61B *3/10*

U.S. Cl. 351—6 **5 Claims**


TO ELECTRICAL MEASURING AND COMPUTING EQUIPMENT
TO POWER SOURCE
TO ELECTRICAL MEASURING AND COMPUTING EQUIPMENT
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1. An improved oculometer which comprises:
radiation source means;
directing means for focusing and directing the emissions from said radiation source onto an observers eye;
optical integration means which processes the reflections from the observers eye by compressing the optical field in at least one dimension so that the optical field of the reflections is converted into a linear form with varying light information along its length; and
linear sensing array means comprising a series of individual sensing elements upon which the linear form of the reflections are focused which yield electrical information varying with the intensity of radiation falling on the individual elements of the array.

4,003,643
MOTION-PICTURE CAMERA ACCOMMODATING SILENT-FILM AND SOUND-FILM CASSETTES

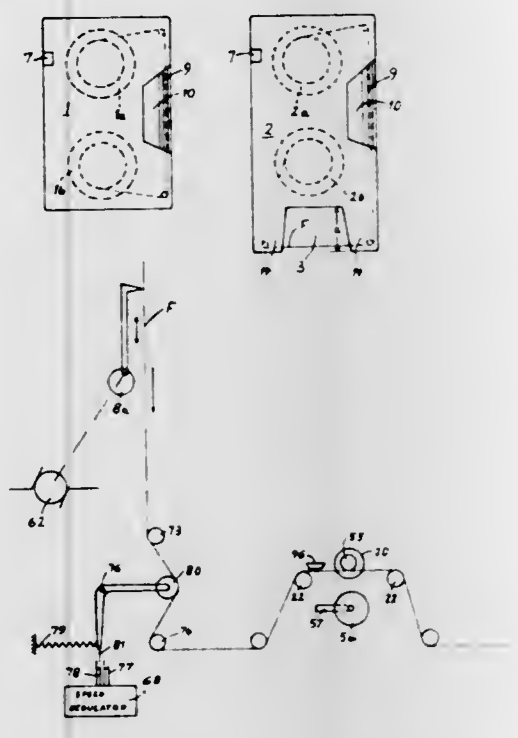
Otto Freudenschuss; Otto Kantner, and Peter Revy von Belvard, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation-in-part of Ser. No. 460,136, April 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,085

Claims priority, application Austria, Apr. 16, 1973, 3383/73

Int. Cl.² G03B *31/00*

U.S. Cl. 352—14 **7 Claims**



1. A motion-picture camera for alternatively exposing a silent film contained in a cassette of a first type and a sound film contained in a cassette of a second type differing in shape from that of said first type, the film being accessible with either type of cassette at an upstream location for illumination and with said second type of cassette also at a downstream location for sound recording, comprising:
a casing forming a cassette-receiving chamber and an image gate opening into said chamber;
first feed means in said chamber engageable with the film of an inserted cassette at said upstream location for intermittently transporting said film past said image gate;
sound-recording means in said chamber positioned for co-operation with the film of an inserted cassette of said second type at said downstream location;
second feed means in said chamber engageable with the film of an inserted cassette of said second type at said downstream location for transporting the film past said sound-recording means at a substantially constant speed;
drive means for actuating said first and second feed means, said drive means including a motor operatively coupled with said first feed means;
sensing means in said casing for detecting the presence of a cassette of said second type in said chamber;
first speed-regulating means for stabilizing the operating speed of said motor with a cassette of said first type;
second speed-regulating means for controlling said drive means to maintain a substantially constant length of film between said upstream and downstream locations with a cassette of said second type; and
switchover means responsive to said sensing means for activating said first speed-regulating means to the exclusion of said second speed-regulating means in the absence of a cassette of said second type and for activating said second speed-regulating means to the exclusion of said first speed-regulating means in the presence of a cassette of said second type.

4,003,644
CINEMATOGRAPHIC VIEWER-PROJECTOR

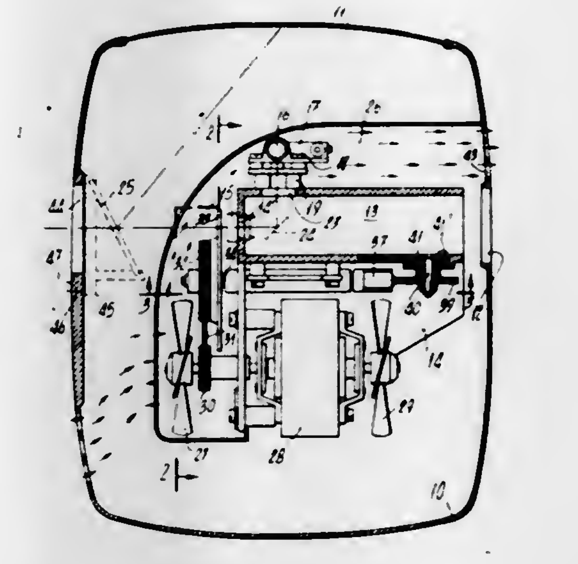
Angela Aruanno, Milan, Italy, assignor to Lamy S.r.l., Milan, Italy

Filed Jan. 23, 1974, Ser. No. 435,991

Claims priority, application Italy, Jan. 25, 1973, 19584/73; Dec. 31, 1973, 32426/73

Int. Cl.² G03B *21/10*

U.S. Cl. 352—72 **5 Claims**



1. A projector-viewer for motion picture films continuously unwinding and winding on a spool within a magazine, comprising, in combination, a case having a translucent wall operating as a screen, and defined in another wall first opening for inserting and removing the magazine; a frame mounted internally of said case defining a magazine housing which at one outer opened end thereof communicates with said first opening in said case for the passage of the magazine, while the other opposite end thereof has an exposition opening across which the film passes for exposing a frame of the film moving in front of the exposition opening and an optical projection system aligned with the exposition opening, a light source mounted on a larger side of the magazine housing which extends between said one outer opened end and the other opposite end, said larger side having an opening located to correspond with the light source so that the light from the light source passes therethrough to be reflected by a mirror on the magazine onto the frames of the film; an electrical motor controlling a rotating shutter disc having on a face thereof a U-shaped cam for operating a claw drawing the film in front of the exposition opening, and also controlling by means of mechanical drives a pin for the film spool in the magazine and cooling fans, said case having defined therein a second opening in front of the optical projection system and a reflecting means carried on a movable reflecting means frame mounted on said case slidably with respect to said second opening and being mounted to be movable between a first position covering said second opening and reflecting an image to said screen, and a second position uncovering said second opening, a stationary frame secured to said case in registry with said second opening, said stationary frame having projection window masked by a transparent means, said reflecting means including an inclined mirror and the movable frame carrying the inclined mirror at a position inwardly of the case, and a control handle outwardly projecting from a slit defined in the stationary frame for imparting a sliding movement to the movable frame relative to the stationary frame for moving the reflecting means.

4,003,645
FILM-HANDLING APPARATUS

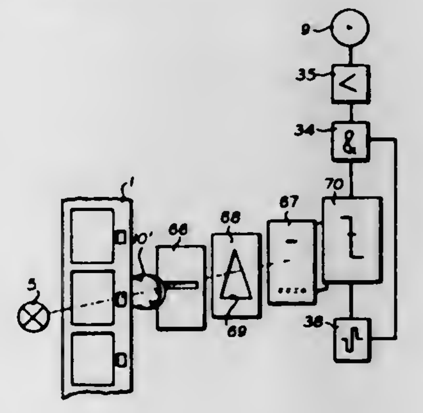
Heinz Broeckl, Gmund; Friedrich Forch, Vienna; Otto Freudenschuss, Vienna; Eduard Keznickl, Vienna; Gottfried Patels, Vienna, and Leopold Rollenitz, Totzenbach, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Division of Ser. No. 189,623, Oct. 15, 1971, Pat. No. 3,806,244. This application Feb. 11, 1974, Ser. No. 441,000

Claims priority, application Austria, Oct. 20, 1970, 9455/70; Nov. 5, 1970, 9983/70; Nov. 19, 1970, 10457/70; Nov. 24, 1970, 10601/70; Mar. 4, 1971, 1893/71; Apr. 6, 1971, 2944/71

Int. Cl.² G03B *41/10*

U.S. Cl. 352—109 **5 Claims**



1. An apparatus for handling an elongate recording strip for optical information, said strip being provided with optically detectable marks, comprising:
- feed means for continuously advancing said strip past an information-transfer point;
- a source of light rays incident upon said strip at said transfer point;
- optical means forming said light rays into a beam generally perpendicular to said strip at said transfer point;
- light-deflecting means in the path of said beam pivotable about an axis transverse to the direction of advance of said strip;
- reciprocating drive means for said light-deflecting means provided with a control circuit responsive to electrical signals for keeping said beam trained upon a specific area of the advancing strip in a relatively slow forward sweep during a major portion of a recurrent operating cycle and for restoring said beam to an initial position in a relatively fast return sweep during a terminal phase of said cycle;
- signal-generating means for said control circuit producing a pair of consecutive pulses of opposite polarities in said terminal phase for effecting said return sweep and arresting said light-deflecting means in said initial position, respectively; and
- synchronizing means controlled by said feed means for triggering said signal-generating means and matching said forward sweep to the advance of said strip, said synchronizing means including a detecting circuit provided with photoelectric means positioned to receive light from said marks, electronic switching means connected to said photoelectric means for energization thereby, said switching means having an output connected to said signal-generating means for triggering same into emission of said pair of pulses in response to a predetermined output voltage from said photoelectric means, focusing means in said detecting circuit, and masking means for partly obstructing the transmission of light from said marks through said focusing means to said photoelectric means, said masking means having an aperture of nonuniform width for causing generation of said predetermined output voltage from said photoelectric means in a limiting position of a mark.

4,003,646
CINE CAMERAS

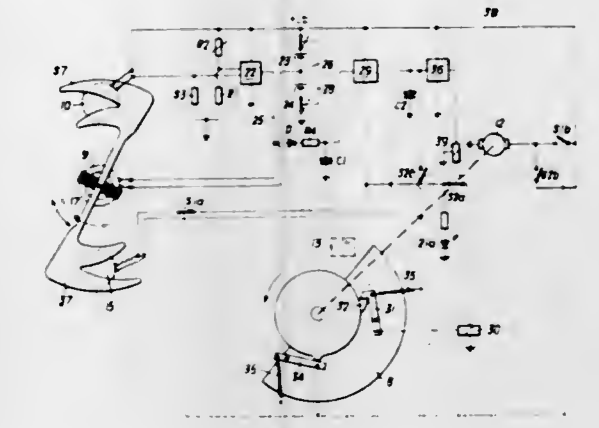
Otto Freudenschuss, and Gerd Kittag, both of Vienna, Austria, assignors to Karl Vockenhuber and Dennis Hauser, both of Vienna, Austria

Filed Oct. 22, 1975, Ser. No. 624,650

Claims priority, application Austria, Oct. 24, 1974, 8543/74

Int. Cl.² G03B *9/58, 19/18*

U.S. Cl. 352—141 **14 Claims**



1. In a cine camera including a lens system for image light from a subject onto a film; and a shutter arranged in the path of the light; in combination
- exposure regulating means including a photo-electric transducer and an adjustable diaphragm for varying the filming aperture, during continuous operation of the shutter with predetermined exposure time for each film frame, to provide correct film exposure;
- sensing means for sensing when the maximum available aperture is inadequate for correct exposure within the said predetermined exposure time; and
- means operable in response to an output of said sensing means for holding the shutter open, for each film frame, for a sufficient time to achieve correct exposure.

4,003,647
CLAW MECHANISM

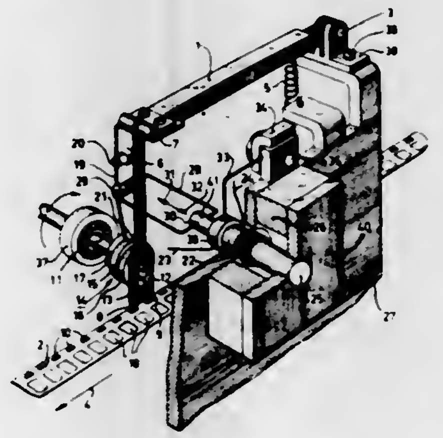
Bernardus Johannes Kuppens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,327

Claims priority, application Netherlands, Sept. 10, 1974, 7411986

Int. Cl.² G03B *1/22*

U.S. Cl. 352—194 **6 Claims**



1. A claw mechanism for the transport of a perforated record carrier, in particular a film (2) in a film projector, along a transport path, and comprising:
- a claw arm (1) which is disposed substantially parallel to the transport path and which is pivotable about a pivoting spindle (3) transverse to the direction of transport of the record carrier,

- a spring (5) which loads the claw arm in a direction towards the transport path,
- a claw means (6) having one or more claw teeth, which means extends substantially transversely to the transport path and which is connected to the free end of the claw arm (1) and is pivotable about a spindle (7) which is also transverse to the direction of transport,
- a drive shaft (11) which is disposed parallel to said two pivoting spindles (3, 7) and which rotates continuously during operation, and a crank (12) which cooperates with a slot (13) in the claw means (6), as well as
- electromagnetic control means for controlling the movements of the claw arm and thus the speed of transport of the record carrier, characterized in that:
- a cam roller (14), is disposed on the drive shaft, which roller comprises a first cam (15) for keeping the claw means out of engagement with the perforations of the record carrier, and a second cam (16) with a profile which is adapted for temporarily bringing the claw means (6) into engagement with the perforations (10) per revolution of the drive shaft (11) for advancing the record carrier (2), the cam profiles coinciding for a part of their circumference, and the claw mechanism furthermore comprises:
- a cam follower (19) which is connected to the free end of the claw arm (1) so as to be pivotable about a spindle (20) parallel to the direction of transport (4), which cam follower is pressed against the cam roller (14) with its free end (21) by the spring (5), as well as
- connection means, which connect the cam follower to the electromagnetic control means and which transmit the movements thereof to the cam follower.

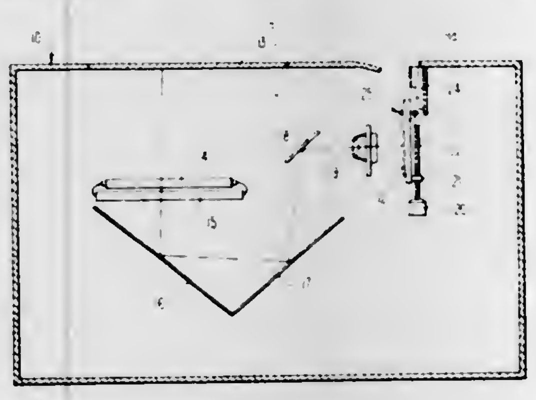
4,003,648
APPARATUS FOR MAKING ELECTRICAL CONTACT WITH AN ELECTROPHOTOGRAPHIC FILM

Frank C. Gross, Wilbraham, Mass., assignor to A.B. Dick/Scott, South Hadley, Mass.

Filed Apr. 23, 1975, Ser. No. 570,821

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**



1. In an apparatus for imaging an electrophotographic film comprising an enclosure within which the film is imaged, a carrier for holding the film while it is imaged, and reciprocating means for moving the carrier holding the film to and from a load position and an imaging position,
- the improvement of electrical connective means for establishing electrical contact with an electrically conductive area on the surface of the film comprising:
- an electrical contact member connected to the carrier for making electrical contact with the conductive area;
- engagement means for moving the contact member into electrical contact with the conductive area of a film placed on the carrier in response to movement of the carrier from the load position to the imaging position; and
- disengagement means for moving the contact member away from the film in response to movement of the carrier from the imaging position to the load position.

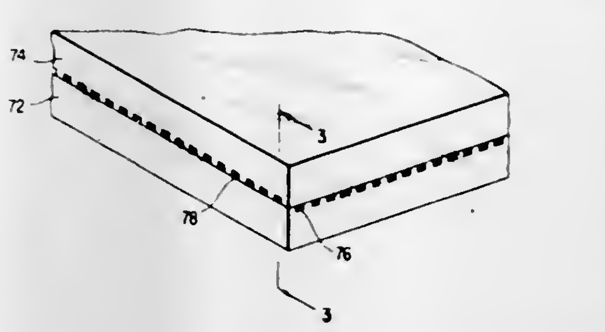
4,003,649
ELECTROPHOTOGRAPHIC HALFTONE PRINTING MACHINE EMPLOYING A PHASE SCREEN

Robert Nathan Goren, Rochester, N.Y.; William Streifer, Palo Alto, Calif., and Lawrence Morton Marks, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1975, Ser. No. 556,387

Int. Cl.² G03G *15/01*

U.S. Cl. 355—4 **22 Claims**



1. Apparatus for providing a halftone pattern on a photosensitive member comprising:
- means for projecting a light image onto the photosensitive member; and
- a phase screen, interposed between said projecting means and the photosensitive member so that the light image passes therethrough, including a substrate having a plurality of grooves therein, said phase screen transmitting light therethrough, in which light transmitted only through the substrate is phase shifted with respect to light passing through both the grooves and the substrate, the grooves being of a preselected depth so that the light transmitted therethrough forms a halftone pattern of the light image on said photosensitive member having substantially the same spatial frequency over a predetermined extended range of wavelength of light.

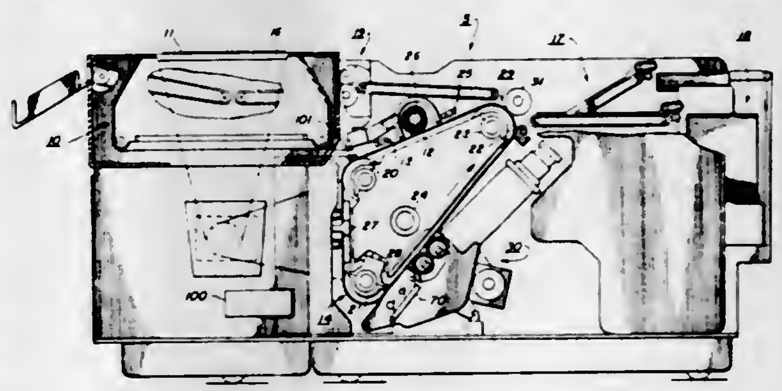
4,003,650
CONTROLLER FOR REPRODUCTION APPARATUS

John E. Courtney, Fairport; Charles J. Urso, Webster, and Charles D. Wilson, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1974, Ser. No. 521,102

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **4 Claims**



1. In an apparatus for controlling the electrostatic development field in a reproduction machine to enhance development of the latent electrostatic images on the photoconductive member of said reproduction machine, the reproduction machine including as components contributing to said electrostatic development field, charging means for charging the photoconductive member in preparation for imaging, exposing means for exposing the charged photoconductive member to provide a latent electrostatic image of the original on the member, and developing means for developing the image, the combination of
- a potential controller including a probe operatively arranged adjacent said photoconductive member to sense

potentials on said member and a control section adapted to control a power source for biasing at least one of said reproduction machine components in response to changes in potential on said photoconductive member as sensed by said probe; said probe producing a signal indicative of the potential on said photoconductive member,

said controller having an internal power source for driving said controller;

a first circuit means operatively coupling said controller power source with at least one of said reproduction machine components whereby the controller's own power source serves as the source of power for said one component and for said controller;

said control section including a first control for regulating power input from said controller power source to said first circuit means in response to the signal from said probe whereby to vary bias to said one component in accordance with changes in said photoconductive member potentials; and

a second circuit means operatively coupling said controller power source with said probe whereby to bias said probe and neutralize probe spacing effects,

said control section including a second control for regulating power input from said controller power source to said second circuit means in response to the signal from said probe whereby to vary bias to said probe in accordance with changes in said photoconductive member potentials, said controller including

means to enable the potential control point of said controller to be selected,

said control section providing control signals reflecting the relationship between the potential control point selected and the potential sensed by said probe for each of said first and second controls.

4,003,651

SYSTEM FOR RECORDING IMAGES RECEIVED BY FACSIMILE

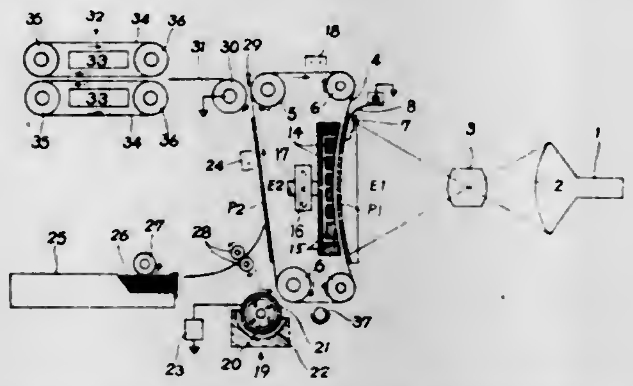
Yoshisuke Hashida, and Tsuneo Hibino, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1975, Ser. No. 543,903

Claims priority, application Japan, Jan. 28, 1974, 49-11964; Jan. 28, 1974, 49-12107[U]

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—16 **4 Claims**



1. An image recording system for use in combination with a facsimile in which a series of light spots scanning in sequence on the screen surface of a flying-spot scanner tube are projected onto a photosensitive sheet through an optical system to produce a latent image composed of said series of light spots on said photosensitive sheet and said latent image is visualized by use of toner, said system comprising: a carrying member movable along a fixed path containing a projection station of said optical system, two photosensitive sheets mounted on said carrying member is such a manner that one of said photosensitive sheet is positioned at said projection station while the other of said photosensitive sheet is position at another fixed position, means for mounting said two photosensitive sheets on said carrying member so that upon one and a half times of revolving movement of said carrying member, said one photosensitive sheet is positioned at said another fixed position while the other photosensitive sheet is positioned at said projection position, a developing means, a transfer means and an electrically charging means arranged along the movement path of said carrying member, and a fixing means, said developing means selectively functioning to develop the photosensitive sheet subjected to projection of said light spots and to remove the residual toners on the photosensitive sheet by application of electrical potential of desired polarity and of desired magnitude, and means for producing two copies of the recorded image for every three times of revolving movement of said carrying member.

4,003,652

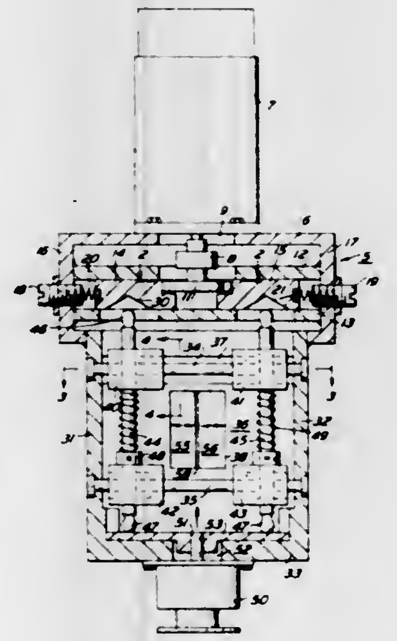
SHUTTER-OPENING PRESETTING MECHANISM FOR MOTION PICTURE COPYING APPARATUS

William H. Allen, Bellerose, and Dom Capano, Staten Island, both of N.Y., assignors to F & B/CECO Industries, Inc., New York, N.Y.

Filed Feb. 25, 1975, Ser. No. 552,818

Int. Cl.^{2} G03B *9/42, 27/48, 27/78*

U.S. Cl. 355—71 **11 Claims**



1. Control mechanism for rapidly setting the width of opening between linearly movable opposed shutter halves, comprising: a rotatable cam having an eccentric circumferential surface of curvature, opposed slide members in yieldable contact with said circumferential surface at opposite sides thereof, whereby rotation of said cam effects relative movement of said slide members in opposite directions, each of said slide members having a V-shaped groove in a wall thereof, the apex of which groove is located substantially normal to the path of movement of the slide members; separate spaced apart slide blocks mounted for movement toward and away from each other in a path parallel to that of the aforesaid slide members, each of said slide blocks carrying a rod member for integral movement with its associated slide block each of said rod members also being movable relative to its associated slide block in a path normal to the path of movement of said slide block; each said rod member terminating in a ball-shaped forward end normally positioned at rest in an area defined by the width of the base of said V-shaped groove, and said end being normally spaced apart from the sloping walls of said groove; each of said slide blocks also having a shutter half integrally associated for movement therewith; means for rotating said cam through a predetermined distance to fix the position of said slide members and their associated V-shaped grooves; and separate operating means to move said rod members relative to their associated block members in a forward stroke to effect displacement of their ball-shaped ends from normal rest position and causing each such end to impinge upon a sloping wall of an adjacent V-shaped groove and to move along such wall to the apex of the groove, thereby moving its operatively associated slide block and shutter half to a position determined by the spacing between the apexes of the grooves, thus fixing the width of opening between said shutters.

4,003,653

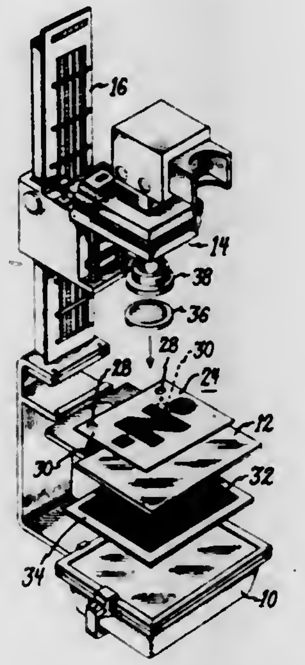
METHOD OF PRODUCING COLOR SLIDES FROM BLACK AND WHITE ORIGINALS

James H. Kelly, II, Adams, Mass., assignor to General Electric Company

Filed Mar. 17, 1975, Ser. No. 558,677

Int. Cl.^{2} G03B *27/32*

U.S. Cl. 355—77 **7 Claims**



1. A method of making a color slide from a black and white original comprising the steps of

a. providing a positive and a negative of the black and white original
b. placing said positive between a light box and a camera
c. placing a color filter on the lens of said camera
d. exposing a film frame in said camera to said positive
e. removing said positive and placing said negative between said light box and said camera
f. providing another color filter to said camera lens
g. exposing the same film frame to said negative whereby a color slide is provided having one color of background and a second color of foreground.

4,003,654

CONTACT PRINT TEST WINDOW

William G. Smolen, Jamaica, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

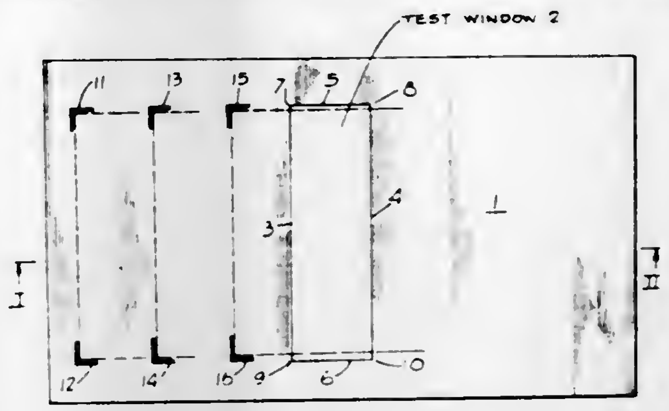
Filed May 30, 1975, Ser. No. 582,074

Int. Cl.^{2} G03B *27/28*

U.S. Cl. 355—125 **2 Claims**

1. A contact photoprint testing device, comprising

a sheet of opaque material having a substantially rectangular window positioned in the center of said sheet, said window having four sides and four corners, said sheet having marks thereon indicating the positioning of an edge of a test print for placement over the window to expose different areas of the test print in succession, said marks comprising a plurality of pairs of corner indications at different distances from a pair of corners of the window whereby a test print is first positioned with the corners of one edge at the corner indications farthest from the window for exposure and is successively positioned at the indications closer to the window for exposure.



4,003,655

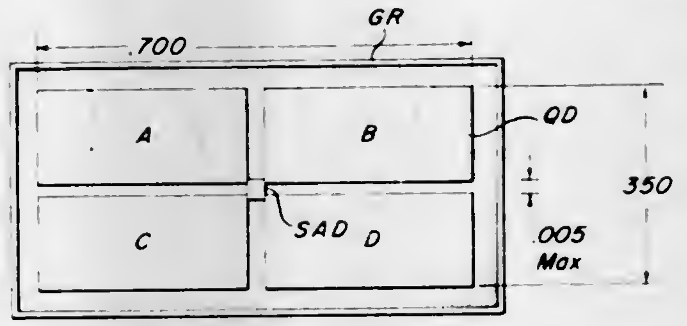
HYBRID SILICON AVALANCHE QUADRANT DETECTOR

Robert Wasilko, Belmar, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1975, Ser. No. 569,045

Int. Cl.^{2} G01C *3/08*; G01J *1/20*

U.S. Cl. 356—4 **7 Claims**



1. An airborne laser tracker with a target ranging capability including an optical system having an optical axis and receptive of laser radiation from a target comprising: a first detector means disposed adjacent said optical axis for detecting radiation received by said optical system, said first detector means including spaced electrodes upon which a portion of said received radiation impinges, another portion of said received radiation passing through spaces between said electrodes; and second detector means for target ranging mounted in fixed relation with respect to said first detector means, said second detector means disposed behind said first detector means along said optical axis in substantial alignment with said first detector means for intercepting said another portion of said radiation for detecting radiation transmitted between electrodes of said first detector means, said second detector means having a sensitivity greater than that of said first detector means and an aperture smaller than that of said first detector means.

4,003,656

FINGERPRINT SCANNING DEVICE

Stephen Richard Leventhal, Suite 506E, 7315 Wisconsin Ave., Bethesda, Md. 20014

Continuation-in-part of Ser. No. 359,008, May 10, 1973, Pat. No. 3,864,042. This application Oct. 7, 1974, Ser. No. 512,862

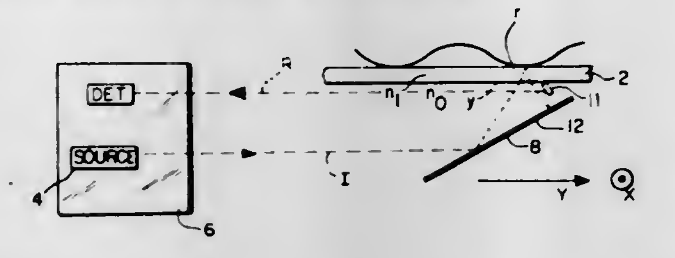
The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.^{2} G06K *9/08*

U.S. Cl. 356—71 **7 Claims**

1. A system for producing a pattern comprising ridges and troughs in accordance with a fingerprint of an individual's finger, said system comprising:

a. light source means;
b. scanner means for scanning said light source over said finger in a point-by-point scan, said scanner means comprising first means including a reflector means for scanning said light source along one axis of said finger; second means positioned to receive the light from said first means, for directing the light to said finger along a path such that said light is reflected by said finger and for directing the light reflected by a ridge in said finger along a predetermined path, wherein the light reflected by a trough is directed along other paths, and driver means for driving said second means such that the light source is scanned along a second axis of said finger;



c. detector means for detecting only the light from said light source means reflected along said predetermined path by said finger; and wherein said second means includes first and second mirrors positioned such that light from said first means is reflected by said first mirror towards said finger and light reflected by a ridge along said predetermined path is then reflected by said first mirror towards said second mirror and said light is then reflected by said second mirror such that it is detected by said detector means; and
e. output means, coupled to said detector means, for reproducing said pattern of ridges and troughs in accordance with the light detected by said detector means, wherein said pattern corresponds to the fingerprint of said finger.

4,003,657
ROTATING SUPPORT TABLE AND DRIVE FOR AN ECHELLE GRATING

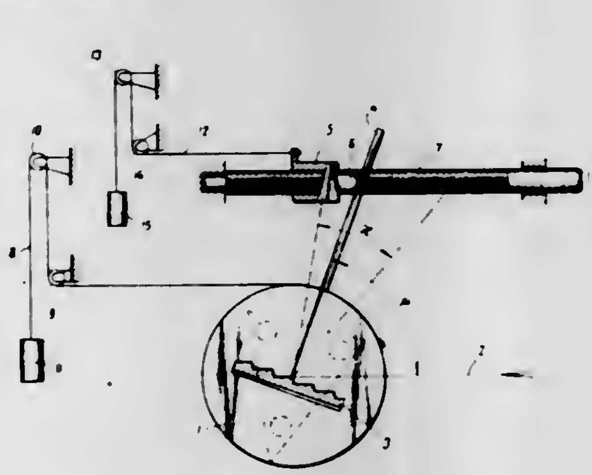
Rostislav Sovicka, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 7, 1975, Ser. No. 565,706

Claims priority, application Czechoslovakia, Apr. 9, 1974, 2543-74

Int. Cl.² G01J *3/12*

U.S. Cl. 356—100 **7 Claims**



1. In an arrangement for the control of a diffraction grating wherein a light beam is directed to impinge on the grating; the improvement comprising a rotatable table having a substantially planar top surface, said diffraction grating being supported on said table, the lines of said grating being perpendicular to said top surface on said table, a control arm fixed to said table, a nut having a cam, said control arm being positioned to rest against said cam, a motion screw, the axis of said motion screw being parallel to said light beam at the point of impingement and pointing in a direction which does not intersect the center of rotation of the rotatable table, said nut being threaded on said screw, whereby rotation of said screw transmits a linear movement to said nut and cam.

4,003,658
TRIANGULAR INTERFEROMETRIC LIGHT-SOURCE TRACKER

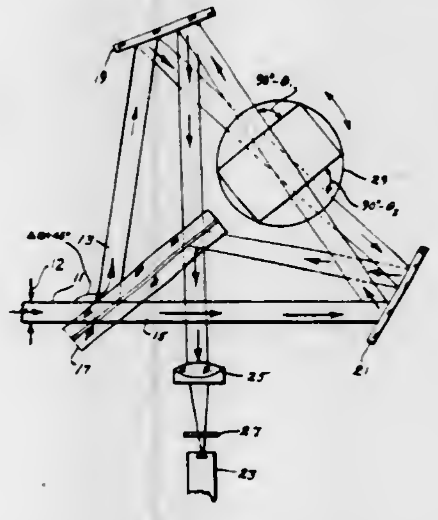
Dennis Kelsall, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,093

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G01B *9/02;* **G01D** *21/04*

U.S. Cl. 356—110 **5 Claims**



1. A triangular interferometric tracker of a source light comprising:
a. a gimballed platform;
b. an X-axis and a Y-axis rotational drive means for said platform;
c. means for providing a collimated beam from the light of said source;
d. means for splitting said beam to provide two beams;
e. means for rotating the wavefront of one of the two beams through ninety degrees in space;
f. a triangular interferometer mounted on said gimballed platform with the rotated and non-rotated beams being physically separated beam inputs thereto and with said interferometer producing two separate electrical output signals, said signals being the modulation transfer function of each of the beam inputs; and
g. means for producing signals from said two output signals suitable to actuate the X-axis and the Y-axis drive means to move said gimballed platform to cause said collimating means to track said source of light.

4,003,659
SINGLE PLANE CORNER REFLECTOR GUIDANCE SYSTEM

Robert G. Conard, Huntsville, Ala., and Kynric M. Pell, Laramie, Wyo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

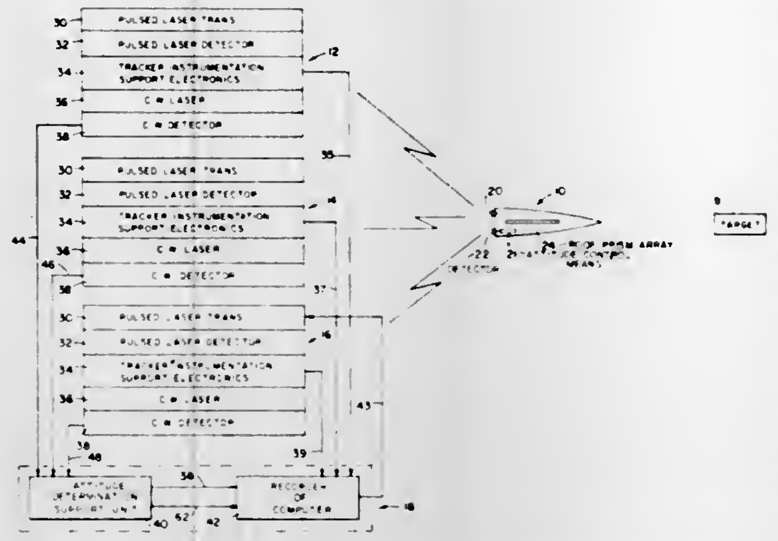
Filed Nov. 15, 1974, Ser. No. 524,287

Int. Cl.² G01B *11/26;* **F41G** *7/00*

U.S. Cl. 356—152 **4 Claims**

1. A method for detecting the attitude of a launched missile relative to a predetermined trajectory to a target comprising tracking said missile with a plurality of laser trackers to produce azimuth and elevation angles plus range data of said missile at each tracker location, said missile having an outer skin with a single plane roof prism array mounted therein along an axis that is generally longitudinal to an axis of the missile, illuminating said roof prism array on said missile with

a continuous wave laser of each of said plurality of laser trackers as said missile rotates said roof prism array into view of said continuous wave laser of each of said plurality of said laser trackers, detecting the reflections of each continuous wave laser of each of said laser trackers to enable the production of signals that are processed into yaw and pitch signals for the missile, and storing in storage means, as received data, the azimuth and elevation angles plus range data of said missile and the yaw and pitch signals from the detecting of the reflections received at each laser tracker location.



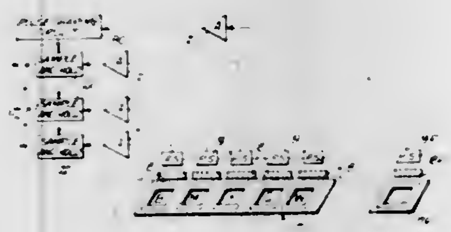
4,003,660
SENSING HEAD ASSEMBLY FOR MULTI-COLOR PRINTING PRESS ON-LINE DENSITOMETER

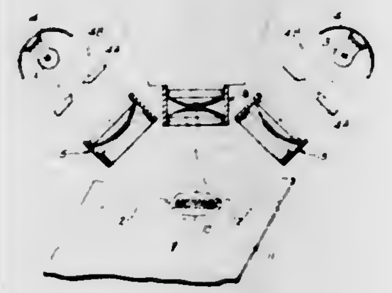
John S. Christie, Jr.; Richard S. Hunter, both of McLean, and S. Upton Jenkins, Fairfax, all of Va., assignors to Hunter Associates Laboratory, Inc., Fairfax, Va.

Filed Dec. 3, 1975, Ser. No. 637,391

Int. Cl.² G01J *3/50*

U.S. Cl. 356—178 **40 Claims**





1. In a sensing head assembly for a multi-color printing press on-line densitometer comprising a sensing head housing movably mounted on support members extending across the width of a material being printed by a multi-color press together with means for traversing the sensing head housing back and forth across the width of the printed material and the material being printed having printed thereon a plurality of spaced-apart color bars extending across the width of the material at predetermined intervals along its length, the color bars comprising a plurality of aligned discrete areas each printed with an elemental color such that each color bar includes all of the elemental colors appearing on the material; the improvement comprising a multiplicity of high luminance lamps mounted within the sensing head housing adjacent respective reflectors for projecting light through window means in the underside of the sensing head housing and onto a common convergence point located below the specimen plane of the material being printed for forming a high intensity spot of light that defines an inspection zone for illuminating a single selected color bar at any point along the width and length of the material, receptor objective lens means having a maximum numerical aperture for viewing an area on the printed material passing through the inspection zone and illuminated by said high luminance lamps and for projecting an image of a selected color bar onto an image plane located within the sensing head housing, means defining an aperture plane located at a position below the best focused color bar image and having respective aperture openings therein corresponding in position to each discrete elemental color area comprising the color bar, and opto-electric conversion means comprising small area high impedance semiconductor photodetector cells positioned in back of the respective aperture openings and responsive primarily only to a respective elemental color light corresponding to the discrete elemental color area of the color bar being imaged through the respective aperture opening.

4,003,661
APPARATUS FOR DETECTING CONTAMINATION OF LIQUID

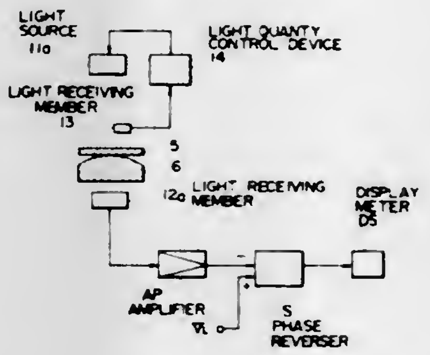
Shigemi Yamano, Isehara, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 23, 1975, Ser. No. 598,346

Claims priority, application Japan, July 26, 1974, 49-86364; Nov. 13, 1974, 49-130617

Int. Cl.² G01N *33/28*

U.S. Cl. 356—201 **5 Claims**


LIGHT SOURCE 11a
LIGHT QUANTY CONTROL DEVICE 14
LIGHT RECEIVING MEMBER 13
5
6
12a LIGHT RECEIVING MEMBER
DISPLAY METER 15
AP AMPLIFIER
S PHASE REVERSER

1. In apparatus for detecting contamination of liquid of the type wherein light emanated by a luminous element is transmitted through a liquid sample and the quantity of the transmitted light is detected by a light receiving member, the improvement which comprises a pair of transparent members interposed between said luminous element and said light receiving member, at least one of said pair of transparent members being convex and in contact with the other at the top of the convex member thus forming therebetween a gap for accommodating a liquid sample.

4,003,662
PORTABLE PHOTOMETER

Erich Retzer, Maisach; Otto Holzinger, Munich, and Wilhelm Pross, Munich, all of Germany, assignors to Compur-Electronic Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed May 21, 1975, Ser. No. 579,676

Claims priority, application Germany, June 4, 1974, 7419211

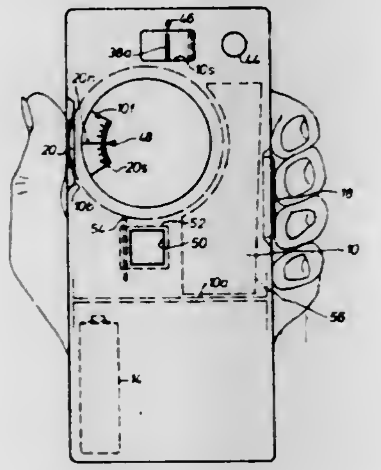
Int. Cl.² G01N *21/24*

U.S. Cl. 356—206 **10 Claims**

1. A portable photometer for measuring the light permeabil-

ity of a material for testing, said photometer being arranged within a casing sized and shaped for hand holding and manipulating, and said photometer comprising:

a. a battery power supply;
b. a lamp in circuit with said power supply;
c. means for establishing a path for a light beam from said lamp;
d. a manually operable switch for energizing said lamp, said switch being located and arranged for operation by fingers of a hand which holds and supports the photometer;
e. an electrical measuring circuit;
f. said measuring circuit including at least one light-sensitive element;
g. a wedge filter movably arranged in said path of said light beam;
h. a manually movable setting member arranged for positioning said wedge filter, said setting member being located and arranged for manual actuation by the same hand which holds the photometer and which operates said switch for energizing said lamp;
i. said measuring circuit including an indicator instrument having a pointer cooperating with an index mark for indicating zero compensation of said measuring circuit;
j. an element arranged in said measuring circuit and manually operable for effecting said zero compensation before a test measurement;
k. said casing having an opening for receiving a cuvet containing said material so said cuvet is positioned in said path of said light beam between said lamp and said light-sensitive element and so arranged that light of said beam must pass through said cuvet in order to reach said light-sensitive element; and
l. a viewable scale movable by said setting member with movement of said wedge filter for displaying a directly readable test result value from adjustment of said wedge filter during measurement of said material.



4,003,663
DEVICE FOR CALIBRATING INSTRUMENT THAT MEASURES CIRCULAR DICHROISM OR CIRCULARLY POLARIZED LUMINESCENCE

Izchak Zevi Steinberg, Rehovot, Israel, assignor to Yeda **Research & Development Co., Ltd., Rohovath, Israel**

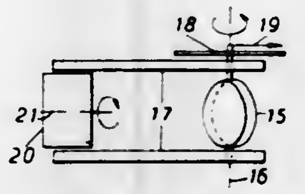
Division of Ser. No. 490,660, July 22, 1974, which is a continuation-in-part of Ser. No. 224,706, Feb. 9, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,329

Claims priority, application Israel, Feb. 26, 1971, 36297

Int. Cl.² G01V *1/04, 4/00;* **G02B** *5/30, 27/28*

U.S. Cl. 356—243 **4 Claims**

1. A device for calibrating an instrument having a main irradiation direction and by which circular dichroism or circularly polarized luminescence is measured comprising: a transparent dielectric plate rotatably mounted in a framework so as to be rotatable about an axis passing through the plate substantially normal to the main irradiation direction, means for indicating the angular position of the plate relative to its axis of rotation, and a quarter-wavelength plate mounted on the framework spaced from the dielectric plate with a surface normal to the irradiation direction.



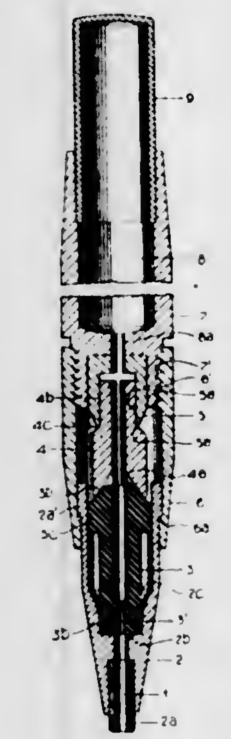
4,003,664
MECHANICAL PENCIL WITH LEAD FEED RESPONSIVE TO WRITING PRESSURE

Kemal Butka, 372 Central Park West, New York, N.Y. 10025

Filed Dec. 18, 1975, Ser. No. 641,916

Int. Cl.² B43K *21/16*

U.S. Cl. 401—67 **14 Claims**



1. In a mechanical pencil, especially for thin leads, a combination comprising an elongated tubular casing having a lower end; a tubular guide having a tip projecting coaxially beyond said lower end of said casing and having a passage through which lead may pass to said tip; means mounting and guiding said tubular guide for movement in axial direction in said lower end of said casing; abutting means spaced from said lower end of said casing and having a central passage through which lead may pass, said abutting means having a contact surface at an end thereof which faces said lower end of said casing and which bounds a conical interior section; and means for automatically feeding the lead in direction outwardly of said tip as a function of the exertion of pressure on said tip during writing or drawing, said feeding means comprising a tubular, resilient element having upper and lower wall portions bounding a central channel coaxial with said central passage, said upper wall portions being movable between a normal position in which said central channel allows the lead from said central passage to pass therethrough and a clamping position in which said upper wall portions clamp the lead in said central channel, said lower wall portions frictionally engaging the lead in said central channel, said element further having an end adjacent said tubular guide and another conically shaped end which is adjacent said contact surface and which is configurated so as to be wedged in tight engagement within said conical interior section upon slight inward movement of said tubular guide when pressure is exerted on said tip for thereby compressing said element and moving said upper wall portions towards said clamping position so as to tightly engage the lead in said central passage, and said conically shaped end being further configurated so as to be normally loosely received within said conical interior section upon slight outward movement of said tubular guide when said pressure on said tip has been terminated for thereby permitting said compressed element to expand towards an expanded position and said upper wall portions to return to said normal position and said lower wall portions to frictionally engage the lead and advance the same automatically along with the outward movement of said tubular guide towards said tip.

4,003,665
METHOD FOR THE MANUFACTURE OF WRITING INSTRUMENTS

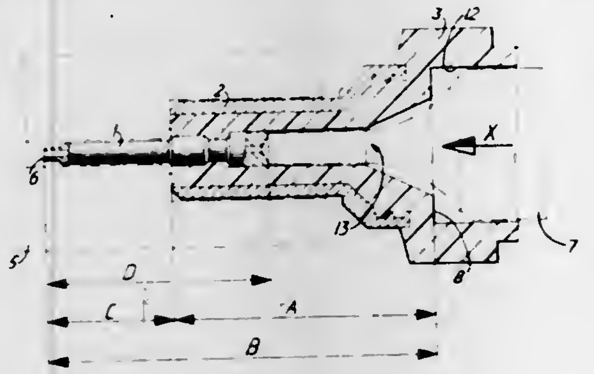
Hans Dreyer, Oberentfelden, and Roman Etter, Rombach, both of Switzerland, assignors to Kern & Co. AG, Aarau, Switzerland

Filed Mar. 20, 1975, Ser. No. 560,216

Claims priority, application Switzerland, Mar. 28, 1974, 4375/74

Int. Cl.² B32B *31/22*

U.S. Cl. 401—259 **14 Claims**



1. In the manufacture of writing instruments, the method of mounting and fastening a non-plastic ink tube in the bore of a plastic tip, comprising the steps of:providing said bore with a radially inward tapering surface forming an annular contact area with said tip, introducing the ink tube at least partially into the bore of said plastic tip, centering the ink tube within said bore, subjecting said ink tube and said plastic tip to ultransonic treatment at least in the area of contact with one another to cause said plastic tip to soften and to partially melt about the periphery of said ink tube and thereafter stopping the ultrasonic treatment to cause said molten plastic material to set about the entire circumference of said ink tube.

12. A writing instrument having a plastic tip with an axial bore and an ink tube therein and welded thereto, said instrument comprising an injection molded plastic tip with an annular peripheral supporting portion within its bore, a cleaning wire shiftable within the ink tube, attached to a controlling weight and protruding, at a given weight position, beyond the writing surface of the ink tube, said ink tube after insertion and centering within the plastic tip being fixed thereto by an ultrasonic treatment, the plastic material of a contact area of tip and tube softened and partially melted thereby facilitating a further axial insertion of the ink tube to a predetermined position with a low exertion of force only and the plastic material after the ultrasonic treatment solidifying and keeping the ink tube fixedly in its position.

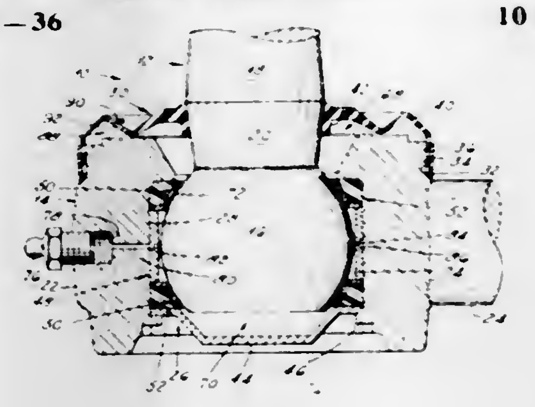
4,003,666
BALL JOINT ASSEMBLY

Donald R. Gaines, Farmington Hills; Jon M. Smallegan, Ann Arbor, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 21, 1976, Ser. No. 688,846

Int. Cl.² F16C *11/06*

U.S. Cl. 403—36 **10 Claims**



1. In a joint assembly with a socket member having an opening therethrough with a substantially cylindrical recess therein, a stud member with a ball received in said recess and a stud projecting therefrom through said opening to the exterior of said socket member, and a seal member of a flexible resilient material engaging both the stud and the socket member and at least in part defining a lubricant reservoir adjacent the ball, the improvement comprising a ring of a bearing material received in said recess of said socket member and encircling an equatorial area of said ball, a pair of separate wear rings of a high density plastic material with a low coefficient of friction received in said recess of said socket member adjacent opposed ends of said bearing ring and each surrounding an area of said ball between the equatorial area and one of the polar regions of said ball, load rings of a resilient material each interposed and compressed between one of said wear rings and said recess of said socket member and each urging one of said wear rings into engagement with said ball such that the joint assembly has wear take-up compensation, and both said bearing ring and at least said wear ring adjacent said sealing member each having at least two circumferentially spaced grooves extending generally axially thereacross and opening onto said ball to provide lubricating passages communicating with said ball and with said lubricant reservoir defined at least in part by said seal member.

4,003,667
LUBRICATABLE BALL JOINT ASSEMBLY

Donald R. Gaines, Farmington Hills; Jon M. Smallegan, Ann Arbor, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

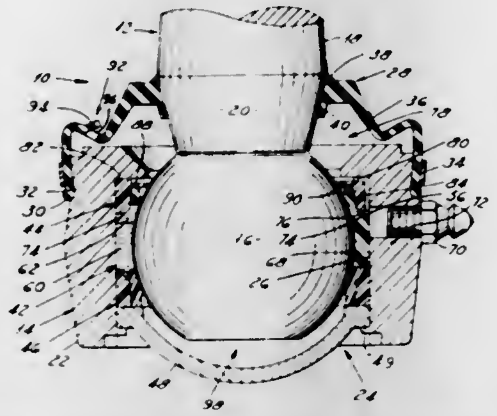
Filed May 21, 1976, Ser. No. 688,847

Int. Cl.² F16C *11/06*

U.S. Cl. 403—36 **10 Claims**

1. In a joint assembly with a socket member having an opening therethrough with a substantially cylindrical recess therein, a stud member with a ball received in said recess and a stud projecting therefrom through said opening to the exterior of said socket member, a bearing ring substantially coaxially received in said recess and surrounding a relatively large equatorial area of said ball between the polar regions thereof, said bearing ring having a sufficient thickness at its mid section to substantially fill the space in said recess between said ball and said socket member and having portions adjacent each edge of said ring spaced from said recess of said socket member, and load rings of a deformable expansible compressible material each received and compressed between one of said portions adjacent each edge of said bearing ring and said recess of said socket member to urge at least said edge por-

tions of said bearing ring into firm engagement with said ball, the improvement comprising a seal member of a flexible resilient material engaging both said stud and said socket member and both providing a seal therebetween and at least in part defining a lubricant reservoir adjacent said ball, at least one groove extending generally axially across the one load ring adjacent said lubricant reservoir and defining at least in part a

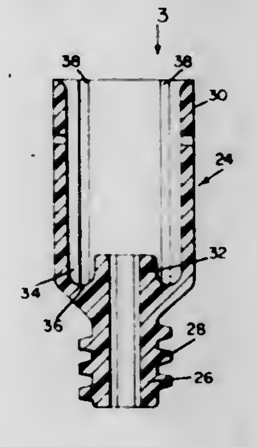


grease passage communicating with said lubricant reservoir, and a grease fitting carried by said socket member and communicating with said passage defined at least in part by said groove extending axially across said one load ring such that grease entering said grease fitting under sufficient pressure can flow through said passage defined at least in part by said groove in said one load ring and into said lubricant reservoir.

4,003,668
THREADED BROOM POLE ADAPTER

J. Joseph Kelly, III, West Boylston, and Galen Bruso, Lancaster, both of Mass., assignors to Clinton Plastics, Inc., Clinton, Mass.

Filed June 18, 1975, Ser. No. 587,811
Int. Cl.² B25G *3/30*
U.S. Cl. 403—287 **2 Claims**

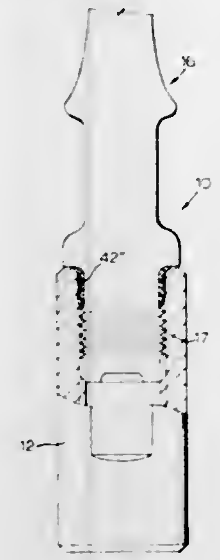


1. A plastic adapter for connecting a handle with respect to a head wherein the head is provided with a recess,
- interengaging means between the adapter and the head for securing the adapter to the head,
- said adapter including a socket extending away from the interconnecting means thereon, said socket receiving the proximate end of the handle,
- an abutment means integral with the adapter at the bottom portion of the socket and extending into the socket for spacing the latter from the proximate end of the handle,
- and means on the interior side walls of the socket spacing the latter from the proximate end portion of the handle,
- said abutment means extends inwardly of the socket from the bottom thereof and is spaced about its periphery from the interior wall of said socket and connected thereto by a concave inner wall defining said bottom with the concavity thereof facing the open end of said socket.

4,003,669
ANTI-CORROSIVE INSERT FOR SUCKER ROD COUPLINGS

Edward F. Fenske, 16 Village Court, Sherwood Park, Alberta, and Robert P. Smith, 2064 Obeck Crescent, Mississauga, Ontario, both of Canada

Filed Jan. 27, 1975, Ser. No. 544,232
Claims priority, application Canada, July 26, 1974, 205716
Int. Cl.² F16B *7/18*
U.S. Cl. 403—288 **9 Claims**



1. In combination:
- a sucker rod for an oil well, the sucker rod having at one end an externally threaded portion, a substantially cylindrical waisted portion longitudinally adjacent and inward of the threaded portion and a radially outwardly extending flange portion longitudinally inward of the substantially cylindrical waisted portion;
- a coupling having abutment structure at one end engaging said flange portion in surface-to-surface abutment, means radially inwardly of the abutment structure defining with part of the sucker rod a first annular space of which the volume would shrink if the sucker rod and coupling approached each other, a substantially cylindrical wall portion longitudinally inward of the said means and defining with said cylindrical waisted portion a second annular space of constant section communicating with said first annular space, and an internally threaded portion longitudinally inward of said substantially cylindrical wall portion, said internally threaded portion being in threaded engagement with said externally threaded portion;
- and an integral sealing insert of resilient material inert to the oil well environment, the insert being preformed to have a substantially tubular portion contained in said second annular space and having, at one end of the tubular portion, a flared portion contained in said first annular space in gasket sealing relationship therewith, the tubular portion being of appreciably greater mass than the flared portion and lending to the flared portion a greater stability and resistance to distortion than the flared portion would by itself possess.

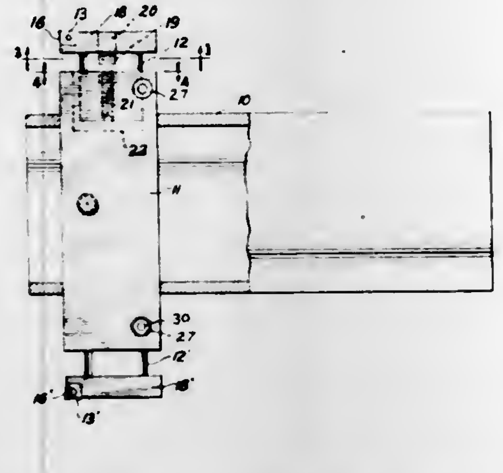
4,003,670
BLOCK BORING TOOL

H. Richard Ewing, Rte. 4, Box 31A, Titusville, Pa. 16354

Filed Oct. 24, 1975, Ser. No. 625,580
Int. Cl.² B23B *29/034*
U.S. Cl. 408—185 **12 Claims**

1. A holder for a cutting tool bit comprising
- an elongated block adapted to be supported on a boring bar,
- an elongated tang,
- cutting tool means on said tang,
- said tang being generally rectangular in cross section,
- a bore in said block defined by at least two side surfaces and at least one edge surface enclosing a space generally complementary in shape to said tang,

- said tang being received in said bore and having at least two side surfaces and at least one edge surface parallel to and slideably engaging said side surfaces and edge surface respectively defining said bore in said block,

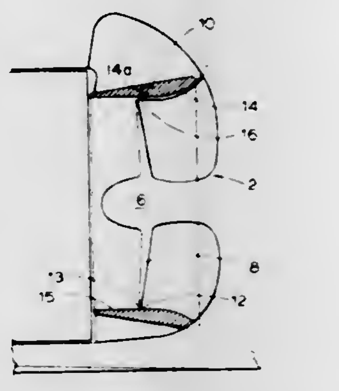


- wedge means on said block engaging a flat surface adjacent said side surface and edge surface on said tang for clamping said tang in said block in selected positions relative to said block.

4,003,671
METHOD AND MEANS TO PREVENT CAVITATION EROSION IN PROPELLER DUCTS

Erling Huse, Vikhamar, and Knut Minsaas, Trondheim, both of Norway, assignors to Norges Skipsforskningsinstitutt, Trondheim, Norway

Filed Nov. 26, 1974, Ser. No. 527,423
Claims priority, application Norway, Dec. 4, 1973, 4625/73
Int. Cl.² B63H *11/02*
U.S. Cl. 415—1 **10 Claims**



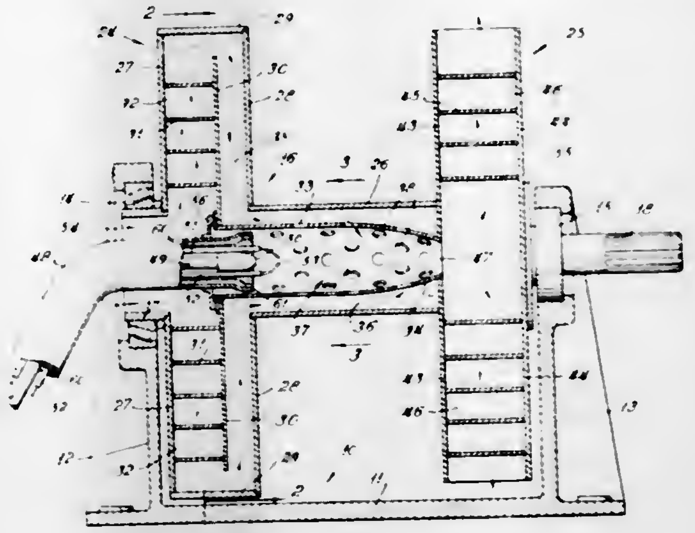
1. A method for preventing erosion of a ship propeller duct, wherein propeller blade tips rotate adjacent a surface of said duct with the resultant formation of gap cavities therebetween, said method comprising:
- supplying air to said gap cavities between said propeller blade tips and said duct surface, by passing air through at least one tube fixed to the inner surface of said duct.

4,003,672
INTERNAL COMBUSTION ENGINE HAVING COAXIALLY MOUNTED COMPRESSOR, COMBUSTION CHAMBER, AND TURBINE

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

Division of Ser. No. 401,206, Sept. 27, 1973, Pat. No. 3,886,732. This application Feb. 26, 1975, Ser. No. 553,281
Int. Cl.² F01D *5/00*
U.S. Cl. 415—71 **4 Claims**

1. A compressor adapted for use in an internal combustion engine comprising an axially disposed, tubular housing, a first outer radial wall having an axial inlet therein, a second outer radial wall affixed to and projecting radially from one end of said housing and having an axial outlet communicating directly with said housing, a peripheral axial wall connecting said first and second outer radial walls and forming therewith a cylinder which is concentric with said housing, but which has a substantially larger diameter, and an inner radial wall mounted intermediate said first and second outer radial walls and of smaller diameter than said outer radial walls, whereby the periphery thereof is uniformly spaced from said peripheral axial wall, and a spiral web intermediate said first outer wall

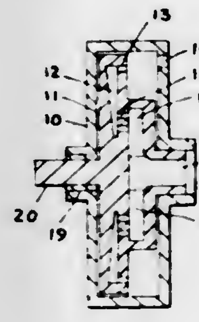


and said inner wall having its edges affixed to said walls, cooperating to define a spiral chamber, said inner radial wall and said second outer radial wall cooperating to define a radial duct communicating with said housing through said axial outlet, and said spiral chamber communicating at its innermost end with said inlet and at its outermost end with said radial duct, the sole communication between said inlet and said housing being through said spiral chamber, said radial duct, and said axial outlet, and bearing means for supporting said compressor for rotation about its axis.

4,003,673
FLUID PRESSURIZER

Michael Eskell, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 386,273, Aug. 7, 1973, Pat. No. 3,758,223, and a continuation-in-part of Ser. No. 185,060, Sept. 30, 1971, Pat. No. 3,879,152. This application Apr. 17, 1975, Ser. No. 568,895
Int. Cl.² F01D *1/18*
U.S. Cl. 415—80 **3 Claims**

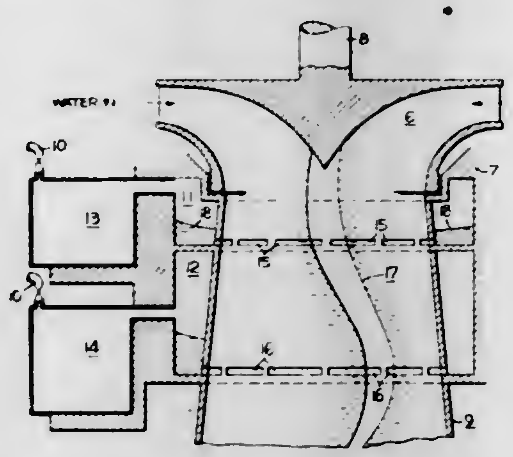


1. A fluid pressurizer comprising a shaft mounted for rotation, a rotor mounted on said shaft so as to rotate therewith, a casing enclosing the rotor said rotor having an entry for a fluid to be pressurized near its center, said rotor having a first cavity concentric with said shaft communicating with said entry for passage of said fluid and having a set of vanes, said first cavity having a set of feeder nozzles for discharging said fluid in a direction that is forwardly and in the direction of rotation into a second cavity, said second cavity being a radially outward cavity concentric with said shaft, said fluid being pressurized within said second cavity by centrifugal force acting on said fluid, said fluid being then discharged from said second cavity

into the casing through a set of exit openings located near to the outer radius of said second cavity, said fluid pressurizer having an outlet through which the fluid in the casing may flow from the pressurizer.

4,003,674
HYDRAULIC TURBINE DRAFT TUBE PRESSURE STABILIZER

Ignacy Swiecicki, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Continuation of Ser. No. 423,544, Dec. 10, 1973, abandoned. This application May 5, 1975, Ser. No. 574,527
Int. Cl.² F01D *25/30, 5/10*
U.S. Cl. 415—116 **2 Claims**

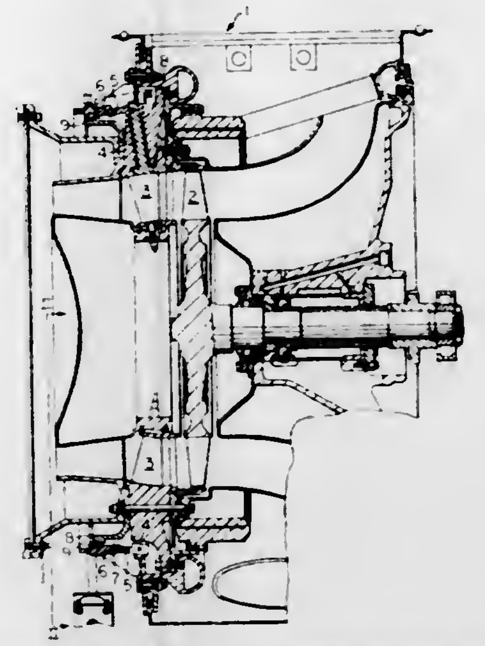


1. In a hydraulic turbine having a casing to permit the flow of water therethrough, a runner mounted for rotation within said casing and a draft tube connected to said casing downstream from said runner and having high and low water pressures therein, the improvement comprising:
- an air chamber positioned about said draft tube;
- a plurality of circumferentially spaced openings connecting the interior of said draft tube to said air chamber; and
- a source of pressurized air connected to said air chamber, means for maintaining the pressure of said air greater than the pressure of said water in the low pressure areas of said draft tube where the air enters said draft tube and less than the pressure of said water in the high pressure areas of said draft tube where the water enters said air chamber, said openings being located adjacent the lower end of said chamber whereby the vertical space above said openings in said chamber is sufficient to permit the draft tube water to rise therein until the sum of the air pressure and the pressure of the water head in said chamber is equal to the high pressure water in said draft tube.

4,003,675
ACTUATING MECHANISM FOR GAS TURBINE ENGINE NOZZLES

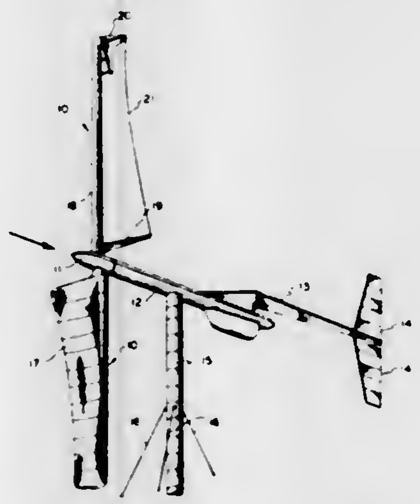
Wallace Gene Stevens, Dunlap, and Karl Wilfred Karstensen, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 2, 1975, Ser. No. 609,764
Int. Cl.² F01D *17/12*
U.S. Cl. 415—150 **5 Claims**

1. A movable vane assembly of the type used in a gas turbine engine or compressor for interaction with a gas stream comprising: a plurality of radially aligned vanes circumferentially arranged within an annular passage formed by a first housing, said vanes being supported for rotation about their radial axes to vary the effective cross sectional area of said annular passage, a plurality of rotatable gear means connected for rotation with said plurality of aligned vanes, a ring gear having teeth means adapted for simultaneous engagement with the teeth means of said plurality of rotatable gear means such that rotation of the ring gear causes rotation of said plurality of vanes, actuating means for selectively rotating said ring gear, said actuation means including first and second link means connected at first and second diametrically opposed points on the periphery of said ring gear, and first motor means for simultaneously actuating said first and second links to rotate said ring gear, said actuating means further including first and second bell crank means connected between said first and second links and said first motor means, first lever means connected by rod means for movement with said fluid motor, said first lever means being fixed for rotation upon a first shaft, and second lever means also fixed for rotation upon said first shaft and connected for movement with said link means.



4,003,676
WINDMILL BLADE AND PROCESSES RELATED THERETO

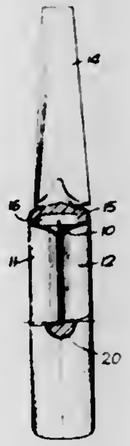
Thomas E. Sweeney, 95 Hartly Ave., Princeton, N.J. 08540, and Walter B. Nixon, 30 Merritt Drive, Trenton, N.J. 08638
Division of Ser. No. 408,837, Oct. 23, 1973, Pat. No. 3,874,816. This application Jan. 15, 1975, Ser. No. 541,248
Int. Cl.² F03D *7/00*
U.S. Cl. 416—132 B **8 Claims**



1. A windmill blade comprising a rigid leading edge portion, said rigid leding edge portion having a side positioned to not be exposed to the oncoming ambient wind, a rigid root portion connected to said rigid leading edge portion, a rotatable tip member rotatably connected to the outer end portion of said rigid leading edge portion, said rotatable tip member having a side positioned to not be exposed to the oncoming ambient wind, a rigid link member having two ends with one end thereof operatively connected to the side of said rigid leading edge portion which is positioned not to be exposed to the oncoming ambient wind and the opposite end thereof operatively connected to the side of said rotatable tip member which is positioned to not be exposed to the oncoming ambient wind, said rigid link member having a length to give the proper blade tip member angle and hence blade twist for the best performance under the expected ambient wind conditions, and an elongated flexible member having one end thereof connected to said rotatable tip member and the other end thereof connected to the aft end of said rigid root portion.

4,003,677
FAN ASSEMBLY WITH BLADES SECURED BETWEEN TWO HUB MEMBERS

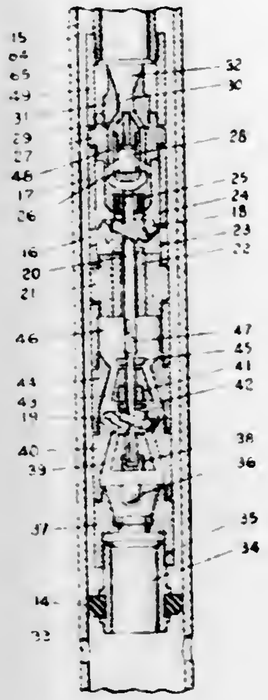
George Robertson Parkes, Streetly, England, assignor to Wilmot Breeden (Truflo) Limited, England
Filed May 2, 1974, Ser. No. 466,454
Claims priority, application United Kingdom, May 7, 1973, 21679/73
Int. Cl.² F04D *29/34*
U.S. Cl. 416—208 **4 Claims**



1. A fan comprising two hub members; a flat plate member sandwiched between said hub members; at least two blades, each blade having a short stem at the root thereof with a boss on the end of the stem remote from the blade which boss is secured between said two hub members, each hub member being semi-circularly notched to fit around said stem and each boss being of circular cross-section transverse to the axis of the boss, said axis being a radial axis of the fan, each boss further including a diametral groove formed in the boss at the root end of each blade for partially straddling the periphery of said plate member, each boss being smoothly curved in its longitudinal section with its maximum diameter intermediate its ends, the side surface of the boss merging smoothly into the end surface nearer the blade, which end surface is a portion of a spherical surface whose radius of curvature is equal to the distance of that surface from the center point of said flat plate member; and means securing said two hub members and plate together with said hub members at least partially embracing said bosses and with their outer peripheries adjacent one another in a diametral plane in the regions between said blades whereby said blades are held onto said plate; said hub members being of the same uniform shape in all radial planes to conform to and fit around the side and top of each boss, the peripheral portions of said hub members being smoothly curved in a plane transverse to said radial planes and containing said center point so as closely to embrace the spherical end surface of the boss on each of said blades; and the radially outermost portions of said hub members extending inwardly towards one another over part of the end surfaces of the boss adjacent the root of the fan blade.

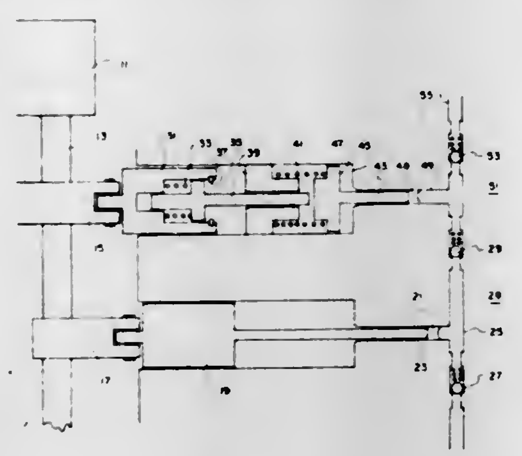
4,003,678
FLUID OPERATED WELL TURBOPUMP

Ed B. David, Benton, Ark., assignor to E M C Energies, Inc., Casper, Wyo.
Filed Feb. 10, 1975, Ser. No. 548,860
Int. Cl.² F04B *23/04*
U.S. Cl. 417—88 **9 Claims**



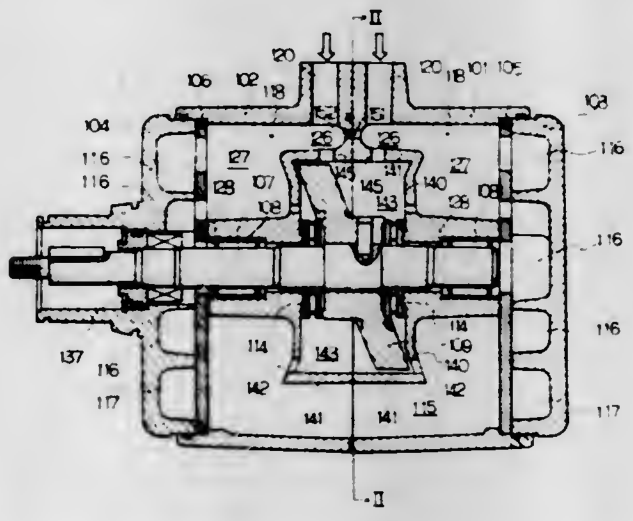
1. A fluid operated oil well turbopump adapted for connection to the bottom hole end of the tubing of an oil well and for operation by means of pressurized driving fluid circulating from an above-ground source through a path which includes the tubing and an annular space between the tubing and a casing of the well, said turbopump comprising:
- an upper driving turbine and an axially spaced lower driven pump, each including a housing containing a revoluble impeller,
- a drive shaft extending coaxially through each of said impellers, said drive shaft having a solid portion secured to the pump impeller and a coextensive tubular portion secured to and extending beyond the turbine impeller, the solid portion merging with the tubular portion at a junction located between said impellers,
- said tubular portion being closed at the junction end and open at the other end and having a plurality of peripherally spaced intake openings extending through the wall of said tubular portion at a location spatially adjacent to said junction,
- the bore of said tubular portion defining a production fluid conduit extending through said turbine impeller from the intake openings to the open outlet end thereof,
- a production fluid inlet at the lower end of said pump,
- a production fluid intake channel effective for directing production fluid from said inlet to said pump impeller,
- a production fluid discharge channel extending upwardly from said pump impeller to the connection of the turbopump to said well tubing above said turbine impeller,
- said discharge channel including the tubular portion of said drive shaft,
- circumferentially spaced slotted driving fluid inlet openings in said turbine housing effective for directing pressurized fluid from said annular space to impingement on said turbine impeller, and
- a spent driving fluid passageway in communication with said turbine housing effective for directing spent driving fluid upwardly into said well tubing.

4,003,679
HIGH PRESSURE PUMP WITH METERING
Douglass McManigill, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 2, 1975, Ser. No. 564,246
Int. Cl.² F04B *3/00, 9/08*
U.S. Cl. 417—246 **11 Claims**



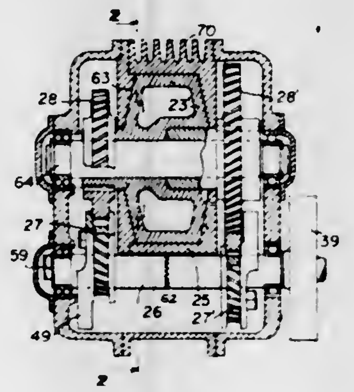
1. A pumping system comprising:
first pumping means for metering fluid charges of a desired volume and delivering said metered charges against a predetermined first pressure; and
second pumping means interconnected with said first pumping means for receiving said metered fluid charges and delivering said fluid charges to a load at a second pressure higher than said first pressure;
said second pumping means including pressure establishing means for providing said predetermined first pressure against which said first pumping means delivers said metered charges and insuring that no charge is drawn into said second pumping means by action of said second pumping means.

4,003,680
SWASH-PLATE COMPRESSOR
Shozo Nakayama; Kimio Kato, both of Kariya, and Sigeru Suzuki, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Filed Apr. 22, 1975, Ser. No. 570,317
Claims priority, application Japan, May 15, 1974, 49-55977
Int. Cl.² F04B *1/12;* **F01M** *1/00;* **F04B** *21/00*
U.S. Cl. 417—269 **1 Claim**



1. In a swash-plate type compressor of the type having a pair of horizontal axially aligned cylinder blocks forming a combined block which is provided with an inlet port in each block for introducing a refrigerant gas having oil particles suspended therein from the exterior of the compressor into each block, a pair of oil separating passageways communicating with each port respectively and extending in opposite axial directions of the combined block for separating the oil particles from the introduced refrigerant gas, means defining a lubricating oil reservoir and a swash-plate chamber in the middle portion of said combined block for rotatably supporting a swash-plate which is mounted on a drive shaft and causes reciprocal motions of compressor pistons slidably retained in aligned cylinder bores of said combined block, a pair of cylinder heads positioned at opposite ends of said combined block, each said head having a suction chamber connected to each of said oil passageways and valve plates interposed between said cylinder heads and said cylinder blocks, the improvement comprising a single fluid conduit for communicating each of said inlet ports with said lubricating oil reservoir, one end of said fluid conduit opening into the top of said reservoir above the level of lubrication oil stored in said reservoir and the other end of said fluid conduit is provided with oppositely directed ports each of which meets at right angles with the flow of refrigerant gas from each inlet port respectively whereby foaming lubricating oil generated in said reservoir upon starting said compressor is sucked into said reservoir refrigerant gas passing through said inlet ports, said fluid conduit being a groove located at the joining surface of said cylinder blocks.

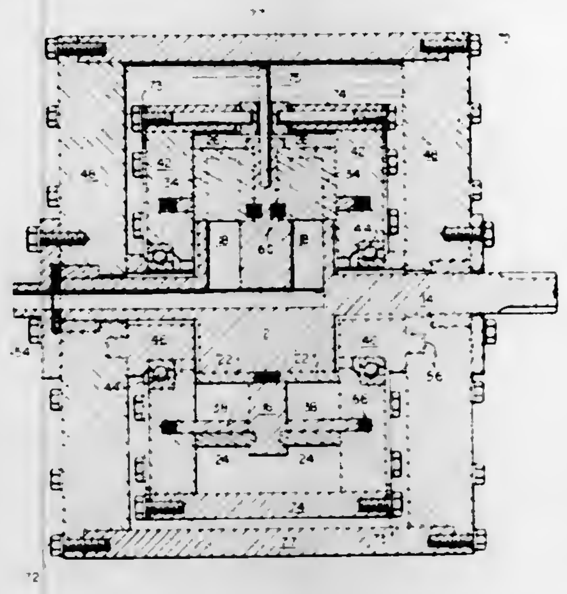
4,003,681
POSITIVE-DISPLACEMENT UNIT WITH COAXIAL ROTORS
Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y. 14620
Filed Feb. 20, 1975, Ser. No. 551,102
Int. Cl.² F01C *1/00;* **F04C** *17/00;* **F16H** *35/02, 55/04*
U.S. Cl. 418—36 **10 Claims**



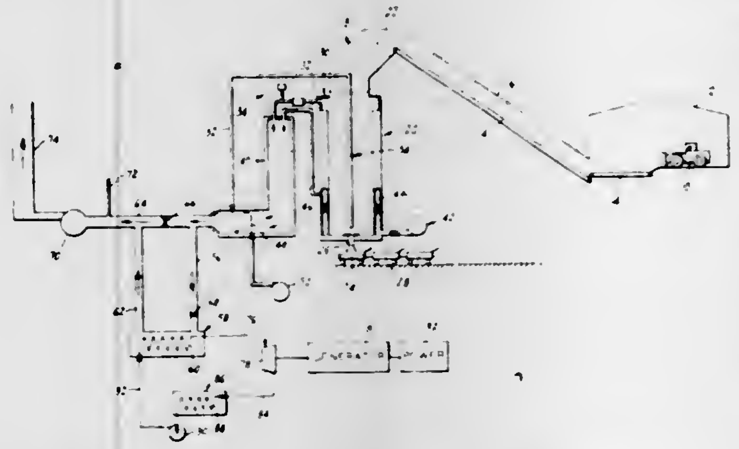
1. A rotary positive displacement unit having two coaxial rotors whose arms project outwardly from their axis inside of a housing,
- a shaft offset from the rotor axis for transmission of motion between said rotors and the outside,
- a pair of varying-motion gears between said shaft and one of said rotors, another pair of varying-motion gears of opposite phase connecting said shaft with the other rotor, to achieve spaces of varying volume between said arms,
- wherein the gear on the rotor of each of said pairs has twice as many teeth as the mating gear on said offset shaft,
- said mating gear has beeth arranged in a circle eccentric of its axis of rotation while its pitch lines, that roll on the mate without slippage, have a varying distance from said circle.

4,003,682
ROTARY PISTON ENGINE HAVING CONTINUOUS TORQUE CHARACTERISTICS
John William Stein, 5 Falcon Road, Flanders, N.J. 07836
Filed July 14, 1975, Ser. No. 595,393
Int. Cl.² F01C *19/00, 1/00;* **F04C** *1/00*
U.S. Cl. 418—107 **5 Claims**

1. In a rotary machine of the type having inner and outer concentric rings disposed about a first axis and an intermediate ring disposed about a second offset axis for rotation therewith in which said intermediate ring makes a rolling contact seal with both said inner and outer rings to define a plurality of crescent-shaped chambers of varying volume therebetween, the improvement comprising means for adjustably moving said second axis relative to said first axis along an arcuate path constituted by an arc of a circle having its center on the outside surface of said inner concentric ring and having a radius extending from said center through said first axis to said second axis, whereby frictional wear between said rings is compensated and the maintenance of said rolling contact seal is ensured.

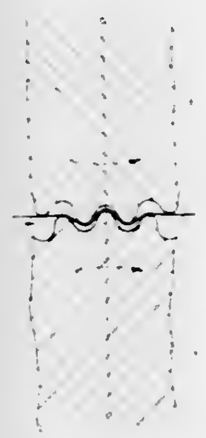


4,003,683
APPARATUS FOR PYROLYTIC TREATMENT OF SOLID WASTE MATERIALS TO FORM CERAMIC PRILLS
Orlo A. Powell, Jr., Wethersfield, and Angelo J. Roncari, East Granby, both of Conn., assignors to Urban Research & Development Corporation, East Granby, Conn.
Division of Ser. No. 542.027, Jan. 16, 1975, which is a division of Ser. No. 321,449, Jan. 5, 1973, Pat. No. 3,926,582. This application Feb. 23, 1976, Ser. No. 660,726
Int. Cl.² B22D *23/08;* **C10B** *1/00*
U.S. Cl. 425—6 **9 Claims**



1. Apparatus for disposing of solid waste comprising:
A. a reactor having a shell providing a substantially vertical pyrolysis chamber, a charging inlet and a gas outlet in the upper region thereof and a liquid outlet in the lower region thereof;
B. means for charging solid waste material having organic and inorganic components through said charging inlet;
C. gas-feed means for charging an oxygen-rich gas into said chamber under pressure at a plurality of vertically spaced points along the length thereof so as to produce combustion of the waste organic components and generate heat;
D. means for controlling the charging of the oxygen-rich gas at each of said plurality of vertically spaced points to maintain a plurality of different temperature zones along the length of said chamber so as to effect incomplete combustion of the waste organic component and form a combustible gas and an organic-free molten refractory material whereby the combustible gas is removed through said gas outlet and the molten refractory material is removed through said solids outlet; and
E. prilling means in communication with said solids outlet for prilling the molten refractory material.

4,003,684
APPARATUS FOR TREATING WEBS OF FILTERING MATERIAL FOR TOBACCO PRODUCT FILTERS, PARTICULARLY CIGARETTE FILTERS
Paul Adolf Muller, Triesenberg, Liechtenstein, and Hans Muster, Hadlikon-Hinwil, Switzerland, assignors to Celfil Company Establishment, Vaduz, Liechtenstein
Continuation-in-part of Ser. No. 161,366, July 8, 1971, Pat. No. 3,849,526, and a continuation-in-part of Ser. No. 358,472, May 9, 1973, abandoned, and a continuation-in-part of Ser. No. 420,095, Nov. 29, 1973, Pat. No. 3,930,135, which is a division of Ser. No. 161,366, July 8, 1971, abandoned. This application Oct. 9, 1974, Ser. No. 513,430
Claims priority, application Switzerland, May 10, 1972, 6918/72; May 13, 1971, 7064/71
Int. Cl.² D01D *5/20*
U.S. Cl. 425—76 **10 Claims**



1. Apparatus for treating an elongated web of fibrous material to render the same particularly adapted to be gathered transversely and enclosed in a wrapper to make a filter cord subdividable into filter rods and filter plugs for cigarettes, comprising:
- a first group of a pair of meshing rotating rolls provided with narrow longitudinal grooves alternating with narrow longitudinal ribs, said grooves and ribs being parallel to the axes of said rolls, said ribs being adapted to engage a web of fibrous material passed through the bight between said rolls and to prevent appreciable longitudinal contraction of the web so that the latter is stretched longitudinally in closely-spaced successive narrow transverse areas to loosen and expose fibers in such areas without substantial impairment of the longitudinal continuity of the web;
- a second group of meshing rotating rolls provided with narrow circumferential grooves alternating with narrow circumferential ribs adapted to engage a web of fibrous material passed through the bight between said rolls and to prevent appreciable lateral contraction of the web so that the web is grooved in a direction parallel to its travel and stretched transversely of the grooves in a plurality of closely-spaced narrow longitudinal areas to loosen and expose fibers in such areas without substantial impairment of the transverse continuity of the web; and
- means for advancing a web of fibrous material successively through the bights between the rolls of said first and second group.

8. A plant for producing wrapped filter rods containing a filter of fibrous material, consisting of an apparatus for treating an elongated web of fibrous material to render the same particularly adapted to be gathered transversely and of a rod

making machine for enclosing the gathered web in a wrapper to make a filter cord subdivided into filter rods for making filter plugs for cigarettes, comprising:

a first group of a pair of meshing rotating rolls provided with narrow longitudinal grooves alternating with narrow longitudinal ribs, said grooves and ribs being parallel to the axes of said rolls, said ribs being adapted to engage a web of fibrous material passed through the bight between said rolls and to prevent appreciable longitudinal contraction of the web so that the latter is stretched longitudinally in closely-spaced successive narrow transverse areas to loosen and expose fibers in such areas without substantial impairment of the longitudinal continuity of the web;

a second group of meshing rotating rolls provided with narrow circumferential grooves alternating with narrow circumferential ribs adapted to engage a web of fibrous material passed through the bight between said rolls and to prevent appreciable lateral contraction of the web so that the web is grooved in a direction parallel to its travel and stretched transversely of the grooves in a plurality of closely-spaced narrow longitudinal areas to loosen and expose fibers in such areas without substantial impairment of the transverse continuity of the web; and

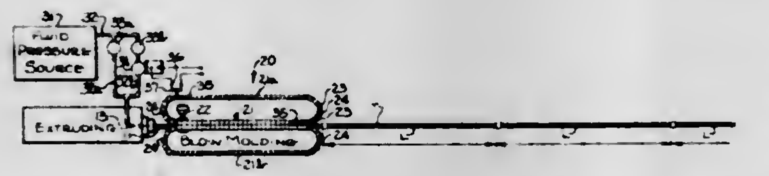
means for advancing a web of fibrous material successively through the bights between the rolls of said first and second group including a common adjustable driving assembly for one of the group of rolls and an adjustable speed adjusting member for the other group of rolls, and

a tension gauge on the web of material entering the rod making machine which is influencing the said adjustable driving assembly.

4,003,685

APPARATUS FOR MOLDING PLASTIC PIPE WITH ENLARGED PORTIONS FORMED THEREIN

Ernest J. Maroschak, P.O. Box 878, Roseboro, N.C. 28382
Division of Ser. No. 513,279, Oct. 9, 1974, Pat. No. 3,919,367, which is a continuation-in-part of Ser. No. 271,225, July 13, 1972, Pat. No. 3,891,733, and a continuation-in-part of Ser. No. 316,825, Dec. 20, 1972, Pat. No. 3,859,025. This application June 13, 1975, Ser. No. 586,737
Int. Cl.² B29D *23/03*
U.S. Cl. 425—135 **9 Claims**

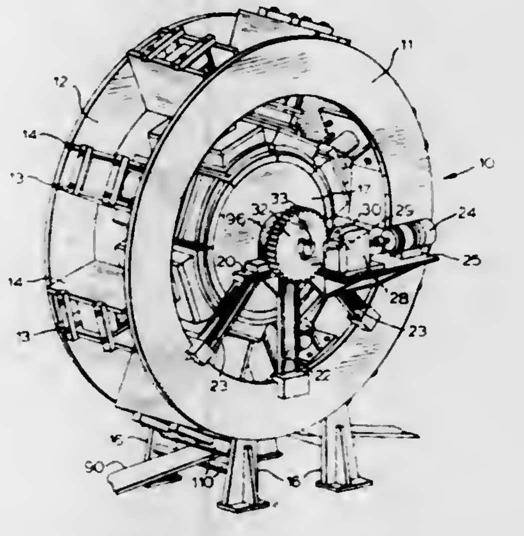


1. In a blow molding apparatus for molding a plastic tube having spaced apart enlarged sleeve portions formed therein along its length, said apparatus including an extruder for continuously extruding hot plastic material in the form of a tube, an endless series of cooperating pairs of forwardly moving die blocks defining a blow molding zone for receiving and molding the tube of hot plastic material, most of the cooperating pairs of die blocks being body-forming die blocks having concave inner surfaces defining a body-forming mold cavity for molding the tube into body portions of predetermined tubular dimension, at least one of the cooperating pairs of die blocks being sleeve-forming die blocks having concave inner surface portions of larger internal dimension than the inner surfaces of said body-forming die blocks and defining an enlarged mold cavity for molding enlarged sleeve portions in the tube between adjacent body portions, and means for supplying internal fluid pressure in the hot plastic tube during forward movement of the same through said blow molding zone to expand and mold the hot tube against said body-forming and sleeve-forming mold cavities, the improvement comprising means for automatically effecting lowering of the internal fluid pressure in the hot plastic tube for a short period of time each time said enlarged sleeve-forming mold cavity is in a predetermined location during molding of the tube therein to thereby avoid blowing holes in the hot plastic tube as the hot tube is stretched and expanded to conform with the enlarged sleeve-forming mold cavity and form enlarged portions in the tube.

4,003,686

MOULDING PRESS

Cedric W. McLeod, 1065 Don Mills Rd., Don Mills, Ontario, and Samuel J. Hughes, 198 Magnolia Ave., Scarborough, Ontario, both of Canada
Filed Mar. 18, 1976, Ser. No. 668,122
Claims priority, application Canada, Dec. 24, 1975, 242559
Int. Cl.² B29H *5/28, 17/00*
U.S. Cl. 425—373 **12 Claims**



1. A press for moulding strip material, comprising a drum having an exterior circumferential moulding surface on which the strip material is to be applied, the drum moulding surface being formed with a contoured moulding profile for moulding the strip material with corresponding contours when it is pressed onto the drum, a stationary frame extending around the drum moulding surface, means rotatably mounting said drum on said frame for rotation about its axis, a plurality of press shoes being supported on said frame by means whereby they can be extended and retracted radially towards and away from the drum between an outer, inoperative position and an inner, closed position for pressing the strip material into conformity with the drum moulding surface, the shoes in their inner, closed position forming together an inwardly-facing arcuate press surface which extends circumferentially part way around the exterior of the drum and defines a gap between the ends thereof exposing a portion of the drum moulding surface, in which gap portions of continuous strip material to be moulded in the press can be accommodated.

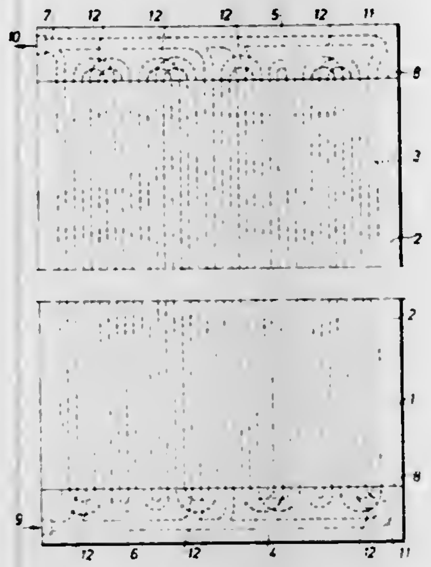
4,003,687

PRESS PLATE HAVING HEATING MEANS AND ADAPTED FOR USE IN SINGLE-STOREY OR MULTI-STOREY PRESSES FOR THE MANUFACTURE OF FIBREBOARD, CHIPBOARD, LAMINARBOARD AND THE LIKE

Borje Vilhelm Hedin, Motala, Sweden, assignor to Aktiebolaget Motala Verkstad, Motala, Sweden
Filed June 9, 1975, Ser. No. 584,883
Claims priority, application Sweden, June 13, 1974, 7407832
Int. Cl.² B30B *15/06;* **B29J** *5/08*
U.S. Cl. 425—406 **7 Claims**

1. A press plate adapted to be heated to a generally uniform temperature for use with presses to manufacture board-like members, comprising: an elongated expansive center section having longitudinally opposed ends and spaced sides and defining a plurality of only longitudinal fluid-flow passages

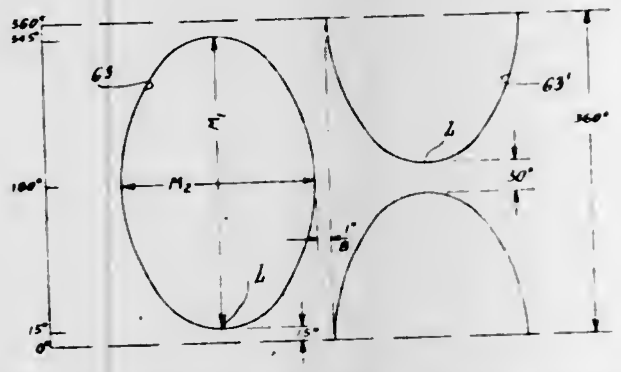
spaced generally in parallel relationship to each other for passage of a heating fluid between said ends to heat said press plate; a first end piece secured to one of said longitudinal ends, having spaced sides and defining a first set of looped passages fluidly connecting said longitudinal passages and defining an inlet at one of said sides for supplying fluid to said longitudinal passages to heat said first end piece; a second end piece secured to the other of said longitudinal ends, having spaced sides and defining a second set of looped passages fluidly connecting said longitudinal passages to heat said second end piece; and one of said end pieces defining an outlet for spent fluid passing through said longitudinal passages; and wherein said first end piece has a first corner at the side thereof opposite said inlet and defines a first curved fluid-flow passageway in flow communication with said longitudinal passages and adjacent said first corner to heat said first corner, and said second end-piece has a second corner at the side thereof longitudinally opposite said first corner and defines a second curved fluid-flow passageway in flow communication with said longitudinal passages and adjacent said second corner to heat said second corner.



4,003,688

REVOLVING CYLINDRICAL ESCAPEMENT EXTRUSION APPARATUS FOR SHAPING FOODSTUFF ARTICLES

Eberhard Mueller-Lobeck, Stamford, Conn., assignor to Automation International Corporation, Norwalk, Conn.
Filed Dec. 26, 1974, Ser. No. 536,346
Int. Cl.² B29C *23/00*
U.S. Cl. 425—465 **17 Claims**



1. Revolving cylinder escapement extrusion apparatus for forming an extrudable material into product blanks, such as blanks of dough for pancakes, pie crusts, tortillas, pizza rounds, crispy deep-fried articles and for forming blanks of other extrudable foodstuff material for making other food products, said extrusion apparatus comprising:

nozzle means forming an elongated narrow orifice slot,

feed means for feeding the extrudable material to said nozzle means under pressure for extruding the material through the orifice slot,

a cylindrical escapement member having a cylindrical peripheral surface containing a plurality of axially spaced openings, said openings having sharp edges at the peripheral surface of said escapement member,

mounting means for revolvably mounting said cylindrical escapement member at the outside downstream end of said nozzle means adjacent to said orifice slot and with the axis of said cylindrical member extending parallel with said elongated orifice slot,

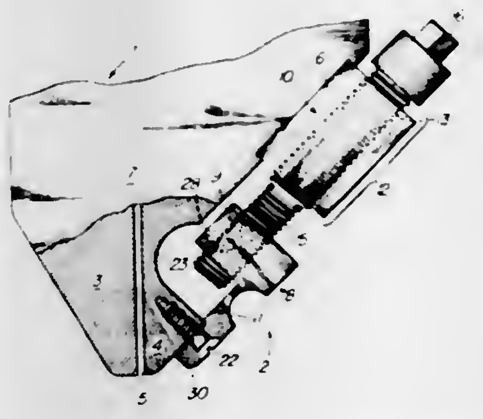
drive means for revolving said cylindrical member for moving the peripheral surface containing said openings past said orifice slot for controlling extrusion of the material from the orifice slot and for shaping said extruded material into product blanks as the respective cavities of said escapement member revolve past said orifice slot, and

said axially spaced openings being angularly displaced about the axis of said escapement member and overlapping each other in the circumferential direction so that as the revolving escapement member is diminishing the flow of the material being shaped by the sharp edges of one of the openings the flow of the material being shaped by the sharp edges of another of the openings is concurrently increasing, thereby producing an aggregate flow of the material through said nozzle means which continues without undue surging.

4,003,689

DIE-GAP ADJUSTING MEANS

Eugene Harrison, Central, and Edgar G. Williams, Greenville, both of S.C., assignors to Celanese Corporation, New York, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,678
Int. Cl.² B29F *3/04*
U.S. Cl. 425—466 **19 Claims**



1. An adjusting means for controlling the thickness of extrudate moving from a die comprising:

a non-flexible block, connected to a die body, provided with a tapped hole;

a flexible block, connected to a flexible lip of said die body, provided with a tapped hole; and

a bolt including a first threaded cylindrical section, having a first thread pitch, accommodated in said tapped hole provided on said non-flexible block, and a second threaded cylindrical section, having a second thread pitch, accommodated in said tapped hole provided on said flexible block, said second thread pitch being different from said first thread pitch.

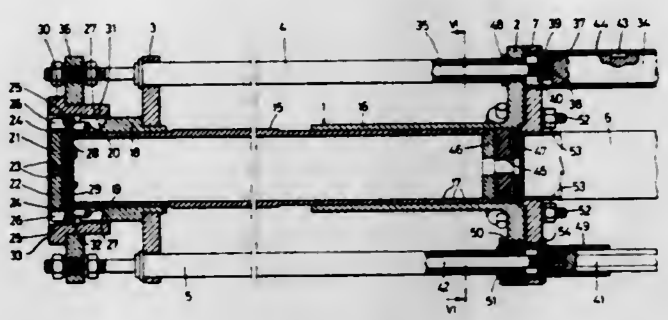
4,003,690

CLOSURE DEVICE

Gilbert Magnollay, Romanel, Switzerland, assignor to Maillefer S.A., Switzerland
Filed Mar. 22, 1976, Ser. No. 668,920
Int. Cl.² B29F *3/04*
U.S. Cl. 425—466 **11 Claims**

1. A downstream closure device for apparatus used in treating large-diameter insulated electrical conductors, said device

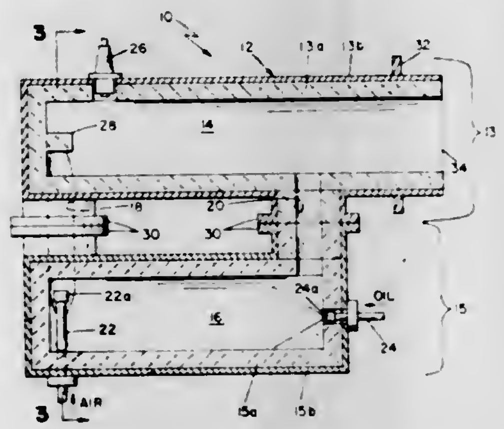
comprising a main exit gasket, a movable plug, an auxiliary exit gasket borne by said plug, and means for controlling the movement of said plug, wherein said means comprise a control-sleeve cooperating with said plug for causing said plug to open gradually.



4,003,691
RECIRCULATING BURNER

Alex F. Wormser, Marblehead, Mass., assignor to Consolidated Natural Gas Service Co., Inc., Pittsburgh, Pa.

Filed Aug. 22, 1975, Ser. No. 606,841
Int. Cl.² F23L *7/00*
U.S. Cl. 431—116 **2 Claims**



1. A burner for burning a vaporizable liquid fuel comprising:

a housing,

a combustion chamber in said housing, said combustion chamber having an inlet and an outlet,

a vaporizing chamber in said housing, said vaporizing chamber having an inlet and an outlet,

a first passage interconnecting said combustion chamber inlet with said vaporizing chamber outlet, said first passage serving as a mixing chamber,

a second passage interconnecting said combustion chamber toward said combustion chamber outlet with said vaporizing chamber inlet, for carrying hot combustion gases from said combustion chamber into said vaporizing chamber,

a vaporizable liquid fuel inlet atomizer connected to said vaporizing chamber and positioned to direct atomized liquid fuel into said vaporizing chamber, for vaporization therein of said fuel by said hot combustion gases, said atomizer being effective to support vaporization of said fuel before the same touches a wall,

an air inlet at the interface of said first passage and said vaporizing chamber outlet, positioned to direct air under pressure through said first passage and combustion chamber inlet into said combustion chamber,

said second passage, said vaporizing chamber, and said first passage together defining a recirculation path for hot combustion gases from said combustion chamber back to said combustion chamber inlet, said path having sufficient width to provide in conjunction with said air inlet enough recirculation to maintain blue-flame combustion,

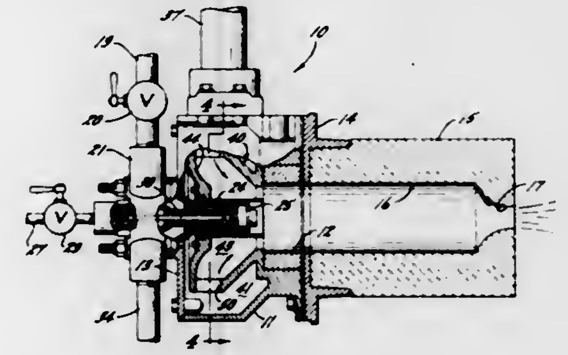
said hot combustion gases being drawn by suction created by said air inlet into said vaporizing chamber and said vaporized fuel and hot gases being drawn by said suction into said first passage, where they are mixed with air entering from said air inlet to provide a combustible mixture, said mixture entering said combustion chamber through said combustion chamber inlet for burning in said combustion chamber, and

said combustion chamber being cylindrical, said first passage entering said combustion chamber tangentially thereto through said combustion chamber inlet, said second passage connecting tangentially with said combustion chamber, said vaporizing chamber being cylindrical, said second passage entering said vaporizing chamber tangentially through said vaporizing chamber inlet, and said fuel inlet atomizer being directed into said cylindrical vaporizing chamber along the axis thereof.

4,003,692
HIGH VELOCITY BURNER

Edward E. Moore, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Aug. 6, 1975, Ser. No. 602,248
Int. Cl.² F23R *1/02*
U.S. Cl. 431—158 **4 Claims**

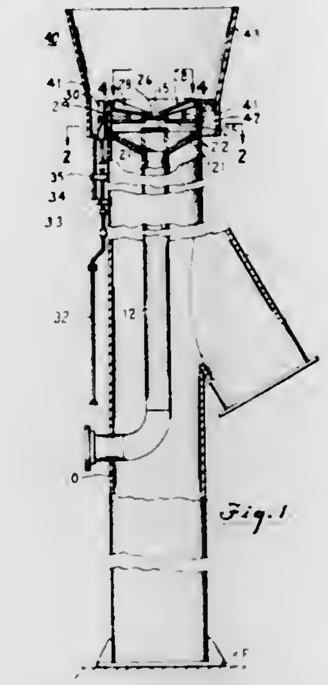


1. A dual fuel, high velocity burner comprising a tubular body having a rear upstream end and a forward downstream end, an annular partition within said body and dividing the latter into inner and outer chambers, said inner chamber being open at the downstream end of said body and said outer chamber being substantially closed at the downstream end of said body, both of said chambers being substantially closed at the upstream end of said body, a tube extending axially within the central portion of said inner chamber, first means within said tube for delivering a flow of gaseous fuel through said tube for ignition of such fuel into a flame adjacent the downstream end of said body, second means within said tube for alternatively delivering a flow of liquid fuel and atomizing air through said tube for atomization and ignition of such fuel into a flame adjacent the downstream end of said body, a source of forced combustion air communicating with said outer chamber between the ends thereof to produce a generally circumferential flow of air within said outer chambes, a series of passages formed through and spaced circumferentially around said partition and extending substantially tangentially of said tube to impart a rotational spinning motion to the combustion air flowing from said outer chamber to said inner chamber through said passages, said inner chamber converging inwardly upon progressing toward the downstream end of said body so as to form the spinning combustion air into a vortical swirl which flows out of the open end of said inner chamber and imparts a swirling motion to said fuel and said flame, a tubular burner block secured to the downstream end of said body and having a generally cylindrical internal wall communicating with and extending a substantial distance beyond the open end of said inner chamber so as to receive the swirling stream from said inner chamber, and an inwardly converging internal wall at the downstream end of said cylindrical wall and defining a central discharge nozzle for radially contracting the swirling stream and increasing the forward velocity thereof.

4,003,693
FLARE STACK GAS BURNER

John F. Straitz, III, Jenkintown, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Mar. 6, 1975, Ser. No. 555,974
Int. Cl.² F23D *13/20*
U.S. Cl. 431—202 **4 Claims**



1. A flare stack gas burner for combustible waste gas comprising

a vertical stack pipe having a free upper end for combustion therebeyond,

means for delivering primary air under pressure to the interior of the stack pipe for delivery to said upper end,

a waste gas delivery pipe connected to a supply of waste combustible gas under pressure interiorly vertically centrally disposed in said stack pipe,

said waste gas delivegy pipe in spaced relation below said upper end of said stack pipe having a plurality of outwardly extending arms with spaces between said arms for upward movement of air,

said arms having elongated discharge slot portions facing toward said upper end of said stack pipe for waste gas discharge therethrough and extending substantially the distance between said waste gas pipe and said stack pipe, and

a fixedly mounted diffuser disposed at the upper end of said stack pipe,

said diffuser being adjacent to and in vertically spaced relation to said arms to provide a pre-combustion waste gas and air mixing space therebetween,

said diffuser comprising a central hub with a plurality of radially disposed titled vanes extending therefrom imparting a vortex pattern to the air and waste gas passing through said diffuser for turbulent burning therebeyond in a vortex pattern.

4,003,694
FUEL DELIVERY SYSTEM FOR A HAND-HELD LIQUID FUEL CIGARETTE LIGHTER

Charles Lowell, Concord, Mass., assignor to Wingaersheek, Inc., Peabody, Mass.

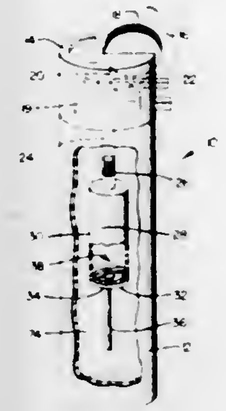
Filed Dec. 22, 1975, Ser. No. 643,403
Int. Cl.² F23Q *1/02*
U.S. Cl. 431—344 **12 Claims**

1. A cigarette lighter fuel delivery system for feeding gaseous fuel to the burner of the lighter from a reservoir of volatile liquid fuel in the lighter, said system comprising:

a fuel vaporizing chamber in the liquid fuel reservoir, one end of said chamber being in communication with the burner of said lighter through a manually operable valve,

a wall of said chamber spaced apart from said one end defining a passage for passing fuel from the reservoir to said chamber; and

a valve in said passage, said valve being biased to open said passage to allow fuel therethrough when the pressure in said chamber falls a selected amount below the pressure in said reservoir, said valve comprising:



an anchoring portion in contact with a wall of said chamber;

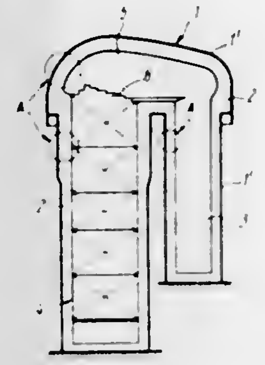
a poppet for blocking said passage; and

at least one resilient arm extending from said anchoring portion to said poppet for maintaining a selected biasing force on said poppet.

4,003,695
STOVE OF BLAST FURNACE

Gennady Petrovich Kandakov, Sevastopolsky prospekt, 51, korpus 2, kv. 163, Moscow, and Albert Nikolaevich Zharikov, ulitsa Kosiora, 64, kv. 37, Dnepropetrovsk, both of U.S.S.R.

Filed June 3, 1975, Ser. No. 583,245
Int. Cl.² F24H *1/00*; F27B *1/14*
U.S. Cl. 432—219 **4 Claims**



1. A stove of a blast furnace comprising a metal jcket; a gunite on the inner surface of said jacket; a gastight cover in the form of a layer sprayed on the surface of said gunite coating, said layer being selected from the group consisting of metals and heatproof synthetic materials; heat-insulating layers adjacent to said gastight cover from the inner side of the stove; and refractory layers positioned over said heat-insulating layers from the inner side of the stove.

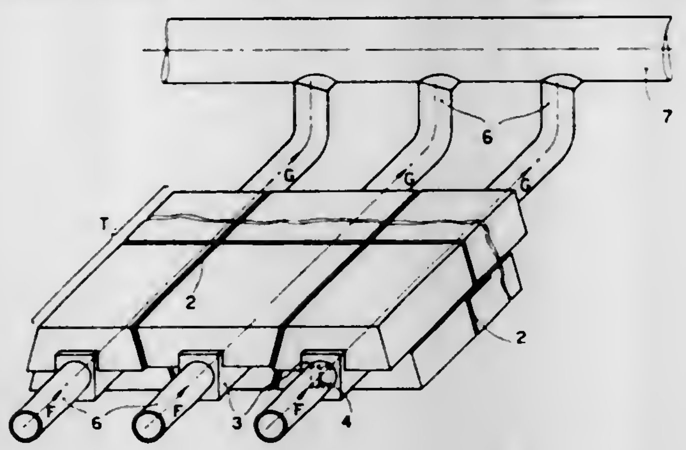
4,003,696
FLAT SELF-SUPPORTING VAULT FOR TUNNEL TYPE FURNACES PARTICULARLY FOR BAKING BRICKS AND TILES

Aldo Rolla, Via S. Andrea 7, Monza, Italy

Filed July 7, 1975, Ser. No. 593,218
Claims priority, application Italy, July 12, 1974, 25114/74
Int. Cl.² F27D *1/12*
U.S. Cl. 432—238 **6 Claims**

1. A flat vault for tunnel-type furnaces for baking materials having parallel extended side walls, comprising a plurality of

linear self-supporting beams laid transversely to the direction of forward movement of the material to be baked and bearing at their respective ends on the side walls of said tunnel, each beam being fixed to the adjacent beams and comprising a plurality of segments of a refractory material, clamped to each other by means of expansion joints, and each segment being provided with an inner metal core and an insulating material sheath surrounding said core, whereby said core and inner surfaces of said sheath define, along the whole length of each of said segments, a free volume suitable to provide a passage for a cooling fluid, flowing by means of a cooling system.



4,003,697

PRESSURE FURNACE FOR TREATING PRODUCTS AT HIGH TEMPERATURE AND HIGH PRESSURE

Staffan Elmgren, Helsingborg, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

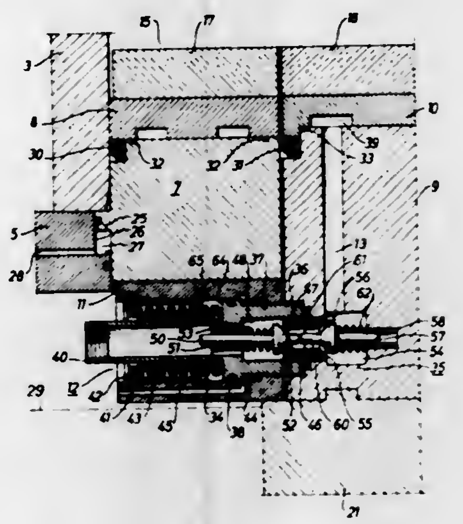
Filed July 3, 1975, Ser. No. 593,048

Claims priority, application Sweden, July 30, 1974, 7409804

Int. Cl.² F27B *5/04;* **F27D** *1/12*

U.S. Cl. 432—238 **5 Claims**

1. A pressure furnace for treating products at high temperature and high pressure, comprising a high pressure chamber including a vertical high pressure cylinder with end closures projecting into the cylinder, a press stand with a window aperture which is somewhat larger than the length of the high pressure chamber when the end closures are fully inserted, which press stand encloses the high pressure chamber during the pressing operation and takes up the axial forces which a pressure medium in the pressure chamber exerts on the end closures, and a support member for the pressure chamber, which support member holds the pressure chamber in such a position that gaps are formed between the press stand and the end closures of the chamber when the end closures are moved into their innermost positions in the cylinder, in which the lower end closure comprises a bottom portion provided with cooling channels, which bottom portion carries material to be pressed during charging and pressing, at least one stationary and one movable connection unit for connecting the bottom portion to a coolant source, of which the movable unit is radially displaceable between a connected position in contact with the stationary connection unit and a released position, and a valve member in at least one of the connection units, which, in released position, is held pressed against a valve seat and means carried by one of the units to raise the valve from its seat in response to relative movement between the units to the connecting position.



4,003,698

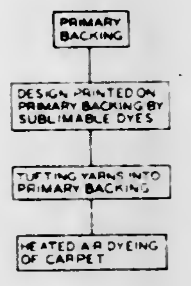
PRODUCT AND METHOD OF PRINTING CARPET

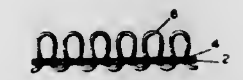
Robert W. Snyder, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 12, 1975, Ser. No. 612,907

Int. Cl.² D06P *1/00*

U.S. Cl. 8—1 XB **6 Claims**


PRIMARY BACKING
DESIGN PRINTED ON PRIMARY BACKING BY SUBLIMABLE DYES
TUFTING YARNS INTO PRIMARY BACKING
HEATED AIR DYEING OF CARPET



1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:
   - a. printing sublimable dyes on the carpet backing prior to the time the carpet face yarns are tufted into the carpet backing,
   - b. tufting the carpet face yarn into the carpet backing with the carpet face yarn pile being on the side of the carpet backing which contains the sublimable dyes, and then
   - c. transferring the sublimable dyes from the carpet backing to the carpet face yarn through the application of a heated gaseous medium passing through the carpet product from the carpet backing side of the carpet to the carpet face yarn side of the carpet.

4,003,699

OXIDATION HAIR DYES BASED UPON TETRAAMINOPYRIMIDINE DEVELOPERS

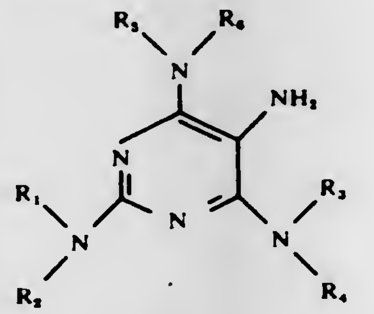
David Rose, Dusseldorf-Holthausen; Ferdi Saygin, Erkrath, and Erwin Weinrich, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Nov. 22, 1974, Ser. No. 526,232

Int. Cl.² A61K *7/13*

U.S. Cl. 8—10.2 **9 Claims**

1. An aqueous preparation for the dyeing of hair consisting essentially of (1) from 0.2% to 5% by weight of an oxidation dyestuff combination of a developer component, and a coupling component in substantially equimolar amounts, said developer component consisting essentially of (A) a tetraaminopyrimidine of the formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are each selected from the group consisting of hydrogen, phenyl, alkyl having 1 to 4 carbon atoms, phenylalkyl having 7 to 10 carbon atoms, phenylalkenyl having 7 to 10 carbon atoms,

$X-(CH_2)_n-$

wherein *n* is an integer from 1 to 4, and X is selected from the group consisting of hydroxyl, halogen and NR_7R_8— in which R_7 and R_8 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, and together with the nitrogen atom R_7 to R_8 form a 5 to 6 membered heterocyclic ring optionally containing an additional nitrogen atom or an oxygen atom,

and wherein R_1 and R_2 or R_3 and R_4 or R_5 and R_6, together with the nitrogen atom form a 5 to 6 membered heterocyclic ring, optionally containing another nitrogen or oxygen atom in the ring or (B) a water-soluble acid addition salt of (A); (2) from 0% to 5% by weight of a direct dyestuff; (3) from 0% to 30% by weight of a surfactant; (4) from 0% to 25% by weight of a thickener; and (5) the balance up to 100% by weight of water.

4,003,700

CLEANING FABRICS

Frederick William Gray, Summit, and Jon C. Jervert, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 447,712, March 4, 1974, which is a continuation of Ser. No. 138,372, April 28, 1971, abandoned. This application Apr. 16, 1976, Ser. No. 677,653

Claims priority, application United Kingdom, May 1, 1970, 21080/70

Int. Cl.² D06L *3/02*

U.S. Cl. 8—111 **26 Claims**

1. Process for the removal of stains from fabrics which comprises forming an aqueous wash medium by dispersing in water a mixture consisting essentially of a peroxygen compound, an activator for said peroxygen compound which activator has carboxylic acyl amide groups and which activator reacts with said peroxygen compound to form a percarboxylic acid, a salt of an aminopolycarboxylic acid selected from the group consisting of trisodium nitrilotriacetate and ethylene diamine tetraacetic acid sodium salt, the proportions being such as to supply to said water about 5 to 50 ppm of said activator, an amount of peroxygen compound within the range representing about 3 to 80 ppm of active oxygen and substantial excess of active oxygen over that stoichiometrically equivalent to the amount of activator, and about 100 to 300 ppm of said aminopolycarboxylic acid salt, and maintaining said wash medium in contact with stained fabric immersed therein for a period of time sufficient to effect bleaching of said fabric.

4,003,701

GRAFT COPOLYMERIZATION PROCESSES

W. James Brickman, Philadelphia, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 2, 1971, Ser. No. 112,071

Int. Cl.² D06M *13/02, 15/26, 13/08*

U.S. Cl. 8—115.6 **2 Claims**

1. A process for simultaneously printing and grafting a water-insoluble, thioated fabric which comprises:
   - A. applying to said fabric a printing paste comprising:
     - 1. at least one ethylenically unsaturated monomer,
     - 2. a peroxidic free-radical initiator, and
     - 3. a pigment or a dyestuff; and
   - B. subjecting the pasted fabric to microwave energy having a frequency of about 900 Mega Hertz or greater.

4,003,702

METHOD FOR CARBONIZING CELLULOSE MATERIALS

Jean Knott, Polleur, Belgium, assignor to I.W.S. Nominee Company Limited, London, England

Filed Apr. 15, 1974, Ser. No. 461,133

Claims priority, application Germany, Apr. 25, 1973, 2320825

Int. Cl.² D01C *3/00, 5/00*

U.S. Cl. 8—140 **11 Claims**

1. A method of carbonizing cellulose material present in a substrate which also comprises noncarbonizable fibers and solvent soluble material, said method comprising the steps of:

treating said substrate with a solution of anhydrous HCl gas in an organic solvent for said solvent soluble material inert as to said non-carbonizable fibers at a temperature, for a time and at an acid concentration sufficient to achieve carbonization of the cellulose material without damage to the non-cabonizable fibers;

expressing some of said solution from said substrate; and subsequently drying the treated substrate.

4,003,703

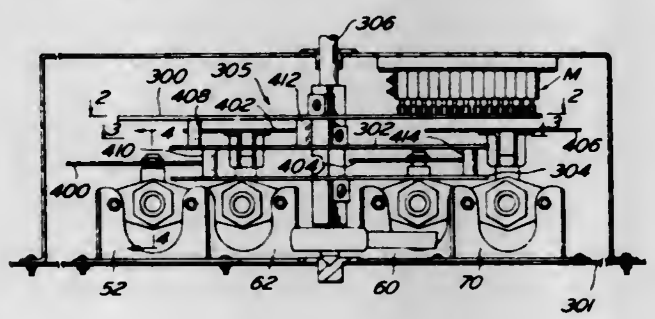
METHOD OF STERILIZING USING A ROTARY DISK-BALL VALVE CONTROL SYSTEM

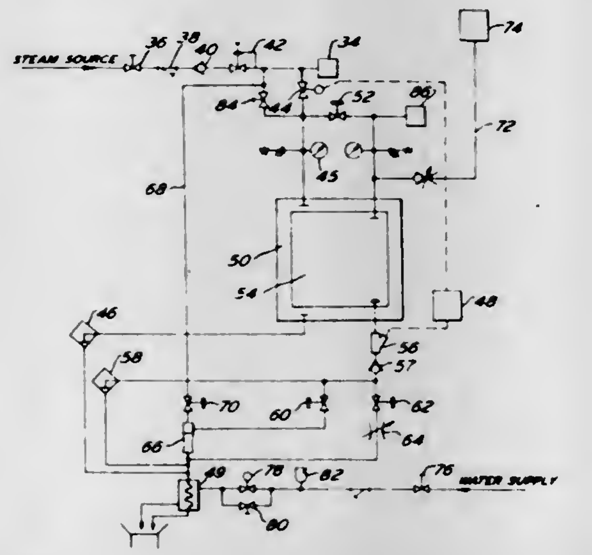
Robert A. G. Montgomery, Jr., Southampton, and Richard Laurence Burley, Holland, both of Pa., assignors to Environmental Tectonics Corporation, Southampton, Pa.

Filed Oct. 18, 1974, Ser. No. 515,939

Int. Cl.² A61L *1/00, 5/00*

U.S. Cl. 21—56 **6 Claims**





1. A method for sterilizing an article in a chamber operatively connected to a plurality of ball valves provided with rotary means for opening and closing said ball valves, comprising:

programming a disc having a plurality of posts depending therefrom by providing said disc with a plurality of slots;

rotating said programmed disc in slidable contact with a plurality of switches to cause said switches to open and close in a predetermined sequence determined by said slots and to cause said posts to contact said ball valve rotary means to open and close said ball valves in a predetermined sequence determined by said posts;

admitting a gaseous sterilizing agent to said chamber;

maintaining the temperature of said sterilizing agent in said chamber within a preselected range of a set point temperature for a predetermined interval of time;

exhausting said sterilizing agent from the chamber and

controlling the sequence and duration of said admitting, maintaining and exhausting steps in response to said predetermined sequence in which said switches are opened and closed and said posts contact said rotary means in response to said rotation of said programmed disc.

4,003,704

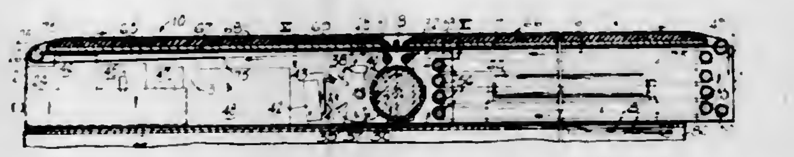
MEDICAL EXAMINATION TABLE COVER SYSTEM HAVING STERILIZING MEANS THEREFOR

Gabriel J. Zurolo, and Elmer G. Bull, both of Hamden, Conn., assignors to Mark Medical Supply, Inc., New Haven, Conn.

Filed Mar. 26, 1975, Ser. No. 562,220

Int. Cl.² A61G *13/00;* **A61L** *3/00*

U.S. Cl. 21—91 **8 Claims**



1. A medical examination table cover system comprising an examination table having a patient-supporting upper surface and an enclosed chamber below said upper surface, an endless web of cover material, first means for guiding said web to cause a unit length thereof to lie in a position exposed on said upper surface, additional means for guiding other lengths of said web through said enclosed chamber, means for subjecting said other lengths to a sterilization procedure in said chamber, and feed means for moving the exposed unit length of the web from said upper surface into said chamber and another length of said web into said exposed position.

4,003,705

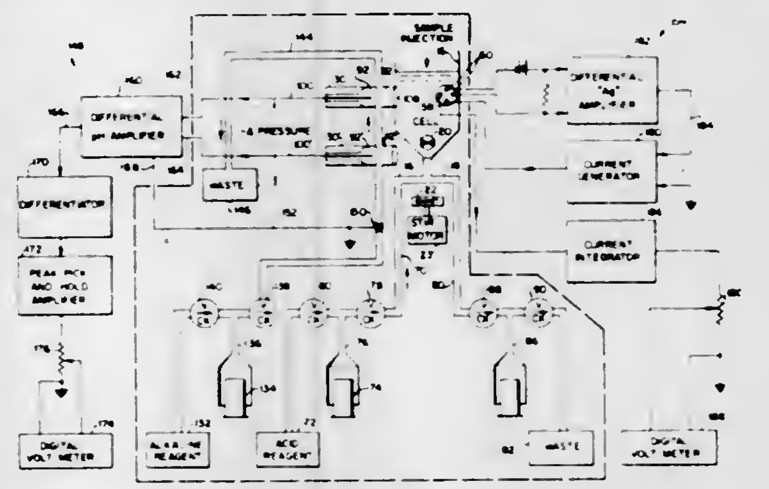
ANALYSIS APPARATUS AND METHOD OF MEASURING RATE OF CHANGE OF ELECTROLYTE pH

Edmund E. Buzza, and James C. Sternberg, both of Fullerton, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 12, 1975, Ser. No. 586,435

Int. Cl.² G01N *27/26, 31/16, 33/16*

U.S. Cl. 23—230 R **21 Claims**



1. In combination:

sensor means for monitoring a chemically reactable substance, said sensor means including an electrolyte which undergoes a chance in pH with time upon reaction with said substance,

means coupled to said sensor means for generating an output signal proportional to the instantaneous time rate of change of pH of said electrolyte; and

means for measuring said output signal to determine the concentration of said substance in said electrolyte.

4,003,706

METHOD AND REAGENTS FOR THE DETECTION, ESTIMATION AND QUANTITATIVE DETERMINATION OF NITRATE IONS

Eugen Szekely, Beer-Sheva, Israel, assignor to Ben-Gurion University of the Negev Research & Development Authority, Beer-Sheva, Israel

Filed Jan. 21, 1976, Ser. No. 650,851

Claims priority, application Israel, Feb. 21, 1975, 46677

Int. Cl.² G01N *31/22*

U.S. Cl. 23—230 R **24 Claims**

1. A method for the detection, estimation and quantitative determination of nitrate ions comprising preparing a nitrate reagent comprising:

a. about 0.005 to 0.05 wt/v %. of a diphenylamine redox indicator;

b. about 0.1 to 2.0 wt/v %. 4,4′-sulfonyldianiline;

c. about 0.1 to 2.0 wt/v %. of a chloride selected from the group consisting of ammonium chloride, hydroxylamine hydrochloride or a mixture thereof;

d. concentrated sulfuric acid; and

e. concentrated phosphoric acid or an alkaline dihydrogen phosphate;

and combining said reagent with an aqueous nitrate sample.

4,003,707

METHOD AND ARRANGEMENT FOR MEASURING THE CONCENTRATION OF GASES

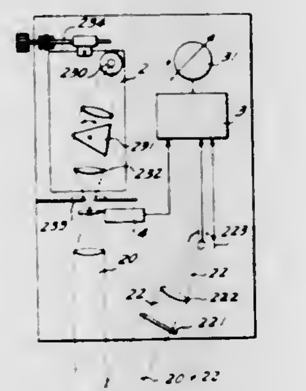
Dietrich W. Lübbers, and Norbert Opitz, both of Dortmund, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Munich, Germany

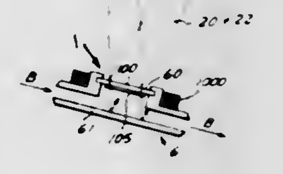
Filed Feb. 26, 1976, Ser. No. 661,636

Claims priority, application Germany, Feb. 28, 1975, 2508637

Int. Cl.² G01J *3/30;* **G01N** *21/26, 21/48, 33/16*

U.S. Cl. 23—232 R **27 Claims**





1. A method of measuring the concentration of gases in a sample comprising the steps of generating a monochromatic light beam having a predetermined color characteristic; generating light signals indicative of the concentration of gases in a sample to be measured by positioning an indicator having a light-transmissive surface positioned to be impinged by said monochromatic light beam, a diffusion membrane adapted to be placed in the proximity of a sample and being selectively permeable to a gas component thereof, and an indicating substance positioned to be impinged by the monochromatic light beam penetrating said light-transmissive surface and by said gas component penetrating said diffusion membrane, said indicating substance reacting when illuminated by said incident monochromatic light beam by emitting a resultant light beam having an emitted component which has a color characteristic different from said predetermined color characteristic; conducting said resultant light beam away from said indicating substance through said light-transmissive surface; and discriminating said emitted component from said resultant light beam so that the change in the color characteristic of said indicating substance can be measured and correlated with the concentration of gases in the sample.

4,003,708

AUTOMATIC PHOTOMETRIC ANALYZER

Isamu Taguchi, Tokyo; Akihiro Ono, Yokohama, and Ryutaro Matsumoto, Tokyo, all of Japan, assignors to Nippon Steel Corporation and Kokusai Electric Co., Ltd., both of Tokyo, Japan

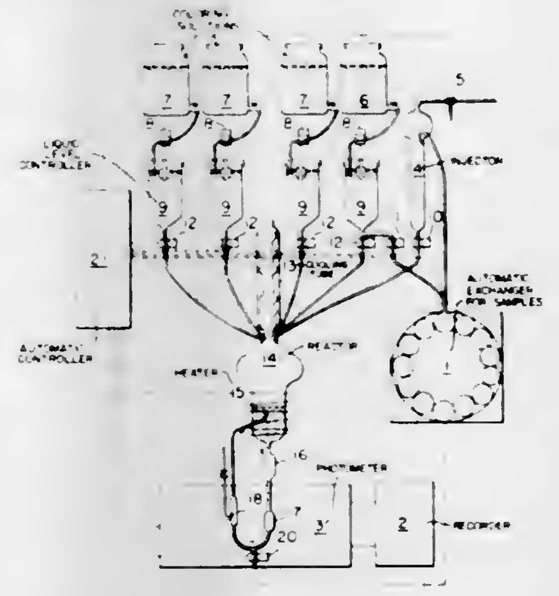
Continuation of Ser. No. 511,205, Oct. 2, 1974, abandoned, which is a continuation of Ser. No. 283,851, Aug. 25, 1972.

This application May 6, 1975, Ser. No. 575,078

Claims priority, application Japan, Aug. 26, 1971, 46-65729

Int. Cl.² G01N *31/00*

U.S. Cl. 23—253 R **11 Claims**



1. An automatic photometric analyzer, comprising an automatic exchanger having a vessel and carrying solutions to be analyzed, a reactor, injector means for injecting a sample solution from said vessel to said reactor, water supply means, coloring solution supply means, means for controlling the supply of said water and coloring solution to said reactor to form a reactant with said sample solution, photometric analysis means, for measuring the absorbency of the reactant, and fluid passage means coupled to said reactor for circulating said reactant from the reactor through the photometric means and back to the reactor.

4,003,709

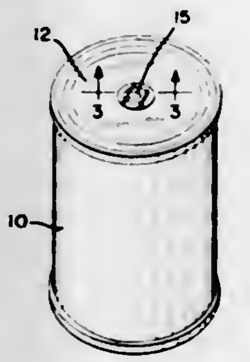
VISUAL SPOILAGE INDICATOR FOR FOOD CONTAINERS

John C. Eaton, Dayton; Marshall B. Kilgore, Franklin, and Richard B. Livingston, Dayton, all of Ohio, assignors to Visual Spoilage Indicator Company, Dayton, Ohio

Filed Oct. 2, 1975, Ser. No. 619,017

Int. Cl.² G01N *31/02*

U.S. Cl. 23—253 R **2 Claims**



1. A visual spoilage indicator for food containers for providing a visual indication of the possibility of deterioration or

contamination of the food contents by reasons of CO_2 evolution, comprising

- a. a liquid impermeable assembled plug of plastic material in an aperture in a lid of the food container,
- b. a window forming a portion of said plug,
- c. said plug also including a portion of microporous plastic which is CO_2 gas permeable and means forming a contrasting colored field opposite said window,
- d. means forming a cup in said plug for receiving an indicator means, and
- e. indicator means comprising an aqueous liquid calcium hydroxide solution at approximately 0.19 molarity sealed within said cup formed in said plug for producing a visible white calcium carbonate precipitate when the CO_2 level evolved upon deterioration of said food contents and passing through said gas permeable microporous plastic portion of said plug exceeds approximately a 5% CO_2 level, said visible white precipitate being observable through said window with the aid of said contrasting field opposite said window.

4,003,710

CHEMICAL FEEDER FOR WATER SOFTENERS

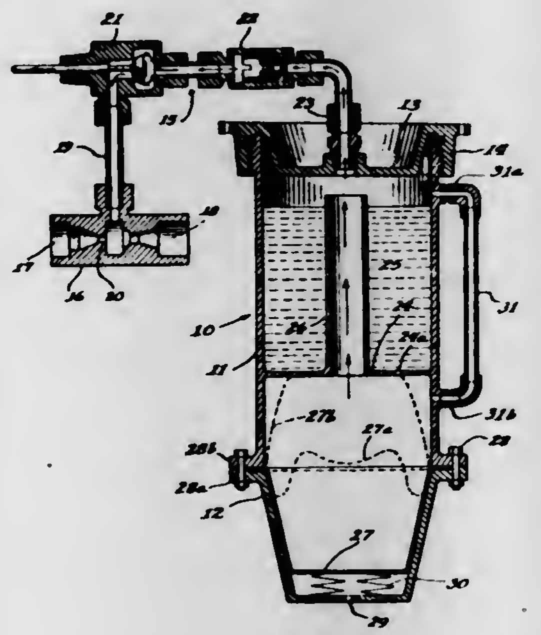
Andrew Joseph Fleckenstein, Brookfield; Herman C. Mitchell, Wauwatosa, both of Wis., and Donald G. Fettes, Regina, Canada, assignors to L. W. Fleckenstein, Inc., Butler, Wis.

Filed Jan. 17, 1975, Ser. No. 541,936

Claims priority, application Canada, Feb. 1, 1974, 191,533

Int. Cl.^{2} B01F *1/00*

U.S. Cl. 23—267 R **3 Claims**



1. A regenerative chemical system including a substantially vertical closed container, a substantially horizontal perforated wall member dividing said container into an upper first chamber adapted to contain a solid regenerative chemical and a lower second chamber adapted to contain a liquid solution of said chemical and to allow liquid communication between said first and second chambers, said second chamber defining a bottom wall therein, said bottom wall including a vent in communication with the atmosphere; flexible diaphragm disposed in said second chamber between said bottom wall and said perforated wall member, said diaphragm and said perforated wall member cooperating to define a variable effective storage volume therebetween; liquid inlet-outlet in said container in communication with said effective storage volume and adapted to be connected to a source of inlet liquid and adapted for removal of said liquid solution whereby said flexible diaphragm is adapted to flex in response to addition or withdrawal of said liquid solution from said container to vary the variable effective storage volume of said container.

4,003,711

APPARATUS FOR ELIMINATION OF NITROGEN OXIDES FROM COMBUSTION WASTE GASES

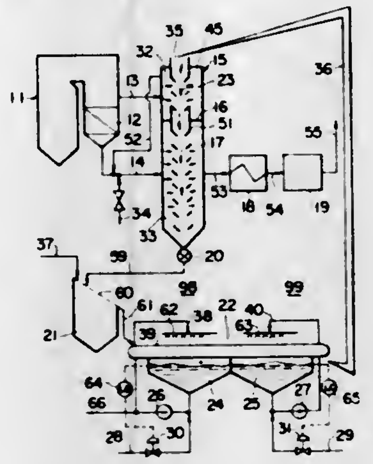
Yukio Hishinuma; Hidetoshi Akimoto, both of Hitachi; Zensuke Tamura, Kudamatsu, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1974, Ser. No. 514,130

Claims priority, application Japan, Oct. 12, 1973, 48-113941

Int. Cl.^{2} B01J *8/12, 23/94;* **F01N** *3/15*

U.S. Cl. 23—288 F **10 Claims**



1. An apparatus for the removal of nitrogen oxides (NOx) from combustion waste gases, comprising: a reaction tower having a combustion waste gas inlet and outlet; a fluent ferrous catalyst within said reaction tower; means for injecting a reducing gas into the combustion waste gases to deoxidize the nitrogen oxides in the presence of said ferrous catalyst within said reaction tower; means for moving said ferrous catalyst in a substantially closed path including entry into the top of said reaction tower, movement downwardly through said reaction tower in contact with the mixed combustion waste gases and the reducing gas, and exit from the lower portion of said reaction tower; means for separating dust from said ferrous catalyst after it has exited from the reaction tower where dust was picked-up from the combustion waste gases; means for regenerating the ferrous catalyst of the reaction tower; said means for regenerating including means for washing the ferrous catalyst for removing ferric sulfate, which was produced by reaction of the sulfur oxides in the waste combustion gases with the ferrous catalyst, from the surface of the ferrous catalyst after the means for separating dust has separated dust from the ferrous catalyst exiting from the reaction tower; said means for regenerating including means for providing ferrous sulfate on the surface of the ferrous catalyst after it has passed through said means for washing; and said regenerating means including means for heating the ferrous catalyst after washing by a part of the combustion waste gases prior to their movement in contact with the mixed combustion waste gases and the reducing gas in the reaction tower.

4,003,712

FLUIDIZED BED REACTOR

Adam R. Miller, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 64,106, July 29, 1970, abandoned, which is a continuation of Ser. No. 662,045, Aug. 21, 1967, abandoned. This application Mar. 14, 1975, Ser. No. 558,435

Int. Cl.^{2} B01J *8/24*

U.S. Cl. 23—288 S **7 Claims**

1. A fluid bed reactor system in which olefin monomers may be catalytically polymerized continuously in a fluid bed under gas medium fluidized conditions, and comprising

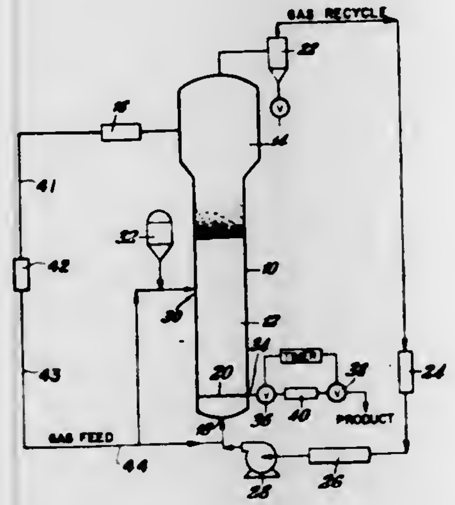
a vertical reactor having a cylindrical lower section and an upper section have a cross section greater than that of

said lower section, said lower section being adapted to house a polymerization zone in which the catalyzed polymerization reaction may be conducted under gas medium fluidized fluid bed conditions, and said upper section being adapted to function as a velocity reduction zone for the recovery of particles entrained in fluidizing medium entering said upper section from said lower section, fluidizing medium permeable distribution plate means within and towards the base of said lower section, said distribution plate means being adapted to diffuse fluidizing medium up through the fluidized bed in said lower section and to support said bed thereon when said bed is quiescent,

fluidizing medium supply line means in gas communication with, and adapted to supply fluidizing medium and make up gas to, the lower section of said reactor and below said distribution plate means,

catalyst injection means in catalyst supply communication with, and adapted to supply particulate olefin polymerization catalyst to, the side of the fluidized bed in the polymerization zone in said lower section,

polymer product recovery means in polymer product recovery communication with, and adapted to recover polymer product from, the base of said polymerization zone and above said distribution plate means,



said polymer product recovery means comprising a valved chamber which is adapted to recover polymer product from said reactor at a rate equal to the rate of polymer product formation with the aid of a pressure differential between the pressure within said reactor and the pressure within said chamber,

fluidizing medium recycle line means in gas communication with said reactor and adapted to recover fluidizing medium from the upper section of said reactor and to recycle the thus recovered fluidizing medium to the lower section of said reactor at a point below said distribution plate means,

heat exchange means within said recycle line means adapted to remove heat of reaction from the recycled fluidizing medium,

gas analyzer means in gas communication with said velocity reduction zone and adapted to analyze gas component deficiency in the fluidizing medium in sad velocity reduction zone, and

said fluidizing medium supply line means being in gas communication with said recycle line means and in gas supply activating response communication with said gas analyzer means and adapted to supply deficient components of the fluidizable medium to said recycle line means in response to gas supply activating communication from said gas analyzer means.

4,003,713

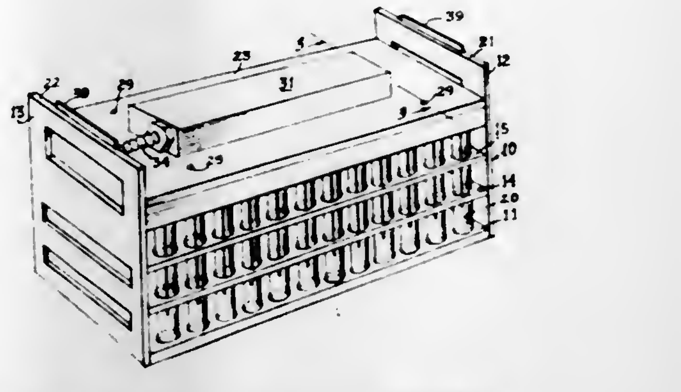
MULTIPLE TEST TUBE EVAPORATOR

Everett N. Bowser, 715 N. Main St., Glen Ellyn, Ill. 60137

Filed Aug. 14, 1975, Ser. No. 604,557

Int. Cl.^{2} B10L *3/00*

U.S. Cl. 23—292 **5 Claims**



1. A multiple test tube evaporator comprising

- a. a rack having a substantially rectangularly shaped bottom wall and upstanding end walls,
- b. supports extending between said end walls below a midline therethrough so as to permit the upper portions of said end walls to be yieldably separable,
- c. means provided by said bottom wall for receiving the closed end of a test tube,
- d. means provided by said supports, in vertical alignment with said receiving means provided by said bottom wall, retaining said test tubes in a perpendicular position relative to said receiving means,
- e. a vacuum manifold removably carried between said separable end wall portions in spaced parallel relation above said supports and said bottom wall,
- f. recessed conically shaped seats formed in the underside of said manifold for receiving the open end of the test tube retained by said supports so as to close the same, and
- g. an evaporating needle depending from the underside of and having communication with said manifold concentrically of said recessed conically shaped seats for projection into a test tube held by said rack.

4,003,714

DEVICE FOR CLOSING INLET AND OUTLET PORTS OF A TUNNEL AUTOCLAVE

Giorgio Foglino; Alfio Battain, both of Turin, and Raffaello Cappucciati, Venaria (Turin), all of Italy, assignors to Superga S.p.A., Turin, Italy

Filed Oct. 24, 1975, Ser. No. 625,624

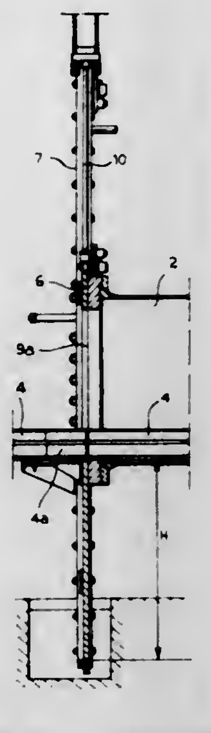
Claims priority, application Italy, Nov. 15, 1974, 70349/74

Int. Cl.^{2} B01J *3/02;* **E01B** *11/42*

U.S. Cl. 23—290 **2 Claims**

1. In a tunnel autoclave having inlet and outlet ports at opposite ends, at least one guide rail extending through said autoclave and carriages movable along said rail in groups at predetermined intervals for the transportation of articles through said autoclave, respective guillotine doors assembled on said inlet and outlet ports, each of said guillotine doors comprising a first part having a size at least complementary to the size of the respective port and a second part having an opening for the passage of said carriages, said rail having a fixed portion within said autoclave and a movable portion fixed to said second part of said door adjacent an edge portion of the opening therein, each door being movable between an open position in which the opening of said second part of said door is aligned with a corresponding port of the autoclave and

the movable portion of said rail is aligned with the fixed portion of said rail and a closed position in which the first part of



said door is aligned with the corresponding port of said autoclave.

4,003,715

COPPER-MANGANESE-ZINC BRAZING ALLOY

Paul J. Cascone, New Rochelle, N.Y., assignor to A. Johnson & Co. Inc., Nynashamn, Sweden

Continuation-in-part of Ser. No. 427,326, Dec. 21, 1973, abandoned. This application June 13, 1975, Ser. No. 586,562

Int. Cl.² B32B *15/18, 15/20*

U.S. Cl. 29—182.3 **14 Claims**

1. A brazed joint comprised of assembled parts with a fused brazing alloy interposed therebetween, at least one part being a ferrous metal, said fused brazing alloy making up the joint consisting essentially by weight of about 15% to 30% manganese, about 15% to 30% zinc, 0 to about 10% nickel and the balance essentially copper ranging from about 45% to 65% and having a melting point ranging from about 1500° F to 1700° F.

4,003,716

CAST CEMENTED REFRACTORY METAL CARBIDES HAVING IMPROVED SINTERED DENSITY

James Q. Steigelman, Athens; Joseph J. Cleveland, Wysox; Richard N. Kleiner, Towanda, all of Pa., and Frank Rymas, Sterling Heights, Mich., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 15, 1974, Ser. No. 488,727

Int. Cl.² B22F *7/00;* **C22C** *1/04;* **C04B** *31/02*

U.S. Cl. 29—182.7 **13 Claims**

1. A cemented refractory metal carbide article consisting essentially of from about 75 to 97 weight % of discrete particles of at least one refractory metal carbide distributed in a matrix of from about 3 to about 25 weight % of a lower melting binder metal, said article having a predetermined configuration including at least a portion having a thickness of from about 0.004 inches to about 0.08 inches defined by at least 2 uneroded formed surfaces, characterized in that said article exhibits A-type, B-type and C-type porosities in accordance with ASTM specification No. B-276-54 of up to and including A_3, B_3 and C_3.

4,003,717

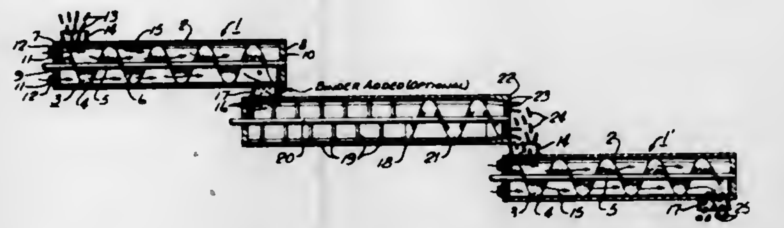
METHOD AND APPARATUS FOR RECOVERING BY-PRODUCT SILT FINES FROM A SLURRY THEREOF

Boyd E. Cass, Ligonier; David W. Coate, and Joseph R. Quigley, both of Pittsburgh, all of Pa., assignors to Carad, Inc., Pittsburgh, Pa.

Filed June 27, 1975, Ser. No. 591,161

Int. Cl.² C10L *5/00, 5/22*

U.S. Cl. 44—10 R **31 Claims**



12. The method of recovering coal fines from a slurry thereof having a moisture content in the area of 30% or more, comprising the steps of dissociating the slurry mass into discreet units, loosely conveying the dissociated coal slurry through a tubular conveyor housing with a continuous rotary-driven impeller while simultaneously flowing hot air in contact with said discreet units through said conveyor housing to uniformly break up and dry said discreet units by evaporation into particles having a moisture content of about 15% to 25%.

23. Apparatus for recovery of fines from a slurry thereof comprising means to dissociate the slurry mass into discreet units, conveyor means fed in tandem from said dissociation means and having a tubular conveyor housing with a continuous rotary-driven impeller to break up said discreet units into particles while loosely conveying the same, and means for forcing hot gas through said conveyor housing to dry said particles by evaporation to a desired degree.

4,003,718

SUBSTITUTED TETRAHYDROPYRIMIDINES

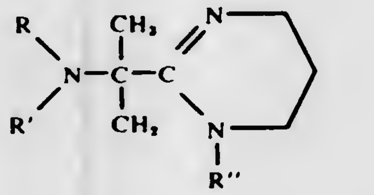
Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 12, 1975, Ser. No. 557,744

Int. Cl.² C10L *1/14*

U.S. Cl. 44—63 **13 Claims**

1. A substituted tetrahydropyrimidine having the generic formula:



in which R and R′ are independently selected from the group consisting of alkyl of from 1 to 20 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms in the ring, phenyl and benzyl, and R″ is hydrogen or alkyl of from 1 to 20 carbon atoms.

4,003,719

SCHIFF BASES AS BIOCIDES IN PETROLEUM PRODUCTS

David R. McCoy; Raymond Cadorette, and George W. Eckert, all of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

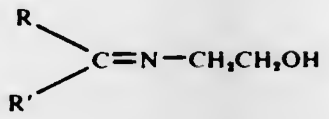
Filed Feb. 5, 1975, Ser. No. 547,279

Int. Cl.² C10L *1/22*

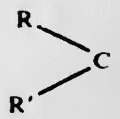
U.S. Cl. 44—63 **2 Claims**

1. A fuel composition comprising a mixture of hydrocarbons boiling in the range of about 70° to 625° F. containing from about 0.05 to 0.1 volume percent of at least one hydrocarbon soluble Schiff base selected from the group consisting of:

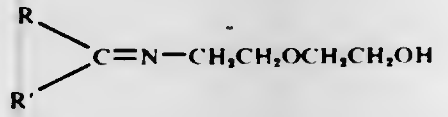
N-Benzylidenemethylamine;
an alkyliminoethanol of the formula:



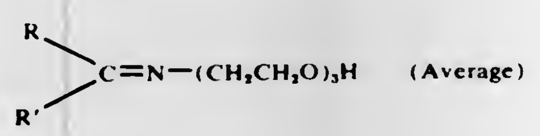
wherein



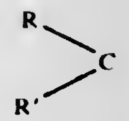
taken together, form an alkyl group having from 11 to 13 carbon atoms;
an alkyliminoethoxyethanol of the formula:



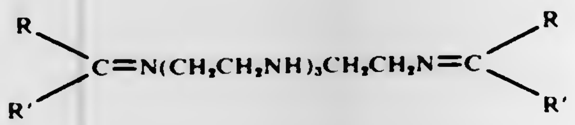
wherein R and R′, taken together, form an alkyl group having from 11 to 13 carbon atoms; an imino ethoxylate of the formula:



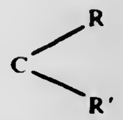
wherein



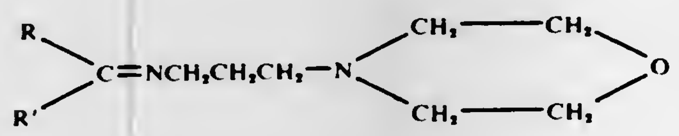
taken together form an alkyl group having 11 to 13 carbon atoms; a tetraethylenepentamine base of a ketone of the formula:



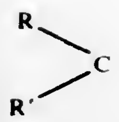
wherein



taken together form an alkyl group having from 11 to 13 carbon atoms; and, an alkyliminopropyl morpholine of the formula:



wherein



taken together form an alkyl group having from 11 to 13 carbon atoms.

4,003,720

TELOMERIC-HYDROCARBON PHOSPHORUS COMPOUND AND HYDROCARBON COMPOSITION CONTAINING SAME

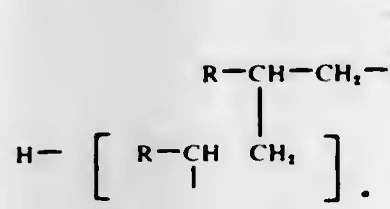
Raymond C. Schlicht, Fishkill, and Justin C. Powell, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 11, 1975, Ser. No. 585,943

Int. Cl.² C10L *1/26*

U.S. Cl. 44—76 **4 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range and a surface active amount ranging from about 0.00002 to 0.04 weight percent based on said fuel composition of a telomeric phosphorus compound represented by the formula:



in which R is a hydrocarbyl radical having from 1 to 18 carbon atoms and *n* has a value from 1 to 25 with the average value for *n* being from 1 to 10.

4,003,721

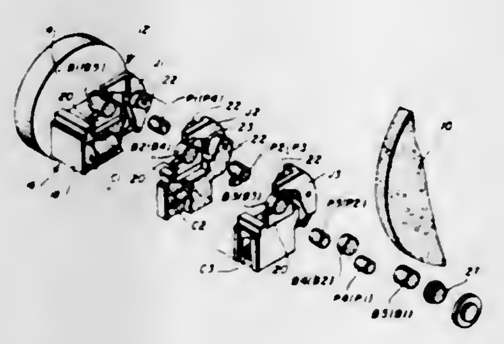
CYLINDRICAL GRINDER

Ralph E. Price, and James C. Harris, both of Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Filed Apr. 26, 1976, Ser. No. 680,040

Int. Cl.² B24B *5/42*

U.S. Cl. 51—105 SP **7 Claims**



7. A cylindrical grinder comprising
means including a drive plate and a clamping assembly secured to the drive plate for rotating a workpiece about a selected axis,
the workpiece having a plurality of work diameters, one of which is to be ground and a plurality of main bearings located between one end of the workpiece and the one work diameter to be ground, at least one of the plurality of main bearings being located between the two work diameters,
a grinding wheel assembly including a grinding wheel for effecting stock removal from the one work diameter, and
a clamping assembly including means

for clamping each of said plurality of main bearings.

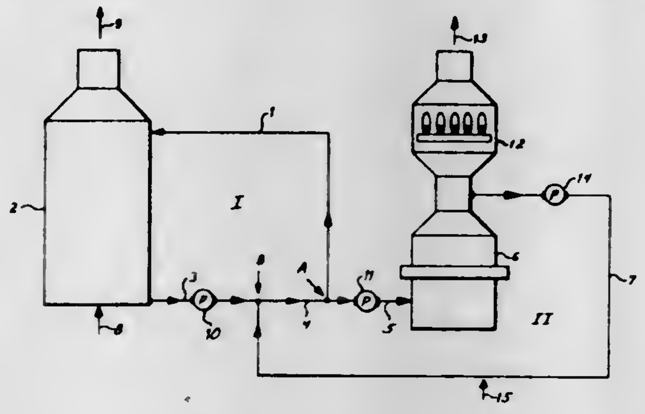
4,003,722
PROCESS AND ARRANGEMENT FOR THE REMOVAL OF IMPURITIES FROM GASES

Heinz Hölter, Beisenstr. 39, 439 Gladbeck, Germany

Filed Oct. 11, 1974, Ser. No. 514,283

Int. Cl.² B01D *47/06*

U.S. Cl. 55—68 **14 Claims**



1. A process for the removal of undesired components, particularly odor-causing components, from fluids, comprising the steps of conveying a cleansing fluid along a closed flow system; contacting the cleansing fluid with an impurity-containing fluid medium in at least one portion of said system so as to permit at least partial transfer of impurities from said fluid medium to said cleansing fluid; evaporating the impurity-laden cleansing fluid in another portion of said system so as to effect at least partial separation of the impurity-laden cleansing fluid into an impurity constituent and a purified cleansing fluid constituent; collecting said purified cleansing fluid constituent; combusting said impurity constituent subsequent to said separation; and recycling said collected and purified cleansing fluid constituent by withdrawing at least part of the latter from said other portion of said system and thereupon conveying said withdrawn cleansing fluid constituent towards said one portion of said system so as to conserve the amount of cleansing fluid employed in said closed system.

4,003,723
PURIFICATION OF CRUDE HYDROGEN CHLORIDE

Stefan Schäfer, Bruhl; Alexander Oborodnik, Erftstadt-Liblar; Klaus Gehrmann, Erftstadt-Lechenich, and Albert Mainski, Rodenkirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

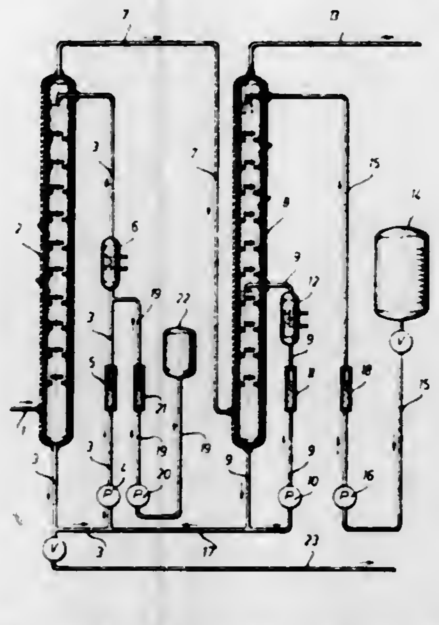
Filed May 17, 1976, Ser. No. 686,928

Claims priority, application Germany, May 20, 1975, 2522286

Int. Cl.² B01D *19/00*

U.S. Cl. 55—71 **11 Claims**

1. A process for the purification of a crude hydrogen chloride gas by-product, which is obtained in the production of chloroacetic acids by the catalytic chlorination of acetic acid with chlorine gas in contact with acetic anhydride and/or acetyl chloride, and continues to be contaminated, even after having been prepurified, with about 0.6 up to 3 % by volume of acetyl chloride and optionally with some minor proportion of chloroacetyl chloride, which comprises: introducing the crude hydrogen chloride gas into the base portion of a scrubbing zone and scrubbing it countercurrently therein with about 0.5 up to 20 liter, per normal cubic meter (S.T.P.) of hydrogen chloride gas, of a cooled scrubbing liquid under circulation and consisting substantially of about 20 up to 80 weight % of concentrated H_2SO_4, about 15 up to 60 weight % of acetic acid, and about 5 up to 50 weight % of water; introducing the resulting purified moist hydrogen chloride gas issuing at the head of the scrubbing zone into the base portion of a drying zone and drying it therein by scrubbing it countercurrently with precooled sulfuric acid under circulation, the sulfuric acid being used at a rate of about 0.5 up to 20 liter, per normal cubic meter of hydrogen chloride; and removing dry hydrogen chloride near the head of the drying zone.



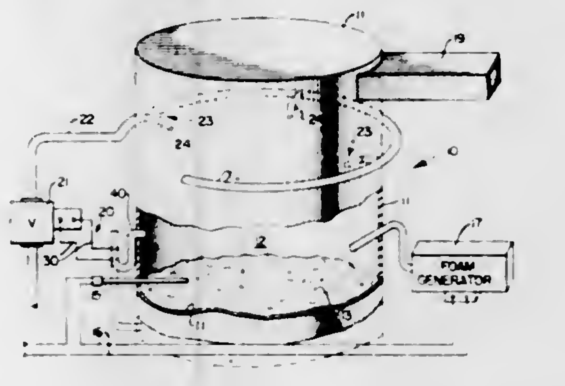
4,003,724
FOAM SCRUBBER AND METHOD

Thomas F. Payne, and Philip D. Sauer, both of Flathead, Mont., assignors to The Anaconda Company, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,375

Int. Cl.² B01D *47/04*

U.S. Cl. 55—87 **13 Claims**



1. In a foam scrubber apparatus for separating gaseous pollutants and/or particulate matter from a gas with a foam which comprises means defining a treatment chamber having spaced gas inlet and gas outlet means which permits the flow of gas therethrough and a foam layer therebetween for separating gaseous pollutants and/or particulate matter as said gas travels through said layer, the improvement comprising monitoring means for monitoring the thickness and/or pressure drop of said foam layer, dispensing means for dispensing a liquid to said foam layer for at least partially collapsing said foam layer, and control means responsive to said monitoring means for controlling the dispensing of liquid by said dispensing means, said monitoring means comprises a manometer for measuring the pressure drop across said foam layer, said dispensing means comprising at least one spray nozzle positioned in said treatment chamber, and said control means is an electrically activated solenoid valve.

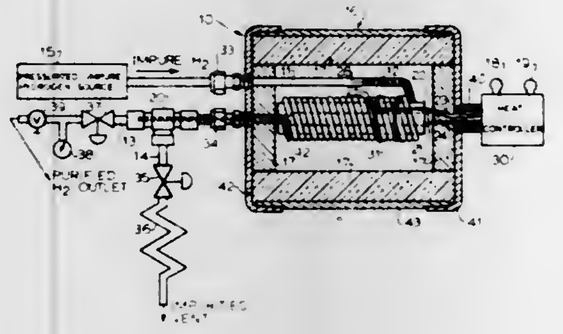
4,003,725
APPARATUS FOR PURIFYING HYDROGEN GAS

Julian Wilbur Bunn, Jr., Raleigh, N.C., and Charles Omar Buckley, Lewisburg, W. Va., assignors to Trienco, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 576,730, May 12, 1975, Pat. No. 3,972,695. This application May 3, 1976, Ser. No. 682,408

Int. Cl.² B01D *53/22*

U.S. Cl. 55—158 **6 Claims**



1. An apparatus for separating pure hydrogen gas from a hydrogen containing gas, comprising in combination:

- a. a gas-impervious metal jacket tube having an inlet end and a vent end and having a circular cross-section and a continuous central opening capable of receiving a plurality of tubes therein, said jacket tube having the characteristics of withstanding high internal pressures and of being bendable to form a compact tortuous path and when in such tortuous condition said jacket tube substantially maintaining said continuous central opening;
- b. a plurality of hydrogen permeable tubes inserted within said jacket tube and residing within said jacket tube along a substantial portion of the length of said permeable tubes, said permeable tubes each having at least one end thereof connected to pure hydrogen outlet means, and said permeable tubes each having a circular cross-section and a continuous central opening for the passing of pure hydrogen gas therethrough, said permeable tubes being grouped closely together and the spacing between said permeable tubes outer wall portions and the wall of said jacket tube central opening being such that said permeable tubes may not be appreciably bent without forming a corresponding bend in the respective adjacent portion of said jacket tube, said permeable tubes having the characteristic of being bendable to form a compact tortuous path without substantially altering said permeable tube continuous central opening, said jacket tube with said permeable tubes inserted therein together being bent into a compact tortuous path such that the outer wall portions of said permeable tubes remain in close spaced relation with the respective adjacent wall surfaces of said jacket tube central opening;
- c. heater means located proximate the tubes for maintaining said tubes at a controlled temperature;
- d. means for introducing a hydrogen containing gas into the inlet end of said jacket tube;
- e. means for venting gas impurities from the vent end of said jacket tube; and
- f. means for controlling the pressure in said tubes so that the pressure within said jacket tube and external of said permeable tubes is greater than the pressure within said permeable tubes.

4,003,726
CLEANING OF PARTICULATE OR MIST ELIMINATING APPARATUS WITH SO_2

F. Dale Huillet, Snohomish, and L. Michael Minshull, Everett, both of Wash., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Dec. 10, 1975, Ser. No. 639,226

Int. Cl.² B01D *46/04*

U.S. Cl. 55—90 **7 Claims**

1. A process of cleaning fiber-containing apparatus having water-insoluble particulate material from the treatment of combustion flue gases deposited on the fibers, which process comprises;

treating the fibers and the particulate material with an aqueous, acidified potassium permanganate solution,

removing the aqueous acidified potassium permanganate treatment solution, followed by

treating the fibers and remaining particulate material with gaseous sulfur dioxide, and

removing the sulfur dioxide treated material with water.

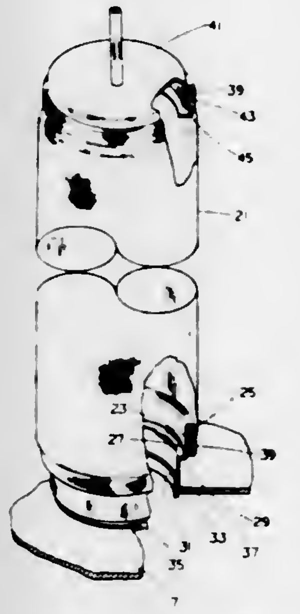
4,003,727
TUBULAR FILTER CONNECTOR

Leonard J. O'Dell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed July 2, 1975, Ser. No. 592,539

Int. Cl.² B01D *46/02*

U.S. Cl. 55—377 **3 Claims**



1. In a baghouse arrangement for filtering particulate matter from a gaseous stream including at least one plenum having an apertured member for gas passage therethrough and at least one vertically extending tubular filter bag with one of its ends connected to said apertured member in flow-through communication with said plenum, the improvement comprising:

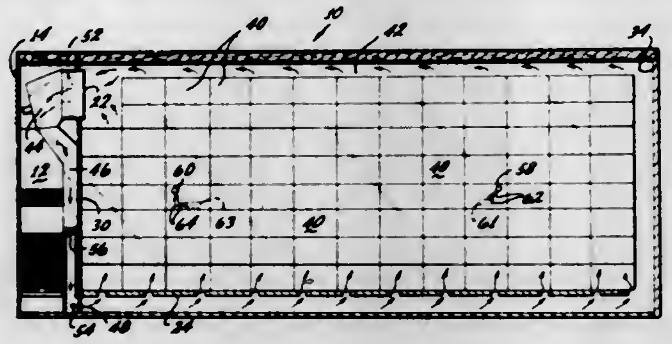
a flow-through elongated mounting member having a vertically extending portion with a radially outwardly extending flange at one end thereof in communication with said one end of said tubular filter bag, a radially inwardly extending seat at the opposed end thereof with a vertically downwardly extending portion terminating at its lower extremity, the vertically downwardly extending portion being received by the aperture in said apertured member such that the seat rests upon the periphery of the aperture, said vertically downwardly extending portion between said flange and said radially inwardly extending seat being defined by two vertically extending offset sections connected by a radially inwardly extending ledge portion; and,

said one end of said tubular filter bag having a means releasably securing said tubular filter bag to said flange of said mounting member.

4,003,728

METHOD AND APPARATUS FOR CONTROLLING THE STORAGE CONDITION OF PERISHABLE COMMODITIES IN LONG-DISTANCE TRANSPORT VEHICLES

Eric Rath, 2415 Calle Del Oro, La Jolla, Calif. 92037
Filed Oct. 9, 1974, Ser. No. 513,275
Int. Cl.^{2} F24F *3/16*
U.S. Cl. 62—78 **12 Claims**



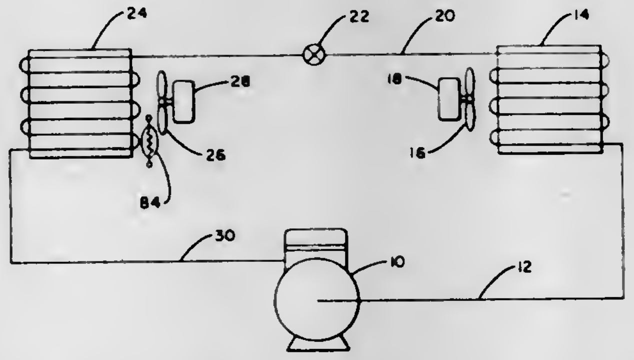
1. A method of maintaining field fresh perishable agriculture commodities in optimum condition during storage and transportation comprising the steps of:

a. packing commodities in a chamber having a controllable environment;
b. forcing temperature regulated, humidified air through the floor of said chamber and upwardly through said stored commodities;
c. withdrawing air from the top of said chamber;
d. sensing circulating air for temperature and humidity;
e. circulating withdrawn air through heating, cooling, and humidifying means for altering the temperature and humidity thereof according to predetermined desired criteria;
f. sensing the temperature of said packed commodities; and
g. changing the predetermined desired criteria to achieve a desired optimum storage temperature of said commodities.

4,003,729

AIR CONDITIONING SYSTEM HAVING IMPROVED DEHUMIDIFICATION CAPABILITIES

William L. McGrath, Naples, Fla., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 17, 1975, Ser. No. 632,330
Int. Cl.^{2} F25D *17/06*
U.S. Cl. 62—93 **11 Claims**



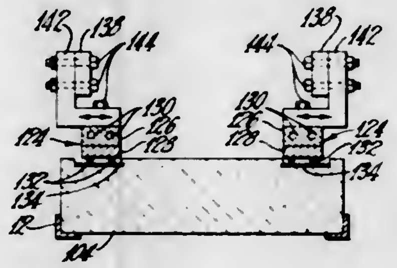
1. In an air conditioning system including a mechanical refrigeration unit having a fan to route air in heat transfer relationship with the evaporator and actuating means to drive said fan, a control system to increase the dehumidifying capabilities of said system comprising:

temperature responsive means to sense the temperature level of the refrigerant passing through the evaporator coil;
means to generate a control signal in response to said sensed refrigerant temperature including means to vary the magnitude of said signal as the sensed refrigerant temperature varies;
means to supply said variable magnitude control signal to said fan actuating means to vary the speed of said actuating means and thus the speed of said fan, whereby the speed of said fan is decreased as the sensed refrigerant temperature increases to decrease the flow rate of the air across the evaporator, and the speed of the fan is increased as the sensed refrigerant temperature decreases to increase the flow rate of air across the evaporator to maintain a substantially constant refrigerant temperature;
means to sense the temperature level of the air in the space being served by said air conditioning system;
means to generate a second control signal in response to said sensed air temperature including means to vary the magnitude of said second signal as the sensed air temperature varies;
means to supply said second variable magnitude control signal to said fan actuating means to vary the speed of said fan; and
monitoring means to determine the magnitude of said second control signal including means to discontinue operation of said refrigeration unit if the magnitude of said second control signal is indicative of the air temperature having fallen below a predetermined value.

4,003,730

APPARATUS FOR MAKING GLASS FIBERS

William C. Brady, Granville; Arthur S. Warner, Hebron, and Harold D. Hankinson, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sept. 26, 1975, Ser. No. 616,973
Int. Cl.^{2} C03B *37/02*
U.S. Cl. 65—1 **19 Claims**



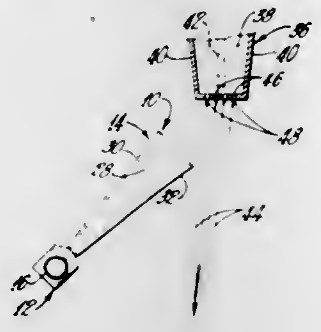
1. Apparatus for producing molten glass streams in fiber-forming condition comprising:

a walled melting receptacle of high-temperature resistant material having at least a partially open top and a partially open bottom and in which molten glass is formed from batch material;
a feeder communicating with the melting receptacle through the bottom opening in the melting receptacle, molten glass formed in the melting receptacle flowing from the melting receptacle through the bottom opening into the feeder, the bottom of the feeder having holes through which the molten glass flows as molten streams;
a heating element extending across the interior of the receptacle and having opposite edge portions, the heating elements being electrically conductive and being positioned to be beneath the surface of a body of molten glass formed within the receptacle, and the heating element being subject to changes in its dimensions when heated;
a pair of bus bars for distribution of electrical energy effective to heat the heating element to form molten glass from the batch material, each bus bar being connected to an edge portion of the heating element;
a mounting means holding the bus bars so that at least one of the bus bars is movable to accommodate the dimensional changes in the heating element; and
means for providing electrical power to the bus bars.

4,003,731

NOZZLE FOR FLUIDS

Thomas K. Thompson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 26, 1976, Ser. No. 680,246
Int. Cl.^{2} C03B *37/02*
U.S. Cl. 65—12 **5 Claims**



1. A nozzle comprising:

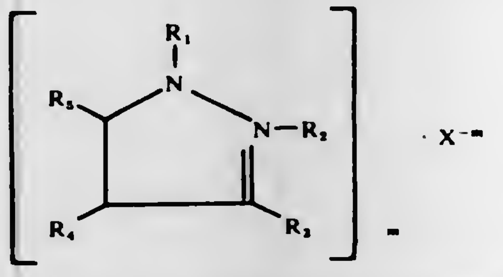
a. a chamber;
b. means opening into said chamber;
c. a plurality of apertures opening from said chamber for discharging a fluid;
d. a conduit abutting said chamber in open communication with said chamber and surrounding said apertures, said conduit having a rectangular cross-section with two outwardly diverging opposing walls; and,
e. a plurality of vane means positioned within said conduit.

4,003,732

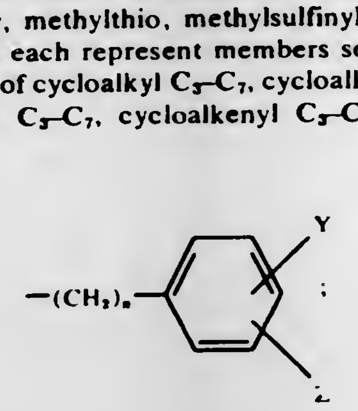
PYRAZOLINIUM COMPOUNDS AS HERBICIDES

Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 484,515, July 1, 1974, Pat. No. 3,925,408.
This application July 28, 1975, Ser. No. 599,805
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—92 **7 Claims**

1. A method for the control of undesirable plant species comprising, contacting said undesirable plant species with a herbicidally effective amount of a compound having the formula:



wherein R_1 and R_2 each represent alkyl C_1–C_4; R_4 represents a member selected from the group consisting of hydrogen, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl; R_3 and R_5 each represent members selected from the group consisting of cycloalkyl C_3–C_7, cycloalkylmethyl C_3–C_7, methylcycloalkyl C_3–C_7, cycloalkenyl C_3–C_7, alkyl C_2–C_{11}, thienyl and



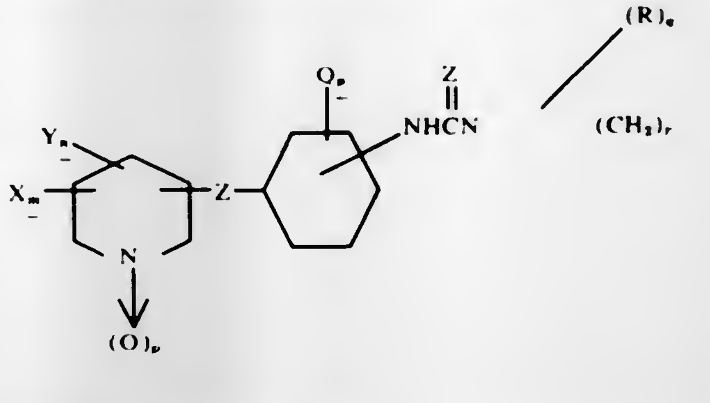
X represents an anion having a charge of from 1 to 3; *n* is an integer selected from 0 and 1; *m* is an integer selected from 1, 2 and 3; and Y and Z each represent members selected from the group consisting of hydrogen, halogen, nitro, cyano, alkyl C_1–C_4, alkoxy C_1–C_4 and CF_3.

4,003,733

SUBSTITUTED PYRIDINYLOXY(THIO)PHENYL -ACETAMIDES, -UREAS AND UREA DERIVATIVES

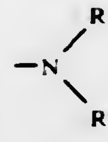
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 435,615, Jan. 22, 1974, Pat. No. 3,931,201. This application Oct. 16, 1975, Ser. No. 623,157
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—94 **25 Claims**

1. A compound corresponding to the formula:



wherein:

r represents an integer of 4 or 5;
q represents an integer of 0 to 2, inclusive;
each *p* independently represents an integer of 0 or 1;
each X independently represents bromo, chloro, iodo or fluoro;
m represents an integer of 0 to 4, inclusive;
each Y independently represents nitro, ZR^3, $-C(X')_3$



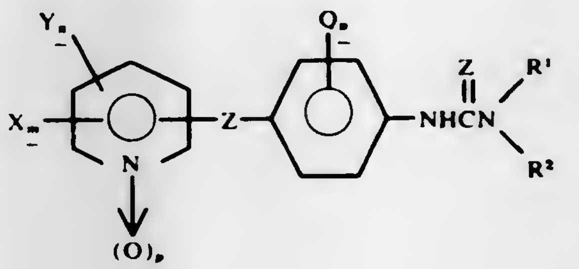
n represents an integer of 0 to 2, inclusive;
each Z independently represents oxygen or sulfur;
Q represents methyl, ethyl, halo, nitro or trifluoromethyl;
each X′ independently represents hydrogen or halo;
each R independently represents hydrogen or alkyl of from 1 to 3 carbon atoms;
R^3 represents alkyl of from 1 to 3 carbon atoms, and
R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms.

4,003,734

SUBSTITUTED PYRIDINYLOXY(THIO)PHENYL-ACETAMIDES, -UREAS AND UREA DERIVATIVES AND HERBICIDAL COMPOSITIONS AND METHODS CONTAINING SAID COMPOUNDS

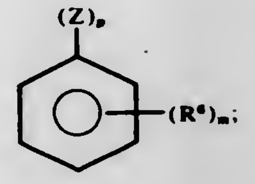
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 435,615, Jan. 22, 1974, Pat. No. 3,931,201. This application Oct. 16, 1975, Ser. No. 623,151
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—94 **52 Claims**

1. A compound corresponding to the formula:



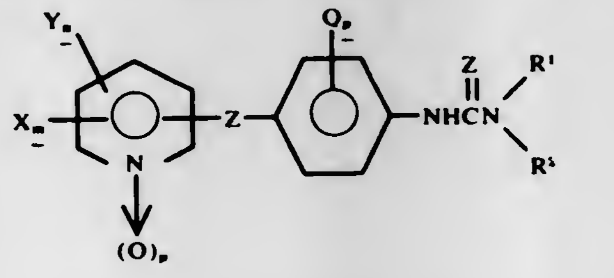
wherein:

each p independently represents an integer of 0 or 1;
each X independently represents bromo, chloro, iodo or fluoro;
m represents an integer of 0 to 4, inclusive;
each Y independently represents cyano
n represents an integer of 0 to 2, inclusive;
each Z independently represents oxygen or sulfur;
Q represents cyano;
R^1 represents hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms;
R^2 represents alkyl of from 1 to 3 carbon atoms or

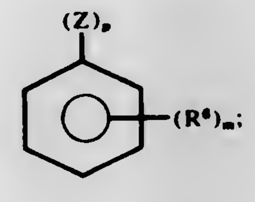


and
each R^6 represents halo or alkyl of from 1 to 3 carbon atoms.

27. The method of controlling undesired plant growth which comprises applying to plants and/or their habitats a herbicidally-effective amount of a compound of the formula:



wherein:
each p independently represents an integer of 0 or 1;
each X independently represents bromo, chloro, iodo or fluoro;
m represents an integer of 0 to 4, inclusive;
each Y independently represents cyano;
n represents an integer of 0 to 2, inclusive;
each Z independently represents oxygen or sulfur;
Q represents cyano;
R^1 represents hydrogen, alkyl of from 1 to about 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms;
R^2 represents alkyl of from 1 to 3 carbon atoms or



and
each R^6 represents halo or alkyl of from 1 to 3 carbon atoms in the presence of an inert carrier therefor.

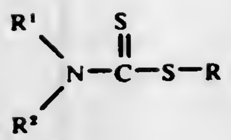
4,003,735
COMPOSITIONS AND METHODS FOR REDUCING HERBICIDAL INJURY

Albert J. Czajkowski, Maryland Heights, and David E. Schafer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 4, 1974, Ser. No. 520,521
Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—101 **30 Claims**

1. A method for reducing injury to crops by α-haloacetanilide herbicides which comprises applying to the soil, crop, or crop seed an effective safening amount of a compound of the formula



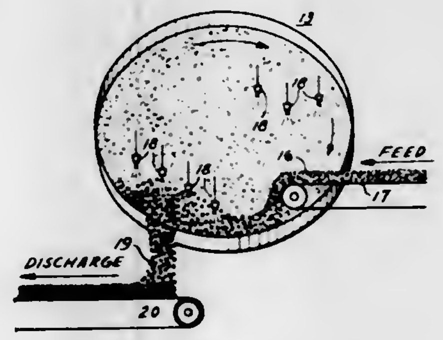
wherein R is C_{1-4} alkyl, C_{2-8} alkenyl or haloalkenyl, phenyl, cyanomethyl, cyclohexyl, cyclohexenyl, benzyl or benzyl substituted with halo, nitro or trifluoromethyl groups; R^1 is C_{1-8} alkyl, C_{2-8} alkenyl, phenyl or phenyl substituted with halo, nitro or lower alkyl groups and R^2 is hydrogen, C_{1-8} alkyl or C_{2-8} alkenyl or haloalkenyl.

4,003,736
METHOD FOR PREPARING DRY-COLLECTED FUME FOR USE IN METALLURGICAL FURNACES

John W. Kreiger, and Charles E. Jablonski, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed July 1, 1975, Ser. No. 592,288
Int. Cl.^{2} C22B *1/08*

U.S. Cl. 75—3 **3 Claims**



1. A method for preparing strong, stable green balls, suitable for charging into metallurgical furnaces, from dry-collected iron-bearing fume containing not less than a total of about 8% combined amount of lime (CaO) and magnesia (MgO), formed in basic oxygen steelmaking furnaces, said method comprising:
- a. charging said fume onto a balling device,
- b. agglomerating said fume into green balls on said balling device while adding an amount of water continuously to said fume and retaining said fume on said balling device for a time sufficient for said water to:
  - i. combine stoichiometrically with substantially all of said lime and magnesia in said fume, and
  - ii. leave an amount of moisture between about 7 and 12% to act as a binder in said green balls discharged from said balling device.

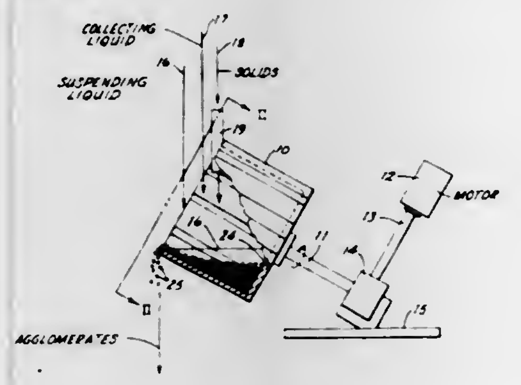
4,003,737
METHOD OF AGGLOMERATING WITH ADDITIVES IN THE BRIDGING LIQUID

Bruce F. Caswell, Ann Arbor, Mich., and I. E. Puddington, Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 295,295, Oct. 5, 1972, abandoned. This application July 22, 1974, Ser. No. 490,285
Int. Cl.^{2} C22B *1/08*

U.S. Cl. 75—3 **3 Claims**

1. A process for forming agglomerates of aluminum oxide from finely divided aluminum oxide particles in a two-phase liquid system, comprising:
- a. forming a suspension of aluminum oxide particles having a particle size in the range of from 10 to 250 microns, in a first liquid which is lyophobic with respect to aluminum oxide particles;
- b. adding to said suspension a second liquid consisting essentially of an aqueous nitric acid solution containing from 0.3 to 10 percent by weight of nitric acid and from 0.5 to 20 percent by weight of aluminum nitrate, said second liquid being lyophilic with respect to said aluminum oxide particles and being immiscible with said first liquid whereby to form a two-phase liquid system containing said particles in suspension;
- c. agitating the two-phase liquid system to effect repeated collisions of said aluminum oxide particles and thereby forming in said system a dispersion of agglomerates of said aluminum oxide particles and said second liquid, and during said agitating, simultaneously initiating a chemical reaction between said nitric acid and aluminum oxide on the surfaces of said aluminum oxide particles to form aluminum nitrate;



- d. discontinuing said agitating, maintaining said agglomerates immersed in the liquid phase and permitting said chemical reaction to proceed for a period of time effective to form aluminum nitrate on the surfaces of the aluminum oxide particles in the agglomerates, and then separating the agglomerates from the liquid phase;
- e. drying said agglomerates to drive off water and to crystallize said aluminum nitrate which bonds together the aluminum oxide particles in the agglomerates, the drying step being carried out at a rate effective to prevent cracking of the agglomerates; and
- f. calcining the dried agglomerates to transform said aluminum nitrate to aluminum oxide, whereby to obtain agglomerates of aluminum oxide particles bonded together by aluminum oxide binder.

4,003,738
METHOD OF PURIFYING ALUMINUM

Alex R. Valdo, Phoenix, Ariz., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 240,864, April 3, 1972, which is a continuation of Ser. No. 26,752, April 8, 1970, abandoned, and a continuation-in-part of Ser. No. 168,363, Aug. 2, 1971, Pat. No. 3,846,122, which is a continuation-in-part of Ser. No. 26,751, April 8, 1970, abandoned. This application Dec. 10, 1975, Ser. No. 639,263

The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.
Int. Cl.^{2} C22B *21/00*

U.S. Cl. 75—68 C **11 Claims**

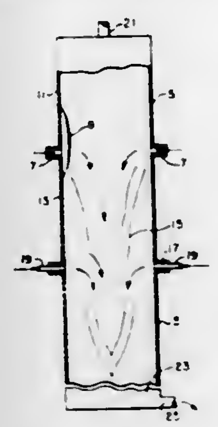
1. A process for purifying aluminum carbide containing aluminum formed by decomposition of an alkyl aluminum compound, comprising the steps of:
- a. melting the aluminum under a molten fluoride cover flux;
- b. bubbling through the body of molten aluminum a stream of gas containing chlorine but otherwise essentially inert, until the carbide content of the aluminum is essentially removed; and,
- c. separating the treated aluminum from the flux and any dross formed thereon and casting the separated aluminum to thereby form an aluminum product substantially free of aluminum carbide.

4,003,739
COPPER EXTRACTION BY ARC HEATER

Floyd E. Camp, Trafford, and Chikara Hirayama, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 16, 1975, Ser. No. 587,762
Int. Cl.^{2} C22B *15/00*

U.S. Cl. 75—72 **1 Claim**



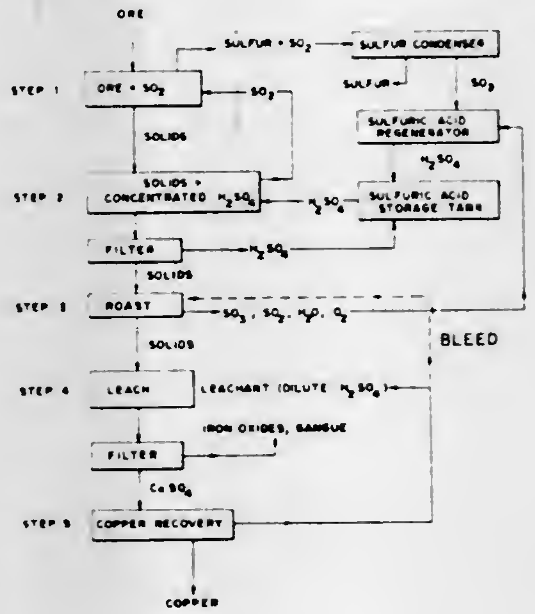
1. A process for the production of copper from copper sulfide ore comprising the steps of:
striking an electric arc in an axial gap between generally hollow, cylindrical electrodes spaced along a common axis which form an arc chamber;
passing a non-conductive gas consisting essentially of oxygen-containing gas selected from the group consisting of oxygen and air forcefully through the gap into the arc chamber and through the arc to produce an arc heated plasma jet while forming a downstream reaction zone;
injecting into the reaction zone a stream of powdered copper sulfide material to effect a reaction between said material and said oxygen-containing gas at a temperature ranging from about 2000° K to about 3500° K to produce molten copper and sulfur-dioxide; and
cooling the copper to below its melting point.

4,003,740
RECOVERY OF COPPER FROM COPPER SULFIDE ORES CONTAINING COPPER AND IRON

Dale K. Huggins, Golden, Colo.; Lowell R. Anderson, Morristown, and Fred J. Gefri, Hackettstown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 6, 1976, Ser. No. 646,807
Int. Cl.^{2} C22B *15/08*

U.S. Cl. 75—117 **15 Claims**



1. A cyclic process for recovering copper from sulfide ores containing copper and iron which comprises:
- a. reacting the sulfide ore with sulfur dioxide gas at a tem-

perature of at least about 500° C., thereby forming elemental sulfur, magnetite and a copper sulfide

b. condensing and removing the elemental sulfur from the reaction mixture,
c. reacting the residual solids with concentrated sulfuric acid at a temperature of about 180° to 500° C., thereby forming copper sulfate and sulfur dioxide gas,
d. recycling the sulfur dioxide gas to step (a)
e. separating the solids comprising magnetite and copper sulfate from the liquid phase,
f. roasting the separated solids at a temperature of about 400° to 900° C.,
g. leaching the roasted solids with an aqueous solution comprising water or dilute sulfuric acid, thereby solubilizing the copper sulfate,
h. separating the solids comprising magnetite and gangue from the liquid phase and
i. recovering copper from the solubilized copper sulfate.

4,003,741
METHOD OF PREPARATION OF SEMICONDUCTING COMPOUNDS

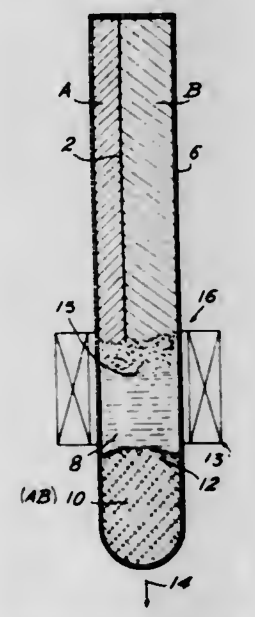
Jean Gallet; Jean Marine; Bernard Pelliciari, and Bernard Schaub, all of Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 9, 1975, Ser. No. 639,112

Claims priority, application France, Dec. 24, 1974, 74.42769

Int. Cl.^{2} C22C *1/02*

U.S. Cl. 75—135 **7 Claims**



1. A method of preparation of a ternary alloy composed of the elements A^1, A^2 and A^3, wherein said method consists of the following steps:

the preparation of a binary alloy A^1A^2,
the purification of said binary alloy by zone melting,
the placing of said binary alloy A^1A^2 which is in the solid state together with the third element A^3 within a container in the presence of a solvent,
the crystallization of the ternary alloy by melting all the elements $A^1A^2 + A^3$ and recrystallization in the presence of the solvent.

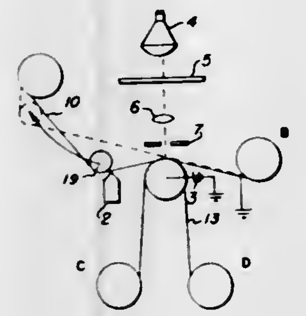
4,003,742
VELOCITY COMPENSATION FOR BEAD BYPASS WITH SPEED REDUCTION

Earl V. Jackson, Penfield; Roger G. Teumer, Fairport, and LeRoy Baldwin, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 476,185, June 4, 1974, Pat. No. 3,950,088. This application Nov. 17, 1975, Ser. No. 632,435

Int. Cl.^{2} G03G *15/24*

U.S. Cl. 96—1 PE **5 Claims**



1. A photoelectrophoretic imaging method comprising

a. providing a pair of electrodes having inside and outside surfaces, wherein one of said electrodes is a web;
b. coating a layer of an imaging suspension comprising electrically photosensitive pigment particles in an electrically insulating carrier liquid on at least a portion of the inside surface of at least one of said electrodes before the inside surfaces of said electrodes are brought into contact with each other to form a nip;
c. advancing successive portions of the inside surfaces of said electrodes into contact with each other to form a nip, wherein a bead of accumulated imaging suspension forms at the entrance to the nip;
d. applying an electrical field across the imaging suspension between said electrodes;
e. exposing said suspension at the nip to an imagewise pattern of activating radiation at least when the inside surfaces of said electrodes are in contact at the nip with the suspension therebetween;
f. advancing at least said web electrode relative to the nip region so that at least the bead of accumulated imaging suspension is advanced beyond the nip region when the inside surfaces of the electrodes are separated;
g. separating the inside surfaces of said electrodes at the nip to a spacing sufficient to allow the bead of accumulated imaging suspension to pass the nip region;
h. compensating for motion during said separating step (g) whereby the advancing rate of velocity for said web electrode remains constant by moving at least one roller, always in continuous contact with the outside surface of said web electrode, in a fixed approximately elliptical path which always causes reduction of the wrap angle formed by said advancing web electrode in contact with said other electrode to cause separation of the inside surfaces of said electrodes without changing the advancing velocity of the web electrode; and
i. reducing the advancing velocity of said other electrode when the inside surfaces of said electrodes are being separated or while they are separated whereby said other electrode is advanced at a slower velocity than its prior velocity.

4,003,743
PROCESS FOR PRODUCTION OF MOTION PICTURE FILM WITH SOUND TRACK CONTAINING p-TOLUENESULFONIC ACID AND GLACIAL ACETIC ACID

Goro Akashi; Masaaki Fujiyama, and Akira Kasuga, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 345,823, March 28, 1973, abandoned. This application May 19, 1975, Ser. No. 578,957

Claims priority, application Japan, Mar. 30, 1972, 47-31943

Int. Cl.^{2} G03C *7/24, 5/14;* **G03G** *19/00*

U.S. Cl. 96—4 **13 Claims**

1. In a motion picture film comprising a support having coated thereon (1) a photographic emulsion layer having as its main component a hydrophilic component and containing at least one silver halide and (2) an oleophilic magnetic sound track coated on said emulsion layer, said sound track comprising a film-forming polymeric material and containing one or more ferromagnetic powders, the improvement wherein the sound track contains p-toluene sulfonic acid present in an amount of 3 to 60 parts by weight based on 300 parts by weight of said ferromagnetic powders, and wherein said sound track also contains glacial acetic acid present in an amount of at least 9 parts by weight based on 300 parts by weight of said ferromagnetic powders.

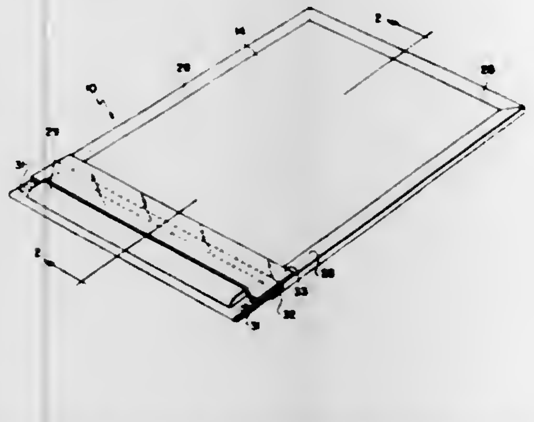
4,003,744
PHOTOGRAPHIC PRODUCTS WITH PHOTOSENSITIVE LAYERS OF SAME SPECTRAL SENSITIVITY AND DIFFERENT SPEED

Peter O. Kliem, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 312,827, Dec. 7, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,197

Int. Cl.^{2} G03C *5/54, 1/76, 7/00, 1/40*

U.S. Cl. 96—29 D **23 Claims**



1. A composite photographic diffusion transfer process film unit which comprises a plurality of sequential layers arranged in substantially parallel planar relationship including, in combination:

a dimensionally stable layer having one side serving as an external surface of said film unit,
a composite photosensitive unit comprising:
a first layer comprising a particulate dispersion of photosensitive silver halide grains possessing first means particle size and exhibiting gamma value within the range of about 1.7 to 3.0; and
a second layer comprising a particulate dispersion of photosensitive silver halide grains possessing a second mean particle size less than said first mean particle size, being spectrally sensitive within the sensitivity range of said first layer silver halide grains and combined with a diffusion transfer process dye image-forming material having a spectral absorption characteristic within the spectral sensitivity range of the said silver halide grains of said first and second layers, said second layer exhibiting a gamma value within the range of about 1.7 to 3.0;
said gamma values of said first and second layers differing from each other by at least 0.25;
the diffusion transfer speed of said first layer being greater than that of said second layer by an amount equivalent to about four to seven stops;
said first layer being contiguous with said second layer and being positioned intermediate said second layer and the exposure surface of said film unit;
said first layer being substantially free of diffusion transfer process dye image-forming material;
said composite photosensitive unit exhibiting a predetermined gamma within a range of 1.1 to 1.7;
receptor means including a layer adapted to receive diffusion transfer process dye image-forming material diffusing thereto as a function of the point-to point degree of said photosensitive unit's exposure to incident actinic radiation; and
means for providing a processing composition intermediate said photosensitive unit and said receptor means.

4,003,745
METHOD FOR IDENTIFYING COLOR SEPARATION FILM

William L. Blanks, Dallas, Tex., assignor to Blanks Engraving Company, Dallas, Tex.

Filed Feb. 2, 1976, Ser. No. 654,513

Int. Cl.^{2} G03C *5/04;* **G03F** *1/00*

U.S. Cl. 96—41 **3 Claims**

1. A process to identify and register film in color separation photography comprising the steps of: positioning a color identifying tape next to the article to be copied, said tape having a black positive register mark thereon with colored backgrounds shaded in the three primary colors spaced in three quadrants about the black positive register mark, said backgrounds having negative indicia positioned therein to indicate the color of the background, and said tape further having a negative register mark in spaced relationship with the positive register mark, said negative register mark having colored positive indicia shaded in each primary color on clear background spaced in corresponding quadrants to the quadrants on the colored background of the black positive register mark; photographing the article to be copied and said positive and negative register marks through a first filter to substract a first primary color from a first primary color quadrant about the black positive register mark and the first primary color indicia about the negative register mark; photographing the article to be copied and said positive and negative register marks through a second filter to substract a second primary color from a second primary color quadrant about the black positive register mark and the second primary color indicia about the negative register mark; photographing the article to be copied and said positive and negative register marks through the third filter to substract a third primary color from a third primary quadrant about the black register mark and the third primary color indicia about the negative register mark; photographing the article to be copied and said positive and negative register marks through a fourth filter to highlight the black color to produce only the black positive register mark and negative register mark; developing each of the films; affixing the film having the first primary color on a first flat; affixing the film having the second primary color on a second flat, and aligning the register marks on the film having the second primary color with the register marks on film having the first primary color; affixing the film having the third primary color on a third flat, and aligning the register marks on the film having the first and second primary colors with the register mark on the film having the third primary color; affixing the film with black color on a fourth flat, and aligning the register marks on the film having the black color with the register marks on the film having first, second and third primary colors thereon, wherein each said flat comprises a transparent sheet.

4,003,746

ORGANIC HETEROCYCLIC AND THIOARYL PHOSPHINES IN SILVER HALIDE EMULSIONS AND DEVELOPERS THEREFOR

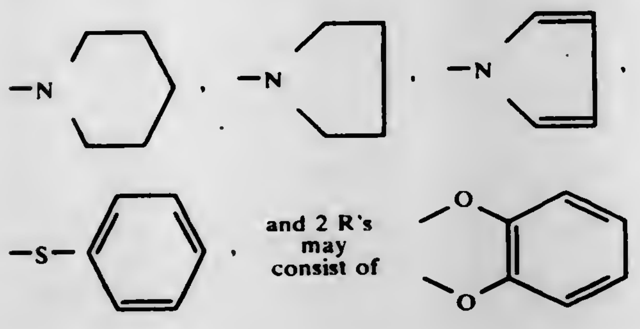
John Howard Bigelow, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 1, 1975, Ser. No. 592,262

Int. Cl.² G03C *5/24, 1/34, 1/06*

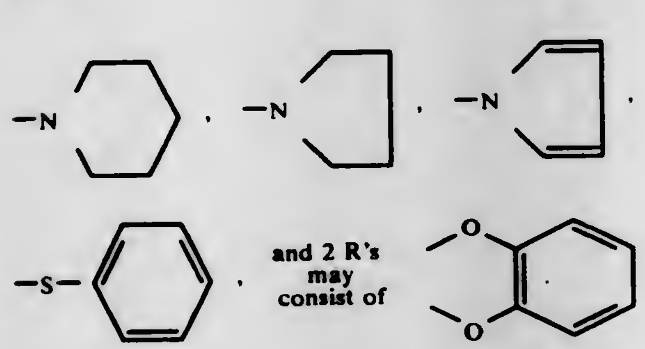
U.S. Cl. 96—66.3 **9 Claims**

1. A light-sensitive silver halide photographic material comprising a support bearing a layer of a silver halide emulsion containing in said layer or in a contiguous layer a tertiary phosphine of the formula PR_3 wherein at least one R but not more than 2 R's being the same, is a member of the groups



and any remaining one R, or 2 R's being the same, is selected from the group consisting of alkyl, alkoxy, aryl, aryloxy, and aralkyl.

8. A silver halide photographic developer solution which contains at least one silver halide developing agent and a tertiary phosphine of the formula PR_3 wherein at least one R, but not more than 2 R's being the same, is a member of the groups



and any remaining R one R or 2 R's being the same is consist of selected from the group consisting of alkyl, alkoxy, aryl, aryloxy, and aralkyl; said tertiary phosphine being present in an amount of 0.01 to 0.3 grams per liter of developer solution.

4,003,747

PHOTOSENSITIVE AZIDE COMPOUND CONTAINING COLOR-FORMING ELEMENT

Takahiro Tsunoda, Funabashi; Minoru Ozutsumi, Tokyo; Shigeo Maeda, Tokyo; Susumu Suzuka, Tokyo, and Hidetoshi Komiya, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd. and Oji Paper Co., Ltd., both of Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,400

Claims priority, application Japan, Sept. 9, 1974, 49-102911

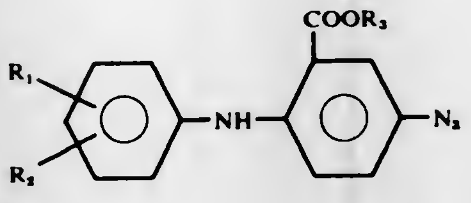
Int. Cl.² G03C *1/58, 1/72*

U.S. Cl. 96—75 **9 Claims**

1. A photosensitive color-forming element comprising a support, and a photosensitive color-forming layer coated on said support, said layer containing therein an admixture of:

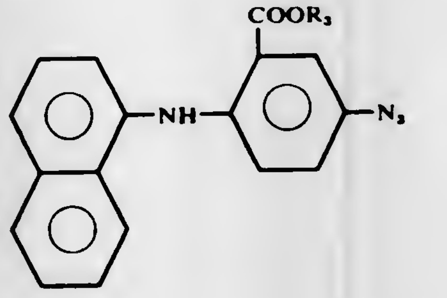
A. at least one color-forming coupler selected from the group consisting of 2-hydroxynaphthalene, 1-hydroxynaphthalene, 2,3-dihydroxynaphthalene, 4-methoxy-1-naphthol, 2-hydroxy-3-naphthanilide, 2,4-dichloro-1-naphthol, phenol, 2,4-dihydroxybenzene, 1,4-dihydroxybenzene, 4-acetylphenol, p-cresol, m-phenylenediamine, 5-methyl-2-acetylphenol, N,N-dimethyl-m-aminophenol, N,N-diethylaniline, N-ethyl-N-benzylaniline, N-methyldiphenyl amine, N,N-bis-cyano-ethylaniline, N,N-dibenzylaniline, acetacetic anilide, 1-phenyl-3-methyl-5-pyrazolone, 1-(3'-aminophenyl)-3-methyl-5-pyrazolone, 1-(4'-chlorophenyl)-3-methyl-5-pyrazolone, 1-nathyl-3-methyl-5-pyrazolone, 1-methyl-2-phenylindole, 2-phenylindole, 1,2-dimethylindole, 2,3,3-trimethylindoline, 1,2,3,3-tetramethylindoline, 4-hydroxycoumarin and 4-cyanomethyl-nitrobenzene, and

B. at least one photosensitive azido compound selected from the group consisting of the azido compounds of the formula (I) and the azido compound of the formula (II):



(I)

and



(II)

wherein R_1 represents a substituent selected from the group consisting of halogen atoms, and alkoxyl, diethylamino and hydroxyl radicals, R_2 a substituent selected from the group consisting of alkoxyl and hydroxyl radicals, and R_3 a substituent selected from the group consisting of a hydrogen atom and alkyl and phenyl radicals.

4,003,748

INCORPORATION PROCESS

Hans Langen, Bonn; Erwin Ranz, Leverkusen; Rudolf Meyer, Leverkusen, and Johannes Sobel, Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 3, 1975, Ser. No. 554,716

Claims priority, application Germany, Mar. 7, 1974, 2410914

Int. Cl.² G03C *1/84, 1/40*

U.S. Cl. 96—84 UV **8 Claims**

1. A process for the production of photographic layers containing emulsified substances in heterogeneous distribution comprising the step of emulsifying the substances in solubilized form into a hydrophilic phase in the presence of an oilformer compound and applying the emulsion formed to a substrate, the emulsified substances are selected from the group consisting of couplers, UV-absorbers, white toners or stabilizers (to dissolve said substances, wherein the improvement comprises providing a substantially diffusion-resistant, substantially water-insoluble, substantially non-coupling oilformer compound which is of the formula

$$R_1 - CO - CH_2 - R_2$$

wherein

R_2 represents a cyano group or the group COR_3,

R_1 and R_3 represents alike or different groups selected of linear or branched chain alkyl with up to 20 carbon atoms, cyclohexyl and cyclopentyl groups, aryl groups, aralkyl groups, alkoxy groups, aroxy groups and aralkoxy groups; the total number of carbon atoms in R_1 and R_3 amounting to at least 6, if R_1 an R_3 both are alkyl or together complete an alkyl substituted or aryl substituted or annelated heterocyclic, heteroaromatic or aromatic ring and the total number of carbon atoms in R_1 and R_3 amounting to at least 10, if R_1 represents alkoxy and R_3 represents alkoxy or aralkoxy,

which oilformer compound is capable of stabilizing the photographic layers against the damaging influence of aldehyde-containing or releasing hardening agents.

4,003,749

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIALS USING THE REACTION PRODUCT OF A ORGANIC SILVER SALT AN A N-HALO-OXAZOLIDINONE

Takao Masuda, and Nobuyoshi Sekikawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

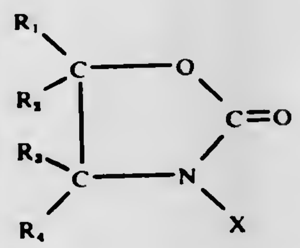
Filed July 15, 1975, Ser. No. 596,130

Claims priority, application Japan, July 15, 1974, 49-81353

Int. Cl.² G03C *1/02, 1/34*

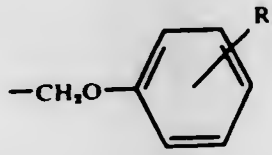
U.S. Cl. 96—114.1 **7 Claims**

1. A heat-developable light-sensitive material comprising a support having therein or in one or more layers thereon (a) an organic silver salt which is comparatively stable to light, is substantially colorless and reacts with a reducing agent on heating in the presence of exposed silver halide to produce silver images, (b) a light-sensitive silver halide, and (c) a reducing agent, with said light-sensitive silver halide comprising the reaction product of a part of the organic silver salt (a) and an N-halo compound represented by the following formula (I):

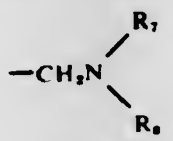


(I)

wherein R_1, R_2, R_3 and R_4 each is a hydrogen atom; an alkyl group having 1 to 22 carbon atoms; a haloalkyl group having 1 to 22 carbon atoms; an amino group; a hydroxyalkyl group having 1 to 22 carbon atoms; an allyl group; a naphthyl group; a benzyl group; a



group in which R_5 is a hydrogen atom, a halogen atom, an alkyl group, an alkylthio group, an amino group or an alkylamino group; a benzyloxy group; an aryl group; a haloaryl group; an alkylaryl group; an alkoxyaryl group; an $-OR_6$ group in which R_6 is a hydrogen atom, an alkyl group, an allyl group, an aryl group or an alkoxyaryl group; a



group in which R_7 and R_8 each is a hydrogen atom, an alkyl group, an aryl group or an allyl group; a cyclohexyl group; a $-CH_2OR_9$ group in which R_9 is a naphthyl group; or a $-CH_2R_{10}$ in which R_{10} is a morpholino group, a piperadino group or an alkylthio group; and X is a chlorine atom or a bromine atom.

4,003,750

SILVER HALIDE EMULSION CONTAINING PHOTOGRAPHIC SENSITIZING DYES

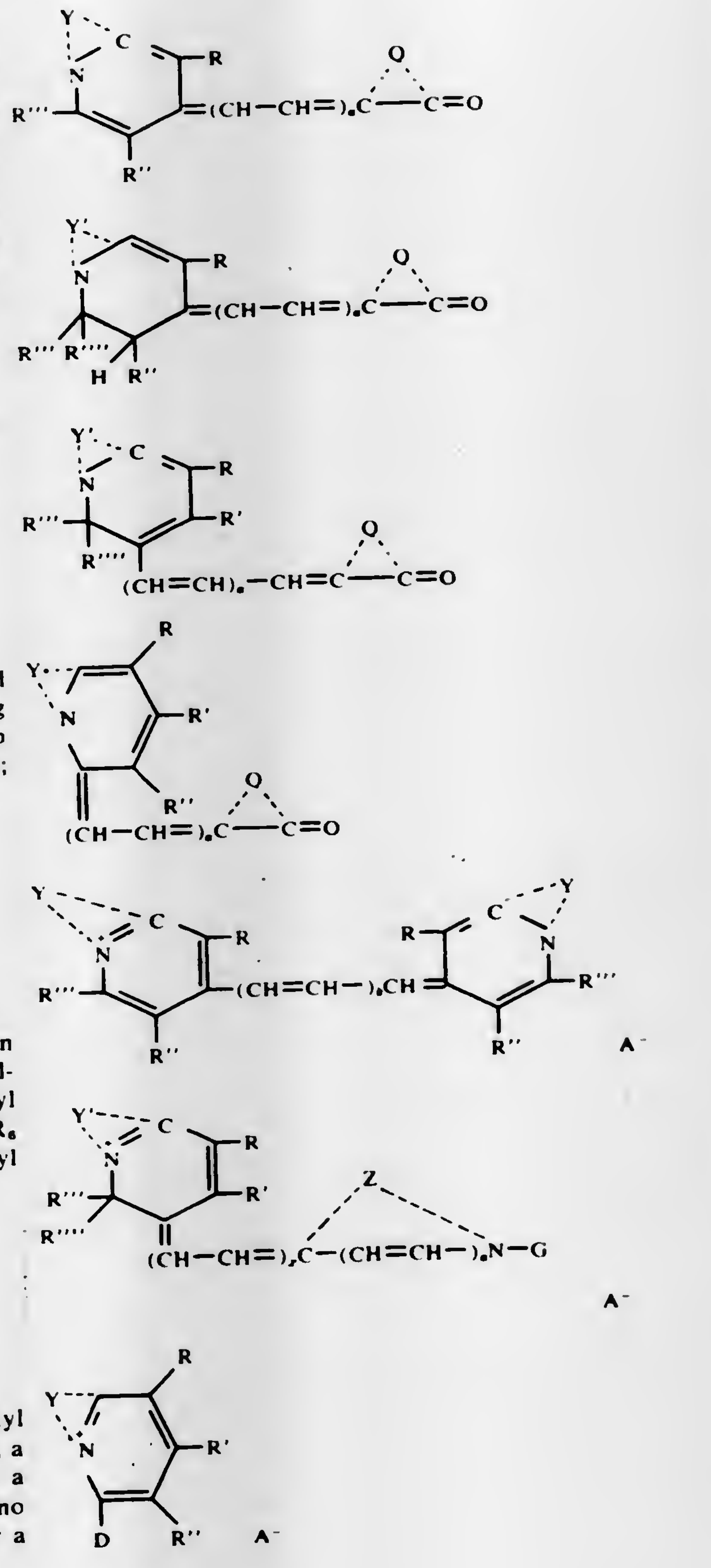
Donald W. Heseltine; Donald W. Kurtz; Derek D. Chapman, and James K. Elwood, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1973, Ser. No. 356,980

Int. Cl.² G03C *1/24, 1/16*

U.S. Cl. 96—129 **19 Claims**

1. A photographic silver halide composition containing at least one dye selected from those having the formulas



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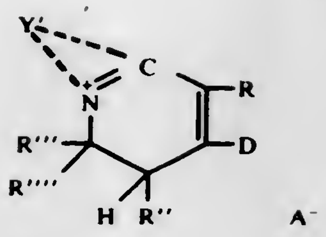

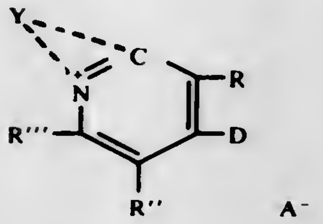

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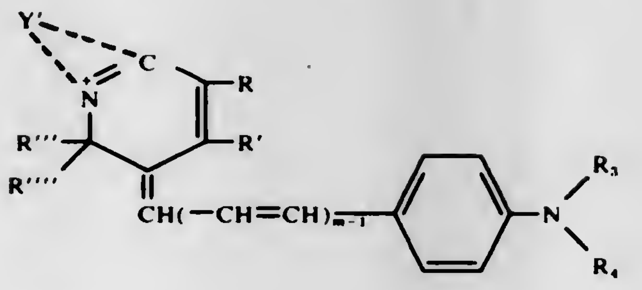


wherein:

Y represents the nonmetallic atoms necessary to complete a heterocyclic ring, said heterocyclic ring selected from the class consisting of an indole nucleus, a thiazole nucleus, an oxazole nucleus, an imidazole nucleus, or a selenazole nucleus;

R' represents the nonmetallic atoms necessary to complete a heterocyclic ring, said heterocyclic ring selected from the class consisting of a thiazole nucleus, an oxazole nucleus, an imidazole nucleus or a selenazole nucleus;

R, R', R'' and R''' each represents hydrogen, an alkyl group of 1 to 8 carbon atoms, an aryl group of 6 to 20 carbon atoms provided that when the ring system is represented by Y', R can also represent an alkoxy group of 1 to 8 carbon atoms or an aryloxy group having from 6 to 20 carbon atoms, and when Y and Y' represent the atoms required to complete a benzimidazole nucleus R, can also represent an alkoxycarbonyl group of 3 to 12 carbon atoms;

R'''' represents hydrogen or an alkyl group of 1 to 8 carbon atoms;

a has a value of 1 or 2;

Q represents the nonmetallic atoms necessary to complete a heterocyclic nucleus containing 5 or 6 atoms in the heterocyclic ring;

A⁻ represents an anionic group;

b has a value of 1, 2 or 3;

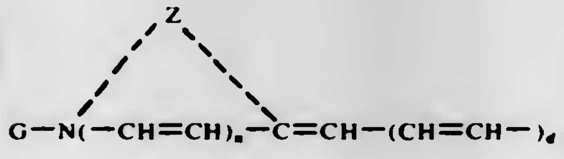
x has a value of 0, 1, 2 or 3;

n is 0 or 1;

Z represents the nonmetallic atoms necessary to complete a heterocyclic nucleus containing 5 or 6 atoms in the heterocyclic ring;

G represents a lower alkyl group, an aryl group, or an alkenyl group;

D represents a group having one of the following formulas



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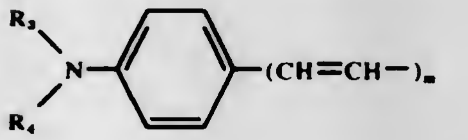

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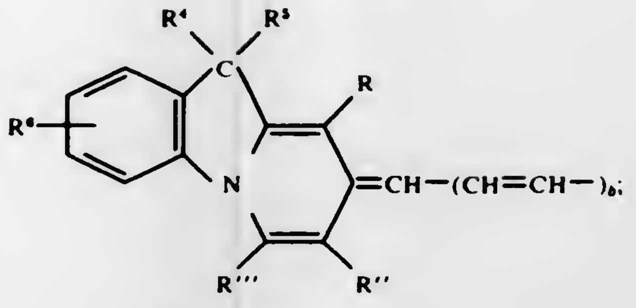
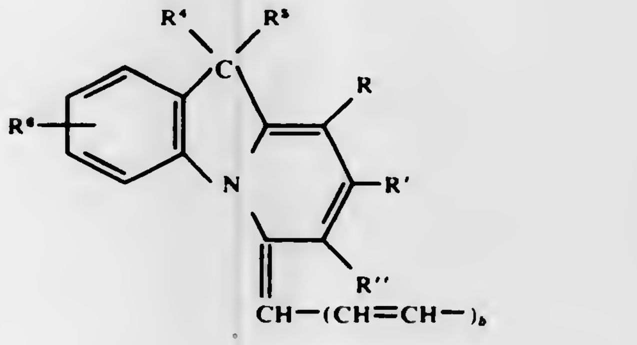




wherein:

n, Z, R, R', R'', R''' and G are as previously defined;

d and b has a value of 0, 1, 2 or 3; m is 1 or 2;

R_3 and R_4 each represents a lower alkyl group;

R^4 and R^5 each represents a lower alkyl or cycloalkyl group; and,

R^6 represents hydrogen a lower alkyl group, cyano, a lower alkoxy group, an aryl group of 6 to 20 carbon atoms, a halogen or a nitro group.

4,003,751

COATING AND INK COMPOSITIONS

Charles H. Carder, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

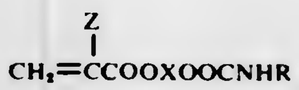
Filed Sept. 5, 1974, Ser. No. 503,476

Int. Cl.² C09D *11/00*

U.S. Cl. 106—20 **11 Claims**

1. A coating or ink composition comprising:

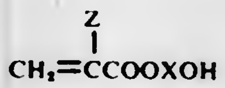
a. from 1 to 80 weight percent of at least one monofunctional acrylate-urethane of the formula:



$$CH_2{=}\overset{\overset{\displaystyle Z}{|}}{C}COOXOOCNHR$$

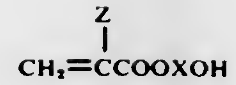
wherein Z is hydrogen or methyl; X is divalent alkylene of 1 to 10 carbon atoms, cycloalkylene of 5 to 12 carbon atoms; and R is alkyl of 1 to 10 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, or aryl of 6 to 12 carbon atoms;

b. from 20 to 99 weight percent of at least one polyfunctional acrylate-urethane of the group: i. polycaprolactone-polyurethane-polyacrylate oligomers, said oligomers being the reaction product of polycaprolactone polyol having a molecular weight of from 130 to 20,000, organic polyisocyanate and hydroxyl substituted ester of the formula:



$$CH_2{=}\overset{\overset{\displaystyle Z}{|}}{C}COOXOH$$

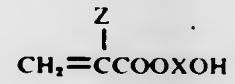
ii. diurethane-diacrylate, said compound being the reaction product of two moles of a hydroxyl substituted ester of the formula:



$$CH_2{=}\overset{\overset{\displaystyle Z}{|}}{C}COOXOH$$

and one mole of an organic diisocyanate, or,

iii. urea-urethane-polyacrylate oligomer said oligomer being the reaction product of a hydroxyl substituted ester of the formula:



$$CH_2{=}\overset{\overset{\displaystyle Z}{|}}{C}COOXOH$$

an organic diisocyanate and a hydroxylamine of the formula:

HOR'NHR

wherein R' is a linear or branched divalent alkylene of 1 to 12 carbon atoms, cycloalkylene of 5 to 12 carbon atoms, or arylene of 6 to 12 carbon atoms and Z and X are as hereinabove defined;

c. from 0 to 50 weight percent of at least one polyfunctional acrylate crosslinker; and

d. from 0 to 30 weight percent of at least one monofunctional acrylate.

4,003,752

MAGNESIA CEMENT COMPOSITION, PROCESS OF ITS MANUFACTURE, AND COMPOSITE COMPRISING SAME

Susumu Isohata; Kazutaka Watabe; Morio Shimoshimizu, all of Fuji, and Toshiyuki Iwaisako, Saitama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1975, Ser. No. 579,068

Claims priority, application Japan, May 22, 1974, 49-56621; May 22, 1974, 49-56622; July 8, 1974, 49-77371; July 8, 1974, 49-77372

Int. Cl.² C04B *9/04*

U.S. Cl. 106—105 **4 Claims**

1. A magnesia cement composition comprising 42 to 94% by weight of active magnesia, 5 to 38% by weight of magnesium sulfate, and 1 to 20% by weight of pulp.

4,003,753

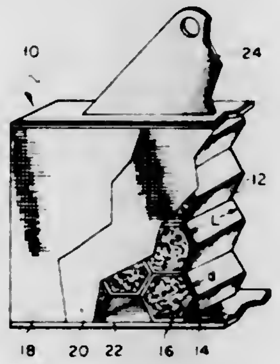
ELECTRODE STRUCTURE FOR ELECTRICAL ENERGY STORAGE DEVICE

John C. Hall, Granada Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 15, 1976, Ser. No. 667,001

Int. Cl.² H01M *43/00*

U.S. Cl. 429—199 **11 Claims**



1. In a rechargeable electrical energy storage device containing an electrolyte molten at the operating temperature of the device and electropositive and electronegative electrode structures spaced apart in said electrolyte, the improvement wherein at least one of said electrode structures comprises a unitary multi-cell structure including:

a plurality of wall members having edges and axially extending surfaces which form a plurality of cells having at least one open end and a cell cross-sectional open area of at least about 0.04 cm², said edges of said wall members and the open end of said cells being aligned in a common plane to form a planar face, the axially extending surfaces of said wall members being substantially perpendicular to said planar face;

a body of electrochemically active material disposed in said cells, said material being a solid at the operating temperature of said device; and

an electrolyte-permeable member affixed to said wall members and covering the open end of said cells for retaining said active material in said cells.

4,003,754

HERMETIC ALKALINE STORAGE BATTERY

August Winsel, Kelkheim, and Eckart Buder, Kriftel, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Aug. 14, 1975, Ser. No. 604,496

Claims priority, application Germany, Nov. 7, 1974, 2452064

Int. Cl.² H01M *4/38*

U.S. Cl. 429—149 **23 Claims**

1. In an alkaline storage battery cell which is hermetically sealed, and which includes a negative electrode having higher capacity than the positive electrode, the improvement wherein

the positive electrode is constructed and arranged to provide a capacity which is limiting during discharging, and

the negative electrode includes additive selected from the group of reduced Raney metal and Raney metal alloy of one or more metals in Group VIII of the periodic table,

the additive being present in a quantity sufficient to conduct the maximum polarity reversal current.

16. In the method of producing an alkaline storage battery cell which is hermetically sealed, which includes a negative electrode having higher capacity than the positive electrode and which is subject to polarity reversal during deep discharging

the improvement which comprises the step of

incorporating in the negative electrode additive selected from the group of reduced Raney metal and Raney metal alloy of one or more metals in Group VIII of the periodic table in a quantity sufficient to conduct the maximum polarity reversal current.

4,003,755

DISPERSION-HARDENED LEAD ALLOY

Robert Lawrence Gustison, 2982 Wilson School Lane, Sinking Spring, Pa. 19608

Filed Aug. 22, 1975, Ser. No. 606,966

Int. Cl.² H01M *2/28;* **C22C** *11/00*

U.S. Cl. 429—178 **11 Claims**

1. A lead alloy comprised of from about 5% to about 35% by weight of finely divided silicon dispersed in a continuous phase of lead.

9. An improved lead-acid battery in which the metallic lead used to form at least some of the components of the battery is in the form of a dispersion-hardened alloy of lead and a minor but significant hardness-modifying amount of minus 80 mesh silicon.

4,003,756

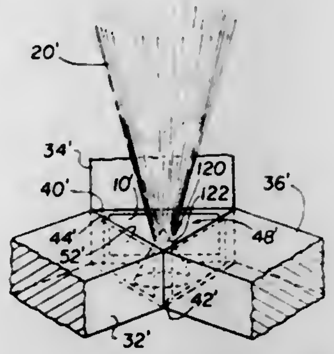
DEVICE FOR CONVERTING SUNLIGHT INTO ELECTRICITY

Eugene Abrams, Franklin Square, N.Y., assignor to Solar Dynamics Corporation, Franklin Square, N.Y.

Continuation-in-part of Ser. No. 407,662, Oct. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 393,168, Aug. 30, 1973, abandoned. This application Mar. 7, 1974, Ser. No. 448,887

Int. Cl.² H01L ***31/04***

U.S. Cl. 136—89 PC **6 Claims**



1. A device for converting sunlight into electricity using silicon solar cells comprising wall means bounding a pyramidal cell compartment having an entrance opening thereinto, Fresnel lens means operatively arranged in an interposed position between the sun and said cell compartment so as to beam sunlight through said compartment entrance opening in a selected concentrated form which has a circular shape in cross-section and which approximates in size that of said compartment entrance opening, three said silicon solar cells electrically connected to each other operatively arranged on said cell compartment wall means in facing relation to each other and oriented lengthwise of said cell compartment so as to intercept said sunlight beamed through said compartment entrance opening, and heat exchange means operatively arranged in heat exchange relation to said silicon solar cells to dissipate an extent of heat from said concentrated sunlight impinging thereon to obviate any damage to said cells, whereby an optimum amount of electricity is generated by said device as a function of said concentrated sunlight input.

4. A device for converting sunlight into electricity using silicon solar cells comprising wall means bounding a cell compartment having an entrance opening thereinto, a centrally located conical light-reflecting member in said compartment, Fresnel lens means operatively arranged in an interposed position between the sun and said cell compartment so as to beam sunlight through said compartment entrance opening in a concentrated conical shape onto said conical light-reflecting member, at least three said silicon solar cells electrically connected to each other operatively arranged on said cell compartment wall means in encircling relation about said conical light-reflecting member, and heat exchange means operatively arranged in heat exchange relation to said silicon solar cells to dissipate an extent of heat from said concentrated sunlight impinging thereon to obviate any damage to said cells.

4,003,757

SILVER-II-OXIDE FOR GALVANIC ELEMENTS

Walter Karl Lux, Horn, Austria, and Tsvetko Chobanov, Frankfurt am Main, Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed June 23, 1975, Ser. No. 589,562

Claims priority, application Germany, June 27, 1974, 2430910

Int. Cl.² H01M ***6/00***

U.S. Cl. 429—219 **12 Claims**

1. In a process for producing silver II-oxide for galvanic elements, the improvement which comprises

adding an oxidant to an alkaline solution containing undissolved metallic silver powder, thereby oxidizing the powder to silver-II-oxide, the oxidant being potassium peroxidisulfate.

12. A material for use in primary cells produced by the steps of

forming a suspension of metallic silver powder in an alkaline solution, and

adding an oxidant to the solution to oxidize the powder into silver-II-oxide, the oxidant being potassium peroxidisulfate.

4,003,758

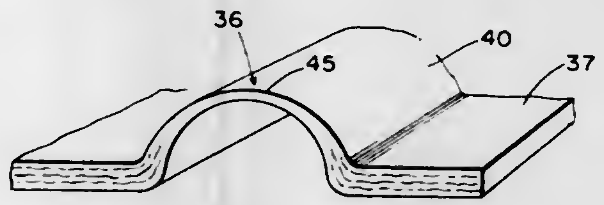
BATTERY SEPARATOR WITH POROUS BODY AND FUSED RIB

Nigel Innes Palmer, Lexington, and Don O'Neil Grammer, Scituate, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 21, 1972, Ser. No. 317,107

Int. Cl.² H01M ***2/14***

U.S. Cl. 264—119 **8 Claims**



1. A method of embossing and differentially compressing a fibrous mat comprising applying heat and pressure substantially uniformly to said mat by means of engaging two opposite faces of said mat between two calendering rolls with opposed mating surfaces that have female grooves and male ridges with lands therebetween extending therearound, said opposed surfaces being substantially evenly spaced where the grooves and ridges are and where the lands are and thereafter applying additional heat and pressure to regions of said mat corresponding generally to where said mat was engaged by said grooves and ridges while restricting the application of said additional heat and pressure from regions of said mat corresponding generally to where said mat was engaged by said lands by means of passing said mat between a second two calender rolls with opposed mating surfaces that have female grooves and male ridges with lands therebetween extending therearound with said female grooves and male ridges engaging said mat and applying said additional heat and pressure, said female grooves and male ridges being sized such that the mat is suspended between said female grooves and male ridges without touching the intermediate land portions of said second calender rolls.

4,003,759

ION IMPLANTATION OF GOLD IN MERCURY CADMIUM TELLURIDE

Toivo Koehler, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1976, Ser. No. 662,293

Int. Cl.² H01L ***21/265***

U.S. Cl. 148—1.5 **7 Claims**

1. A method of introducing acceptor impurities into a region of a mercury cadmium telluride body, the method comprising:

implanting gold ions into the region; and

heat treating the mercury cadmium telluride body at a temperature of between about 150° C and about 250° C for a time of between about 2 minutes and about 40 minutes.

4,003,760

METHOD OF APPLYING PROTECTIVE COATINGS TO METAL PRODUCTS

Wolfgang Labenski, Leimen; Heinz Paul Schapitz, Walldorf, and Hans-Peter Wessel, Heidelberg, all of Germany, assignors to Mecano-Bundy GmbH, Heidelberg, Germany

Filed Mar. 1, 1974, Ser. No. 447,105

Claims priority, application France, Mar. 9, 1973, 73.08593

Int. Cl.² C23F ***7/26***

U.S. Cl. 148—6.2 **8 Claims**

1. In the method of providing a metal body with a protective coating that is resistant to chemical and mechanical attack and that comprises successive layers of zinc, chromate and synthetic resin applied to the metal body, in which the zinc is galvanically coated onto the metal body to have a finely crystalline, highly homogenous structure,

the improvements comprising

1. applying a chromate layer over the zinc layer by immersing the metal body in a chromic acid solution having a pH value over 2 and containing a reducing agent to form a largely trivalent chromate layer;
2. rinsing and drying the chromate layer to form a layer containing water of crystallization;
3. applying a layer of fluoroplastic synthetic resin dispersed in a liquid over the dried chromate layer; and then
4. thermally treating the metal body to dry the fluoroplastic layer and cause it to interlock with and adhere to the chromate layer and remove said liquid therefrom while preserving water of crystallization in the chromate layer.

4,003,761

PROCESS FOR THE PRODUCTION OF SPRAYED PHOSPHATE COATS ON IRON AND STEEL

Hans Gotta, Weiden, and Franz-Heinz Schroll, Hurth, both of Germany, assignors to Gerhard Collardin GmbH, Cologne-Ehrenfeld, Germany

Filed Apr. 2, 1975, Ser. No. 564,556

Claims priority, application Germany, Apr. 13, 1974, 2418118; Feb. 7, 1975, 2505172

Int. Cl.² C23F ***7/08***

U.S. Cl. 148—6.15 R **10 Claims**

1. A process for forming a phosphate coating on a corrodible ferric surface, thereby rendering said surface corrosion resistant which comprises spraying said surface for 0.5 to 5 minutes with a solution having a pH of 4.3 to 6.5 consisting essentially of 1 to 20 g./liter of an orthophosphate salt of a cation selected from the group consisting of alkali metals and ammonium, 0.05 to 5 g./liter of an oxidizing agent or reducing agent accelerator, 0.05 to 1 g./liter of a short-chain alkylolamine having from 2 to 4 carbon atoms in each alkylol group from 0.01 to 1.5 g./liter of at least one non-ionic wetting agent and the remainder water at a temperature in the range of about 40° to 95° C.

9. A substantially anhydrous composition which when diluted with water to 1,000 parts by weight is useful for rendering corrodible ferrous surface corrosion resistant consisting essentially of 1 to 20 parts by weight of an orthophosphate salt of a cation selected from the group consisting of alkali metals and ammonium, 0.05 to 5 parts of an oxidizing or reducing accelerator, 0.05 to 1 part of a C_2-C_4 alkanolamine, and 0.01 to 1.5 parts of a non-ionic wetting agent, and an acid or alkali to provide a pH between 4.3 and 6.5 when said composition is dissolved in water to 1,000 parts by weight.

4,003,762

PROCESS FOR THE PRODUCTION OF SUPERCONDUCTOR WIRES OR CABLES OF Nb_3Al AND SUPERCONDUCTOR WIRES OR CABLES OBTAINED THEREBY

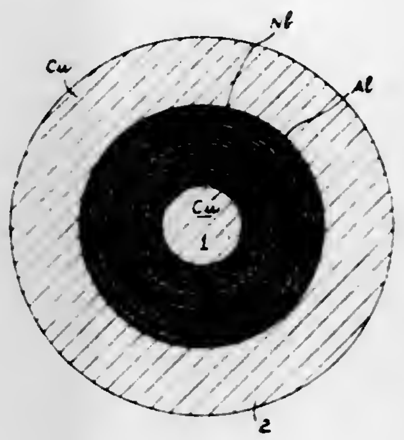
Sergio Ceresara, Via Magalotti 4, Novara; Giancarlo Sacerdoti, Via Montagne Rocciose 62, Rome, and Nicola Sacchetti, Largo Ottavio Manilio 7, Frascati, all of Italy

Filed Mar. 17, 1975, Ser. No. 559,628

Claims priority, application Italy, Mar. 22, 1974, 49510/74

Int. Cl.² H01L ***39/24***

U.S. Cl. 148—11.5 R **6 Claims**



1. A process for the production of superconductor wires of Nb_3Al characterized in that it comprises forming at least one assembly of superimposed sheets of Nb and sheets of Al, inserting said assembly of superimposed sheets in at least one copper container so as to avoid direct contact between the superimposed Al sheet faces and the copper container, subjecting said copper container with the sheets inserted therein to a plastic deformation processing so as to obtain a reduction in the thickness of the Al sheet to a value of less than about 1.5 μm and finally subjecting the product thus processed to heat treatment at a temperature between 800° and 1000° C.

4,003,763

METHOD OF AND PLANT FOR PATENTING STEEL WIRE BUNDLES

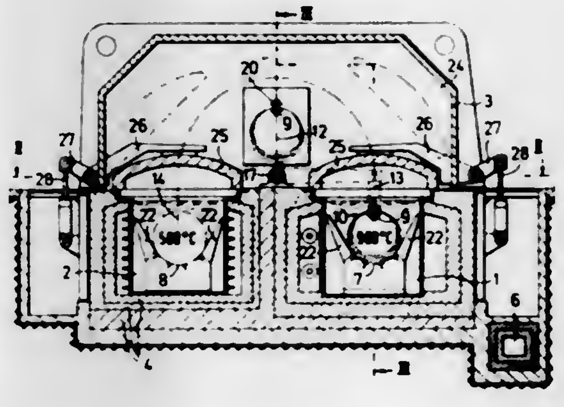
Rolf Kohlgrüber, Cologne, Germany, assignor to Ofenbaugesellschaft Berg u. Co. m.b.H., Cologne, Germany

Filed Apr. 7, 1975, Ser. No. 565,444

Claims priority, application Germany, Oct. 26, 1974, 2450955

Int. Cl.² C21D ***1/46***

U.S. Cl. 148—15 **2 Claims**



1. A method of patenting a loosened steel wire bundle in a steel wire patenting plant having a cooling vat and a heating furnace, which includes in combination the step of first preheating the wire bundle in the cooling vat to a desired temperature in said cooling vat, introducing the thus pre-heated wire bundle into said furnace and heating the same to a desired elevated temperature, and subsequently returning the thus

heated wire bundle to said cooling vat for cooling said wire bundle to the temperature in said cooling vat to, and simultaneously, at least approximately maintain the desired pre-heating temperature in said cooling vat.

4,003,764

PREPARATION OF AN ϵ-CARBON NITRIDE SURFACE LAYER ON FERROUS METAL PARTS

Joachim Wünning, Warmbronn, Germany, assignor to Firma J. Aichelin, Korntal near Stuttgart, Germany

Filed May 8, 1974, Ser. No. 467,913

Claims priority, application Germany, May 17, 1973, 2324918

Int. Cl.^{2} C23C *11/12, 11/18*

U.S. Cl. 148—16.5 **14 Claims**

1. The carbon nitriding process of producing an ϵ-carbon nitride layer on the surface of ferrous metal articles in a gaseous atmosphere contained in a furnace chamber, comprising contacting at a temperature between 500° and 650° C said ferrous metal articles with said gaseous atmosphere, said gaseous atmosphere comprising (i) partially dissociated ammonia, and (ii) carbon monoxide and carbon dioxide in a total of between 2 and 20 volume %, and maintaining said gaseous atmosphere during the nitriding process to have an average nitriding potential, $p_{NH_3}/p_{H_2}{}^{1.5}$, of between 0.5 and 5, and a partial pressure relationship, p_{CO}/p_{CO_2}, of between 1 and 10; wherein,

p_{NH_3} is the partial pressure of ammonia in the furnace chamber;

p_{H_2} is the partial pressure of the hydrogen in the furnace chamber;

p_{CO} is the partial pressure of carbon monoxide in the furnace chamber;

p_{CO_2} is the partial pressure of the carbon dioxide in the furnace chamber

said gaseous atmosphere having been formed by introducing (a) an ammonia-containing gas, and (b) a combusted gas which is a mixture of carbon monoxide, carbon dioxide and nitrogen, into said furnace chamber, said ammonia-containing gas (a) being in a ratio to said combusted gas (b) of between 1:0.3 and 1:3.

4,003,765

HEAT TREATMENT OF COBALT BASE ALLOYS

James H. Davidson, Varennes-Vauzelles, France, assignor to Creusot-Loire, Paris, France

Continuation-in-part of Ser. No. 316,716, Sept. 20, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 511,093

Claims priority, application France, May 4, 1972, 72.15818

Int. Cl.^{2} C22F *1/02*

U.S. Cl. 148—20.3 **2 Claims**

FIG.7

Alliage 1. 1200°C 2h TE + 850°C 16h TA

1. A process of heat treating an alloy consisting in: preparing an alloy consisting of, in percentages by weight,

from 5 to 30% nickel
from 18 to 25% chromium,
from 5 to 17% in total of one or more of tungsten, tantalum, and molybdenum,
from 0.10 to 0.30% carbon,
from 50 to 200 ppm boron,
from 0 to 0.3% iron
from 0 to 2% manganese,
from 0 to 1% hafnium,
from 0 to 1% lanthanum,
from 0 to 1% yttrium,
from 0.5 to 2% in total of titanium and/or niobium,

the balance being cobalt and incidental impurities, solution heat treating the alloy in a protective atmosphere at from 1150° to 1250° C for at least 1 hour, and rapid cooling and then age hardening for from 12 to 24 hours at from 750° C to 850° C, to effect carbide precipitation of MC carbides, M being titanium or niobium.

4,003,766

WELDING MATERIALS FOR ALUMINUM-COATED STEEL

Yoshinori Ito, Nishinomiya; Mutsuo Nakanishi, Amagasaki; Masamichi Nakakoji, Nagaokakyo; Masahiko Ikeda, Ashiya, and Tadashi Ito, Nara, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan

Filed Feb. 21, 1975, Ser. No. 551,649

Int. Cl.^{2} B23K *35/34*

U.S. Cl. 148—24 **7 Claims**

1. Welding materials for aluminium-coated steel comprising on weight basis less than 1.5% of Si, and less than 1.0% of Mn, 2 to 15% of CaF_2, and 15 to 50% of a mixture of oxides having a basicity ranging from 1.0 to 12.5, the balance being essentially Fe.

4,003,767

PROCEDURE FOR THE PRODUCTION OF PERMANENT MAGNETIC SINTER BODIES USING A TERNARY COBALT-LANTHANOID COMPOUND

Kurt Bachmann, Nussbaumen, Switzerland, and Emanuel de Lamotte, Brussels, Belgium, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 303,595, Nov. 3, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,561

Claims priority, application Switzerland, Dec. 27, 1971, 18903/71

Int. Cl.^{2} C21D *1/04;* **H01F** *1/08*

U.S. Cl. 148—105 **3 Claims**

1. A method for producing a permanent magnetic sinter body which comprises:

a. admixing particles of a first binary alloy of cobalt and a first lanthanoid element, $Ln^{(1)}$, having the formula $Co_5Ln^{(1)}$ with particles of a second binary alloy of cobalt and a second lanthanoid element, $Ln^{(2)}$, having the formula $Co_5Ln^{(2)}$,

b. admixing a different cobalt-samarium alloy with said first and said second binary alloys of cobalt as a sintering additive,

c. and thereafter sintering at a temperature 800° – 1350° C, said particulate mixture, whereby a permanent magnet is formed,

wherein said lanthanoid elements $Ln^{(1)}$ and $Ln^{(2)}$ are different from one another and are selected from the group consisting of yttrium, lanthanum and lanthanoid having an atomic number of 58 to 71; wherein the ratios of the binary alloys are selected so that the proportion of the elements in said sintered body correspond to the formula $Co_uLn_x^{(1)}Ln_{1-x}^{(2)}$, wherein $3.5<u<5$ and $0<x<1$; said cobalt-samarium alloy being composed of 46–65% by weight samarium and 54–35% by weight of cobalt based on the total weight of the alloy, and wherein the weight ratio of said sintering additive is chosen such that the total content of the cobalt in the final mixture is 62–64 wt. percent.

4,003,768

METHOD FOR TREATING MAGNETIC ALLOY TO INCREASE THE MAGNETIC PERMEABILITY

Ronald L. Anderson, Mountain View, Calif.; Eugene E. Castellani, Putnam Valley, N.Y.; Patrick M. McCaffrey, Mahopac Falls, N.Y., and Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,401

Int. Cl.^{2} C21D *1/04*

U.S. Cl. 148—108 **17 Claims**

1. A method of increasing the magnetic permeability of a body of magnetic alloy having an easy axis and a hard axis, and containing from about 20 to 95% by weight of nickel, from about 5 to 80% by weight of iron, and up to 20% by weight of an element selected from the group consisting of copper, manganese, molybdenum, titanium, silicon, chromium, beryllium and tungsten wherein said body of magnetic alloy has a thickness of from about 0.25 to about 5 microns and is a film containing in the lateral plane 1–12 μ wide gaps in the magnetic material which comprises:

a. subjecting said body to a magnetic field greater than the sum of the demagnetizing field and coercive force of said body and being at least about 100 Gauss oriented along said hard axis;

b. said body being maintained during step (a) at or above the temperature needed to deposit the magnetic alloy on a substrate, wherein said temperature is in the range between about 200° and below about 250° C; provided however, that the body of magnetic alloy is not maintained at a temperature and for a time sufficient for causing the magnetic alloy to undergo recrystallization to such an extent as to lose its anisotropy and further provided said body is subjected to the magnetic field for about ½ hour to about 6 hours.

4,003,769

METHOD OF MAKING NON-RETENTIVE Al-Ni-Co-Fe ALLOY

Albert Roy Davis, Green Cove Springs, Fla., assignor to Bio-Magnetics International, Inc., Jacksonville, Fla.

Filed Oct. 11, 1974, Ser. No. 514,311

Int. Cl.^{2} H01F *1/00*

U.S. Cl. 148—121 **5 Claims**

1. A method for converting a high magnetic retentivity, high magnetic conductivity aluminum-nickel-cobalt-iron alloy consisting essentially of 8–12% aluminum, 14–28% nickel, 5–24% cobalt, balance iron, to a substantially magnetically non-retentive alloy consisting essentially of the steps of:

a. heating said alloy to a temperature in the range 1400°–1500° F for a period of from 24 to 36 minutes, said heating temperatures and times selected to yield a product having a magnetic retentivity of about 1/1000 gauss or less in applied fields of up to 1500 gauss; and

b. rapidly quenching said heated alloy.

4,003,770

PLASMA SPRAYING PROCESS FOR PREPARING POLYCRYSTALLINE SOLAR CELLS

Richard J. Janowiecki, Dayton; Michael C. Willson, Waynesville, and Douglas H. Harris, Dayton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Mar. 24, 1975, Ser. No. 561,405

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.^{2} H01L *21/203, 31/00*

U.S. Cl. 148—174 **6 Claims**

1. A process for preparing solar cells comprising the steps of:

a. generating a flowing plasma gas stream,

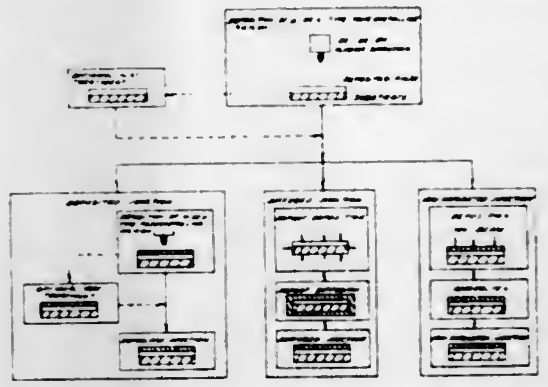
b. heating p- or n-doped silicon particles by injection into said plasma stream,

c. discharging said heated particles from said plasma stream onto a substrate providing a polycrystalline silicon film,

d. during steps (b) and (c) providing a suitable atmosphere surrounding said particles to inhibit oxidation,

e. preparing a p-n junction in said polycrystalline silicon film by diffusion or ion-implantation of a dopant of opposite polarity or type into said film or by forming a layer on said polycrystalline silicon film by plasma spraying doped silicon particles of opposite polarity or type, and

f. providing electrical conductors to control the flow of electricity produced by illuminating said p-n junction.



4,003,771

SOLID GRAIN FUELS CONTAINING POLYPHOSPHONITRILICS DIFLUORIDE FOR CHEMICAL LASERS

Hyman R. Lubowitz, Hawthorne, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 7, 1975, Ser. No. 602,629

Int. Cl.^{2} C06B *45/04*

U.S. Cl. 149—17 **2 Claims**

2. A solid grain fuel composition for a chemical laser comprising:

a. an oxidizing salt containing fluorine;

b. a polymer fuel comprising polyphosphonitrilic nitrilic difluoride; and, as optional ingredients,

a. an alkali metal fluoride sequestering agent; and

b. an augmenting fuel.

4,003,772

METHOD FOR PREPARING THIN FILM INTEGRATED CIRCUIT

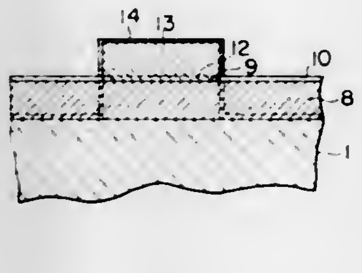
Masanobu Hanazono, and Osamu Asai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,366

Claims priority, application Japan, Feb. 18, 1974, 49-18587

Int. Cl.^{2} H01L *21/441*

U.S. Cl. 156—656 **10 Claims**



8. A method for forming a thin film integrated circuit comprising a substrate, a first conductor layer on said substrate and a second conductor layer on said first conductor layer, each of said first and second conductor layers comprising an aluminum conductor pattern and adjacent insulation of equal thickness, the conductor pattern in said first conductor layer contacting the conductor pattern in said second conductor

layer in at least one cross-connectional area, said method comprising:

- forming a first aluminum film on said substrate;
- forming on said first aluminum film a first anodizing mask comprising an anodized film formed in an ordinary solution and a photoresist film on said anodized film, said first anodizing mask having a shape corresponding to the shape of the aluminum conductor pattern to be produced in said first conductor layer;
- anodizing by means of a chromic acid solution said first aluminum film except for the portion of said first aluminum film defining the aluminum conductor pattern of said first conductor layer to the entire thickness of said first aluminum layer to produce the aluminum conductor pattern and insulation of said first conductor layer;
- removing said anodizing mask from those portions of said first conductor layer defining said at least one cross-connectional area by etching; and
- forming said second conductor layer.

9. The method of claim 8, wherein said second conductor layer is formed by:

- forming a second aluminum film overlying the entire surface of said first conductor layer;
- forming on said second aluminum film a second anodizing mask comprising an anodized film formed in an ordinary solution and a photoresist layer on said anodizing film; and
- anodizing by means of a chromic acid solution said second aluminum film except for the portions of said second aluminum film defining the aluminum conductor pattern of said second conductor layer to the entire thickness of said second aluminum film.

4,003,773

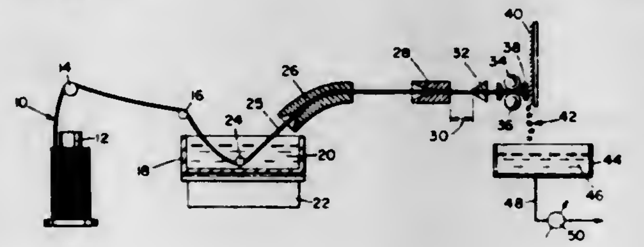
METHOD OF PREPARING GRAPHITE FIBERS OF ULTRA-SHORT LENGTH AND NARROW SIZE DISTRIBUTION

Michael Anthony Grable, Frostburg, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 2, 1976, Ser. No. 663,164

Int. Cl.^{2} B26D *7/08*; B02C *23/00*

U.S. Cl. 156—155 **8 Claims**



1. A method for preparing fibers of ultra-short length and narrow size distribution from multi-filament tow comprising the steps of:

a. providing a source of multi-filament tow;
b. passing said multi-filament tow through a bath of liquid impregnating material at elevated temperature, said impregnating material being one which is solid at ambient temperature;
c. passing said impregnated tow through a die sized to control the quantity of material impregnating the tow and to compact the filaments of the tow into a closely packed bundle;
d. cooling the compact tow to solidify the impregnating material therein and to convert the tow to a rigid form;
e. cutting said rigid tow to produce wafer-thin disks therefrom;
f. stripping the impregnating material from said wafer-thin disks with a solvent to yield fibers of ultra-short length and narrow size distribution; and
g. removing solvent from the fibers.

4,003,774

STABILIZATION OF TOWS OF FILAMENTARY MATERIAL

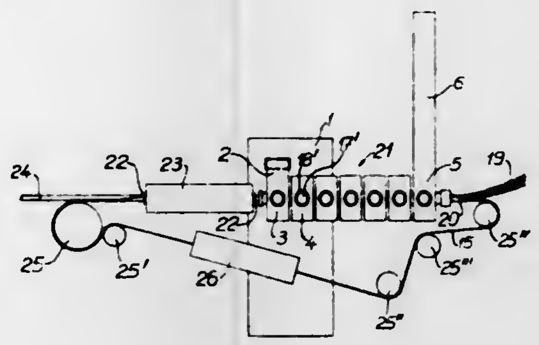
Jean-Pierre Lebet, Montreux, and Jöel Daniel Ducommun, Chavannes, both of Switzerland, assignors to Baumgartner Papiers S.A., Switzerland

Filed Sept. 20, 1974, Ser. No. 507,804

Claims priority, application Switzerland, Sept. 24, 1973, 13675/73

Int. Cl.^{2} B29H *9/02*; B04H *3/08*

U.S. Cl. 156—180 **9 Claims**



1. A process of stabilizing a tow of filamentary dielectric material, comprising:

a. providing a tow of filamentary dielectric material, and a plurality of resonant cavities coupled in series to transfer electromagnetic energy therebetween, and each having a pair of opposed apertures for providing communication between the interior and the exterior thereof, said plurality of cavities being aligned with their respective apertures along a common straight line to define in use a path of travel for the tow of filamentary dielectric material, and wherein each of said cavities includes means for adjusting the resonant frequency thereof to a common frequency between about 3×10^8 and 3×10^{11} Hertz;
b. developing a spatially contained electric field within said plurality of resonant cavities and oriented substantially parallel to the straight line defining the path of advance of the tow, and having a frequency between about 3×10^8 and about 3×10^{11} Hertz;
c. advancing the tow through the plurality of cavities through the spatially contained electric field contained the rein, along a direction parallel to the field and along the straight line along which the apertures are aligned to effect sufficient dielectric heating within the tow to thermally fuse dielectric filaments within the tow; and
d. simultaneously supporting the tow along an entire portion thereof within the spatially contained electric field contained within the plurality of cavities as the tow is being advanced therethrough and heated, to prevent deformation of the heated portion of the tow.

3. An apparatus for stabilizing a tow of filamentary dielectric material, comprising:

a. a plurality of resonant cavities in series, each of said cavities including means for adjusting the resonant frequency to a common frequency between about 3×10^8 and 3×10^{11} Hertz, and
   each of said cavities having a pair of opposed apertures for providing communication between the interior and exterior thereof, said plurality of cavities aligned with their respective apertures along a common straight line to define in use a path of travel, for a tow of filamentary dielectric material, through the plurality of series connected cavities;
b. means for coupling said cavities in series to transfer electromagnetic energy therebetween;
c. an elongated tube disposed extending through the plurality of aligned apertures for supporting the tow as it is advanced in use through the plurality of series connected cavities, said elongated tube comprised of a low permittivity material to prevent heating by electromagnetic energy within said cavities;
d. a driven flexible endless conveyor belt of low permittivity material having a portion disposed through said elongated tube, and which advances through said elongated tube when driven;
e. drive means for driving said flexible endless conveyor to advance it through said elongated tube;
f. means receptive in use of a tow of filamentary dielectric material and coactive with a portion of said endless conveyor belt for wrapping the tow of filamentary dielectric material in said conveyor belt as said belt is driven, whereby the tow of filamentary dielectric material wrapped in said endless conveyor belt is advanced through said elongated tube; and
g. means for developing an electric field having a frequency between about 3×10^8 and about 3×10^{11} Hertz within said cavities and substantially parallel to the path of advance of the tow wrapped in said endless conveyor belt to effect dielectric heating within the tow in use as it is advanced by said drive means through said elongated tube.

4,003,775

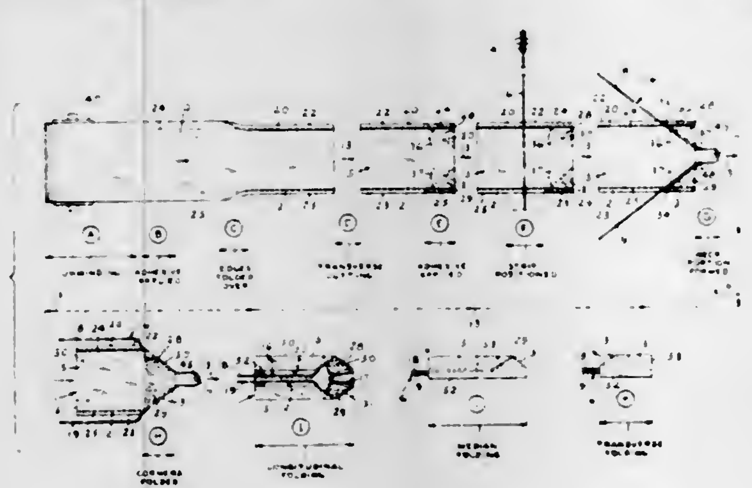
METHOD FOR MAKING A GARMENT

Richard A. Batt, and Charles B. Green, both of Lewisburg, Pa., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 322,722, Jan. 11, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,713

Int. Cl.^{2} B31F *1/00*

U.S. Cl. 156—226 **3 Claims**



1. In a method for making a garment (11) from a continuous web (10) of material, during movement of the web (10) along a feed path (13), which comprises the steps of: directing the web (10) along the feed path (13); cutting the web in a predetermined direction to form a blank (15); providing a strip (16) of material having a generally V configuration above the blank (15) with: a center portion (17) of the strip (16) protruding from the blank (15), end portions (18) and (19) of the strip (16) protruding from opposite sides of the blank, and leg portions (33 and 34) of the V configured strip (16), between the center portion (17) and the end portions (18 and 19) thereof, being positioned adjacent opposed corner portions (28 and 29) of the blank; folding the opposed corner portions (28 and 29) of the blank (15) over the adjacent leg portions (33 and 34) of the strip (16) and into overlying relationship with portions of the body of the blank (15) on the other side of the leg portions of the strip; and securing the corner portions (28 and 29) to the underlying body portions of the blank (15) to maintain the strip (16) in a fixed relationship with the blank; the improvement in providing the strip (16) with a generally V-configuration above the blank (15), which comprises:

- positioning the strip (16) across the blank (15), so that the strip extends in a direction perpendicular to the blank's direction of movement along the feed path (13), with the end portions (18 and 19) of the strip (16) protruding from the opposite sides of the blank (15); and
- then moving the center portion (17) of the strip (16) with a depending member (45) in the blank's direction of movement along the feed path (13) and through two spaced guides (47 and 48) located along the feed path between the opposite sides of the blank (15), so that: the strip (16) has the generally V-configuration, its center portion (17) protrudes from the blank (15), and its leg portions (33 and 34) are positioned adjacent the opposed corner portions (28 and 29) of the blank (15).

4,003,776

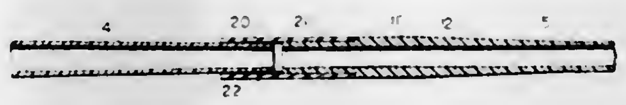
METHOD OF FABRICATING A DEMOUNTABLE ROD

Richard D. Barnes, Costa Mesa, Calif., assignor to The Conolon Corporation, Santa Ana, Calif.

Filed June 18, 1974, Ser. No. 480,380

Int. Cl.^{2} B29D *3/02*; B29C *17/08*

U.S. Cl. 156—242 **5 Claims**



1. The method of fabricating a demountable rod comprising the steps of:

a. forming a tapered fiberglass tube having a thickened central portion with an outwardly thickened wall;
b. cutting the tube in two at the large end of the thickened portion forming a tapered butt portion and a tip portion having the thickened portion at its large end;
c. providing a cylindrical sleeve;
d. sizing the large end of the thickened portion to receive the sleeve thereover;
e. fixing the sleeve on the sized end of the thickened portion with the sleeve projecting rearwardly therefrom;
f. coating the small end of the butt portion with a release agent;
g. placing a molding material in the sleeve; and
h. inserting the small end of the butt portion in the projecting end of the sleeve and allowing the molding material to harden forming a demountable joint.

4,003,777

METHOD OF FORMING A LAMINATED STRUCTURE

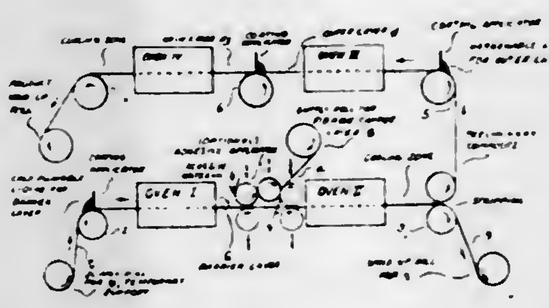
Robert G. Eddy, 20 Casablanca Court, Elnora, N.Y. 12065

Continuation of Ser. No. 416,247, Nov. 15, 1973, abandoned, and a continuation-in-part of Ser. No. 667,181, Sept. 12, 1967, Pat. No. 3,562,043. This application Sept. 8, 1975, Ser. No. 610,924

The portion of the term of this patent subsequent to Feb. 9, 1988, has been disclaimed.

Int. Cl.^{2} B29D *7/02*

U.S. Cl. 156—246 **8 Claims**



1. A method of forming a flexible artificial leather product comprising the steps of:

- forming a synthetic resinous intermediate layer on a moving temporary support having a surface of predetermined smoothness thereby forming the surface of said intermediate layer contacting said support to said predetermined smoothness, said intermediate layer which, when solidified, is substantially impervious to penetration by preselected outer layer materials and is adherent to a fibrous substrate and an outer layer after solidification;

then moving a fibrous substrate having interconnecting interstices throughout its body into contact with the exposed surface of said intermediate layer on said moving temporary support while at least the exposed surface of said intermediate layer is in a formable condition;

then pressing said intermediate layer on said temporary moving support into said fibrous substrate to force said intermediate layer into the surface of said substrate while preventing the intermediate layer from substantially filling the interstices throughout the substrate;

solidifying said intermediate layer, while maintaining said first named surface at said predetermined smoothness, to adhere said exposed surface of said intermediate layer to said substrate and thereby prevent the interstices of said substrate from being filled by subsequent layers coated onto the smooth first names surface of said intermediate layer;

separating said temporary support and said intermediate layer, said separating and solidifying steps occurring in any desired sequence;

forming a synthetic resinous outer layer capable of solidifying into a flexible, water vapor permeable layer on the smooth first named surface of said intermediate layer; and

solidifying said outer layer to form a flexible, water vapor permeable outer layer adhering to the smooth first named surface of said intermediate layer.

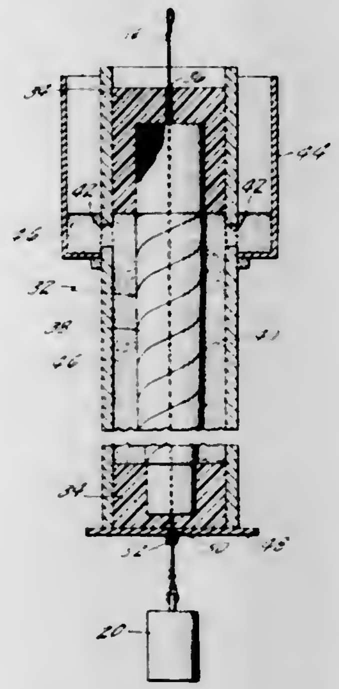
4,003,778
METHOD OF MAKING SLENDER ROD FOR FISHING RODS

Donald F. Phillips, West Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 519,883, Oct. 31, 1974, Pat. No. 3,953,637. This application Sept. 15, 1975, Ser. No. 613,770

Int. Cl.^{2} B29D *3/02, 31/00;* **B29G** *7/00*

U.S. Cl. 156—289 **11 Claims**



1. A method for making a solid tapered fiber-reinforced resin matrix composite rod having a high aspect ratio comprising:

forming a plurality of resin-impregnated fibers into a handleable green compact having the shape of a solid tapered composite rod of high aspect ratio;

completely encasing said green compact within an embracing flexible, releasable layer;

placing said green compact encased by said layer, within a rigid tube in spaced relation to walls thereof;

filling space between said encased compact and said tube with particulate material to apply uniform peripheral contact pressure to said compact along the length thereof; and

heating said green compact to harden said resin.

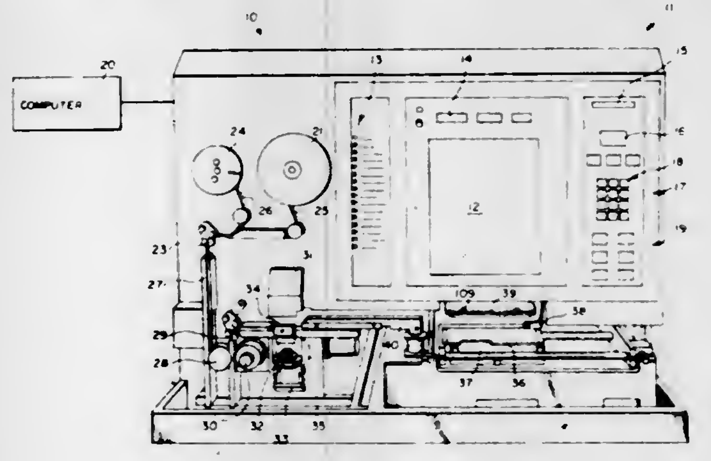
4,003,779
MICROFICHE MOUNTER

Augustus W. Griswold, Rush; Boris W. Haritonoff, Geneseo, and Angus W. Westkirk, Springwater, all of N.Y., assignors to Dynak, Inc., Rochester, N.Y.

Filed May 12, 1975, Ser. No. 576,796

Int. Cl.^{2} B26D *5/00*

U.S. Cl. 156—353 **46 Claims**



1. An automatic apparatus using preprogrammed instructions for applying the image frames of a filmstrip to predetermined destination regions of a fiche base in the making of a microfiche, said apparatus comprising:

a. control means for receiving and implementing said instructions;

b. a transfer device for receiving and holding a predetermined length of said filmstrip, said predetermined length being determined by said instructions as a variable number of said image frames;

c. means responsive to said control means for advancing said filmstrip by a predetermined and variable extent into said transfer device to position said predetermined length of said filmstrip in said transfer device according to said instructions;

d. means for cutting said filmstrip in the inter-frame region behind and adjacent to said predetermined length of said filmstrip;

e. means for supporting said base for movement relative to said transfer device;

f. means responsive to said control means for moving said base supporting means according to said instructions to bring said base into a predetermined one of a plurality of possible relationships with said transfer device for accurately positioning said predetermined destination region of said base in registry with said predetermined length of said filmstrip; and

g. means for pressing said predetermined length of said filmstrip from said transfer device accurately into engagement with said destination region of said base for securing said predetermined length of said filmstrip to said base.

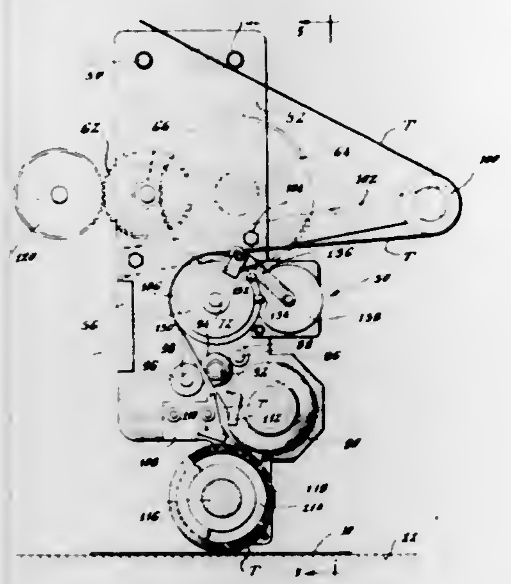
4,003,780
TAPE DISPENSING APPARATUS

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 26, 1976, Ser. No. 670,835

Int. Cl. ^{2}B32B *31/00*

U.S. Cl. 156—519 **3 Claims**



1. Tape dispensing apparatus comprising:

means for continuously feeding a substantially planar tape having an adhesive surface from a supply roll,

means for cutting said piece of tape into discrete lengths as said tape is continuously fed by said feeding means,

said tape feeding means including a draw roll engaging the adhesive surface of said tape for frictionally advancing said tape from said supply roll to said cutting means,

means between said tape feeding means and cutting means for rigidifying said tape as it is being fed continuously just prior to it being cut,

said means for rigidifying said tape including a cooperating concave and convex roller for forming said tape into a V as it is fed by said tape feeding means to said cutting means,

said cutting means including a stationary knife blade having a shear edge, and

a rotary knife blade having a planar surface in contact with the tape just prior to its being cut to flatten the tape and push it against the shear edge of said stationary knife blade to cut said tape,

said rotary knife blade being mounted on a rotary knife holder having a convex circumference in contact with the adhesive surface of the tape to feed the tape rapidly about the knife holder, and

means for transporting said cut length of tape and applying it to a sheet of material,

said tape transporting means including a vacuum roll connected to a source of negative pressure for receiving tape with its adhesive side out from the convex circumference of said rotary knife holder and pressing said tape on said sheet of material.

4,003,781
TAPING GUN

Roger W. Holsten, 1012 W. 10th St., North Platte, Nebr. 69101

Filed May 5, 1976, Ser. No. 683,255

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—526 **11 Claims**

1. A tapping tool comprising,

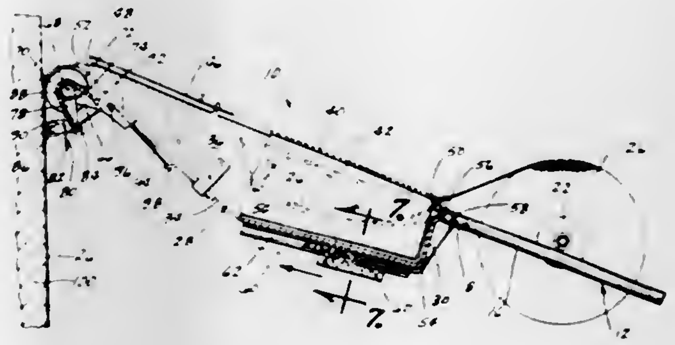
a support means having rearward and forward ends,

a container mounted on said support means adapted to receive a cement material therein,

said container having a rearward wall, a forward wall, spaced apart side walls, a bottom wall and a closable top wall,

said container having a first tape opening formed therein between rearward wall and said top wall, said container having a second tape opening formed therein between said front wall and said top wall,

means for supporting a roll of tape material on said support means adjacent the rearward end thereof so that said tape material may pass into said container through said first opening, thence adjacent said rearward wall, thence adjacent said bottom wall, thence adjacent said forward wall, thence outwardly through said second opening, said cement material in said container being normally positioned above said tape material so that a layer of cement material is placed on said tape material as said tape material is pulled through said container,



a first roller means operatively rotatably mounted at the forward end of said container adapted to have the tape material with cement thereon pass at least partially therearound and onto a wall surface as the tape material is applied thereto,

and a tape cutter assembly pivotally mounted at the forward end of said container adjacent said first roller,

said tape cutter assembly being movable between a first non-cutting position to a second cutting position, said tape cutter assembly having a blade mounted thereon,

means normally yieldably urging said tape cutter assembly to its said cutting position,

and means on said tape cutter assembly for selectively maintaining said blade out of engagement with the tape material when said tape material is being applied to the wall surface.

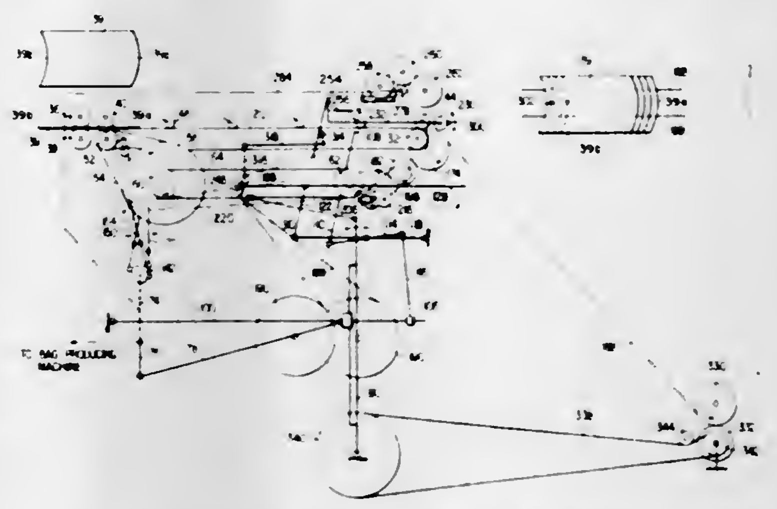
4,003,782
APPARATUS FOR PRODUCING A PACKAGE OF IMBRICATED BAGS

Walter M. Farrelly, Wilmington, Del., assignor to Vac-Pac Manufacturing Co., Baltimore, Md.

Filed May 30, 1975, Ser. No. 582,099

Int. Cl.^{2} B32B *31/10;* **B65D** *73/00*

U.S. Cl. 156—552 **23 Claims**

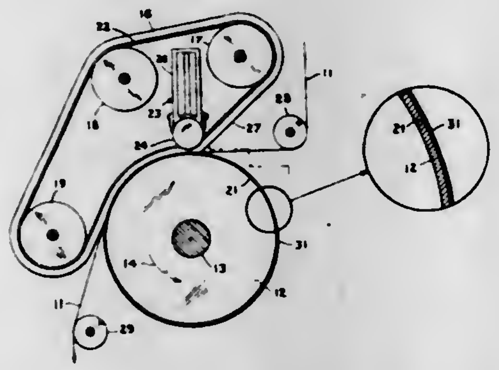


1. An apparatus for securing bags to an adhesive coated tape to form an imbricated, continuous chain of said bags, said bags being intermittently fed to said apparatus from a bag source on an individual basis where the forward end of each

bag, immediately prior to its being fed from said bag source, extends out of said source while the trailing end thereof is momentarily held in place by said source until the bag is fed therefrom, said apparatus comprising:
- a. a frame,
- b. an endless conveyor carried by said frame,
- c. drive means responsive to said bag source for driving said conveyor means so that each bag released by the source is conveyed a first predetermined distance until the said trailing end thereof is disposed at a bag taping position at which time the conveyor means is momentarily stopped while the following bag is momentarily held at its trailing end in the bag source with its forward end extending onto said conveyor whereby said bags are conveyed to said bag taping position regardless of the length thereof since the bags are conveyed with respect to the said trailing ends thereof, and
- d. a taping means mounted on said frame at said taping position in the path of movement of said bag, said taping means having at least one taping roll located beneath said taping position around which is fed an adhesive coated tape, said taping means further having at least one presser roll located above said taping position directly opposite said taping roll, said taping roll and said presser roll being operatively connected to said drive means for sequentially pressing said bags onto said tape with said presser rolls and incrementally rotating said taping roll to sequentially remove said bags a second predetermined distance from said conveyor after they have been pressed onto said tape when said endless conveyor is stopped so that said bags are sequentially pressed onto said tape to form said imbricated, continuous chain of bags regardless of the length of said bags since said trailing ends of said bags are conveyed to the bag taping position.

4,003,783
METHOD FOR COMPACTING A NONWOVEN FABRIC IMPREGNATED WITH A THERMOPLASTIC BINDER

Ernest J. Groome, Covington, Va., and Henry L. Hamrick, Hartsdale, N.Y., assignors to Clupak, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 394,993, Sept. 7, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,823
Int. Cl.² D21H ***5/24***
U.S. Cl. 162—168 R **2 Claims**

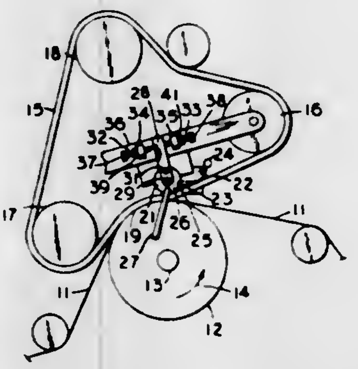


1. In a method of treating a preformed, non-woven fabric web having staple textile fibers randomly bonded together at contact points between said fibers by a thermoplastic binder having a predetermined softening temperature, including the steps of:
- a. moisture conditioning said web;
- b. continuously moving said conditioned web to the nip of a compactor means, the nip including a stretched surface of a moving elastic belt and a peripheral segment of a rotating, heated drum having a polished metal surface, the binder being normally adherent to the metal surface when heated in excess of its softening temperature;
- c. compacting the web by the contraction of said elastic surface just beyond the nip while the web is confined between the belt and the drum periphery, whereby due to the frictional adherence between the web and the elastic surface, said web is caused to slip relatively to the drum periphery and to be contracted and compressed lengthwise thereby causing the fibers to be rearranged and locally flexed and crimped in upon themselves between the points of bonding with one another;

the improvement comprising:
- d. coating the drum surface with a solid film of polytetrafluoroethylene resin prior to the compaction step; and
- e. heating the surface of the drum in excess of the softening temperature of the binder during compaction, whereby the fabric web can be compacted while the temperature of the drum is in excess of the softening temperature of the binder without the binder and the web adhering to the drum surface, the web having improved handle and drape qualities imparted thereto by such treatment.

4,003,784
METHOD OF LUBRICATING RESILIENT BELT DURING WEB COMPACTION

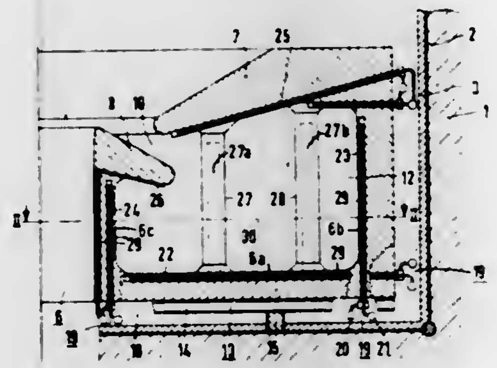
Albert Helm, Oberageri, Switzerland, and Fausto Baroni, Verona, Italy, assignors to Clupak, Inc., New York, N.Y.
Division of Ser. No. 552,981, Feb. 26, 1975, Pat. No. 3,954,557. This application Oct. 16, 1975, Ser. No. 622,861
Claims priority, application Italy, July 22, 1974, 52262/74
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.² D21H ***5/24***
U.S. Cl. 162—199 **4 Claims**



1. A method for lubricating the inner surface of a moving endless resilient belt used in a web compacting apparatus, the belt approaching and travelling under compression beneath a smooth curved portion of a compactor bar extending across the width of the belt and contiguous to its inner surface and over a curved drum surface contiguous to the outer surface of the belt, the web compaction occurring at the belt outer surface as the belt outer surface changes in curvature in passing from the bar to the drum, commprising the steps of:
- a. providing a liquid dam wall section closely adjacent to and coextensive with the curved portion of the compactor bar on the belt approach side thereof, and spaced from the inner surface of the belt;
- b. providing at least one weir opening in said dam wall section for receiving overflow liquid lubricant;
- c. continuously applying liquid lubricant to the inner surface of the belt on the belt approach side of the compactor bar sufficient to establish a pool of such liquid lubricant between the dam wall section and the inner surface of the belt on the belt approach side of the compactor bar, the upper level of the pool lying at the same level as the weir opening, whereby the depth of the pool is limited by overflow of excess liquid lubricant over the weir opening; and
- d. confining the sides of the pool of liquid lubricant at the belt edges by suitable confining means.

4,003,785
REACTOR CORE MELT CONTAINMENT RECEPTACLE

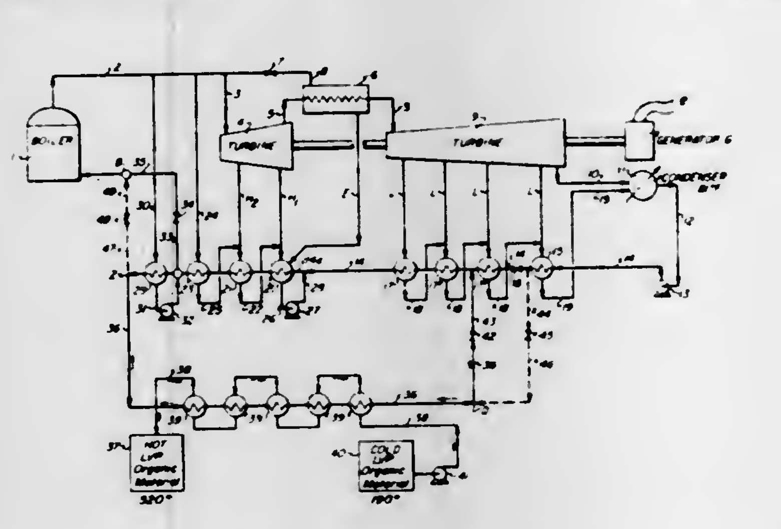
Peter Rau, Mittelehrenbach near 89, Germany, and Kevin Hunt, Macclesfield, England, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 19, 1974, Ser. No. 462,433
Claims priority, application Germany, Apr. 19, 1973, 2320091
Int. Cl.² G21C ***9/00***
U.S. Cl. 176—38 **8 Claims**



1. A reactor core melt containment receptacle for use beneath a reactor core, said receptacle comprising a bottom wall, an outer annular wall and at least one inner wall surrounded by and laterally spaced from said outer annular wall, said outer and inner walls having tops and extending upwardly from said bottom wall and forming a lateral space between each other for containing a core melt at a level below said tops, a declining annular roof extending radially inwardly from the top of said outer wall and above said level having a bottom surface forming a first heat shield against upward heat radiation from said core melt, a declining roof extending towards said outer wall from said inner wall and above said level having a bottom surface forming a second heat shield against upward heat radiation from said core melt, said roofs having terminating edge portions forming a space therebetween above said level and through which a core melt can fall into said lateral space, said bottom and said outer and inner walls having surfaces heated by said core melt when contained in said lateral space, and means for cooling all of said surfaces.

4,003,786
THERMAL ENERGY STORAGE AND UTILIZATION SYSTEM

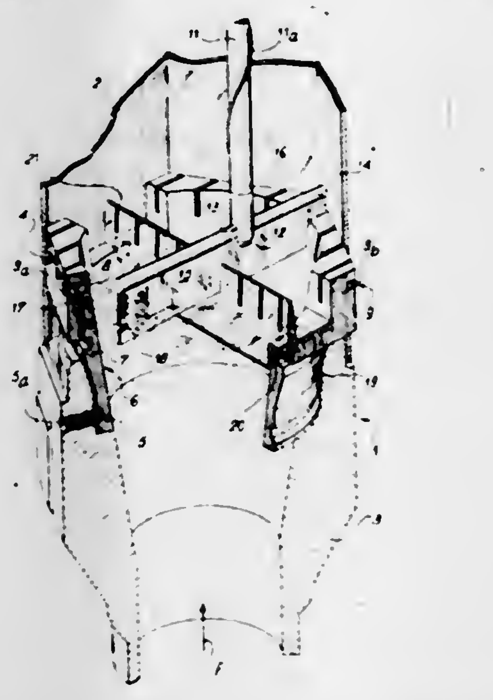
Robert P. Cahn, Millburn, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed Sept. 16, 1975, Ser. No. 613,754
Int. Cl.² G21C ***15/16***
U.S. Cl. 176—39 **19 Claims**



1. A process for efficiently utilizing the heat output of a constant output nuclear reactor or fossil fuel furnace and boiler in an electricity generating plant and enabling the plant to achieve flexible power output which comprises the steps of:
- a. using extraction steam and primary high pressure steam to heat boiler feed water in heat exchanger means;
- b. shunting a portion of the hot boiler feed water during periods of low power demand to oil-water heat exchanger means;
- c. moving low vapor pressure organic heat retention material from cold storage means to hot storage means through the oil-water heat exchanger means of (b);
- d. heating low vapor pressure organic heat retention material in the oil-water heat exchanger means by means of the hot boiler feed water of (b);
- e. storing the hot low vapor pressure organic heat retention material at atmospheric pressure in isolation from the atmosphere in a hot storage location means;
- f. during periods of peak power demand curtailing boiler feed water heating by extraction steam and primary high pressure steam in the heat exchanger means of (a);
- g. reversing the flow of the shunted portion of boiler feed water so that cold boiler feed water passes through the oil-water heat exchanger means of (c),
- h. moving hot low-vapor pressure organic heat retention material from hot storage location means to cold storage location means;
- i. passing the moving hot low vapor pressure organic heat retention material through the oil-water heat exchanger means;
- j. heating the cold boiler feed water passing through the oil-water heat exchanger means by means of the moving hot low vapor pressure organic thermal energy retention material moving from hot to cold storage location means;
- k. passing the hot boiler feed water to the boiler.

4,003,787
DEVICE FOR SUPPORTING A FUEL-PIN CLUSTER WITHIN A NUCLEAR REACTOR FUEL ASSEMBLY WRAPPER

Pierre Marmonier; Bernard Mesnage; Jean Teulon, all of Aix-en-Provence, and Jean-Pierre Simonneau, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 11, 1975, Ser. No. 557,319
Claims priority, application France, Mar. 28, 1974, 74.10906
Int. Cl.² G21C ***3/30***
U.S. Cl. 176—76 **9 Claims**



1. A device for supporting a cluster of fuel pins having lower end-caps within the wrapper of a nuclear reactor fuel assembly comprising a coaxial supporting member at the lower end of the vertically disposed fuel assembly wrapper, a series of parallel rails, grooves in said lower end-caps engaging on the

upper extremities of said rails, vertical parallel slots in said supporting member engaging lateral extremities of said rails, locking means securing said rails in said slots including open grooves in the sides of said supporting member extending along said vertical slots, and said locking means annularly engaging portions of said rails in said grooves and within said vertical slots.

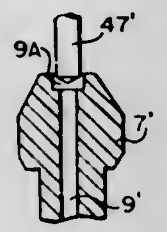
4,003,788
NUCLEAR FUEL ELEMENTS SEALED BY ELECTRIC WELDING

Eugene S. Boyko, Monroeville; Joseph Campbell, Pittsburgh, and Roger J. Wiggins, Allison Park, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 96,153, Dec. 8, 1970, Pat. No. 3,842,238. This application June 27, 1974, Ser. No. 483,601

Int. Cl.^{2} G21C *3/10*

U.S. Cl. 176—79 **1 Claim**



1. A nuclear fuel unit which comprises a tubular container having a first end sealed and having a second end sealed except for a stepped opening extending from the interior to the exterior of the container and nuclear fuel disposed within the container, said stepped opening having a first portion with a first cross section adjacent the outer end of the opening and a second portion having a second cross section smaller than the first cross section which extends from the first portion towards the interior of the container, a gas under a pressure of a plurality of atmospheres located within the container, a welding filler metal located in the first portion of the opening and disposed in sealing engagement therewith, said welding filler metal having been formed by positioning a fusible welding electrode within the opening in a manner to make essentially line contact with a portion of the opening and the fusible electrode, directing sufficient current through said electrode, line contact and wall containing the opening to fuse the electrode by resistance heating and continuing said heating by arc discharge until the desired amount of weld filler material seals said opening.

4,003,789
TRIGLYCERIDE-ACCUMULATING CLONAL CELL LINE

Howard Green, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 438,042, Jan. 30, 1974, Pat. No. 3,884,758. This application Jan. 8, 1975, Ser. No. 539,378

Int. Cl.^{2} C12K *9/00*

U.S. Cl. 195—1.8 **3 Claims**

1. An isolated clonal cell line derived from a culture of mouse fibroblast 3T3 cell line, said clonal cell line having the characteristic of accumulating relatively large amounts of triglyceride fats while in a resting state and a suitable growth media therefrom.

2. A method for isolating and establishing a triglyceride-accumulating clonal cell line from a fibroblast parent cell culture comprising:

- a. separating a portion from said parent culture which is rich in triglyceride-accumulating cells;
- b. transferring said portion to a culture medium;
- c. growing a new culture from said transferred portion;
- d. repeating steps (a) through (c) until a separate colony of triglyceride-accumulating clonal cells is established; and,
- e. separating said colony in a pure state.

4,003,790
NITROGEN CONTROL IN MIXED CULTURE PRODUCTION

Lionel J. Barnes, Ashford; John H. Harwood, Stoke-on-Trent; David E. F. Harrison, and Harmannus J. Doddema, both of Faversham, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 11, 1975, Ser. No. 603,416

Claims priority, application United Kingdom, Aug. 12, 1974, 35435/74

Int. Cl.^{2} C12B *1/00*

U.S. Cl. 195—28 R **4 Claims**

1. A process for production of bacteria in which a methane-utilizing bacterium having the NCIB Accession No. 11084 is grown under aerobic conditions in a liquid growth medium comprising urea and essential minerals salts in the presence of methane and in the presence of (a) a methanol-utilizing bacterium having the NCIB Accession No. 11112 which is capable of metabolizing methanol produced by the bacterium having the NCIB Accession No. 11084 and (b) four non-hydrocarbon-utilizing bacteria having the NCIB Accession Nos. 11062, 11061 11063 and 11065 capable of metabolizing organic substances produced during the metabolism of methane and/or methanol.

4,003,791
MATERIAL USEFUL FOR AND METHOD OF EMPLOYING THE SAME FOR THE GROWING OF MICROORGANISMS

Anthony Benny Rizzuto, Piscataway, N.J.; Richard David Skole, Elmhurst, N.Y.; Henry Harry Newman, Bronx, N.Y.; Jacqueline Noailles-Benito Hogu, Brooklyn, N.Y., and Vincent Anthony Toscano, Lawrenceville, N.J., assignors to Amstar Corporation, New York, N.Y.

Division of Ser. No. 485,730, July 3, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,369

Int. Cl.^{2} C12D *9/08*

U.S. Cl. 195—36 P **11 Claims**

1. A method for the production of penicillin which comprises growing a penicillin-producing mold in a culture medium in the presence of about 4–8% wt./vol. of a high-ash containing sucrose syrup as the carbohydrate, said sucrose syrup analyzing on a solids basis, about 40–85% by weight sucrose, about 8–30% by weight invert, about 3–25% by weight ash, the remaining percent being other organic components.

4,003,792
CONJUGATES OF ACID POLYSACCHARIDES AND COMPLEX ORGANIC SUBSTANCES

Patrick James Mill, Beaconfield; Michael Alan Cresswell, High Wycombe, and Joseph George Feinberg, London, all of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 741,212, June 28, 1968, abandoned. This application Aug. 8, 1972, Ser. No. 278,880

Claims priority, application United Kingdom, July 1, 1967, 31374/67

Int. Cl.^{2} C07G *7/00;* C07C *103/52*

U.S. Cl. 195—63 **32 Claims**

1. An immunologically active conjugate capable of forming soluble sodium salts and insoluble calcium salts comprising:

an acid polysaccharide selected from the group consisting of pectin, pectic acid, alginic acid, celluronic acid, lichenin uronic acid, and carrageenan and comprising from about 93 to 98% of said conjugate, which polysaccharide is bonded covalently by a linkage selected from the group consisting of amide, ester, and a combination of amide and ester bonds to

an immunologically active proteinaceous component selected from the group consisting of ovalbumin, lactalbumin, insulin, trypsin, chymotrypsin, ficin, Timothy pollen extract, cocksfoot pollen extract, ragweed pollen extract,

birch pollen extract, horse dander extract, cat epithelium extract, haddock extract, dry rot extract, baker's yeast extract, tetanus toxoid, diptheria toxin, bee venom, and snake venom and comprising from about 2 to 7% of said conjugate.

4,003,793
MEDIA CONTAINING MOLASSES AND SOY FLOUR FOR PRODUCING GLUCOSE ISOMERASE AND METHOD

Kenneth K. Shieh, St. Louis County, Mo., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Feb. 10, 1975, Ser. No. 548,432

Int. Cl.^{2} C12D *13/10;* C12B *3/04*

U.S. Cl. 195—66 R **7 Claims**

1. A method of making glucose isomerase comprising the steps of adding an inoculum of an organism belonging to the genus of *Actinoplanes* to a fermentor containing a medium composed of about 0.4% to about 7.0% particulate soy material selected from the group consisting of soy flour and soy meal as a growth nutrient, growing said inoculum for a period of time and at a temperature sufficient to produce a desired yield of glucose isomerase, and harvesting the glucose isomerase.

4,003,794
PROCESS FOR PRODUCING CHOLESTEROL OXIDASE

Mamoru Sugiura, Konan; Hiroshi Shimizu, Nagaokakyo; Masayasu Sugiyama, Kyoto; Takeo Kuratsu, Osaka, and Fumio Hirata, Suita, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 29, 1975, Ser. No. 645,048

Claims priority, application Japan, Dec. 27, 1974, 50-1603

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—66 R **2 Claims**

1. A process for producing a cholesterol oxidase, which comprises cultivating Schizophyllum commune (IFO 4928) in a culture medium and extracting the cholesterol oxidase from the culture filtrate.

4,003,795
PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATENDEHYDROGENASE

Walther Lamprecht, Iserhagen FB, Germany, assignor to Kommanditgesellschaft Schwarzhaupt, Cologne, Germany

Filed Sept. 12, 1975, Ser. No. 612,633

Claims priority, application Germany, Sept. 12, 1974, 2443741

Int. Cl.^{2} G01N *31/14*

U.S. Cl. 195—103.5 R **6 Claims**

1. Process for the determination of at least one of the isoenzymes 4 and 5 of lactate dehydrogenase in a test sample by visually observing the conversion of lactate and nicotinamideadenine-dinucleotide to pyruvate as brought about by the isoenzymes 4 and 5 of lactate dehydrogenase in a test reagent carrier which has had applied thereon said lactate and nicotinamide-adenine-dinucleotide into contact with a test sample to be assayed for said isoenzymes, said test reagent having been buffered to provide for said conversion a buffer specific pH value of 6–6.5.

4,003,796
APPARATUS FOR MIXING A LIQUID PHASE WITH A GASEOUS PHASE

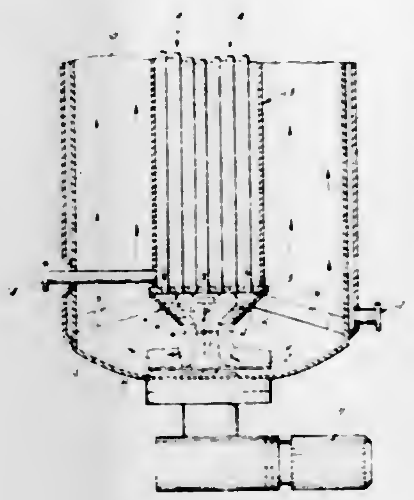
Hans Müller, Erlenbach, and Konstantin Sotirianos, Stafa, both of Switzerland, assignors to Dr. Ing. Hans Muller, Mannedorf, Switzerland

Filed May 15, 1975, Ser. No. 577,749

Claims priority, application Switzerland, May 28, 1974, 7247/74

Int. Cl.^{2} C12B *1/14*

U.S. Cl. 195—142 **10 Claims**



1. In a fermentation device for mixing a fermentation liquor containing micro-organisms with a gaseous phase, a combination comprising a vessel having an interior adapted to contain liquor to be aerated with gaseous phase; a conically-shaped mixing chamber mounted in said vessel and having an inlet and an outlet which is in communication with said interior of said vessel; conveying means intermediate said vessel and said chamber for communicating the interior of said vessel with said inlet and adapted to cause liquor and gaseous phase contained in the vessel to flow along a path through said chamber; mixing and dispersing means including a rotary element mounted for turning movement in said chamber and a plurality of substantially radially-extending baffles mounted in said chamber intermediate said inlet and said outlet thereof so as to extend in direction generally transversely of the path, said rotary element being formed with a venturi-shaped passage composed of a throat portion downstream of said baffles which is in communication with said outlet, whereby centrifugally-created suction generated by said throat portion is adapted to draw liquor and gaseous phase through said chamber so as to become mixed therein prior to centrifugal ejection of the thus aerated liquor from said outlet into said vessel.

4,003,797
SUPERATMOSPHERIC PRESSURE SHALE RETORTING PROCESS

George D. Cheadle, Fullerton, and Roland O. Dhondt, Long Beach, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 5, 1976, Ser. No. 683,541

Int. Cl.^{2} C10B *53/06*

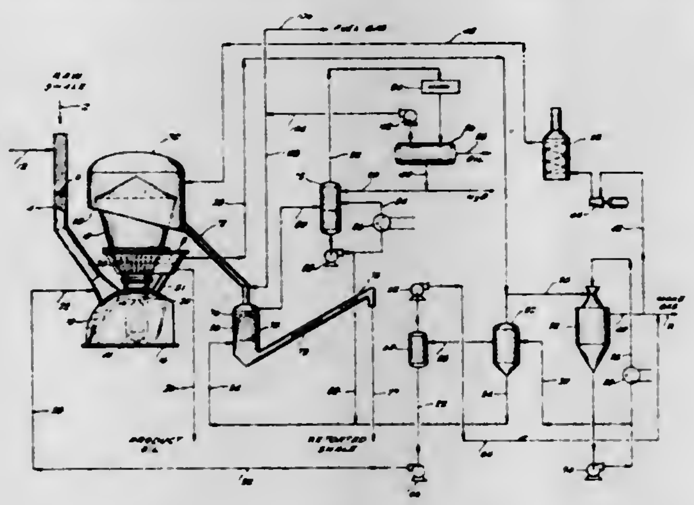
U.S. Cl. 201—28 **12 Claims**

1. A shale retorting process which comprises:

1. gravitating crushed oil shale downwardly through a feed conduit into a feeder cylinder which alternately receives a charge of shale and then discharges the same upwardly by means of a reciprocating piston into the bottom of a communicating retort;
2. contacting the resulting upflowing shale in said retort with hot, downflowing eduction gases at superatmospheric pressures to educe product oil and gas from said upflowing shale, said oil and gas being discharged from the bottom portion of said retort into an isobaric product

collection vessel in which a first liquid level of crude product oil is maintained;

3. maintaining substantially continuous hydraulic communication between the product oil in said collection vessel and the bottom of said feed conduit, whereby a second liquid oil level is maintained in said feed conduit, said second oil level being substantially above said first oil level and forming a hydrostatic seal against retort pressure;
4. transferring hot, retorted shale overflowing the top of said retort through a gas-tight transfer conduit to a water quenching zone in which is maintained a first liquid water level substantially below the top of the retorted shale bed maintained therein;
5. removing retorted shale from the bottom of said quenching zone through an upwardly extending outlet conduit communicating therewith below said first water level, whereby a second water level is maintained in said outlet conduit, said second water level being substantially above said first water level and forming a hydrostatic seal against retort pressure, the rate of removal of said retorted shale being controlled so as to maintain the top of said retorted shale bed substantially above said first liquid water level;
6. recovering a quench gas mixture of superheated steam, a combustible water gas and vaporized heavier hydrocarbons from the top of said quenching zone; and
7. recycling to said feed conduit sufficient of a light product oil recovered from said retorting to maintain said second oil level and to substantially prevent entry into said feed conduit of said crude product oil, said light product oil having a substantially lower pour point than said crude product oil.



9. A shale retorting process which comprises:

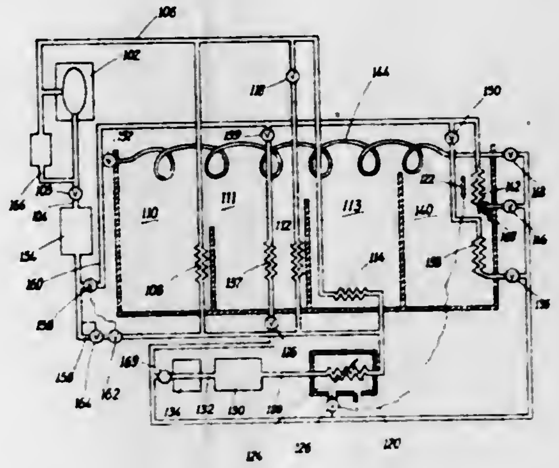
1. gravitating crushed oil shale downwardly through a feed conduit into a feeder cylinder which alternately receives a charge of shale and then discharges the same upwardly by means of a reciprocating piston into the bottom of a communicating retort;
2. contacting the resulting upflowing shale in said retort with hot, downflowing eduction gases at superatmospheric pressures to educe product oil and gas from said upflowing shale, said oil and gas being discharged from the bottom portion of said retort into an isobaric product collection vessel in which a first liquid level of crude product oil is maintained;
3. maintaining substantially continuous hydraulic communication between the product oil in said collection vessel and the bottom of said feed conduit, whereby a second liquid oil level is maintained in said feed conduit, said second oil level being substantially above said first oil level and forming a hydrostatic seal against retort pressure;
4. transferring hot, retorted shale overflowing the top of said retort through a gas-tight transfer conduit to a water quenching zone in which is maintained a first liquid water level substantially below the top of the retorted shale bed maintained therein;
5. removing retorted shale from the bottom of said quenching zone through an upwardly extending outlet conduit communicating therewith below said first water level, whereby a second water level is maintained in said outlet conduit, said second water level being substantially above said first water level and forming a hydrostatic seal against retort pressure, the rate of removal of said spent shale being controlled so as to maintain the top of said retorted shale bed substantially above said first liquid water level;
6. recovering a quench gas mixture of superheated steam, water gas and vaporized heavier hydrocarbons from the top of said quenching zone;
7. cooling and partially condensing said quench gas mixture to recover heat and liquid water therefrom while controlling condensation temperature so as to recover an overhead off-gas containing sufficient steam to carry overhead at least about 90% of said hydrocarbons; and
8. further cooling and condensing said overhead off-gas to recover therefrom a relatively small volume of water and hydrocarbon condensate, and a combustible off-gas.

4,003,798
VAPOR GENERATING AND RECOVERING APPARATUS

James W. McCord, 9829 Timberwood Circle, Louisville, Ky. 40223

Filed June 13, 1975, Ser. No. 586,611
Int. Cl.² B01D *3/42*

U.S. Cl. 202—160 **18 Claims**



1. A vapor generating and recovering apparatus for separating and recovering one component from a second component of a liquid solution comprising:

a housing including at least one chamber therein for vaporizing a first component from a liquid solution containing at least two components therein and recovering said vapor in the form of a liquid;

heat emitting means disposed in heat emitting relation with said chamber, said heat emitting means vaporizing said first component;

heat absorbing means disposed around the periphery of the housing at a preselected distance above said chamber, said heat absorbing means condensing the vaporized first component; and,

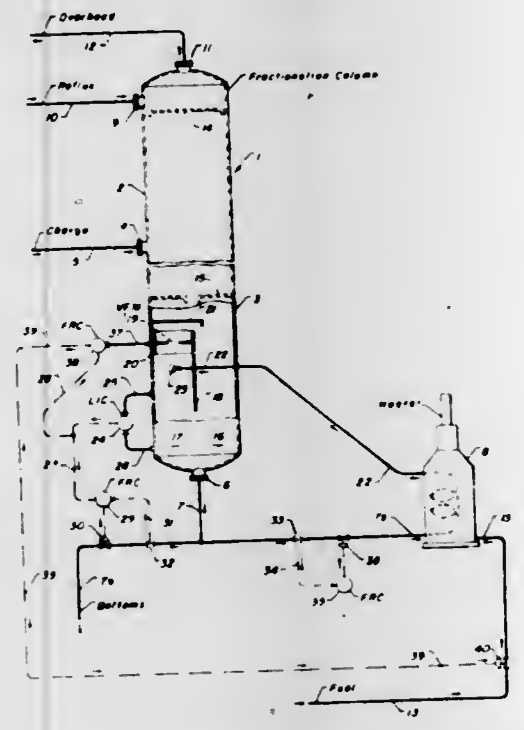
a variable heat system including said heat emitting means and said heat absorbing means, said system including a refrigerant compressor for compressing a refrigerant, said compressor being in fluid communication on its discharge side with said heat emitting means, said heat emitting means including coils therein whereby the compressed refrigerant is condensed upon heat exchange relation with the liquid in the chamber, said heat emitting means discharge being in series and in fluid communication with a by-pass system and said heat absorbing means, said by-pass system and said heat absorbing means being in parallel, said by-pass system and said heat absorbing means being in fluid communication with the suction side of said compressor, said by-pass system including a pressure actuated valve actuated at a preselected pressure of refrigerant discharging from said heat absorbing means.

4,003,799
METHOD FOR CONTROLLING HEAT INPUT TO THE REBOILER SECTION OF A DISTILLATION COLUMN

R. Gene Fickel, Roselle, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 459,973, April 11, 1974, abandoned. This application June 12, 1975, Ser. No. 586,447
Int. Cl.² B01D *3/42*; C10G *7/00*

U.S. Cl. 203—2 **4 Claims**



1. A reboiler section, adapted to be disposed within a distillation column, which comprises, in combination:

a. a chordal baffle vertically disposed in said reboiler section, terminating at its upper extremity a finite distance below the lowermost tray, or deck of said column and at its lower end a finite distance above the bottom of said column, thereby forming a partially partitioned reboiler section having two chambers in open communication with each other at the bottom of said column;
b. a fluid outlet port in the bottom of said distillation column and a fluid inlet port in open communication with a first of said two chambers;
c. flow-measuring means, responsive to upwardly flowing vapors leaving said reboiler section, within said first chamber and disposed at the upper extremity thereof;
d. signal-sensing means, in open communication with said flow-measuring means, for transmitting a signal representative of the rate of vapor flow through said flow-measuring means, without the confines of said reboiler section; and,
e. an imperforate baffle, horizontally disposed between said lowermost tray and said flow-measuring means, said imperforate baffle extending entirely across said first chamber into the second of said two chambers and terminating a distance less than the internal diameter of said distillation column.

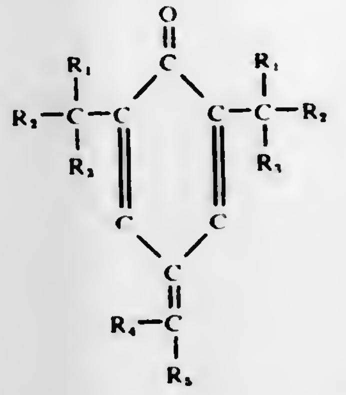
4,003,800
STYRENE PURIFICATION PROCESS

John D. Bacha, and Charles M. Selwitz, both of Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,403
Int. Cl.² C07C *7/04*

U.S. Cl. 203—9 **3 Claims**

1. In a method for inhibiting the polymerization of styrene monomers during the vacuum distillation processing thereof, the improvement which comprises a continuous mass process for preparing styrene, adding during said vacuum distillation processing a polymerizing inhibiting amount of a quinone alkide, said quinone alkide having the formula:



wherein R_1, R_2 and R_3 are either alike or different, members selected from the group consisting of hydrogen, straight or branched chain alkyl moieties having from 1 to 8 carbon atoms, phenyl and alkyl substituted phenyl moieties having up to 9 carbon atoms, cyclic hydrocarbon moieties having from 3 to 5 carbon atoms, and wherein R_4 and R_5 are either alike or different, members selected from the group consisting of hydrogen, straight or branched chain alkyl moieties having from 1 to 18 carbon atoms, phenyl and alkyl substituted phenyl moieties having up to 9 carbon atoms, and cyclic hydrocarbon moieties having from 3 to 5 carbon atoms.

4,003,801
TREATMENT OF WATER VAPOR GENERATED IN CONCENTRATING AN AQUEOUS UREA SOLUTION

Sadashi Chikaoka; Toyotaro Kawabe; Hisashi Miyakawa, and Naotoshi Seki, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed May 14, 1975, Ser. No. 577,341
Claims priority, application Japan, May 14, 1974, 49-52891
Int. Cl.² C07C *126/02*

U.S. Cl. 203—42 **17 Claims**

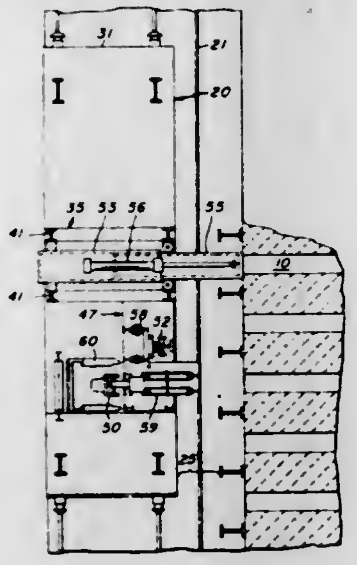
1. In the process for treatment of water vapor generated in concentrating an aqueous urea solution obtained by reacting carbon dioxide and ammonia at urea synthesis temperatures and pressures, wherein the resulting reaction mixture is passed through a plurality of unreacted ammonium carbamate decomposition stages, the pressures of which are stepwise reduced, to decompose and separate the unreacted ammonium carbamate from the aqueous urea solution, the aqueous urea solution containing small amounts of ammonia and carbon dioxide is subjected to concentration to separate therefrom water vapor containing a mist of the aqueous urea solution, ammonia and carbon dioxide, and the water vapor is treated to recover urea and ammonia values, the improvement which comprises:

1. separating from the water vapor the mist of the aqueous urea solution together with a part of the ammonia, carbon dioxide and water vapor to form a first condensate containing urea, ammonia and carbon dioxide,
2. condensing by indirect cooling the water vapor discharged from step (1) and containing the remaining part of the ammonia and carbon dioxide to form a second condensate containing ammonia and carbon dioxide,

3. subjecting the second condensate to rectification in a rectification zone to separate a mixed gas of ammonia and carbon dioxide containing a small amount of moisture, from water substantially free of ammonia and carbon dioxide, and
4. recovering the mixed gas from step (3).

4,003,802
COKE GUIDE MACHINE FOR A BATTERY OF COKE OVENS

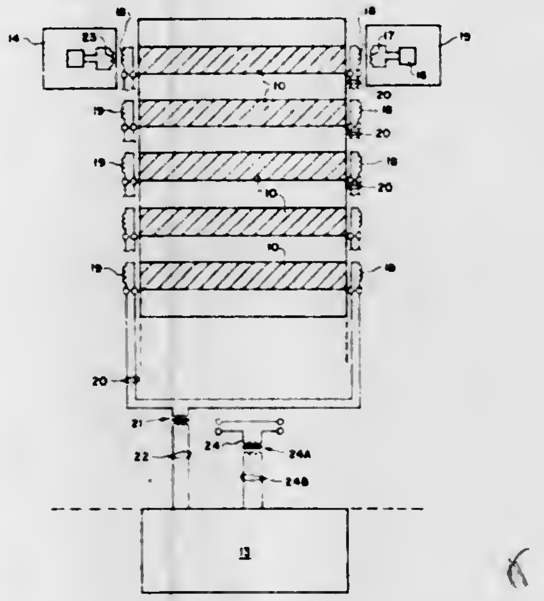
Erich E. Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany
Filed Feb. 3, 1975, Ser. No. 546,619
Claims priority, application Germany, Oct. 9, 1974, 2448043
Int. Cl.² C10B *25/14, 43/04*
U.S. Cl. 202—241 **7 Claims**



1. In a battery of coke ovens wherein horizontally spaced-apart coking chambers have sealing surfaces at door frames defining coke discharge openings which are normally closed by individually removable doors, and wherein a longitudinal coke bench extends along the battery of coke ovens in a direction which is generally normal to the axes of the coke oven chambers and below the coke discharge openings thereof, a coke guide apparatus movable along said coke bench comprising, in combination:
- a shuttle car adapted for positioning into desired stationary locations relative to the spaced-apart coking chambers by movements along said coke bench while spaced outwardly from the coke ovens in a manner to define an open passageway between the coke ovens and the shuttle car,
- carriage means supported in a suspended manner by said shuttle car for movement along the shuttle car in a generally parallel direction to the movement by the shuttle car along said coke bench,
- a coke guide including an extendible guide member supported by said carriage means for bridging said open passageway to conduct coke pushed from an oven chamber above said coke bench,
- door handling means carried by said carriage means for movement therewith along said shuttle car in the same general direction which the shuttle car moves along the coke bench,
- means adapted to clean the sealing surface of a coking chamber while said means is carried by said carriage means and movable therewith along the shuttle car in the same general direction which the shuttle car moves along the coke bench,
- first transport means operative to bridge said open passageway while extending between said carriage means and said means adapted to clean the sealing surface by displacing the latter in a generally parallel direction with said axes of the coke oven chambers from an inoperative position lying generally within the bounds of said shuttle car into an operative location at a coking chamber for cleaning the sealing surface thereof,
- second transport means operative to bridge said open passageway while extending between said carriage means and said door handling means by displacing the latter in a generally parallel direction with said axes of the coke oven chambers from an inoperative position lying generally within the bounds of said shuttle car into a door transferring position at a door frame of a coking chamber,
- door cleaning means mounted in a fixed manner upon said shuttle car for cleaning said removable doors, and
- spaced-apart suspension members supported by said carriage means for side-by-side support of said first and second transport means, said suspension members supporting said door handling means and said means adapted to clean the sealing surface, said suspension members being adapted to pivot about a common vertical axis through an angle of 180° relative to said shuttle car to pivotally displace said door handling means from a position defining an aligned relation with a coke oven chamber for movement into a door transferring position therewith into a position where movement of only said carriage means defines an aligned relation with said door cleaning means, said means adapted to clean the sealing surface being pivotally displaced by the suspension members from an inoperative position into a position defining an aligned relation with a coking chamber to clean the sealing surface thereof, said coke guide and said door handling means being supported by said carriage means in a spaced-apart and side-by-side relation for movement along said shuttle car in relation to the fixed location of said door cleaning means on said shuttle car such that when the coke guide is operatively positioned along the shuttle car to receive coke pushed from an oven chamber then concurrently the door handling means is positioned in front of said door cleaning means.

4,003,803
CONTROL SYSTEM FOR PREVENTING AN EXCESSIVE TEMPERATURE RISE IN A BATTERY OF COKE OVENS

Helmut Schmidt-Balve, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany
Filed Dec. 3, 1974, Ser. No. 529,043
Claims priority, application Germany, Nov. 30, 1973, 2359745
Int. Cl.² C10B *21/12, 41/00*
U.S. Cl. 202—262 **7 Claims**



1. A control system for preventing the development of an excessive temperature within heating flues for individual coke oven chambers in a battery of coke ovens, said control system including:
- valve means for controlling the flow of combustion gas into the heating flues located at the sides of a given coke oven chamber,
- means responsive to the charging of coal into the given coke oven chamber for producing a first electrical signal,
- means responsive to the pushing of coke from the given coke oven chamber for producing a second electrical signal,
- means responsive to the amount of heat fed into the given coke oven chamber for producing a third electrical signal,
- means responsive to the amount of heat yielded from flues at the sides of the given coke oven chamber for producing a fourth electrical signal,
- means for producing a fifth electrical signal which varies in response to a comparison of the actual temperature rise in heating flues for the coke oven chamber with a predetermined acceptable temperature in the heating flues during a desired coking period and determined in relation to the properties of the refractory material forming the heating flues, and
- controller means including a timer circuit to clock a predetermined coking period for a coal charge in the given coke oven chamber, said timer circuit being responsive to said first and second electrical signals to control said valve means in a manner to block the flow of combustion gas into the heating flues at the sides of the given coke oven chamber when the clocked duration of the coking time for a coal charge therein exceeds a predetermined coking period, said controller means being responsive to a signal produced by means receiving said third, fourth and fifth electrical signals for computing a maximum duration to the coking period by the coke oven chamber.

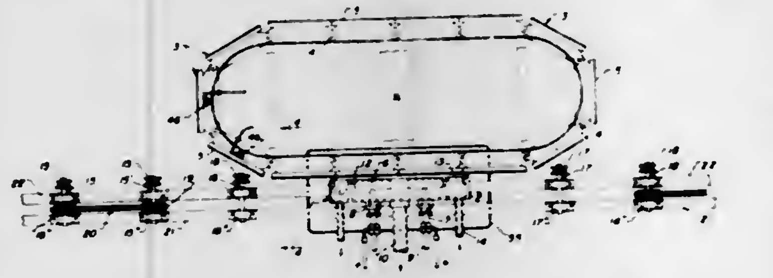
4,003,804
METHOD OF ELECTROPLATING OF ALUMINUM AND PLATING BATHS THEREFOR

Jack Yea Wong, San Jose, Calif., assignor to Scientific Mining & Manufacturing Company, Arroyo Grande, Calif.
Filed Dec. 31, 1975, Ser. No. 645,552
Int. Cl.² C25D *3/44*
U.S. Cl. 204—14 N **31 Claims**

1. In a method for forming an electroplating solution for aluminum or its alloys, the step of reacting aluminum with a hydrogen halide in an aromatic hydrocarbon solvent and in the absence of water, to form a plating solution having an aluminum cation molarity, in a complex ion form, of below about 4.2 M, and a hydrogen ion molarity of below about 0.5 molarity whereby said plating solution has the ability to plate aluminum onto a cathode substrate at low voltages, on the order of below 3 volts, in the absence of an aluminum anode.

4,003,805
SYSTEM FOR ELECTROPLATING A SEQUENCE OF MOVING PLATE MEMBERS

Glenn R. Schaer, and Harold E. Trumbull, both of Columbus, Ohio, assignors to UOP Inc., Des Plaines, Ill.
Filed Oct. 20, 1975, Ser. No. 624,209
Int. Cl.² C25D *5/02, 5/26*
U.S. Cl. 204—27 **10 Claims**



1. A continuous automatic method for effecting the plating of a thin copper coating onto a steel plate, which comprises the steps of:
- a. conveying a cleaned steel plate in a generally vertical position to a plating station and transferring such plate to movable generally vertical cathode-conveyor means providing a current conducting face for supplying electrical current uniformly to the back side of said plate as it passes the plating station,
- b. supplying a copper containing electrolyte solution into contact with a vertical strip portion of said steel plate from a containment zone with an open portion maintained against the face of the moving plate to be coated while simultaneously supplying electric current to said cathode-conveyor means and to an anode means positioned to be maintained closely adjacent substantially the full height of a strip of the front face of the steel plate from within said electrolyte containment zone,
- c. with said supply of electrolyte solution to said containment zone and the withdrawal of solution therefrom providing turbulent electrolyte flow between the spaced faces of the anode and the steel plate during the plating operations, and
- d. continuously withdrawing and conveying away the resulting copper coated steel plates as they are passed by the anode means and leave the plating station.

4,003,806
SILVER PLATING BATH

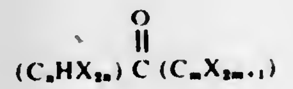
Robert William Etter, Lancaster County, Pa., assignor to RCA Corporation, New York, N.Y.
Filed May 30, 1975, Ser. No. 582,856
Int. Cl.² C25D *3/46*
U.S. Cl. 204—46 R **6 Claims**

1. An improved acidic, aqueous silver-electroplating solution containing silver iodide and potassium iodide, wherein the improvement comprises the addition of from about 0.12 mols/liter to about 0.20 mols/liter of a calcium salt to said solution.

4,003,807
ELECTROCHEMICAL FLUORINATION OF KETONES WITHIN THE PORES OF AN ANODE

William V. Childs, and Forrest N. Ruehlen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed June 2, 1975, Ser. No. 583,315
Int. Cl.² C25B *3/08*
U.S. Cl. 204—59 F **10 Claims**

1. A process for the electrochemical fluorination of a ketone having the formula



$$(C_nHX_{2n})\overset{O}{\overset{\|}{C}}(C_mX_{2m+1})$$

wherein X is hydrogen or fluorine, wherein *m* and *n* are integers having the value of 1, 2 or 3 and wherein the sum of *m*+*n* is 2, 3 or 4 comprising:
- passing an electric current through a current-conducting essentially anhydrous liquid hydrogen fluoride electrolyte contained in an electrolysis cell provided with a cathode and a porous carbon anode;
- contacting said ketone with said electrolyte within pores of said anode to thus at least partially fluorinate at least a portion of said ketone; and
- recovering perfluorinated product from said anode.

4,003,808

METHOD AND APPARATUS FOR REGULATING AND CONTROLLING THE ANODE CURRENT AND FOR AVOIDING SHORT-CIRCUITS BETWEEN THE ELECTRODES OF AN ELECTROLYSIS CELL

Karl-Heinz Sieberer, Zirndorf near Nurnberg, Germany, assignor to Firm C. Conradty, Nurnberg, Germany

Filed Apr. 30, 1975, Ser. No. 573,367

Claims priority, application Germany, Nov. 14, 1974, 2454014

Int. Cl.² C25B *1/36, 15/02*

U.S. Cl. 204—99 **8 Claims**

1. Apparatus for regulating and controlling the anode current and for avoiding short circuits between the anode means and cathode of an electrolysis cell, said anode means being positionable with respect to the cathode to control the current in an anode means current path, said apparatus comprising:

sensing means located along the current path for the anode means and within the magnetic field produced by the current, said sensor comprising semi-conductor means, the resistance of which is responsive to the strength of the magnetic field and thereby proportional to the magnitude of the anode current;

means coupled to said sensing means for ascertaining the deviation of the resistance of said sensing means from a preselected value corresponding to a desired anode current value; and

indicator means for indicating a deviation of said sensing means resistance and said anode current from said preselected value.

4,003,809

ISOTOPE SEPARATION PROCESS

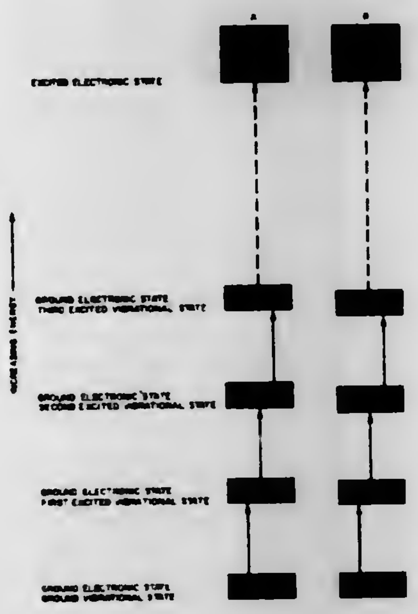
Richard K. Lyon, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 408,669, Oct. 23, 1973, Pat. No. 3,937,956. This application Apr. 23, 1975, Ser. No. 570,849

The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 R **15 Claims**



1. A method of separating the isotopes of an element, said method being applied to a gaseous compound of said element, and said method comprising subjecting molecules of said compound to radiation from an IR laser at or about a predetermined frequency at a power density of at least 10^4 watts per cm^2 per torr pressure of the gaseous compound for a time between 10^{-10} and 5×10^{-5} seconds, in the presence of a second gas, said second gas partial pressure being at least 5 times the partial pressure of said gaseous compound, whereby the molecules containing the isotope or isotopes are preferentially excited and sequentially absorb more than 1 quanta of IR radiation, preferentially converting the excited molecules by any means whose rate or selectivity is sensitive to temperature and separating said converted molecules from the molecules which are either unconverted or have been converted to some chemically different product.

4,003,810

PREVENTING DISCOLORATION IN HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMERS

John M. Hoyt; Karl Koch, and Mathew Williams, Jr., all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 516,247, Oct. 18, 1974, abandoned, which is a division of Ser. No. 377,997, July 10, 1973, Pat. No. 3,882,005. This application May 6, 1976, Ser. No. 683,991

Int. Cl.² C08F *8/12*

U.S. Cl. 204—159.14 **2 Claims**

1. A hydrolyzed ethylene-vinyl acetate copolymer having a residual vinyl acetate content of 0.1 to 15 weight percent, said hydrolyzed ethylene-vinyl acetate copolymer having a yellowness index (ASTM D-1925-63T) of a specimen thickness of 0.25 inch and having been prepared by

alcoholyzing an ethylene-vinyl acetate copolymer containing 8–40 weight percent vinyl acetate and having a melt index in the range of from 1 to 25 in suspension in a substantially anhydrous alcoholyzing medium containing a lower alkanol having from 1 to 4 carbon atoms and an alkali metal alkoxide or hydroxide catalyst, and

subjecting the alcoholyzing reaction medium containing the copolymer to electromagnetic radiation of wave lengths in the range of about 3,000 to 8,000 Angstrom units during at least a portion of the alcoholysis reaction.

4,003,811

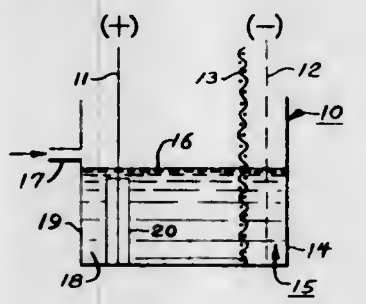
ELECTROKINETIC SEPARATION OF SOLID PARTICLES FROM AQUEOUS SUSPENSIONS THEREOF

Albert C. Kunkle, Macon, Ga., assignor to J. M. Huber Corporation, Borger, Tex.

Continuation of Ser. No. 436,408, Jan. 25, 1974, abandoned, and a continuation-in-part of Ser. No. 403,191, Sept. 26, 1973, abandoned, and a continuation-in-part of Ser. No. 263,376, June 5, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,657

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 R **9 Claims**



1. A method of electrokinetically separating finely divided clay particles suspended in an aqueous medium which comprises

introducing a suspension of the solid particles into an electrokinetic cell provided with an anode and a cathode, and a semi-permeable membrane impermeable to clay particles separating the anode and cathode, the anode and membrane forming an anodic compartment in the cell, the cathode and membrane forming a cathodic compartment in the cell;

directing the particle suspension into the anode compartment;

circulating an electrolyte solution having a pH range from about 2 to about 7 through the cathode compartment;

applying a direct current field between the anode and cathode to cause the solid particles to be deposited from the suspension by electrophoretic action onto the anode concomitantly with the aqueous portion of the suspension being caused to migrate electroosmotically through the semi-permeable membrane and into the cathode compartment; and

removing the solid particles from the anode and the water from the cathode compartment.

4,003,812

COLLOIDAL POLYSULFONE ELECTRODEPOSITION COMPOSITIONS

Luciano C. Scala, Murrysville, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,227

Int. Cl.² C08K *3/18, 3/28;* **C25D** *13/06, 13/10*

U.S. Cl. 204—181 **9 Claims**

1. A method of making a conducting, non-aqueous, colloidal polysulfone electrodeposition composition, comprising the steps of:

a. combining 1 part by weight of a polysulfone comprising aromatic groups selected from the group consisting of phenylene and diphenylene and mixtures thereof joined together by linkages selected from the group consisting of sulfone, ether and isopropylidene and mixtures thereof, said polysulfone characterized as having at least sulfone linkages, 20–37 parts by weight of a non-aqueous, organic, aprotic solvent for the polysulfone and 0.8–1.2 parts by weight of a secondary or tertiary amine, to form a polysulfone solution, followed by

b. adding this polysulfone solution to 25–150 parts by weight of a non-aqueous, organic, non-electrolizable, liquid, non-solvent for the polysulfone, which is miscible with the aprotic solvent, to provide an electrodeposition composition having a colloidal dispersion within the solvent mixture, said composition having a pH of between about 7–11.

4,003,813

METHOD OF MAKING A MAGNETIC OXIDE FILM WITH HIGH COERCIVE FORCE

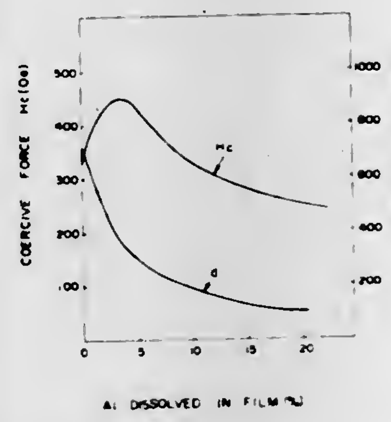
Seizi Hattori, Asahi; Nobuo Inagaki, Katsuta, and Yoshikazu Ishii, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,774

Claims priority, application Japan, Aug. 26, 1974, 49-97647

Int. Cl.² C23C *15/00;* **B05D** *5/12;* **G11B** *23/00*

U.S. Cl. 204—192 **7 Claims**



1. A method of making a high coercive force magnetic oxide film comprising the steps of sputtering a target made of iron and aluminum in an atmosphere containing an inert gas and oxygen with the oxygen above a certain partial pressure to form on a substrate an $\alpha\text{-}Fe_2O_3$ non magnetic oxide film having aluminum dissolved therein, and reducing said non-magnetic oxide film under a hydrogen gas atmosphere to yield an Fe_3O_4 magnetic oxide film having aluminum dissolved therein.

4,003,814

APPARATUS FOR THE CONTINUOUS MEASUREMENT OF THE OXYGEN CONTENT OF MOLTEN COPPER OR ALLOYS THEREOF

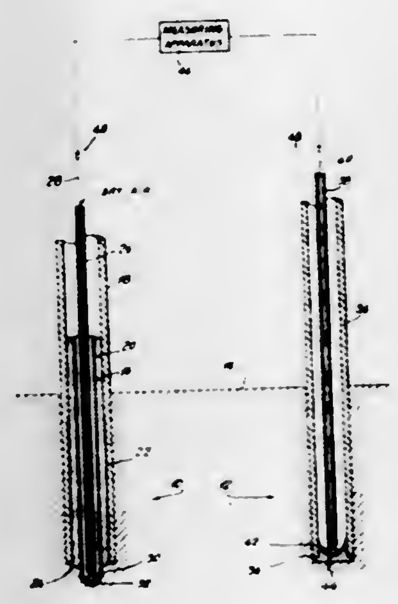
Peter Tarassoff, Dollard des Ormeaux; Tadeusz R. Kowalski, Ville d'Anjou, and Meguru Nagamori, Ste. Foy, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed July 21, 1975, Ser. No. 597,760

Claims priority, application Canada, Aug. 2, 1974, 206219

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **12 Claims**



1. An apparatus for the continuous measurement of the oxygen content of copper and copper alloys comprising:

a. an austenitic stainless steel tube possessing a large heat capacity and capable of withstanding the operative conditions of the molten copper or alloy thereof;

b. a closed end tube of solid electrolyte inserted inside the stainless steel tube and projecting therefrom a distance at least equal to the diameter of the solid electrolyte tube;

c. a fine grained alumina cement inserted between the stainless steel tube and the solid electrolyte tube for cementing the stainless steel tube to the solid electrolyte tube;

d. means on the inside of stainless steel tube for promoting adhesion of the alumina cement to the stainless steel tube;

e. means for providing a first electrical connection with the inside of the solid electrolyte tube at the bottom thereof wherein a predetermined reference oxygen potential is maintained; and

f. a melt contact immersed in the molten copper or copper alloy for providing a second electrical connection with the outside of the solid electrolyte as an indication of the oxygen content of the molten copper or copper alloy.

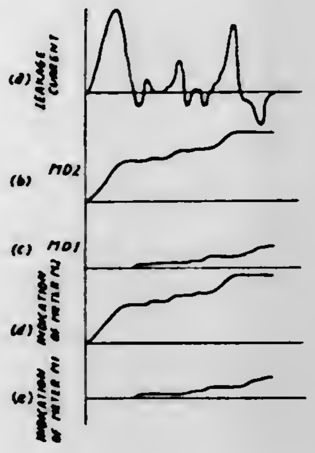
4,003,815
APPARATUS FOR MEASURING STRAY CURRENT ELECTROLYTIC CORROSION

Hironosuke Ikeda, Hirakata; Makoto Yamada, Katano, and Hiroshi Kutsuyama, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 448,285, March 5, 1974, abandoned. This application May 9, 1975, Ser. No. 575,998

Int. Cl.² G01N *27/46, 27/42*

U.S. Cl. 204—195 C **14 Claims**



1. An apparatus for qualitatively measuring an amount of electrolytic corrosion which occurs in an electric conductor installed in electrical contact with the earth due to leakage current flowing between said electric conductor and the earth resulting from a corrosion potential therebetween, comprising:

an earthable reference electrode adapted to be disposed in good electrical contact with the earth,

a solid state electrochemical memory device comprising:
- a cathode including an active metal,
- an anode comprising an alloy including said metal, and
- a solid state electrolyte having ion conductivity sandwiched between said cathode and said anode,

said potential memory device exhibiting a terminal voltage between said anode and said cathode substantially linearly changing as a function of the charging or discharging quantity of electricity supplied to said device in accordance with the anode being positive or negative, respectively,

means for connecting said potential memory device to said electric conductor and to said earthable reference electrode for receiving therefrom a current flow which is produced as a result of the corrosion potential therebetween causing said leakage current, and which may vary in direction of flow corresponding to the polarity of said corrison potential, and for conveying said current flow to said potential memory device so as to effect a linear change of said terminal voltage, and,

output means connected to said potential memory device for providing a qualitative indication of the amount of electrolytic corrosion occurring in said electric conductor in terms of the terminal voltage of said potential memory device,

said apparatus further including a selecting means, disposed between said connecting means and said device, for automatically selecting that current flow having a direction corresponding to a preselected polarity of said corrosion potential, whereby to cause said output means to provide said qualitative indication of the amount of electrolytic corrosion due to leakage current flowing in said direction corresponding to said preselected polarity.

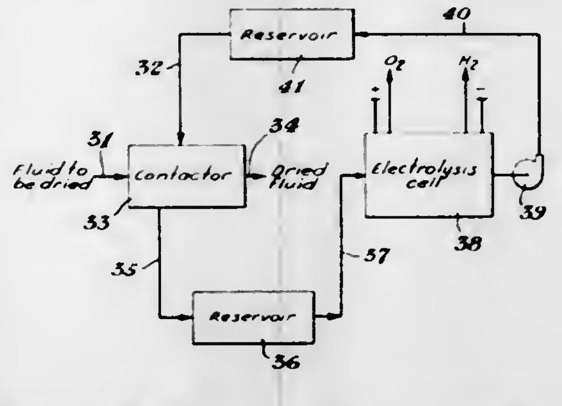
4,003,816
SULFURLESS ELECTROLYTIC CONCENTRATION OF AQUEOUS SULFURIC ACID SOLUTIONS

E. Colin W. Clarke; Jeffrey F. Gilbert, and David N. Glew, all of Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 517,345, Oct. 23, 1974, Pat. No. 3,915,821. This application June 3, 1975, Ser. No. 583,375

Int. Cl.² C25B *1/02, 1/04*

U.S. Cl. 204—237 **2 Claims**



1. An apparatus for reducing the H_2O content of a wet fluid comprising:
- a. means for contacting the wet fluid with a stream of sulfuric acid solution and thereafter to separate the wet sulfuric acid solution from the fluid,
- b. an electrolytic cell for subjecting the wet sulfuric acid solution to electrolysis to remove at least a substantial portion of the H_2O removed from the wet fluid and containing, in contact with the cathode which is exposed to the wet sulfuric acid, a quantity of a chlorine containing oxidizing agent sufficient to control the build-up of sulfur deposits on said cathode during the electrolysis of said wet sulfuric acid, said electrolytic cell being equipped with platinum electrodes,
- c. a first liquid conduit means in communication with said contacting means and said electrolytic cell,
- d. a second liquid conduit means in communication with said electrolytic cell and said contacting means,
- e. a quantity of sulfuric acid solution contained in said elements (a), (b), (c) and (d) that is sufficient to remove at least a substantial portion of the H_2O content of the fluid, said sulfuric acid having a concentration greater than about 50 per cent by weight H_2SO_4, and
- f. means for urging said sulfuric acid solution to circulate in a closed loop through said contacting means, said electrolytic cell, said first liquid conduit means, and said second liquid conduit means.

4,003,817
VALVE METAL ELECTRODE WITH VALVE METAL OXIDE SEMI-CONDUCTIVE COATING HAVING A CHLORINE DISCHARGE IN SAID COATING

Giuseppe Bianchi, Milan, Italy; Vittorio de Nora, Nassau, Bahamas; Patrizio Gallone, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies, S.A., Geneva, Switzerland

Division of Ser. No. 141,946, May 10, 1971, Pat. No. 3,846,273, which is a continuation-in-part of Ser. Nos. 690,407, Dec. 14, 1967, Pat. No. 3,616,445, and Ser. No. 771,665, Oct. 29, 1968, Pat. No. 3,948,751. This application Sept. 23, 1974, Ser. No. 508,232

Int. Cl.² C25B *11/06, 11/08, 11/10*

U.S. Cl. 204—290 F **21 Claims**

1. An electrode comprising a metal base from the group consisting of titanium and tantalum, having over at least a portion of the base a coating containing oxides of rhenium, together with oxides from the group consisting of iron, manganese, zinc and tin and mixtures of oxides from the group consisting of iron, manganese, zinc and tin.

4,003,818
METHOD OF OBTAINING A MICRO-POROUS MEMBRANE AND NOVEL PRODUCT THUS OBTAINED

Michel Julliard, Orsay, and Pierre Bouy, Enghein-les-Bains, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 31, 1975, Ser. No. 600,219

Claims priority, application France, Feb. 8, 1974, 74.26922

Int. Cl.² B29D *27/08;* **C25B** *13/08*

U.S. Cl. 204—296 **10 Claims**

1. A method of producing a micro-porous membrane, characterized in that a homogeneous paste is first formed from a pore-forming particulate filler material and a latex of a fluorinated polymeric resin, said paste is dried in order to obtain a material containing between about 0.1 and 1% of water and the resulting material is reduced to powder form, the product so obtained is preformed and a membrane is formed by rolling said preform, the membrane thus obtained is sintered and the pore-forming particulate filler material removed.

10. A micro-porous membrane for use in electrolysis made by the process of claim 1.

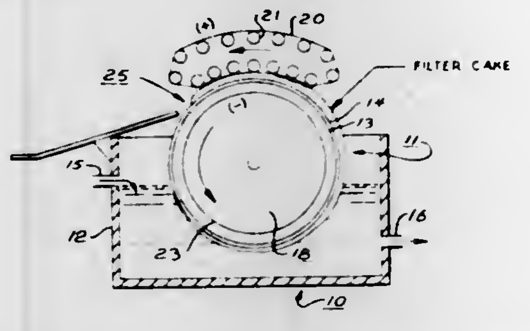
4,003,819
FILTRATION OF SOLIDS SUSPENSION ENHANCED BY APPLIED DC POTENTIAL

Albert C. Kunkle, and William Floyd Abercrombie, Jr., both of Macon, Ga., assignors to J. M. Huber Corporation, Borger, Tex.

Continuation of Ser. No. 436,413, Jan. 25, 1974, abandoned, and a continuation-in-part of Ser. No. 401,086, Sept. 26, 1973, abandoned, which is a continuation of Ser. No. 263,380, June 5, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,662

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 **10 Claims**



1. A filter apparatus for solid liquid separation which comprises

a tank for the material to be filtered, a hollow cylindrical drum supported for rotation about a horizontal axis in the tank,

said drum being partially immersed in the material in the tank during the operation of the filter,

filter means impervious to solid particles mounted on the outer surface of the drum,

means for maintaining the interior region within the drum under vacuum,

a first electrode disposed above the filter means,

a second electrode disposed within the drum and spaced from the inner surface thereof,

means for applying a source of DC potential to create an electric field across said electrodes,

means for rotating said drum,

means for removing the filter cake deposited on the filter means, and

means for withdrawing filtrate from the drum interior.

4,003,820
SHORT RESIDENCE TIME HYDROPYROLYSIS OF CARBONACEOUS MATERIAL

Arnold H. Pelofsky, East Brunswick, and Marvin Greene, Somerset, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Oct. 7, 1975, Ser. No. 620,468

Int. Cl.² C10G *1/02*

U.S. Cl. 208—8 **11 Claims**

1. A process for treating carbonaceous material with hydrogen, in the absence of added catalyst, comprising, in serial combination,
- a. adding liquid or crushed solid carbonaceous material into a first reaction zone of a reactor having at least two reaction zones;
- b. adding hot hydrogen to the stream of carbonaceous material to effect a reaction with same at a carbonaceous material heating rate of between about 500° C/second and about 100,000° C/second, a temperature of between about 400° and 2000° C and a pressure of between 500 and 5000 psig;
- c. quenching the mixture of step b) while insuring that the total residence time of steps b) and c) varies from about 2 milliseconds to about 2 seconds;
- d. removing at least a portion of the reaction products from said quenched mixture of step c); and
- e. intoducing the residual carbonaceous material into a subsequent reaction zone and repeating steps (a) - (d) for said subsequent reaction zone.

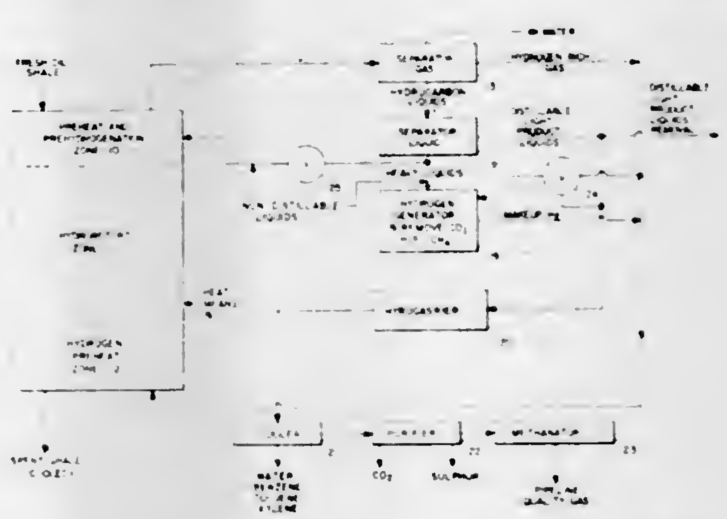
4,003,821
PROCESS FOR PRODUCTION OF HYDROCARBON LIQUID FROM OIL SHALE

Sanford A. Weil, Chicago; Paul B. Tarman, Elmhurst, and Dharamvir Punwani, Bolingbrook, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 409,915, Oct. 26, 1973, abandoned, and a continuation-in-part of Ser. No. 339,547, March 9, 1973, Pat. No. 3,891,403. This application Aug. 18, 1975, Ser. No. 605,411

Int. Cl.² C10G *1/02*

U.S. Cl. 208—11 R **12 Claims**



1. A process for the production of predominately distillable aliphatic and alicyclic hydrocarbon liquids from kerogen containing oil shale wherein above about 77 percent of the organic carbon in said oil shale is converted to liquids and gases and there is minimal carbon residue formation resulting from the conversion of kerogen to the hydrocarbon liquids comprising the steps:

introducing fresh oil shale into a preheat and prehydrogenation zone;

gradually preheating oil shale in the preheat and prehydrogenation zone at a rate to provide at least ten minutes to heat the oil shale from a temperature of 600° F. to a temperature of about 700° to about 950° F. in the presence of hydrogen-rich gas which inhibits the formation of carbonaceous residue;

hydroretorting the preheated and prehydrogenated oil shale in a hydroretort zone at a temperature of about 850° to about 1250° F. in the presence of hydrogen-rich gas containing stoichiometric required amounts and greater of hydrogen to form predominately distillable aliphatic and alicyclic hydrocarbon liquids from the preheated and prehydrogenated organic portion of said oil shale, said hydrogen-rich gas passing sequentially through said hydroretort and preheat and prehydrogenation zones in a single stream countercurrent to said shale and maintaining the hydrogen partial pressure in the preheat and prehydrogenation zone and in the hydroretort zone at a pressure of more than 35 psia;

removing the hydrogen-rich gas and distillable aliphatic and alicyclic liquids from the preheat and prehydrogenation zone and

separating the aliphatic and alicyclic product liquids from the hydrogen-rich gas.

4,003,822

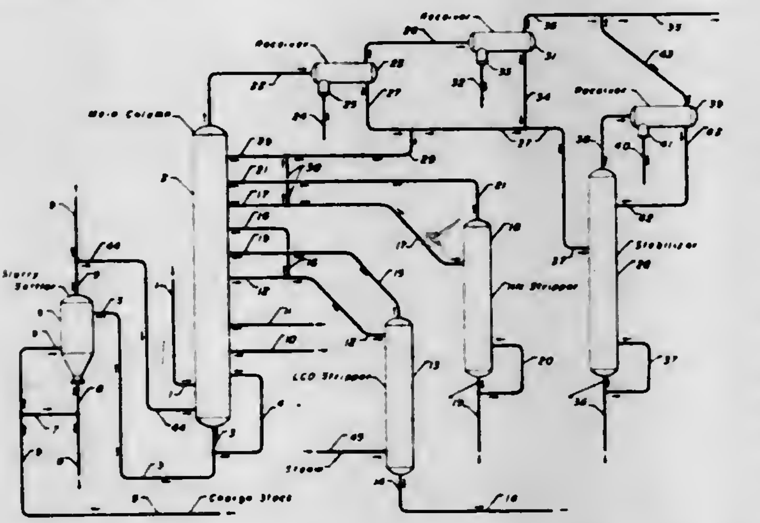
MAIN COLUMN SEPARATION OF FCC PRODUCT EFFLUENT

Hong-Kyu Jo, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1976, Ser. No. 652,276

Int. Cl.^{2} C10G *37/00*

U.S. Cl. 208—102 **7 Claims**



1. In a fluid catalytic cracking process, wherein a hydrocarbonaceous charge stock is converted into lower-boiling hydrocarbons in contact with finely-divided catalyst particles, the method of separating catalyst-containing, catalytically-cracked product effluent which comprises the steps of:

a. introducing said product effluent into a first fractionation column through a first locus in the bottom portion thereof;
b. withdrawing a light naphtha fraction from a second locus in the upper portion of said column, condensing and separating said light naphtha fraction to provide (i) a first vaporous phase and, (ii) a liquid phase;
c. recycling a first portion of said liquid phase, as a reflux stream, to said first column through a third locus below said second locus, and introducing a second portion into a second fractionation column;
d. separating said second portion to provide (i) a second vaporous phase and, (ii) a light naphtha product stream;
e. withdrawing a heavy naphtha fraction from said first column, through a fourth locus below said third locus, and introducing at least a portion thereof into a third fractionation column;
f. separating the portion of said heavy naphtha fraction to provide (i) a heavy naphtha bottoms product stream substantially free from light naphtha and, (ii) a light naphtha containing overhead stream;
g. introducing at least a portion of said overhead stream into said first column through a fifth locus intermediate said third and fourth loci; and,
h. withdrawing a catalyst-containing slurry oil fraction from said first column through a sixth locus below said first locus.

4,003,823

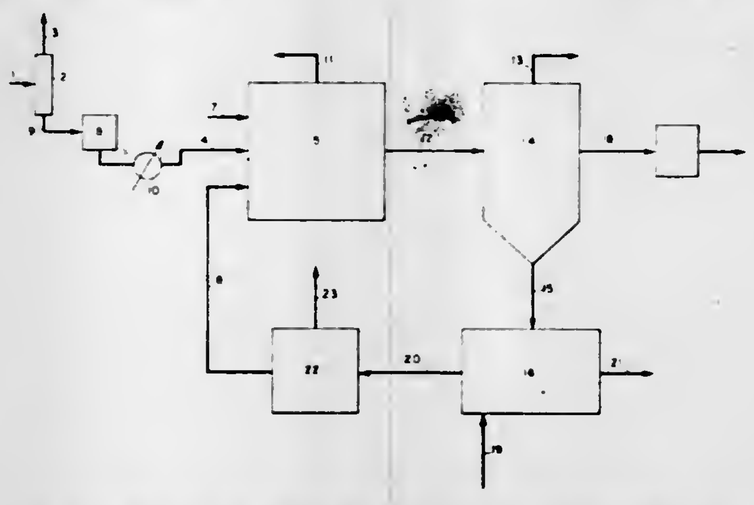
COMBINED DESULFURIZATION AND HYDROCONVERSION WITH ALKALI METAL HYDROXIDES

William C. Baird, Jr., and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,912

Int. Cl.^{2} C10G *13/06*; B01J *27/04*

U.S. Cl. 208—108 **21 Claims**



1. A process for the simultaneous desulfurization and hydroconversion of a sulfur-containing hydrocarbon feedstock containing at least 10 wt.% of materials boiling above about 1,050° F, which comprises contacting said hydrocarbon feedstock, substantially in a liquid state, with an alkali metal hydroxide in a conversion zone, in the presence of added hydrogen, said conversion zone being maintained at elevated temperatures ranging between 500°–1,500° F, whereby the sulfur and metals content of said hydrocarbon feedstock is reduced and wherein at least a portion of the 1,050° F+ fraction of said feedstock is converted to lower boiling products.

4,003,824

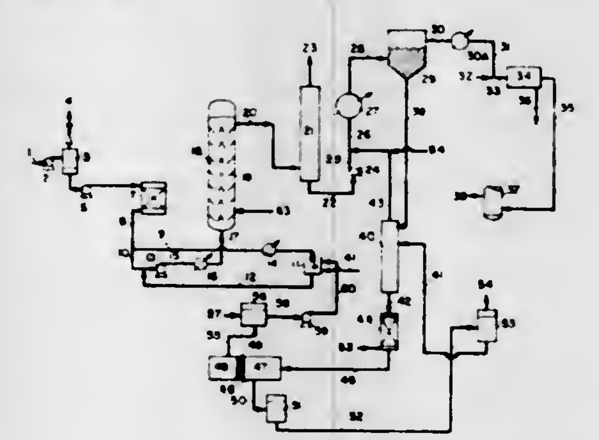
DESULFURIZATION AND HYDROCONVERSION OF RESIDUA WITH SODIUM HYDRIDE AND HYDROGEN

William C. Baird, Jr., and Roby Beardon, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,913

Int. Cl.^{2} C01G *13/06*; B01J *27/04*

U.S. Cl. 208—108 **17 Claims**



1. A process for the desulfurization and hydroconversion of a sulfur-containing heavy petroleum oil feedstock containing at least 10 wt.% of components boiling above 1,050° F, which comprises contacting said sulfur-containing petroleum oil feedstock with sodium hydride at elevated temperatures in the presence of hydrogen, the hydrogen providing a hydrogen partial pressure within the range of from about 500 to about 5000 psig, said feedstock being maintained substantially in the liquid phase, to form an oil phase having a reduced sulfur content and a reduced Conradson carbon content, and a salt phase.

4,003,825

SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION, METHOD OF PRODUCING SAME AND PROCESS OF USING SAME

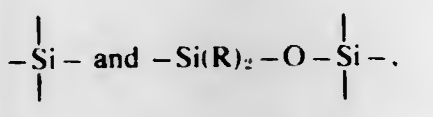
Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 450,967, March 14, 1974, Pat. No. 3,983,055. This application Dec. 8, 1975, Ser. No. 638,405

Int. Cl.^{2} C10G *13/02*; B01J *27/06*

U.S. Cl. 208—120 **27 Claims**

1. A shape-selective-cracking process wherein hydrocarbon feedstock is subjected to cracking conditions in the presence of a solid containing, at least in part, a synthetic amorphous solid having shape selective properties prepared by the steps of (1) hydrolzying, (2) polymerizing at up to 20° C in the presence of water a silane having the formula $R(Si)X_3$, wherein R is a nonhydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of



$$-\overset{|}{\underset{|}{Si}}- \text{ and } -Si(R)_2-O-\overset{|}{\underset{|}{Si}}-,$$

and (3) calcining the polymerizing product said silane being admixed with a second compound, R'_nMY_m, wherein R' is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is a least one member selected from the group consisting of Groups IIIA, IVA, IVB, VA, VB, VIB, VIIB and VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8.

4,003,826

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 422,464, Dec. 6, 1973, Pat. No. 3,915,845. This application Oct. 28, 1975, Ser. No. 626,151

Int. Cl.^{2} C10G *35/08*

U.S. Cl. 208—139 **20 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % tin or lead, about 0.1 to about 3.5 wt. % halogen, and a lanthanide series component in an amount sufficient to result in an atomic ratio of lanthanide series component to platinum group metal of about 0.1:1 to about 1.25:1, wherein the platinum group metal, tin or lead, and lanthanide series component are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin or lead is present in an oxidation state above that of the corresponding elemental metal, and wherein substantially all of the lanthanide series component is present in an oxidation state above that of the corresponding elemental metal.

4,003,827

MERCAPTAN CONVERSION PROCESS FOR A PETROLEUM DISTILLATE CHARGE STOCK

David H. J. Carlson, Park Ridge, and Peter Urban, Northbrook, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 12, 1975, Ser. No. 590,525

Int. Cl.^{2} C10G *19/00*

U.S. Cl. 208—206 **14 Claims**

1. A process for the substantially complete conversion of mercaptan compounds to disulfide compounds in a petroleum distillate which comprises treatment of said distillate at a temperature of from about 15° C. to about 300° C. and a pressure of from about 1 atmosphere to about 100 atmospheres in an oxygen containing atmosphere and a medium possessing a pH of from about 8 to 14 in the presence of a catalyst consisting essentially of 4,4',4'',4'''-cobalt phthalocyanine tetrasulfonate.

4,003,828

CATALYST AND PROCESS FOR REMOVING SULFUR AND METAL CONTAMINANTS FROM HYDROCARBON FEEDSTOCKS

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 23, 1975, Ser. No. 598,285

Int. Cl.^{2} C10G *29/04*, *23/02*

U.S. Cl. 208—251 H **10 Claims**

1. A process for removing metal and sulfur contaminants from a feed stock which comprises (a) contacting a metal and sulfur contaminated feedstock in a conversion zone at 500–900° F in the presence of hydrogen with a catalyst comprising a hydrogenating component and a support component comprised of alumina having 1 to 6 wt.% phosphorus oxide expressed as P_2O_5 incorporated therein based on the weight of the alumina and incorporated phosphorus oxide and (b) recovering from said conversion zone a feedstock having a reduced metal and sulfur content.

4,003,829

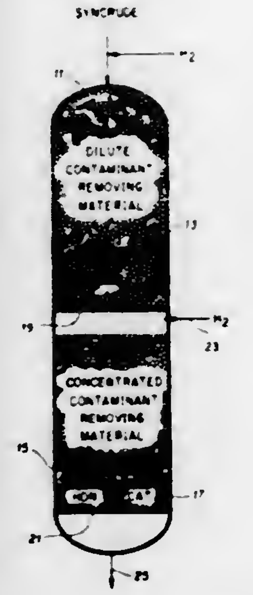
METHOD OF REMOVING CONTAMINANT FROM A HYDROCARBONACEOUS FLUID

Edward D. Burger; Daniel J. Curtin, both of Plano, Tex., and Robert R. Edison, Olympia Fields, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 548,516, Feb. 10, 1975, abandoned. This application June 2, 1975, Ser. No. 582,660

Int. Cl.^{2} C10G *29/04*

U.S. Cl. 208—253 **6 Claims**


SYNCRUDE
H2
11
DILUTE CONTAMINANT REMOVING MATERIAL
13
19
H2
23
CONCENTRATED CONTAMINANT REMOVING MATERIAL
15
17
21
25

1. A method of removing a contaminant comprising at least one of arsenic and selenium from a synthetic hydrocarbonaceous fluid containing same comprising

a. preparing a guard bed having a plurality of sections; at least one section which is to be contacted by said fluid and contaminant first having from about 10 to about 75 percent by volume occupied by a contaminant-removing material composed of a carrier material carrying active material, the remainder being essentially an inert material different from said contaminant-removing material; said contaminant-removing material being particulate and consisting essentially of a material selected from the group consisting of iron, cobalt, nickel, at least one oxide thereof, at least one sulfide thereof, and combinations of two or more thereof; said inert material being stable at temperatures in excess of 850° F and inoperable to remove said contaminant from said fluid; said guard bed having a least one additional section having its volume substantially completely occupied by said contaminant-removing material for additional removal of contaminant from said hydrocarbonaceous fluid;

b. flowing said hydrocarbonaceous fluid through said first section of said guard bed under a reducing atmosphere, in the substantial absence of water, and an elevated temperature of from about 300° to about 550° F to effect a reduction in the concentration of said contaminant in said hydrocarbonaceous fluid and deposition of said contaminant in said first section of said guard bed; and, thereafter,

c. flowing the hydrocarbonaceous fluid reduced in said contaminant into contact with said at least one additional section of said guard bed under essentially the same conditions as step b. above except that the temperature in said at least one additional section is higher than the temperature in said first section and from about 550° to about 850° F to effect a further reduction of the concentration of said contaminant.

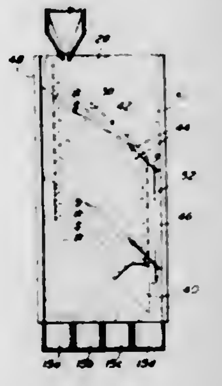
4,003,830
NON-FERROMAGNETIC MATERIALS SEPARATOR

Ernst F. R. A. Schloemann, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 509,203, Sept. 25, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,576

Int. Cl.² B03B *1/00*

U.S. Cl. 209—3 **28 Claims**



20. Materials separating apparatus for sorting commingled waste materials including ferromagnetic materials and nonferromagnetic electrically conductive materials, the apparatus comprising:

shredding means operatively disposed for receiving commingled waste materials and producing corresponding items of shredded waste materials;

guide means operatively disposed with respect to the shredding means for receiving the items of shredded waste materials and directing them into a stream;

magnetic attracting means operatively coupled to the stream for removing ferromagnetic items therefrom and converting it to a stream of nonferromagnetic items;

conducting means operatively disposed with respect to the magnetic attracting means for directing the stream of nonferromagnetic items along downwardly predetermined path; and

steady-state magnetic means operatively coupled to the path for establishing transversely at an oblique angle thereto at least one spatially alternating series of oppositely directed static magnetic fields in substantially parallel relationship with one another and inducing eddy currents in nonferromagnetic items of electrically conductive material, the eddy currents and associated magnetic fields producing force components means for moving the items of electrically conductive material laterally out of the stream in a uniform direction.

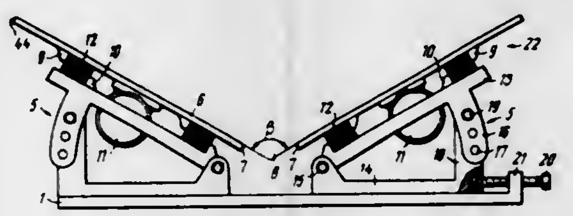
4,003,831
VIBRATION SCREEN

Anatoly Yakovlevich Tishkov, ulitsa Derzhavina, 19, kv. 67; Sergei Alexandrovich Fedorov, ulitsa 20 Partsiezda, 12, kv. 21; Anatoly Markovich Freidin, ulitsa Ippodromskaya, 31, kv. 9, all of Novosibirsk; Mikhail Zakharovich Latyshev, ulitsa Arsenieva, 98, kv. 20, Primorsky krai, Kavalerovsky raion, poselok Kavalerovo; Vitaly Markovich Grigoriev, ulitsa Tankovaya, 49, kv. 7, Novosibirsk; Jury Alexeevich Menshikov, ulitsa Arsenieva, 128, kv. 60, Primorsky krai, Kavalerovsky raion, poselok Kavalerovo; Andrei Andreevich Bovin, ulitsa 20 Partsiezda, 12, kv. 24, Novosibirsk; Vladimir Isaakovich Kreimer, ulitsa Voskhod, 7, kv. 73, Novosibirsk; Viktor Ananievich Chekushkin, ulitsa Zorge, 255, kv. 28, Novosibirsk; Vladimir Petrovich Lumpov, ulitsa Gorskaya, 41, Novosibirsk, and Dmitry Semenovich Alexeev, ulitsa Novogodnaya, 38, kv. 51, Novosibirsk, all of U.S.S.R.

Filed Sept. 20, 1974, Ser. No. 507,981

Int. Cl.² B07B *1/28*

U.S. Cl. 209—315 **17 Claims**



1. In a classifier for classifying solid bodies according to size, a pair of oppositely inclined plates having upper rear receiving ends and lower front discharge ends and defining between themselves a trough along which material to be classified is adapted to flow from said upper rear receiving ends toward said lower front discharge ends of said plates, said plates having distant from each other outer side edges and adjacent each other inner side edges which are lower than said outer side edges and which define between themselves a gap through which bodies smaller than the width of said gap are adapted to fall while bodies too large to fall through said gap are discharged at the front discharge ends of said plates, a pair of conveyer means one of which is situated beneath said gap and the other of which is situated beneath said front discharge ends of said plates for respectively receiving the classified material and conveying the classified material respectively away from said gap and said front discharge ends of said plates, a pair of self contained vibrating means respectively connected operatively with said plates for vibrating the latter, support means for supporting said plates, and shock-absorbing means interposed between and engaging said support means and said plates, said support means supporting said plates only through said shock-absorbing means while said pair of vibrating means are respectively connected operatively with said plates but not to said support means so that said shock-absorbing means insulates said support means from said plates and so that the vibrations of one of said plates is not transmitted to the other of said plates.

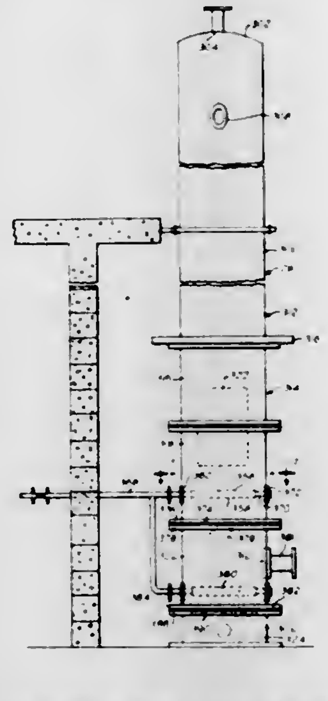
4,003,832
METHOD OF APPLYING OZONE AND SONIC ENERGY TO STERILIZE AND OXIDIZE WASTE WATER

Angus D. Henderson, Bayside, and John M. Periale, Central Islip, both of N.Y., assignors to TII Corporation, Lindenhurst, N.Y.

Continuation of Ser. No. 431,012, Jan. 7, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,874

Int. Cl.² C02B *3/08;* C02C *5/06*

U.S. Cl. 210—19 **6 Claims**



1. A method of treating waste water having entrained solids and dissolved contaminants therein, comprising the steps of:

adding a coagulating agent to said waste water;

adding a polyelectrolyte to said waste water to form a floc;

then passing said waste water through a lamina to remove a substantial portion of any solids suspended therein;

passing said waste water in a counter-flow through a large gravity gradient stand of water; and

subjecting said waste water to the pre-treatment of ozone and sonic energy to cause cavitation therein, said waste water being subject to said cavitation at increasing energy levels while it encounters increasing concentrations of said ozone;

forcing said waste water through a restriction into a hydraulic gradient of water and subjecting said waste water to highly confined and increasingly concentrated quantities of ozone in the presence of high ultransonic energy at increasing energy levels to effect cavitation within said waste water for effective sterilization and oxidation of said waste water.

4,003,833
DETOXIFICATION OF AQUEOUS WASTE STREAMS CONTAINING CYANIDE

James V. Cavender, Jr., Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed May 24, 1976, Ser. No. 689,695

Int. Cl.² C02C *5/02*

U.S. Cl. 210—59 **10 Claims**

1. The method of treating an aqueous stream containing cyanide wastes in a concentration of up to about 1000 ppm of said contaminant which comprises contacting said stream with formaldehyde and a compound which will generate HSO_3^- at a temperature from about 80° to about 135° C while maintaining the pH of the reaction mixture in the range from about 8 to about 12 for a period of time sufficient to reduce the cyanide content to less than 1 ppm using a $HCHO/CN^-$ molar ratio of at least one and an HSO_3^-/CN^- molar ratio from about 1.0 to about 1.5.

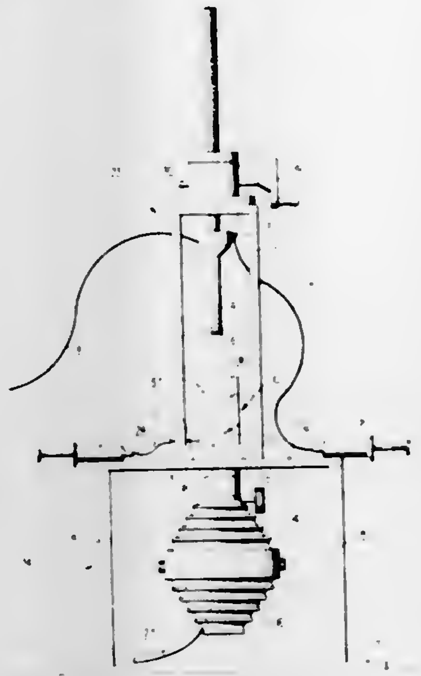
4,003,834
DENSITY GRADIENT FRACTIONATION BY PISTON DISPLACEMENT

David H. Coombs, Corvallis, Oreg., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,513

Int. Cl.² G01N *1/02*

U.S. Cl. 210—83 **14 Claims**



1. A fractionation apparatus for the fractionation of a density gradient of liquids comprising:

a gradient holder having a centrifuge tube hole for receiving a centrifuge tube containing a density gradient of liquids having individual bands;

a black, rigid displaceable piston of external diameter equal to the internal diameter of the centrifuge tube suspended above said holder, said piston having at least one opening passing therethrough and having sealing means thereabout to prevent liquid from escaping by the piston when it is displaced within the tube;

a collection means connected to said displaceable piston for collecting the density gradient through said opening;

actuator means connected to said displaceable piston for incrementally and accurately lowering said piston into and for raising said piston from the density gradient within the centrifuge tube; and

illuminating means placed under said gradient holder for illumination of the density gradient to determine the exact position of each individual band.

4,003,835
FITTINGS

Harley D. Johnson, 708-9th St. West, Bradenton, Fla. 33505

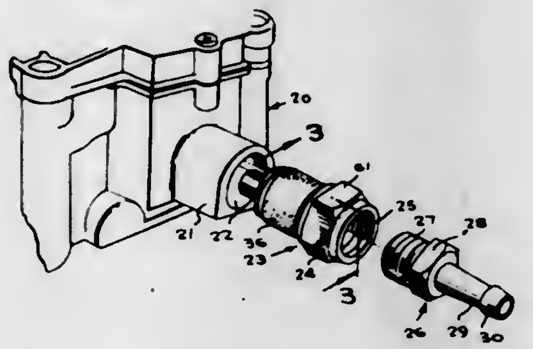
Filed Aug. 18, 1975, Ser. No. 605,450

Int. Cl.² B01D *35/02*

U.S. Cl. 210—232 **4 Claims**

1. A sealable fuel inlet fitting for connecting a fuel line to a carburetor having an open cavity with a generally cylindrical wall and a bottom wall, said fitting comprising a body having a portion for engaging said carburetor adjacent to said cavity, said body having a reduced threaded portion connected to said carburetor engaging portion by a chamfered frusto-conical surface, said reduced portion and said chamfered surface extending into said cavity, a cone nut threadedly engaging said reduced portion of said body, said cone nut having a chamfered frusto-conical surface in spaced facing relationship with said chambered surface of said body, a resilient generally tubular seal member having an outer wall with a diameter less than the diameter of the cylindrical wall of said cavity and an

inner wall with a diameter greater than said reduced portion of said body, said seal member extending between said chamfered surfaces of said body and said cone nut, and said body having a bore extending axially therethrough, whereby said cone nut is rotated to squeeze said seal member and force the opposite ends outwardly to provide a snug fit with the cylindrical wall of said cavity after which said fitting is inserted into said cavity and said body is rotated to squeeze said seal member into sealing engagement with the cylindrical wall of said cavity, said body includes a counterbore extending inwardly through said reduced portion, and fuel filter means slidably mounted in said counterbore.



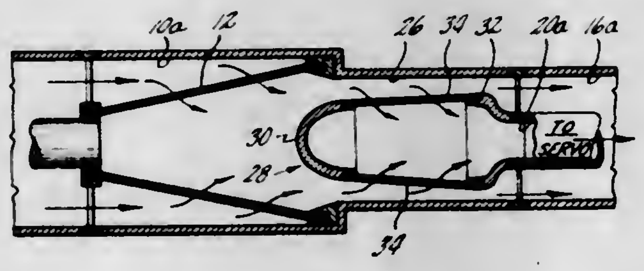
4,003,836
DEVICE FOR FILTERING A MOVING FLUID

Charles F. Stearns, East Longmeadow, Mass., and Kenneth P. Hansen, Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 518,593, Oct. 25, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,334

Int. Cl.² B01D *35/02*

U.S. Cl. 210—247 **2 Claims**



1. A device for filtering a portion of the fluid from a moving fluid stream comprising:

a. conduit means having a wall defining a passageway with a fluid inlet for axially receiving the moving fluid stream, and a first outlet axially spaced downstream in the flow from said inlet;

b. filter means in said passageway for filtering relatively coarse particles from said moving fluid stream; and

c. a tapered plug mounted within the passageway downstream of said filter means in spaced relation to said wall to form an annular passageway between said plug and said wall which is convergent in the direction of flow of said stream and communicating with said first outlet, said plug having a fluid-impervious dome-shaped nose portion adjacent said inlet, the plug cooperating with the conduit means to accelerate the flow of fluid and to direct particles entrained in the fluid generally outwardly in said annular passageway toward the wall and said first outlet, said plug having a frusto-conically shaped hollow body portion the smaller end of which is attached to said nose portion, said body portion made from a fluid filtering material pervious to the flowing fluid adapted to bleed a portion of said flowing fluid therethrough to filter relatively fine particles therefrom, said plug including a fluid impervious base attached to the larger end of said hollow body portion and having an opening leading to a second outlet, said opening adapted to receive the fluid which is bled through said pervious body portion of said plug.

4,003,837
SELF-CLEANING STRAINER

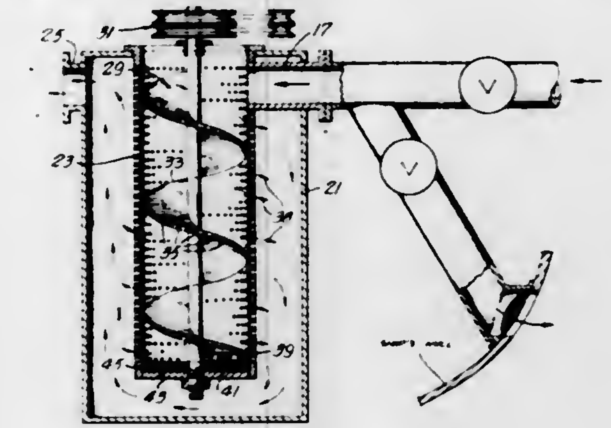
Winston G. Osborne, 3270 Goyer St., Apartment 5, Montreal, Quebec, Canada (H3S 1J1)

Filed May 28, 1974, Ser. No. 474,138

Claims priority, application United Kingdom, May 29, 1973, 25385/73

Int. Cl.² B01D *29/38*

U.S. Cl. 210—408 **7 Claims**



1. A self-cleaning strainer for reducing the size of foreign objects in a fluid used in the cooling system of a ship comprising:

a. a fluid inlet;

b. a fluid outlet;

c. a screen receiving fluid from said inlet;

d. spiral screw means on the inlet side of said screen for keeping said screen free of foreign objects;

e. said spiral screw means having a first crushing means comprising a serrated edge thereon for grinding and crushing foreign matter on the inlet side of said screen, whereby said foreign matter is reduced in size and passes through said screen;

f. a second crushing means at an axial end of said spiral screw means for crushing foreign matter that is not ground and crushed by said serrated edge on said spiral screw, and

g. a casing surrounding said screen for conveying the fluid and reduced foreign matter therefrom to said outlet.

4,003,838
WATER LOSS REDUCTION AGENTS

Jack M. Jackson, Houston, and Arlynn H. Hartfiel, Alvin, both of Tex., assignors to Chemical Additives Company, Houston, Tex.

Continuation of Ser. No. 355,166, April 27, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,203

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **6 Claims**

1. An aqueous clay-free, non-thixotropic wellbore fluid having improved fluid loss control at high temperatures for use in subterranean formations in the earth consisting essentially of water, at least 1% of a brine forming soluble salt or mixture of salts of potassium, sodium or calcium and hydroxypropyl ether starch in an amount sufficient to provide water loss control.

4,003,839
NON-FOAMING LUBRICATION OIL

Jan Willem van Hesden, Baulkham Hills, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 9, 1974, Ser. No. 468,603

Claims priority, application Australia, May 31, 1973, 3505/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C10M *1/10*

U.S. Cl. 252—25 **4 Claims**

1. A lubrication oil composition having improved resistance to foaming in use comprising a lubrication oil and a foam-preventing amount of an annydrous alkali metal or alkaline earth metal compound selected from the group consisting of oxides, sulfates and halides.

4,003,840
MICROWAVE ABSORBER

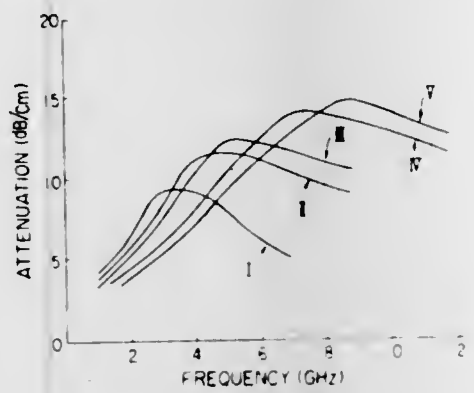
Ken Ishino, Nagareyama; Takashi Watanabe, Tokyo, and Yasuo Hashimoto, Ichikawa, all of Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed May 12, 1975, Ser. No. 576,697

Claims priority, application Japan, June 5, 1974, 49-63786

Int. Cl.² B65D *43/00*; **C04D** *21/00*

U.S. Cl. 252—62 **8 Claims**



1. A microwave absorber consisting essentially of a mixture of from 0.2 to 0.9 part by volume of a ferrite powder and from 0.8 to 0.1 part by volume of an organic high molecular compound, said ferrite powder being a powder having a particle size of less than 1.65 mm of a ferrite having the general formula MFe_2O_4 in which M is selected from the group consisting of manganese, nickel, copper, zinc, magnesium and cobalt and having an initial permeability of more than 300 at 10 kHz, said organic high molecular compound being a thermosetting resin selected from the group consisting of phenol resin, polyester resin, epoxy resin and silicone resin; or a thermoplastic resin selected from the group consisting of polyvinyl chloride, polyethylene and polypropylene; or a natural and synthetic rubber selected from the group consisting of polychloroprene, acrylonitrile-butadiene-styrene and fluorine-contained rubber, said ferrite powder in a certain particle size range being used for absorbing the microwave in a certain frequency range as shown below:

Particle size of ferrite powder			Frequency of microwave
1.65 mm	–	701 μ	500 MHz – 1.5 GHz
701 μ	–	351 μ	1.0 GHz – 2.0 GHz
351 μ	–	104 μ	1.8 GHz – 3.0 GHz
104 μ	–	43 μ	2.5 GHz – 7.5 GHz
<43 μ			6.0 GHz – 12.0 GHz.

5. A microwave absorber consisting essentially of a mixture of from 0.2 to 0.9 part by volume of a ferrite powder and from 0.8 to 0.1 part by volume of an organic high molecular compound, said ferrite powder being a powder having a particle size of less than 1.65 mm of a ferrite having the general formula MFe_2O_4 in which M is selected from the group consisting of manganese, nickel, copper, zinc, magnesium and cobalt and having an initial permeability of less than 300 at 10 kHz, said organic high molecular compound being a thermosetting resin selected from the group consisting of phenol resin, polyester resin, epoxy resin and silicone resin; or a thermoplastic resin selected from the group consisting of polyvinyl chloride, polyethylene and polypropylene; or a natural and synthetic rubber selected from the group consisting of polychloroprene, acrylonitrile-butadiene-styrene and fluorine-contained rubber, said ferrite powder in a certain particle size range being used for absorbing the microwave in a certain frequency range as shown below:

Particle size of ferrite powder			Frequency of microwave
1.65 mm	–	701 μ.	1.0 GHz – 3.0 GHz
701 μ	–	351 μ	2.0 GHz – 4.5 GHz
351 μ	–	104 μ	4.0 GHz – 6.0 GHz
104 μ	–	43 μ	5.0 GHz – 7.5 GHz
<43 μ			6.0 GHz – 12.0 GHz.

4,003,841
COATED STABILIZED BLEACH ACTIVATORS, PROCESS AND WASHING COMPOSITIONS

Klaus Hachmann, Hilden; Rolf Puchta, Haan, and Gerhard Sperling, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Aug. 6, 1975, Ser. No. 602,138

Claims priority, application Austria, Aug. 14, 1974, 6646/74

Int. Cl.² C11D *3/395, 7/18*

U.S. Cl. 252—94 **14 Claims**

1. A coated stabilized bleaching assistant suitable for use in pulverulent washing and bleaching compositions comprising drop-shaped to globular-shaped particles having an average diameter of 0.01 mm to 2.5 mm, and at least 70% of which have a diameter within the range of 0.1 to 1 mm consisting essentially of 10 to 70% by weight of at least one activator for active oxygen derived from compounds yielding H_2O_2 in aqueous solutions having an activating action of at least 3 in the Per-Acid Formation Test selected from the group consisting of (1) N-acyl compounds having 2 to 9 carbon atoms in the acyl, (2) O-acyl compounds having 2 to 9 carbon atoms in the acyl, wherein acyl is an organic group of the formula

$$R-CO-$$

wherein R designates the hydrocarbon radical with from 1 to 8 carbon atoms, optionally substituted with alkoxy having 1 to 3 carbon atoms, halo, nitro or cyano, (3) carbonic acid esters of the formula

$$X-O-CO-O-R$$

wherein X is an electron-attracting residue selected from the group consisting of p-carboxyphenyl, p-sulfophenyl and alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy and R has the above-assigned values, and (4) pyrocarbonic acid esters of C_1 to C_4 alkanols, substantially surrounded by from 30 to 90% by weight of a mixture of (a) from 2 to 10 parts by weight of said mixture of acids having substantially from 12 to 24 carbon atoms selected from the group consisting of substantially saturated fatty acids, saturated hydroxy fatty acids, and mixtures thereof, (b) 1 part of weight of said mixture of alcohols selected from the group consisting of substantially saturated hydrocarbon monohydric alcohols having from 10 to 20 carbon atoms, their ethoxylated products, their propoxylated products and mixtures thereof, where the alkoxylated products are water-insoluble and have from 1 to 5 alkoxy units, and

(c) from 5 to 25% by weight of said mixture of water-soluble sulfates of alcohols selected from the group consisting of substantially saturated hydrocarbon monohydric alcohols having from 8 to 18 carbon atoms, their ethoxylated products, their propoxylated products and mixtures thereof, where the alkoxylated products have from 1 to 5 alkoxy units.

4,003,842
CORROSION AND SCALE INHIBITORS FOR INDUSTRIAL RECIRCULATING COOLING WATER SYSTEMS

Tzeng Jiueq Suen, New Canaan, and Arthur James Begala, Jr., Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 14, 1975, Ser. No. 595,651

Int. Cl.² C02B *5/00*

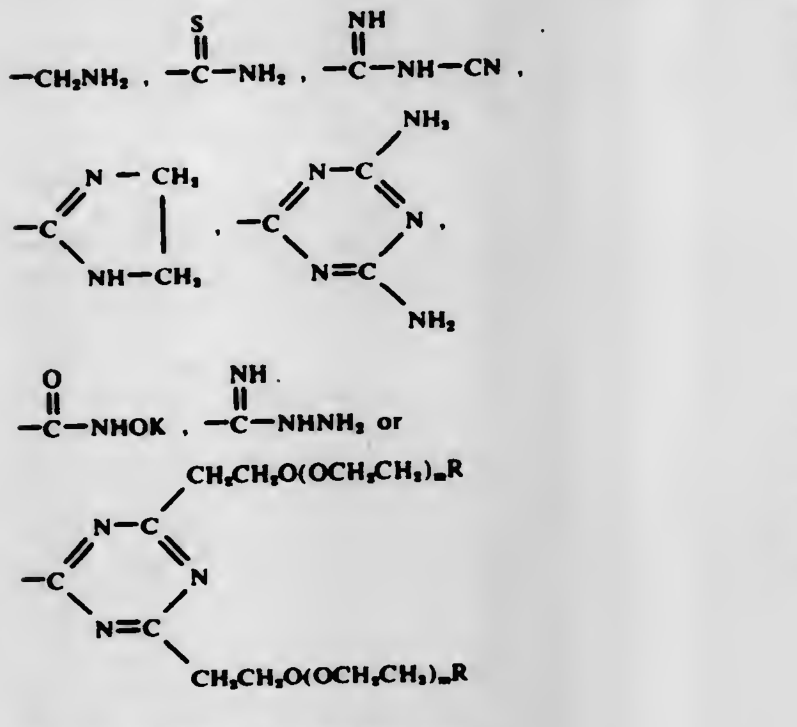
U.S. Cl. 252—175 **5 Claims**

1. A process for inhibiting corrosion and scaling on metal surfaces in water systems comprising: adding to water in said systems an effective amount of additive selected from compounds having the formula:

$R(OCH_2CH_2)_mOCH_2CH_2\ Z$

wherein:

R is a hydrocarbon radical having 8 – 22 carbon atoms;
m is a value from 1 to 6; and
Z is — COOM, where *M* is H or an alkali metal,



$-CH_2NH_2$, $-C(=S)-NH_2$, $-C(=NH)-NH-CN$, $-C(=O)-NHOK$, $-C(=NH)-NHNH_2$ or

where *m* and *R* are as defined above.

4,003,843
VULCANIZATION SYSTEMS FOR RUBBER MIXTURES WITH LIGHT FILLERS

Theo Kempermann, Cologne, and Gunter Marwede, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 17, 1975, Ser. No. 587,415

Claims priority, application Germany, June 21, 1974, 2429818

Int. Cl.² C08K *9/06, 5/54, 5/47, 5/40*

U.S. Cl. 252—182 **4 Claims**

1. An accelerator mixture for the sulphur vulcanisation of rubbers comprising:

a. 0.1 to 4.0 parts by weight of a silane corresponding to the formula $(R_1O)_3SiR_2$ or $(R_1O)_3SiR_3Si(OR_1)_3$, in which R_1 represents a hydrocarbon radical, R_2 represents a monovalent sulphur-containing hydrocarbon radical and R_3 represents a divalent sulphur-containing hydrocarbon radical;

b. 1.0 to 4.0 parts by weight of a thiazole accelerator;

c. 1.0 to 4.0 parts by weight of a guanidine accelerator; and

d. 0.1 to 1.0 part by weight of a thiuram accelerator.

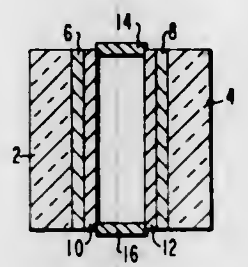
4,003,844
LIQUID CRYSTAL DEVICES

Howard Sorkin, Berkeley Heights, N.J., assignor to RCA Corporation, New York, N.Y.

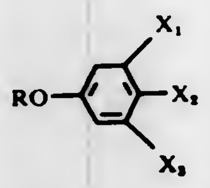
Filed Nov. 17, 1975, Ser. No. 632,815

Int. Cl.² C09K *3/34*; **G02F** *1/13*

U.S. Cl. 252—299 **16 Claims**



1. In an electro-optic device comprising a twisted nematic liquid crystal composition between two electrodes, the improvement which comprises dissolving in said liquid crystal composition a nitrobenzene compound having the formula



wherein R is an alkyl radical of 1–20 carbon atoms X_1 and X_3 independently can be hydrogen or nitro, X_2 can be hydrogen, nitro, or $-O-CH_2CN$ with the proviso that at least one of X_1, X_2 or X_3 is a radical other than hydrogen, in an amount effective to lower the threshold voltage of said device.

4,003,845
LUMINESCENT MATERIAL

Petrus Franciscus Josef van den Boom, and Albert Leendert Nicolaas Stevels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,441

Claims priority, application Netherlands, Apr. 16, 1975, 7504502

Int. Cl.² C09K *11/46*; **H01J** *1/63*

U.S. Cl. 252—301.4 R **4 Claims**

1. A luminescent material consisting essentially of a luminescent cerium- and manganese-activated aluminate having a composition defined by the formula $La_{1-x-p}Ba_xCe_pAl_{y-q}Mn_qO_{1.5y+1.5-0.5x-0.5q}$

where

$10 \leq y \leq 13$
$0.10 \leq x \leq 0.75$
$0.05 \leq p \leq 0.75$
$(x+p \leq 0.90$
$0.10 \leq q \leq 0.50.$

4,003,846
PROCESS FOR THE ENCAPSULATING OF SUBSTANCES IMMISCIBLE WITH WATER

Martin Kuhn, Birsfelden, and Melvin Harris, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,634

Claims priority, application Switzerland, Nov. 16, 1973, 16174/73

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **5 Claims**

1. A process for the encapsulating of substances immiscible with water, wherein the substance to be encapsulated is dispersed in a distribution medium in the presence of an aqueous solution of a polyacrolein or acrolein copolymer present as hydrate or bisulphite adduct, which aqueous solution is capable of forming a compound insoluble in the distribution medium; and the hydrate or the bisulphite adduct is reacted in the resulting dispersion with an alkyleneamine having 2 to 5 amino groups, which are separated by straight-chair or branched-chain alkylene groups having 2 to 6 carbon atoms to form an insoluble capsule material.

4,003,847
SOLVENT SOLUTIONS OF SILOXANE FLUIDS

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 475,967, June 3, 1974, Pat. No. 3,905,924, which is a continuation-in-part of Ser. No. 325,327, Jan. 22, 1973, abandoned. This application June 19, 1975, Ser. No. 588,345

Int. Cl.² C09K *3/00*

U.S. Cl. 252—350 **6 Claims**

1. A composition suitable for use in the production of high resilience polyether urethane foam consisting essentially of an organic solvent solution of a cyanoalkyl modified siloxane fluid having the average formula

$(X)_zR_{3-z}SiO(R_2SiO)_x[(X)(R)\ SiO]_ySiR_{3-z}X_z$

wherein *x* has a value of 1 of 6 inclusive; *y* has a value of 0 to 6 inclusieve; z has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is a cyanoalkyl radical of the formula $-(O)_nR'CN$ where n has a value of 0 to 1 and R′ is an alkylene radical having from 2 to 4 carbon atoms; said siloxane fluid containing at least one of said cyanoalkyl radicals and having an average molecular weight in the range of about 400 to about 1500, said solution containing at least 5 parts by weight of said siloxane fluid per 95 parts by weight of said solvent, and wherein the organic solvent is an organic polyether selected from the group consisting of mono-ol, diol and triol hydroxy compounds.

4,003,848
METHOD FOR THE ADSORPTION OF SULFUR DIOXIDE

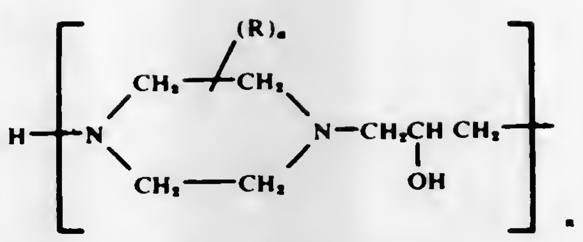
Robert James Cotter, Bernardsville; Michael John Keogh, Somerville, and William Donald Heitz, Flagtown, all of N.J., assignors to Union Carbide Corporation, New York, N.Y. Continuation-in-part of Ser. No. 531,398, Dec. 10, 1974, abandoned, which is a division of Ser. No. 489,126, July 17, 1974, Pat. No. 3,876,395, which is a continuation-in-part of Ser. No. 448,999, March 7, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,256

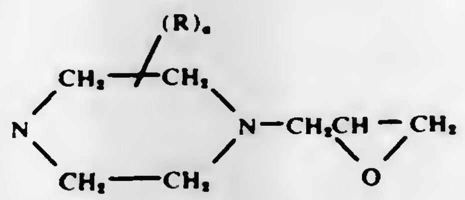
Int. Cl.² B01J *31/02, 31/02*; **B01D** *39/00, 53/02*

U.S. Cl. 252—427 **30 Claims**

1. Method of fabricating an article which adsorbs SO_2 from gas mixtures which comprises

1. depositing on a support, having a high surface area, an oligomer having the structure:





wherein each R is a lower alkyl group having up to about 8 carbon atoms, *a* is an integer having values of 0 to 4 and *n* is an integer having values of about 2 to about 20; and

2. heating the resultant combinatin of (1) above room temperature until the oligomer is converted to a water-insoluble, crosslinked polymer.

4,003,849
LEAD/CHLORIDE/ALUMINA ISOMERIZATION CATALYST FOR GASOLINE

William T. Nelson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 526,940, Nov. 25, 1974, Pat. No. 3,929,623. This application June 9, 1975, Ser. No. 585,162

Int. Cl.² B01J *27/06*; **C10G** *35/06*

U.S. Cl. 252—442 **5 Claims**

1. A platinum-free catalyst consisting essentially of
1. an alumina base;
2. chlorine in an amount within the range of 0.1 to 5 weight percent calculated as hydrogen chloride based on the weight of said catalyst; and
3. 0.01 to 5 weight percent lead calculated as PbO based on the weight of said catalyst.

4,003,850
NOVEL IRON OXIDE CATALYSTS

Robert H. Callighan, Verona, and John O. Hawthorne, Penn Hills Township, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 186,557, Oct. 4, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,979

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 R **6 Claims**

1. A process for preparing an iron oxide catalyst comprising:

a. adding iron carbonyl to an inert carrier gas,

b. flowing the carbonyl containing carrier gas over a suitable support to deposit the carbonyl onto the support at a rate such that the temperature remains in the range of about 0° – 100°C for a period of time sufficient to saturate the support, and

c. flowing an oxidizing gas over the support while maintaining the temperature below 100°C to oxidize the adsorbed carbonyl to iron oxide.

4,003,851

STABLE ALUMINA CATALYST SUPPORT, PROCESS THEREFOR, AND PROMOTED SUPPORT

Robert Henry Ebel, Riverside, Conn., and Louis Leonard Lento, Jr., Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 411,531, Oct. 31, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,551

Int. Cl.^{2} B01J *21/04, 23/42, 23/44, 23/86*

U.S. Cl. 252—465 **14 Claims**

1. A stable catalyst support consisting essentially of precipitated alumina having a residual geometric volume shrinkage of less than about 5% upon exposure to a temperature of 1800° F. for 24 hours and a surface area in the range of about 75 to 120 square meters per gram.

4,003,852

NONACIDIC MULTIMETALLIC DEHYDROGENATION CATALYST

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 458,607, April 8, 1974, Pat. No. 3,936,395, which is a division of Ser. No. 365,877, June 1, 1973, Pat. No. 3,856,870, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Jan. 8, 1976, Ser. No. 647,461

Int. Cl.^{2} B01J *21/04, 23/58*

U.S. Cl. 252—466 PT **8 Claims**

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to 2 wt. % iridium, about 0.01 to about 5 wt. % tin or lead, and about 0.1 to about 5 wt. % of an alkali or alkaline earth metal; wherein the platinum or palladium, iridium, tin or lead, and alkali or alkaline earth metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and iridium are present in the corresponding elemental metallic state; wherein substantially all of the tin or lead is present in an oxidation state above that of the elemental metal; and wherein substantially all of the alkali or alkaline earth metal is present in an oxidation state above that of the elemental metal.

4,003,853

METHOD OF ACTIVATING A SUPPORTED OLEFIN CONVERSION CATALYST

Martin Cherubim, Rheinkamp-Eick; Elmar Wilms, Kamp-Lintfort, and Hans Arendsen, Homberg, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 529,182, Dec. 3, 1974, Pat. No. 3,961,490. This application Oct. 31, 1975, Ser. No. 627,644

Claims priority, application Germany, Dec. 7, 1973, 2360981

Int. Cl.^{2} B01J *23/24, 23/32, 23/78, 23/04*

U.S. Cl. 252—467 **9 Claims**

1. A method of activating a supported catalyst comprising a member selected from the group consisting of oxides of metals of Group VB, Group VIB, Group VIIB and the iron group and used for the conversion of olefins characterized by calcining the supported catalyst at a temperature of from 300° to 800° C. impregnating said calcined catalyst with an alcoholic solution of a member selected from the group consisting of alkali metal salts, alkali metal bases and alkali metal alcoholates, and subsequently repeating the calcination of said catalyst at temperatures of from 400° to 700° C. for from 0.5 to 8 hours.

4,003,854

CATALYST OF SUPPORTED VANADIUM OXIDE AND MANGANESE OXIDE AND METHOD OF PRODUCING SAME

Gennady Alexeevich Skvortsov, ulitsa Kima, 32, kv. 50; Nellya Nikitichna Nizeeva, ulitsa Lermontova, 17, kv. 4; Avrum Iosifovich Podzharsky, ulitsa Juzhnaya, 12, kv. 10, and Irma Viktorovna Dobrovolskaya, ulitsa Prokhodnoi tupik, 3, kv. 2a, all of Dneprodzerzhinsk Dnepropetrovskoi oblasti, U.S.S.R.

Filed June 3, 1974, Ser. No. 476,044

Int. Cl.^{2} B01J *23/22, 23/34*

U.S. Cl. 252—471 **4 Claims**

1. A catalyst for selective removal of nitrogen oxides from waste gases, said catalyst consisting essentially of a mixture oxides of vanadium and of manganese applied to an inert carrier, said oxides being taken in the weight ratio V_2O_5/Mn_2O_3 of 0.1 – 30:1, the total content of the metal oxides being 5 – 40 percent of the total weight of the catalyst.

4,003,855

NONLINEAR RESISTOR MATERIAL AND METHOD OF MANUFACTURE

Joe Wong, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 23, 1975, Ser. No. 589,430

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 252—519 **8 Claims**

1. A method of controlling the breakdown voltage of a polycrystalline zinc oxide varistor of the type comprising a sintered mixture of zinc oxide, bismuth oxide, and materials selected from the group consisting of transition metal oxides and post-transition metal oxides comprising the step of

sintering said mixture at a temperature between approximately 1100° C and approximately 1415° C for a period of time between 1 hour and approximately 48 hours, said period of time being chosen as an inverse function of a desired breakdown voltage characteristic of said varistor whereby the zinc oxide grain size in said varistor is caused to vary in approximate proportion to the one-sixth power of said period of time.

4,003,856

OIL-SOLUBLE COMPOSITION FOR REMOVING IRON SULFIDE AND SLUDGE FROM METAL SURFACES

Thomas L. Sharp, 715 Nenana St., Houston, Tex. 77035

Filed Sept. 23, 1974, Ser. No. 508,674

Int. Cl.^{2} C11D *1/40*

U.S. Cl. 252—546 **4 Claims**

1. An oil-soluble composition capable of removing iron sulfide and sludge from metal surfaces in an oil system comprising:

- a. from about 2 to about 15% by weight of a high molecular weight linear diamine derived from a higher fatty acid containing from 12 to 30 carbon atoms;
- b. from about 3 to about 20% by weight of acetic acid;
- c. from about 20 to about 50% by weight of a low molecular weight ketone ether solvent containing from 4 to 8 carbon atoms;
- d. from about 1 to about 15% by weight of an alcohol solvent selected from monohydric hydrocarbon alcohols of up to 6 carbon atoms and diacetone alcohol; and
- e. from about 20 to about 50% by weight of a heavy aromatic naphtha solvent having a specific gravity of 0.885 to 0.970 and a boiling point within the range of 160°–220° C.

4,003,857

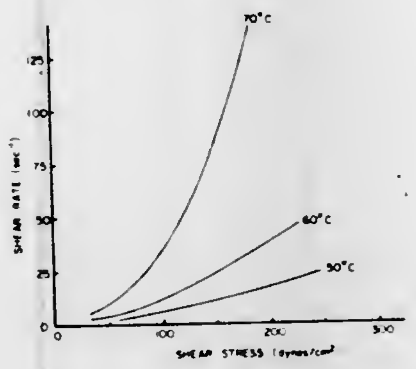
CONCENTRATED AQUEOUS OLEFINS SULFONATES CONTAINING CARBOXYLIC ACID SALT ANTI-GELLING AGENTS

Richard D. Gorsich, and William J. DeWitt, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 17, 1973, Ser. No. 425,198

Int. Cl.^{2} C11D *1/14, 1/37, 3/20, 11/04*

U.S. Cl. 252—546 **12 Claims**



1. A composition of matter consisting essentially of, on weight percent basis:

- A. from about 50 to about 70 percent of olefin sulfonate having from about 10 to about 24 carbon atoms per molecule,
- B. from about 3 to about 50 percent of salt of the formula HCOOM wherein M is alkali metal, ammonium, lower alkanol ammonium or lower alkyl ammonium, and
- C. from about 5 to about 57 percent water.

4,003,858

PROCESS FOR PRODUCING EXPANDIBLE STYRENE POLYMERS USEFUL IN THE MANUFACTURE OF SHAPED CELLULAR ARTICLES

Gianfranco Biglione; Antonio Alvares, both of Mantova, and Guido Bertazzoni, Campitello di Marcaria (Mantova), all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Dec. 20, 1974, Ser. No. 534,776

Claims priority, application Italy, Dec. 24, 1973, 54581/73

Int. Cl.^{2} C08J *9/02, 9/16, 9/22*

U.S. Cl. 260—2.5 HB **9 Claims**

1. In the process for making molded bodies of styrene polymers consisting of the following steps in the order stated: polymerization of styrene or of mixtures of styrene with other monomers copolymerizable with it; addition of an expanding agent; treatment of the expandible particles with an agglomeration inhibitor for avoiding agglomeration of the particles prior to expansion thereof; pre-expansion of the expandible particles; ageing of the pre-expanded particles; and molding of the pre-expanded and aged particles in a mold which is pressure resistant but not gas-tight, the improvement which consists in carrying out the polymerization, the treatment of the expandible particles prior to pre-expansion thereof, or both the polymerization and the treatment of the expandible particles prior to pre-expansion thereof, in the presence of 0.005 to 0.5 parts by weight of dimers or trimers of unsaturated fatty acids C_{18} or esters thereof with C_1–C_{18} alcohols per 100 parts by weight of the styrene or styrene-containing polymerizable mixture.

4,003,859

NOVEL PROCESS FOR TRIMERIZING POLYISOCYANATES

Harold E. Reymore, Jr., Wallingford, and John K. Zane, East Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

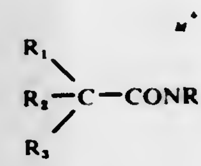
Division of Ser. No. 437,781, Jan. 30, 1974, Pat. No. 3,899,443. This application May 19, 1975, Ser. No. 578,428

Int. Cl.^{2} B01J *31/12;* **C08G** *18/18, 18/24*

U.S. Cl. 260—2.5 AC **16 Claims**

1. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is isocyanurate which process comprises bringing together in the presence of a blowing agent, a polyisocyanate, a trimerization catalyst, and from about 0.01 to about 0.3 equivalent per equivalent of said polyisocyanate of a polyol, wherein the improvement consists essentially of employing as the catalyst, a combination of the following ingredients:

- a. from 0.005 to 0.04 equivalent per equivalent of said polyisocyanate of a tertiary amine trimerization catalyst;
- b. from 0.001 to 0.03 equivalent per equivalent of said polyisocyanate of an amide salt having the formula



$$R_1R_2R_3C{-}CONR_4^{-}\ M^{+}$$

wherein M is an alkali metal, R_1, R_2, R_3 can be the same or different and are selected from the group consisting of H, lower alkyl, aryl, aralkyl, and cycloalkyl, R_4 is selected from the group consisting of lower alkyl and aryl; and

- c. from 0.0005 to 0.005 equivalent per equivalent of said polyisocyanate of a dibutyl tin di(alkanoate) wherein the alkanoate residue contains from 2 to 12 carbon atoms, inclusive.

4,003,860

NONSHRINK CELLULAR RUBBER COMPOSITION

André LeClerc, Overijse, Belgium, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 9, 1975, Ser. No. 585,163

Int. Cl.^{2} C08J *9/10*

U.S. Cl. 260—2.5 HA **9 Claims**

1. A foamable blend consisting essentially of:

- a. a monovinyl-substituted aromatic compound/diene block copolymer, said monovinyl-substituted aromatic compound having 8 to 18 carbon atoms per molecule and said diene having 4 to 12 carbon atoms per molecule, said copolymer having 40 to 80 weight percent diene;
- b. an ethylene/vinyl acetate copolymer, said copolymer having 10 to 50 weight percent vinyl acetate;
- c. a blowing agent; and
- d. a curing agent,

said component (a) being present in an amount sufficient to give 10 to 30 weight percent block styrene homopolymer in said total blend of polymers and a ratio of said component (a) to (b) being within the range of 10/90 to 90/10.

4,003,861
MELAMINE PYROPHOSPHATE AS FLAME-RETARDANT IN POLYURETHANE FOAM COMPOSITIONS

Christos Savides, and Joseph Frederick Cannelongo, both of Piscataway, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 393,374, Aug. 31, 1973, abandoned, which is a continuation of Ser. No. 261,187, June 9, 1972, abandoned. This application July 9, 1975, Ser. No. 594,470

Int. Cl.^{2} C08G *18/14, 18/48;* **C08K** *5/52, 5/34*

U.S. Cl. 260—2.5 AJ **10 Claims**

1. A flame-retarded composition comprising a foamed polyurethane resin derived solely from the coreaction of a phosphorus-free and nitrogen-free polyol and an aromatic diisocyanate and containing from about 12 to about 20 parts, by weight, of melamine pyrophosphate salt per 100 parts of polyol.

4,003,862
N-SUBSTITUTED TETRAHALOPHTHALIMIDES AS FLAME RETARDANTS

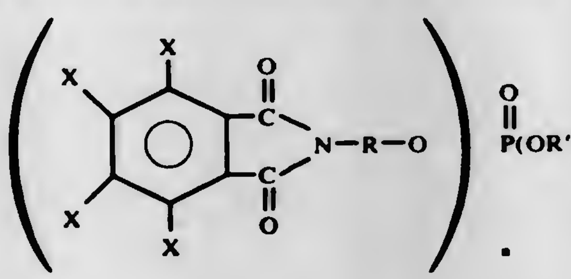
James A. Albright, Ann Arbor, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Filed Oct. 23, 1975, Ser. No. 625,052

Int. Cl.^{2} C07D *209/48;* **C08K** *5/34, 5/52*

U.S. Cl. 260—2.5 AJ **11 Claims**

1. A flame retardant compound of the formula



wherein each X is independently selected from chlorine or bromine, R is an alkylene group containing from 1 to 6 carbon atoms, each R' is independently selected from an alkyl or haloalkyl group containing from 2 to 6 carbon atoms, and wherein the haloalkyl group contains from 1 to 3 halogen atoms independently selected from the group comprising chlorine and bromine, and wherein *n* is 1 to 3.

5. A polymeric composition comprising a polymer and a flame retarding amount of the flame retardant compound of claim 1 wherein said polymer is selected from polyurethane, polystyrene and acrylonitrile/butadiene/styrene terpolymers.

4,003,863
NOVEL INTUMESCENT COMPOSITION

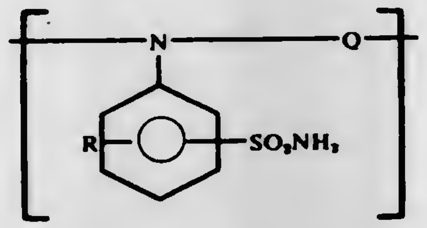
William S. Stoy, Princeton, and Shirley H. Roth, Highland Park, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed July 2, 1976, Ser. No. 702,153

Int. Cl.^{2} C08J *9/02*

U.S. Cl. 260—2.5 FP **10 Claims**

1. A composition comprising (A) about 1-9 parts by weight of a water-insoluble amine-aldehyde copolymer having a number average molecular weight of about 350–2000 and consisting essentially of repeating units corresponding to the formula:



wherein Q is the residue of an alkanal containing 1–5 carbon atoms and R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido, (B) respectively, about 9–1 parts by weight of an epoxy resin which is polyglycidyl ether of an aliphatic or aromatic polyol, and (C) about 0.5–75%, based on the combined weights of the amine-aldehyde resin and the epoxy resin, of a polyol ester selected from the group consisting of polyacrylates and polymethacrylates.

4,003,864
INTUMESCENT COMPOSITION

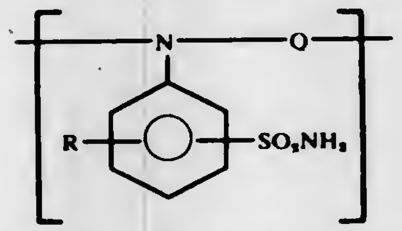
Shirley H. Roth, Highland Park, and William S. Stoy, Princeton, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed July 2, 1976, Ser. No. 702,152

Int. Cl.^{2} C08J *9/02*

U.S. Cl. 260—2.5 FP **10 Claims**

1. An intumescent composition comprising (A) a water-insoluble amine-aldehyde copolymer having a number average molecular weight of about 350–2000 and consisting essentially of repeating units corresponding to the formula:



wherein Q is the residue of an alkanal containing 1–5 carbon atoms and R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido and (B) about 0.5–75%, based on the weight of the amine-aldehyde resin, of a polyol ester selected from the group consisting of polyacrylates and polymethacrylates.

4,003,865
ENZYME INHIBITORS, USES AND COMPOSITIONS CONTAINING SAME

Milton Nowak, South Orange, and William Singer, Teaneck, both of N.J., assignors to Troy Chemical Corporation, Newark, N.J.

Filed Feb. 2, 1973, Ser. No. 328,990

Int. Cl.^{2} C08L *1/26*

U.S. Cl. 260—17 R **17 Claims**

1. An aqueous paint composition thickened to a viscosity of between 80 and 100 KU units by having incorporated therein at least one cellulosic thickening agent and stabilized against degradation of viscosity by enzyme action on said cellulosic thickening agent by having additionally incorporated therein approximately 0.05% to 2% based on the aqueous composition of at least one adduct of formaldehyde and an amine selected from the group consisting of primary amines and secondary amines, said adduct having the formula $Q—N-H—CH_2OH$ if the amine is a primary amine, and $QRN—CH_2OH$ if the amine is a secondary amine and wherein Q and R are selected from the group consisting of alkyl, alkoxy, substituted alkyl and substituted alkoxy groups and Q and R having no more than a total of ten carbon atoms.

4,003,866
CONSTRUCTION MATERIAL AND A PROCESS FOR PRODUCING THE SAME

Rene Paturle, St. Laurent-du-Pont, France, assignor to Etablissements Paturle S.A., St. Laurent-du-Pont, France

Filed Jan. 20, 1975, Ser. No. 542,254

Claims priority, application Germany, Jan. 22, 1974, 2402976; Sept. 17, 1974, 2444420

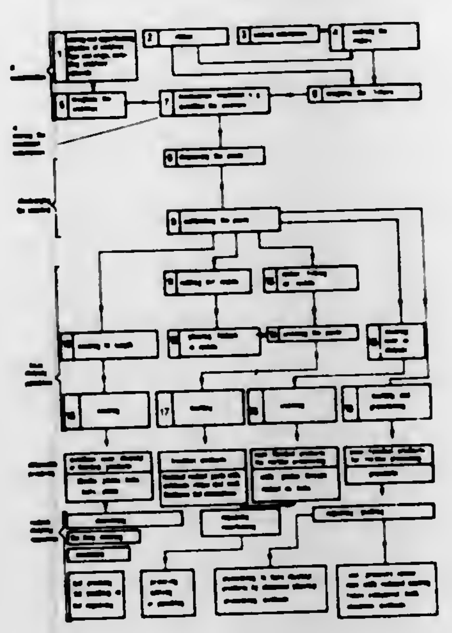
Int. Cl.^{2} C08L *1/02*

U.S. Cl. 260—17.4 R **25 Claims**

1. A construction material which comprises a mixture of:

a. a plastic component constituting at least one thermoplastic resin; and

b. a filler component consitituting at least one mineral and/or organic filler in an amount at least equal in weight to the amount of said plastic component, the individual particles of the filler being coated or encapsulated with a polyethylene or polypropylene wax having a molecular weight of from 1,000 to 10,000, a thermofluid high molecular weight polymer, or a silicate coating material.



4,003,867
GLASS MOLD COATING DISPERSION OF ALUMINUM PHOSPHATE AND RESINOUS AGENT, PIGMENT, STABILIZER AND DISPERSING AGENTS

Arthur William Cooper, and Thomas Edmund Rupp, both of Port Huron, Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed June 12, 1974, Ser. No. 478,587

Int. Cl.^{2} B28B *7/36;* **C03B** *39/00*

U.S. Cl. 260—17.5 **9 Claims**

1. A stable dispersion coating composition, suitable for use in forming a coating on surfaces which contact hot glass in the manufacture of glassware,

comprising in weight percent of total solids,

a. about 5% to about 45% of finely divided pigment from at least one of the group consisting of lubricating pigments, clay pigments, and refractory pigments,

b. about 1% to about 15% of a pigment dispersing agent to provide for proper dispersion of the pigment in the composition, said agent being selected from the group consisting of anionic surfactants of the non-foaming type,

c. about 20% to about 60% of aluminum phosphate as a binder material,

d. about 3% to about 20% of a stablizing buffering agent to maintain a stable dispersion in the presence of the aluminum phosphate, selected from at least one of the group consisting of the ammonium and the alkali metal monobasic, dibasic, or tribasic salts of phosphoric, phosphorus, boric, phthalic, tartaric, and acetic acids,

e. about 1% to about 50% of an organic water dispersible resinous film-modifying agent for providing a fine smooth coating,

f. aout ½% to about 20% of a nonionic emulsifying agent for said film modifying agent.

and total solids being between about 2% to about 50% by weight of the composition, and the balance being an aqueous solvent carrier.

4,003,868
INK OR COATING COMPOSITIONS OF LOW VOLATILITY

Oliver Wendell Smith, South Charleston; Charles Hobert Carder, Charleston, both of W. Va., and David John Trecker, Old Lyme, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 205,855, Dec. 8, 1971, Pat. No. 3,935,330. This application Apr. 25, 1975, Ser. No. 571,786

Int. Cl.^{2} C09D *3/52, 3/58, 3/81*

U.S. Cl. 260—21 **10 Claims**

1. A liquid or paste composition comprising:

I. — from 5 to 35 weight percent of a melamine/formaldehyde resin or urea/formaldehyde resin,

II.— from 40 to 90 weight percent of an acrylate or methacrylate ester of an epoxidized fatty oil, said ester having vicinal hydroxyl groups and an average of at least two acrylate or methacrylate groups per mole thereof,

III. — from 5 to 55 weight percent of a different hydroxyl-containing polyacrylate or polymethacrylate ester having an average of more than one functional acrylate or methacrylate group in the molecule,

IV. — a catalytic amount of a condensation catalyst sufficient to catalyze the condensation polymerization, and

V. — from 0 to 20 weight percent of a photoinitiator;

said liquid or paste composition having a viscosity of from W to greater than Z on the Gardner-Holdt Scale.

4,003,869
ETHYLENE-PROPYLENE COPOLYMER EMULSIONS

William E. Archibald, Marietta, Ga., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 13, 1975, Ser. No. 540,317

Int. Cl.^{2} C08L *23/08*

U.S. Cl. 260—29.6 XA **12 Claims**

1. A process for producing ethylene-propylene copolymer emulsions comprising contacting ethylene and propylene in a reaction zone in the presence of an aqueous medium containing minor amounts of a water-soluble alkali metal persulfate initiator and an emulsifier selected from anionic emulsifiers, nonionic emulsifiers, and mixtures thereof, at a temperature in the range of from about 75° C to about 150° C and at a pressure in the range of from about 1,500 psi to about 5,000 psi for a period of time sufficient to form said ethylene-propylene copolymer, the mole ratio of propylene to ethylene in said reaction zone being maintained in the range of from about 0.2:1 to about 1:1.

4,003,870
POLYMERIC THICKENERS

David Vincent Gibson, North Bayswater, and Bruce Leary, Frankston, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Division of Ser. No. 520,897, Nov. 4, 1974, abandoned. This application July 17, 1975, Ser. No. 596,837

Claims priority, application Australia, Nov. 21, 1973, 5723/73

Int. Cl.^{2} C08L *33/10, 33/12*

U.S. Cl. 260—29.6 RW **6 Claims**

1. A thickened aqueous latex paint comprising 0.1 to 15.0% by weight of latex solids of an amphipathic polymer in which the disperse particles of film-forming polymer of the latex have a diameter below 0.5 micron, characterised in that the amphipathic copolymer is essentially a copolymer of (a) poly(ethylene glycol) acrylate or methacrylate and (b) methyl acrylate or methacrylate and which is further characterised in that:

1. the poly(ethylene glycol) must have a molecular weight of 500 - 1500, and
2. the weight balance of (a) to (b) is from about 0.7/1.0 to 0.5/1.0.

4,003,871

HIGH SOLIDS STYRENE-BUTADIENE EMULSIONS

John R. Costanza, North Plainfield, N.J., and Ellsworth E. Faust, Yardley, Pa., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,470

Int. Cl.^{2} C08L *47/00*

U.S. Cl. 260—29.7 R **8 Claims**

1. In a process for producing conjugated diene/monoethylenically unsaturated monomer-copolymer aqueous emulsions having solids contents in the range of 50–75 weight percent, wherein the monoethylenically unsaturated monomers contain a $CH_2=C<$ group from corresponding monomers by forming an aqueous monomer pre-emulsion by admixing at least one of the monomers with about 3 to about 50 percent, by weight, of water, based on the total weight of the monomers in the pre-emulsion, and a nonionic or anionic surfactant in an amount sufficient to emulsify said monomers, and the polymer subsequently formed therefrom, and adding the pre-emulsion to a polymerization reaction medium comprising free radical polymerization catalysts in initiating amounts in water, together with added free radical polymerization catalysts to complete the polymerization of the monomers and maintaining the rate of addition of the pre-emulsion at sufficient speed to maintain the addition polymerization, the improvement of which comprises utilizing as catalysts about 0.1 to about 2.0 percent, based on the total weight of the polymerizable monomers of a lypophilic initiator and about 0.01 to about 0.2 percent, based upon the total weight of the monomers of a hydrophilic initiator.

4,003,872

METAL-PIGMENTED PLASTIC POWDER AND PROCESS

Rolf Rolles; James E. Williams, Jr., both of New Kensington, and Thomas J. Kondis, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 19, 1973, Ser. No. 380,578

Int. Cl.^{2} C08K *7/00*

U.S. Cl. 260—37 EP **2 Claims**

1. A process for producing a polished metal, plastic powder product, comprising brush polishing metal flake particles and plastic particles together, wherein the metal flake particles are aluminum and the plastic particles are based on thermosetting epoxy resin, have a specific gravity of 1.15 to 1.98, a melting point of 185° to 205° F, a time to gel of approximately 100 to 120 seconds at 360° F and volatiles of less than one weight-%.

4,003,873

CEMENT-PHENOLIC RESIN COMPOSITIONS

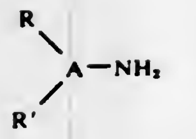
Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 195,835, Nov. 4, 1971, abandoned. This application Nov. 16, 1972, Ser. No. 306,999

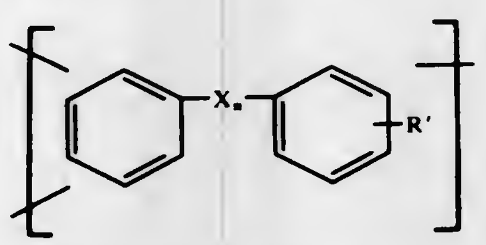
Int. Cl.^{2} C08K *3/30*

U.S. Cl. 260—38 **3 Claims**

1. An adhesive composition comprising a curable phenol-aldehyde resin and from about 20 to about 55 percent based on the weight of the resin of portland cement wherein the phenol reactant used in making said resin is phenol or a mixture of phenol with up to about 90 mole percent of a substituted phenol having at least two of the positions ortho and para to the phenolic hydroxyl group unsubstituted and capable of reaction with an aldehyde and wherein the resin is a methylolated novolac or a resole obtained by reacting said phenol with formaldehyde in the presence of an acidic or an essentially neutral condensation catalyst and wherein the said phenol-formaldehyde resole or methylolated novolac is the product of reaction of about 0.05–0.5 gram mole per 100 grams of resole or novolac of at least one aromatic amine of the group consisting of aniline, ar-(lower alkyl)aniline, lower alkoxyaniline, and a difunctional aromatic amine of the formula



wherein A represents a benzene ring, a naphthalene nucleus, or a dicyclic moiety of the formula



wherein X is oxygen, lower alkylidene, S, SO_2, or NH, *n* is zero or one, R is OH or NH_2, and R' is H, lower alkyl, or lower alkoxy.

4,003,874

PRODUCING GLASS-REINFORCED POLYOLEFIN COMPOSITIONS

Fumio Ide, and Isao Sasaki, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1972, Ser. No. 284,722

Claims priority, application Japan, Aug. 30, 1971, 46-66501; Oct. 21, 1971, 46-83512; Dec. 22, 1971, 46-104317

Int. Cl.^{2} C08K *7/14*

U.S. Cl. 260—42.18 **24 Claims**

1. In an extrusion process for providing a glass-reinforced polyolefin composite comprising the addition of an unsaturated carboxylic acid or anhydride thereof having 3 to 8 carbon atoms and 0.05 to 0.5 parts by weight of an organic peroxide to 100 parts by weight of a polyolefin, meltmixing the mixture in an extruder to form a modified polyolefin, and blending the resulting modified polyolefin with 5 to 200 parts by weight of a glass reinforcement, the improvement which comprises:

controlling the amount of the unsaturated carboxylic acid or anhydride thereof added within a range of 0.01 to 0.8 parts by weight, the unsaturated carboxylic acid or anhydried thereof serving as the essential agent to enhance adhesion and affinity of the polyolefin to the glass reinforcement.

4,003,875

ASYMMETRICAL OXALIC ACID DIARYL AMIDE STABILIZERS

Christian Lüthi, Basel; Max Dünnenberger, Frenkendorf, and Hans Rudolf Biland, Gelterkinden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

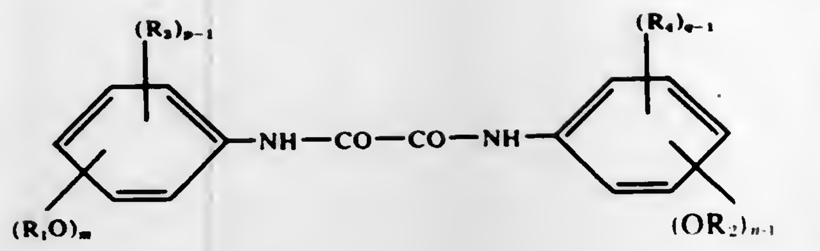
Continuation-in-part of Ser. No. 376,665, July 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 253,070, May 15, 1972, abandoned, which is a continuation of Ser. No. 820,712, April 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 614,039, Feb. 6, 1967, Pat. No. 3,529,982. This application Nov. 19, 1975, Ser. No. 633,200

Claims priority, application Switzerland, Feb. 7, 1966, 1680/66

Int. Cl.^{2} C08K *5/25*

U.S. Cl. 260—45.9 NC **12 Claims**

1. A composition of matter substantially consisting of an organic material that can be damaged by ultraviolet rays, having incorporated therein an ultraviolet absorbing agent in a proportion sufficient to protect said material against the influence of ultraviolet rays, said ultraviolet absorbing agent being represented by an asymmetrical oxalic acid diarylamide of the formula



in which R_1 and R_2 each stands for a member selected from the group consisting of an alkyl group with 1 to 18 carbon atoms which may be substituted by a member selected from the group consisting of chlorine, a hydroxyl group, an alkoxy group with 1 to 4 carbon atoms, a carboxyl group, a nitrile group, a carboxylic acid amide group and a carboxylic acid alkyl ester groups with 1 to 12 carbon atoms, an alkenyl group with 3 to 4 carbon atoms, a benzyl group which may be substituted by chlorine atoms or alkyl groups, an aliphatic acyl group containing up to 18 carbon atoms and a benzoyl group which may be substituted by chlorine or an alkyl group with 1 to 4 carbon atoms; R_3 and R_4 each stands for a member selected from the group consisting of an alkyl group with 1 to 12 carbon atoms, a halogen atom, halogenalkyl group, a sulphonic acid group, a phenyl group and a phenylalkyl group whose alkyl residue contains 1 to 4 carbon atoms, or in each case two-ortho-positioned residues R_3 and/or R_4 together form a fused-on six-membered aromatic carbon ring, and m and $n =$ 1 or 2 and p and $q = 1$, 2 or 3, each of the two ring systems containing apart from the bond via the —NH—group at most three substituents and the sum $m+(m-1) = 1$ or 2, and in other respects the substituents R_1O—, R_2O—, R_3 and R_4 being so constituted as to kind, number or positions that the molecule is asymmetrical.

4,003,876

SUPER COOLED M-PHENYLENE DIAMINE AS A CURING AGENT FOR EPOXY RESINS

Robert W. Warfield, Germantown; Thomas J. Wade, Takoma Park, and Porter W. Erickson, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 668,272, Aug. 7, 1967, abandoned, which is a division of Ser. No. 311,596, Sept. 25, 1963, abandoned. This application July 25, 1975, Ser. No. 599,297

Int. Cl.^{2} C08G *59/50*

U.S. Cl. 260—47 EN **4 Claims**

1. A method of combining a curing agent with an epoxide resin consisting of:

a. heating normally solid nonadulterated m-phenylene diamine to a temperature above its melting point.

b. allowing said melted m-phenylene diamine to cool slowly to room temperature to form a stable supercooled liquid, and thereafter,

c. admixing said supercooled liquid with said epoxide resin.

4,003,877

PHOTOPOLYMERIZABLE SCREEN PRINTING INKS FOR PERMANENT COATINGS PREPARED FROM ARYLOXYALKYL COMPOSITIONS

Melvin A. Lipson, Fullerton; Dale W. Knoth, Norwalk; Walter D. Custer, Garden Grove, and Michael N. Gilano, Fullerton, all of Calif., assignors to Dynachem Corporation, Santa Ana, Calif.

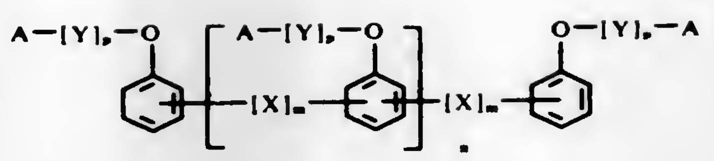
Filed May 24, 1974, Ser. No. 473,180

Int. Cl.^{2} C09D *11/10*

U.S. Cl. 260—47 UA **9 Claims**

1. A photopolymerizable screen-printing ink which comprises:

A. 35–70% by weight of an aryloxyalkyl acrylate having the general formula:



wherein

X is a methylene, an alkyl-substituted methylene group, a dialkyl-substituted methylene group, a carbonyl group, a sulfide, a sulfoxide, a sulfone, an amine, an alkyl-substituted amine, an ethylene ether, a propylene ether, a 2-hydroxylpropylene ether, wherein each alkyl group contains from 1 to 8 carbon atoms;

Y is lower aklyl or hydroxylower alkyl of up to 8 carbon atoms;

A is an unsaturated acyloxy group having from 3 to 18 carbon atoms; and

n is 0 through 20,

m is 0 or 1,

p is 0 or 1;

B. 15–45% by weight of a photopolymerizable diluent having terminal ethylenic groups selected from

ethylene diacrylate; diethylene glycol diacrylate; tetraethylene glycol diacrylate; glycerol diacrylate; glycerol triacrylate; ethylene dimethacrylate; 1,3-propylene dimethacrylate; 1,2,4-butanetriol trimethacrylate; 1,4-benzenediol dimethacrylate; pentaerythritol tetremethacrylate; 1,3-propanediol diacrylate; 1,6-hexanediol diacrylate; the bis-acrylate of a polyethylene glycol having a molecular weight of 200 to 500; the bis-methacrylate of a polyethylene glycol having a molecular weight of 200 to 500; trimethylol-propane triacrylate; pentaerythritol triacrylate; methylene bis-acrylamide; methylene bis-methacrylamide; 1,6-hexamethylene bis-acrylamide; diethylene triamine tri-methacrylamide; bis-(methacrylamidopropoxy) ethane; bis-methacrylamidoethyl methacrylate N-(beta-hydroxyethyloxy) ethyl acrylamide; divinyl succinate; divinyl adipate; divinyl phthalate; divinyl terephthalate; divinyl benzene-1,3-disulfonate; divinyl butane-1,4-disulfonate; and sorbaldehyde;

C. 0.1–10% by weight of a free radical generating addition polymerizing initiating system;

said photopolymerizable composition having a viscosity of from 5,000 to 200,000 centipoises and a thixotropic index of from 1.00 to 6.00.

4,003,878

METHOD OF PREPARING AN ALKALI-METAL SALT OF AN ALKOXYSULFONATED BENZOIC ACID GLYCOL ESTER

Thomas F. Skaar, Wilmington, Del., and John A. Price, Swarthmore, Pa., assignors to Avtex Fibers Inc., Valley Forge, Pa.

Continuation of Ser. No. 313,140, Dec. 7, 1972, abandoned. This application Mar. 26, 1973, Ser. No. 345,230

Int. Cl.^{2} C08G *63/68*

U.S. Cl. 260—49 **8 Claims**

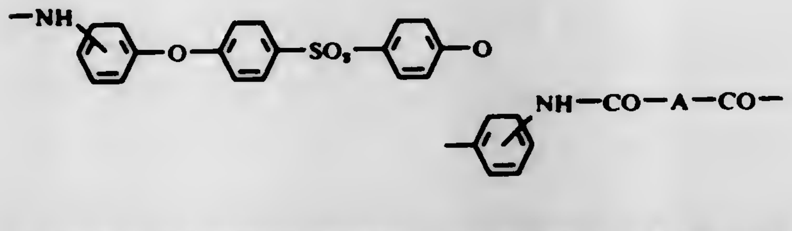
1. A method of preparing an alkali-metal salt of an alkoxysulfonated benzoic acid glycol ester which comprises reacting an alkyl ester of a meta- or para-hydroxy substituted benzoic acid wherein the alkyl group has from 1 to 6 carbon atoms with an alkali-metal alkoxide wherein the alkoxide group has from 1 to 4 carbon atoms and a solvent-reactant consisting essentially of an alkylene glycol having from 2 to 10 carbon atoms or diethylene glycol whereby a glycol ester of an alkali-metal oxy substituted benzoic acid is formed, and reacting said glycol ester with an alkane sultone having from 3 to 4 carbon atoms to form an alkali-metal salt of an alkoxy sulfonated benzoic acid glycol ester dissolved in said solvent-reactant glycol.

4,003,879
POLYAMIDES

Alan Francis Lennox, Welwyn Garden City, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 259,606, June 5, 1972, abandoned.
This application Oct. 11, 1973, Ser. No. 405,260
Claims priority, application United Kingdom, June 7, 1971, 19190/71
Int. Cl.^{2} C08G *69/40, 69/42*
U.S. Cl. 260—49 **5 Claims**

1. A polyamide consisting essentially of repeating units having the structure

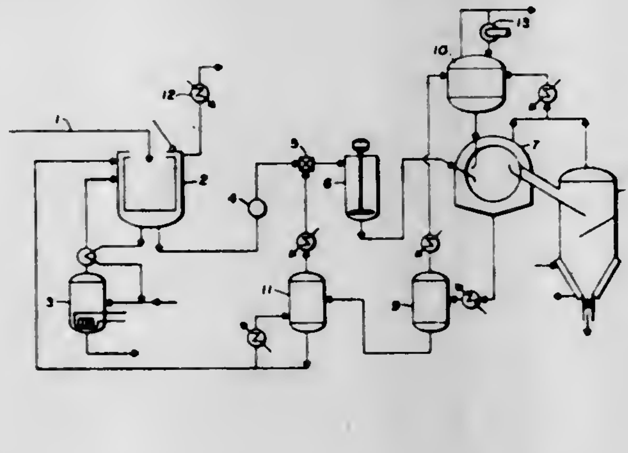


in which A is a bivalent aliphatic, cycloaliphatic or araliphatic radical containing at least 4 carbon atoms, said polyamide having improved resistance to opacity and curling on immersion in boiling water.

4,003,880
FABRIC DYE STRIPPING, SEPARATION AND RECOVERY OF POLYESTER

Norman C. Sidebotham, Decatur, Ala.; Paul D. Shoemaker, and Clarence W. Young, III, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed May 19, 1975, Ser. No. 578,592
Int. Cl.^{2} C08G *63/70;* **D06M** *9/00*
U.S. Cl. 260—75 T **29 Claims**



1. A process for separation, recovery and reuse in production, of polyester polymer from collections of fibers comprising a first polyester fiber component comprising polyester fibers selected from the group consisting of dyed fibers and undyed fibers and a second component consisting of fibers other than polyester fibers, said process comprising:

1. stripping the dye from said dyed polyester fibers by contacting the collections with a dye-stripping solvent for the first polyester fiber component at a temperature below which the polyester dissolves and above which the crystalline lattice of the polyester fibers swell so as to release the dye;
2. removing the excess of the dye-containing dye-stripping solvent which is not absorbed by the fabric;
3. contacting the residual dye-containing dye-stripping solvent-laden fiber with sufficient addition of a primary dissolution solvent which is not a solvent for said second component to dissolve the polyester component, under selective dissolution conditions for the polyester component
4. separating the dissolved polyester component from the undissolved second component; and
5. precipitating the polyester out of solution.

4,003,881
POLYESTER POLYMER RECOVERY FROM DYED POLYESTER FABRICS

Norman C. Sidebotham, Decatur, Ala.; Paul D. Shoemaker, and Clarence W. Young, III, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 24, 1975, Ser. No. 552,839
Int. Cl.^{2} D06M *9/00;* **C08G** *63/70*
U.S. Cl. 260—75 T **12 Claims**

1. A process for recovery and reuse of dyed polyester fibers comprising stripping the dye from said fibers by:

1. contacting said fibers with a dye stripping solvent for said fibers at a temperature below which said fibers dissolve and above which the crystalline lattice of the polyester fibers swell so as to release the dye;
2. removing the excess of the dye-containing dye stripping solvent which is not absorbed by said fibers;
3. contacting the residual dye-containing dye stripping solvent-laden fibers with sufficient addition of a primary dissolution solvent under dissolution conditions for said fibers;
4. precipitating the polyester out of solution; and,
5. separating the precipitated polymer from the solvent.

4,003,882
POLYESTERETHER HAVING COMMERCIALLY ACCEPTABLE MOLD RELEASE CHARACTERISTICS

David R. Fagerburg, and Burns Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,517
Int. Cl.^{2} C08G *63/12*
U.S. Cl. 260—75 R **2 Claims**

1. A composition comprising a polyesterether having an inherent viscosity of at least 0.4 comprised of

A. a dicarboxylic acid component comprised of terephthalic acid, and
B. a diol component comprised of
   1. a glycol comprised of 95–75 mole percent 1,4-cyclohexanedimethanol and 5–25 mole percent ethylene glycol, and
   2. 20–45 weight percent, based on the weight of the polyesterether, of a poly(alkylene oxide) glycol having 2 to 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 2,000.

4,003,883
POLYESTERETHER HAVING COMMERCIALLY ACCEPTABLE MOLD RELEASE CHARACTERISTICS

David R. Fagerburg, and Burns Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,518
Int. Cl.^{2} C08G *63/12*
U.S. Cl. 260—75 R **2 Claims**

1. A composition comprising a polyesterether having an inherent viscosity of at least 0.4., comprised of

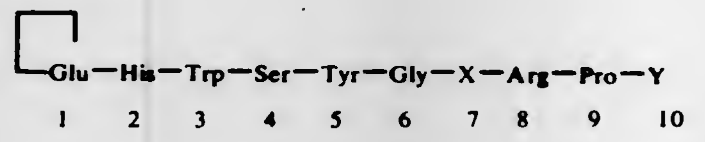
A. a dicarboxylic acid component comprised of terephthalic acid, and
B. a diol component comprised of
   1. a glycol comprised of 90-60 mole percent 1,4-cyclohexanedimethanol and 10-40 mole percent tetramethylene glycol, and
   2. 10–50 weight percent, based on the weight of the polyesterether, of a poly(alkylene oxide) glycol having 2 to 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 2,000.

4,003,884
PEPTIDES HAVING LH-RH/FSH-RH ACTIVITY

Wolfgang König, Hofheim, Taunus; Rolf Geiger, and Jürgen K. Sandow, both of Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 16, 1975, Ser. No. 578,196
Claims priority, application Germany, May 18, 1974, 2424287; Dec. 20, 1974, 2460333; Dec. 20, 1974, 2460335
Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 LH **7 Claims**

1. A peptide of the general formula



$$\underset{1}{\text{Glu}}-\underset{2}{\text{His}}-\underset{3}{\text{Trp}}-\underset{4}{\text{Ser}}-\underset{5}{\text{Tyr}}-\underset{6}{\text{Gly}}-\underset{7}{\text{X}}-\underset{8}{\text{Arg}}-\underset{9}{\text{Pro}}-\underset{10}{\text{Y}}$$

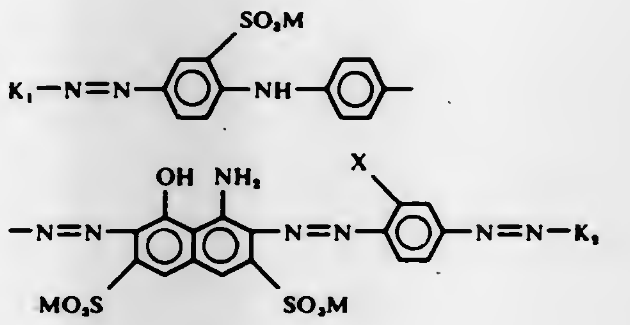
wherein X represents Ser(Bu^t), Cys(Bu^t), Asp(OBu^t), Glu (OBu^t), Orn(Boc) or Lys(Boc) and Y is glycinamide or a NH-alkyl group wherein the alkyl radical contains 1 to 3 carbon atoms and may be substituted by OH groups or halogen atoms, or Y is the NH-cyclopropyl radical and wherein Trp may be substituted by pentamethylphenyl alanine, Ser by Ala or Thr, Tyr by Phe, Gly by D-amino acids corresponding to the naturally occuring L-amino acids, Arg by Orn, Lys or homoarginine.

4,003,885
TETRAKISAZO COMPOUNDS HAVING A 1-HYDROXY-2-(4′-(2′′-SULFOANILINO)PHENYLAZO)-3,6-DISULFO-7-(OPTIONALLY 2′-SUBSTITUTED PHENYLAZO)-8-AMINONAPHTHALENE MIDDLE COMPONENT

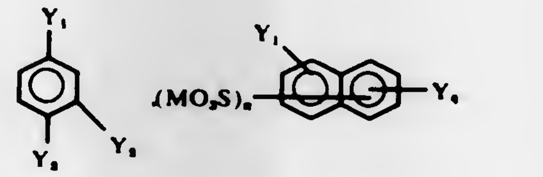
Claude Vogel, Saint-Louis, France, and Heinz Wicki, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed July 2, 1974, Ser. No. 485,281
Claims priority, application Switzerland, July 9, 1973, 9953/73
Int. Cl.^{2} C09B *31/30, 33/18, 35/36, 35/50*
U.S. Cl. 260—166 **22 Claims**

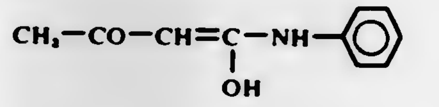
1. A dye of the formula



or a mixture thereof, wherein X is hydrogen, halo or $-SO_3M$, each of K_1 and K_2 is independently the radical of a coupling component of the formula



or



wherein

Y_1 is $-OH$ or $-NH_2$,
Y_2 is $-OH$, $-NH_2$, anilino or toluidino,
Y_3 is hydrogen, $-SO_3M$ or alkyl of 1 to 6 carbon atoms, with the proviso that when Y_3 is alkyl of 1 to 6 carbon atoms, Y_1 and Y_2 are $-NH_2$,
Y_4 is hydrogen, $-OH$, $-NH_2$, anilino, toluidino or acetamido, n is 0, 1 or 2, and each M is hydrogen or a non-chromophoric cation, wherein each halo is independently fluoro, chloro, bromo or iodo.

4,003,886
TETRACARBOXYLIC ACID ESTER SUBSTITUTED DISAZO PIGMENTS

Willy Müller, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

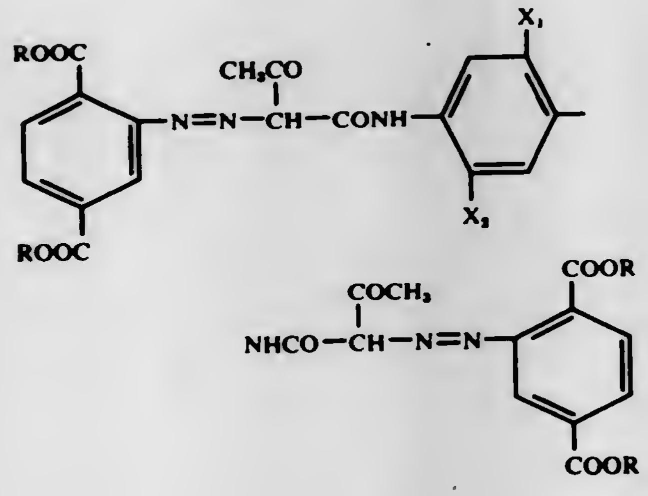
Continuation-in-part of Ser. No. 461,760, April 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 178,839, Sept. 8, 1971, abandoned. This application May 13, 1976, Ser. No. 686,198

Claims priority, application Switzerland, Sept. 11, 1970, 13541/70

Int. Cl.² C09B *43/00*

U.S. Cl. 260—176 **3 Claims**

1. A compound of the formula



in which X_1 and X_2 represent hydrogen, chlorine, bromine, methyl, methoxy, ethoxy or cyano and R represents methyl or ethyl, which has been subjected to an aftertreatment, said aftertreatment consisting of heating said compound in an inert organic liquid at a temperature of from 100° C to 150° C.

4,003,887
NOVEL PENICILLINS AND THEIR PREPARATION

Hisao Tobiki, Toyonaka; Hirotada Yamada; Iwao Nakatsuka, both of Nishinomiya; Kozo Shimago, Takarazuka; Shigeru Okano, Kawanishi; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Toyonaka; Hiroshi Noguchi, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

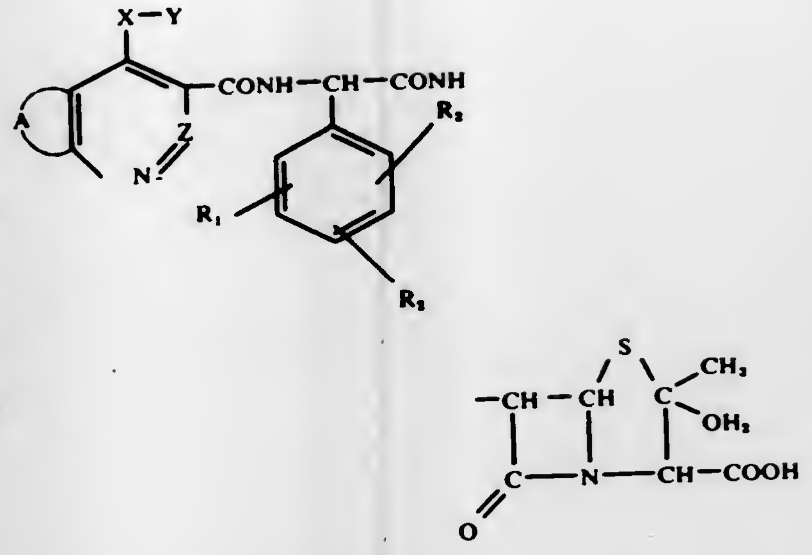
Division of Ser. No. 424,271, Dec. 13, 1973, Pat. No. 3,954,753. This application Sept. 3, 1975, Ser. No. 609,982

Claims priority, application Japan, Dec. 15, 1972, 47-126634

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **13 Claims**

1. A compound of the formula:



wherein Z is a nitrogen atom or a methylene group, the ring A is a benzene, pyrazole, thiazole, imidazole, pyrazine, pyridazine or pyrimidine ring when Z is a nitrogen atom or a methylene group, or a pyridine ring when Z is a nitrogen atom, the ring A being unsubstituted on being substituted with one on more substituents selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, lower alkylenedioxy, halogen, hydroxyl, nitro, amino, lower alkoxycarbonylamino, lower alkylamino, di(lower)alkylamino and lower alkanoylamino, R_1 is hydroxyl, lower alkanoxyloxy, lower alkoxycarbonyloxy or benzyloxycarbonyloxy, R_2 and R_3 are each hydrogen or halogen, X is oxygen or sulfur and Y is hydrogen, lower alkoxycarbonyl or lower alkanoyl, the Y-X-group being present on the carbon atom adjacent to the carbon atom to which the 6-(α-aminoacylamido)penicillanic acid moiety is linked, and non-toxic pharmaceutically acceptable salts thereof.

4,003,888
AMINOALKYL ETHERS OF 2- AND 3-HYDROXYBENZIL

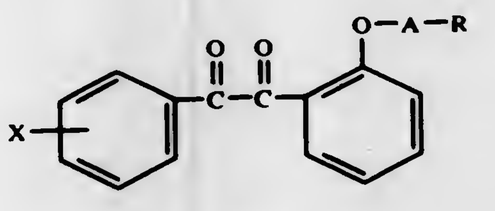
Michael W. Winkley, Malvern, and Gerhard R. Wendt, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,488

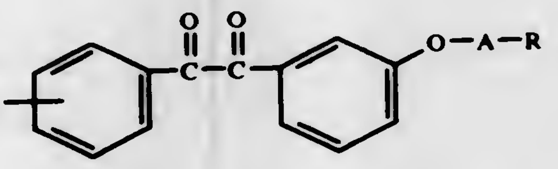
Int. Cl.² C07D *295/08*

U.S. Cl. 260—239 B **2 Claims**

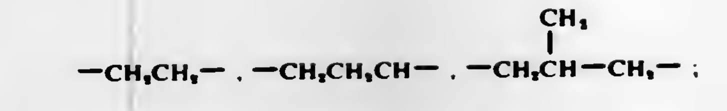
1. A compound of the formula:



or



wherein A is a divalent aliphatic hydrocarbon radical of the formula



$$-CH_2CH_2- \ , \ -CH_2CH_2CH- \ , \ -CH_2\overset{CH_3}{\overset{|}{C}H}-CH_2- \ ;$$

and R is a substituted amino group of the formula

$$-N \qquad (CH_2)_n$$

wherein X is hydrogen, lower alkyl, lower alkoxy, halo, or nitro; and *n* is the number 4, 5, 6, 7, or 8; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,003,889
1,3-DIARYL-2-PYRAZOLINE DERIVATIVES

Ivan Joseph Bolton, Bingley; Alec Victor Mercer, Leeds, both of England, and Fritz Fleck, Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

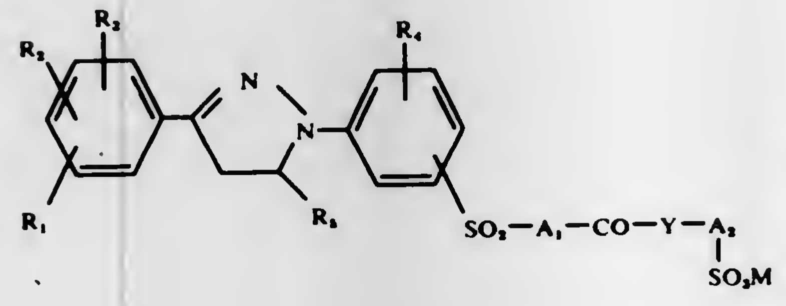
Filed June 17, 1974, Ser. No. 480,128

Claims priority, application United Kingdom, June 21, 1973, 29478/73; Nov. 16, 1973, 53255/73; Feb. 15, 1974, 6952/74

Int. Cl.² C07D *231/42, 233/00, 235/00, 261/16*

U.S. Cl. 260—239.9 **30 Claims**

1. A compound of the formula,



in which either

R_1, R_2 and R_3, which may be the same or different, each signifies a hydrogen atom, a chloro or fluoro radical, an alkyl radical of 1 to 4 carbon atoms, an alkoxy radical of 1 to 4 carbon atoms, a cyano group, a group $—SO_3M$, an unsubstituted phenyl radical or a phenyl radical substituted by up to 2 substituents selected from chloro, fluoro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and the group $—SO_3M$, with the proviso that only one of R_1, R_2 and R_3 signifies an unsubstituted or substituted phenyl radical,

or two of

R_1, R_2 and R_3 together form a methylenedioxy group, the other of R_1, R_2 and R_3 having one of the above significances,

R_4 signifies a hydrogen atom, a chloro or fluoro radical, an alkyl radical of 1 to 4 carbon atoms or an alkoxy radical of 1 to 4 carbon atoms,

R_5 signifies a hydrogen atom, an alkyl radical of 1 to 4 carbon atoms, an unsubstituted phenyl radical or a phenyl radical substituted by 1 or 2 substituents selected from chloro, fluoro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and the group $—SO_3M$,

A_1 signifies a $C_1$to C_3 alkylene chain, unsubstituted or substituted by up to two alkyl groups of 1 to 4 carbon atoms,

A_2 signifies a C_1 to C_3 alkylene chain, unsubstituted or substituted by up to two alkyl groups of 1 to 4 carbon atoms; or a phenylene group, unsubstituted or substituted by up to 2 substituents selected from chloro, fluoro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and the group $—SO_3M$,

Y signifies $—O—$ or $—NR_6—$,

in which

R_6 signifies a hydrogen atom or an alkyl radical of 1 to 4 carbon atoms, and

the Ms, which may be the same or different, each signifies a hydrogen atom, or a non-chromophoric cation.

4,003,890
BENZYLIDENE PYRANO (4,3-c)PYRAZOLES

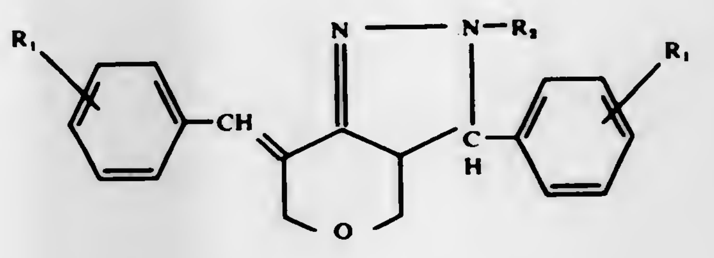
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 27, 1976, Ser. No. 690,702

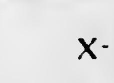
Int. Cl.² C07D *491/06, 405/12*

U.S. Cl. 260—240 F **6 Claims**

1. A compound having the formula

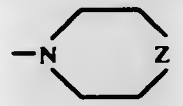


or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, hydroxy, alkyl, alkoxy, alkylthio, trifluoromethyl, halogen, nitro, cyano, dialkylamino or alkylsulfinyl; and R_2 is hydrogen, alkyl, aryl, arylalkyl,



$$X-\overset{\overset{\displaystyle O}{\|}}{C}$$

wherein X is alkyl or aryl, or $A\text{-}NR_3R_4$ wherein A is a straight or branched chain alkylene group having 2 to 5 carbon atoms, R_3 is hydrogen or alkyl, and R_4 is hydrogen, alkyl, phenyl or phenylalkyl, or R_3 and R_4 together with the nitrogen atom to which they are attached are



wherein Z is CH_2, oxygen or N-R_5 wherein R_5 is hydrogen, alkyl, aryl or arylalkyl; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms and the term aryl refers to phenyl or phenyl monosubstituted with an alkyl, alkoxy, halogen or trifluoromethyl group.

4,003,891
PREPARATION OF METAL COMPLEXES OF 6-METHOXY-1-PHENAZINOL 5,10-DIOXIDE

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 213,748, Dec. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 139,287, April 23, 1971, abandoned. This application Feb. 12, 1975, Ser. No. 549,414

Int. Cl.² C07D *241/52*

U.S. Cl. 260—242 **7 Claims**

1. A solid state reaction process for producing a complex of 6-methoxy-1-phenazinol 5,10-dioxide with a metal selected from the group consisting of calcium, strontium and magnesium which comprises reacting, in a water reaction medium, an agitated suspension of solid 6-methoxy-1-phenazinol 5,10-dioxide and a salt or hydroxide of said metal.

6. A process for producing a complex of 6-methoxy-1-phenazinol 5,10-dioxide with ferric chloride which comprises reacting ferric chloride hexahydrate with a solution of 6-methoxy-1-phenazinol 5,10-dioxide in a concentrated aqueous mineral acid selected from the group consisting of hydrochloric acid and sulfuric acid.

4,003,892
METHOD OF SEPARATING THIONINE AND ITS N-METHYL DERIVATIVES FROM EACH OTHER

Walter Löhr, Heuweiler; Norbert Grubhofer, Heidelberg; Inge Sohmer, Freiburg, and Dietrich Wittekind, Bad Krozingen, all of Germany, assignors to Serva-Entwicklungslabor v. Grothe & Co., Heidelberg, Germany

Filed Mar. 18, 1976, Ser. No. 668,051

Claims priority, application Germany, Apr. 17, 1975, 2516920

Int. Cl.² C07D *279/28*

U.S. Cl. 260—243 A **2 Claims**

1. A method of separating at least two mixed, cationic dyes of the group consisting of thionine, azure A, azure B, azure C, and methylene blue from each other which comprises:

a. subjecting said mixed dyes to chromatography on a column of silica gel with a solvent system consisting essentially of water, formic acid, and acetic acid until an eluate is discharged from said column;

b. separately collecting sequentially discharged fractions of said eluate, one of said fractions containing only one of the separated dyes, each dye being present in said fractions as the formate or acetate;

c. adsorbing the separated dye as the formate or acetate from said one fraction on an adsorbent substrate;

d. exposing the adsorbed dye to an aqueous sodium chloride solution until the dye is converted from the formate or acetate form to the chloride form; and

e. eluting the dye in the chloride form from said substrate with an organic solvent volatile in a vacuum at 37° C.

4,003,893
3-HETEROTHIO[(THIOALKYL)THIOACETYL]CEPHALOSPORANIC DERIVATIVES

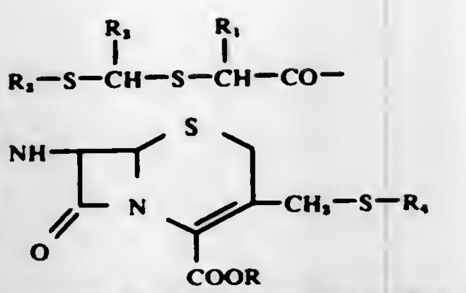
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 11, 1974, Ser. No. 513,978

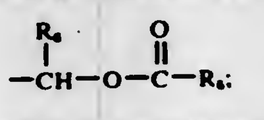
Int. Cl.² C07D *501/50*

U.S. Cl. 260—243 C **13 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, benzhydryl, tri(lower alkyl)silyl, alkali metal, alkaline earth metal, triethylamine salt, (lower alkyl)amine salt or



$$-\underset{}{\overset{R_6}{\overset{|}{C}}}H-O-\overset{O}{\overset{\|}{C}}-R_5;$$

R₁ is hydrogen, lower alkyl, phenyl, thienyl or furyl; R_2 and R_6 each is hydrogen or lower alkyl; R_3 and R_5 each is lower alkyl, phenyl or phenyl-lower alkyl; R_4 is oxadiazolyl, thiadiazolyl, thiatriazolyl, tetrazolyl, 1oxopyridinyl or their lower alkyl derivatives; said lower alkyl groups having up to eight carbon atoms.

4,003,894
PREPARATION OF 7-SUBSTITUTED AMINO-DESACETOXYCEPHALOSPORANIC ACID COMPOUNDS

Jan Verweij, Leiden; Hong Sheng Tan, Bleiswijk, and Hermanus Jacobus Kooreman, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 279,868, Aug. 11, 1972, abandoned. This application May 5, 1975, Ser. No. 574,365

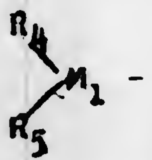
Claims priority, application United Kingdom, Aug. 17, 1971, 38637/71; Dec. 21, 1971, 59516/71

Int. Cl.² C07D *501/10*

U.S. Cl. 260—243 C **26 Claims**

1. A process for the preparation of 7β-acylamido-3-methyl-3-cephem-4-carboxylic acids by conversion of the corresponding 6β-acylamido penicillanic sulfoxide acids comprising heating a 6β-acylamidopenicillanic sulfoxide acid anhydride having the group $-COOR_3$, selected from the group consisting of

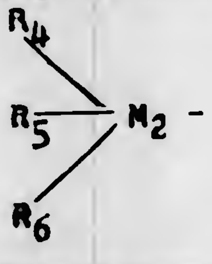
a. an acid anhydride group wherein R_3 is



V

wherein R_4 and R_5 are the same or different and each is selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, phenyl alkyl having 1 to 2 carbon atoms in the alkyl, lower alkoxy and lower alkylthio of 1 to 6 carbon atoms, phenoxy, phenylalkoxy containing 1 to 2 carbon atoms in the alkoxy, halogen and a 6β-acylamido-penicillanylsulfoxide-3-carbonyloxy group, or R_4 and R_5 together form an alkylene group and M_1 is selected from the group consisting of boron, aluminum and phosphorous atoms and

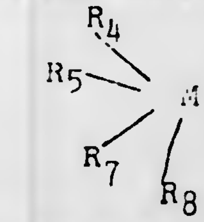
b. an acid anhydride group wherein R_3 has the formula



VI

wherein R_4, R_5 and R_6 are the same or different and each is selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, phenylalkyl having 1 to 2 carbon atoms in the alkyl, lower alkoxy of 1 to 6 carbon atoms, lower alkylthio of 1 to 6 carbon atoms, phenoxy, phenylalkoxy group having 1 to 2 carbon atoms in the alkoxy, halogen and a 6β-acylamidopenicillanyl sulfoxide-3-carbonyloxy group or R_4 and R_5 together form an alkylene group or R_4 and R_5 or R_6 together are selected from the group consisting of =O and =S, and M_2 is selected from the group consisting of silicon, sulfur, germanium and tin atoms, or a carbon atom when R_4 and R_6 together are selected from the group consisting of =O and =S.

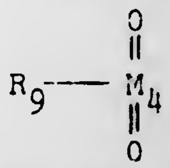
c. an acid anhydride group wherein R_3 has the formula



VII

wherein R_4 and R_5 are the same or different and have the above definition, and R_7 and R_8 are the same or different and are selected from the group consisting of halogen and a 6β-acylamido-penicillanyl sulfoxide-3-carbonyloxy group or R_7 and R_8 together form an alkylene group or together are selected from the group consisting of =S and =O, and M_3 is selected from the group consisting of phosphorous and tungsten atoms,

d. an acid anhydride group, wherein R_3 has the formula

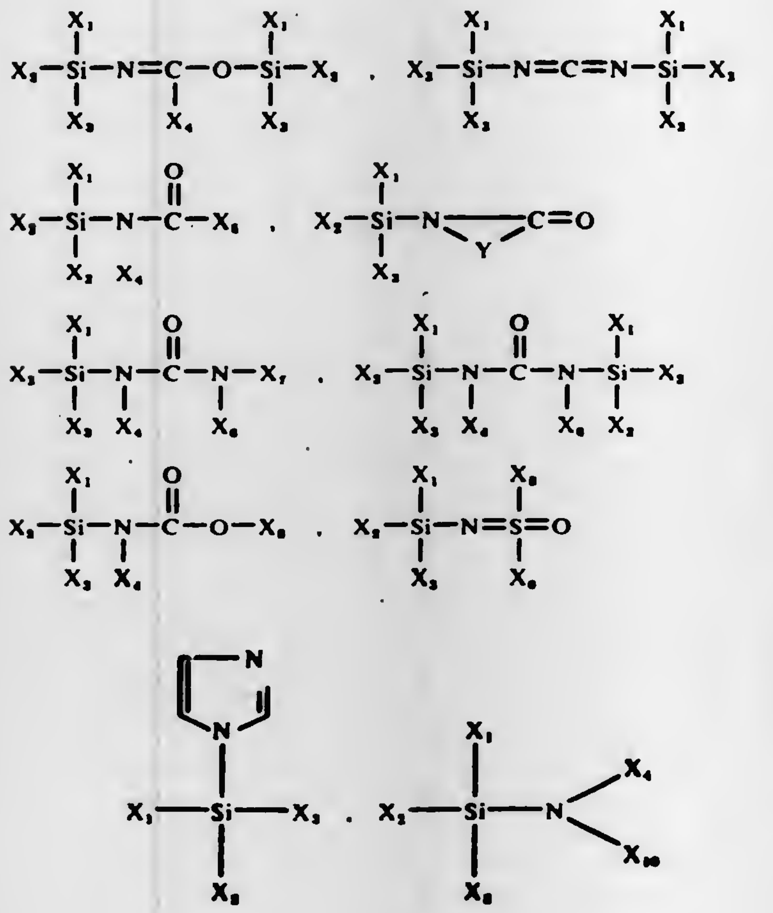


$$R_9-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{M_4}}}}-$$

VIII

wherein R_9 is selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, phenylalkyl having 1 to 2 carbon atoms in the alkyl, lower alkoxy of 1 to 6 carbon atoms, lower alkylthio of 1 to 6 carbon atoms, phenoxy, or phenylalkoxy group having 1 to 2 carbon atoms in the alkoxy, and M_4 is a sulfur atom and

e. a group wherein R_3 is selected from the group consisting of an alkali metal, alkaline earth metal ion and a cation derived from an amine in a dry inert organic solvent at a temperature up to 160° C with an anhydrous acid capable of causing ring expansion of the penam ring to a Δ3-cephem ring in the presence of at least one molar equivalent based on the compound of a silicon-containing compound having a formula selected from the group consisting of



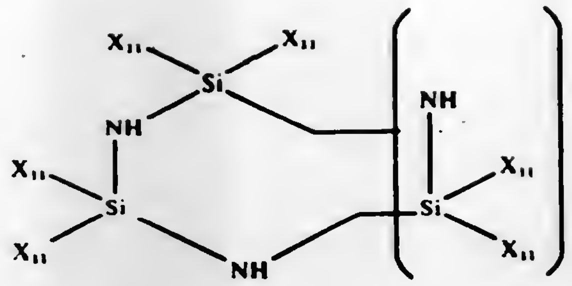
$$X_2-\overset{X_1}{\underset{X_3}{Si}}-N=\underset{X_4}{C}-O-\overset{X_1}{\underset{X_3}{Si}}-X_2,\quad X_2-\overset{X_1}{\underset{X_3}{Si}}-N=C=N-\overset{X_1}{\underset{X_3}{Si}}-X_2$$

$$X_2-\overset{X_1}{\underset{X_3}{Si}}-\underset{X_4}{N}-\overset{O}{\overset{\|}{C}}-X_5,$$

$$X_2-\overset{X_1}{\underset{X_3}{Si}}-\underset{X_4}{N}-\overset{O}{\overset{\|}{C}}-\underset{X_6}{N}-X_7,\quad X_2-\overset{X_1}{\underset{X_3}{Si}}-\underset{X_4}{N}-\overset{O}{\overset{\|}{C}}-\underset{X_6}{N}-\overset{X_1}{\underset{X_2}{Si}}-X_3$$

$$X_2-\overset{X_1}{\underset{X_3}{Si}}-\underset{X_4}{N}-\overset{O}{\overset{\|}{C}}-O-X_8,\quad X_2-\overset{X_1}{\underset{X_3}{Si}}-N=\overset{X_8}{\underset{X_9}{S}}=O$$

and



wherein X_1, X_2 and X_3 are individually selected from the group consisting of halogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, phenyl, phenylalkyl of 1 to 2 alkyl carbon atoms, cycloalkyl of 5 to 8 carbon atoms and when the X's are not halogen or alkyl, optionally substituted with a member of the group consisting of halogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms and di(lower)alkylamino of 1 to 6 carbon atoms, X_4, X_5, X_6 and X_7 are individually selected from the group consisting of hydrogen and hydrocarbon group of 1 to 8 carbon atoms, with no aliphatic unsaturation and X_6 and X_7 together with the nitrogen atom to which they are attached may form a 5- or 6-membered heterocyclic group which may contain a non-adjacent second hetero atom selected from oxygen and nitrogen, with the provisos that X_6 and X_7 together contain not more than 18 carbon atoms, and X_6 is alkyl with a tertiary carbon atom linked to the depicted nitrogen atom, X_7 is hydrogen, or X_4 and X_6 together with the nitrogen atoms to which they are attached and the carbonyl group complete a 5- or 6-membered heterocyclic group with an ethylene or tri-methylene group in the ring; X_8 and X_9 each are hydrocarbon of 1 to 8 carbon atoms, with no aliphatic unsaturation, X_{10} is selected from the group consisting of hydrogen, hydrocarbon of 1 to 8 carbon atoms with no aliphatic unsaturation and $-Si\equiv(X_1, X_2, X_3)$; X_{11} is alkyl of 1 to 8 carbon atoms; Y is alkylene of 3 to 18 carbon atoms with 3 to 5 carbon atoms between the nitrogen atom and the carbonyl group to which Y is attached; and n is 1 or 2, the aforesaid acid being strong enough not to be substantially silylated under the reaction conditions employed; and hydrolyzing the resulting compound in situ to form a 7β-acylamido-3-methyl-3-cephem-4-carboxylic acid.

4,003,895
1,4-THIAZINES

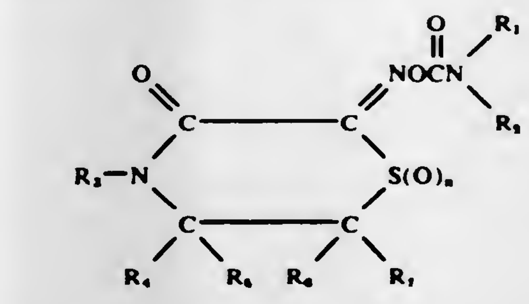
John A. Durden, Jr., South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 319,532, Dec. 29, 1972, Pat. No. 3,894,150. This application Mar. 26, 1975, Ser. No. 562,130

Int. Cl.² C07D *279/12*

U.S. Cl. 260—243 R **11 Claims**

1. A compound having the structure:



wherein:

R_1 and R_2 are individually, hydrogen, lower alkyl, halo substituted lower alkyl, lower alkenyl, lower alkynyl, lower alkoxyalkyl, lower alkyl thioalkyl, lower trihaloalkanesulfenyl or lower alkanoyl, with the proviso that when R_1 is lower trihaloalkanesulfenyl or lower alkanoyl, R_2 is hydrogen or lower alkyl;

R_3 is lower cycloalkyl, lower dialkylamino, lower alkoxyalkyl, lower alkylthioalkyl, lower alkylcarbamoyl, carbamoyl, alkylsulfinylalkyl, alkylsulfonylalkyl, lower furylalkyl, lower tetrahydrofurylalkyl, lower thienylalkyl, lower pyridylalkyl, lower dioxanylalkyl, lower oxazolylalkyl, lower oxathiolanylalkyl or lower dithiolanylalkyl

R_4, R_5, R_6, and R_7 are individually hydrogen or lower alkyl; and

n is 0, 1 or 2.

4,003,896

METHOD OF PREPARING A SPARINGLY SOLUBLE COMPLEX OF CEPHALEXIN

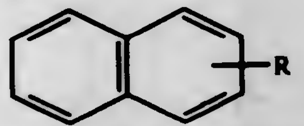
Peter Faarup, Frederiksberg, Denmark, assignor to Novo Industri A/S, Denmark

Filed Dec. 17, 1974, Ser. No. 533,624

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C **7 Claims**

1. A method of preparing a sparingly soluble complex of cephalexin, comprising the step of reacting cephalexin with a compound having the formula:



wherein R is selected from the group consisting of hydrogen, hydroxy, chlorine, nitro, methyl, $-CH_2CN$ and $-COCH_3$.

4,003,897

CARBAMATE PESTICIDAL COMPOUNDS

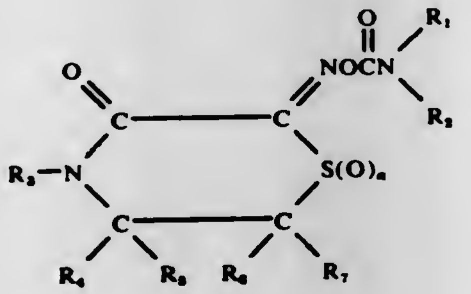
John Apling Durden, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 477,417, June 7, 1974, Pat. No. 3,930,002, which is a continuation-in-part of Ser. No. 319,532, Dec. 29, 1972, Pat. No. 3,894,150. This application Sept. 5, 1975, Ser. No. 610,680

Int. Cl.² C07D *279/12*

U.S. Cl. 260—243 R **13 Claims**

1. A compound of the formula:



wherein:

R_1 is lower trihaloalkanesulfenyl or lower alkanoyl;

R_2 is hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl, or lower alkenyl;

R_4, R_5, R_6 and R_7 are individually hydrogen or lower alkyl; and

n is 0, 1 or 2.

4,003,898

PROCESS FOR THE MANUFACTURE OF CATIONIC DYESTUFFS

Walter Gomm, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

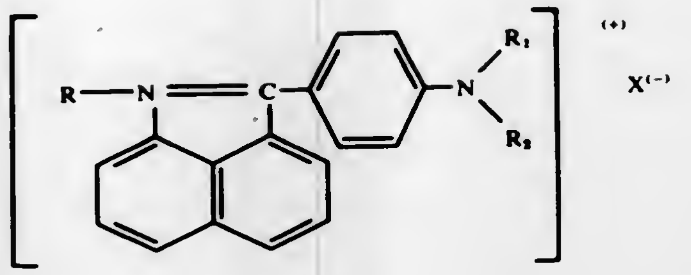
Filed Feb. 26, 1971, Ser. No. 119,393

Claims priority, application Germany, Mar. 6, 1970, 2010579

Int. Cl.² C07D *209/90, 413/06, 401/06, 401/10*

U.S. Cl. 260—247.1 L **6 Claims**

1. Process for the manufacture of cationic dyestuffs of the formula:



wherein

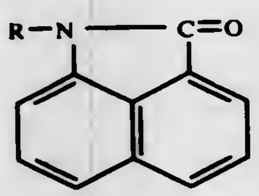
R is alkyl of 1-6 carbon atoms; alkyl of 1–6 carbon atoms substituted by a member of the group consisting of methoxy, ethoxy, methoxycarbonyl, ethoxycarbonyl, dimethylamidocarbonyl, diethylamidocarbonyl, piperidinyl, morpholinyl, chloro, cyano, dimethylamino and diethylamino; cyclohexyl; benzyl; β-phenylethyl; phenyl; phenyl substituted by methyl or methoxy; or trimethylene to form a ring structure attached to the carbon atom of the naphthalene ring adjacent to the carbon atom to which the nitrogen is attached;

R_1 is alkyl of 1–5 carbon atoms; alkyl of 1–5 carbon atoms substituted by a member of the group consisting of chloro, cyano, methoxycarbonyl and ethoxycarbonyl; cyclohexyl; benzyl; phenyl; phenyl substituted by methyl, methoxy, ethoxy or chloro; or trimethylene to form a ring structure when it is attached to the carbon atom of the phenyl ring adjacent to the carbon atom to which the nitrogen is attached;

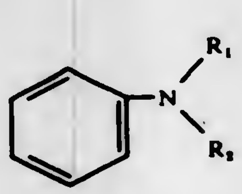
R_2 is alkyl of 1–5 atoms; alkyl of 1–5 carbon atoms substituted by a member of the group consisting of chloro, cyano, methoxycarbonyl and ethoxycarbonyl; cyclohexyl; benzyl; or trimethylene to form a ring structure when it is attached to the carbon atom of the phenyl ring adjacent to the carbon atom to which the nitrogen is attached;

X is an anion;

by condensation at a temperature of 20°–120° C. of a naphtholactam derivative of the formula:



with an aromatic amine of the formula:



wherein R, R_1, and R_2 have the above-described meanings, in the presence of an inorganic acid halide condensation agent and phosphorus pentoxide in the amount of 0.2–2 mols of phosphorus pentoxide per mole of said naphtholactam derivative; the ring structures in each of the foregoing formulas being unsubstituted or substituted with one or more non-ionic substituents from the group consisting of chloro, bromo, methyl, ethyl, methoxy, ethoxy, acetoxy, dimethylamino, and methylsulfonylamino, and additionally, the benzene ring in said formulas may be substituted by a fused benzene ring.

4,003,899

PROCESS FOR RECOVERY OF CYANURIC ACID FROM TREATED CHLORINATOR MOTHER LIQUOR

James L. Manganaro, New York, N.Y., and Ronald H. Carlson, Willingboro, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 443,112, Feb. 15, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,556

Int. Cl.² C07D *251/32*

U.S. Cl. 260—248 A **16 Claims**

1. In a process for recovering cyanuric acid values from the group consisting of cyanuric acid and alkali metal salts thereof and mixtures thereof, isomers and salts, said cyanuric acid values being present in aqueous solution in an effluent mother liquor produced in the preparation of chlorinated isocyanuric acids and salts thereof, and from which mother liquor available free chlorine has been removed by acidification,

the improvement, comprising contacting said effluent mother liquor with aqueous solution of alkali metal cation selected from the group consisting of sodium and potassium, in amounts sufficient to effect precipitation of said cyanuric acid values as corresponding salt from said effluent mother liquor at a pH within the range of about 7 to about 11.

4,003,900

1-BENZYL-5-CHLORO-2-(1H)-PYRIMIDONE

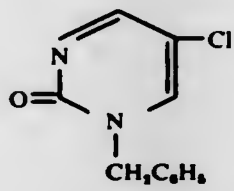
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 11, 1976, Ser. No. 666,024

Int. Cl.² C07D *239/22*

U.S. Cl. 260—251 R **1 Claim**

1. A compound of the formula:



4,003,901

NITROSOUREA DERIVATIVE

Hideo Nakao; Masao Arakawa, and Masami Fukushima, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 307,042, Nov. 16, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 527,017

Claims priority, application Japan, Nov. 20, 1971, 46-93485; Dec. 4, 1971, 46-98034; July 26, 1972, 47-74782

Int. Cl.² C07D *239/42*

U.S. Cl. 260—256.4 N **1 Claim**

1. 1-(2-Chloroethyl)-1-nitroso-3-[(2-methyl-4-aminopyrimidine-5-yl)methyl]urea.

4,003,902

NAPHTHYRIDINOMYCIN ANTIBIOTICS

Dieter Kluepfel, Montreal; Surendra N. Sehgal, Dollard-des-Ormeaux, and Claude Vezina, Oka, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed June 20, 1974, Ser. No. 481,291

Int. Cl.² C07D *498/22*

U.S. Cl. 260—268 PC **1 Claim**

1. Naphthyridinomycin A, which

a. is a ruby red crystalline compound having mp 108° – 110° C (dec) after crystallization from dry ethyl ether;

b. has a molecular formula of $C_{21}H_{27}N_3O_6$;

c. has C, H and N in substantially the following proportions by weight; C, 60.29%; H, 6.63%; and N, 9.93%;

d. exhibits a characteristic absorption maximum in its ultraviolet absorption spectrum of λ_{max} 270 nm, $E_{1cm}^{1\%}$ 248.5 (MeOH);

e. has a specific rotation $[\alpha]_D^{25}$) of + 69.4° (c = 1, $CHCl_3$);

f. is soluble in water methanol, acetone, chloroform, methylene chloride, ethyl acetate and ether; insoluble in hexane;

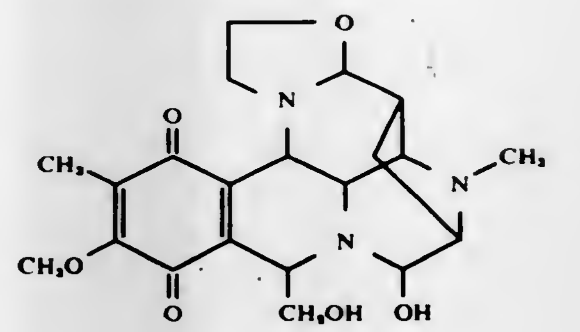
g. has an infrared spectrum as shown in accompanying FIG. 1;

h. has nuclear magnetic resonance spectrum as shown in accompanying FIG. 2;

i. has an Rf of about 0.66 on a thin layer plate of silica gel when using acetone-n-propanol-ethylene dichloride (6:2:3) as the mobile phase;

j. has an Rf of about 0.78 on a thin layer plate of alumina when using benzene-acetone-methanol (7:1.5:1.5) as the mobile phase; and

k. has the structural formula



4,003,903

N-ACYL-N-NORSALUTARIDINES AND PROCESS FOR MAKING THEM

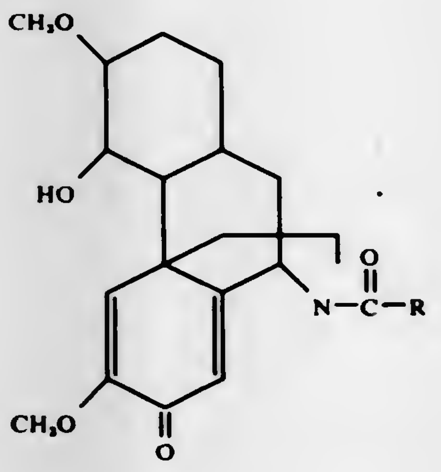
Martin Alan Schwartz, Tallahassee, Fla., assignor to Florida Board of Regents, Tallahassee, Fla.

Filed Feb. 12, 1975, Ser. No. 549,491

Int. Cl.² C07D *217/06*

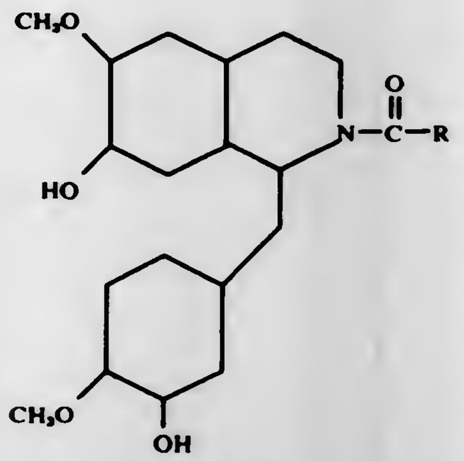
U.S. Cl. 260—285 **19 Claims**

1. Process for synthesizing an N-acyl-N-norsalutaridine of the formula:



where R is hydrogen or an organic radical selected from C_1–C_{12} alkyl, C_6–C_{12} aryl, C_3–C_7 cycloalkyl, C_1–C_{12} alkoxy, C_6–C_{12} aryloxy, C_5–C_8 cycloalkyloxy, C_3–C_{12} alkenyloxy, halogen substituted C_1–C_{12} alkyl, halogen substituted C_6–C_{12} aryl, halogen substituted C_3–C_7 cycloalkyl, halogen substituted C_1–C_{12} alkoxy, halogen substituted C_6–C_{12} aryloxy, halogen substituted C_5–C_8 cycloalkoxy, halogen substituted C_{3-C12} alkenyloxy, C_{1-C8} alkyl substituted with C_1–C_8 alkoxy or C_6–C_{12} aryl, C_1–C_8 alkoxy substituted with C_1–C_8 alkoxy or C_6–C_{12} aryl, C_6–C_{12} aryl substituted with 1-2 C_1–C_2 alkoxy radicals C_6–C_{12} aryloxy substituted on the aryl portion of said aryl radical with 1-2 C_1–C_2 alkoxy radicals, C_1–C_8 alkyl substituted with C_6–C_{12} aryl having 1–2 C_1–C_2 alkoxy radicals substituted on the aryl portion of said aryl radical and C_1–C_8 alkoxy substituted with C_6–C_{12} aryl having 1–2 C_1–C_3 alkoxy radicals substituted on the aryl portion of said aryl radical, said halogen substituent being chlorine or fluorine and the number of substituents being from 1 to 7

which comprises reacting an N-acyl-N-norreticuline of the formula



with thallium tristrifluoroacetate or with a coordinating agent selected from the trifluoroacetates, perchlorates, chlorides, bromides and iodides of palladium, copper, nickel, magnesium, calcium and lithium, and an oxidizing agent selected from manganese dioxide, silver carbonate, silver oxide, vanadyl chloride, ferric chloride and lead dioxide.

4,003,904
ANTI-DIARRHEAL OXADIAZOLES

Gilbert W. Adelstein, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 456,755, April 1, 1974, Pat. No. 3,917,615. This application Apr. 16, 1975, Ser. No. 568,694

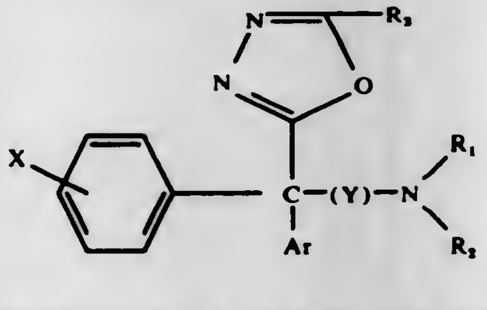
Claims priority, application South Africa, Feb. 26, 1975, 75/1193; Greece, Mar. 26, 1975, 6337

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

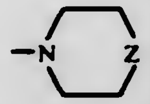
Int. Cl.² C07D *85/54*

U.S. Cl. 260—293.54 **15 Claims**

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein Y is alkylene having 1–4 carbon atoms; R_1 and R_2 together with N is a heterocyclic ring system consisting of an azamonocyclic ring of the formula



wherein Z is oxygen, methylene, phenylhydroxymethylene, phenylcarboxymethylene, phenylloweralkoxymethylene, or an azabicycloalkane structure having 6–9 carbon atoms and having at least 5 atoms in each ring of the azabicycloalkane structure; X is hydrogen, halogen, loweralkyl having 1–7 carbon atoms, or loweralkoxy having 1–7 carbon atoms; and Ar is phenyl, pyridyl, or monosubstituted phenyl wherein the substituent is halogen, loweralkyl having 1–7 carbon atoms, or loweralkoxy having 1–7 carbon atoms when R_3 is hydrogen, or Ar is 3 or 4 pyridyl when R_3 is lower alkyl having 1–7 carbon atoms.

4,003,905
DIELS-ALDER ADDUCTS OF BENZDIAZEPINES

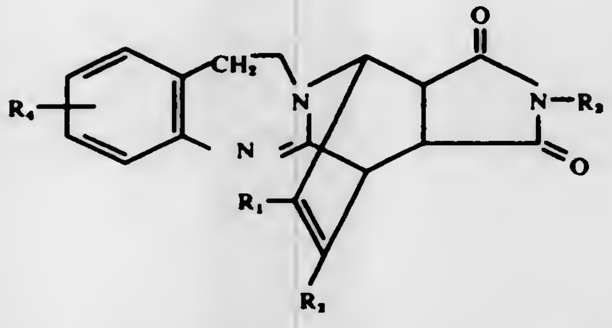
Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 11, 1974, Ser. No. 531,512

Int. Cl.² C07D *471/18, 498/18, 513/18*

U.S. Cl. 260—293.55 **7 Claims**

1. A compound having the structure



wherein R_1 is hydrogen, halogen, alkyl, aryl or arylalkyl; R_2 is hydrogen, alkyl, aryl or arylalkyl; R_3 is hydrogen, alkyl, aryl or arylalkyl; and R_4 is hydrogen, halogen, alkyl, phenyl, dialkylamidosulfonyl or trifluoromethyl; and wherein alkyl and alkoxy refer to groups having 1 to 4 carbon atoms and aryl refers to phenyl or phenyl substituted with halogen, alkyl or alkoxy.

4,003,906
SUBSTITUTED PYRIDINYL METHYLTHIO OR (METHYLSULFONYL)BENZENEAMINES

Alin H. Gulbenk, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 435,608, Jan. 22, 1974, Pat. No. 3,931,200. This application Oct. 14, 1975, Ser. No. 622,195

Int. Cl.² C07D *213/34*

U.S. Cl. 260—294.8 F **6 Claims**

1. The compound which is 4-(((3,6-dichloro-2-pyridinyl)-methyl)thio)benzenamine.

4,003,907
Δ^1-1-AZACYCLOALKENE-2-CARBOXYLIC ACIDS AND THEIR PRODUCTION

Artur Botta, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 27, 1974, Ser. No. 527,582

Claims priority, application Germany, Dec. 1, 1973, 2359990

Int. Cl.² C07D *207/02, 211/08, 223/04*

U.S. Cl. 260—295 R **13 Claims**

1. The process which comprises treating the lactam of a ω-amino-2,2-dihalocarboxylic acid, said lactam having from 6 to 8 lactam ring members, with at least two molar equivalents of a base selected from the group consisting of (a) an oxide, hydroxide or carbonate of lithium, sodium, potassium, magnesium, calcium, strontium or barium, (b) ammonium hydroxide and (c) a quaternary ammonium hydroxide at temperatures of from about 20° to about 180° C to produce a 1-azacycloalk-1-ene-2-carboxylic acid having one less ring member than said lactam.

4,003,908
DERIVATIVES OF IMIDAZO(4,5-b)PYRIDINES

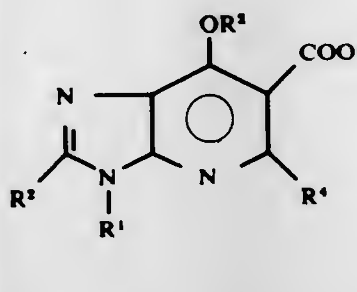
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 11, 1976, Ser. No. 665,754

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 B **14 Claims**

1. A compound of the formula



wherein
- R is hydrogen or lower alkyl;
- R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or cyclo-lower alkyl;
- R^2 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl;
- R^3 is lower alkyl or lower alkenyl;
- R^4 is hydrogen, lower alkyl or phenyl; and physiologically acceptable salts thereof.

4,003,909
[(1,2,4-OXADIAZOL-3-YL)PHENYL]CARBAMIC OR THIOCARBAMIC ACID ESTERS

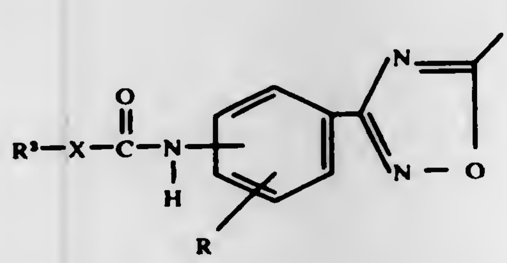
Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 490,643, July 22, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,595

Int. Cl.² C07D *271/06*

U.S. Cl. 260—307 G **10 Claims**

1. A compound of the formula



wherein X is oxygen or sulfur; R is selected from the group consisting of hydrogen, lower alkyl, phenyl, chloro, bromo, lower alkoxy, trifluoromethyl, phenoxy, and di(lower alkyl)-amino; R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of 3 to 6 carbons, phenyl, and substituted-phenyl; and R^2 is selected from the group consisting of lower alkyl, substituted-lower alkyl, lower alkenyl, lower alkynyl; cycloalkyl of 3 to 6 carbons, phenyl and substituted phenyl; said phenyl substituent being one or two members selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, amino, trifluoromethyl, lower alkyl, and lower alkoxy or trimethoxy and said lower alkyl substituent being one or more members selected from the group consisting of chloro, bromo, fluoro and iodo; and the pharmaceutically acceptable salts thereof.

4,003,910
MESO-IONIC SE- AND S-CONTAINING TETRAZOLES

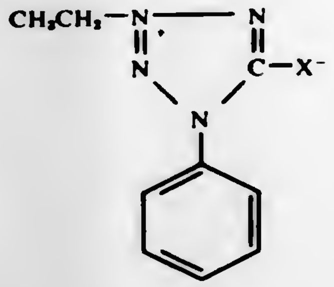
James R. Bartels-Keith, Lexington, and Mary T. Burgess, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 18, 1975, Ser. No. 605,401

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **8 Claims**

1. A compound of the formula



wherein X^- is $—S^-$ or $—Se^-$.

4,003,911
SELECTED 3-PYRROLIDINONES AND 2,4-PYRROLIDINDIONES

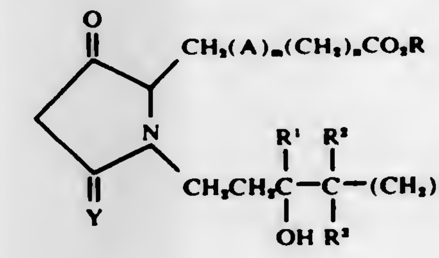
Richard Merrill Scribner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1975, Ser. No. 617,054

Int. Cl.² C07D *207/24*

U.S. Cl. 260—326.2 **13 Claims**

1. A compound of the formula



- Y is O or H_2;
- A is CH═CH, $C \equiv C$ or phenylene;
- *m* is 0 or 1;
- *n* is 0–6;
- R is H, alkali metal, amine salt, alkyl or cycloalkyl of up to 12 carbons;
- R^1 is H, CH_3, C_2H_5, CH═CH_2 or $C \equiv CH$;
- R^2 and R^3 individually are H, F, CH_3 or C_2H_5;
- p is 0–6; and
- Q is CH_3, CF_2CH_3, CF_3, phenyl or phenyl substituted with up to two halogens or alkyls of 1–4 carbons;

with the provisos that when R^1 is not H then R^2 and R^3 are each H; and

that when Q is phenyl or substituted phenyl *p* is 0–3.

4,003,912
DICARBOXIMIDO-N-PHENYLSUBSTITUTED CARBAMATES AND DERIVATIVES

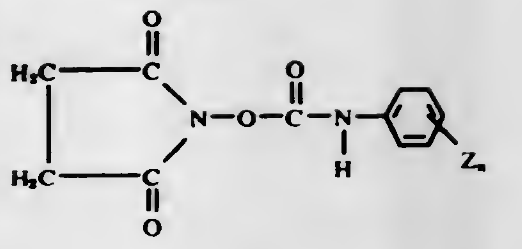
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 368,794, June 11, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 561,013

Int. Cl.² C07D *207/46*

U.S. Cl. 260—326.4 **9 Claims**

1. A compound of the formula



wherein *n* is 0–3 and Z is halo or lower alkoxy.

4,003,913
PYRANO- AND THIOPYRANOINDOLE DERIVATIVES, COMPOSITIONS AND METHODS OF USE

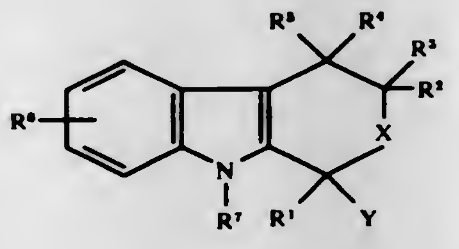
Christopher A. Demerson, Montreal; Lesie G. Humber, Dollard des Ormeaux; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Roxboro, all of Calif., assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 377,837, July 9, 1973, Pat. No. 3,880,853, and a continuation-in-part of Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Mar. 5, 1975, Ser. No. 555,906

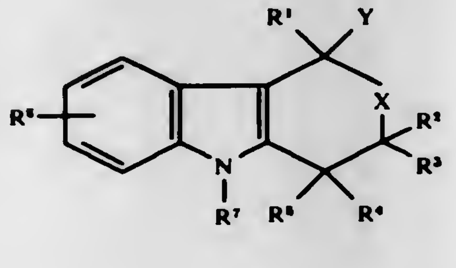
Int. Cl.² C07D *495/04*

U.S. Cl. 260—326.9 **26 Claims**

1. A compound selected from those of the formulae I and I*a*



I

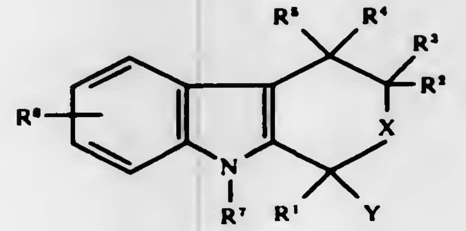


Ia

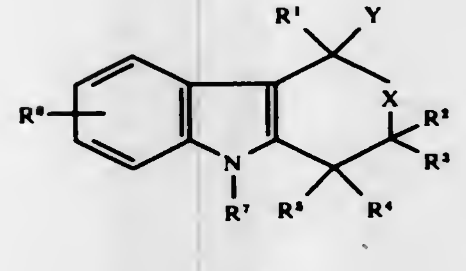
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower(alkyl or an amino(lower)alkyl radical of formula $-Alk-NR^8R^9$ wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl, and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is thio; and Y is lower alkyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of fromula $—Alk—NR^8R^9$ wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is $—Alk-NR^8R^9$ and that in the compounds of formula 1*a*, Y is $-Alk\ NR^8R^9$ as defined herein: or a corresponding acid addition salt thereof with a pharmaceutically acceptable acid.

11. A method of relieving the symptoms of depression in warm blooded animals which comprises:

> administering to said mammal an effective dose of from about 0.1 milligram to about 50 milligrams per kilogram of mammal weight per day of a compound selected from those of the formulae I and 1*a*



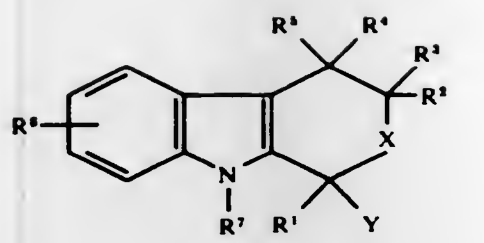
I



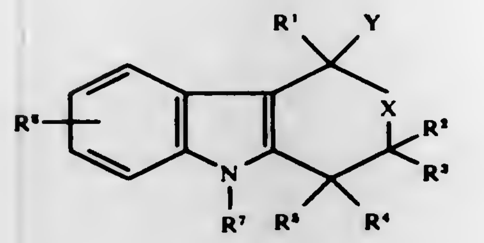
Ia

in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula $-Alk-NR^8R^9$ wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$, and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is thio; and Y is lower alkyl, phenyl(lower)alkyl or an amino(-lower)alkyl radical of formula $—Alk—NR^8R^9$ is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is $—Alk—NR^8R^9$ and that in the compounds of formula 1*a*, Y is $-Alk\ -NR^8R^9$ as defined herein: and the corresponding acid addition salt with a pharmaceutically acceptable acid.

19. A pharmaceutical composition, which comprises: a compound selected from those of the formulae I and I*a*



I



Ia

in which R^1 is lower alkyl or lower cycloalkyl; R^2. R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula $—Alk—NR^8R^9$ wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl, and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is thio; and Y is lower alkyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula $—Alk—NR^8R^9$ wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is $-Alk-NR^8R^9$ and that in the compounds of formula 1*a*, Y is $-Alk\ -NR^8R^9$ as defined herein: and the corresponding acid addition salt with a pharmaceutically acceptable acid; and a pharmaceutically acceptable carrier.

4,003,914
SULPHUR CONTAINING DERIVATIVES

Henri Ramuz, Birsfelden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

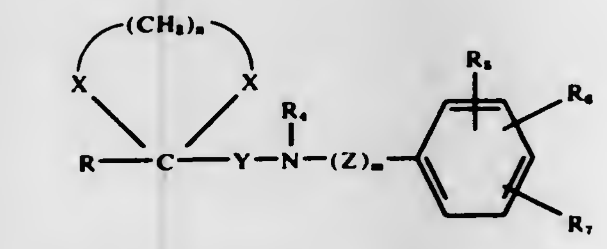
Filed Dec. 16, 1974, Ser. No. 532,990

Claims priority, application Switzerland, Dec. 21, 1973, 18030/73; Nov. 16, 1974, 15248/74

Int. Cl.² C07D *339/06*

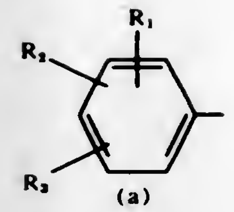
U.S. Cl. 260—327 M **15 Claims**

1. A compound of the formula



(1)

, wherein R is a group of the formula



(a)

in which R_1, R_2 and R_3 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, aryl-(lower alkoxy), aryloxy, phenyl, nitro, amino, lower alkylthio, trifluoromethyl, hydroxy, cyano, di(lower alkyl)amino, lower alkanoylamino, carboxyl, lower alkoxycarbonyl, lower alkylsulphonyl, hydroxymethyl, lower alkanoyloxy, containing amido, lower alkanoyl, sulphamoyl, mono(lower alkyl)-sulphamoyl, di(lower alkyl) sulphamoyl, aminocarbonyloxy, mono(lower alkyl)-amino-carbonyloxy, di(lower alkyl)aminocarbonyloxy or (lower alkylamino)-(lower alkyl) in which "aryl" means unsubstituted or substituted phenyl. The substituent being selected from halogen, lower alkyl, lower alkoxy, nitro and amino; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy; X is a sulphur atom, SO or SO_2; Y is a straight-chain or branched-chain, aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; and Z is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and contaning 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain;

m is zero or 1 and *n* is 2 or 3, and acid addition salts thereof.

4,003,915
TRICYCLIC IMINES

Philippe Dostert, Versailles, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

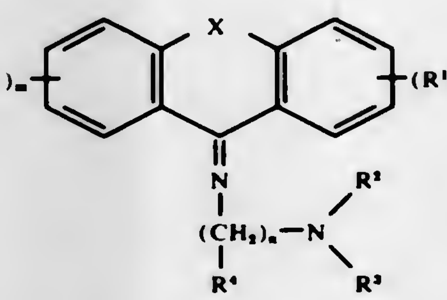
Division of Ser. No. 433,318, Jan. 14, 1974, Pat. No. 3,905,972, which is a division of Ser. No. 184,901, Sept. 29, 1971, Pat. No. 3,803,234. This application June 19, 1975, Ser. No. 588,268

Claims priority, application Switzerland, Oct. 9, 1970, 14972/70

Int. Cl.² C07D *337/12*

U.S. Cl. 260—327 B **3 Claims**

1. A compound of the formula



wherein X is thiomethylene; R^1 is hydrogen or lower alkyl; R^2 and R^3, individually, are hydrogen or lower alkyl; R^4 is hydrogen or lower alkyl; and *n* is an integer from 2 to 5; and *m* is an integer from 1 to 3,

or a pharmaceutically acceptable acid addition salt thereof.

4,003,916

TOTAL SYNTHESIS OF STEGANACIN AND DERIVATIVES THEREOF

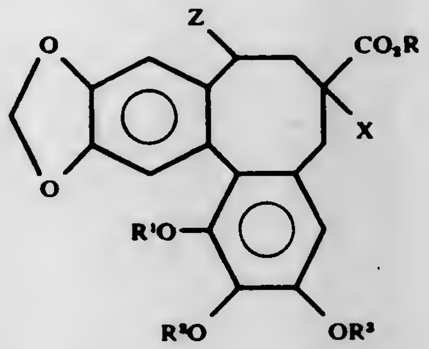
Andrew S. Kende, 19 Larchwood Drive, Pittsford, N.Y. 14534, and Lanny S. Liebeskind, 185 Freeman St., Apt. 446, Brookline, Mass. 02146

Filed Dec. 22, 1975, Ser. No. 642,954

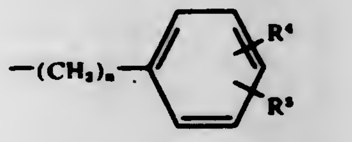
Int. Cl.² C07D *317/44*

U.S. Cl. 260—340.5 **12 Claims**

1. A compound having the formula

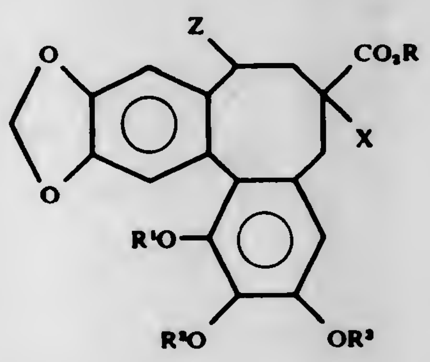


in which Z is H, hydroxy or oxo (=O), X is H or $-CO_2R$, R is H, (lower)alkyl of 1 to 5 carbon atoms, or a radical of the formula

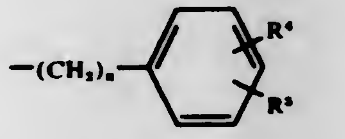


wherein *n* is an integer of 0 to 5 and R^4 and R^5 are alike or different and each is H, (lower)alkyl, Cl, Br, I, H, (lower)alkoxy, CF_3 or NO_2, and R^1, R^2 and R^3 are alike or different and each is H or (lower)alkyl of 1 to 3 carbon atoms; or a metallic or amine cationic salt thereof when R is H.

9. A process for the preaparation of the compound having the formula

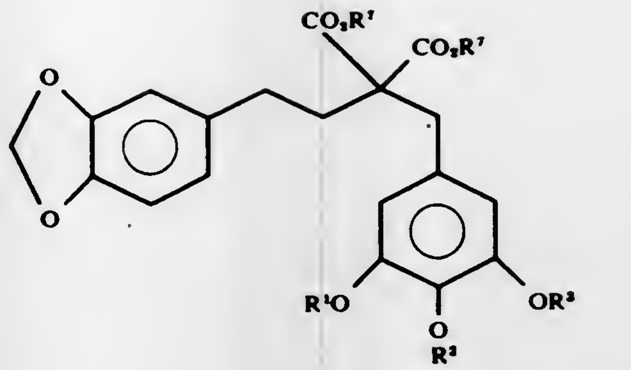


in which Z is H, hydroxy or oxo (=O), X is H or $-CO_2R$, R is H, (lower)alkyl of 1 to 5 carbon atoms or a radical of the formula



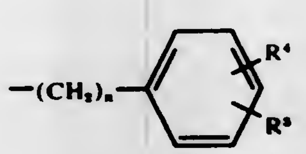
wherein *n* is an integer of 0 to 5 and R^4 and R^5 are alike or different and each is H, (lower)alkyl, Cl, Br, I, F, (lower)alkoxy, CF_3 or NO_2, and R^1, R^2 and R^3 are alike or different and each is H or (lower)alkyl of 1 to 3 carbon atoms, which process comprises the consecutive steps of

A. treating the compound having the formula

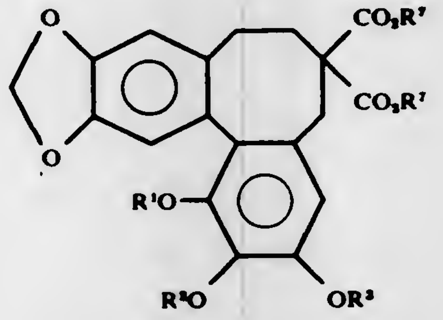


4

in which R^7 is (lower)alkyl of 1 to 5 carbon atoms or a radical having the formula



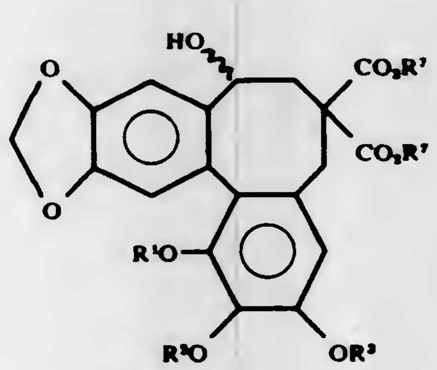
wherein *n* is an integer of 0 to 5 and R^4 and R^5 are alike or different and each is H, Cl, Br, I, (lower)alkoxy, CF_3 or NO_2, with an excess of VOF_3 or $VOCl_3$ in the presence of trifluoroacetic anhydride to produce the compound having the formula



5

in which R^7, R^1, R^2 and R^3 are as defined above; and when desired

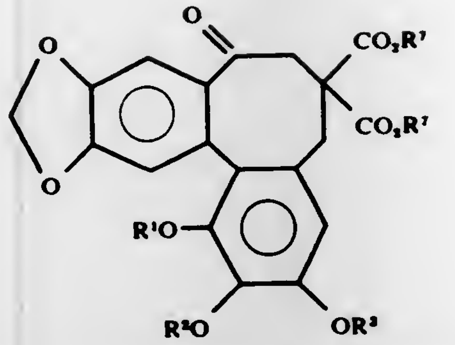
B. treating compound 5 with N-bromosuccinimide in the presence of a catalytic amount of benzoyl peroxide, followed sequentially by silver trifluoroacetate and weak base to produce the compound having the formula



6

in which R^7, R^1, R^2 and R^3 are as defined above; and when desired

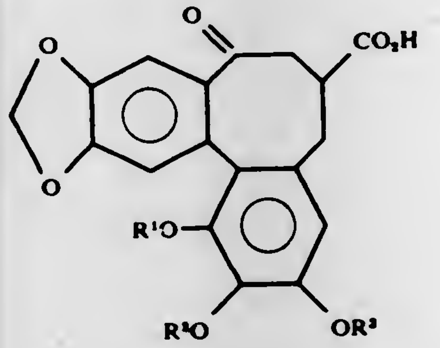
C. treating compound 6 with an oxidizing agent selected from the group consisting of Jones reagent and dipyridine-chromium trioxide to produce the compound having the formula



7

in which R^7, R^1, R^2 and R^3 are as defined above; and when desired

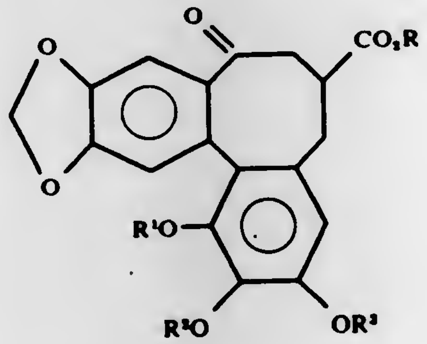
D. saponifying compound 7 to produce the corresponding ketodiacid, then heating the resulting ketodiacid until decarboxylation occurs to produce the compound having the formula



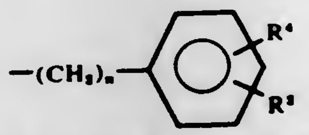
8a

in which R^1, R^2 and R^3 are as defined above; and when desired

E. esterifying compound 8*a* to produce the compound having the formula



in which R is (lower)alkyl of 1 to 5 carbon atoms or a radical having the formula



wherein *n* is an integer of 0 to 5 and R^4 and R^5 are alike or different and each is H, (lower)alkyl, Cl, Br, I, F, (lower)alkoxy, CF_2 or NO_2.

4,003,917

SILOXANEDIOLATE COMPLEXES AND PREPARATION THEREOF

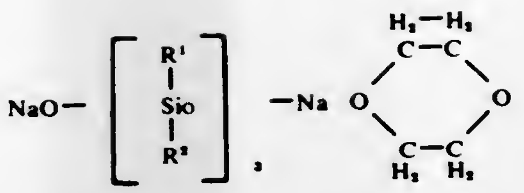
Terry G. Selin, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 602,490, Dec. 19, 1966, Pat. No. 3,923,834. This application May 27, 1975, Ser. No. 581,146

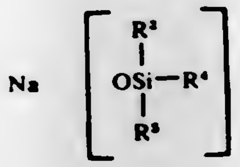
Int. Cl.² C07D *319/10*

U.S. Cl. 260—340.6 **7. Claims**

1. A process for forming a siloxanediolate complex having the formula

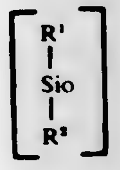


which comprises: reacting a metalsilanolate having the general formula



$$Na\left[OSi(R^3)(R^4)(R^5)\right]$$

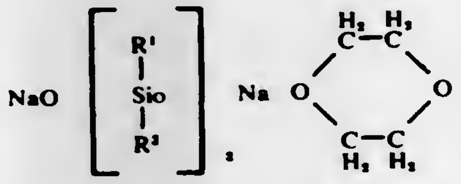
wherein R^3, R^4, and R^5 are hydrocarbyl radicals, with a cyclic polysiloxane having the general formula



$$\left[Si(R^1)(R^2)O\right]_b$$

in the presence of p-dioxane, where *b* is an integer of at least 3 and R^1, R^2 are aryl radicals.

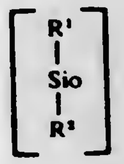
6. A process for forming a siloxanediolate complex having the formula



which comprises: reacting a metal alkoxide having the general formula

$NaOR^3$

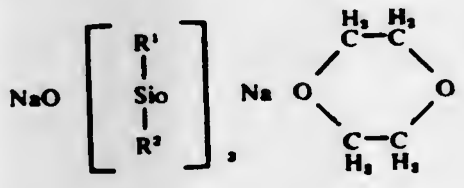
wherein R^3 is a hydrocarbyl group, with a cyclic polysiloxane having the general formula



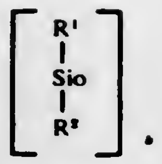
$$\left[Si(R^1)(R^2)O\right]_b$$

in the presence of p-dioxane, where *b* is an integer of at least 3, wherein R^1, R^2 are aryl radicals.

7. A process for forming a siloxanediolate complex having the formula



which comprises: reacting sodium hydroxide with a cyclic polysiloxane having the general formula



$\left[-\mathrm{Si}(R^1)(R^2)\mathrm{O}- \right]_b$

in the presence of p-dioxane, where *b* is an integer equal to at least 3, wherein R^1, R^2 are aryl radicals.

4,003,918
PRODUCTION OF 2-VINYL-1,3-DIOXANE COMPOUNDS

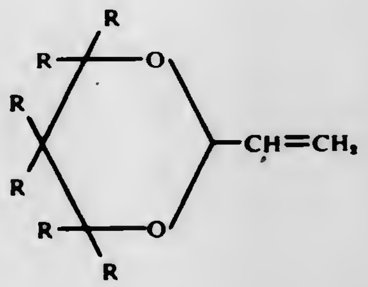
Oscar Richard Hughes, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,618

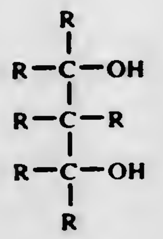
Int. Cl.² C07D *319/04*

U.S. Cl. 260—340.7 **9 Claims**

1. An improved process for producing 2-vinyl-1,3-dioxane compounds corresponding to the formula:



which process comprises (1) forming a liquid mixture of acrolein and diol compound of the formula:



$R_2C(OH)-CR_2-C(OH)R_2$

wherein R is hydrogen or an alkyl group containing between one and about five carbon atoms, and (2) contacting the acroleindiol liquid mixture with solid perfluoro sulfonic acid cation exchange resin in acid form at a reaction temperature in the range between about −20° C and 100° C for a reaction period sufficient to achieve an equilibrium condensation between acrolein and diol compound.

4,003,919
ANTIOXIDANT CHROMAN COMPOUNDS

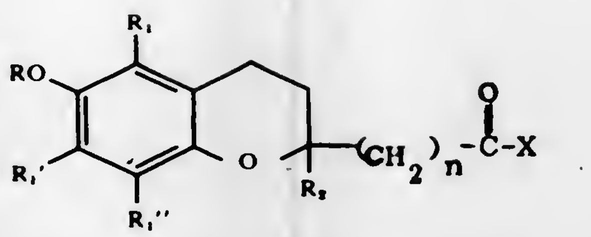
John William Scott, Upper Montclair; David Richard Parrish, Glen Ridge, and Gabriel Saucy, Essex Falls, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 417,465, Nov. 19, 1973, Pat. No. 3,947,473, which is a continuation-in-part of Ser. No. 317,566, Dec. 22, 1972, abandoned. This application Dec. 4, 1975, Ser. No. 637,547

Int. Cl.² C07D *311/72*

U.S. Cl. 260—345.5 **5 Claims**

1. A compound of the formula



wherein R_1, R_1' and R_1'' are hydrogen or lower alkyl; *n* is an integer from 0 to 1; R_2 is hydrogen, lower alkyl or phenyl; R is lower alkanoyl, benzoyl, benzyl, benzylhydryl or tetrahydropyranyl; and X is halogen.

4,003,920
METHOD FOR PRODUCING MALEIC ANHYDRIDE USING A PROMOTED TUNGSTEN, PHOSPHOROUS OXIDE CATALYST

Ryuhei Ueeda, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 301,933, Oct. 30, 1972, Pat. No. 3,906,008. This application Nov. 30, 1973, Ser. No. 420,742

Claims priority, application Japan, Dec. 4, 1972, 47-121865; Dec. 4, 1972, 47-121866; Dec. 4, 1972, 47-121867; Dec. 4, 1972, 47-121868

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 A **10 Claims**

1. A method for preparing maleic anhydride which comprises oxidizing in the vapor phase an unsaturated hydrocarbon selected from the group consisting of butene-1, butene-2, butadiene, cyclopentadiene, pentene-1, mixtures thereof and C_4-fractions obtained by naphtha cracking in a reaction zone at a temperature of from 250° to 650° C, in the presence of a catalyst consisting essentially of the oxides of tungsten and phosphorous of a metallic element belonging to groups III-A, III-B, IV-A and VIII of the periodic table, arsenic, zirconium, antimony and niobium.

4,003,921
PROCESS FOR THE PRODUCTION OF AZOMETHINES

Werner Kluy, Stiepel; Hans Feichtinger, and Jurgen Falbe, both of Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Germany

Continuation of Ser. No. 326,181, Jan. 24, 1973, abandoned. This application May 1, 1975, Ser. No. 573,729

Claims priority, application Germany, Jan. 24, 1973, 2205791

Int. Cl.² C07C *119/00*

U.S. Cl. 260—347.7 **14 Claims**

1. A process for the production of an azomethine, which comprises reacting a saturated or unsaturated aliphatic, cycloaliphatic, aromatic or heterocyclic aldehyde with ammonia and hydrogen at atomspheric pressure and at a temperature of 20° to 200° C in the presence of a catalyst containing at least one metal of group VIII B of the periodic table.

4,003,922
SYNTHESIS OF CIS-1,4-CYCLOHEXADIENE DIOXIDE

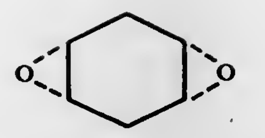
Gerry Kavadias, St-Lambert, and Bernard Belleau, Westmount, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 634,396, Nov. 24, 1975. This application Feb. 10, 1976, Ser. No. 656,919

Int. Cl.² C07D *301/14*

U.S. Cl. 260—348.5 L **3 Claims**

1. A process for the preparation of the compound having the formula



which process comprises the oxidizing of 1,4-cyclohexadiene with m-chloroperbenzoic acid in a temperature range of about −10° C. to about +35 ° C to produce a mixture of cis-and trans- bisepoxides in a ratio of about 2:1, respectively, and separating the cisbisepoxide from the mixture.

4,003,923
PREPARATION OF QUINONES

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 19, 1975, Ser. No. 551,128

Int. Cl.² C07C *49/68, 49/62*

U.S. Cl. 260—369 **5 Claims**

1. A process for the production of quinones which comprises reacting an aromatic compound selected from the group consisting of acenaphthene, fused ring compounds having from 14 to 22 carbon atoms per molecule and containing from 3 to 5 six-membered carbocyclic rings, and monosulfonic acid derivatives thereof, with oxygen in the liquid phase in a carboxylic acid medium in the presence of a catalyst system consisting of a mixture of a copper compound and an alkali metal compound, wherein said copper compound is selected from the group consisting of the carboxylates, halides, oxides and carbonates thereof, and wherein said alkali metal compound is selected from the group consisting of the halides, carboxylates and oxides thereof, said reaction being carried out at a temperature in the range of from 30° to about 200° C and a pressure in the range of from 0.1 to about 750 psig of oxygen above autogenous pressure at the temperature employed, wherein said copper compound is present in an amount ranging from about 0.1 to about 50 mole percent based on said aromatic compound and said alkali metal compound is present in an amount ranging from 0.1 to 2 molar based on said carboxylic acid medium.

4,003,924
PROCESS FOR PREPARING 1-AMINO ANTHRAQUINONE

Wolfgang Auge, Odenthal-Hahnenberg; Karl-Werner Thiem, Cologne; Rutger Neeff, Leverkusen; Paul Losacker, Leichlingen, and Rudolf Braden, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 3, 1975, Ser. No. 546,833

Claims priority, application Germany, Mar. 5, 1974, 2410310

Int. Cl.² C07C *97/24*

U.S. Cl. 260—382 **13 Claims**

1. Process for preparing 1-amino-anthraquinone which comprises treating a reaction mixture containing 1-amino-anthraquinone imine, after substantially or completely removing ammonia therefrom, with water thereby converting said 1-amino-anthraquinone imine into 1-amino-anthraquinone.

4,003,925
PURIFICATION OF SODIUM ISETHIONATE

Vincent Lamberti, Upper Saddle River, and Beth Ann Di Lorenzo, Ridgewood, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 456,576, April 1, 1974, abandoned. This application June 12, 1975, Ser. No. 586,323

Int. Cl.² C07C *143/10*

U.S. Cl. 260—513 R **6 Claims**

1. A process for the extraction of ethylene glycol impurity from an aqueous solution of sodium isethionate having dissolved therein said sodium isethionate in an amount of about 40% to about the saturation level thereof and wherein said ethylene glycol impurity is present in an amount of about 0.05% by weight to about 3% by weight comprising the steps of:

i. contacting said aqueous solution with an amount sufficient to result in said extraction of a solvent selected from the group consisting of n-propanol, isopropanol, 2-butanol, isobutanol, n-butanol and mixtures thereof at a temperature of about 15° C to a temperature of about 10° C below the boiling point of the solvent selected, wherein a solvent phase and an aqueous phase are formed, and

ii. removing the solvent phase containing the extracted ethylene glycol.

4,003,926
HERBICIDAL 2-ARYLAMINOCARBONYL-1-CYCLOHEXENE-1-CARBOXYLIC ACIDS AND SALTS THEREOF

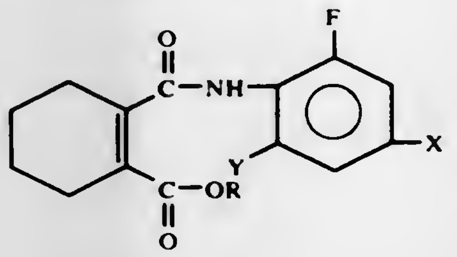
Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1975, Ser. No. 545,602

Int. Cl.² C07C *63/12*

U.S. Cl. 260—518 A **4 Claims**

1. A compound of the formula

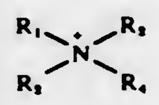


wherein

X is chlorine, bromine or fluorine;

Y is hydrogen or fluorine provided that when Y is fluorine, X is fluorine;

R is hydrogen or a cation selected from sodium, lithium, potassium, calcium, magnesium, zinc, manganese, barium or



$R_1R_2R_3R_4N^+$

wherein

R_1, and R_2, and R_3 can be the same or different and each can be hydrogen alkyl of 1 through 4 carbon atoms or hydroxyalkyl of 2 through 4 carbon atoms;

R_4 is hydrogen, alkyl of 1 through 12 carbon atoms, benzyl, or NR_5R_6 where R_5 is hydrogen or alkyl of 1–4 carbon atoms and R_6 is hydrogen or alkyl of 1 through 4 carbon atoms.

4,003,927
(1-OXO-7,8-DISUBSTITUTED-1,2,3,4-TETRAHYDRO-6-NAPHTHYLOXY)- AND (3,4-DISUBSTITUTED-5-OXO-6,7,8,9-TETRAHYDRO-5H-BENZOCYCLOHEPTENE-2-YLOXY) ACETIC ACIDS AND DERIVATIVES

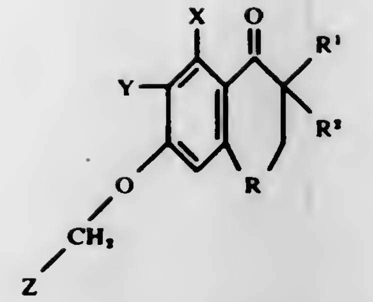
Otto W. Woltersdorf, Jr., Chalfont; Edward J. Cragoe, Jr., Lansdale; Everett M. Schultz, Ambler, and Gerald E. Stokker, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 12, 1973, Ser. No. 405,980

Int. Cl.² C07C *63/595*

U.S. Cl. 260—520 D **1 Claim**

1. A compound of the formula:



wherein R is methylene; R^1 is cyclopentyl; R^2 is C_1 to C_4 alkyl or hydrogen; X and Y are independently halogen or methyl; and Z is carboxy or a carboxylate salt of physiologically acceptable non-toxic cations.

4,003,928

PROCESS FOR THE PREPARATION OF UREA

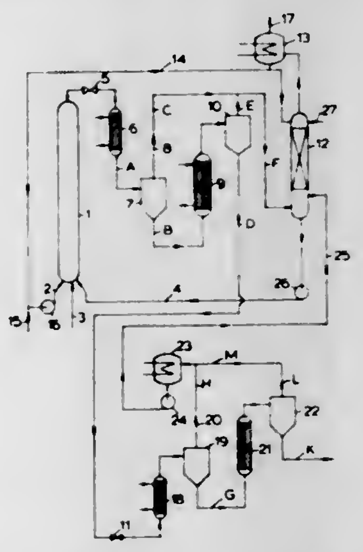
Antonius M. A. Heunks, Geleen, Netherlands, assignor to Stamicarbon N.V., Geleen, Netherlands

Continuation of Ser. No. 222,274, Jan. 31, 1972, abandoned. This application June 24, 1974, Ser. No. 482,763

Claims priority, application Netherlands, Feb. 3, 1971, 7101398

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 A **4 Claims**



1. In a process for the preparation of urea having at least three successively lower pressure stages comprising:

a urea-synthesis pressure stage wherein ammonia and carbon dioxide together with recycled ammonium carbamate are fed into a urea-synthesis reactor in an overall ammonia to carbon dioxide ratio of 3–5 to 1 and reacted at a pressure of at least 160 atmos. absolute and at a temperature of at least 160° C thereby forming an aqueous urea solution, said aqueous urea solution also containing ammonium carbamate and excess ammonia; and

at least two ammonium carbamate decomposition pressure stages wherein the aqueous urea solution from the next higher pressure stage is reduced in ammonium carbamate and excess ammonia content, each of such ammonium carbamate decomposition pressure stages having the process steps including:

the adiabatic expansion of said aqueous urea solution from the next higher pressure stage thereby decomposing ammonium carbamate,

a first separation wherein the expanded aqueous urea solution is separated into a first off-gas stream and a residual aqueous urea solution,

heating said residual aqueous urea solution thereby further decomposing ammonium carbamate,

a second separation wherein said heated residual aqueous urea solution is separated into a second off-gas stream and an aqueous urea solution reduced in ammonium carbamate content,

combining said first and said second off-gas streams into a combined off-gas stream, and

condensing and recycling said combined off-gas stream to the next higher pressure stage,

the improvement consisting essentially in including in at least one of said ammonium carbamate decomposition pressure stages, the step of preliminary heating of said expanded aqueous urea solution prior to said first separation, so as to increase the temperature of said expanded aqueous urea solution to no more than 20° C above the temperature of said expanded aqueous urea solution, said temperature increase further constituting no more than 40% of the total temperature increase in said at least one of said ammonium decomposition pressure stages subsequent to said expansion.

4,003,929

ANTIVIRAL SUBSTITUTED PHENYLENEDIMETHYLENE DIAMINES

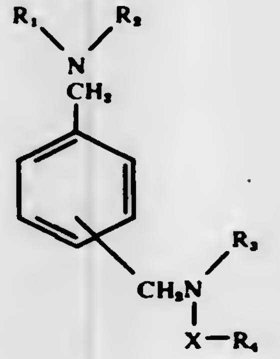
Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 543,824, March 11, 1975, abandoned. This application Sept. 10, 1975, Ser. No. 611,856

Int. Cl.² C07C *143/74, 143/75;* **A61K** *31/18*

U.S. Cl. 260—556 A **5 Claims**

1. A compound of the structure

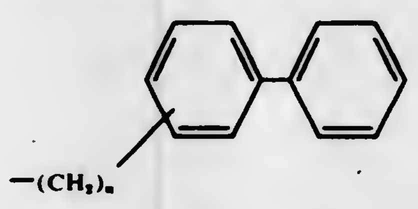


and its acid addition salts;

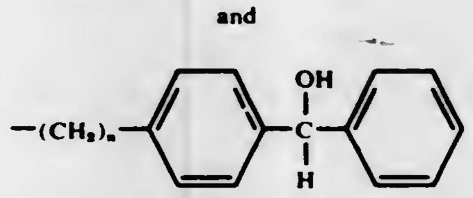
R_1 is selected from the group consisting of hydrogen, methyl and 2-hydroxyethyl;

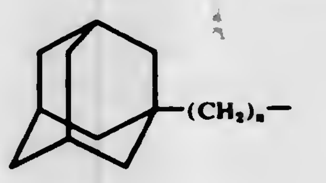
R_2 is selected from the group consisting of hydrogen, lower alkyl having 1 to 6 carbon atoms and ω-hydroxyalkyl having 1 to 6 carbon atoms;

R_3 is selected from the group consisting of alkyl having from 12 to 24 carbons, a monovalent aliphatic non-cyclic hydrocarbon having from 12 to 24 carbon atoms and 1 to 2 double bonds therein,



and

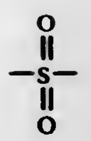




wherein

n is an integer from one to six;

X is



$$-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle O}{\|}}{S}}-$$

and R_4 is selected from the group consisting of alkyl having from 12 to 24 carbon atoms, a monovalent noncyclic aliphatic hydrocarbon having from 12 to 24 carbon atoms and 1 to 2 double bonds therein, ω-hydroxyalkyl having 1 to 6 carbon atoms and phenylalkyl having up to three carbon atoms in the alkyl moiety.

4,003,930

2,3-TRANS-5-[3-(AMINO)-2-HYDROXY-PROPOXY]-1,2,3,4-TETRAHYDRO-3-(OR 2)-AMINO-2-(OR 3)-HYDROXY-NAPHTHALENES AND SALTS THEREOF

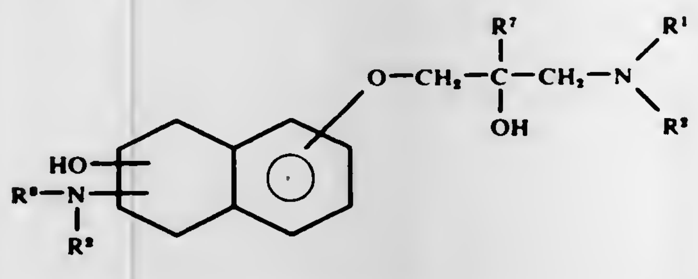
Frederic P. Hauck, Somerville; Christopher M. Cimarusti, Hamilton, both of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 268,301, July 3, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,859

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **9 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R^1, R^2, R^8 and R^9 are each independently selected from the group consisting of hydrogen, lower alkyl, and aryl-lower alkyl and R^7 is selected from the group consisting of hydrogen and methyl, and wherein lower alkyl refers to alkyl groups having up to 8 carbon atoms and aryl refers to phenyl or phenyl substituted with lower alkyl, halogen or nitro.

4,003,931

DERIVATIVES OF ALPHA-METHYL BENZYLAMINE

Michèle Moreau; Isaac Karadavidoff, both of Paris, and Claude Rissé, Saint-Michel-sur-Orge, all of France, assignors to Fuveau S.A., Paris, France

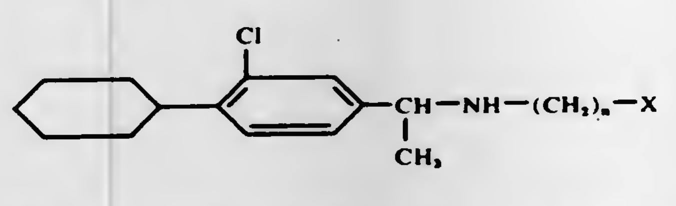
Filed Oct. 27, 1971, Ser. No. 193,175

Claims priority, application France, Oct. 28, 1970, 70.38818; July 15, 1971, 71.25902

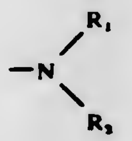
Int. Cl.² C07C *87/28*

U.S. Cl. 260—570.5 P **5 Claims**

1. Compounds of formula:



in which X is hydrogen, halogen or an amine group of the formula



$$-N\begin{matrix} \diagup R_1 \\ \diagdown R_2 \end{matrix}$$

in which R_1 and R_2 are each hydrogen or a lower alkyl group, *n* is equal to 1, 2, or 3 and may equal 0 when X is hydrogen and their addition salts of pharmaceutically acceptable acids.

4,003,932

AMINOALKYLETHERS

Johan Gootjes, Heerhugowaard, Netherlands, assignor to Gist-Brocades N.V., Netherlands

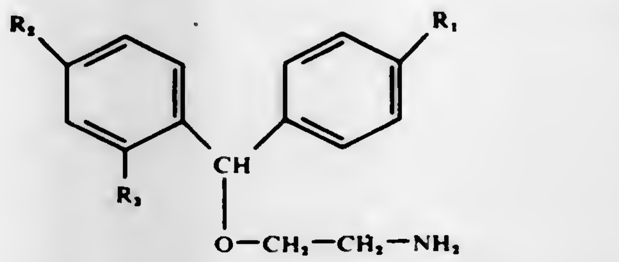
Filed Mar. 6, 1973, Ser. No. 338,621

Claims priority, application United Kingdom, Mar. 7, 1972, 10543/72

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570 R **5 Claims**

1. Diphenylmethoxyethylamines of the general formula



II

in which R_1 represents a fluoride, bromine or chlorine atom, R_2 represents a hydrogen or fluorine atom; and R_3 represents a hydrogen, fluorine or chlorine atom; with the provisos that R_3 is a hydrogen atom when R_2 is a fluorine atom, R_1 is a fluorine atom when R_3 is a chlorine atom and R_1 is a fluorine or bromine atom when R_2 and R_3 both are hydrogen atoms; and their non-toxic acid addition salts; and having dopamenergic activity.

4,003,933

HYDROGENATION OF NITRILES IN ABSENCE OF SECONDARY REACTION SUPPRESSANT

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 16, 1975, Ser. No. 596,350

Int. Cl.² C07C *87/14*

U.S. Cl. 260—583 K **16 Claims**

1. A process for the catalytic hydrogenation of at least one nitrile having the formula $(A)_xR(C \equiv N)_y$ wherein x is zero or an integer and y is an integer, R is a hydrocarbyl radical having a valence of $x+y$, and each A is selected from the group consisting of $-OR'$ and $-NR'_2$ wherein each R' is individually selected from the group consisting of hydrogen and hydrocarbyl radicals having from 1 to 10 carbon atoms, to produce primary amines; comprising contacting said at least one nitrile with hydrogen and a catalyst under first suitable hydrogenation conditions in the at least substantial absence of any secondary amine formation suppressant; said catalyst comprising at least one first component selected from the group consisting of elemental Group VIII metals and compounds of Group VIII metals which are reducible by hydrogen to the corresponding elemental metal at said hydrogenation conditions, and at least one second component selected from the group consisting of elemental Group IVB metals and compounds of Group IVB metals which are reducible by hydrogen to the corresponding elemental metal at said hydrogenation conditions.

4,003,934

DI-BICYCLO[3.1.1] AND [2.2.1]HEPTYL AND DI-BICYCLO[3.1.1] AND [2.2.1]HEPTENYL KETONES

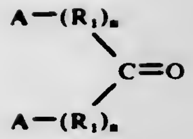
Nathaniel Grier, Englewood, N.J., and Richard A. Dybas, Center Square, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 2, 1975, Ser. No. 609,772

Int. Cl.² C07C *49/61, 49/43*

U.S. Cl. 260—586 G **20 Claims**

1. A compound of the formula:

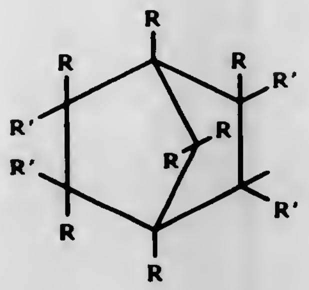


$$\begin{array}{l} A-(R_1)_n \\ \qquad \diagdown \\ \qquad\quad C=O \\ \qquad \diagup \\ A-(R_1)_n \end{array}$$

where:

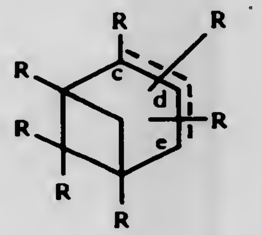
each A is alike or different and is a [2.2.1] bicyclic group of the formula:

a.



or a [3.1.1] bicyclic group of the formula:

b.



where R is alike or different and is hydrogen or C_1 to C_4 alkyl, R' is alike or different and is hydrogen or C_1 to C_4 alkyl or R' on adjacent carbon atoms taken together comprise an olefinic bond, and the dashed line indicates either saturation or c-, d- or d-, e- unsaturation;

each R_1 is alike or different and is C_1 to C_4 alkylene; and each *n* is alike or different and is the integer 0 or 1.

4,003,935

7-METHYL-OCTAHYDRO-1,4-METHANO-NAPHTHAL-EN-6-ONE

Erling Sundt, Pinchat-Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

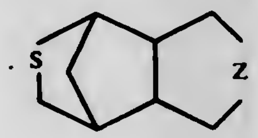
Division of Ser. No. 528,729, Dec. 2, 1974, Pat. No. 3,968,070, which is a continuation of Ser. No. 292,723, Sept. 27, 1972, abandoned. This application Feb. 27, 1976, Ser. No. 662,251

Claims priority, application Switzerland, May 19, 1972, 7456/72; Oct. 11, 1971, 14784/71

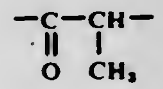
Int. Cl.^{2} C07C *49/36*

U.S. Cl. 260—586 G **1 Claim**

1. Cycloaliphatic compounds of formula



wherein the symbol Z represents a radical of formula



$$-\underset{\underset{O}{\|}}{C}-\underset{\underset{CH_3}{|}}{CH}- \qquad (d)$$

and X represents a divalent radical of formula

$-CH_2$ (e)

4,003,936

2-HYDROCINNAMPYL-1,3-CYCLOPENTANEDIONES

Masaji Ohno; Mutsuo Kataoka, and Norio Kawabe, both of Kamakura, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

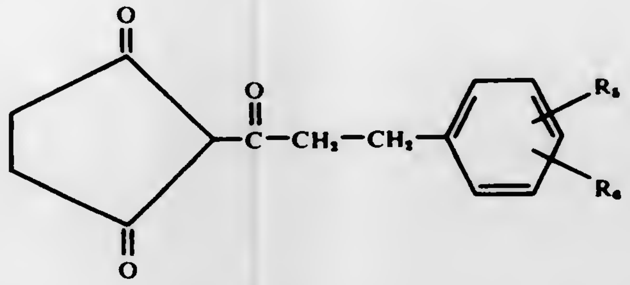
Filed Nov. 26, 1971, Ser. No. 202,597

Claims priority, application Japan, Dec. 15, 1970, 45-111292; Mar. 8, 1971, 46-11787; Apr. 15, 1971, 46-23501

Int. Cl.^{2} C07C *49/76, 49/80, 49/82, 49/84*

U.S. Cl. 260—590 C **13 Claims**

1. 2-hydrocinnamoyl-1,3-cyclopentanedione of the formula:



wherein R_5 and R_6 may be the same or different and may be halogen, hydroxyl, a lower alkyl of 1–4 carbon atoms or a lower alkoxyl of 1–4 carbon atom.

4,003,937

METHOD FOR THE PREPARATION OF YTTERBIUM(III) BETA-DIKETONATES

Pierpaolo Garibaldi, San Donato Milanese, and Fausto Calderazzo, Ghezzano, both of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Dec. 10, 1975, Ser. No. 639,445

Claims priority, application Italy, Dec. 10, 1974, 30337/74

Int. Cl.^{2} C07F *5/00*

U.S. Cl. 260—429.2 **6 Claims**

1. A method for the preparation of ytterbium (III) beta-diketonates comprising of reacting an anhydrous ytterbium (III) halide with a chelating agent selected from the group consisting of acetylacetone, dibenzoylmethane and dipivaloylmethane in the presence of gaseous ammonia and of a nonaqueous solvent.

4,003,938

MANUFACTURE OF ALIPHATIC ISOCYANATES

Karl-Heinz Koenig, Frankenthal; Siegfried Kersten, Ludwigshafen, and Christian Reitel, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 4, 1976, Ser. No. 663,968

Claims priority, application Germany, Mar. 21, 1975, 2512514

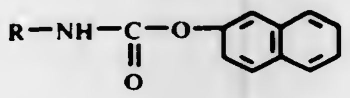
Int. Cl.^{2} C07C *118/00*

U.S. Cl. 260—453 P **3 Claims**

1. A process for the manufacture of aliphatic isocyanates of the general formula I

$$R-N=C=O \qquad I$$

in which R denotes straight-chain or branched-chain alkyl of from 1 to 10 carbon atoms or alkenyl of from 2 to 6 carbon atoms, wherein β-naphthyl carbamates of the general formula II



II

in which R has the meanings stated above, are thermally decomposed at a temperature of from 150° to 500° C.

4,003,939

ADDITION OF SULFENYL HALIDES TO OLEFINS AND ACETYLENES

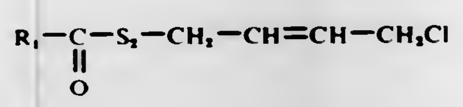
Wolfgang H. Mueller, Elizabeth; Alexis A. Oswald, Mountainside, and Daniel N. Hall, Linden, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 836,128, June 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 595,559, Oct. 28, 1966, abandoned. This application July 10, 1975, Ser. No. 594,593

Int. Cl.^{2} C07C *179/22*

U.S. Cl. 260—453 RZ **1 Claim**

1. Compounds selected from the group of compounds represented by the general formula:



$$R_1-\underset{\underset{O}{\|}}{C}-S_2-CH_2-CH=CH-CH_2Cl$$

wherein R_1 is selected from the group consisting of C_1–C_{14} alkyl radicals and C_6–C_{16} aryl radicals.

4,003,940

ALKYNYL PHENYLPHENOL DIVALENT ALIPHATIC SULFITES

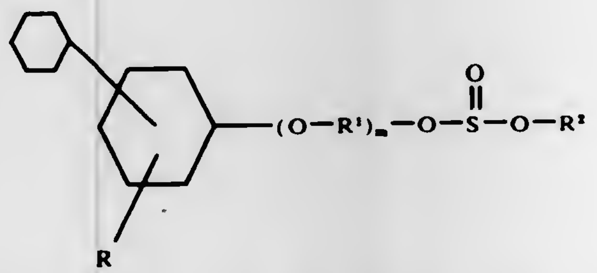
Rupert A. Covey, Bethany, and Robert E. Grahame, Jr., Cheshire, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 414,047, Nov. 8, 1973, Pat. No. 3,916,005. This application July 23, 1975, Ser. No. 598,463

Int. Cl.^{2} C07C *137/00*

U.S. Cl. 260—456 NS **9 Claims**

1. A sulfite having the structure:



wherein R is hydrogen, bromine, chlorine, iodine or an alkyl radical having not more than 6 carbon atoms;

R^1 is an alkylene radical selected from the group consisting of ethylene, 1,2-propylene, 1,2-butylene and 2,3-butylene

R^2 is an alkynyl group containing from 3 to 6 carbon atoms; and,

m is an integer from 1 to 3.

4,003,941

PROCESS FOR PRODUCING POLYHALOCARBONS OXIDES

George H. Crawford, White Bear Lake, and Nicholas Kowanko, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 525,357, Feb. 7, 1966, abandoned. This application May 16, 1973, Ser. No. 360,905

Int. Cl.^{2} C08G *67/00;* **C07C** *43/17*

U.S. Cl. 260—463 **7 Claims**

1. A process for producing polyhalocarbon oxides comprising introducing into a reaction zone as the only essential reactive components ozone and an acyclic perhaloolefin having 3 to 6 carbon atoms, while maintaining said perhaloolefin under liquid phase conditions for a period of time sufficient to directly produce, in the absence of ultraviolet light, polyhalocarbon oxide polymer substantially free of oxidizing linkages.

5. A process for producing polyfluorocarbon oxides comprising introducing into a reaction zone as the sole essential reactive components liquid perfluoropropene and ozone and reacting said components at about −30° C. to −100° C. for a period of time sufficient to directly produce, in the absence of ultraviolet light, polyfluorocarbon oxide polymers substantially free of oxidizing linkages.

4,003,942

BLOCKED BIS 2-CYANOACRYLATE MONOMERS

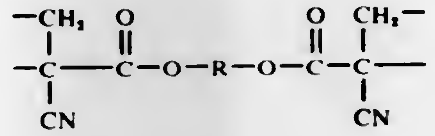
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 512,276, Oct. 4, 1974, which is a continuation-in-part of Ser. No. 308,375, Nov. 21, 1972, abandoned, and a continuation-in-part of Ser. No. 308,376, Nov. 21, 1972, abandoned. This application Nov. 18, 1975, Ser. No. 633,145

Int. Cl.^{2} C07C *121/48, 121/70*

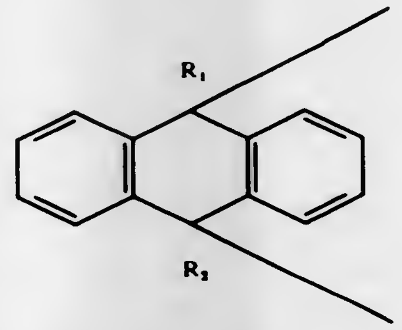
U.S. Cl. 260—464 **2 Claims**

1. As a new composition of matter a compound represented by the formula V

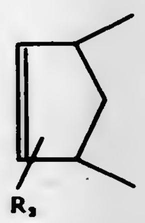


$$-\overset{\overset{-CH_2}{|}}{\underset{\underset{CN}{|}}{C}}-\overset{\overset{O}{\|}}{C}-O-R-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{CH_2-}{|}}{\underset{\underset{CN}{|}}{C}}-$$

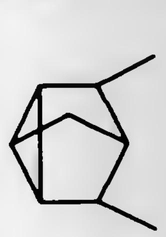
wherein D is selected from the group consisting of



where R_1 and R_2 are the same R_1 and R_2 may be H, an alkyl group of 1 to 5 carbons, phenyl, Br or Cl and where R_1 and R_2 are different, R_1 is H and R_2 may be any of the group consisting of an alkyl group of 1 to 5 carbons, phenyl, Br and Cl;



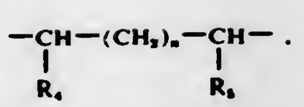
where R_3 is H or CH_3; and



wherein the organo linking group R of Formula V is any one of the group consisting of:

$-(CH_2)_m-$,

where *m* is an integer of from 1 to 20 inclusive;

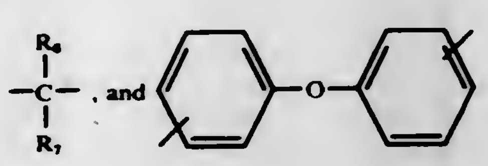


$-\underset{\substack{|\\ R_4}}{CH}-(CH_2)_n-\underset{\substack{|\\ R_5}}{CH}-$.

where *n* is an integer of from 0 to 18 inclusive, and R_4 and R_5 are independently hydrogen or a C_1 to C_5 alkyl group, R_4 and R_5 not simultaneously being hydrogen;

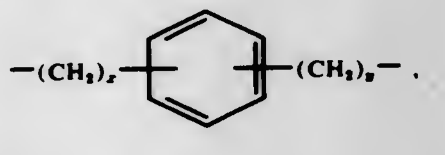
$-(CH_2)_r-Z-(CH_2)_s-$,

where Z is —O—, —S—, —CH=CH—; —C C—;

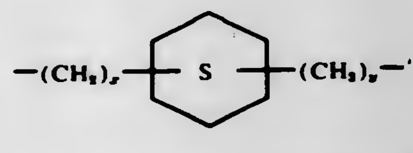


$-\overset{\substack{R_6\\ |}}{\underset{\substack{|\\ R_7}}{C}}-$, and

where *r* and *s* are independent integers of from 1 to 10 inclusive and *r* and *s* total from 2 to 20, R_6 and R_7 are independently hydrogen or a straight or branched chain C_1 to C_5 alkyl group;



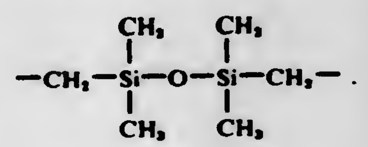
where *x* and *y* are integers of from 1 to 6 inclusive;



where *x* and *y* are as hereinbefore defined;

$-CH_2-(CF_2)_z-CH_2-$,

where *z* is an integer of from 1 to 10 inclusive; and



$-CH_2-\overset{\substack{CH_3\\ |}}{\underset{\substack{|\\ CH_3}}{Si}}-O-\overset{\substack{CH_3\\ |}}{\underset{\substack{|\\ CH_3}}{Si}}-CH_2-$.

4,003,943
SUBSTITUTED TRIMETHYLENE CYCLOPROPANES, SALTS THEREOF, INTERMEDIATES AND METHODS OF MAKING THE SAME

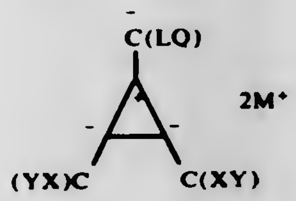
Tadamichi Fukunaga, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 535,138, Dec. 20, 1974, Pat. No. 3,963,769. This application Mar. 2, 1976, Ser. No. 663,102

Int. Cl.² C07C *121/60, 121/66, 121/76*

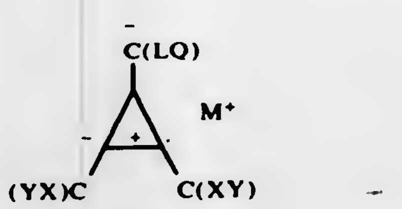
U.S. Cl. 260—465 H **8 Claims**

1. A compound having the formula:



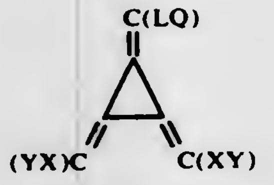
wherein X and Y are selected from cyano, —COO (lower alkyl) or —CO (lower alkyl); L and O are selected pairwise from phenyl and cyano, phenacetyl and cyano or benzenesulfonyl and cyano: and M⁺ is one equivalent of an inert cation.

3. A compound having the formula:



wherein X and Y are selected from cyano, —COO (lower alkyl) or —CO (lower alkyl): L and Q are selected pairwise from phenyl and cyano, phenacetyl and cyano or benzene sulfonyl and cyano; and M⁺ is one equivalent of an inert cation.

5. A compound having the formula:



wherein X and Y are selected from cyano, —COO (lower alkyl) or —CO (lower alkyl); and L and Q are selected pairwise from phenyl and cyano, phenacetyl and cyano or benzenesulfonyl and cyano.

4,003,944
PREPARATION OF 2,4-DICYANO-3,5-DIMETHYLANILINE

Peter Kurtz, Tegernsee, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

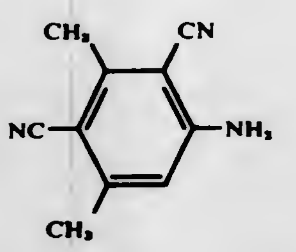
Filed May 25, 1972, Ser. No. 256,845

Claims priority, application Germany, May 25, 1971, 2125907

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **3 Claims**

1. A process of the preparation of a compound of the formula



which comprises heating a starting compound having the empirical $C_{12}H_{12}N_4$ and a melting point of 204°–205° C, in a vacuum of 0.01 to 50 mm Hg and at a temperature of 150° to 250° C; said starting compound comprising the product which can be obtained by dimerizing 3-methylene-glutaric acid dinitrile or 3-methyl-glutaconic acid dinitrile by heating in an inert solvent.

4,003,945
NOVEL CYCLOPROPANECARBOXYLATES

Shigeyoshi Kitamura, Saitama; Nobushige Itaya, Nishinomiya; Yoshitoshi Okuno; Nobuo Ohno, both of Toyonaka; Takashi Matsuo, Nishinomiya; Masachika Hirano; Toshio Mizutani, both of Toyonaka, and Hisami Takeda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

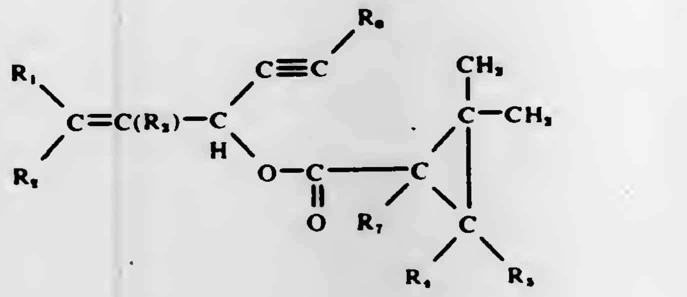
Filed Apr. 15, 1974, Ser. No. 461,029

Claims priority, application Japan, Apr. 20, 1973, 48-45915; May 24, 1973, 48-58830; June 4, 1973, 48-63118

Int. Cl.² C07C *9/74*

U.S. Cl. 260—468 H **5 Claims**

1. Alkynyl cyclopropanecarboxylic acid esters represented by the formula (I),



wherein R_1 represents hydrogen, halogen, lower alkyl having up to 5 carbon atoms, lower alkenyl having up to 5 carbon atoms, lower alkynyl having up to 5 carbon atoms, C_1–C_4 alkoxy C_1–C_4 alkyl, C_1–C_4 alkylthio C_1–C_4 alkyl, phenyl, phenyl C_1–C_4 alkyl, furyl, thienyl, furfuryl, thenyl, cyclo C_3–C_8 alkyl or cyclo C_3–C_8 alkenyl; R_2 and R_3 individually represent hydrogen, halogen, lower alkyl having up to 5 carbon atoms, lower alkenyl having up to 5 carbon atoms, lower alkynyl having up to 5 carbon atoms, phenyl, phenyl C_1–C_4 alkyl or may form a carbon-carbon bond; or R_1 and R_2 are bonded to each other at the ends to form a C_3–C_4 polymethylene chain containing or not containing an oxygen or a sulfur atom, or R_1 and R_2 are bonded to each other at the ends to form a C_5 polymethylene chain containing or not containing an oxygen or a sulfur atom; R_4 represents hydrogen R_5 represents 2,2-dichlorovinyl and R_6 and R_7 represent hydrogen or methyl.

4,003,946
4,5-CIS-DIDEHYDRO-PGF₁ ANALOGS

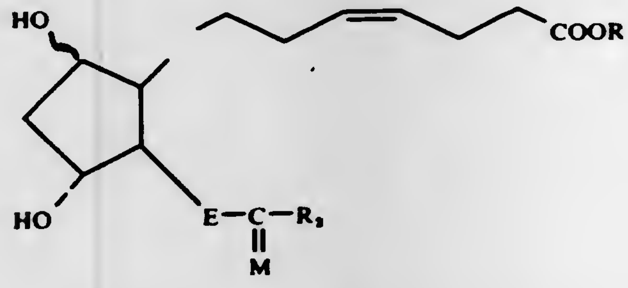
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 440,629, Feb. 7, 1974, Pat. No. 3,933,889, which is a continuation-in-part of Ser. No. 247,993, April 27, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 629,873

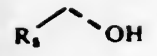
Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **32 Claims**

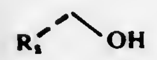
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ is alpha or beta; wherein M is

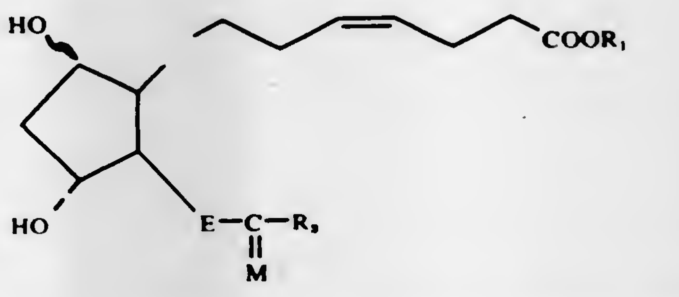


or

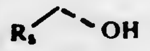


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is alkyl of 2 to 4 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; and wherein E is trans—CH=CH— or $—CH_2CH_2—$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

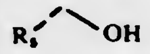
10. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ is alpha or beta; wherein M is

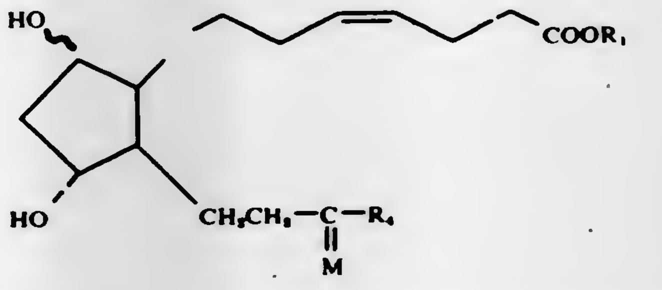


or

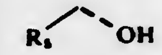


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_3 is branched-chain alkyl of 5 carbon atoms or alkyl of 5 carbon atoms substituted with one or 2 fluoro; and wherein E is trans—CH=CH— or $—CH_2CH_2—$; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

17. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is



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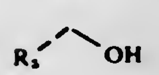
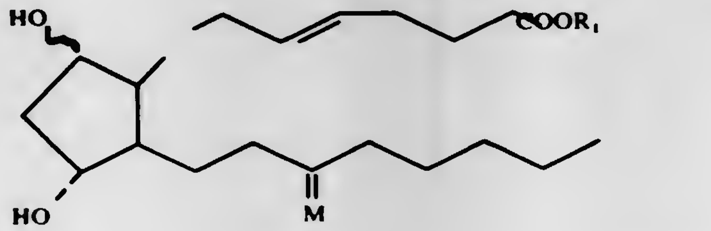
or

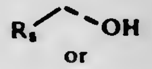


wherein R_5 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_4 is alkyl of 6 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

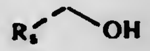
29. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein is alpha or beta; wherein M is



or



wherein R_5 is hydrogen, methyl, or ethyl; and wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,003,947

COATING COMPOSITION AND METHOD OF COATING SUBSTRATES THEREWITH

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 3, 1974, Ser. No. 475,483

Int. Cl.² C07C *103/74*

U.S. Cl. 260—471 R **5 Claims**

1. A heat curable monomeric coating material comprising an aromatic diamide diacid diamine formed as the reaction product of an aromatic diamine and an aromatic dianhydride in the molar ratio of two-to-one respectively.

4,003,948

PROCESS FOR PREPARING DIMETHYL 2,6-NAPHTHALENEDICARBOXYLATE

Gentaro Yamashita; Nobuo Taneda; Kiyoshi Yamamoto; Toru Matsubayashi, and Hiromitsu Takamoto, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 4, 1975, Ser. No. 555,125

Claims priority, application Japan, Oct. 2, 1974, 49-112822; Mar. 8, 1974, 49-26338

Int. Cl.² C07C *69/76*

U.S. Cl. 260—475 FR **7 Claims**

1. A process for preparing dimethyl 2,6-naphthalenedicarboxylate, which comprises continuously esterifying 2,6-naphthalenedicarboxylic acid with methanol at a temperature of about 140° to 350° C. in the presence or absence of an esterifying catalyst, said 2,6-naphthalenedicarboxylic acid being fed into an esterification reaction zone in the form of solid particles having a specific surface area of from about 4,000 cm^2/g to about 100,000 cm^2/g.

4,003,949

STEROID INTERMEDIATES

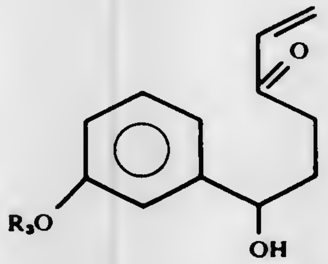
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 406,980, Oct. 16, 1973, Pat. No. 3,932,519, which is a division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Sept. 24, 1975, Ser. No. 616,230

Int. Cl.² C07C *49/82*

U.S. Cl. 260—590 R **3 Claims**

1. The compound of the formula



where R_3 is a cycloalkyl group of 3 to 8 carbon atoms, or a primary alkyl group of from 1 to 8 carbon atoms.

4,003,950

DIPHENYL METHANE BIODEGRADABLE INSECTICIDES

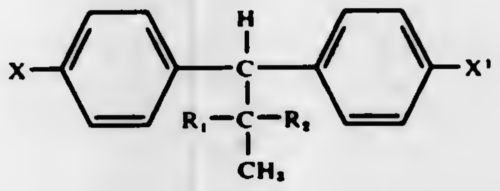
Robert L. Metcalf, and Joel R. Coats, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 4, 1974, Ser. No. 520,370

Int. Cl.² C07C *43/20*

U.S. Cl. 260—612 R **9 Claims**

1. Biodegradable insecticides having the formula:



wherein R_1, R_2, X and X' are groups having the relationships shown in the following table in the compounds numbered 1 through 8:

Compound	R_1	R_2	X	X'
1	H	Cl	CH_3	OC_2H_5
2	H	Cl	OCH_3	OC_2H_5
3	H	Cl	OC_2H_5	OC_3H_7
4	H	Cl	CH_3	C_3H_7
5	H	CH_3	OC_2H_5	OC_3H_7
6	H	CH_3	CH_3	OC_2H_5
7	H	CH_3	CH_3	OC_3H_7
8	H	CH_3	CH_3	OC_4H_9

4,003,951

OCTAHYDROAZULENOLS

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

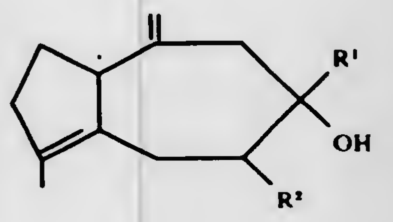
Division of Ser. No. 363,207, May 23, 1973, Pat. No. 3,935,253. This application Nov. 3, 1975, Ser. No. 628,305

Claims priority, application Switzerland, June 5, 1972, 8265/72

Int. Cl.² C07C *35/34*

U.S. Cl. 260—617 F **3 Claims**

1. A compound of the formula



VIII

wherein

R^1 represents hydrogen, lower alkyl or lower alkenyl and
R^2 represents hydrogen or lower alkyl.

4,003,952

DIRECT HYDRATION OF OLEFINS TO ALCOHOLS

Elton Gordon Foster, Houston; Robert A. Golding, Missouri City, and Delwin E. Dodd, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 23, 1974, Ser. No. 508,030

Int. Cl.² C07C *29/04, 29/24*

U.S. Cl. 260—641 **3 Claims**

1. In the direct hydration process of producing ethanol by reaction ethylene with water in a reaction zone and in the presence of a catalyst whereby the ethanol along with a portion of the organic impurities produced as byproducts in the reaction including predominantly diethyl ether, are recovered from the effluent from said reaction zone in a scrubbing zone in which water is employed as a scrubbing agent, the improvement which comprises introducing said reaction zone effluent at an intermediate point in the scrubbing zone, introducing water near the top of the scrubbing zone, and introducing at least about 25% of the fresh ethylene feed stream near the bottom of the scrubbing zone, the ethylene thereby stripping the diethyl ether from the aqueous alcohol comprising the scrubber liquid bottom product and producing an aqueous alcohol product as scrubber liquid bottom product containing no more than trace amounts of diethyl ether.

4,003,953

PURIFICATION OF TNT WITH MAGNESIUM SULFITE-BISULFITE MIXTURES

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,073

Int. Cl.² C07C *79/10*

U.S. Cl. 260—645 **7 Claims**

1. A process for purifying 2,4,6-trinitrotoluene containing unsymmetrical trinitrotoluene impurities, which comprises reacting the impure 2,4,6-trinitrotoluene with an aqueous medium consisting essentially of a mixture of magnesium sulfite and magnesium bisulfite to convert said isomeric impurities into products soluble in said aqueous medium, and separating the purified 2,4,6-trinitrotoluene from the aqueous medium containing said soluble conversion products.

4,003,954

HYDROPROCESSING AROMATICS TO MAKE CYCLOPARAFFINS

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Mar. 31, 1976, Ser. No. 672,183

Int. Cl.² C07C *5/10;* **C10G** *13/04;* **B01J** *23/62*

U.S. Cl. 260—667 **4 Claims**

1. A process for producing a cycloparaffinic hydrocarbon which comprises contacting hydrogen and an aromatic hydrocarbon in a reaction zone, in contact with a catalytic composite comprising a porous carrier material containing, on a elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, cobalt and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions, or in a mixture of these states, and from about 0.01% to about 1.5% by weight of an alkalinous metal component, separating the resulting reaction zone effluent to recover said cycloparaffinic hydrocarbon.

4,003,955

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 490,171, July 19, 1974, Pat. No. 3,948,762. This application Mar. 8, 1976, Ser. No. 664,458

Int. Cl.² C07C *3/04;* **C10G** *23/04;* **B01J** *27/08, 23/62*

U.S. Cl. 260—673.5 **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, or an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 5 wt. % nickel and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium and nickel are uniformly dispersed throughout the porous carrier material; and wherein substantially all of the platinum or palladium, rhodium and nickel are present in the elemental metallic state.

4,003,956

HYDROPROCESSING AROMATICS TO CYCLOPARAFFINS

Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

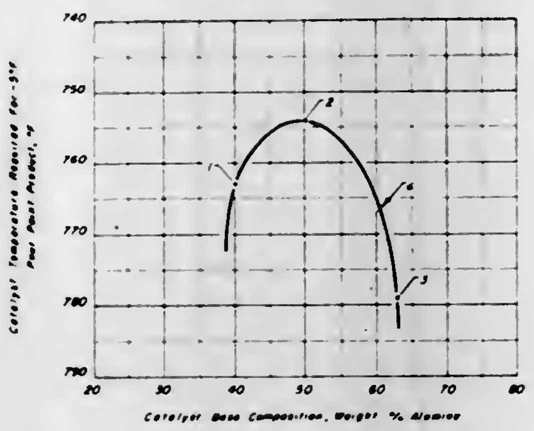
Continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application July 28, 1975, Ser. No. 599,561

Int. Cl.² C07C *5/10*

U.S. Cl. 260—667 **5 Claims**

1. A process for producing a cycloparaffinic hydrocarbon which comprises contacting hydrogen and an aromatic hydrocarbon in a reaction zone, in a contact with a tungsten component catalytic composite consisting essentially of a combination of a nickel component, and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said compo-

nents are present in amounts sufficient to result in the composite containing, on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten component, and from about 0.01 to about 1.5% by weight of an alkalinous metal component, separating the resulting reaction zone effluent to recover said cycloparaffinic hydrocarbon.



4,003,957

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Feb. 5, 1976, Ser. No. 655,661

Int. Cl.^{2} C07C *3/04;* **C10G** *23/04;* **B01J** *27/08, 23/67*

U.S. Cl. 260—673.5 **24 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hyrocarbon at dehydrocyclization conditions with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium and abot 0.1 to about 3.5 halogen; wherein the platinum group metal, catalytically available cobalt and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the element metallic state under dehydrocyclization conditions or in a mixture of these states.

4,003,958

PROCESS FOR PRODUCING MYRCENE

Atsuo Murata; Shuji Tsuchiya; Akihiro Konno, all of Funabashi; Juntaro Tanaka, and Kunihiko Takabe, both of Hamamatsu, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Sept. 25, 1975, Ser. No. 616,625

Claims priority, application Japan, Sept. 26, 1974, 49-110748; July 16, 1975, 50-86993

Int. Cl.^{2} C07C *11/12*

U.S. Cl. 260—677 R **9 Claims**

1. A process for producing myrcene which comprises dimerizing isoprene in a solvent of a cyclic ether, N-alkylmorpholine or mixtures thereof, with 0.5 – 20 mole% of an alkali metal catalyst and 1–20 mole% of a primary or secondary amine having branched-chain hydrocarbon residual groups, wherein the mole percentages are based on the amount of isoprene.

4,003,959

EPOXY RESIN COMPOSITIONS CONTAINING CYCLOPENTADIENE COPOLYMER

Akira Wada, Kamakura, and Kazunobu Karino, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 533,249

Claims priority, application Japan, Dec. 20, 1973, 48-142616

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—837 R **3 Claims**

1. An epoxy resin composition comprising (I) 10 to 70% by weight of a cyclopentadiene resin, (II) 90 to 30% by weight of an epoxy resin (II) and an effective amount of a curing agent for the epoxy resin, said cyclopentadiene resin (I) being prepared by thermal polymerization of the following mixture without polymerization catalysts, said mixture consisting of

A. 85 to 35% by weight of a compound selected from the group consisting of cyclopentadiene, dicyclopentadiene, methylcyclopentadiene, methylcyclopentadiene dimer, cyclopentadiene and methylcyclopentadiene trimer and tetramer, and

B. 15 to 65% by weight of at least one compound selected from the group consisting of unsaturated nitriles containing 3 to 6 carbon atoms, unsaturated monocarboxylic acids containing 3 to 4 carbon atoms, unsaturated monocarboxylic acid containing 3 to 4 carbon atoms and glycides or aliphatic alcohols containing 1 to 8 carbon atoms, alkenyl alkanoates derived from aliphatic monocarboxylic acids containing 1 to 4 carbon atoms and vinyl alcohol or allyl alcohol, α,β-unsaturated dicarboxylic acids containing 4 to 5 carbon atoms, mono- and di-esters derived from α, β-unsaturated dicarboxylic acids containing 4 to 5 carbon atoms an aliphatic alcohols containing 1 to 8 carbon atoms, and unsaturated aldehydes containing 3 to 6 carbon atoms,

C. 0 to 30% by weight of α, β-unsaturated dicarboxylic anhydrides containing 4 to 5 carbon atoms, and

D. 0 to 30% by weight of unsaturated hydrocarbon compounds containing 3 to 10 carbon atoms, and having an acid number of not more than 150, a bromine number of not more than 75 and a softening point of not more than 170° C.

4,003,960

BLOCK COPOLYMERS

Pierino Radici, Turate (Como); Gaudenzio Bianchi, Fagnano Olona (Varese); Daniele Colombo, Castellanza (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 22, 1975, Ser. No. 642,810

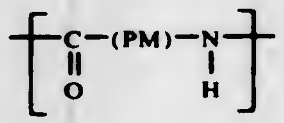
Claims priority, application Italy, Dec. 20, 1974, 30830/74

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—857 F **12 Claims**

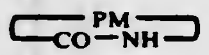
1. A block copolymer of the structure A-B wherein:

A is a polylactamic block consisting of a chain of recurring units:



$$\left[-\underset{\overset{\|}{O}}{C}-(PM)-\underset{\overset{|}{H}}{N}-\right]$$

obtainable from one or more monomeric lactams of the formula



$$\overset{PM}{\overline{CO-NH}}$$

wherein PM is a linear polymethylene chain having from 3 to 13 carbon atoms, non substituted or having at least one hydrogen atom replaced by a radical selected in the group consisting of the alkyl, aryl, alkylaryl and cycloalkyl radicals,

B is a polyoxymethylene block consisting of recurring units, said block B being present in the copolymer in an amount of at least 2% by weight, and said block A being present in the copolymer in an amount of at least 0.05% by weight.

4,003,961

LINEAR COPOLYMERS OF GLYCIDOL

Violete L. Stevens; Arthur R. Sexton, and Frederick P. Corson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 444,078, Feb. 20, 1974. This application Dec. 22, 1975, Ser. No. 643,451

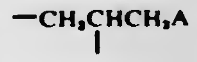
Int. Cl.^{2} C08G *23/22*

U.S. Cl. 260—874 **4 Claims**

1. The process of making compounds of the formula R

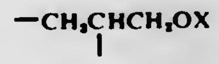
$((R'O)_mX)_n$

wherein R is the residue left by the removal of *n* active hydrogen atoms from an initiator compound, RH_n; each R' independently is an alkylene radical selected from the group consisting of ethylene, trimethylene, tetramethylene, 1,2-butylene, 2,2-bis(halomethyl)-1,3-propylene, and groups of the formula



$$-CH_2\underset{|}{C}HCH_2A$$

each A independently is H, Cl, Br, or OX; each X independently is H or the acyl radical of a carboxylic acid with the proviso that at least one R' is 3-hydroxy-1,2-propylene and at least one is a group of the formula



$$-CH_2\underset{|}{C}HCH_2OX$$

wherein X is the acyl radical of an α,β-unsaturated carboxylic acid; and *m* and *n* are integers such that the total number of R'O groups is at least 2;

said process comprising reacting by contacting an α,β-unsaturated carboxylic acid or the anhydride or acyl halide corresponding to such acid with a polymer or copolymer of tert.-butyl glycidyl ether in the presence of a strong acid catalyst.

4,003,962

METHOD OF PREPARING AN EASY PROCESSING POLYVINYL HALIDE BY AN IN-PROCESS REACTION

Akio Takahashi, Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 318,781, Dec. 27, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,583

Int. Cl.^{2} C08L *27/00*

U.S. Cl. 260—884 **14 Claims**

1. A process for producing a graft copolymer composition comprising grafting a monomeric vinyl ester and maleic anhydride onto a vinyl halide polymer comprising at least 50 percent by weight of vinyl halide, in the presence of a free radical initiator at a temperature of about 150° to about 180° centigrade.

4,003,963

VINYL CHLORIDE POLYMER BARRIER PACKAGING COMPOSITIONS

Walter Stanley Creasy, Bridgewater, and Austin Emidio Barnabeo, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,303

Int. Cl.^{2} C08L *23/08*

U.S. Cl. 260—897 C **12 Claims**

1. Composition suitable for the fabrication of barrier packaging materials having enhanced resistance to oxygen permeability as well as moisture vapor transmission consisting essentially of a mixture of:

A. A vinyl chloride polymer having no carboxyl groups, and

B. About 10 to about 30 percent by weight, based on the weight of vinyl chloride polymer, of an ethylene/vinyl alcohol copolymer containing greater than about 61 weight percent or 50 mole percent of vinyl alcohol in said copolymer.

4,003,964

PHENYLENE-BIS(O,S-DIALKYLTHIOPHOSPHATES)

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

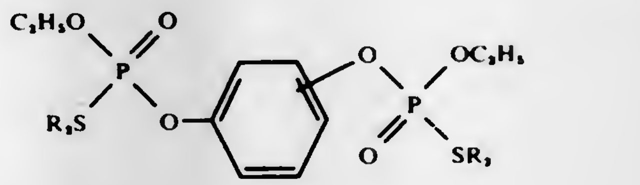
Division of Ser. No. 328,588, Feb. 1, 1973, Pat. No. 3,876,666. This application Mar. 12, 1975, Ser. No. 557,559

Claims priority, application Switzerland, Feb. 1, 1972, 1498/72; Dec. 29, 1972, 19075/72

Int. Cl.^{2} A01N *9/36;* **C07F** *9/18*

U.S. Cl. 260—930 **2 Claims**

1. A compound of the formula



in which R_2 is n-propyl or isobutyl

4,003,965

PHOSPHORUS COMPOUNDS

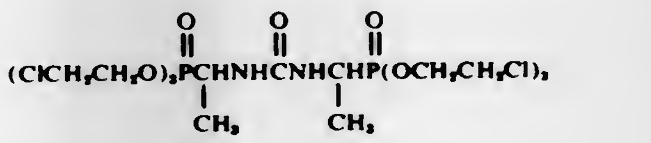
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 385,931, Aug. 6, 1973, Pat. No. 3,920,733. This application June 23, 1975, Ser. No. 589,097

Int. Cl.^{2} C07F *9/40*

U.S. Cl. 260—932 **2 Claims**

1. A compound of the formula



$$(ClCH_2CH_2O)_2\overset{O}{\overset{\|}{P}}\underset{\underset{CH_3}{|}}{C}HNH\overset{O}{\overset{\|}{C}}NH\underset{\underset{CH_3}{|}}{C}H\overset{O}{\overset{\|}{P}}(OCH_2CH_2Cl)_2$$

4,003,966

SELECTIVE PHOSPHORYLATION PROCESS

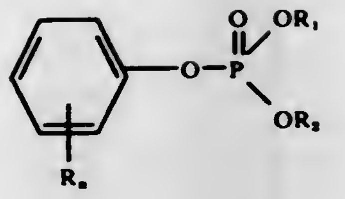
Roger Paul Napier, Califon, N.J., and Orville L. Chapman, Los Angeles, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,508

Int. Cl.^{2} C07F *9/09*

U.S. Cl. 260—971 **9 Claims**

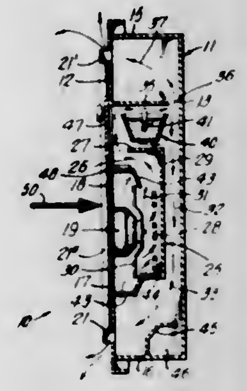
1. A process for the selective preparation of O,O-dialkyl phosphates of phenols having the following general formula:



wherein R is selected from the group consisting of H, alkyl of 1–8 carbon atoms, nitro, nitroso, halo, carboxy, carbalkoxy, alkythio, alkylmercapto and haloalkyl of 1–8 carbon atoms, hydroxymethyl, mercaptomethyl, N-hydroxyiminomethyl and *n* is 1–5; R_1 is alkyl of 1–8 carbon atoms; and R_2 is selected from the group consisting of alkyl of 1–8 carbon atoms, alkoxy, amino and mono or dialkylamino C_1–C_{16} comprising reacting under ambient conditions such phenol with dimethyl disulfide and a trialkyl phosphite each alkyl group thereof having from 1–12 carbon atoms.

4,003,967
ELECTRIC HEATING AND HUMIDIFYING APPARATUS

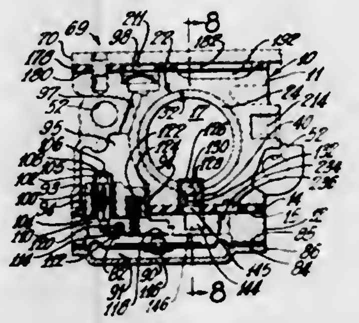
Alfred Marcel Potvin, St. Lambert, Canada, assignor to Les Placement Courteau Limitee, Montreal, Canada
Filed Oct. 31, 1974, Ser. No. 519,696
Int. Cl.² B01F *3/04*
U.S. Cl. 261—30 **4 Claims**



1. A space heating apparatus comprising a main enclosure having a front and a rear wall, side walls and a top and bottom wall; an air inlet opening in said front wall, a filter in said opening, an impeller fan mounted within said enclosure adjacent said opening for drawing outside air into said enclosure through said filter and convecting it through predetermined paths in said enclosure and out of said enclosure through vent openings provided therein, and intermediate enclosure secured between said front and rear walls and having a back wall spaced from said main enclosure rear wall to permit passage of convected air in a space between said back wall and rear wall, said intermediate enclosure being positioned about said opening in said front wall whereby said impeller fan is located within said intermediate enclosure, heating elements secured in said intermediate enclosure between said fan and said back wall for heating said air, an opening in a top wall of said intermediate enclosure for release of air drawn and heated in said intermediate enclosure, said back wall being heated by said heating elements to further heat convected air passing between said back wall and rear wall, a water reservoir having a heater therein for heating water in said reservoir to the boiling point whereby water vapour is mixed with the air convected through said predetermined paths, a horizontal intermediate wall secured a predetermined distance above said intermediate enclosure and said water reservoir and located between said front and rear wall of said main enclosure, and an opening in said horizontal intermediate wall to permit passage of some of said convected air therethrough and out through said vent opening above said intermediate enclosure, said opening in said intermediate enclosure being located adjacent said main enclosure front wall, and said opening in said horizontal intermediate wall being located adjacent said main enclosure rear wall, and control means for regulating the operation time cycle of said fan, heating elements and heater, there being at least three times as much air directed downwardly than that directed upwardly in said housing.

4,003,968
CHARGE FORMING METHOD AND APPARATUS

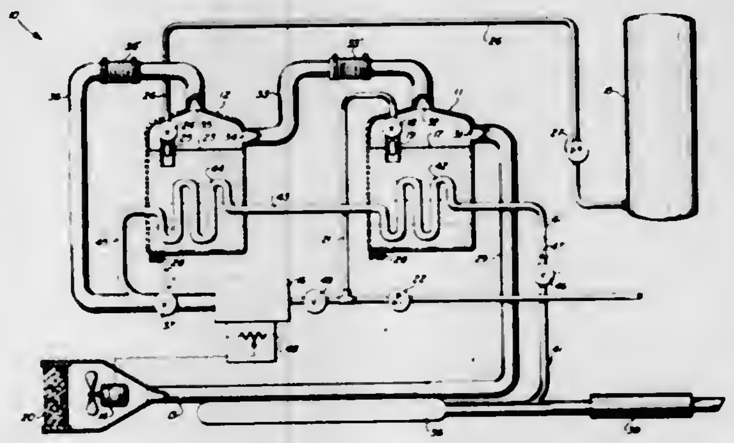
Paul E. Rickert, Oregon, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Continuation of Ser. No. 365,960, June 1, 1973, abandoned.
This application Oct. 31, 1975, Ser. No. 627,871
Int. Cl.² F02M *17/04*
U.S. Cl. 261—35 **24 Claims**



1. Charge forming apparatus comprising, in combination, a body construction including a first body member providing a fuel and air mixing passage, a second body member providing a fuel cavity, aperture means opening into the mixing passage, fluid flow control laminar means disposed between the body members having perforate pattern regions providing passages for fuel and air, a flexible diaphragm forming one wall of the fuel cavity, a recess in the second body member, a fuel inlet valve disposed for slidable movement in said recess, and means in the fuel cavity arranged to transmit movements of the diaphragm to the inlet valve for controlling fuel flow into the fuel cavity.

4,003,969
CARBURETOR SYSTEM FOR INTERNAL COMBUSTION ENGINE

William C. Robinson, 5720 W. Rosewood Lane, Phoenix, Ariz. 85031
Filed Aug. 7, 1975, Ser. No. 602,690
Int. Cl.² F02M *25/02*
U.S. Cl. 261—145 **4 Claims**



1. A carburetor system for a gasoline engine wherein the fuel vaporization functions are accomplished external to a carburetor comprising in combination:

a gasoline vaporization chamber having fluid inlet and outlet ports,

means for connecting a source of gasoline under pressure to said vaporization chamber,

a first float means for controlling the level of gasoline in said vaporization chamber,

an air intake manifold connected to said inlet port of said vaporization chamber at a point above the level of gasoline therein,

a water humidification chamber having fluid inlet and outlet ports,

means for connecting a source of water under pressure to said humidification chamber,

a second float means for controlling the level of water in said humidification chamber,

conduit means for connecting said fluid outlet port of said vaporization chamber arranged at a point above the level of gasoline in said vaporization chamber to said inlet port in said humidification chamber arranged at a point above the water in said humidification chamber,

means for connecting said outlet port of said humidification chamber to a carburetor,

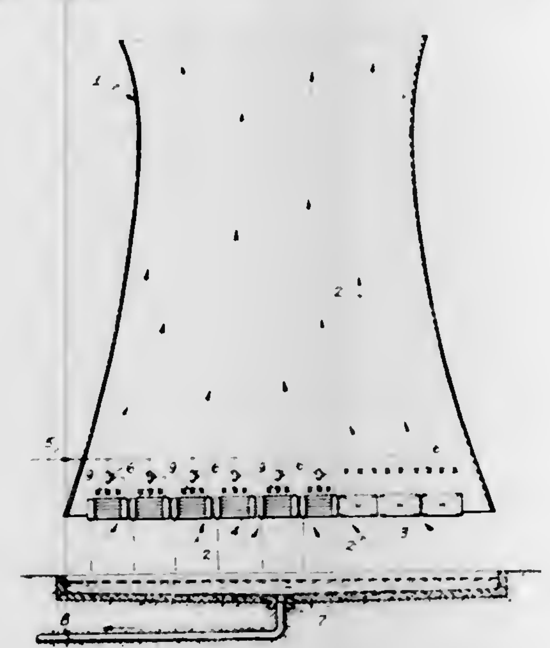
means for heating the gasoline and water in said vaporization and humidification chambers,

said means for heating the gasoline and water in said vaporization and humidification chambers comprising a common element extending in sequence through the gasoline and water in the chambers, and

pressure means comprising a fan for forcing air under pressure through said air intake manifold over the gasoline surface in said vaporization chamber, through said conduit means, over the water surface in said humidification chamber and through said outlet port of said humidification chamber to the carburetor.

4,003,970
COMBINED WET AND DRY HEAT TRANSFER SYSTEM AND METHOD FOR COOLING TOWERS

Vladimir Vodicka, Bochum, Germany, assignor to Balcke-Durr Aktiengesellschaft, Ratingen, Germany
Filed Oct. 28, 1975, Ser. No. 626,538
Claims priority, application Germany, Nov. 2, 1974, 2452123
Int. Cl.² F28D *5/02;* **F28C** *1/02*
U.S. Cl. 261—159 **15 Claims**



1. In a cooling tower installation for the continuous recooling of large quantities of hot cooling water through heat transfer from the water to an air draft generated inside a vertically open tower mantle, an adjustable combined wet and dry heat transfer system comprising in combination:

a plurality of heat exchanger units arranged adjacent to one another within the confines of the cooling tower mantle, so as to occupy substantially the entire cross-sectional area enclosed by the latter;

air flow spaces in the heat exchanger units for the upward passage of air flows through the heat exchanger units;

a water collecting basin arranged underneath the heat exchanger units;

conduit means for bringing a supply of hot water to the heat exchanger units;

a hot water distributing network disposed above the heat exchanger units, including means for distributing the hot water onto surfaces of the heat exchanger units which are also exposed to said air flows;

conduit means for removing the recooled water from the collecting basin; and wherein:

the heat exchanger units comprise a group of so-called wet units, which are operable only for the transfer of heat from downwardly moving flows of water originating from the water distributing network to said upwardly moving air flows, in direct contact therebetween and through evaporation of a portion of the water;

the heat exchanger units further comprise a group of dual-purpose heat exchanger units, having interior water flow channels connectable to said supply conduit means, the channels having walls across which heat is transferable to said upwardly moving air flows in a convective, so-called dry operation, the outer sides of said channel walls being further adapted to guide downwardly moving flows of water originating from the water distributing network, for an evaporative, wet operation; and

the heat transfer system further comprises means for adjusting the vapor content of the heated air leaving the tower, for cloud-free operation, said means including valve and conduit means associated with the hot water supply for selectively operating the dual-purpose heat exchanger units in a dry or wet operating mode, or in both modes simultaneously, by correspondingly controlling the flow of hot water to the water channels inside the units and to the water distributing means arranged above the units.

4,003,971
PRODUCTION OF PARTICLES FOR INCORPORATION IN DENTIFRICES

Giuseppe Mannara, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 4, 1974, Ser. No. 520,665
Claims priority, application Italy, Nov. 16, 1973, 53749/73
Int. Cl.² B01J *2/06*
U.S. Cl. 264—9 **9 Claims**

1. A process for making dentifrice speckles of substantially uniform shape and size which compriese:

A. agitating a heated mixture of a speckling material and a dispersing liquid for said speckling material, said speckling material containing a dentifrice component and a binder for such component, at a temperature at which the binder is liquid, to produce a homogeneous dispersion in the dispersing liquid of individual droplets of said speckling material of sizes in the range of about 0.05 to 1 mm. effective diameter; said mixture being of about

I. 1 to 40% by weight of such speckling material, which is

a. about 75 to 99.9% by weight of a normally solid water insoluble organic dentifrice binder selected from the group consisting of thermoplastic resins, gums, gels, paraffins, waxes, polymers, higher fatty acids, higher fatty acid salts, lower alkylene glycol diesters, glyceryl diesters and glyceryl triesters; and

b. about 0.01 to 25% by weight of a dentifrice component selected from the group consisting of fluorine-containing anti-caries agents, polishing agents, antimicrobial agents, ammoniating agents, vitamins, desensitizing agents, enzymes, optical brighteners, astringents, perservatives, flavoring agents and colorants; and

II. about 60 to 99% by weight of a dispersing liquid which has a normal boiling point which is at least 10° C. above the solidification point of said binder and below the normal boiling point of said binder and which has a solidification point at least 20° C. below the solidification point of the binder, in which dispersing liquid the binder is substantially insoluble, said dispersing liquid being selected from the group consisting of water and aqueous solutions of lower polyhydric alcohols of 2 to 6 carbon atoms; and

B. cooling such mixture of speckling material and dispersing liquid, while containing agitation thereof, to a temperature below the solidification point of said binder, at which temperature the dispersing liquid remains liquid, to obtain solid dentifrice speckles of the binder and dentifrice component in the dispersing liquid, having substantially uniform shape and sizes in the range of about 0.05 to 1 mm. effective diameter, homogeneously dispersed in said dispersing liquid.

4,003,972

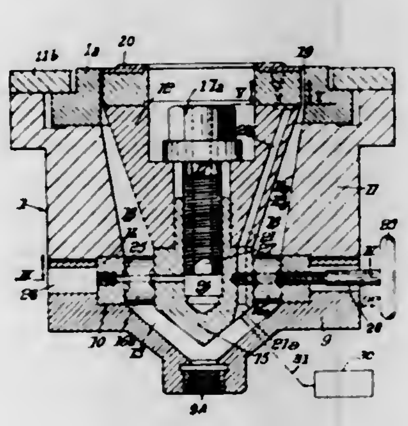
METHOD OF EXTRUDING TUBING FOR FASTENER BAGS

Andre Herz, Nesles-la-Vallee, France, assignor to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 243,966, April 14, 1972, Pat. No. 3,841,816. This application July 30, 1974, Ser. No. 493,026

Int. Cl.² B29C *17/02*

U.S. Cl. 264—40.3 **13 Claims**



1. The method of making a continuous plastic tube with fastener profiles on the surface thereof for use in making reclosable bags comprising:

extruding a heated thermoplastic material from a die through an annular die slot and thereby forming a tube and concurrently extruding plastic through shaped die profile openings aligned with said die slot and thereby forming mating complementary interlocking rib and groove fastener profiles on the tube surface,

supplying tube plastic to the annular slot through a tube passage,

supplying profile plastic to said fastener profile die openings through a profile passage,

supplying gas into the tube emerging from the die slot to circumferentially control the size of the plastic tube,

controllably varying the rate of plastic supply to the annular slot by increasing or decreasing the speed at which plastic material is forced through the tube passage to the slot to thereby vary the rate at which the tube is extruded,

controllably varying the flow of the gas into the tube relative to the rate of plastic supply to control the increase in tube diameter and to obtain a tube of a predetermined wall thickness and tubing diameter,

and controllably varying by adjustment the rate of plastic supply to said profile openings by restricting the flow of plastic supply through the profile passage so as to supply a tube with controlled variation in diameter and thickness with said profiles thereon of constant and optimum dimensions.

12. The method of making a continuous plastic tube with small critically sized complementary interlocking fastener profiles thereon for use in making reclosable bags, comprising:

extruding a heated thermoplastic material from a die through an annular die slot and thereby forming a tube and concurrently extruding plastic through shaped small critically sized die profile openings and aligned with the slot and thereby forming mating complementary rib and groove fastener profiles on the tube surface;

supplying tube plastic to the annular slot;

supplying profile plastic to said fastener profile die openings;

supplying gas into the tube emerging from the die slot to circumferentially control the size of the plastic tube;

controllably varying by a first control means the rate of flow of plastic supply to the annular slot;

controllably varying by a second control means the rate of flow of profile forming plastic to the shaped profile openings until a small critically sized profile is extruded from said openings;

controllably varying by a third control means the flow of gas to control the diameter of the tube;

and changing said second control means as a function of the change of the first and third means so that as said first and third means are changed to obtain a tube of different dimensions the second means is changed to maintain the size of profile constant to said critical size.

4,003,973

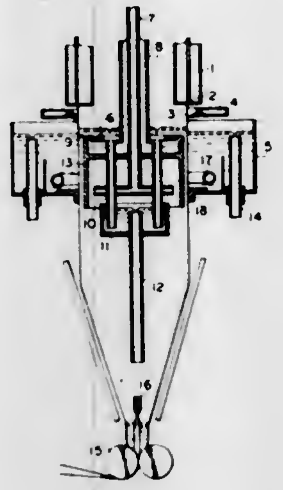
PROCESS AND APPARATUS FOR PRODUCING SHEET FILM FROM TUBULAR THERMOPLASTIC RESIN FILM

Kazuhiko Kurokawa, and Teruchika Kanou, both of Fuji, Japan, assignors to Kabushiki Kaisha Kohjin, Tokyo, Japan

Filed June 23, 1972, Ser. No. 265,894

Int. Cl.² B29D *7/20;* B29C *25/00*

U.S. Cl. 264—101 **8 Claims**



1. A process for producing a sheet film from a tubular thermoplastic resin film which comprises:

a. extruding a molten tubular film of crystalline thermoplastic resin downwardly through an annular die,

b. passing the outside of said downwardly extruded tubular film into contact with a body of a cooling liquid,

c. introducing cooling liquid into the interior of said downwardly extruded tubular film so that a body of cooling liquid is formed in the interior of said tubular film opposite to the body of cooling liquid contacting the exterior of said tubular film,

d. maintaining the level of the body of cooling liquid on the inside of said tubular film 5 – 15 mm higher than that of the level of the body of cooling liquid on the exterior of the tubular film,

e. flattening the cooled film,

f. providing a lengthwise cut in said tubular film immediately prior to step (e) and permitting the liquid which was used to cool the inside the tubular film to flow out, and

g. removing essentially all liquid from the surfaces of the tubular film after it has been cut and flattened.

4,003,974

CONTINUOUS SPIN-DRAWING PROCESS FOR PREPARING POLYETHYLENE TEREPHTHALATE YARNS

William Amdor Chantry, Kinston, N.C., and Roddy Merl Conrad, Hamm, Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1975, Ser. No. 565,079

Int. Cl.² D01D *5/08*

U.S. Cl. 264—210 F **5 Claims**

1. A continuous spin-drawing process for preparaing continuous filament polyethylene terephthalate yarns by a coupled process of extruding, drawing, relaxing and winding up, which comprises heating a freshly-extruded continuous filament polyethylene terephthalate yarn having an HRV of 24 to 28 to a temperature of 75° to 250° C., drawing the yarn to a total denier of 50 to 500 at a draw ratio of 5.2:1 to 6:1, passing the drawn yarn over a draw roll having a temperature of 225° to 250° C., relaxing the yarn at a tension of 0.09 to 0.15 gram per denier and winding up the yarn at a minimum speed of 2,000 yards per minute.

4,003,975

SOLVENT EXTRACTION OF COPPER VALUES USING DIHYDROXY AZOARENES

John Frank Tancredi, Yorktown Heights; Patrick Bernard Sullivan, Peekskill, and Glenn Franklin Mitchell, Bedford Hills, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,432

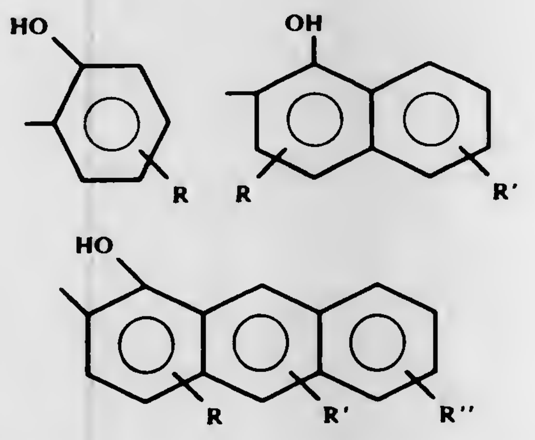
Int. Cl.² C22B *15/00*

U.S. Cl. 423—24 **13 Claims**

1. In a process for the recovery of copper values from an aqueous solution of copper and iron values, wherein said aqueous solution is contacted with an immiscible solution of an extracting agent in an organic solvent and the resultant mixture is separated into a barren aqueous phase and a pregnant organic phase and copper values are subsequently recovered from the organic phase by treatment with an aqueous acid solution, the improvement which comprises utilizing as the extracting agent 2,2′-dihydroxy azoarenes having the formula:

$Ar-N=N-Ar'$

wherein Ar and Ar′ are each selected from the group consisting of



wherein each of R, R′ and R″ is a monovalent radical selected from the group consisting of hydrogen and alkyl groups having 1–20 carbon atoms.

4,003,976

CONVERTER FOR THE PURIFICATION OF EXHAUST GASES

Noboru Komatsu, Toyoake; Osami Kamigaito, Nagoya; Takatoshi Suzuki, Nagoya; Nobuyuki Yamamoto, Nagoya; Haruo Doi, Nagoya; Kazuya Sano, Nagoya; Toshio Kandori, Nagoya, and Yukikazu Tsuzuki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Continuation of Ser. No. 455,909, March 28, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,912

Claims priority, application Japan, Apr. 3, 1973, 48-37427

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.5 **16 Claims**

1. A method of reducing NO_x in exhaust gases over a wide range of oxygen ratios while minimizing ammonia formation, which comprises:

1. passing said exhaust gas through a first layer of catalyst having a sintered body structure; said catalyst having a high conversion rate at low oxygen ratios, exhibiting a decrease in conversion rate as the oxygen ratio increases, the causing minimal formation of ammonia; and said catalyst being selected from the group consisting of:
   - a. a particulate mixture of nickel oxide and copper oxide;
   - b. a particulate mixture of manganese oxide and an oxide selected from the group consisting of cerium oxide, lanthanum oxide, iron oxide, niobium oxide, nickel oxide and mixtures thereof; and
   - c. a particulate mixture of cobalt oxide and an oxide selected from the group consisting of yttrium oxide, niobium oxide and mixtures thereof; and
2. thereafter passing said exhaust gas through a second layer of catalyst; said catalyst having a low conversion rate and producing large amounts of ammonia at low oxygen ratios, and exhibiting higher conversion rates while producing lesser amounts of ammonia as the oxygen ratio increases; and said catalyst being selected from the group consisting of:
   - d. a platinum-rhodium catalyst;
   - e. a platinum catalyst;
   - f. a platinum-palladium catalyst; and
   - g. a nickel oxide-chromium oxide-copper oxide-iron oxide-barium oxide catalyst.

4,003,977

REMOVAL OF TETRANITROMETHANE FROM TNT PLANT WASTE GASES

William H. Gilligan, Washington, D.C., and Thomas N. Hall, Adelphi, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1975, Ser. No. 605,778

Int. Cl.² B01D *53/34*

U.S. Cl. 423—236 **21 Claims**

1. A gas scrubbing process for removing tetranitromethane from trinitrotoluene plant waste gases comprising:

scrubbing the waste gases with a two phase mixture comprising (1) an alkali metal hydroxide, (2) water, and (3) a water insoluble solvent selected from the group consisting of (a) ethers, (b) alkyl aromatic compounds, (c) halo aromatic compounds, (d) hydrocarbons, and (e) mixtures thereof;

provided that the two phase mixture is circulated countercurrent to the flow of the waste gases.

4,003,978

METHOD FOR TREATING AMMONIA-CONTAINING GASES

Tatsuo Shiraishi; Shinkichi Shimizu; Hiroshi Ichihashi; Tadashi Shindo, and Fumiyoshi Kato, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 18, 1974, Ser. No. 515,888

Claims priority, application Japan, Oct. 24, 1973, 48-120185; Apr. 25, 1974, 49-47350

Int. Cl.² C01B *21/02*

U.S. Cl. 423—237 **6 Claims**

1. A method for treating ammonia-containing gases to remove ammonia therefrom by oxidizing the ammonia to nitrogen gas and water in the vapor phase at an elevated temperature in the presence of molecular oxygen and with a substantial reduction in the amount of nitrogen oxides being produced, which comprises contacting the ammonia-containing gases with a metal oxide catalyst of the formula:

$Cr_xA_yO_z$

where Cr is chromium; A is at least one element selected from the group consisting of tin, antimony, vanadium, cobalt, silver, zinc, nickel, titanium, molybdenum, tungsten, sulfur, phosphorus, boron, germanium and zirconium; x is a numeral of 4 to 12; y is a numeral of 0.2 to 8 and z is a numeral of 6.2 to 42, at a temperature of 200° to 500° C., and in a molar ratio of oxygen to ammonia of one or more, said catalyst being prepared by kneading a slurry of (a) a chromium compound selected from a group consisting of chromium nitrate, chromium acetate, chromic anhydride, ammonium chromate, potassium chromate, sodium chromate, ammonium bicromate, potassium bichromate and sodium bichromate and (b) one or more members selected from the group consisting of an oxide, nitrate, chromate, carbonate, acetate or hydroxide of nickel, cobalt or zinc, or a complex salt thereof; a trioxide or dioxide of molybednum or tungsten, ammonium molybdate, ammonium tungstate, or a chelate compound thereof with ethanolamine; an oxide of tin, antimony or titanium, tin tetrachloride, tin dichloride, antimony pentachloride, antimony trichloride or titanium tetrachloride; divanadium pentaoxide, divanadium tetraoxide, divanadium trioxide, vanadyl oxalate, vanadyl chloride, a chelate compound thereof with ethanolamine or ammonium metavanadate; silver oxide, silver nitrate, silver chromate, silver bichromate or silver carbonate; sulfuric acid, ammonium sulfate or chromium sulfate; phosphiric acid, phosphorus pentoxide, ammonium phosphate or chromium phosphate; boric acid; germanium dioxide or germanium chloride; and zirconium dioxide, zirconium silicate, zirconium nitrate or zirconium sulfate with a carrier material selected from the group consisting of silica sol and a fine powder selected from silica, diatomaceous earth or alumina together with water, drying the mixed composition so formed at a temperature sufficient to make it substantially anhydrous and calcining said anhydrous composition at a temperature of from 300° to 1,000° C..

4,003,979

METHOD OF CLEANING AIR CONTAINING CARBON MONOXIDE

Hiroshi Kanno, Amagasaki, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed Nov. 22, 1974, Ser. No. 526,178

Claims priority, application Japan, Nov. 26, 1973, 48-132859; Mar. 19, 1974, 49-32083; Apr. 24, 1974, 49-46800

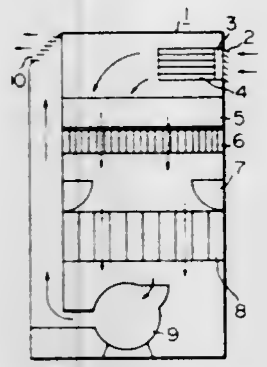
Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **8 Claims**

1. A method for cleaning polluted air containing oxides, nitrogen oxides, organic substances and carbon monoxide wherein the carbon monoxide is oxidized into carbon dioxide, comprising the steps of:

passing the polluted air through two types of filters, one type having a layer of hopcalite or potassium permanganate deposited on active carbon for removing sulfur and nitrogen oxides and the other type being comprised of solid adsorbent selected from the group consisting of active carbon, active alumina, alumina-silica and porous particles of organic high polymers for removing organic substances and then,

passing the air so treated at ambient temperature through a catalyst layer composed of a noble metal catalyst supported by the active carbon, said catalyst layer containing 20 to 50% by weight, based on the total weight of the noble metal catalyst and the active carbon, of water.



4,003,980

URANIUM DIOXIDE PREPARATION

George W. Watt, Austin, Tex., and Daniel W. Baugh, Jr., Baton Rouge, La., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed May 21, 1975, Ser. No. 579,495

Int. Cl.² C01G *43/02*

U.S. Cl. 423—261 **15 Claims**

1. A process for the preparation of an actinide dioxide comprising reacting a starting material comprising an actinide compound selected from the group consisting of (a) plutonyl nitrate, a hydrate of plutonyl nitrate or a tetrahydrofuranate of plutonyl nitrate, (b) neptunyl nitrate, a hydrate of neptunyl nitrate or a tetrahydrofuranate of neptunyl nitrate and (c) uranyl nitrate, a hydrate of uranyl nitrate or a tetrahydrofuranate of uranyl nitrate with a reactant comprising an alkali or alkaline earth metal adduct of a monocyclic or polycyclic hydrocarbon in the presence of an inert organic solvent.

4,003,981

PROCESS OF MAKING SUPERFINE AMORPHOUS HIGH STRUCTURE SILICIC ACID

Günter Türk, Gross-Auheim, and Joseph Welsch, Neu-Isenburg, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 290,884, Sept. 21, 1972, which is a continuation of Ser. No. 199,054, Nov. 15, 1971, abandoned, which is a continuation of Ser. No. 849,739, April 28, 1969, abandoned. This application Feb. 25, 1976, Ser. No. 661,166

Claims priority, application Germany, Apr. 27, 1968, 1767332

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.² C01B *33/18, 33/14*

U.S. Cl. 423—335 **6 Claims**

1. An amorphous, high structure, finely divided percipitated silicic acid for use as a carrier for pesticides which is characterized by a malathion absorption, as defined herein, of at least about 316% and which is made by heating an aqueous alkali-metal silicate solution to a temperature between 70° and 100° C, then adding an acid or an acidic-acting substance or a mixture of said acid and acidic-acting substance together with further alkali-metal silicate to the heated solution, thus causing the mixture to pass first through an alkaline phase and then through an acid precipitation phase, whereby a gradual transition of the silicate to an intermediate hydrated silica sol and thereafter gradual conversion of the hydrated silica sol by flocculation to a silicic acid suspension occurs in said alkaline phase, these steps being carried out with the following provisions:

- a. the alkali number of the reaction mixture is maintained substantially constant throughout the said alkaline precipitation phase at a value within the range from 10 to 40:
- b. the amounts of components for the precipitation reaction are selected to obtain an SiO_2 end concentration above 65 grams SiO_2 per liter;
- c. a dispersing and shearing force is applied to the mixture throughout the major part of the period of said gradual conversion of the intermediate hydrated silica sol to the flocculated silicic acid;
- d. the said dispersing and shearing force is applied by passing the mixture in a continuous stream through a flow-through dispersing pump, centrifugal pump, or combination of these devices, the said pump operating at a frequency of at least 10 per hour, the said frequency being the ratio of the performance of the dispersing device expressed in cubic meters per hour to the initial volume of the reaction mixture in cubic meters; and
- e. the said mixing, precipitation and suspension formation is carried out in a single reaction vessel.

4,003,982

SAFE METHOD FOR THERMAL DECOMPOSITION OF NITROGEN TRICHLORIDE

Howard W. Hill, Sea Ranch, and Ronald E. Hassall, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 30, 1975, Ser. No. 573,224

Int. Cl.² C01B *21/02, 7/03*

U.S. Cl. 423—351 **13 Claims**

1. The process for decomposing nitrogen trichloride to nitrogen and chlorine which comprises heating a solution of not more than about 3.5 weight percent NCl_3 in an inert solvent, under at least autogenous pressure, to a temperature within the range of from about 105° C. to that resulting in an autogenous pressure of 300 psig.

4,003,983

PROCESS OF PREPARING DICYAN

Johannes Heilos, Seligenstadt; Werner Heimberger, Hanau am Main; Theodor Lussling, Grossauheim, and Wolfgang Weigert, Offenbach (Main), all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 124,866, March 16, 1971, abandoned. This application Jan. 23, 1975, Ser. No. 543,367

Claims priority, application Germany, Mar. 17, 1970, 2012509; May 8, 1970, 2022454; May 8, 1970, 2022455

Int. Cl.² C01C *3/00*

U.S. Cl. 423—384 **7 Claims**

1. A process for the production of cyanogen which comprises reacting hydrogen cyanide with hydrogen peroxide at a temperature between 0° and 100° C in the presence of ferric ions and a copper salt selected from the group consisting of copper(II) bromide, chloride, cyanide, nitrate, and sulfate.

4,003,984

PRODUCTION OF SULFURYL FLUORIDE

Edward Stephen Jones, Williamsville; Martin Alvin Robinson, East Amherst, and Richard Elmer Eibeck, Orchard Park, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 2, 1975, Ser. No. 619,103

Int. Cl.² C01B *17/45*

U.S. Cl. 423—468 **9 Claims**

1. A process for producing sulfuryl fluoride which comprises introducing a substantially anhydrous gaseous mixture of chlorine, sulfur dioxide and hydrogen fluoride into a reaction zone in which there is present an alkaline earth metal fluoride catalyst, maintaining the temperature in the reaction zone between about 125° C and 400° C, and recovering the sulfuryl fluoride produced.

4,003,985

PRODUCTION OF SODIUM SULFITE

Robert Joel Hoffman, Liverpool; Samuel Louis Bean, Jamesville; Philip Seeling, North Syracuse, and James William Swaine, Jr., Manlius, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 30, 1976, Ser. No. 653,876

Int. Cl.² C01D *5/14*

U.S. Cl. 423—512 A **11 Claims**

1. The method of producing anhydrous sodium sulfite comprising:

- a. forming a saturated aqueous solution of sodium sulfite containing less than about 3 ppm of dissolved iron, basis the solution, and adjusting the pH of said solution to within the range of from about 6.5 to about 7.6;
- b. introducing into said solution substantially anhydrous sodium carbonate concurrently with a sulfur dioxide-containing gas stream, so proportioned with respect to each other as to maintain the pH of said solution within the range of from about 6.5 to about 7.6, while maintaining the temperature of said solution above about 35° C. to form a slurry of anhydrous sodium sulfite crystals; and
- c. withdrawing anhydrous sodium sulfite crystals from said slurry.

4,003,986

PROCESS FOR PRODUCING SULFUR FROM SULFUR DIOXIDE OR AMMONIUM SULFITES

George W. Lewis, Jr., 8138 Lockwood Lane, Indianapolis, Ind. 46217

Continuation-in-part of Ser. No. 340,963, March 14, 1973, Pat. No. 3,928,536. This application Oct. 6, 1975, Ser. No. 620,024

Int. Cl.² C01B *17/00;* **C01C** *1/02*

U.S. Cl. 423—567 A **6 Claims**

1. A process for producing ammonia and sulfur which comprises subjecting a first solid substance selected from the group consisting of ammonium sulfite, ammonium pyrosulfite, ammonium bisulfite, and a mixture of any two or more of said compounds to carbon monoxide gas at a temperature above 140° F and below 250° F and in the absence of oxygen until substantially all of said first substance has been converted to ammonia and sulfur, and recovering the ammonia and sulfur produced.

4,003,987

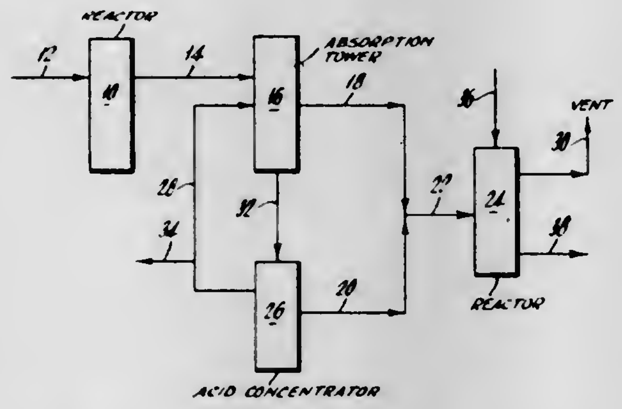
WASTE STREAM TREATMENT

Peter L. Paull, Weston, Conn., and James M. Caffrey Jr., Wappingers Falls, N.Y., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,744

Int. Cl.² C01B *17/04, 17/00, 17/82*

U.S. Cl. 423—570 **6 Claims**



1. In the continuous formation of carbon dioxide, nitrogen, concentrated sulfuric acid and sulfur from an industrial flue gas comprising nitrogen oxides, sulfur dioxide and oxygen, the steps that comprise:

- a. contacting at between about 300° and 350° F. said flue gas with a first oxidation catalyst selected from an oxide of a Group Ib, VIa, VIIa or VIII metal of the Periodic Table or an oxide of vanadium at a space velocity of between about 500 and 10,000 volumes of said flue gas/-volume of said first catalyst to effect conversion substantially of all the nitrogen oxide in said nitrogen oxides to nitrogen dioxide and to effect conversion of only a part of the sulfur dioxide in said flue gas to sulfur trioxide.
- b. admixing the oxidized flue gas with between about 70 and 90 wt. % aqueous sulfuric acid to effect adsorption in said sulfuric acid of the nitrogen dioxide in said industrial flue gas and the nitrogen dioxide formed in said step *a* resulting in the formation of nitrosyl sulfuric acid therein by the reaction of said nitrogen dioxide with sulfuric acid,
- c. separating the resultant sulfuric acid phase and unabsorbed flue gas phase comprising sulfur dioxide resulting from step *b*,
- d. heating said sulfuric acid phase separated in step *c* at between about 300 and 500° F. to remove nitrogen oxides, desorbed sulfur dioxide and water as overhead resulting in a sulfuric acid phase of increased sulfuric acid content and recycling at least a portion of the resultant concentrated sulfuric acid phase to step *b* to be employed as at least a part of said sulfuric acid,
- e. combining the overhead formed in step *d* with the separated unabsorbed flue gas phase of step *c*, and
- f. treating at a temperature between about 300° and 450° F. the combined unabsorbed flue gas phase and overhead of step *e* with carbon monoxide in the presence of a second oxidation catalyst selected from an oxide of Group Ib, VIa, VIIa or VIII metal of the Periodic Table or an oxide of vanadium employing a space velocity of between about 500 and 10,000 volumes of said flue gas/volume of said second oxidation catalyst to yield nitrogen, carbon dioxide and sulfur and separating said nitrogen and carbon dioxide from said sulfur.

4,003,988

DIRECT AGGLUTINATION TEST FOR PREGNANCY

Gail Hoff, Millington, and Metka Prevorsek, Morristown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 1, 1976, Ser. No. 691,915

Int. Cl.² G01N *31/02, 33/16*

U.S. Cl. 424—12 **9 Claims**

1. A liquid reagent having the characteristics of agglutination when placed in contact with fluids which contain human chorionic gonadotropin and which comprises a polymeric latex carrier having a particle size between about 0.15 to about 0.9 microns, said carrier being coated with rabbit anti-human chorionic gonadotropin serum and the reagent being buffered to a pH of from 5.0 to about 8.6 with a buffer which comprises about 0.005 to about 1.0M piperazine dihydrochloride, water and sufficient sodium hydroxide to obtain the buffered pH.

4,003,989

PHARMACEUTICAL PREPARATION

Ernest Bar-On, 3 Pasternak St., Tel-Aviv, Israel

Filed Apr. 24, 1975, Ser. No. 571,430

Claims priority, application Israel, May 6, 1974, 44774

Int. Cl.² A61K *9/00, 31/60, 31/265*

U.S. Cl. 424—43 **12 Claims**

1. A pharmaceutical preparation in unit dosage form for oral ingestion after dissolution in a suitable liquid, said pharmaceutical preparation comprising in combination sodium salicylate and a quantity of 5 to 100 times by weight thereof of dry milk solids.

4,003,990

ANTI-INFLAMMATORY POLYMERS, PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AND PROCESS FOR PRODUCING SAID POLYMERS

Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieux, both of Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

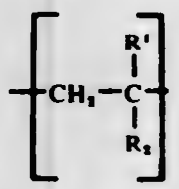
Division of Ser. No. 374,060, June 27, 1973, Pat. No. 3,946,035. This application Nov. 7, 1975, Ser. No. 629,928

Claims priority, application Luxembourg, June 29, 1972, 65621; June 29, 1972, 65622

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

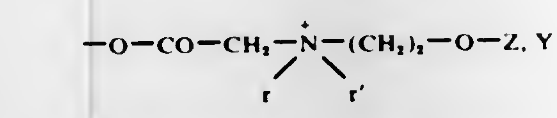
1. A pharmaceutical composition comprising a pharmaceutically acceptable excipient and at least one anti-inflammatory polymer containing repeating units of the formula



$$\left[-CH_2-\underset{R_2}{\overset{R^1}{C}}-\right]$$

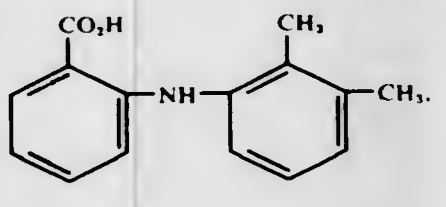
wherein R^1 and R_2 are selected from the group of values consisting of

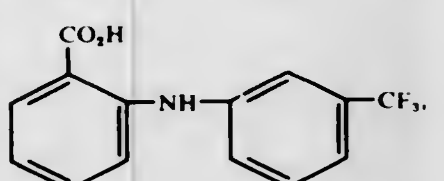
- a. R_2 is $\left[O-CO-CH_2\right]_nO-Z$, R^1 is hydrogen and *n* is 1–10,
- b. R_2 is $-CH_2-O-CO-CH_2-o-Z$ and R^1 is hydrogen or methyl,
- c. R_2 is $-CH_2-NH-CO-CH_2O-Z$ and R^1 is hydrogen,
- d. R_2 is $-CO-NH-CH_2-NH-CO-CH_2-O-Z$ and R^1 is hydrogen, and
- e. R_2 is



$$-O-CO-CH_2-\underset{r\qquad r'}{\overset{+}{N}}-(CH_2)_2-O-Z,\ Y^-$$

wherein r and r' represent alkyl having 1–3 carbon atoms, Y represents chlorine or bromine, and R^1 is hydrogen or methyl, and Z is the acyl residue of an anti-inflammatory carboxylic pharmaceutical agent selected from the group consisting of


(1)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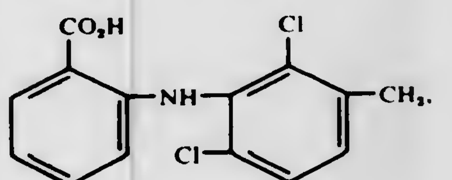
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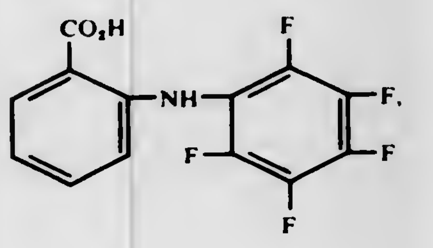
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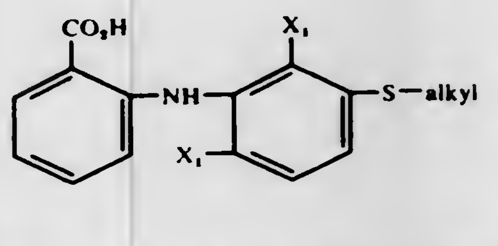
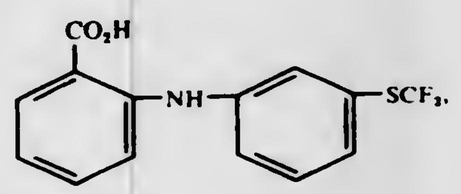

(5)

wherein

X_1 represents Cl, Br, F or I and said alkyl has 1–3 carbon atoms,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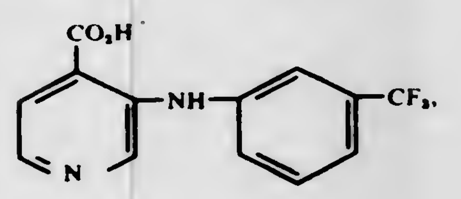
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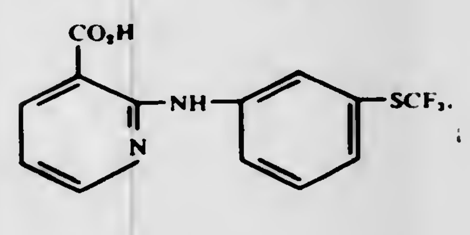
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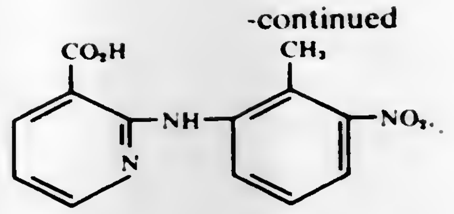
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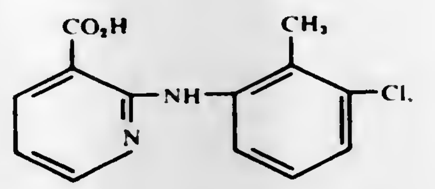
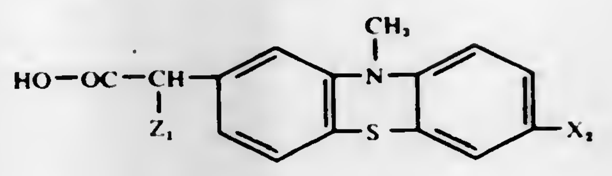
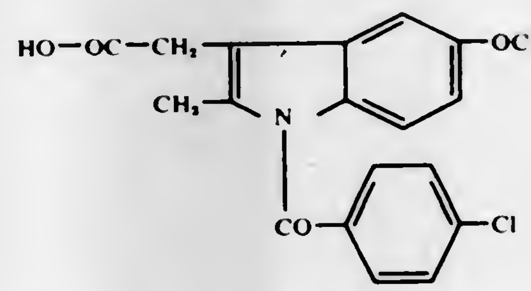
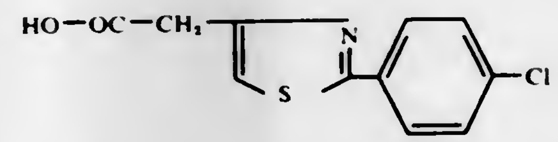

(10)


(11)

wherein Z_1 is selected from the group consisting of hydrogen and methyl, and X_2 is selected from the group consisting of hydrogen and methoxy,


(12)

and


(13)

said anti-inflammatory polymer being present in a sufficient amount effective to produce a delayed and prolonged action of the residue of said anti-inflammatory carboxylic pharmaceutical agent.

4,003,991

OPHTHALMIC FORMULATION

David L. Krohn, New York, N.Y., and Samuel H. Ronel, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Aug. 27, 1974, Ser. No. 501,117

Int. Cl.² A61K *31/74, 31/78, 31/415*

U.S. Cl. 424—81 **34 Claims**

1. A viscous, homogeneous opthalmic formulation comprising

1. water,
2. a therapeutically effective amount of a medicament, and
3. a solid, compatible, non-toxic polymer which is a water-soluble acrylic polymer, a water-soluble 2-alkenamide polymer or a water-soluble ethylenimine polymer, the concentration of said polymer being sufficient to impart to the formulation a slow-flowing characteristic which is substantially shape-retaining as said formulation is initially forced from a tube under mild hand squeezing of the tube.

4,003,992

HYDROLYTIC PROCESS FOR THE PREPARATION OF AMINO ACIDS

Myron A. Beigler, Palo Alto; William B. Benken, San Jose, and Jorge J. Nassar, Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 16, 1975, Ser. No. 587,016

Int. Cl.^{2} A61K *35/14, 31/195*

U.S. Cl. 424—101 **17 Claims**

1. A process for the preparation of a nutritionally acceptable amino acid mixture suitable for intravenous administration which comprises the steps of:

a. heating erythrocytes to denature protein contained therein, followed by separation of the insoluble denatured protein formed thereby from the soluble components;

b. hydrolyzing the denatured protein from step (a) with sulfuric acid at a temperature equal to or greater than 200° F to afford a crude amino acid mixture essentially free of peptides, followed by partial neutralization with calcium hydroxide to a final pH of between 2.7 and 3.5, thereby affording a mixture of soluble amino acids and a cake comprising calcium sulfate and humin impurities;

c. desludging the mixture formed in step (b) by separating the amino acid solution from the calcium sulfate-humin cake;

d. decolorizing the amino acid solution obtained from step (c);

e. deionizing the decolorized amino acid solution from step (d) to remove nutritionally objectionable ions by loading the amino acid solution on a column of a strong cationic exchange resin comprising a sulfonated copolymer of styrene cross-linked with approximately 8% divinyl benzene and eluting the amino acids therefrom with dilute sodium hydroxide solution;

f. concentration of the amino acid solution obtained from step (e) by removal of water to afford an amino acid solution containing greater than 2% w/w of amino acids; and

g. sterilization of the amino acid solution obtained from step (f) to remove microbial contamination.

4,003,993

PIGLET ENTERITIS TREATMENT

Knud Rorvig, Gentofte, Denmark, assignor to Biofac A/S, Copenhagen, Denmark

Filed Dec. 15, 1970, Ser. No. 98,479

Claims priority, application Switzerland, Dec. 15, 1969, 18597/69

Int. Cl.^{2} A61K *35/38*

U.S. Cl. 424—104 **14 Claims**

1. A therapeutic composition useful in the treatment of piglet enteritis which comprises an extract obtained from the contents of at least a portion of that section of the digestive system of a ruminant consisting of the rumen and the section of the alimentary canal immediately successive to the rumen, said extract being prepared by mixing said contents with water, using one to two parts water per two parts of said contents, filtering the mixture, and in arbitrary succession sterilizing by heating and concentrating the filtrate by evaporation to obtain a concentrated extract.

4,003,994

COPPER-ALKALINE EARTH METAL FUNGICIDAL COMPOSITIONS

John D. Downer, and Clarence A. L. Phillips, both of Trinidad, British West Indies, assignors to Texaco Trinidad, Inc., Trinidad, British West Indies

Continuation-in-part of Ser. No. 360,504, May 15, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,512

Int. Cl.^{2} A01N *11/00, 9/00*

U.S. Cl. 424—157 **6 Claims**

1. A fungicidal composition in the form of a micelle, said micelle comprising an outer protective layer consisting of the overbased copper-alkaline earth metal naphthenates of naphthenic acids having a molecular weight in the range of about 200 to about 600, and an inner core consisting mainly of copper hydroxide, the ratio of equivalents of copper to naphthenate ranging from about 1 to about 20, the mole percent ratio of said alkaline earth metal to copper being from 1 to 8.

4,003,995

GLYCOSYL ESTERS OF PHENOXYISOBUTYRIC ACIDS

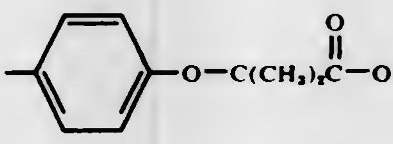
Sumanas Rakhit, Dollard des Ormeaux, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,210

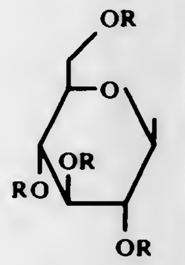
Int. Cl.^{2} A61K *31/70*

U.S. Cl. 424—180 **6 Claims**

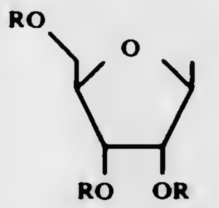
1. A compound of formula I



in which X is chloro, bromo or lower alkyl and Y is



or



wherein R is lower alkanoyl or benzoyl.

3. A method for lowering concentration of blood cholesterol and triglycerides in mammals which comprises administering orally or parentally to said mammal a blood cholesterol and triglyceride lowering amount of compound of formula I as claimed in claim 1.

4,003,996

SPIROLACTONE FOR INHIBITING THE CARDIOTOXIC EFFECTS OF ADRIAMYCIN

Raphael Pappo, Skokie, and Rothwell Polk, Northfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,095

Int. Cl.^{2} A61K *31/71*

U.S. Cl. 424—181 **1 Claim**

1. A method for inhibiting the cardiotoxic effects of adriamycin in an animal which comprises pretreating said animal with the aldosterone inhibitor 3-(3-oxo-7α-acetylthio-17β-hydroxyandrost-4-en-17-yl)propionic acid lactone in an amount sufficient to inhibit said effects prior to treatment with adriamycin.

4,003,997

HEART GLYCOSIDES AND PROCESS FOR PREPARING THEM

Ulrich Stache, Hofheim, Taunus; Kurt Radscheit, Kelkheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Werner Haede, Hofheim, Taunus, and Ernst Lindner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

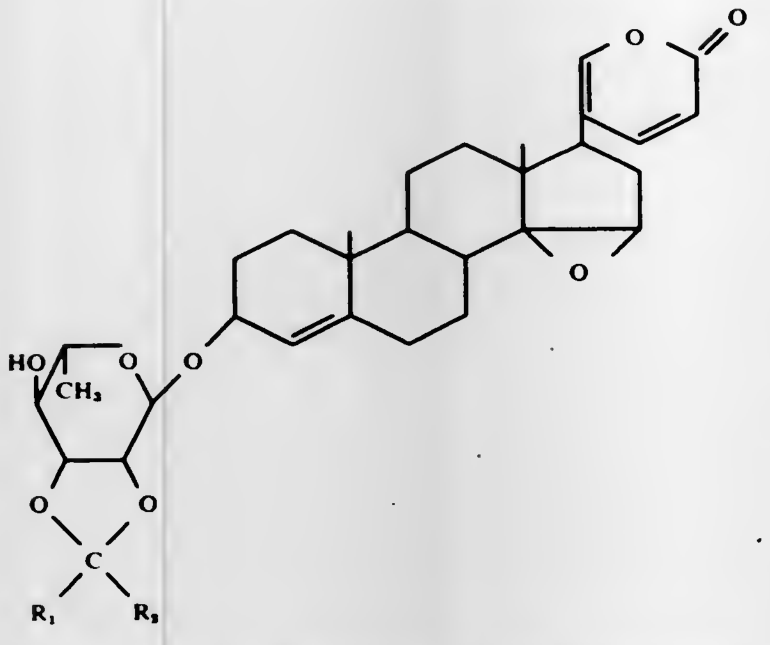
Filed Aug. 12, 1974, Ser. No. 496,892

Claims priority, application Germany, Aug. 14, 1973, 2341023

Int. Cl.^{2} A61K *31/70*

U.S. Cl. 424—182 **8 Claims**

1. A cyclic 2',3'-ether of 3-hydroxy-14,15β-oxido-14β-bufa-4,20,22-trienolide, 3β-(α-L-rhamnopyranoside) of the formula



wherein R₁ and R₂, which may be the same or different but only one of which may be hydrogen, taken alone, are hydrogen, or alkyl, aryl, or aralkyl having 1 to 7 carbon atoms, and R₁ and R₂, taken together, are linear or branched alkylene having 4 to 9 carbon atoms.

7. A pharmaceutical preparation having cardiac insufficiency activity which comprises an effective amount of a compound as in claim 1 in combination with a pharmaceutical carrier.

4,003,998

α-ACYL DERIVATIVES OF DIGITOXIN

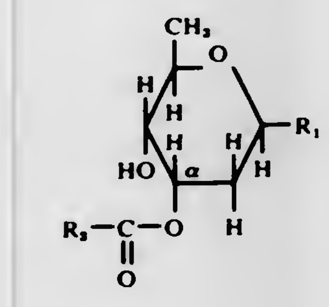
Walter Losel; Herbert Merz, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation of Ser. No. 362,911, May 23, 1973. This application July 7, 1975, Ser. No. 593,800

Int. Cl.^{2} A61K *31/70*

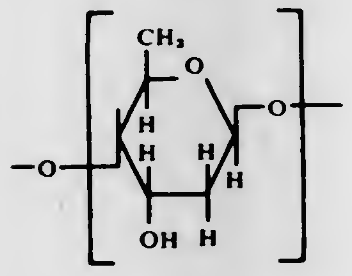
U.S. Cl. 424—182 **10 Claims**

1. A compound of the formula



(I)

wherein
R₁ is



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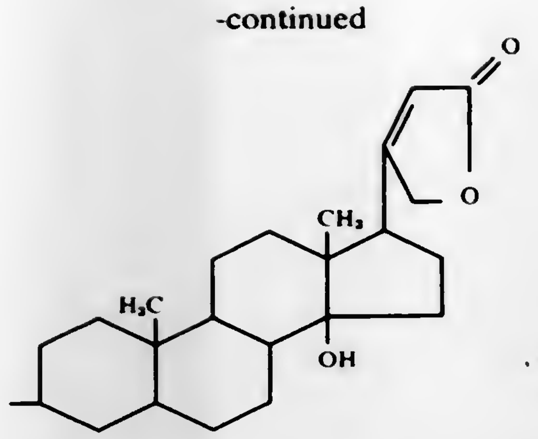


, and

R₂ is straight-chain alkyl of 2 to 15 carbon atoms; monosubstituted alkyl of 1 to 4 carbon atoms the substituent being halogen, cyano, carbethoxy, phenyl, halophenyl, lower alkyl-phenyl, lower alkoxy-phenyl; phenoxy, lower alkyl-phenoxy or halo-phenoxy; cycloalkyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms-methyl; or N-trifluoromethylcarbonyl-aminoethyl.

9. A cardiotonic pharmacutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective cardiotonic amount of a compound of claim 1.

4,003,999

ASPIRIN-TEA COPRECIPITATES FOR TREATING INFLAMMATION

Robert Archie Lybrand, Ashland, and Louis Gary Bell, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 404,945, Oct. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,796, Oct. 25, 1972, abandoned. This application May 8, 1975, Ser. No. 575,898

Int. Cl.^{2} A61K *31/60, 35/78*

U.S. Cl. 424—195 **24 Claims**

1. A process for the preparation of a water insoluble aspirin-tea coprecipitate wherein said coprecipitate is comprised of 85–98 weight % aspirin and 2–15 weight % tea constituent which comprises mixing aspirin, tea and a base in water, said base being an amount to form a soluble acetyl salicylate, the resulting solution containing from about 2 to about 7 weight % acetyl salicylate and from about 0.3 to about 3.5 weight % tea, acidifying the solution at a temperature of from about −2° to about 25° C. and to a pH of from about 4.2 to about 2.6 to cause formation of the coprecipitate and recovering the coprecipitate.

4,004,000

SELF-LIMITING CHEMICAL SYSTEMS FOR NONPOLLUTING CONTROL OF NOXIOUS PESTS

Robert T. Kemp, Jr., Asheville, N.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,409

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—200 **10 Claims**

1. A method of controlling insects comprising applying to the locus of said insects an insecticidally effective amount of a non-polluting insecticidal principle formed by

spraying a first relatively non-toxic, stable reactant, trimethyl phosphite, from one nozzle; and

spraying a second non-toxic, stable reactant selected from the group consisting of chloral, 3,5-diphenyl-N-(trichloroacetyl) pyrazole, and N(trichloroacetyl) pyrazole from a second nozzle, so as to cause said first and said second reactants to combine to form a non-stable insecticidal principal.

4,004,001
PHOSPHORUS CONTAINING INSECTICIDE ACTIVATORS

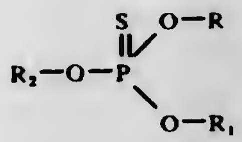
George B. Large, Orinda, and Leland S. Pitt, San Jose, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 433,182, Jan. 14, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,865

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—200 **41 Claims**

1. An insecticidally active composition comprising an insecticidally effective amount of an insecticide which is N-(mercaptomethyl) phthalimide-S-(O,O-dimethylphosphorodithioate) and an effective amount of an activator having the formula



wherein R is selected from the group consisting of methyl, ethyl, n-propyl, i-propyl and i-butyl; R_1 is selected from the group consisting of methyl, ethyl, n-propyl, i-propyl, n-butyl and i-butyl and R_2 is selected from the group consisting of phenyl, substituted phenyl wherein said substituents are selected from the group consisting of methyl, ethyl, i-propyl, t-butyl, methoxy, ethoxy, and dimethylamino; phenalkyl and substituted phenalkyl wherein said substituents are selected from the group consisting of chlorine, methyl, i-propyl and methoxy, said activator being present in an amount ranging between 0.1 and 10.0 parts by weight per each part by weight insecticide and being effective to increase the activity of the insecticide.

4,004,002
ANTI-INFLAMMATORY AGENTS COPRECIPITATED WITH LIGNO-SULFONIC ACID

Robert Archie Lybrand, Ashland, and Louis Gary Bell, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 459,828, April 10, 1974, abandoned, which is a continuation-in-part of Ser. Nos. 271,986, July 14, 1972, abandoned, and Ser. No. 89,999, Nov. 16, 1970, abandoned. This application Nov. 3, 1975, Ser. No. 628,258

Int. Cl.^{2} A61K *31/60*

U.S. Cl. 424—230 **19 Claims**

1. A water insoluble anti-inflammatory coprecipitate of a lignosulfonic acid and an anti-inflammatory agent selected from the group consisting of aspirin, phenylbutazone and indomethacin wherein the amount of said lignosulfonic acid in the coprecipitate varies from 3 to 10 weight % and the amount of anti-inflammatory agent in the coprecipitate varies from 90–97 weight %, said coprecipitate formed by acidifying an aqueous solution of said lignosulfonic acid and the anti-inflammatory agent, said aqueous solution being substantially free of undissolved solids prior to acidification and said solution formed by mixing said lignosulfonic acid or an aqueous solution thereof and an aqueous solution formed by solubilizing said anti-inflammatory agent with a base.

4,004,003
25-HYDROXYCALCIFEROL COMPOUNDS FOR TREATMENT OF STEROID-INDUCED OSTEOPOROSIS

John C. Babcock, and J. Allan Campbell, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

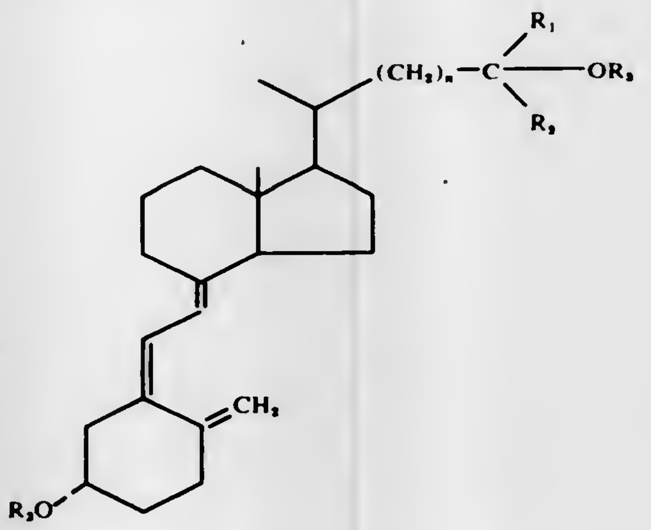
Continuation of Ser. No. 501,039, Aug. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 807,929, March 17, 1969, Pat. No. 3,833,622. This application Oct. 6, 1975, Ser. No. 619,647

Int. Cl.^{2} C07J *9/00*

U.S. Cl. 424—238 **3 Claims**

1. A process for the therapeutic or prophylactic treatment of gluco-corticoid hormone-induced osteoporosis comprising the administration of a compound of the formula:

Formula 1



wherein R_1 and R_2 are the same or different radicals selected from the group consisting of hydrogen, alkyl of less than 9 carbon atoms, and phenyl; R_3 and R_5 are selected from the group consisting of hydrogen and lower acyl; *n* is an integer, selected from the group consisting of 2, 3, and 4; or a hydrate thereof in association with a pharmaceutical carrier to a human or animal.

4,004,004
FUSIDIC ACID DERIVATIVES

Welf von Daehne, Rungsted Kyst, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

Filed Aug. 12, 1975, Ser. No. 604,083

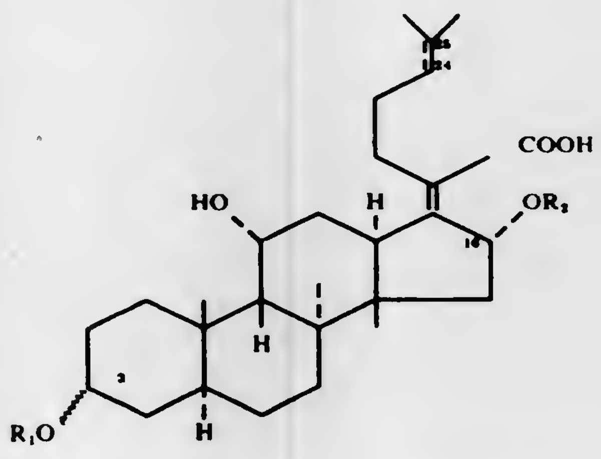
Claims priority, application United Kingdom, Sept. 12, 1974, 39891/74

Int. Cl.^{2} A61K *31/56*

U.S. Cl. 424—238 **10 Claims**

8. A method of treating acute or chronic arthritis which comprises administering into the body an effective amount of a compound of the formula:

I



in which R_1 and R_2 stand for a lower alkanoyl radical having from 2 to 8 carbon atoms, a mono- or bicyclic, carbocyclic aryl-lower alkanoyl radical, or a mono- or bicyclic, carbocyclic aroyl radical; and R_2 also stands for hydrogen; the dotted line between C-24 and C-25 indicates a double bond or a single bond; and the wavy line at C-3 indicates that OR_1 is α- or β-oriented; and pharmaceutically acceptable, non-toxic salts or easily hydrolyzable esters thereof.

9. A method according to claim 8 in which the therapeutically active compound is administered by the oral route, in amounts from 200 to 4000 mg per day, preferably from 500 to 2000 mg per day.

4,004,005
STEROIDAL ERYTHROPOIETIC AGENTS AND THERAPEUTIC COMPOSITIONS AND METHODS

Henry A. Strade, Montville, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Filed Sept. 30, 1975, Ser. No. 618,176

Int. Cl.^{2} A61K *31/56, 31/575*

U.S. Cl. 424—243 **7 Claims**

1. Method for the stimulation of erythropoesis in humans and other warm-blooded animals in need of such therapy which comprises administering an amount effective to produce such stimulation of a compound selected from the group consisting of 3α-hydroxy-5β-estrane-17-one and the 3-esters of organic carboxylic acids and 3-ethers thereof in which the ether group is selected from the group consisting of methoxy, ethoxy, propoxy, benzyloxy and phenylethoxy.

4,004,006
CONTRACEPTIVE AND ANTIVENEREAL AGENTS

Albert Shulman, and Glenda Maud Shulman, both of Flat 2, 1 Muntz St., North Caulfield, Australia (3161)

Filed Nov. 12, 1974, Ser. No. 523,172

Claims priority, application Australia, Nov. 12, 1973, 5608/73

Int. Cl.^{2} A61K *31/555*

U.S. Cl. 424—245 **28 Claims**

1. A method of inactivating spermatozoa and killing the microorganisms *Neisseria gonorrhea* and Treponema pallidum comprising contacting the same with a pharmaceutically acceptable carrier containing a effective, contraceptive and antivenereal amount of a metal chelate contraceptive and antiveneral agent selected from the group consisting of

$(M\ B_3)\ X_n$ and $(M\ B_2)\ X_n$

wherein M represents a metal selected from ferrous (iron(II)), zinc(II), manganous (manganese(II)), cobaltous (cobalt (II)), cobaltic(cobalt(III)), cuprous(copper(I)), cupric(copper(II)), nickelous(nickel(II)), chromous (chromium (II)), chromic (chromium (III)), cadmium(II), ruthenous(ruthenium(II)), osmous(osmium(II)), platinous(platinum(II)), palladous(palladium(II)), rhodic(rhodium (III)) and iridous-(iridium(III)), wherein B represents a ligand provided by a base consisting of 1,10-phenanthroline, 2,2′-bipyridine or their substituted derivatives, the 1,10-phenanthroline base having substituents and mixtures of substituents selected from alkyl, aryl, nitro and chloro in one to eight of the 2-, 3-, 4-, 5-, 6-, 7-, 8-, and 9-, positions and the 2,2′-bipyridine base having substituents selected from alkyl, aryl, nitro and chloro in one to six of the 4-, 5-, 6-, 4′-, 5′-, and 6′- positions, in the case of 1,10-phenanthroline the substitution being in one to eight of the specified positions with the alkyl group and in one or two of the specified positions with the nitro, chloro, aryl, each alkyl substituent of 1 to 16 carbon atoms, the total of all carbon atoms in such substituents not exceeding 16, and where di-substitution involves the 3-, 4-, and 7-, 8-, positions either pairs of carbon atoms may form part of 5-membered and 6-membered cycloalkane ring systems and such aryl, mono- and di-substituents totalling from 4 to 16 carbon atoms, and in the case of the 2,2′-bipyridine there being substitution in one to six of the specified positions with the alkyl groups, and mono-substitution and di-substitution in the 4- and 4′- and 5- and 5′-positions with the nitro, chloro, aryl each alkyl substituent of 1 to 16 carbon atoms, the total of all carbon atoms in such substituents not exceeding 16, and such aryl, totalling from 4 to 16 carbon atoms; wherein X represents the anion of pharmaceutically acceptable inorganic and organic acids; and wherein *n* represents an integer determined by the oxidation state of the metal.

4,004,007
2-HETEROCYCLICALKYL-3,3a,4,5,6,7-HEXAHYDRO-3-PHENYL-7-(PHENYLMETHYLENE)-2H-INDAZOLES

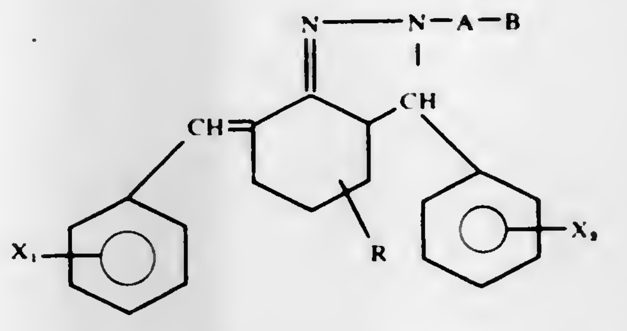
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 8, 1975, Ser. No. 603,222

Int. Cl.^{2} C07D *487/02;* **A61K** *31/395*

U.S. Cl. 424—246 **15 Claims**

1. A compound of the formula



wherein X_1 and X_2 are the same or different and are selected from the group consisting of hydrogen, F, Cl, lower alkyl, lower alkoxy, or CF_3; R is selected from the group consisting of hydrogen or lower alkyl, A is a straight or branched chain alkylene group of from 2 to about 8 carbons, and B is a 5-, 6-, or 7-membered heterocyclic ring selected from the group consisting of piperidinyl, homopiperidinyl, pyrrolidinyl, morpholinyl, thiamorpholinyl, piperazinyl, N-lower alkylpiperazinyl and N-hydroxy-lower alkylpiperazinyl; and N-oxides and pharmaceutically acceptable acid addition salts thereof.

15. A method of treating inflammation in mammalian species, which comprises administering to a mammalian host a therapeutic amount of a compound as defined in claim 1.

4,004,008
O-TERTIARY AMINO-ALKYL-N-BENZOYL TYROSIL AMIDES

Francesco Makovec, Taccona (Milan); Luigi Rovati, San Fruttuoso di Monza (Milan), and Paolo Senin, Monza (Milan), all of Italy, assignors to Rotta Research Laboratorium S.p.A., San Fruttuoso di Monza (Milan), Italy

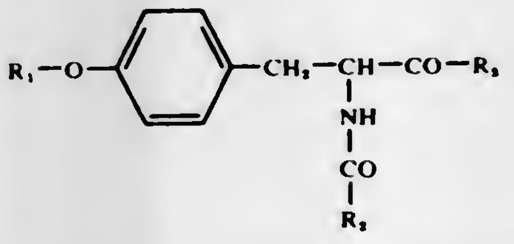
Filed Feb. 3, 1975, Ser. No. 546,481

Claims priority, application Italy, Feb. 1, 1974, 67286/74

Int. Cl.^{2} C07D *295/12*

U.S. Cl. 424—248.54 **11 Claims**

1. A tyrosine compound of the formula:



$$R_1-O-C_6H_4-CH_2-\underset{\underset{\underset{\underset{\displaystyle R_2}{|}}{\displaystyle CO}}{\overset{|}{\displaystyle NH}}}{CH}-CO-R_3$$

wherein: R_1 is linear or branched chain alkyl of 2–5 carbon atoms terminated by a tertiary amino group, wherein the tertiary amino group is dimethylamino, diethylamino, di-n-propylamino, di-isopropylamino, di-isobutylamino, methylethylamino, pyrrolidino, piperidino or N- substituted piperazino wherein the substituent is methyl, 2-Hydroxyethyl or benzyl; R_2 is phenyl, mono or di-substituted phenyl, wherein the substituents are -cl, -Br, $-NO_2$,$-OCH_3$, $-CH_3$ or $-CF_3$; R_3 is a monoalkylamino group of 1–6 carbon atoms, dialkylamino of 2 to 8 carbon atoms, pyrrolidino, piperidino or morpholino; or the pharmaceutically acceptable acid addition salts thereof.

4,004,009

ANTIHYPERTENSIVE ARYL PYRAZOLO[4,3-c]PYRIDAZINONES

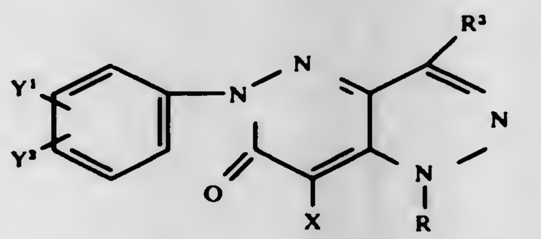
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 31, 1975, Ser. No. 600,885

Int. Cl.^{2} A61K *31/50;* C07D *487/04*

U.S. Cl. 424—250 **15 Claims**

1. A compound which is a pyridazinone of the formula:



wherein

X is a hydrogen atom, fluoro or chloro;

Y^1 and Y^2 are the same or different and are selected from the group consisting of a hydrogen atom, alkyl having from 1 to 4 carbon atoms, fluoro, chloro, bromo, trifluoromethyl, and alkoxy having from 1 to 4 carbon atoms, provided that when both Y^1 and Y^2 are trifluoromethyl or branched alkyl, they are not on adjacent carbon atoms;

R is a hydrogen atom or alkyl having from 1 to 3 carbon atoms; and

R^3 is a hydrogen atom or alkyl having from 1 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

13. A method of treating hypertension in a mammal in need of such treatment comprising internally administering a compound of claim 1, in an amount effective in reducing hypertension, to said mammal.

4,004,010

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-(FURYL-METHYL)-7α-ACYL-6,14-(ENDOETHENO OR ENDOETHANO)-TETRAHYDRO-NORORIPAVINE OR -NORTHEBAINE AND METHOD OF USE

Adolf Langbein; Herbert Merz; Gerhard Walther, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

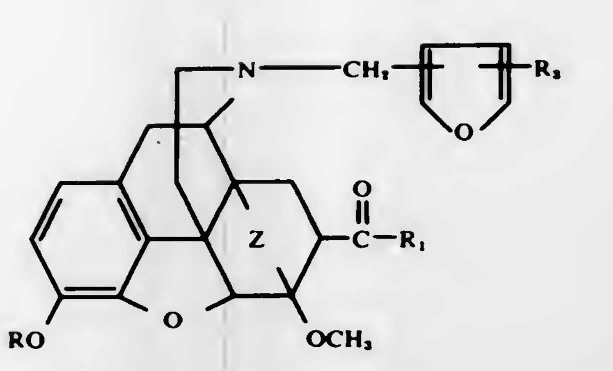
Division of Ser. No. 369,499, June 13, 1973, Pat. No. 3,931,187. This application Oct. 30, 1975, Ser. No. 627,286

Claims priority, application Germany, June 19, 1972, 2229770

Int. Cl.^{2} A61K *31/485*

U.S. Cl. 424—260 **10 Claims**

1. An analgesic or antitussive pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic or antitussive amount of a compound of the formula



wherein

R is hydrogen, methyl or acetyl,

R_1 is methyl, phenyl or hydrogen,

Z is —CH=CH— or $—CH_2—CH_2—$, and

R_3 is hydrogen or methyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,004,011

3-PYRIDYLAMINE SUBSTITUTED ERGOLINES

Hartmut Hauth, Riehen, and Hans Tscherter, Neuallschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

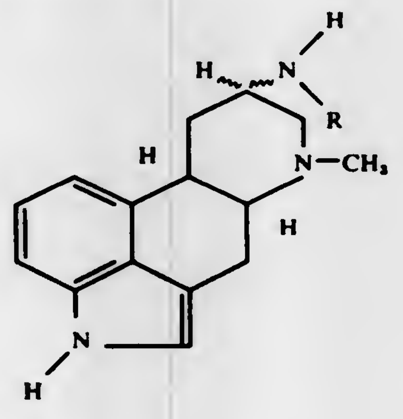
Filed Apr. 9, 1975, Ser. No. 566,355

Claims priority, application Switzerland, Apr. 16, 1974, 5234/74; Feb. 14, 1975, 1893/75; Feb. 14, 1975, 1894/75

Int. Cl.^{2} C07D *457/12*

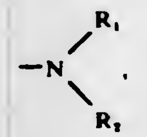
U.S. Cl. 424—261 **40 Claims**

1. A compound of formula I:



I

wherein R is 3-pyridyl or 3-pyridyl mono- or di-substituted by lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, lower alkylthio having 1 to 4 carbon atoms, phenoxy, fluoro, chloro, bromo, hydroxy, or the group


$$-N\genfrac{}{}{0pt}{}{R_1}{R_2},$$

wherein each of R_1 and R_2 is, independently hydrogen or lower alkyl, having 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

4,004,012

3-CYANO-5-(PYRIDINYL)-2(1H)-PYRIDINONES

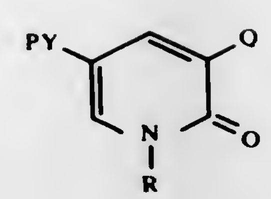
George Y. Lesher, East Greenbush, and Chester Joseph Opalka, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,763

Int. Cl.^{2} A61K *31/395;* C07D *213/57*

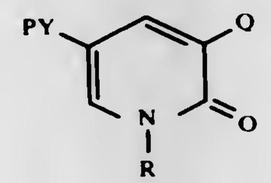
U.S. Cl. 424—263 **5 Claims**

1. A 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl having from two to six carbon atoms and having its hydroxy group and free valence bond on different carbon atoms an Q is cyano.

5. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering to such patient an effective amount of a cardiotonic 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl having from two to six carbon atoms and having its hydroxy group and free valence bond on different carbon atoms and Q is cyano.

4,004,013

2,4,6,8-TETRA-METHYL-2,4,6,8-TETRAAZABICYCLO-[3.3.0]-OCTANEDI-3,7-ONE IN TREATING PSYCHIC DISORDERS

Sergei Sergeevich Novikov, Kotelnicheskaya naberezhnaya, 1/5, kv. 183; Lenor Ivanovich Khmelnitsky, ul. Miklukho-Maklaya, 57, korpus 1, kv. 139; Oleg Vasilievich Lebedev, ul. Obrucheva, 9, kv. 83; Lia Vladimirovna Epishina, Bolotnikovskaya 40, korpus 1, kv. 16; Ljudmila Ivanovna Suvorova, B. Ostroumovskaya, 15, kv. 24, all of Moscow; Lidia Vasilievna Lapshina, dom otdykha Ostalievo, 17, Moskovskaya oblast Podolsky raion, plo Kyazanovo; Valery Dmitrievich Krylov, ul. Uralskaya, 17, kv. 150, Moscow; Irina Vitalievna Zaikonnikova, Chekhova, 4b, kv. 1, Kazan; Irina Evgenievna Zimakova, ul. Lenina, 2a, kv. 18, Kazan; Vladimir Sergeevich Chudnovsky, ul. Dekabristov, 189, kv. 5, Kazan; Viktor Andreevich Babichev, Komsomolsky prospekt, 38/16, kv. 81, Moscow, and Nina Alexandrovna Avdonina, ul. Gagarina, 14, kv. 3 Kazan, all of U.S.S.R.

Division of Ser. No. 275,823, July 27, 1972, Pat. No. 3,966,742. This application May 30, 1975, Ser. No. 582,425

Int. Cl.^{2} A61K *31/46*

U.S. Cl. 424—265 **8 Claims**

1. A medicinal preparation for the treatment of psychic disorders containing a pharmaceutically acceptable carrier and as active ingredient, 2,4,6,8-tetramethyl-2,4,6,8-tetraazabicyclo-[3.3.0]-octanedi-3,7-one in an effective amount ranging from 0.25 to 1.0 gram when administered orally and in an effective amount ranging from 3 to 10 ml of a 10% solution when administered intramuscularly.

4,004,014

2-AMINO-6-DIALKYLAMINODIHYDROPYRIDINES, THEIR PRODUCTION, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE THEREOF

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

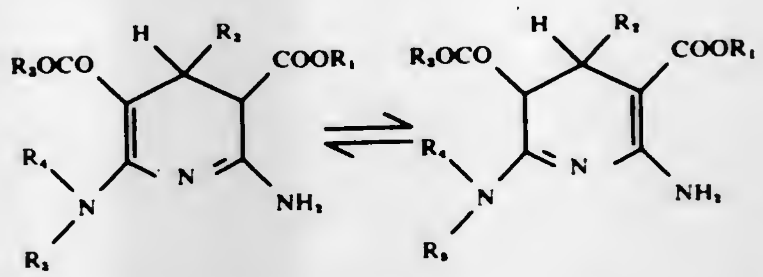
Filed Jan. 29, 1975, Ser. No. 545,202

Claims priority, application Germany, Feb. 9, 1974, 2406198

Int. Cl.^{2} A61K *31/455;* C07D *211/00, 401/00*

U.S. Cl. 424—266 **13 Claims**

1. A compound of the tautomeric formulas:



wherein each of R_1 and R_3 is alkyl of 1 to 6 carbon atoms;

R_2 is phenyl; phenyl substituted by methyl, methoxy, chloro, bromo, fluoro, nitro, trifluoromethyl, or azido; or pyridyl; and

R_4 and R_5 when taken independently are lower alkyl or when taken together, with the nitrogen to which they are attached, pyrrolidino or piperidino.

8. The method of effecting coronary vessel dilation and reducing blood pressure in humans and other animals which comprises administering thereto an effective amount of a compound according to claim 1.

4,004,015

BICYCLIC DERIVATIVES OF 1,4-DIHYDROPYRIDINE AS ANTIHYPERTENSIVE AGENTS AND CORONARY VESSEL DILATORS

Horst Meyer, Wuppertal; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

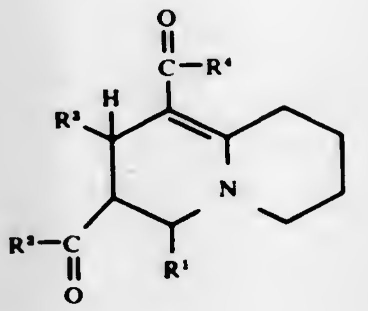
Division of Ser. No. 468,432, May 9, 1974, Pat. No. 3,948,923, which is a division of Ser. No. 336,477, Feb. 28, 1973, Pat. No. 3,856,798. This application Aug. 14, 1975, Ser. No. 604,604

Claims priority, application Germany, Mar. 6, 1972, 2210633

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 **15 Claims**

1. A pharmaceutical composition comprising a compound of the formula:



wherein

R^1 is hydrogen or lower alkyl;

each of R^2 and R^4, independently of the other, is lower alkoxy or alkynyloxy of 2 to 4 carbon atoms; and

R^3 is lower alkyl; phenyl; phenyl substituted by one to three substituents selected from the group consisting of lower alkyl, trifluoromethyl, cyano, halo, nitro and carbo(lower alkoxy); pyridyl; furyl; thienyl; or naphthyl;

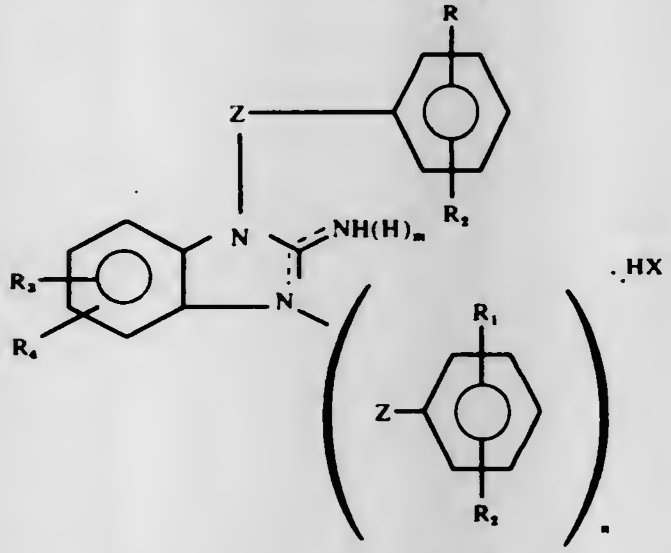
in combination with a nontoxic inert pharmaceutical carrier, said compound being present in said composition in an amount sufficient to produce coronary vessel dilation and an antihypertensive effect in a human.

4,004,016
AMINO-BENZIMIDAZOLE DERIVATIVES

Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 11, 1975, Ser. No. 603,484
Int. Cl.² C07D *235/32*; A61K *31/415*
U.S. Cl. 424—273 **20 Claims**

1. A method for the treatment of inflammation in mammals, which comprises administering to a mammalian host an anti-inflammatory amount of a compound of the structure



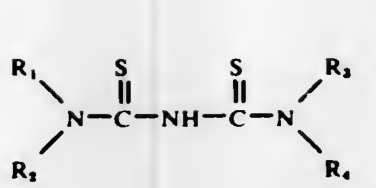
wherein
- Z is a straight or branched alkylene group containing 1 to 4 carbons;
- R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl or N,N-dimethylsulfonamido;
- R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, phenyl, naphthyl, halo, benzyl, phenethyl, or phenyl or naphthyl including an R_1 or R_2 substituent;
- *m* is 0 or 1 and *n* is 0 or 1, provided that when *m* is 0, *n* is 1 and the ⩦ linking N to the ring C is a double bond while the other ⩦ is a single bond, and when *m* is 1, *n* is 0; the ⩦ linking N to the ring C is a single bond while the other ⩦ is a double bond; and
- X is selected from the group consisting of Cl, Br or I.

4,004,017
METHOD OF INDUCING INFERTILITY IN MALE ANIMALS AND INHIBITING THE GROWTH OF THE PROSTATE

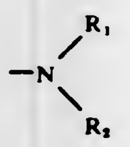
Joseph A. Settepani, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 381,963, July 23, 1973, Pat. No. 3,932,651, which is a continuation-in-part of Ser. No. 137,426, April 26, 1971, abandoned. This application July 31, 1975, Ser. No. 600,663
Int. Cl.² A61K *31/495, 31/15, 31/40, 31/445*
U.S. Cl. 424—274 **3 Claims**

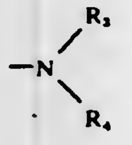
1. A method of inhibiting fertility in male animals and of reducing the size of the prostate and the seminal vesicle in male animals which comprises orally administering to a male animal an effective non-toxic amount of a compound of the formula:



wherein R_1, R_2, and R_3 are alkyl having 1 to 36 carbon atoms, aryl having 6 to 10 carbon atoms, or alkyl aryl having 7 to 12 carbon atoms, R_4 is hydrogen, alkyl having 1 to 36 carbon atoms, aryl or alkyl aryl; and



and



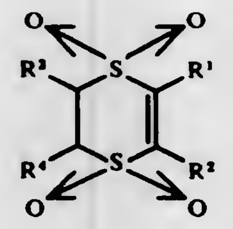
are each pyrrolidino.

4,004,018
2,3-DIHYDRO-1,4-DITHIIN 1,1,4,4-TETROXIDE ANTIMICROBIALS

Arthur D. Brewer, Puslinch, Canada, and Robert A. Davis, Cheshire, Conn., assignors to Uniroyal Inc., New York, N.Y. and Uniroyal, Ltd., Montreal, Canada

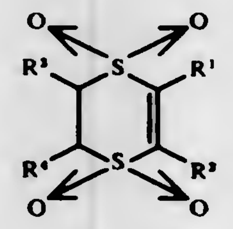
Filed June 20, 1974, Ser. No. 481,010
Int. Cl.² A01N *9/14*; C07D *339/08*
U.S. Cl. 424—277 **35 Claims**

1. A method of controlling fungi or bacteria comprising applying to a locus, subject to attack by fungi or bacteria, in bactericidally or fungicidally effective amount, a 2,3-dihydro-1,4-dithiin 1,1,4,4-tetroxide having the following structural formula:



wherein R_1, R_2, R_3, and R_4 are independently hydrogen, alkyl having 1 to 14 carbon atoms, aryl, aryl substituted with one to three substituents selected from the group consisting of lower alkyl, halogen, lower alkoxy, nitro, and aryl, alkoxymethyl wherein the alkyl group contains 1 to 8 carbon atoms, aryloxymethyl, alkylaminomethyl wherein the alkyl group contains 1 to 8 carbon atoms, or adjacent R's may be joined together as a chain of 3 to 4 methylene groups.

26. A 2,3-dihydro-1,4-dithiin 1,1,4,4-tetroxide of the formula:



wherein the R's have sets of values as follows:

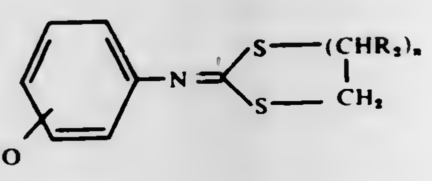
R_1	R_2	R_3	R_4
$pC_2H_5C_6H_4$	H	H	H
CH_3	H	C_6H_5	H
CH_3	H	H	C_6H_5
C_6H_5	H	CH_2OCH_3	H
C_6H_5	H	H	CH_2OCH_3
$pClC_6H_4$	H	CH_2CH_3	H
$pClC_6H_4$	H	H	CH_2CH_3
pFC_6H_4	H	$-(CH_2)_4-$	

4,004,019
INSECT CONTROL COMPOUNDS

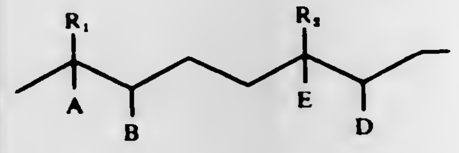
William Wayne Brand, Hopewell, and James Byron Lovell, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 12, 1975, Ser. No. 612,877
Int. Cl.² C07D *339/06*
U.S. Cl. 424—277 **24 Claims**

1. A compound of the formula:



wherein *n* is 0 or 1; R is a hydrocarbon chain of the following general structure:



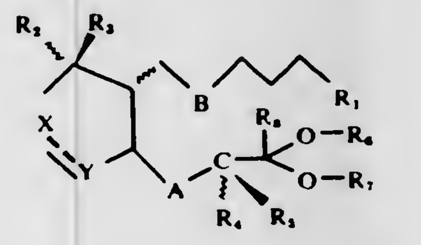
wherein R_1 and R_2 are methyl or ethyl; A is hydrogen, halogen or alkoxy C_1–C_4; B is hydrogen; or A and B together form a carbon-carbon bond, or A and B together represent an "oxido" (—O—) bridge. E and D are hydrogen; or E and D together form a carbon-carbon bond; and R_3 is hydrogen or methyl.

4,004,020
NOVEL PROSTANOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

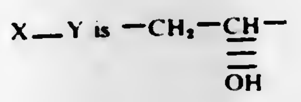
Werner Skuballa; Bernd Raduchel; Helmut Vorbruggen; Walter Elger; Wolfgang Losert, and Olaf Loge, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Dec. 19, 1974, Ser. No. 534,483
Claims priority, application Germany, Dec. 21, 1973, 2365101
Int. Cl.² A01N *9/28*; A61K *31/335*
U.S. Cl. 424—278 **29 Claims**

1. A prostaglandin of the formula

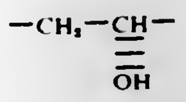


wherein R_1 is hydroxymethyl, carboxy, aryloxycarbonyl, alkoxycarbonyl of 1–8 carbon atoms in the alkoxy group, or the group $-COO-CH_2-U-V$ wherein U is a direct C—C bond, carbonyl or carbonyloxy and V is phenyl substituted by phenyl, alkoxy of 1-2 carbon atoms or halogen; R_2 is hydroxy and R_3 is a hydrogen atom or R_2 and R_3 collectively are an oxygen atom; A is trans-CH═CH; B is $-CH_2-CH_2$ or cis-CH═CH; one of R_4 and R_5 is hydroxy and the other is a hydrogen atom; R_6 and R_7 collectively are alkylene of up to 7 carbon atoms and with 2-3 carbon atoms in the chain, phenylene or naphthylene; R_8 is a hydrogen atom or alkyl of 1–5 carbon atoms.



$X—Y$ is $-CH_2-\underset{OH}{\underset{\equiv}{CH}}-$

when R_2 is hydroxy and R_3 is a hydrogen atom or is



$-CH_2-\underset{OH}{\underset{\equiv}{CH}}-$

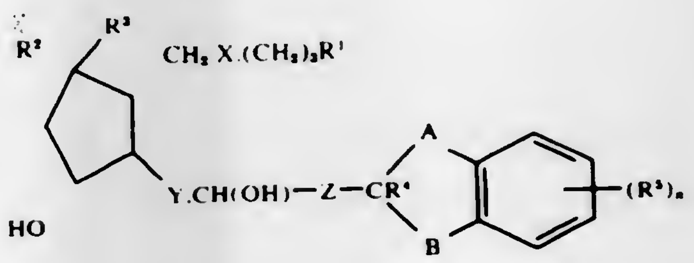
or —CH═CH— when R_2 and R_3 collectively are an oxygen atom, or, when R_1 is carboxy, a physiologically acceptable salt thereof.

4,004,021
CYCLOPENTANE DERIVATIVES

Jean Bowler; Edward Douglas Brown; Peter Robert Marsham, and Edward Raymond Halstead Walker, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 434,303, Jan. 17, 1974. This application Dec. 18, 1975, Ser. No. 641,871
Claims priority, application United Kingdom, Jan. 31, 1973, 4769/73
Int. Cl.² C07D *307/78*
U.S. Cl. 424—278 **7 Claims**

1. A cyclopentane derivative of the formula:



wherein R^1 is carboxy, hydroxymethyl or alkoxycarbonyl of up to 11 carbon atoms,
- R^2 is hydroxy or alkanoyloxy of 1 to 4 carbon atoms, and
- R^3 is hydrogen, or
- R^2 and R^3 together are oxo,
- X is ethylene or cis-vinylene,
- Y is ethylene or trans-vinylene,
- Z is a direct bond or alkylidene of 1 to 5 carbon atoms,
- A is alkylidene of 1 to 5 carbon atoms and
- B is oxygen,
- R^4 is hydrogen or alkyl of 1 to 4 carbon atoms, or
- CR^4 together with an adjacent carbon of A or B forms a double bond,
- R^5 is halogen or alkyl, alkoxy or halogenoalkyl each of 1 to 5 carbon atoms,

which compound bears 0 or 1 alkyl substituent of 1 to 4 carbon atoms on the trimethylene group, and for those compounds wherein R^1 is carboxy, the pharmaceutically or veterinarily acceptable base addition salts thereof.

4,004,022
SPIROLACTONE DERIVATIVES

Izumi Kumita, Oiso; Akiyoshi Ueda, Hiratsuka; Kazuhiko Ohkuma, Ninomiya; Sho Hashimoto, Odawara; Akira Nakada, Hiratsuka, and Masami Mizuno, Oiso, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

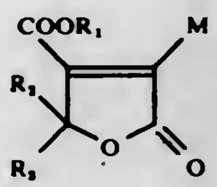
Filed July 28, 1975, Ser. No. 599,428

Claims priority, application Japan, Aug. 9, 1974, 49-90774

Int. Cl.² C07D *307/58*

U.S. Cl. 424—279 **13 Claims**

2. A fungicidal composition comprising an inert carrier and a fungicidally effective amount of a compound of the formula



wherein

R_1 is lower alkyl;

R_2 and R_3 are methyl, or R_2 forms cyclo-alkylene of 4 to 5 carbon atoms by combining with R_3;

M is a substituent selected from the group consisting of $—CH_2X$ and $—CHX_2$ in which X is halogen.

4,004,023
1-(4-BUTYLPHENYL)-1-(3,4-METHYLENEDIOXY-PHENYL)-2-NITROALKANES AND SYNERGISTIC INSECTICIDAL MIXTURES THEREWITH

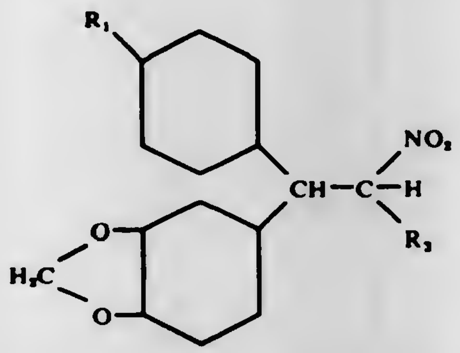
Jerry Glenn Strong, Warren, and Harold Alexander Kaufman, Piscataway, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,660

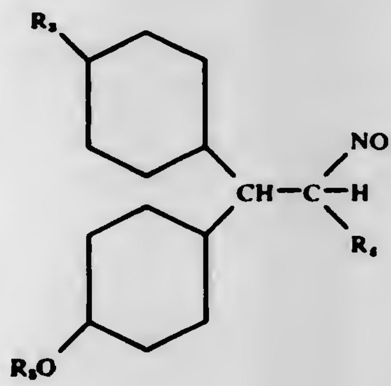
Int. Cl.² C07D *317/44*

U.S. Cl. 424—282 **9 Claims**

1. An insecticidally effective composition comprising about 0.001–0.005 weight percent, based on the total weight of the composition, of a synergistic combination of a compound having the structure:



wherein R_1 is C_4 alkyl branched or unbranched and R_2 is methyl or ethyl and a compound having the structure:



wherein R_3 is C_4 alkyl branched or unbranched, R_4 is methyl or ethyl and R_5 is ethyl, said synergistic combination containing 10–90 to 90–10 weight percent of each compound; and an inert solid or liquid carrier.

6. A method of insect-control comprising applying to an insect or its environment an insecticidally effective amount of a composition as described in claim 1.

4,004,024
DISINFECTANT FURANS

Heinz Eggensperger; Wolfgang Beilfuss, and Helmut Hermann Ehlers, all of Hamburg, Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed July 7, 1975, Ser. No. 593,558

Claims priority, application Germany, July 15, 1974, 2433836

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **10 Claims**

1. A method for controlling bacteria, fungi and spores which comprises applying thereto a bactericidally, fungicidally and sporicidally effective amount of a furan selected from the group consisting of 2-(R_1O)-5-(R_2O)-2,5-dihydrofuran and 2-(R_1O)-5-(R_2O)-tetrahydrofuran, or mixtures of said compounds, where R_1 and R_2 independently are selected from the group consisting of alkyl having from one to twelve carbon atoms, alkyl having from one to twelve carbon atoms substituted by from one to three of the same or different halo substituents, hydroxyalkyl having from two to twelve carbon atoms, nitroalkyl having from two to twelve carbon atoms, phenylalkyl wherein alkyl has from one to two carbon atoms, phenoxyalkyl wherein alkyl has from one to two carbon atoms, cycloalkyl having from five to six ring carbon atoms and a total of from five to twelve carbon atoms, alkenyl having from three to four carbon atoms, alkynyl having from three to four carbon atoms, glycidyl, alkoxyalkyl having from three to twelve carbon atoms and alkoxyalkoxyalkyl having from four to twelve carbon atoms; where in each case phenyl and phenoxy are unsubstituted or substituted by one or two of the same or different substituents selected from the group consisting of halo, hydroxy and nitro.

4,004,025
LONG-ACTING LOCAL SUBCUTANEOUSLY-APPLIED ANESTHETICS AND COMPOSITIONS CONTAINING THE SAME

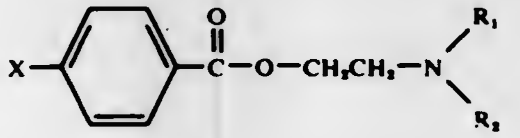
Jack Fishman, New York, N.Y., assignor to Evalina Lewenstein and Henry Hirsch and Stanley Rothschild, trustees, all of New York, N.Y.

Continuation-in-part of Ser. No. 501,131, Aug. 28, 1974, abandoned, which is a division of Ser. No. 324,823, Jan. 18, 1973, abandoned. This application Feb. 4, 1976, Ser. No. 655,458

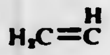
Int. Cl.² A61K *31/235*

U.S. Cl. 424—308 **15 Claims**

1. A composition for subcutaneous administration to induce local anesthesia, said composition being in the form of an injectable solution, said composition comprising an anesthetically effective amount of a compound having the formula



where X is selected from the group consisting of


$H_2C{=}\overset{H}{C}$

or HC C and where each of R_1 and R_2 is selected from the group consisting of H, lower alkyls containing up to 6 carbon atoms, cyclopropyl, cyclobutyl and cyclohexyl, or pharmaceutically acceptable salts thereof, and a sterile water carrier for said compound.

4,004,026
DICARBOXYLIC ACIDS AND DERIVATIVES IN THE TREATMENT OF PAIN AND INFLAMMATION

Georges Haas, Oberwil; Erwin F. Jenny, Basel, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

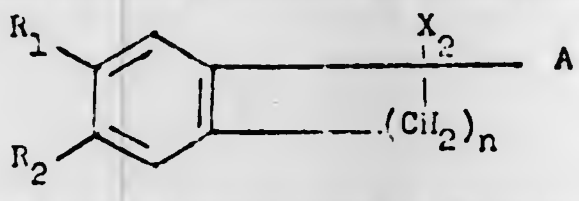
Division of Ser. No. 389,105, Aug. 16, 1973, Pat. No. 3,940,434. This application Nov. 18, 1975, Ser. No. 632,926

Claims priority, application Switzerland, Aug. 24, 1972, 12538/72

Int. Cl.² A61K *31/19, 31/22*

U.S. Cl. 424—311 **8 Claims**

1. An analgesic or antiinflammatory pharmaceutical composition comprising an analgesically or antiinflammatory effective amount of a compound corresponding to the formula



wherein A denotes the direct bond or a methylene group, one of the groups R_1 and R_2 denotes hydrogen, halogen, alkyl with 1 to 4 carbon atoms, or trifluoromethyl and the other denotes cycloalkyl with 4 to 8 carbon atoms, X_1 and X_2 independently of one another denote a carboxyl group or an alkoxycarbonyl group with 2 to 5 carbon atoms, and n denotes an integer from 1 to 3, or a pharmaceutically acceptable salt thereof, together with a pharmaceutical carrier.

8. The method for treating inflammatory conditions in a mammal suffering therefrom, which comprises administering to said mammal an antiinflammatory effective dose of a composition according to claim 1.

4,004,027
PROSTAGLANDIN ANTAGONISTS

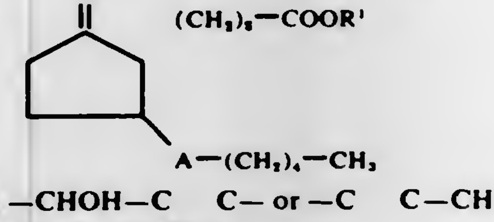
Wilbur Lippmann, Montreal, and Jehan F. Bagli, Kirkland, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed Jan. 28, 1975, Ser. No. 545,664

Int. Cl.² A61K *31/215, 31/19*

U.S. Cl. 424—317 **4 Claims**

1. A method for relieving a complication arising from abnormally increased physiological availability of prostaglandins in a host, comprising: administering to said host a complication alleviating dose of a compound of formula I



I

in which A is —CHOH—C C— or —C C—CHOH— and R^1 is hydrogen or lower alkyl.

4,004,028
PHENOXYPROPANOLAMINES

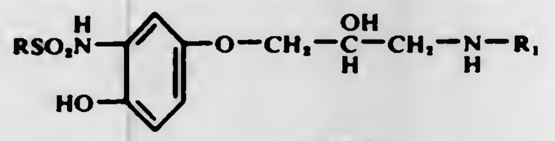
Carl Kaiser, Haddon Heights, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 6, 1975, Ser. No. 602,158

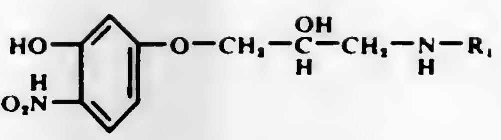
Int. Cl.² A61K *31/18*

U.S. Cl. 424—321 **6 Claims**

1. A chemical compound of the formulas:



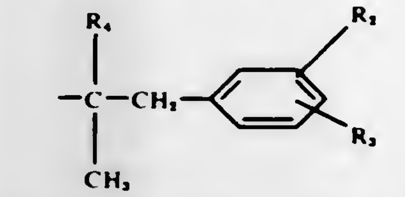
and



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is a straight or branched chain lower alkyl of from 1 to 5 carbon atoms;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms or



R_2 and R_3 are hydrogen, hydroxy, methoxy and R_4 is hydrogen or methyl.

4,004,029
COMPOSITIONS AND METHOD FOR TREATING EPILEPSY AND CONVULSIONS

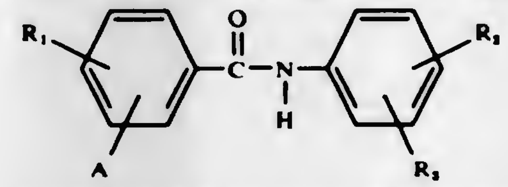
Robert James Collins, and Charles E. Coverdale, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 469,485, May 13, 1974, abandoned, which is a continuation of Ser. No. 347,794, April 4, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 610,939

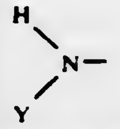
Int. Cl.² A61K *31/13*

U.S. Cl. 424—325 **19 Claims**

1. A method of controlling convulsions and seizures in mammals in need of such therapy which comprises administering an effective amount of a compound of formula:



wherein R_1 and R_2 are each selected from hydrogen and lower alkyl; R_3 is lower alkyl and A is a monovalent group of formula:



wherein Y is selected from hydrogen and the acyl radical of a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms, inclusive; to said mammals.

4,004,030
MICROBIOCIDALLY EFFECTIVE AMINES OR AMINE MIXTURES

Günter Schwarzmann, Essen-Überruhr, and Ulrich Holtschmidt, Essen, both of Germany, assignors to Th. Goldschmidt AG, Germany

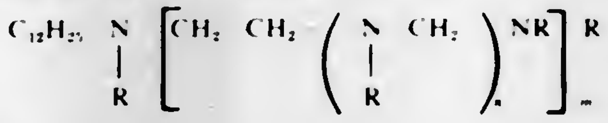
Continuation-in-part of Ser. No. 376,962, July 6, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,552

Claims priority, application Germany, July 11, 1972, 2234017; Sept. 13, 1972, 2244814

Int. Cl.² A01N *9/20, 9/24*

U.S. Cl. 424—325 **14 Claims**

1. A process for killing microbes which comprises contacting said microbes with a microbiocidally effective amount of a compound having the formula


$C_{12}H_{25}\ \underset{R}{N}\left[CH_2\ CH_2\left(\underset{R}{N}\ CH_2\right)_n NR\right]_m R$

in which

n and *m* are 0 or 1, and *n* is 0 if *m* is 0, and

R is hydrogen or a $-(CH_2)_2OH$ group, at least one R being a $-(CH_2)_2OH$ group.

4,004,031

BIS-(O-1-ALKYLTHIO-ETHYLIMINO)-N-METHYL-CARBAMIC ACID)-N,N'-SULPHIDE INSECTICIDES

Jozef Drabek, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

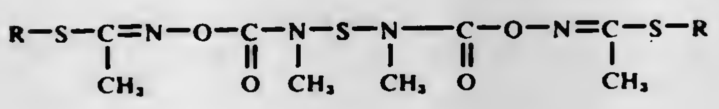
Filed July 9, 1975, Ser. No. 594,381

Claims priority, application Switzerland, July 11, 1974, 9608/74; May 27, 1975, 6749/75

Int. Cl.² A01N *9/20*

U.S. Cl. 424—327 **13 Claims**

1. A compound of formula I



$$R-S-\underset{CH_3}{\underset{|}{C}}=N-O-\underset{O}{\underset{\|}{C}}-\underset{CH_3}{\underset{|}{N}}-S-\underset{CH_3}{\underset{|}{N}}-\underset{O}{\underset{\|}{C}}-O-N=\underset{CH_3}{\underset{|}{C}}-S-R \qquad (1)$$

wherein R represents a C_1-C_5-alkyl radical.

9. A method for combatting insects which comprises applying to the locus of said insects an insecticidally effective amount of a compound according to claim 1.

4,004,032

PHARMACEUTICAL COMPOSITIONS CONTAINING A 1-(3-TRIFLUOROMETHYL-4'-CHLORO-PHENYL)-2-(CARBOXYLIC ACYLAKYL-AMINO) PROPANE AND METHOD OF USE

Kurt Schromm; Ernst-Otto Renth; Anton Mentrup, and Richard Reichl, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

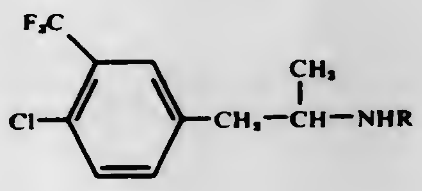
Division of Ser. No. 478,264, June 11, 1974, Pat. No. 3,950,335, which is a continuation-in-part of Ser. No. 138,002, April 27, 1971, abandoned. This application Jan. 27, 1976, Ser. No. 652,801

Claims priority, application Germany, May 2, 1970, 2021620

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. An anorectic pharmaceutical oral dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anorectic amount of a racemic or optically active compound of the formula



wherein

R is $-(CH_2)_n-CO-C_6H_5$ or $-(CH_2)_n-CO-CH_3$,

n is 1 or 2, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,004,033

CERTAIN ALKYLPHENOLS USED TO CONTROL BACTERIA

Max Schellenbaum, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

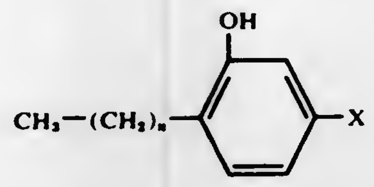
Continuation-in-part of Ser. No. 496,799, Aug. 12, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,521

Claims priority, application Switzerland, Aug. 16, 1973, 11806/73

Int. Cl.² A01N *9/26*

U.S. Cl. 424—347 **4 Claims**

1. A method for inhibiting the growth of bacteria which comprises applying thereto a growth-inhibiting amount of a compound of the formula



wherein

X represents chlorine or bromine and

n denotes an integer from 1 to 6.

4,004,034

PROCESS FOR THE MANUFACTURE OF WORTS

Alain Delhaye, Marquette Lez Lille; Manfred M. Moll, Champigneulles, both of France, and James R. Pollock, Reading, England, assignors to Grandes Malteries Modernes, Marquette Lez Lille; Groupement D'Interet Economique Tepral, Champigneulles, both of France and Pollock International Limited, Hamilton, Bermuda

Continuation of Ser. No. 273,962, July 21, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 519,010

Claims priority, application France, July 26, 1971, 71.27330

Int. Cl.² C12C *7/00*

U.S. Cl. 426—29 **9 Claims**

1. A process for the manufacture of a wort which comprises subjecting barley to at least one treatment cycle comprising a steeping in water followed by exposure to air, the conditions of temperature and the duration of the stages of this cycle being chosen to cause chitting of the barley to form chit malt and to promote the development of a maximum enzymatic potential, rolling the chit malt, drying the rolled chit malt to stop the development of the biological processes occuring in it while retaining its enzymatic potential, grinding the dried and rolled chit malt and extracting it with a mixture of hot water and malt, the quantity of malt being 10 to 40% by weight on a solids basis of the dry weight of the mixture of ground chit and malt, and separating the wort so produced.

4,004,035

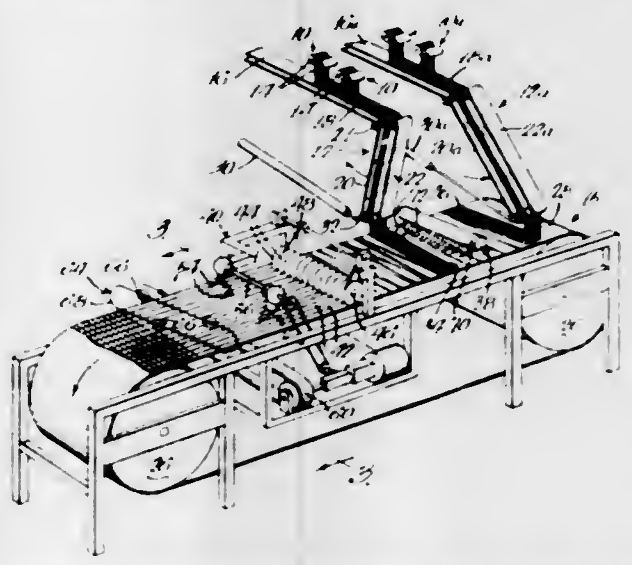
METHOD AND APPARATUS FOR PRODUCING LAPPED SHREDDED FOOD ARTICLES

Rudolph W. Hirzel, Climax; Albert W. Olmstead, Pennfield, and Winship C. Howard, Battle Creek, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed July 28, 1975, Ser. No. 599,669

Int. Cl.² A21D *6/00*

U.S. Cl. 426—275 **9 Claims**



1. Method of preparing a shredded food article comprising the steps of shredding food into the form of a first web comprised of parallel strands of shredded food, lapping the first web back and forth transversely across a moving support bed to produce a second web composed of layers of shredded food strands, lying in an overlapping zigzag configuration on said bed, said second web having a width and thickness greater than that of the first web, and then dividing said second web into a plurality of separate articles.

4,004,036

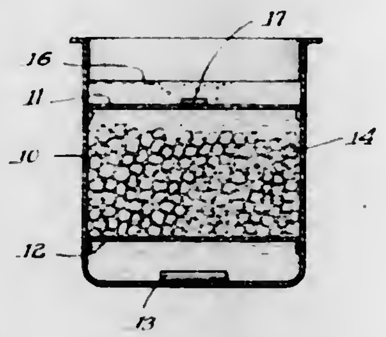
EFFERVESCENT MOLDED TRITURATE TABLETS

William H. Schmitt, Elmhurst, Ill., assignor to Alberto Culver Company, Melrose Park, Ill.

Continuation of Ser. No. 553,989, May 31, 1966, abandoned. This application Mar. 20, 1970, Ser. No. 21,512

Int. Cl.² A23L *1/22, 1/236, 2/40*

U.S. Cl. 426—285 **8 Claims**



1. A method of preparing effervescent molded triturate tablets which are rapidly disintegratable and soluble or dispersible in hot or cold aqueous media, which comprises providing a mixture of pulverulent materials containing two separate ingredients capable of reacting in the presence of water to produce a gas, triturating said mixture, in the presence of a limited amount of water, to form a moldable mass with a volatile organic solvent ingredient in which at least one of said pulverulent materials is at least partially soluble, said limited amount of water not exceeding 10% by weight of said volatile organic solvent, molding said mass into tablet form, said separate gas-forming ingredients interacting to a substantially limited extent to form a small amount of gas in each tablet, and then removing said organic solvent from said tablets, said gas serving to form a substantial number of voids in the bodies of said tablets.

4,004,037

PEANUT BUTTER MANUFACTURE

Francis G. Connick, Downers Grove, Ill., assignor to Swift and Company Limited, Chicago, Ill.

Filed Oct. 25, 1974, Ser. No. 517,924

Int. Cl.² A23L *1/36, 1/38;* **B02C** *19/00*

U.S. Cl. 426—324 **14 Claims**

1. A process for manufacturing peanut butter comprising steps of: grinding roasted peanuts together with solid carbon dioxide to form a pumpable peanut butter grind, to an extent such that the grind contains only trace amounts of free oxygen and some included carbon dioxide gas and the grind is simultaneously cooled by said solid carbon dioxide to thereby minimize oxidation and heat damage during said grinding, the grinding being accomplished in an open, atmospheric environment and under atmospheric pressure, said solid carbon dioxide being in an amount such that said simultaneous cooling maintaining a grinding temperature within the approximate range of about 40° to about 120° F.; filling the pumpable peanut butter grind into container, said filling step including maintaining the peanut grind in said pumpable condition by keeping it within a temperature range of about 80° to about 100° F; and sealing such filled containers.

4,004,038

PROCESS OF MAKING COLD WATER SOLUBLE TEA CONCENTRATES AND POWDERS

Robert L. Wickremasinghe, St. Coombs, Ceylon, assignor to Tea Research Institute of Ceylon, Ceylon

Filed Oct. 11, 1974, Ser. No. 514,329

Claims priority, application Ceylon, Oct. 12, 1973, 7118

Int. Cl.² A23F *3/00;* **B01D** *13/00, 15/08, 31/00*

U.S. Cl. 426—422 **12 Claims**

1. A process for manufacturing cold water soluble tea concentrate and powder which comprises preparing a tea extract by extracting tea leaves with hot water, selectively removing nonphenolic compounds of high molecular weight comprising chlorophyll, protein, polypeptide and polysaccharide from said tea extract while retaining polyphenolic compounds therein by subjecting said tea extract to filtration through a gel or solid material which is capable of effecting the separation of said nonphenolic compounds of high molecular weight from said tea extract which contains said polyphenolic compounds and also caffeine and amino acids and then concentrating the resultant filtered tea extract to obtain a cold water soluble tea concentrate or powder.

4,004,039

SWEETENING COMPOSITION AND PROCESS THEREFOR

Myron D. Shoaf, and LaMonte D. Pischke, both of Danbury, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 421,295, Dec. 3, 1973, Pat. No. 3,928,633. This application Dec. 8, 1975, Ser. No. 638,577

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **7 Claims**

1. Process for stabilizing L-aspartyl-L-phenylalanine methyl ester crystals into a particulate form adapted to be intermixed with other powderous materials and be free-flowing therewith which comprises admixing said ester crystals and a fusing and matrix-forming material selected from the group consisting of dried coffee extract, whey, low dextrose equivalent starch polymers in an intermixture with a polyol and protein extracts selected from the group consisting of gelatin and keratin, said matrix-forming material having a moisture content less than 10%, said material being molten at a temperature at or below 370° F, solidifying into a solid mass when cooled to below its melting point and retaining a thermosetting solid condition at ambient temperatures; heating the admixture of said ester crystals and said fusing and matrix-forming material to a temperature sufficient to convert said fusing and matrix-forming material into a continuous molten condition but below the melting point of the ester crystals wherein the ester crystals are discretely distributed; cooling the molten mass to fuse the same and permanently fix the ester crystals in a dispersed phase; and sub-dividing the cooled mass to a particular size thereby producing particles which encapsulate the crystals distributed therein.

4,004,040

WHIPPED HONEY SPREAD

Ruben W. Puta, Box 46, St. Nazianz, Wis. 54232

Continuation of Ser. No. 522,481, Nov. 11, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,978

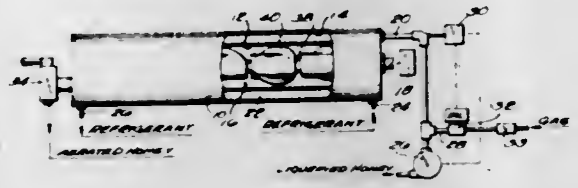
Int. Cl.² A23L *1/08*

U.S. Cl. 426—564 **12 Claims**

1. A process for making a whipped honey spread consisting essentially of the steps of

introducing a feed consisting essentially of unpasteurized natural honey in liquefied and substantially ungranulated form into a closed chamber,

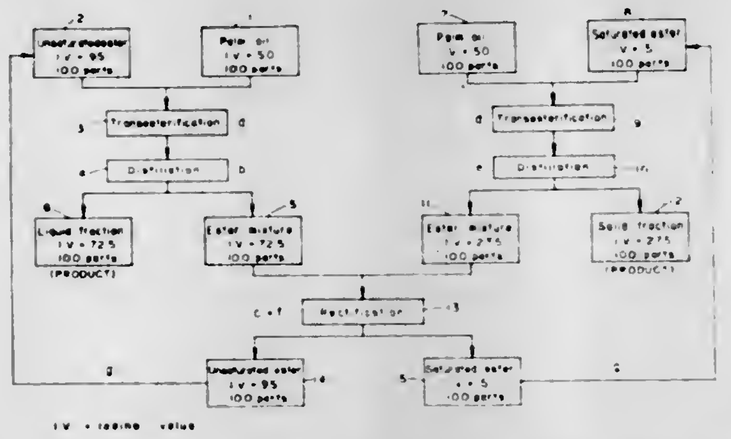
introducing into said chamber an inert gas which is safe for human consumption and will not deleteriously affect yeasts contained in said honey, shearing and agitating said honey inside said chamber in the presence of said gas and under superatmospheric pressure, while maintaining said honey at a temperature from about 50° to 60° F, to incorporate and uniformly distribute minute bubbles of said gas throughout said honey,



withdrawing a resulting whipped product from said chamber, and
curing said product to a butter-like consistency.

4,004,041
PRODUCTION OF LIQUID EDIBLE OIL FROM PALM OIL OR SIMILAR OILS

Ladislav Koslowsky, Ramat-Gan, Israel, assignor to H.L.S. Ltd., Industrial Engineering Company, Petah-Tikva, Israel
Filed Sept. 12, 1975, Ser. No. 612,982
Claims priority, application Israel, Nov. 22, 1974, 46106
Int. Cl.^{2} A23D *5/00*
U.S. Cl. 426—601 **14 Claims**



1. A process of producing an improved edible liquid oil from an oil selected from amongst natural and semiprocessed vegetable and animal oils and fats and mixtures thereof, and comprising saturated and unsaturated fatty acids moieties in a relative molar ratio of about 1:1 where at least 90% of the saturated fatty acid moieties contain not more than 16 carbon atom molecules, which process comprises the steps of:

a. reacting a portion of said oil with at least one unsaturated fatty acid ester of a $(C_1–C_3)$-alkanol provided that where a mixture of two or more such esters are used, they are all derived from the same alkanol, in the presence of a transesterification catalyst, to form a first product mixture;
b. subjecting said first product mixture to distillation under reduced pressure not exceeding 40 Torr, thereby to obtain a first distillate being a mixture of alkanol esters of saturated and unsaturated fatty acids, and a first distillation residue being an edible liquid oil having a higher iodine value than said oil used as starting material;
c. subjecting said first distillate to fractional distillation under reduced pressure not exceeding 40 Torr, to separate it into a lower boiling saturated fatty acid ester fraction and a higher boiling unsaturated fatty acid ester fraction;
d. reacting the saturated fatty acid ester fraction obtained in step (c) with another portion of said oil in the presence of a transesterification catalyst to form a second product mixture;
e. subjecting said second product mixture to distillation under reduced pressure not exceeding 40 Torr, thereby to obtain a second distillate being a mixture of alkanol esters of saturated and unsaturated fatty acids, and a second distillation residue being an oil having a lower iodine value than said oil used as starting material;
f. subjecting said second distillate to fractional distillation under reduced pressure not exceeding 40 Torr, to separate it into a lower boiling saturated fatty acid ester fraction and a higher boiling unsaturated fatty acid ester fraction; and
g. recycling said unsaturated fatty acid ester fractions obtained in steps (c) and (f) to the first transesterification step (a) and recycling the saturated fatty acid ester fraction obtained in step (f) to the second transesterification step (d).

4,004,042
METHOD FOR APPLYING A WEAR AND IMPACT RESISTANT COATING

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio
Filed Mar. 7, 1975, Ser. No. 556,247
Int. Cl.^{2} B05D *1/10, 3/00, 1/36, 7/14*
U.S. Cl. 427—34 **11 Claims**

1. The improved method of applying a wear and impact resistant coating to a base material comprising the steps of:
electrically generating a stream of energy having the capability of heating the base material and the coating mixture sufficiently to create a bond therebetween;
introducing into said stream a mixture of tungsten carbide and a lower melting point matrix-forming material, both in powdered form;
applying said mixture containing stream to the base material to create a coating thereon;
applying by means of said stream, immediately after application of said mixture and without withdrawal of said stream, an additional oxidation-preventing coating prior to fusing; and
thereafter fusing said coatings to the base material at an elevated temperature.

4,004,043
NITRATED POLYMERS AS POSITIVE RESISTS

Hiroyuki Hiraoka, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 26, 1975, Ser. No. 616,980
Int. Cl.^{2} B05D *3/06*
U.S. Cl. 427—43 **8 Claims**

1. A process for forming an image with a positive resist, said process comprising the steps of:

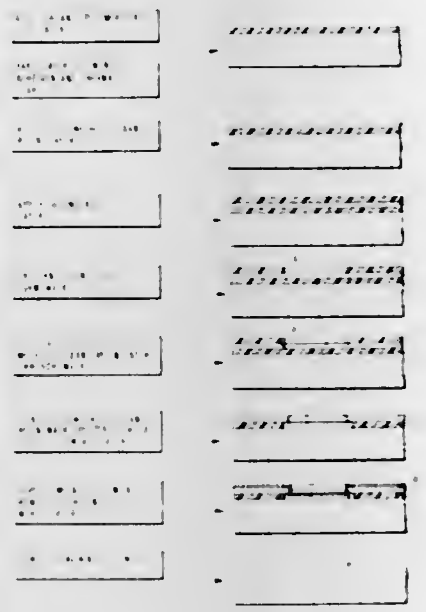
1. forming on a substrate a film comprising a polymer or copolymer of methacrylic acid, methacrylic anhydride, methyl methacrylate, methacrylimide, and N-alkylmethacrylimides, said polymer or copolymer having been nitrated in up to about 10% of the monomer units on the methyl group branching off the polymer chain,
2. exposing said film in a predetermined pattern to radiation, and
3. removing the radiation exposed portion of said film with a solvent.

4,004,044
METHOD FOR FORMING PATTERNED FILMS UTILIZING A TRANSPARENT LIFT-OFF MASK

Jack R. Franco, Poughkeepsie; Janos Havas, Hopewell Junction, and Lewis J. Rompala, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 9, 1975, Ser. No. 576,054
Int. Cl.^{2} B05D *5/12, 1/32*
U.S. Cl. 427—43 **7 Claims**

1. A lift-off method for forming a patterned film on a substrate comprising:
forming on said substrate a first masking layer of organic polymeric material,

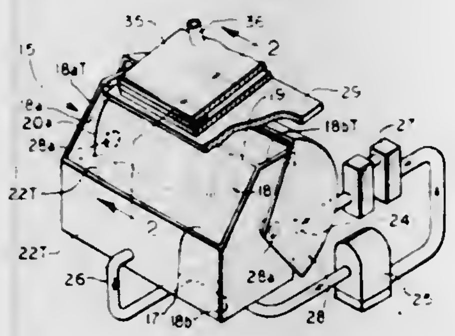
forming on said first layer a transparent layer of polydimethylsiloxane resin material having a preponderance of Si-O bonds relative to the number of Si-CH$_3$ bonds,
forming on said layer of resin material a second masking layer having openings in a desired pattern,
forming by reactive sputter etching in a fist gas ambient including a fluorine-containing gas openings through said layer of resin material aligned with said openings in said second masking layer,



forming by reactive sputter etching in a second gas ambient including oxygen openings through said first masking layer aligned with said openings in said layer of resin material, the last named reactive sputter etching being continued until the edges in said openings through said resin material overhang the edges in said openings through said first masking layer,
depositing said film onto said substrate through said openings in said layer of resin material and said first masking layer, and
removing said layers.

4,004,045
METHOD FOR FLUID FILM APPLICATION

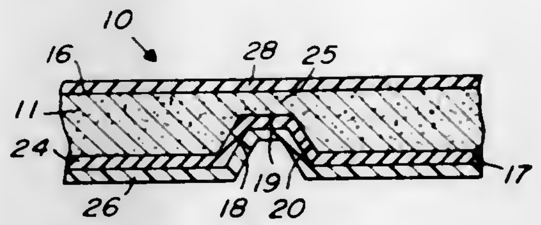
Manfred K. Stelter, 1450 Sunnyside, Highland Park, Ill. 60035
Filed Aug. 9, 1974, Ser. No. 496,070
Int. Cl.^{2} B05D *3/06, 3/10*
U.S. Cl. 427—55 **8 Claims**



1. A method for applying a uniform micro-thin coating of fluid onto the surface of a panel comprising the steps of mounting said panel onto an incline guide means which aligns said panel in an inverted position for preventing the contamination of said panel surface by falling dust particles or the like, and moving said inverted panel in said incline guide means through a position contiguous with the path of a laminar flowing curtain of coating fluid which is moving in a substantially opposite direction to said moving surface across the horizontal top edge of a wall defining a weir, said coating fluid contacting said panel surface and a micro-thin layer of said fluid is transferred to said surface by means of surface tension.

4,004,046
METHOD OF FABRICATING THIN MONOCRYSTALLINE SEMICONDUCTIVE LAYER ON AN INSULATING SUBSTRATE

James B. Price, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Continuation of Ser. No. 239,607, March 30, 1972, abandoned. This application Feb. 27, 1975, Ser. No. 553,769
Int. Cl.^{2} B44D *1/18;* **H01L** *7/50*
U.S. Cl. 427—85 **7 Claims**



1. A method of forming a semiconductor substrate located over a dielectric layer for receiving semiconductor devices comprising the steps of:

a. selecting a body of semiconductor material with substantially planar upper and under surfaces and having a predetermined thickness;
b. removing selectively semiconductor material from the under surface of said body towards its upper surface a predetermined depth for forming a channel, said channel having a channel bottom surface portion substantially parallel to and a predetermined distance from said upper surface, the distance between said upper surface and said channel bottom surface portion defining the upper and lower semiconductor surfaces of the semiconductor substrate;
c. depositing a dielectric material in said channel for selectively forming a dielectric layer for minimizing capacitance between said semiconductor material and said dielectric layer;
d. depositing a layer of material over said dielectric layer for forming a base supporting member for said substrate; and
e. forming directly into the upper surface above said channel of the semiconductor substrate at least one semiconductor junction device.

4,004,047
DIFFUSION COATING METHOD

John J. Grisik, Middletown, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 447,318, March 1, 1974. This application Sept. 2, 1975, Ser. No. 609,829
Int. Cl.^{2} B23P *7/04*
U.S. Cl. 427—142 **9 Claims**

1. In a diffusion coating method in which a coating metal is transferred and diffused from a coating metal source alloy into an article surface at a coating temperature in the range of 1700°–2100° F, the improvement which comprises:
providing a mixture comprising a coating powder and a binder of a type which will decompose substantially without residue upon heating below the coating temperature, the coating powder including the coating metal source alloy which consists essentially of, by weight, about 51 – 61% Al, with the balance Fe, the alloy being predominantly in the form of a two-phase structure of Fe$_2$Al$_5$ and FeAl$_2$ which melts above the coating temperature;
disposing the mixture in a layer of substantially uniform thickness to provide a substantially flexible film;
placing the film in contact with the article surface; and then applying heat in the range of about 1700 – 2100° F to transfer and diffuse the coating metal from the film into the surface.

4,004,048
RAPID FIXATION OF AGENTS ON FLEXIBLE SUBSTRATES

Harold L. Jackson, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 486,115, July 5, 1974, Pat. No. 3,958,934, which is a continuation-in-part of Ser. No. 367,333, June 5, 1973, abandoned. This application May 28, 1975, Ser. No. 581,571

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.^{2} D06M *13/08, 13/36, 13/18*

U.S. Cl. 427—158 **19 Claims**

1. Non-aqueous process for improving a functional property of natural and synthetic, organic, polymeric flexible substrates by applying thereto a non-dye agent which is capable of imparting the desired improved functional property to the substrate, which process comprises:

a. applying said agent to the substrate from a liquid medium;
b. optionally, drying the substrate to remove the liquid while substantially retaining the agent on the substrate; and
c. contacting the agent-treated substrate with a fluorocarbon fluid at a temperature and for a time sufficient to effect fixation of the agent on the substrate, said fluorocarbon having an atmospheric pressure boiling point of at least 25° C., a fluorine to carbon atom ratio of at least 1.5 and a solubility parameter of not greater than 7.0 and being selected from the group consisting of saturated fluorocarbons and perfluorotrialkyl and perfluorotetraalkyl ethylenes.

4,004,049
SPRAYABLE LATEX ADHESIVE SYSTEMS PROVIDING RAISED SPACED DEPOSITS OF ADHESIVE AND LAMINATES PREPARED THEREFROM

David W. Horwat, Morristown, and Albert T. Goldberg, Summit, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 8, 1975, Ser. No. 638,317

Int. Cl.^{2} B05D *1/02, 5/10;* **B32B** *3/10, 7/14*

U.S. Cl. 427—207 C **7 Claims**

1. A method for applying an aqueous adhesive polymer latex to a substrate as raised, spaced deposits which comprises spraying an aqueous pressure sensitive adhesive polymer latex having glass transition temperature of −10° to −80° C., a surface tension of at least 42 dynes/cm^2, a viscosity of 25 to 2,000 cps, a Hamilton Beach grit value of 0.03 to 3.0 and an average particles size of less than 0.5 microns, said spraying occurring in an atmosphere essentially free of volatile basic compounds at a pressure sufficient to atomize and destabilize the latex.

4,004,050
TWO-PART PRIMER SYSTEM FOR FRP BONDING

Thomas G. Rabito; Alvin J. Kieft, and Richard L. Cline, all of Ashland, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 26, 1974, Ser. No. 500,220

Int. Cl.^{2} B32B *27/40;* **C09J** *5/02*

U.S. Cl. 427—302 **4 Claims**

1. A method for improving the adhesion between an adhesive of the isocyanate class and a polyester composition comprising treating the surface of the polyester composition with a first and second treating agent without regard to sequence and then applying an adhesive of the isocyanate class and curing said adhesive, said first treating agent being an organic polyisocyanate and the second treating agent being a tertiary amine.

4,004,051
AQUEOUS NOBLE METAL SUSPENSIONS FOR ONE STAGE ACTIVATION OF NONCONDUCTORS FOR ELECTROLESS PLATING

Leon A. Kadison, and Eileen Maguire, both of Pasadena, Calif., assignors to Crown City Plating Company, El Monte, Calif.

Continuation-in-part of Ser. No. 443,082, Feb. 15, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,539

Int. Cl.^{2} C23C *3/02*

U.S. Cl. 427—304 **52 Claims**

1. An activator suspension for the one stage surface activation of a nonconductive surface for electroless plating which comprises an acidic aqueous suspension of absorbable particles of at least on noble metal formed by the reduction of the corresponding noble metal ion to the free metal state by at least one reducing agent for said noble metal ion which is other than a stannous salt and is noncomplexing with respect to the noble metal ion in the presence of at least one water soluble, organic suspending agent capable of preventing condensation of reduced free noble metal particles without the formation of an absorbable protective colloid and selected from a group consisting of a polymerized alkyl napthalene sulfonic acid, salts of a polymerized alkyl napthalene sulfonic acid, salts of a polymerized alkyl napthalene sulfonic acid and mixtures thereof, the free noble metal particles in said suspension being absorbable onto the surface of a nonconductive substrate when said suspension is at a pH below about 3.5.

4,004,052
PROCESS FOR PRODUCING NON-POROUS COATING FOR CORUNDUM SUBSTRATES

Vera Ivanovna Bystrova, ulitsa Sojuza Svyazi, 8, kv. 28; Galina Konstantinovna Kirillova, Baskov pereulok, 19, kv. 18, and Galina Atkhipovna Mikhailova, Liteiny prospekt 46, kv. 13, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 449,509, March 8, 1974, abandoned, which is a continuation of Ser. No. 300,235, Oct. 24, 1972, abandoned. This application Dec. 1, 1975, Ser. No. 636,446

Int. Cl.^{2} B05D *3/02;* **B32B** *9/04, 13/04*

U.S. Cl. 427—374 F **1 Claim**

1. A process for producing a non-porous coating for corundum substrates having a corundum content of 90 to 100%, comprising applying a barium, calcium or strontium alumosilicate glaze layer onto said corundum substrate and heat treating the same at a temperature within the range of from 1,350° to 1,650° C at a heating rate of from 100° to 500° C per hour, and thereafter cooling at a rate of about 150° C per hour, whereby corundum from the surface layer of said substrate reacts with said glaze thus forming a barium, calcium or strontium feldspar glass-ceramic coating on the substrate.

4,004,053
STABILIZATION OF ACRYLIC FIBERS AND FILMS

Klaus Hannes Gump, Gillette, and Dagobert Engelbert Stuetz, Westfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,183

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—379 **28 Claims**

1. An improved process for the stabilization of an acrylic fibrous material or film selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith comprising:

a. impregnating said fibrous material or film with a minor quantity of an organic antioxidant capable of moderating the oxidative cross-linking reaction of adjoining acrylic molecules by contact with a solution of said organic antioxidant in a solvent incapable of dissolving said

fibrous material or film having a temperature of about 0° to 100° C. while preserving the original configuration of said fibrous material or film substantially intact, with said organic antioxidant being provided in said solution in a concentration of about 0.2 to 20 percent by weight based upon the total weight of the solution,
b. drying said fibrous material or film to substantially remove said solvent therefrom and to form an acrylic fibrous material or film having incorporated therein about 1 to 10 percent by weight based upon the weight of said acrylic polymer of said organic antioxidant, and
c. heating said resulting impregnated and dried fibrous material or film in an oxygen-containing atmosphere at a temperature of about 200° to 360° C. until a stabilized fibrous material or film is formed which is black in appearance, retains its original configuration substantially intact and which is non-burning when subjected to an ordinary match flame.

4,004,054
MIXTURE FOR THE MANUFACTURE OF ANTISTATIC FLOOR COVERINGS AND COATINGS

Thaddeus Audykowski, and Kurt Amsler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 473,548, May 28, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,453

Claims priority, application Switzerland, June 15, 1973, 8724/73

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—385 R **14 Claims**

1. A process for the manufacture of antistatic floor coverings or coatings, which comprises

a. mixing together, based on the total mixture, 30 to 45 percent by weight of a cold-curing liquid synthetic resin combination, 45 to 70 percent by weight of aluminum grit the particles of which have a length of 0.35 to 1.2 mm; 0 to 30 percent by weight of a pigment; and 0.3 to 1.1 percent by weight of a thixotropic agent.
b. applying said mixture to a base, and
c. allowing to cure.

4,004,055
INHIBITING STRESS CRACKING

Daniel N. Hess, 4705 Yadkin Drive, Raleigh, N.C. 27609, and Ramon A. Bannister, P.O. Box 593, Sullivan's Island, S.C. 29482

Continuation-in-part of Ser. No. 254,452, May 18, 1972, Pat. No. 3,880,585. This application Apr. 21, 1975, Ser. No. 569,689

Int. Cl.^{2} C23C *1/10*

U.S. Cl. 427—431 **1 Claim**

1. A method of inhibiting stress cracking of stainless steel in a chloride-ion containing fluid environment which comprises, (a) contacting a stainless steel surface with metallic mercury in an amount effective to coat the stainless steel surface, and (b) contacting said mercury-coated stainless steel with said chloride-ion containing fluid environment, whereby stress cracking of said stainless steel surface is inhibited in the presence of said chloride-ion containing fluid environment.

4,004,056
POROUS LAMINATED SHEET

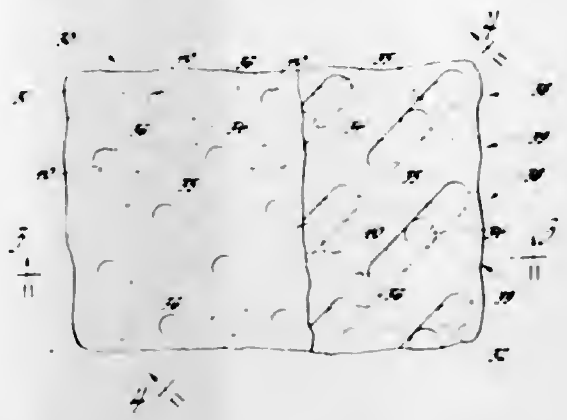
Charles D. Carroll, Greensburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 24, 1975, Ser. No. 598,963

Int. Cl.^{2} B32B *3/10;* **F23D** *15/02*

U.S. Cl. 428—138 **2 Claims**

1. A laminated porous metal sheet adapted for convection cooling of the sheet by gas flow through the sheet and to provide a shielding turbulent gas flow over a front face of the sheet exposed to a source of heat, the sheet comprising a front layer and a rear layer, the two said layers being in abutting face-to-face relation and being bonded together; the front layer having an outer face constituting the front face of the sheet and an inner face abutting the rear layer, having a multiplicity of rows of separate, short grooves in the inner face with the rows extending generally parallel and with the grooves elongated in the direction of the rows, adjacent groups of four grooves being arranged in a rectangular pattern, each groove in said pattern having an inlet into one end of each groove and an outlet hole extending from the other end of each groove through the outer face; the rear layer having an outer face constituting the rear face of the sheet and an inner face abutting the front layer and having a multiplicity of slots in the inner face, one of said slots communicating with two said inlets disposed in grooves of each of said rectangular pattern and others of said slots communicating with inlets of the remaining grooves in said rectangular pattern and with inlets of grooves formed in adjacent ones of said rectangular patterns to spread coolant flow between said front and rear layers; and the rear layer defining an aperture leading from its outer face into each said slot; so that gas flowing through the sheet from the rear face to the front face is fed through the said apertures, slots, inlets, grooves, and outlet holes, and is discharged from the outlet holes of adjacent rows with substantial inclination to a normal to the front face of the sheet.



4,004,057
GOLD CONDUCTOR COMPOSITIONS

Lewis Charles Hoffman, Hockessin; Charles William McMunn, New Castle; Arthur Harvey Mones, Wilmington, all of Del., and Oliver Alton Short, Hemel Hempstead, England, assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 588,131, June 23, 1975, Pat. No. 3,970,590. This application Mar. 12, 1976, Ser. No. 666,496

Int. Cl.^{2} H01B *1/02, 1/06;* **B32B** *15/00*

U.S. Cl. 428—209 **4 Claims**

1. Conductor patterns of a composition of, by weight, 95.0–98.1% gold particles and, complementally, 1.9–5.0% inorganic binder particles, the binder consisting essentially of, by total weight of gold and binder,

0.3–1.5% crystalline PbF_2
0.06–0.32% crystalline Cu_2O
0.2–1 5% crystalline CdO and
0.5–1.95% glass,

the glass having the composition

45–52% PbO
3–6% B_2O_3
30–35% SiO_2
4–6% TiO_2
2–4% ZrO_2
0–1% ZnO
1–4% Na_2O
0–4% CdO and
0–2% Li_2O,

adherent to a dielectric substrate.

4,004,058

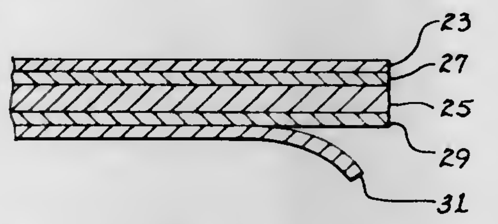
RE-ENCODING LABEL

Melvin S. Buros, and William B. Buros, both of Phoenix, Ariz., assignors to Micr-Shield Company, Phoenix, Ariz.

Filed July 17, 1975, Ser. No. 596,579

Int. Cl.² B32B *7/12;* **C09J** *7/02*

U.S. Cl. 428—215 **2 Claims**



1. A multi-layered re-encoding label for attachment to an erroneously encoded document for covering MICR characters present thereon and for permitting encoding of new MICR characters thereon, said label comprising:

a. a layer of bleached kraft tissue paper of a thickness of from 1 mil to 1.5 mils and having a relative translucency of from 15 to 57;

b. a layer, from 3 to 4 mils thickness, of substantially unplasticized rigid polyvinylchloride;

c. a layer of low density polyethylene securing said layer of tissue paper to said layer of rigid polyvinylchloride; and

d. a layer of pressure-sensitive adhesive on said rigid polyvinylchloride to permit the adhesive placement of said label on a document.

4,004,059

METHOD TO MAKE FIBROUS MATERIAL OIL AND WATER REPELLENT AT THE SAME TIME

Hans Deiner, Neusass; Bernhard Sandner, Biburg, and Willy Bernheim, Diedorf, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1975, Ser. No. 547,078

Claims priority, application Germany, Feb. 8, 1974, 2406002

Int. Cl.² D06M *13/18*

U.S. Cl. 428—224 **9 Claims**

1. A process for simultaneously imparting oil-repellency and water-repellency to fibre materials in which the fibre materials are impregnated with a liquor containing a homopolymer, a copolymer or a mixture thereof, having a plurality of perfluoroalkyl groups of at least 4 carbon atoms per alkyl group and a water-repellent agent as extender, dried and heated, the improvement comprising that as extender is used an addition product of (a) an unsaturated compound which is an olefin selected from the group consisting of a vinyl or allyl ester of an aliphatic straight- or branched-chain acid, a vinyl-alkyl ether whose alkyl radical has at least 4 carbon atoms, and allyl-alkyl ether whose alkyl radical has at least 4 carbon atoms, a vinyl halide and mixtures thereof with (b) an organopolysiloxane which contains hydrogen atoms bonded to silicon atoms, the addition product containing on average more than 7 carbon atoms in the alkyl radical and at least 0.20 mole of unsaturated component (a) per gram atom of hydrogen in the siloxane component (b).

4,004,060

BINDING AGENTS

Arie Dick Kardol, Waddinxveen, and Johannes Helmond, Gouda, both of Netherlands, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 499,813, Aug. 23, 1974, Pat. No. 3,959,196. This application Aug. 4, 1975, Ser. No. 601,582

Int. Cl.² B32B *27/02, 27/10*

U.S. Cl. 428—290 **3 Claims**

1. A non-woven article comprising a substrate treated with an aqueous solution or dispersion of a binding agent and cured, said binding agent being present in an amount from about 3 to 40% by weight of the substrate and obtained by reacting (a) a dimer, trimer or higher oligomer obtained from the polymerization of unsaturated C_{16}–C_{26} fatty acids with (b) one mole (per carboxyl group) of a diglycidyl ether compound selected of the group consisting of Bisphenol A, Bisphenol F and polyoxypropylene glycol, further reacting (c) about 0.5 to 1.5 mols of an alkoxy polyoxyalkylene compound having terminal alkoxy and hydroxyl groups, a molecular weight from about 200 to 500 and alkylene groups containing 2 or 3 carbon atoms and (d) 0.5 to 1.5 mols of an alkanol amine the alkanol groups of which contain 2 or 3 carbon atoms and finally neutralizing to a pH of 4–9 with a (e) monocarboxylic acid containing 1 to 4 carbon atoms.

4,004,061

ADHESIVES

Gordon Robert Creighton, Cambridge, and Barry James Hayes, Little Eversden, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,312

Claims priority, application United Kingdom, Jan. 26, 1973, 4171/73

Int. Cl.² C09J *7/02*

U.S. Cl. 428—349 **10 Claims**

1. A film adhesive which comprises a layer of thermoset resin composition having adhering thereto solid particles of at least 60 μm and at most 1.5 mm of a thermosettable resin composition which is curable at an appreciable rate only at a temperature at least 30° C higher than that at which the thermoset resin composition has been cured.

4,004,062

AQUEOUS POLYESTER COATING COMPOSITION

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 475,483, June 3, 1974, Continuation-in-part of Ser. No. 467,615, May 6, 1974, Continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Aug. 30, 1974, Ser. No. 501,932

Int. Cl.² C08L *67/02*

U.S. Cl. 428—383 **37 Claims**

1. A coating composition for application to a substrate from an aqueous solution comprising the admixture of a water soluble film forming polyester resin and a water soluble aromatic oligorthoamic acid di-primary amine.

4,004,063

AQUEOUS ENAMEL FOR COATING MAGNET WIRE

Marvin A. Peterson, Fort Wayne, Ind., and Oliver I. Cline, Burnsville, Minn., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 31, 1974, Ser. No. 537,650

Int. Cl.² C08L *67/02*

U.S. Cl. 428—383 **30 Claims**

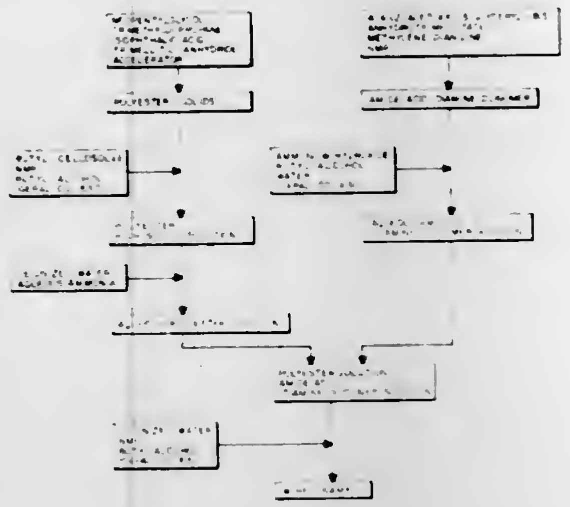
1. A coating composition for application to magnet wire in a wire tower, comprising an aqueous solution of

a. a water soluble polyester resin comprising the reaction product of
   neopentylglycol,
   trimethylolpropane,
   isophthalic acid, and
   trimellitic anhydride,

said reactants being in proportions such that the polyester resin has an acid value of between about 45 and about 100, and a hydroxyl value of between about 150 to about 300; and

b. a water soluble orthoamic acid diamine oligomer comprising the reaction product of
   m moles methylene dianiline, and
   (*m*-1) moles 4,4′-(2-acetoxy-1,3-glyceryl)-bis-anhydrotrimellitate, where *m* has a value of from 2 to 7;

a coating of said aqueous solution on a wire substrate being



curable upon the application of heat to form magnet wire having a cured resin coating thereon.

4,004,064

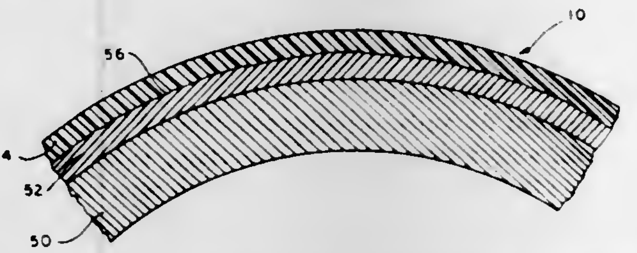
PROTECTIVE COATING FOR ARTICLES

Saul Kessler, Canoga Park, Calif., assignor to Joseph W. Aidlin, Los Angeles, Calif.

Division of Ser. No. 429,911, Jan. 2, 1974, which is a continuation-in-part of Ser. No. 137,429, April 26, 1971, abandoned. This application May 22, 1975, Ser. No. 579,777

Int. Cl.² B32B *9/04, 27/00*

U.S. Cl. 428—421 **18 Claims**



1. A protectively coated article comprising in combination:

a metal substrate; and

a low-friction waxy, continuous, coherent film having a decomposition temperature of at least 575° F adherent to a surface of said substrate comprising the reaction product of a chloride, bromide or iodide of a metal selected from aluminum, boron or titanium and a mononuclear-arylamine containing an alkyl group containing from 1–5 carbon atoms and having three fluorine atoms attached to the terminal carbon atom.

4,004,065

COATED HEAT SENSITIVE RECORDING MEMBER

Hiromu Matsushita, Habikino; Takashi Yamahata, Koriyama, and Hiroshi Kakimoto, Kyoto, all of Japan, assignors to General Company, Ltd., Osaka, Japan

Filed Dec. 24, 1974, Ser. No. 536,326

Claims priority, application Japan, Dec. 13, 1974, 49-142440

Int. Cl.² B32B *23/06, 23/08*

U.S. Cl. 428—532 **13 Claims**

1. In a heat sensitive recording member which comprises a support and a heat sensitive layer overlying said support, said heat sensitive layer being composed of a binder having dispersed therein an iron salt of a higher fatty acid and gallic acid as the color forming components which react with each other to provide a color upon the application of heat thereto; the improvement wherein said heat sensitive layer comprises, dispersed in said binder, in addition to said color forming components, a stilbene series fluorescent dye which inhibits said reaction prior to the use of said recording member, and wherein said binder is at least one member selected from the

group consisting of hydroxypropyl cellulose and hydroxypropyl methylcellulose.

4,004,066

METHOD OF PROTECTING CONCRETE

Anthony J. DeArdo, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 6, 1975, Ser. No. 602,266

Int. Cl.² B32B *9/04*

U.S. Cl. 428—538 **4 Claims**

1. A method of protecting cured concrete from attack by organic lubricants which comprises treating the cured concrete for at least 1 hour with an aqueous solution of citric acid having a concentration of from 0.1% to 5% by weight.

4,004,067

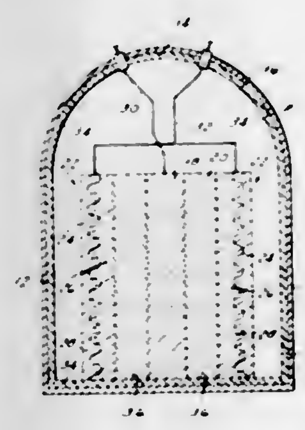
RECHARGEABLE ELECTROCHEMICAL CELL

Donald C. Briggs, Mountain View, and Ronald J. Haas, San Jose, both of Calif., assignors to Aeronutronic Ford Corporation, Dearborn, Mich.

Filed June 7, 1976, Ser. No. 693,573

Int. Cl.² H01M *10/34*

U.S. Cl. 429—57 **5 Claims**



1. In a rechargeable electrochemical cell including a closed container confining therewithin at least a cathode, a gas generating and consuming anode, a separator and electrolyte storage material between the cathode and the anode, an electrolyte in the storage material and an open volume for gas storage, the improvement which comprises:

lining the inside surface of the closed container defining the open volume for gas storage with a layer of a capillary mat material, said lining of said capillary mat material having at least a portion thereof in liquid transfer contact with the separator and electrolyte storage material located between the cathode and the anode, whereby any electrolyte vaporized into the gas storage volume will condense onto said lining material, and whereby the liquid transfer contact of said lining material and the separator and electrolyte storage material between the cathode and the anode will provide a liquid flow path for returning vaporized and subsequently condensed electrolyte to the separator and electrolyte storage material between the cathode and the anode.

4,004,068

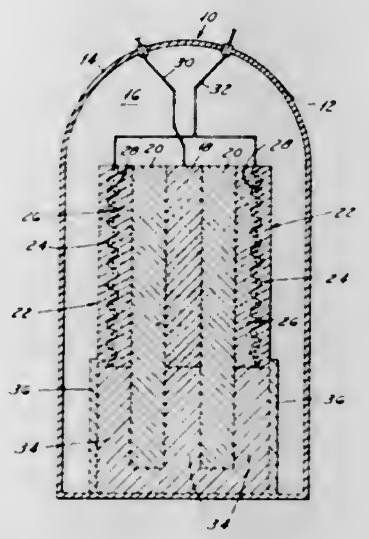
ELECTROCHEMICAL CELL OF A RECHARGEABLE NATURE

Donald C. Briggs, Mountain View, and Ronald J. Haas, San Jose, both of Calif., assignors to Aeronutronic Ford Corporation, Dearborn, Mich.

Filed June 7, 1976, Ser. No. 693,574

Int. Cl.^{2} H01M *10/34*

U.S. Cl. 429—57 **6 Claims**



1. In a rechargeable electrochemical cell including a closed container confining therewithin at least a cathode, a gas generating and consuming anode, a separator and electrolyte storage material between the cathode and the anode, an electrolyte in the storage material and an open volume for gas storage, the improvement which comprises:

providing within the closed container a reservoir formed of a capillary mat material capable of storing electrolyte, said reservoir being in liquid transfer contact with the separator and electrolyte storage material between the cathode and the anode, whereby losses of electrolyte from the separator and electrolyte storage material are substantially replaced by transfer of electrolyte from said reservoir to the separator and electrolyte storage material.

4,004,069

UNSATURATED ETHYLENE-VINYL ACETATE COPOLYMERS AND UNSATURATED POLYETHYLENES AND METHODS OF PREPARING SAME BY PARTIAL OR EXHAUSTIVE DEACETYLATION OF ETHYLENE-VINYL ACETATE COPOLYMERS

Günther Bernhardt, St. Augustin; Werner Trautvetter, and Rudeger Minke, both of Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Cologne, Germany

Filed Oct. 30, 1974, Ser. No. 519,906

Claims priority, application Germany, Nov. 6, 1973, 2355320; Dec. 17, 1973, 2362664

Int. Cl.^{2} C08F *210/02, 218/08, 8/50*

U.S. Cl. 526—48 **24 Claims**

1. Method of deacetylation of ethylene-vinyl acetate copolymers to produce the corresponding olefinically unsaturated, linear polymers which comprises deacetylating ethylene-vinyl acetate copolymers in presence of a catalist for the deacetylation under a vacuum of less than about 50 Torr, by splitting acetic acid from the copolymers while continuously stirring the copolymers wherein the deacetylation is performed at a temperature of about 160° – 350° and wherein said catalyst is a Lewis acid or a protonic acid: and removing acetic acid from the copolymers.

4,004,070

VISCOSITY REDUCTION OF ORGANOPOLYLITHIUM-INITIATED POLYMER SOLUTIONS

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 76,209, Sept. 28, 1970, abandoned. This application Mar. 27, 1972, Ser. No. 238,538

Int. Cl.^{2} C08F *36/06*

U.S. Cl. 526—86 **1 Claim**

1. A method for producing polymers by the homopolymerization of butadiene or the copolymerization of butadiene and styrene which comprises:

a. homopolymerizing said butadiene or copolymerizing said butadiene and said styrene with an initiator comprising an organo-polylithium compound to form a first mixture comprising polymers.

b. introducing an organo-monolithium compound into said first mixture after the polymerization is at least 80 percent complete to form a second mixture comprising polymers;

c. then introducing silicon tetrachloride coupling agent into said second mixture to couple said polymer; and,

d. recovering said polymers.

4,004,071

PROCESS FOR THE POLYMERIZATION OF ETHYLENE

Itsuho Aishima, Fujisawashi; Hisaya Sakurai, Kurashikishi; Yukichi Takashi, Kurashikishi; Hideo Morita, Kurashikishi; Tadashi Ikegami, Kurashikishi, and Toshio Sato, Kurashikishi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 17, 1975, Ser. No. 569,044

Claims priority, application Japan, Apr. 30, 1974, 49-47512; June 13, 1974, 49-66514; June 17, 1974, 49-68135

Int. Cl.^{2} C08F *4/66, 10/02*

U.S. Cl. 526—116 **14 Claims**

1. A method for polymerizing ethylene or of ethylene and other olefin which comprises polymerizing said ethylene or a mixture of ethylene and other olefin with a catalyst obtained by reacting (A) a hydrocarbon-insoluble reaction product formed by reacting (i) a hydrocarbon-soluble complex containing Al and Mg, represented by the general formula

$$Al_nMg_mR^1_{3n-\alpha}R^2_{2m}H_\alpha$$

wherein R^1 and R^2 are same or different hydrocarbon radicals having 1 to 10 carbon atoms; n and *m* are numbers each greater than 0; m/n is in the range of 0.5–10; and α is 0 or 1, with (ii) at least one compound selected from the group consisting of titanium compounds and vanadium compounds both containing at least one halogen atom, with (B) a trialkylaluminum or a dialkylaluminum hydride wherein the alkyl radicals have 1 to 20 carbon atoms.

4,004,072

PROCESS FOR PRODUCING ACRYLONITRILE POLYMERS

Hitoshi Tamura, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 460,678, April 15, 1974, Pat. No. 3,915,942. This application Mar. 26, 1975, Ser. No. 562,133

Claims priority, application Japan, May 1, 1973, 48-49397

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.^{2} C08F *120/44, 220/44*

U.S. Cl. 526—214 **2 Claims**

1. The acrylonitrile homopolymer or copolymer prepared by the process which comprises polymerizing acrylonitrile or a mixture comprising at least 85% by weight of acrylonitrile and at most 15% by weight of other copolymerizable monoethylenically unsaturated compounds in an aqueous medium at 30° C to 70° C at a pH of 1.5 – 5.0, wherein the monomer to water ratio is 1/10 to ⅙, in contact with a redox catalyst comprising

nitrous acid or a salt thereof and sulfurous acid or salt thereof, wherein the ratio of said nitrous acid or salt to said sulfurous acid or salt thereof is 1/30 to ⅓ by weight, and the sulfurous acid or salt thereof is present in an amount of 1/10,000 to 1/50 by weight, based on the amount of water in the aqueous medium, and further in contact with 0.005%–5% by weight based on the weight of monomer of a water insoluble mercaptan selected from the group consisting of alkyl mercaptans containing at least 4 carbon atoms and mercaptan carboxylate acid ester.

4,004,073

POLYMERIC FLUOROMETHYLATED DIENES

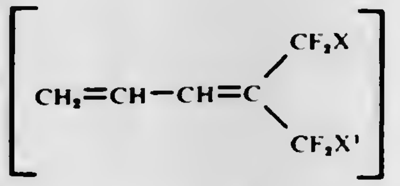
Victor A. Pattison, Tonawanda, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 411,869, Nov. 1, 1973, abandoned, and a continuation-in-part of Ser. No. 788,009, Dec. 30, 1968, abandoned. This application Feb. 9, 1976, Ser. No. 656,219

Int. Cl.^{2} C08F *136/16, 136/18*

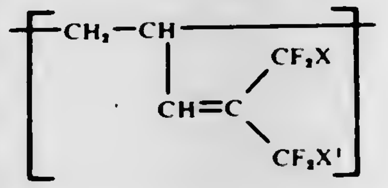
U.S. Cl. 526—252 **5 Claims**

1. Homopolymers of halomethylated dienes of the formula



$$\left[CH_2{=}CH{-}CH{=}C(CF_2X)(CF_2X')\right]$$

wherein X and X′ are halogen and wherein said homopolymers are characterized by the repeating units



$$\left[{-}CH_2{-}CH(CH{=}C(CF_2X)(CF_2X')){-}\right]$$

in the skeletal chain produced by the process comprising allowing said halomethylated dienes to polymerize by the use of a free radical catalyst.

4,004,074

HIGHLY SUBSTANTIVE SUNSCREENING AGENTS

John Fred Gerecht, Somerville, N.J., and Morton Batlan Epstein, Chicago, Ill., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 737,822, June 18, 1968, abandoned. This application Feb. 28, 1973, Ser. No. 336,839

Int. Cl.^{2} C08F *218/04, 220/54, 228/02*

U.S. Cl. 526—305 **8 Claims**

1. A substantive polymeric sunscreening agent consisting essentially of a copolymer of at least one monomeric, substrate binding moiety selected from the group consisting of, vinyl mercaptan, vinyl guanidine, vinyl biguanidine, guanidyl styrene, and biguanidyl styrene, and at least one monomeric sunscreening moiety selected from the group consisting of vinyl or allyl salicylate, vinyl or allyl p-amino-benzoate, allyl amide of p-amino benzoic acid, allyl amide of salicylic acid, and p-allylamino benzoic acid.

4,004,075

PACKAGING FILMS

Michael Hugh Richmond, Sarnia, Canada, and Henry Glyn Wright, Signal Mountain, Tenn., assignors to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 408,680, Nov. 27, 1972. This application Feb. 27, 1975, Ser. No. 553,816

Claims priority, application Canada, Nov. 27, 1972, 157570

Int. Cl.^{2} C08F *220/44, 210/00, 210/08*

U.S. Cl. 526—342 **3 Claims**

1. Molded or extruded articles comprising oriented film formed by extruding an interpolymer at a temperature between 180° C and 250° C, said film being bonded to one or more sheets of one of polystyrene or paper, metal foil or glass, said interpolymer consisting essentially of (1) 60 to 75 weight percent of acrylonitrile, (2) 12.5 to 20 weight percent of styrene and (3) 12.5 to 20 weight percent is isobutylene, the amounts of (2) and (3) being within the weight ratio lf 1.3:1 to 1:1.3, said interpolymer being substantially free of homopolymer and having a permeability to carbon dioxide of less than 7cc/100 sq. inch. 24 hours . atmos. mil at 73° F, permeability to oxygen of less than 3cc/100 sq. inch . 24 hours . atmos . mil at 73° F and water vapor transmission of less than 4g/100 sq. inch. 24 hours . mil at 95 percent relative humidity.

4,004,076

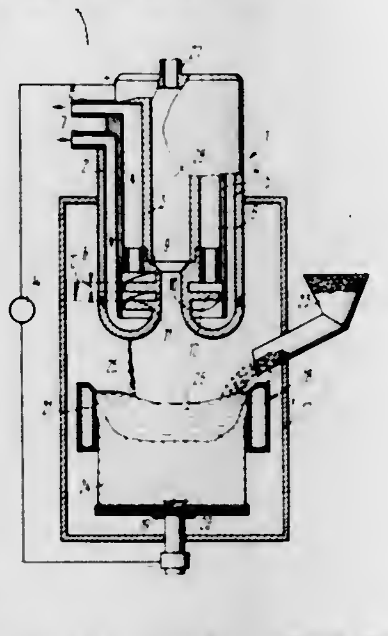
NONCONSUMABLE ELECTRODE FOR MELTING METALS AND ALLOYS

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Viktor Iosifovich Lakomsky, ulitsa Anri Barbjusa, 22/26, kv. 119; Vladimir Nikolaevich Kostyakov, ulitsa Zhelyabova, 10, kv. 56; Vitaly Mikhailovich Shian, ulitsa Borodyanskaya, 12, kv. 58; Alfred Iosifovich Bukalo, ulitsa P. Zaporozhtsa, 8/2, kv. 69; Jury Vladimirovich Lisovol, ulitsa Sovetskaya, 24, and Valentin Petrovich Domrachev, ulitsa Gvardeiskaya, 10, kv. 1, all of Kiev, U.S.S.R.

Filed June 6, 1975, Ser. No. 584,495

Int. Cl.² H05B *7/08*

U.S. Cl. 13—18 **2 Claims**



1. A nonconsumable electrode for melting metals and alloys, comprising: a cooled housing connected to a supply source; a cooled tip having a cavity defined by inner and outer walls of said tip; said inner walls having at least one threaded groove provided on the side of said cavity, said groove serving to rotate the arc generated between said tip and the molten metal and alloy.

4,004,077

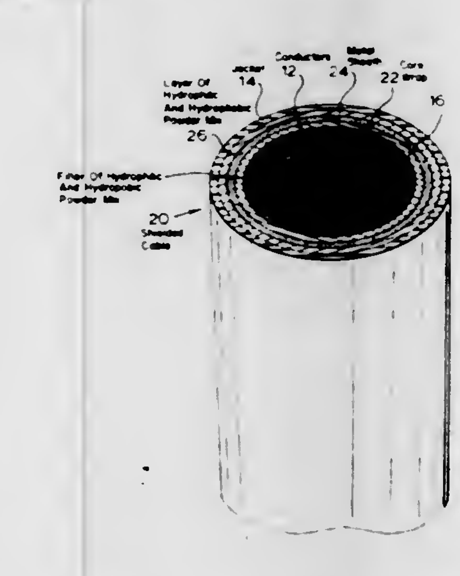
WATER BLOCKED ELECTRIC CABLES

Leo Victor Woytiuk, Pointe-Claire, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Mar. 7, 1975, Ser. No. 556,294

Int. Cl.² H01B *7/28*

U.S. Cl. 174—23 C **2 Claims**


Layer Of Hydrophilic And Hydrophobic Powder Mix
26
Jacket
14
Conductors
12
Metal Sheath
24
22
Core Wrap
16
Layer Of Hydrophilic And Hydrophobic Powder Mix
20
Stranded Cable

1. An electric cable having a core of a plurality of conductors and a jacket, the interstices between the conductors and within the jacket being at least partially filled with a mixture of a hydrophobic and a hydrophilic powder, the hydrophilic powder forming on contact with water a viscous, non-swelling material, the conductors being each coated with a hydrophobic oil.

4,004,078

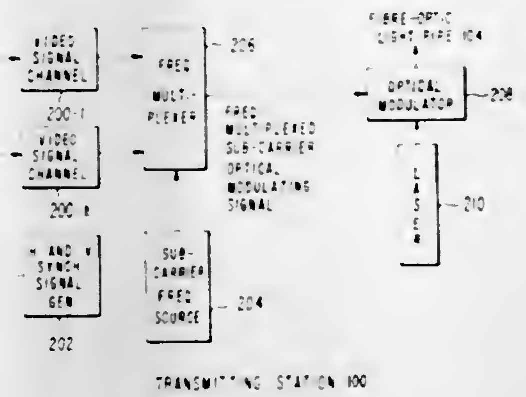
OPTICAL COMMUNICATION AND DISPLAY SYSTEM

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,038

Int. Cl.² H04B *9/00*

U.S. Cl. 358—83 **3 Claims**



1. In a system of the type in which deflecting means scans a light beam applied thereto, which light beam is intensity-modulated with video information manifesting a given scene, comprising translating means coupled to said deflecting means and responsive to received light wave energy from a remotely located source applied as an input thereto which light wave energy as received is modulated in some given form with a video signal manifesting both said given scene and sync signals for synchronizing the scan of said deflecting means, said translating means including means for employing said received light wave energy as the wave energy of said light beam, obtaining said intensity modulation of said light beam from said given form of modulation of said received light wave energy, and separating said sync signals from said received light wave energy and applying them to said deflecting means to synchronize the scan thereof, the improvement:

wherein said given form of modulation comprises a subcarrier modulated by the video signal of said light wave energy, the entire bandwidth of said modulated sub-carrier being above the highest baseband frequency component of said video signal itself, and wherein said translating means comprises means including a photodetector for demodulating only a portion of said light wave energy, an electro-optic modulator having the remainder of said light wave energy applied as an input thereto, means coupled to said photodetector including a sub-carrier detector responsive to the output of said photodetector for reducing said video signal to baseband, sync separator means for removing said sync signals from said baseband video signal, said baseband video signal being applied as a modulating signal to said electro-optic modulator and said separated sync signals being applied to said deflecting means to synchronize the scan thereof, the output from said electro-optic modulator constituting said light beam applied to said deflecting means.

4,004,079

METHOD AND APPARATUS FOR DUAL RESOLUTION PHOTOGRAPHIC REPRODUCTION OF LINE AND CONTINUOUS TONE GRAPHIC MATERIALS

William Thomas Boston, Melrose, Mass., assignor to Optronics International, Inc., Chelmsford, Mass.

Filed Nov. 14, 1975, Ser. No. 632,015

Int. Cl.² H04N *1/26*

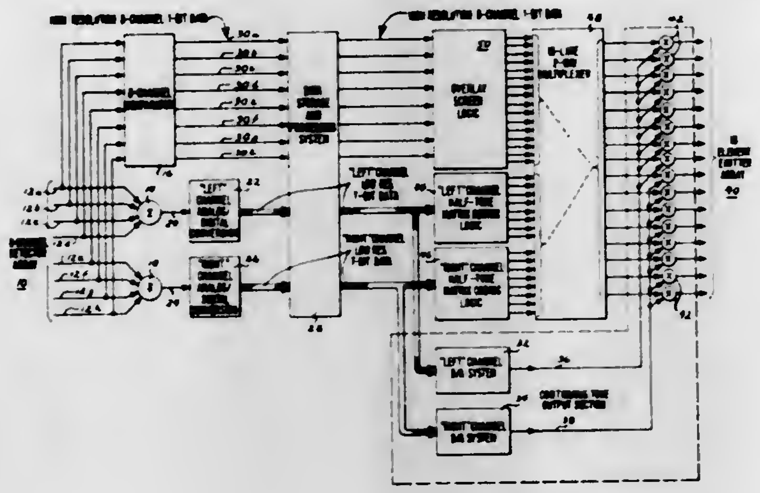
U.S. Cl. 358—256 **12 Claims**

1. A method for reproducing line and continuous tone, graphic material comprising the steps of:

1. opto-electrically scanning incremental areas of line and continuous tone graphic material and producing high resolution line graphic signals representative of the gray levels of incremental areas of the scanned line graphic

materials and low resolution continuous tone graphic signals representative of the gray levels of incremental areas of the scanned continuous tone graphic material;

2. photographically reproducing the line graphic material by scan exposing a photosensitive member in response to the high resolution line graphic signals to produce an exposure of the photosensitive member that is a function of the gray levels of the scanned line graphic material; and,



3. photographically reproducing the continuous tone graphic material by scan exposing a photosensitive member in response to the low resolution continuous tone graphic signals to produce an exposure of the photosensitive member that is a function of the gray levels of the scanned continuous tone graphic material.

4,004,080
METAL COATING FOR VIDEO DISCS

John L. Vossen, Jr., Bridgewater, N.J.; Frederick Russell Nyman, Carmel, Ind.; Dennis Glendon Fisher, Titusville, N.J., and George Frederick Nichols, Oaklandon, Ind., assignors to RCA Corporation, New York, N.Y.

Filed July 25, 1975, Ser. No. 599,129

Int. Cl.² H04N *1/28;* **B32B** *3/02*

U.S. Cl. 358—128 **8 Claims**

1. In a capacitive video frequency recording means in the shape of a disc having a spiral groove on a face thereof and video information in the form of geometric variations in said groove, said disc having a thin conductive layer on said face and a thin dielectric layer disposed on said conductive layer, the improvement which comprises employing as the conductive layer a pseudo-alloy about 200 to 400 angstroms thick of an alloy containing from about 65 to about 80 percent by weight of nickel, from about 10 to about 30 percent by weight of chromium and from 0 to about 10% by weight of iron, which pseudo-alloy contains from about 10 to about 15 atomic percent of copper, and from about 10 to 25 atomic percent of oxygen, wherein atomic percent is determined by Auger electron spectroscopy.

5. A thin, conductive, corrosion-resistant metal film which comprises a pseudo-alloy of an alloy containing from about 65 to about 80% by weight of nickel, from about 10 to about 30% by weight of chromium, and from 0 to about 10% by weight of iron, which pseudo-alloy contains from about 10 to about 25 atomic percent of oxygen and from about 10 to about 15 atomic percent of copper, wherein atomic percent is determined by Auger electron spectroscopy, said film being from about 200 to 400 angstroms thick.

4,004,081
OPTICAL VIDEODISC PICKUP ARM WITH MOVING COIL DRIVE MEANS

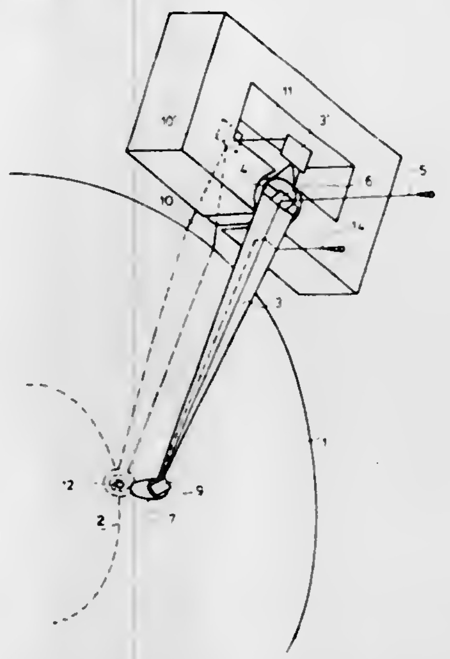
Karl-Ludwig Zorn, Berlin, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 6, 1974, Ser. No. 477,476

Claims priority, application Germany, July 20, 1973, 2337015

Int. Cl.² H04N *5/76*

U.S. Cl. 358—128 **5 Claims**



1. Optical pickup apparatus for a videodisc record arranged to be rotated on the disc axis, comprising:

- an electromagnetic torque-producing transducer arranged to produce torque on an axis parallel to said disc record axis;
- an arm movable by said torque-producing transducer in a manner for moving the end of said arm farthest from said transducer in a path approximately perpendicular to a record trace on said disc record;
- a focusing light beam projection means on said end of said arm for projecting a spot of light on a record trace on said record;
- means for detecting light from said beam, as modified by said record trace, and
- means for positioning said detecting means near the portion of said record trace illuminated by said light spot, including mechanical partial decoupling means interposed between said positioning means and said arm for preventing transmission of short period correction movements crossways of said record trace to said detecting means except as smoothed gradual corrections while permitting said detecting means to follow a tracking movement, as gradually corrected, produced by said arm.

4,004,082
METHOD AND SYSTEM FOR MULTIPLEXING SIGNAL FOR TRANSMISSION

Yasufumi Yumde; Takashi Furuhata, and Kotaro Kawamura, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

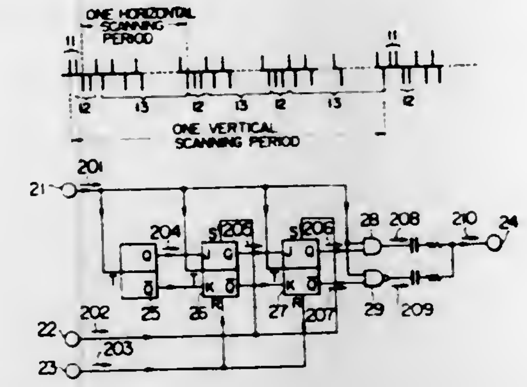
Filed Sept. 30, 1974, Ser. No. 510,630

Claims priority, application Japan, Oct. 1, 1973, 48-109275

Int. Cl.² H04N *7/12;* **H03K** *1/17, 7/00*

U.S. Cl. 358—141 **13 Claims**

5. A method of multiplexing for the transmission of at least two kinds of information signals comprising the steps of providing a two-polarity pulse train consisting of pulses of alternately inverted polarities modulated by a first kind of said information signal, and controlling the polarity of a part of the pulses in said modulated pulse train signal by said information signal of a second kind to thereby code such part of said pulse train signal.



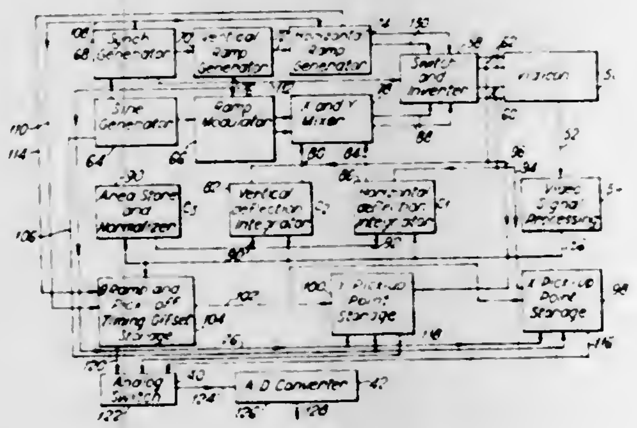
4,004,083
METHOD AND APPARATUS FOR DETERMINING CENTROID COORDINATES AND ANGULAR ORIENTATION OF A SURFACE

Philip Chrislock Norem, Fort Erie, Ontario, Canada, assignors to Autotelic Industries, Incorporated, Ontario, Canada

Filed Oct. 25, 1972, Ser. No. 280,548

Int. Cl.² H04N *7/18*

U.S. Cl. 358—125 **33 Claims**



29. The method of locating the centroid of a surface which comprises: electronically scanning said surface with scan lines in a substantially rectangular raster pattern larger in all directions than said surface, charging first and second capacitors by supplying thereto voltage signals representative respectively of the vertical and horizontal frame voltages of each line during the period of incidence of the line on the surface, discharging each of said capacitors through a respective resistor, and interrupting the discharging of said first and second capacitors at the end of a time period equal to the time period required for the voltage on a third capacitor to reach a predetermined lower level.

4,004,084
VIDEO CONFERENCING SYSTEM USING SPATIAL REDUCTION AND TEMPORAL RESOLUTION

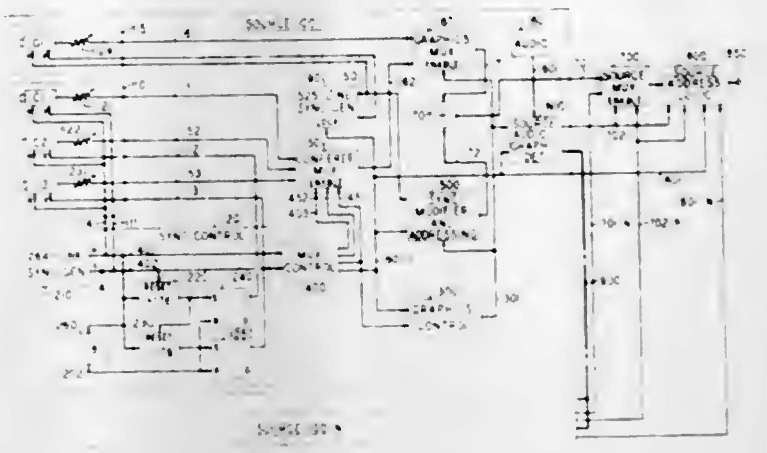
Earl Franklin Brown, Piscataway; John Ormond Limb, Tinton Falls, and Birendra Prasada, Matawan, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1976, Ser. No. 663,622

Int. Cl.² H04N *7/12, 7/18*

U.S. Cl. 358—133 **11 Claims**

1. In a video conferencing system, apparatus for reducing bandwidth of a plurality of video pictures; each picture having one or more fields, each picture being provided by a corresponding one of a plurality of video cameras, and each picture for display on a corresponding one of a plurality of video monitors; said apparatus including means for spatially reducing a picture from a first group of one or more cameras, said spatial reduction means including means for providing a spatial portion of said picture from said first group of cameras, said spatial portion being less than the total raster of a picture



and characterized in that said apparatus further comprises:

- temporal resolution means operative upon said picture from said first group of cameras, said temporal resolution means including means for interleaving each picture in said first group in a prefixed rotational sequence.

4,004,085
RECEIVING PROGRAM-PRESETTING SYSTEM FOR A TELEVISION RECEIVER

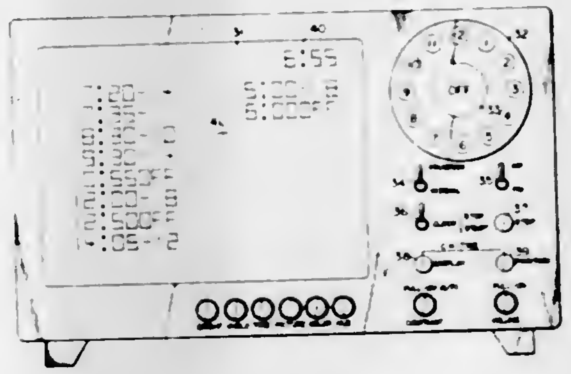
Shinichi Makino, Fujisawa, and Naoyuki Kokado, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 14, 1975, Ser. No. 567,870

Claims priority, application Japan, Apr. 19, 1974, 49-43466

Int. Cl.² H04N *7/18*

U.S. Cl. 340—324 AD **5 Claims**



1. A television receiver program-presetting system for displaying items of program information on the face of a television receiver Braun tube, said system comprising:

a. means for supplying items of program information;

b. memory means for storing each of said items of program information in a designated address;

c. means for designating the instantaneous vertical position on said Braun tube being scanned by said television receiver;

d. address encoder means for generating a plurality of unique display region signals in response to said vertical position, each of said display region signals representing one area on the face of said Braun tube;

e. means for removing an item of program information from an address of said memory means corresponding to one of said display region signals;

f. means for producing signals denoting character patterns corresponding to said removed item of program information; and

g. means for delivering said character patterns to said area of said Braun tube represented by said one display region signal.

4,004,086

APPARATUS FOR THE TELEVISION RECONNOITERING OF TERRAIN FROM THE AIR

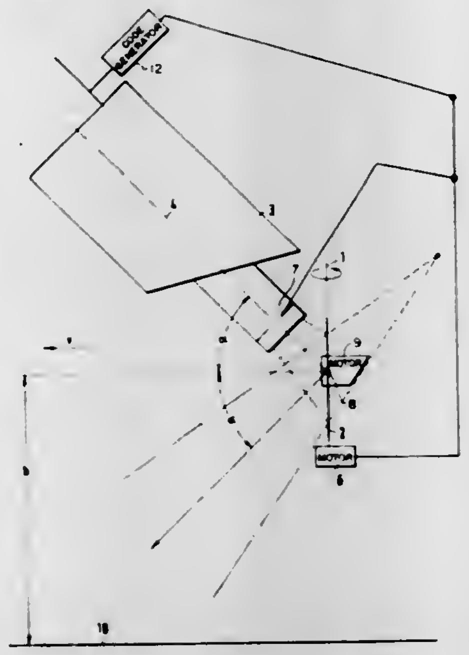
Karl-Bernd Buss, Nuremberg, Germany, assignor to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Germany

Filed Mar. 28, 1975, Ser. No. 562,818

Claims priority, application Germany, July 6, 1974, 2432448

Int. Cl.^{2} H04N *3/16, 3/00*

U.S. Cl. 358—109 **3 Claims**



1. An apparatus for reconnoitering terrain from a moving aircraft flying parallel to the terrain under observation comprising: a mirror arranged nominally perpendicular to the object plane of the terrain under observation; means for stepwise tilting said mirror about an axis perpendicular to said object plane, whereby to define an arc by a series of steps, a television camera having an optic axis directed at said mirror, said optic axis being inclined at an angle and with respect to said object plane, and means interconnecting said camera and tilting means to actuate said camera only when said mirror is in position between steps.

4,004,087

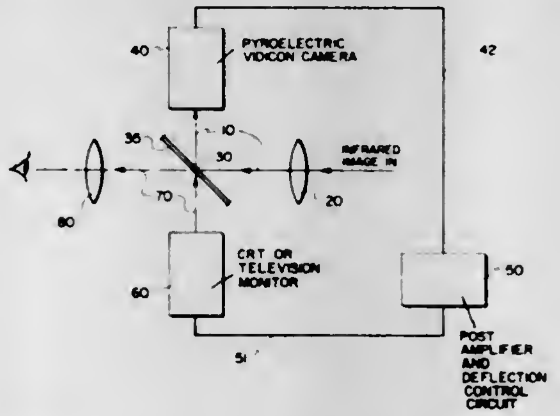
PANNING PYROELECTRIC VIDICON SYSTEM

Reinhard D. Ennulat, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1974, Ser. No. 468,725

Int. Cl.^{2} H04N *5/38*

U.S. Cl. 358—113 **4 Claims**


40
PYROELECTRIC VIDICON CAMERA
42
36
10
30
INFRARED IMAGE IN
70
20
80
CRT OR TELEVISION MONITOR
60
50
51
POST AMPLIFIER AND DEFLECTION CONTROL CIRCUIT

1. In a pyroelectric vidicon panning system for thermal imaging:

a first optical means comprising an infrared objective lens and one side of a two reflective side flat panning mirror for panning a still infrared image across a pyroelectric retina of a vidicon for producing a charge pattern therefrom;

means for generating an electrical signal in accordance with said charge pattern;

means for converting said electrical signal into a visible display on a monitor for providing a visible image therefrom; and

a second optical means comprising another side of said two reflective side flat panning mirror and an eyepiece for panning said visible image into a replica of said infrared image for viewing through said eyepiece by an observer.

4,004,088

SYSTEM FOR THE FORMULATION AND TRANSMISSION OF COORDINATE INFORMATION TO REPRODUCE HANDWRITTEN ITEMS

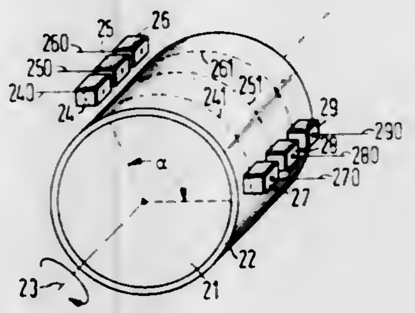
Walter Heywang, Neukeferloh, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 7, 1975, Ser. No. 602,555

Claims priority, application Germany, Aug. 22, 1974, 2440326

Int. Cl.^{2} G08C *21/00*

U.S. Cl. 178—18 **6 Claims**



1. A system for the formulation and transmission of coordinate information to reproduce handwritten items comprising: a writing pad for receiving handwriting and for producing *x-y* coordinate information of the location of the stylus of a pen as it is guided by hand across the pad and for producing information corresponding to the raising and lowering of the stylus from the pad, an output printer for utilizing the *x-y* coordinate information for reproducing the handwriting and which utilizes the raising and lowering information for raising and lowering the printer head and for moving the printer head over the recording material, means for delaying the *x-y* coordinate information for a fixed time interval and for providing said delayed information to said output printer, means for supplying *x-y* coordinate information corresponding to the commencement of a new item of data without delay to said printer at a time corresponding substantially to the instant that the printer is raised from the recording material after executing a given item of handwriting.

4,004,089

PROGRAMMABLE CRYPTIC DEVICE FOR ENCIPHERING AND DECIPHERING DATA

Harold S. Richard, Dayton; Eugene L. Grillmeier, Centerville; Jack R. Gross, Waynesville, and Robert P. Myers, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 28, 1975, Ser. No. 553,955

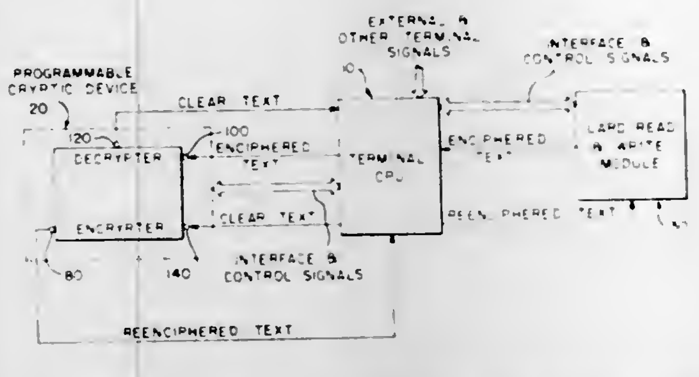
Int. Cl.^{2} H04L *9/00*

U.S. Cl. 178—22 **6 Claims**

1. An encryptor for encoding a string of data bits comprising in combination:

a. register means for generating a pseudo-random bit sequence;

b. non-linear generator means comprising logic means for sequentially receiving portions of the pseudo-random bit sequence and for logically combining bits from the portions of the received pseudo-random bit sequence to provide a plurality of combined bit signals, and parity generator means connected to receive said plurality of combined bit signals for providing said non-linear pseudo-random bit sequence with each bit of said sequence being indicative of the parity of the plurality of combined bit signals;



c. combining means for combining the data bits of said string of data bits with bits of said non-linear pseudo-random bit sequence to provide a partially encoded signal; and

d. shuffle means for receiving said partially encoded signal and for shuffling the bit positions of said partially encoded signal to provide an encoded signal.

4,004,090

BIT SYNCHRONIZATION CIRCUIT

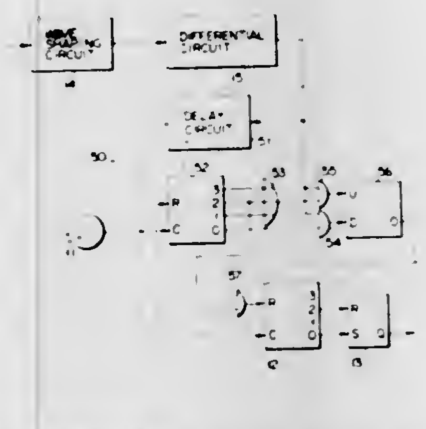
Akio Goto, Hachioji; Shigenori Okamoto, Tama; Shigeru Asakawa, Fujisawa, and Fumio Sugiyama, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,778

Claims priority, application Japan, Jan. 24, 1975, 49-10343

Int. Cl.^{2} H04L *7/00*

U.S. Cl. 178—69.1 **4 Claims**



1. A bit synchronization circuit which comprises a pulse generator for producing a pulse in response to a data signal received; a clock pulse oscillator for generating a clock pulse having a frequency which is an integral multiple of the data speed of said data signal; a synchronization-controlling circuit supplied with outputs from said pulse generator and clock pulse oscillator to produce a signal with a specified phase relative to a pulse delivered from said pulse generator; a first ring counter whose reset terminal is supplied with an output from said synchronization-controlling circuit and which issues a first and a second output signal corresponding to the content 0 and any other content than 0 in response to clock pulses from said clock pulse oscillator; and a flip-flop circuit supplied with the first and second outputs from said first ring counter to produce a pulse synchronous with the data signal received.

4,004,091

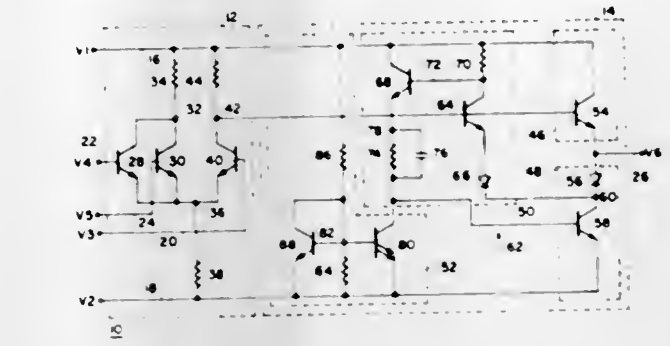
BIDIRECTIONAL LINE DRIVER

Robert Russell Marley, Phoenix; Paul Andrew Nygaard, Mesa, and Walter Christian Seelbach, Scottsdale, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 26, 1975, Ser. No. 590,534

Int. Cl.^{2} H04L *25/20*

U.S. Cl. 178—70 R **6 Claims**



1. A bidirectional line driver circuit comprising:

a. input circuit means, said input circuit means having an output node and said input circuit means responsive to an input logic signal;

b. first output switching means comprising a first transistor having an emitter electrode coupled to the line driver output terminal, a collector electrode coupled to a first power supply conductor, and a base electrode coupled to said output node;

c. second output switching means coupled to a second power supply conductor and coupled to said line driver output terminal;

d. buffered feedback means coupled to said input circuit and coupled to said first output switching means via said output node and coupled to said second output switching means, said buffered feedback means responding to conduction of said first output switching means to effect nonconduction in said second output switching means and responding to nonconduction of said first output switching means to effect conduction in said second output switching means at high speeds in response to a signal transition at said logic input of said input circuit, wherein said buffered feedback means comprises a buffer transistor, said buffer transistor operating in response to the conduction of said first output switching means for providing a conduction replica of said conductive state of said first switching means without loading said line driver output terminal; and

e. constant current source means coupled to said first power supply conductor and to said second power supply conductor and coupled to said buffered feedback means.

4,004,092

COLOR TELEVISION PICTURE TUBES WITH IMPROVED IMPLOSION PROTECTION SYSTEM

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 623,852

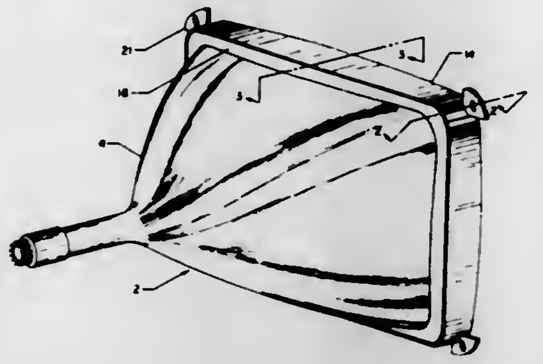
Int. Cl.^{2} H01J *29/87*

U.S. Cl. 358—246 **4 Claims**

1. A color television picture tube having a glass bulb with an approximately rectangular, flangeless, curved faceplate having a convex front surface through which television pictures are viewed, a concave rear surface with a phosphor screen deposited on a portion thereof, and a peripheral edge surface connecting the convex front surface and the concave rear surface of the faceplate, the peripheral edge surfaces being contoured that is, having sides which depart from and return to a plane connecting the four corners of the faceplate, the glass bulb also having a funnel having a convex seal land which mates with the concave inner surface of the faceplate to define a contoured sealing interface, said bulb when impacted on

said faceplate being most susceptable to fracture near the center of the sides thereof, said tube including a low cost edgebond implosion protection system comprising:

- a high tensile strength metal frame which surrounds said edge surface of said faceplate and which overlies a portion of said funnel so that a wedge shaped gap is formed around the bulb between said frame and said portion of said funnel wherein the front-to-back frame depth increases to a maximum at the center of the sides; and



- a cement between said frame and said bulb, said cement and said frame binding up said edge surface of said faceplate, whereby said system providing a maximum overlay of said funnel and a maximum volume of said cement at the center of the sides of said funnel provides greatest implosion protection at portions of said tube where greatest protection is needed.

4,004,093

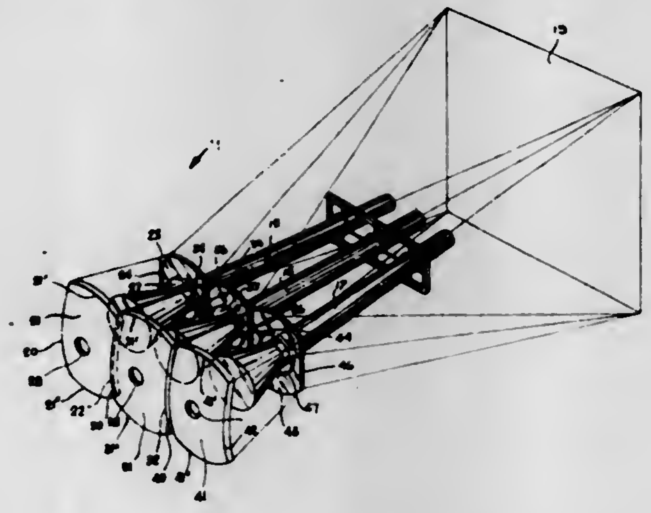
TRUNCATED SCHMIDT OPTICAL SYSTEMS FOR PROJECTING COLOR TELEVISION PICTURES

Bradley H. Oland, Oakland, Calif., assignor to Tinsley Laboratories, Inc., Berkeley, Calif.

Filed Dec. 12, 1975, Ser. No. 640,177

Int. Cl.² H04N *5/74, 9/31*

U.S. Cl. 358—60 **8 Claims**



1. A compact Schmidt optical system for projecting color television pictures from cathode ray tubes onto a screen comprising,

- a plurality of individual Schmidt optical systems adjacently clustered together, each Schmidt optical system comprising, (a) a curved mirror positioned for receiving an image from a respective cathode ray tube and projecting said images toward a screen for common registration with other projected images, and (b) a corrector lens spaced between the curved mirror and the screen, said corrector lens shaped to reduce spherical aberration in said image, each adjacent curved mirror and each adjacent corrector lens having adjacent parallel edges, said edges being chords truncating mirror and lens bodies to permit clustering of adjacent Schmidt optical systems.

4,004,094

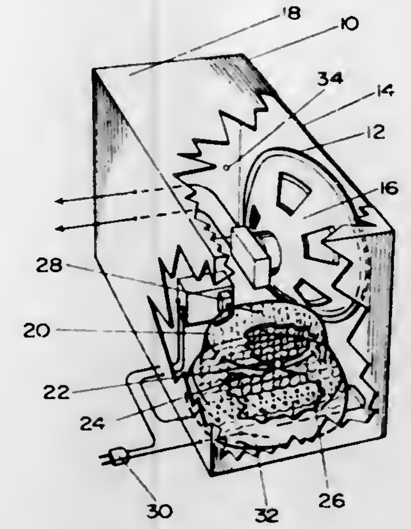
ENCLOSURE SYSTEM FOR SOUND GENERATORS

James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Filed Mar. 16, 1976, Ser. No. 667,351

Int. Cl.² H04R *1/02*

U.S. Cl. 179—1 E **8 Claims**



1. An improved sound production apparatus of the type having a less than perfectly sealed enclosure with an interior space and a port formed in a wall thereof and having a vibratorily driven membrane mounted at said port, wherein the improvement comprises a displaceable-walled container formed within said interior space, said container having an expansible and contractable volume and containing a composition of matter having an equilibrium state between a gas phase and another phase, said composition of matter has an average gas/liquid phase equilibrium at atmospheric pressure and wherein there is further provided a heat transferring means including a sensing means and a control means for maintaining said composition of matter at an equilibrium wherein there is a substantial volume of gas phase which is greater than the maximum volume displacement of said membrane.

4,004,095

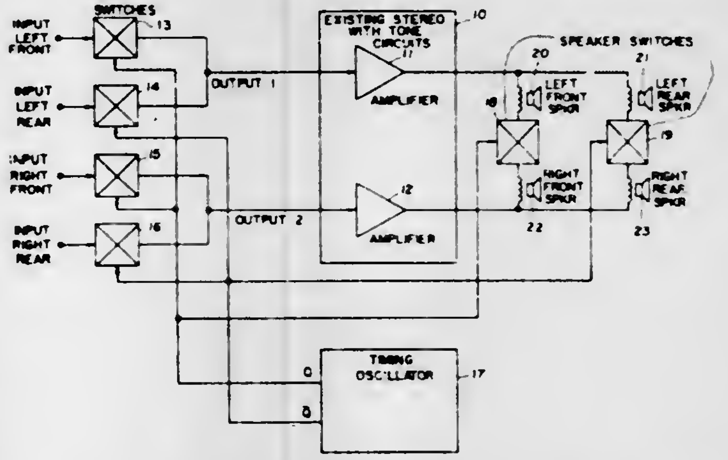
SYSTEM FOR TIME SHARING AN AUDIO AMPLIFIER

Vincent Cardone, 28 Peabody Drive, Stowe, Mass. 01775

Filed Jan. 14, 1975, Ser. No. 540,954

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **10 Claims**



1. A circuit arrangement for time sharing at least one amplifier and at least two speakers, said arrangement having a first and second low level audio signal being supplied thereto, said circuit arrangement comprising means interposed between said first and second low level signals for supplying a first and second gating signal of opposite phase; means responsive to the first gating signal and first low level signal for gating said low level signal; means responsive to the second low level signal and the second gating signal for gating said second low level signal; means for amplifying said gated signals; means responsive to the amplified signal and said first gating signal for gating a first portion of said amplified signal to the high side of one of said speakers; and means responsive to the amplified signal and said second gating signal for gating a second portion of said amplified signal to the high side of the other of said speakers said means for gating the respective amplified signals including means for providing alternately a low impedance between the low side of one of the speakers and ground during one portion of a switching period and a high impedance between the low side of the other of the speakers and ground during the same portion of said switching period.

4,004,096

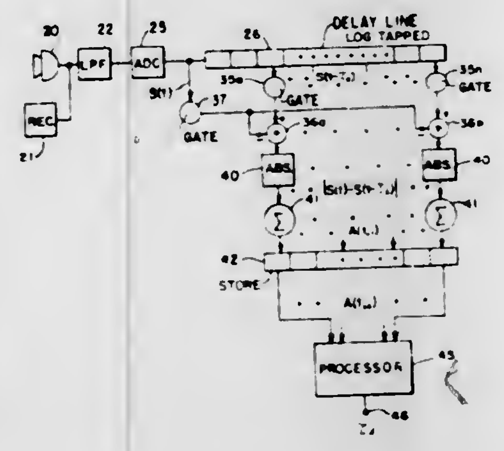
PROCESS FOR EXTRACTING PITCH INFORMATION

William R. Bauer, Glen Burnie, and William A. Blankinship, Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,904

Int. Cl.² Q10L *1/04*

U.S. Cl. 179—1 SC **6 Claims**



1. A process for extracting pitch information from a digitized speech signal comprising the steps of:

- selecting a plurality of values τ_i, each value representative of a frequency within the speech spectrum and logarithmically spaced within said spectrum;
- segmenting the digitized signal into frames of predetermined length;
- generating, for each frame and each value of pitch period τ_i, a score $W_t(i)$ representative of the cost of the cheapest sequence of pitch values ending with τ_i at time t;
- generating for each frame an array $P_t(i)$ representative of the index of the immediately preceeding pitch period in said cheapest sequence, and
- selecting for the current frame that τ_i for which $W_t(i)$ is minimum.

4,004,097

AUTOMATIC METER READING DEVICE

David M Spaulding, Marin County, Calif., assignor to Badger Meter, Inc., Richmond, Calif.

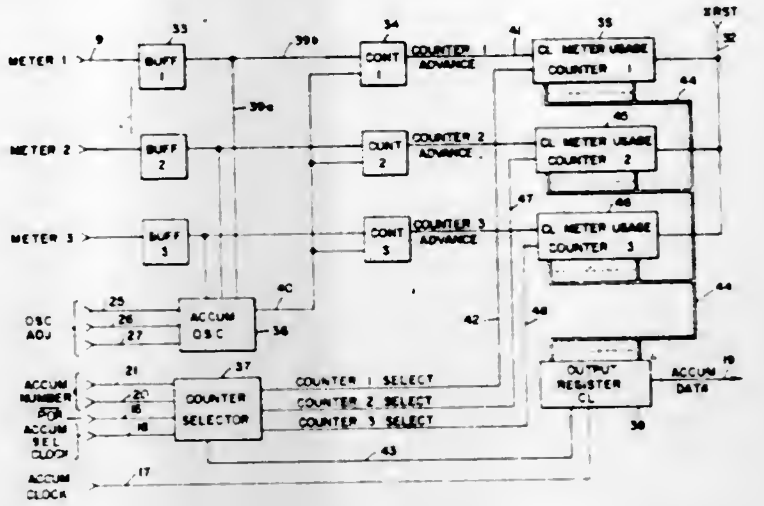
Filed Jan. 3, 1975, Ser. No. 538,355

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 A **18 Claims**

1. An apparatus used for reading a number of meters and for transmitting meter data to a remote receiver, the improvement comprising:

- means for repeating transmission of said data to said receiver, said repeating means being responsive to a condition of said receiver to terminate said transmission, said repeating means comprising a modulo-n counter, n



being an integer corresponding to the number of meters being read.

4,004,098

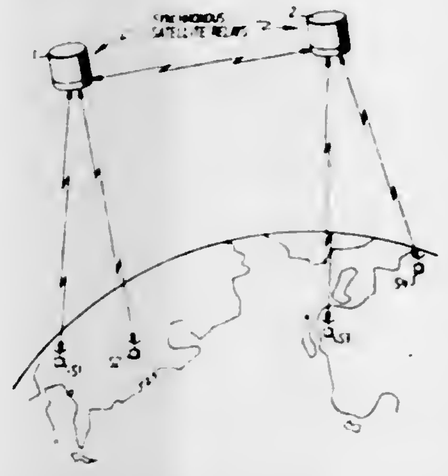
SATELLITE ON-BOARD SWITCHING SYSTEM WITH SATELLITE-TO-SATELLITE LINK

Nobuhiko Shimasaki, Tokyo, Japan, assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Continuation of Ser. No. 422,219, Dec. 6, 1973, abandoned. This application July 10, 1975, Ser. No. 594,881

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **8 Claims**



8. In a space division multiple access communications satellite system employing a first and second satellite each having an on-board switching matrix means under control of a precision oscillator and each satellite having separate spotbeam antennae in view of separate geographic zones and each satellite being communicatively link one to another and to a terrestrial reference station, a method of detecting a state of synchronization between said switching matrices comprising the steps of

- a. transmitting to said first satellite from said reference station a burst of four unique words;
- b. relaying the unique word burst from said first satellite to said second satellite, back to said first satellite and back to said reference station;
- c. detecting at said reference a preselected pair of unique words in the unique word burst;
- d. transmitting control signals to said oscillator upon failure to properly detect said preselected unique word pair; and
- e. adjusting said oscillator in accordance with said control signals.

4,004,099

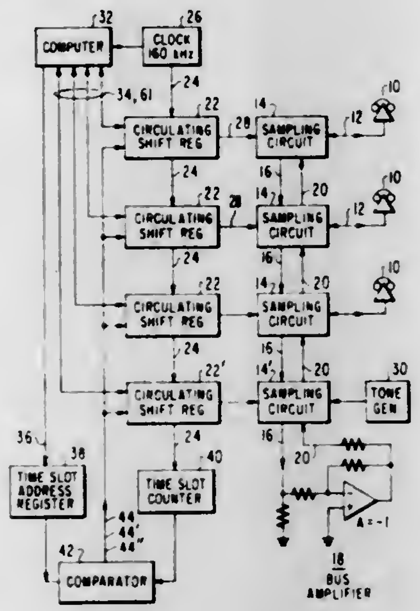
TIME DIVISION MULTIPLEX SWITCHING SYSTEM

Charlie Luther Jones, Jupiter; Gordon Lambert Hopkins, and William Lester Schulte, Jr., both of Lake Park, all of Fla., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,309

Int. Cl.² H04J *3/10*

U.S. Cl. 179—15 AL **1 Claim**



1. A time division multiplex private automatic branch exchange system for n telephones, comprising

a common interconnection input bus and output bus,

a bus amplifier connected from said output bus to said input bus,

n sampling circuits each including a unidirectional signal path loop from said input bus through a first transmission gate and an inverting amplifier to a connection with a respective telephone and on through a second transmission gate to said output bus,

means coupling the input and output of said inverting amplifier to cancel signals in the path to said output bus which arrived on said input bus from a telephone associated with another sampling circuit, whereby to prevent the return of signals from the other telephone back to the other telephone,

an additional path in each sampling circuit including a third transmission gate connected in parallel with the path including said bus amplifier to cancel signals from said respective telephone that would otherwise return through said bus amplifier to said respective telephone,

n simultaneously-clocked recirculating shift registers each having a plurality of stages providing an equal number of signal-sampling time slots, and each having an output coupled to the transmission gates in a respective sampling circuit, and

means to insert 1s in corresponding stages of at least two predetermined ones of said shift registers, said insert means including a flip-flop associated with each of said n shift registers, a computer connected to load 1s in predetermined ones of said flip-flops, gate means to transfer the contents of said flip-flops to input stages of said shift registers, a time slot address register connected to receive from said computer the number of said corresponding stages in the shift registers, a time slot counter operated from the same clocking means which advances the shift registers, and a comparator for comparing the number in the time slot address register with the number of the time slot counter and operative to enable said gate means when a coincidence occurs,

whereby to make a signal-sampling interconnection between the corresponding two telephones through said bus every time the 1s in the two recirculating shift registers simultaneously reach the outputs thereof and enable the respective transmission gates.

4,004,100

GROUP FRAME SYNCHRONIZATION SYSTEM

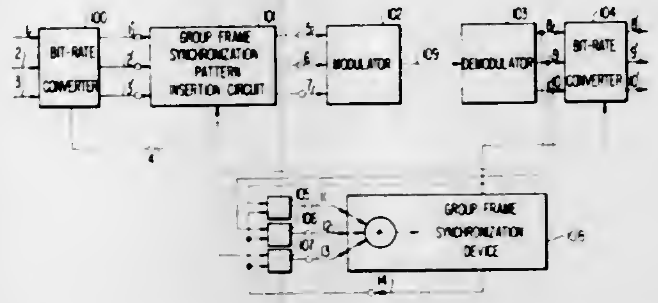
Yukio Takimoto, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1975, Ser. No. 603,903

Claims priority, application Japan, Aug. 14, 1974, 49-93000

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **6 Claims**


100
101
102
103
104
105
106
BIT-RATE CONVERTER
GROUP FRAME SYNCHRONIZATION PATTERN INSERTION CIRCUIT
MODULATOR
DEMODULATOR
BIT-RATE CONVERTER
GROUP FRAME SYNCHRONIZATION DEVICE

1. A group frame synchronization system for establishing the frame synchronization in common to a plurality of time-division multiplexed digital signals of a common bit rate to be transmitted through a common carrier wave, comprising: means at the transmitting end for inserting identical but time-shifted group frame synchronization pseudo-random sequence code patterns respectively into said digital signals, said time-shifting being by an interval equal to an integral multiple of the clock pulse period corresponding to said common bit rate; and at the receiving end, means for extracting said synchronization pseudo-random sequence code patterns from said digital signals derived from the transmitted carrier wave, gate means for obtaining the exclusive -OR function of said synchronization pseudo-random sequence code patterns supplied from said extraction means, and means for establishing the group frame synchronization among said digital signals in response to the output signal of said gate means.

4,004,101

METHOD AND DEVICE FOR DETECTING OCCUPANCY OF TELECOMMUNICATION CHANNELS

Francois René Vaillant, Saint-Germain-en-Laye, France, assignor to Societe Anonyme de Telecommunications, France

Continuation-in-part of Ser. No. 385,244, Aug. 3, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,816

Claims priority, application France, Jan. 12, 1973, 73.01049

Int. Cl.² G10L *1/00*

U.S. Cl. 179—15 AS **11 Claims**

1. A device for detecting occupancy of a telephone communication channel along which pass pulse code modulated telecommunication signals, said device comprising:

means for extracting cyclically, from samples of pulse-coded signals corresponding to discrete amplitudes of the transmitted signals passing along said channel and comprising several bits, the bit which defines the algebraic sign of each sample,

first means for comparing the bit corresponding to the sign of the samples present on the channel with a bit of known sign to determine the sign of the samples,

first means for counting the number n of successive samples bearing the same algebraic sign, whatever the amplitude and whichever the algebraic sign,

first means defining a plurality different ranges $]n_1, n_2[$of successive integral values, said ranges possibly overlapping one another, the values n_1 and n_2 limiting said ranges not being included in the respective ranges,

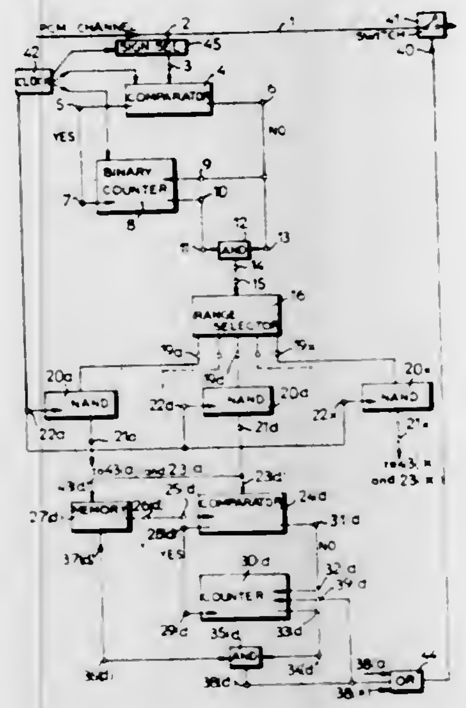
second means defining for each of said ranges an empirical threshold value L which has been determined to represent speech signals,

second means for comparing the number n of successive samples bearing the same algebraic sign with said values n_1, n_2 defining each of said ranges to select at least one range of values comprising said number n,

second means for counting the consecutive times that the different ranges of values comprising the value n are selected,

third means for comparing the number of consecutive times that the different ranges are selected to the threshold values L respectively associated with the selected ranges, and

means for controlling the transmission of signals along said channel according to whether said number of consecutive times a range is selected is at least equal to the respective threshold value L.



4,004,102

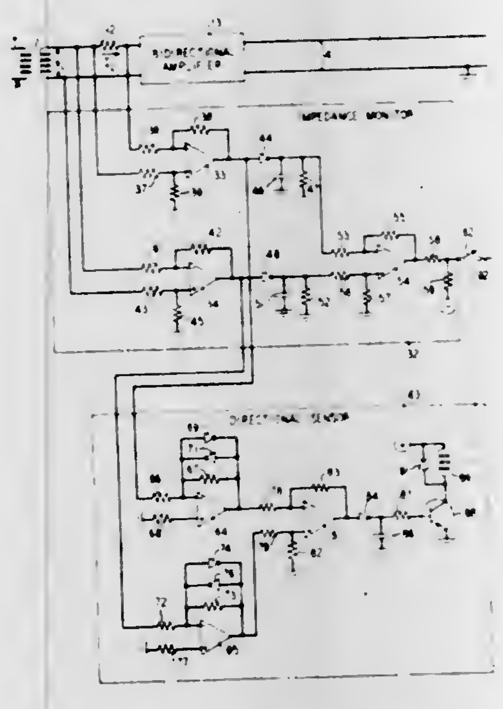
AUTOMATIC IMPEDANCE MODIFICATION OF TRANSMISSION LINES

Henry Walter Ott, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 8, 1975, Ser. No. 602,988

Int. Cl.² H04B *3/40*

U.S. Cl. 179—16 F **7 Claims**



1. In apparatus for modifying the impedance characteristics of a transmission line while transmitting a signal, the combination of,

impedance monitor means in predetermined circuit relationship to said line comprising means for deriving a first signal proportional to the signal current flowing through said line, means for deriving a second signal proportional to the signal voltage across said line, means for changing the amplitude of at least one of said first and second signals to produce a pair of signals that have a substantially equal amplitude when said signal current and voltage are indicative of a prescribed impedance, and means for comparing the amplitude of said pair of signals to each other, said means for comparing including biasing means to produce a control signal at the output of said impedance monitor means having a magnitude indicative of the impedance of said line,

impedance matching means responsive to the magnitude of said control signal comprising variable resistive means for changing the effective resistance of said transmission line as the magnitude of said control signal varies to provide compensation within a first frequency range and variable capacitive means for changing the effective shunting capacitance across said line as the magnitude of said control signal varies to provide compensation within a second frequency range for said line, the second frequency range including a predominance of frequencies higher than the frequencies of the first frequency range and at least one frequency in common with a frequency of the first frequency range, the compensation serving to alter the impedance of said line over the bandwidth of the transmitted signal to correspond substantially to said predetermined impedance magnitude within a frequency range that falls within the frequency spectrum coextensive with said first and second frequency ranges, and

detecting means in circuit relationship with said line for ascertaining the direction of propagation of intelligence signals transmitted by said line, said detecting means including means for completing a conductive path for said control signal for application to said impedance matching means for a predetermined direction of propagation.

4,004,103

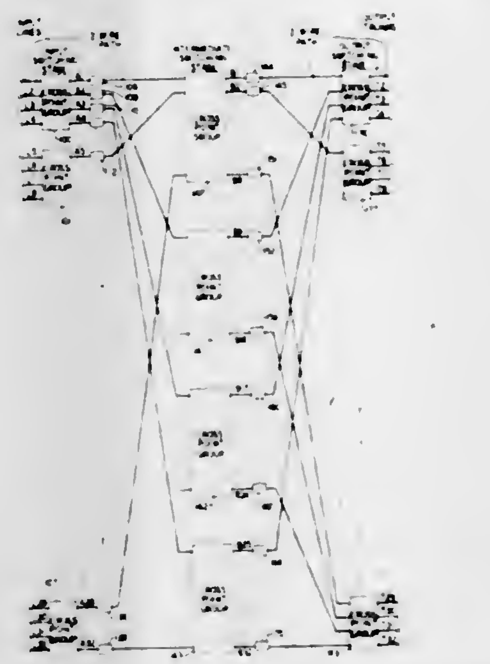
PATH-FINDING SCHEME FOR A MULTISTAGE SWITCHING NETWORK

Chao Kai Liu, Matawan, and Douglas Charles Smith, Locust, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1975, Ser. No. 622,516

Int. Cl.² H04Q *3/42, 3/56*

U.S. Cl. 179—18 EA **10 Claims**



1. A switching network, including an input switching stage, at least one intermediate switching stage and an output switching stage, a plurality of interstage links connected between adjacent switching stages, means for indicating the busy and

idle state of each interstage link and means responsive to the indicating means for identifying idle paths between a particular incoming path terminating on the input stage and a particular outgoing path terminating on the output stage, characterized in that the switching network further includes

- means for forming a pseudorandom pattern of binary bits consisting of a predetermined number of portions,
- means responsive to the identifying means and to a first portion of the pseudorandom pattern for selecting a first idle path identified by the identifying means,
- means responsive to the identifying means and to a second portion of the pseudorandom pattern for rejecting the first idle path identified and for selecting a second idle path identified by the identifying means and
- means responsive to the identifying means and to a third portion of the pseudorandom pattern for rejecting the first and second idle paths identified and for selecting a third idle path identified by the identifying means.

4,004,104

SYSTEM FOR FEEDING IN CONTINUOUS CURRENT TO A TELEPHONE LINE

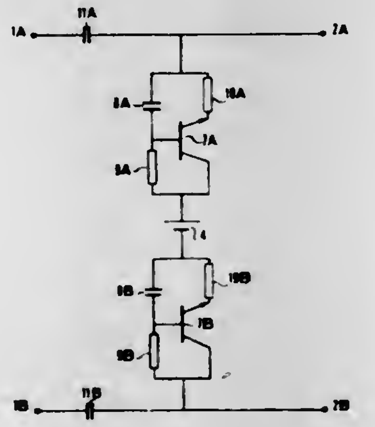
Jean Picandet, Paris, and Francois Boullier, Saint-Ouen, both of France, assignors to Jeumont-Schneider, Puteaux, France

Filed Apr. 29, 1975, Ser. No. 572,724

Claims priority, application France, May 7, 1974, 74.15721

Int. Cl.² H04M *19/08*

U.S. Cl. 179—70 **8 Claims**



1. A d.c. power supply circuit for connection between telephone exchange terminals and telephone subscriber line terminals comprising:

- a. a d.c. source having two poles,
- b. a first transistor circuit for transforming a capacitive reactance and providing an effective inductive reactance therefor, said first transistor circuit being connected to one pole of said d.c. source and to a first juncture of said exchange and subscriber terminals,
- c. a second transistor circuit for transforming a capacitive reactance and providing an effective inductive reactance therefor, said second transistor circuit being connected to the other pole of said d.c. source and a second juncture of said exchange and subscriber terminals, and
- d. capacitor means connected between each of said transistor circuits and said exchange terminals.

4,004,105

MULTIFREQUENCY SIGNAL RECEIVER FOR USE IN TELEPHONE SIGNALING SYSTEMS OR THE LIKE

Shigeyuki Mizukoshi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed May 13, 1975, Ser. No. 576,961

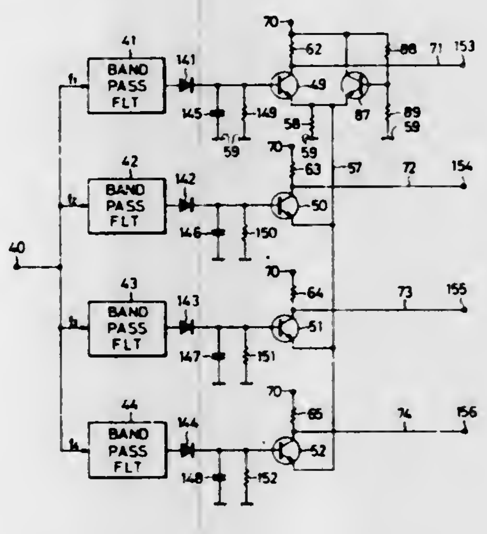
Claims priority, application Japan, May 15, 1974, 49-54057

Int. Cl.² H04M *1/50*

U.S. Cl. 179—84 VF **5 Claims**

1. A multifrequency signal receiver capable of separately detecting a plurality of incoming electrical signals of different frequencies transmitted through a common transmission medium, said receiver comprising input means connected to said transmission medium, a plurality of bandpass filters connected to said input means each permitting the passage therethrough of the incoming signal of a preselected frequency, and a plurality of detectors connected to said plurality of bandpass filters respectively, the improvement comprising:

- a. a plurality of detector control transistors having bases coupled to said bandpass filters and associated with said detectors, respectively, each detector control transistor being operative to produce an output signal in response to the particular incoming signal which is passed through the bandpass filter to which the detector control transistor is connected;
- b. a pair of biasing power lines for biasing said detector transistor;



- c. a plurality of first resistors connected between one of said biasing power lines and the collectors of said detector control transistors, respectively;
- d. a common line connecting emitters of said detector control transistors;
- e. a second resistor connected between said common line and the other of said biasing power lines; and
- f. a plurality of output circuits connected to the collectors of said detector control transistors, respectively, for delivery therethrough of the output signals from said detector control transistors,

  whereby, during operation of any one of said detector control transistors, the other of said detector control transistors are held unresponsive to any incoming signals applied thereto whose voltage is less than the voltage of an incoming signal supplied to said one detector controlled transistor.

4,004,106

LINE CIRCUIT FOR USE WITH A KEY TELEPHONE SYSTEM

Gerald J. Yachabach, Lakeland, and Regis B. Mellon, St. Petersburg, both of Fla., assignors to Akzona Incorporated, Asheville, N.C.

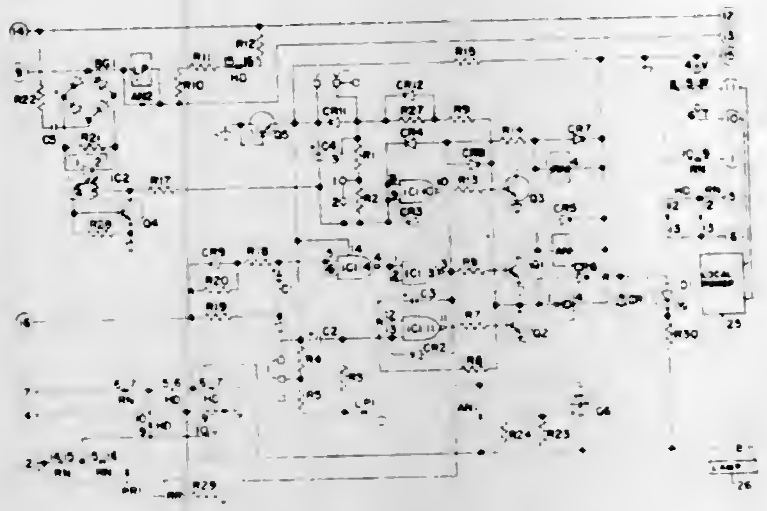
Filed June 25, 1975, Ser. No. 590,004

Int. Cl.² H04M *1/00*

U.S. Cl. 179—99 **18 Claims**

1. A line circuit for use with a key telephone system comprising:

- first and second input terminals adapted to be respectively connected to tip and ring conductors;
- a hold circuit including a hold impedance adapted to be connected across first and second input terminals during the hold condition, said hold circuit including a first switch means for activating said hold circuit;
- a first output terminal adapted to be connected to a indicating means; the indicating means adapted to provide a first signal during said hold condition; timing means including an analogue circuit for initiating the indicating means at a predetermined time after said hold circuit has been activated; the indicating means providing a second signal after said predetermined time.



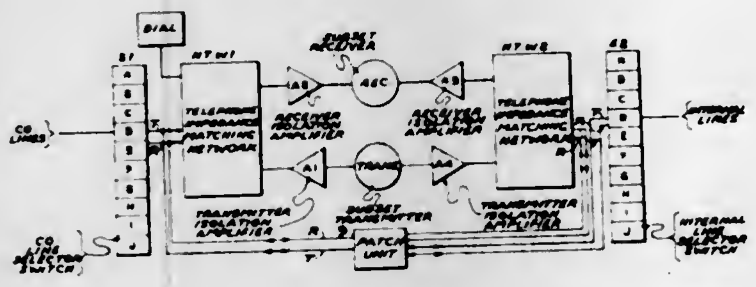
4,004,107

TELEPHONE CIRCUIT TO ELIMINATE USE OF A HOLD BUTTON

Richard E. Herlacher, Camp Hill, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J. Continuation-in-part of Ser. No. 549,240, Feb. 11, 1975, abandoned. This application Oct. 10, 1975, Ser. No. 622,287

Int. Cl.² H04M *1/72, 3/56*

U.S. Cl. 179—99 **19 Claims**



DIAL
NTW1
NTW2
A1
A2
A3
A4
AEC
PATCH UNIT
TELEPHONE IMPEDANCE MATCHING NETWORK
CO LINES
INTERNAL LINES
CO LINE SELECTOR SWITCH
INTERNAL LINE SELECTOR SWITCH
TRANSMITTER ISOLATION AMPLIFIER
RECEIVER ISOLATION AMPLIFIER
SUBSET TRANSMITTER

1. A telephone circuit to eliminate use of a hold button comprising:

- a subset having a receiver and a transmitter for use by one party;
- a plurality of central office lines connected to outside parties;
- a plurality of internal lines connected to internal parties;
- first means to couple said receiver and said transmitter to a selected one of said central office lines to enable a first two-way conversation between said one party and a selected one of said outside parties;
- second means to couple said receiver and said transmitter to a selected one of said internal lines to enable to second two-way conversation between said one party and a selected one of said internal parties; and
- third means coupled between said first means and said second means, said third means having a first state to enable said first and second conversations to be carried on simultaneously and to prevent said selected one of said outside parties and said selected one of said internal parties from hearing each other and a second state to selectively enable said one party, said selected one of said outside parties and said selected one of said internal parties to be placed in a two-way conference.

4,004,108

ARMATURE FOR SOUND PICK-UP CARTRIDGE

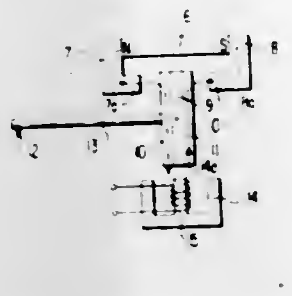
Junichi Kurata, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 11, 1975, Ser. No. 585,893

Claims priority, application Japan, June 11, 1974, 49-65535

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 K **3 Claims**



1. A pick-up cartridge comprising: an armature, pivotably mounted for rotation about an axis passing therethrough, a cantilever fixedly attached to said armature and having a sound needle at an end thereof, said armature composed of two pieces of high magnetic permeability material and a piece of high magnetic resistance material interposed between said two pieces of high magnetic permeable material at right angles to the axis of rotation, each piece of high magnetic permeability material constituting a separate magnetic path, a magnet fixedly positioned in an opposing relation to an end of the armature, and an E-shaped yoke having outer arms on respective sides of a central arm and being fixedly disposed in opposition to another end of the armature, generally centered with respect thereto, and having a detecting coil wound on said central arm, whereby; magnetic flux created by the magnet is first caused to pass through one of said two pieces of the high magnetic permeability material and on its return caused to pass through the other piece of said high magnetic permeability material.

4,004,109

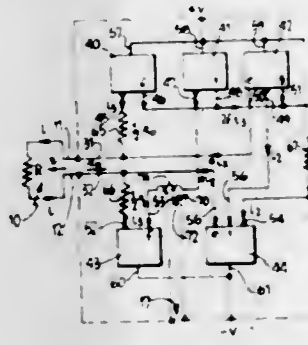
HYBRID CIRCUIT

Frank S. Boxall, 380 Eleanor Drive, Woodside, Calif. 94062

Filed May 9, 1975, Ser. No. 575,927

Int. Cl.² H04B *1/58*

U.S. Cl. 179—170 NC **20 Claims**



1. A direct coupled hybrid circuit for providing signal conversion between a balanced bidirectional transmission path and a pair of unbalanced unidirectional transmission paths, said hybrid circuit comprising:

- loop terminal means adapted to be coupled to said bidirectional transmission path;
- first and second unidirectional terminal means each adapted to be coupled to a different one of said pair of unidirectional transmission paths; and
- a plurality of current mirror circuit means coupled to said loop terminal means and said first and second terminal means said plurality of current mirror circuit means including current mirror circuits for coupling balanced

signals appearing on said loop terminal means to said second unidirectional terminal means and current mirror circuits for coupling incoming signals on said first unidirectional terminal means to said loop terminal means, said plurality of current mirror circuit means interconnected so that they suppress longitudinal mode signals appearing on said loop terminal means, and provide signal balance to suppress transmission of reflected echo signals from said first unidirectional terminal means to said second unidirectional terminal means.

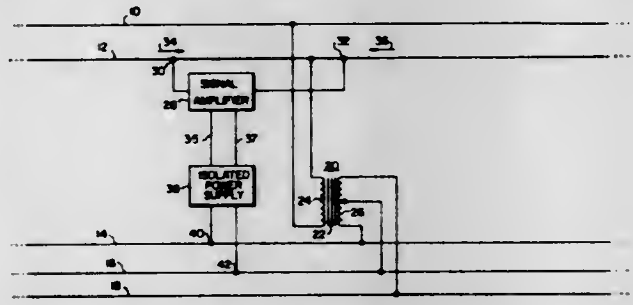
4,004,110
POWER SUPPLY FOR POWER LINE CARRIER COMMUNICATION SYSTEMS

Ian A. Whyte, Churchill Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1975, Ser. No. 620,444

Int. Cl.² H04B *3/44*

U.S. Cl. 179—170 J **6 Claims**



1. A power line communication system for transmitting carrier signals over a distribution power line having high voltage primary and low voltage secondary conductors, said communication system comprising:
- a signal amplifier means detecting and processing said carrier signals transmitted on said primary line conductor wherein said signal amplifier includes a power supply input; and
- a power supply means for said signal amplifier means including:
  - an input means connected to said secondary line conductors,
  - an oscillator circuit means supplied by electric power applied to said input of said power supply means and operating at a frequency substantially higher than the frequency of the applied electric power,
  - an air core transformer having primary and secondary windings inductively coupled together through an air space,
  - first and second tuned circuit means each having a resonant frequency substantially equal to the oscillator frequency, said first tuned circuit means being connected between said oscillator circuit means and said primary winding and said second tuned circuit means being connected to said secondary winding, and
  - an output means including a rectifier means connected between said secondary winding and said power supply input of said signal amplifier means whereby said power supply means is effective to supply said signal amplifier means while being electrically isolated from the high voltage of the associated primary line conductor.

4,004,111
HORN TESTING DEVICE

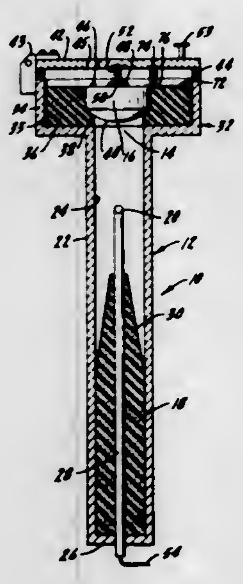
Juris Turlais, Marion, Ind., assignor to United Filtration Corporation, Marion, Ind.

Filed Sept. 18, 1975, Ser. No. 614,497

Int. Cl.² H04R *29/00*

U.S. Cl. 179—175.1 A **2 Claims**

1. A sound-detecting fixture for testing electric horns, comprising an elongated progressive wave tube, one end being adapted to receive sound from a horn being tested, means for seating a horn adjacent said one end of the progressive wave tube so that sound emitted from the horn is directed into the tube, a mass of sound-absorptive material within the progressive wave tube, spaced from said one end and substantially filling a partial length of the tube, sound-detecting means interposed within the progressive wave tube between said one end and the mass of sound-absorptive material, the mass of sound-absorptive material having an upper surface facing said one end of the tube, said upper surface being generally conical, the other end of the progressive wave tube being closed and the mass of sound-absorptive material engaging said other end and filling a substantial portion of the tube, the sound-detecting means comprising a microphone, said microphone being mounted in a generally fixed position within the progressive wave tube, the progressive wave tube comprising a generally cylindrical, elongated pipe having a hard reflective inner surface, said means for seating a horn comprising a generally bowl-shaped horn mounting overlying said one end of the progressive wave tube, said mounting being of greater diameter than the progressive wave tube and containing an annular body of sound-absorptive material for surrounding a horn and an inner annular shoulder of such material for supporting a horn to be tested, the horn mounting including a removable and generally transparent cover for closing and sealing the mounting, said mounting having an aperture therethrough through which horn adjustment may be made during testing, and an annular electromagnetic noise interference shield disposed between the horn mounting and annular body of sound-absorptive material for reducing electromagnetic interference during the testing of D.C. horns.



4,004,112
QUICKLY ATTACHABLE NOTE PAD SUPPORT ACCESSORY FOR DESK TELEPHONES

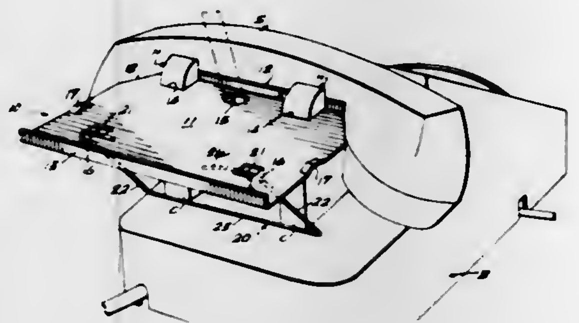
Irving Einstein, Miami Beach, Fla., assignor to Ruth Astor, Boulder, Colo. and Estelle Goldberg, Silver Springs, Md.

Filed Feb. 11, 1976, Ser. No. 657,213

Int. Cl.² H04M *1/21*

U.S. Cl. 179—178 **8 Claims**

1. A desk telephone accessory comprising a flat platform sized to extend along the rear of a desk telephone base and have a front edge portion resting on the hand set cradle and to extend horizontally rearwardly to support a note pad thereon, said front edge portion being formed with a pair of spaced cutout openings for engaging the horns of the rear pair of cradle posts of said base, a pair of spaced ears extending from a bottom side and adjacent a rear edge of said platform, a wire bail-like brace pivotally attached at opposite ends thereof to said ears and extending forwardly and downwardly to engage said telephone base, said brace and horn engagement in the cutout openings supporting said platform in said horizontal position for writing on said note pad positioned on the platform.



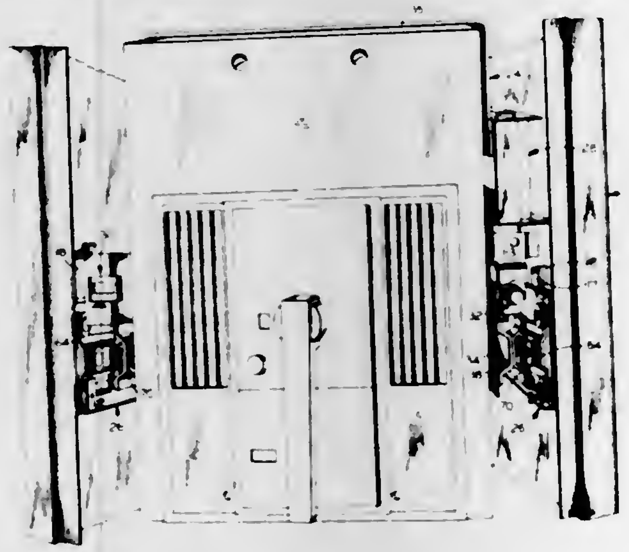
4,004,113
DRAWOUT APPARATUS FOR ELECTRICAL SWITCHBOARDS

Eric Axel Ericson, Plainville, and Frederick Daniel Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,618

Int. Cl.² H01H *9/20*

U.S. Cl. 200—50 AA **21 Claims**



1. Drawout apparatus for racking an electrical device into and out of a compartment in an electrical enclosure, wherein the electrical device and the enclosure are equipped with mating primary and secondary disconnect contacts, said drawout apparatus comprising, in combination:
- A. a carriage mounting the electrical device, said carriage having opposed pairs of laterally extending mounting pins;
- B. opposed rail assemblies mounted by the enclosure and supporting said carriage for movement of the device between an extended position where the primary and secondary contacts are disengaged and an engaged position where the primary and secondary contacts are engaged, each said rail assemblies including
  1. an intermediate rail rollingly mounted to each compartment sidewall, and
  2. an inner rail rollingly mounted to each intermediate rail, whereby said rails of each assembly move telescopically relative to each other,
  3. said inner rails including upwardly opening notches receiving said carriage mounting pins;
- C. locking means carried by each said intermediate rail and operable to open said notches for receipt of said carriage mounting pins when said intermediate and inner rails are fully extended and to securely lock at least one mounting pin of each pair in its respective notch during initial compacting movements of said rails;
- D. means defining a test position for the device intermediate said extending and engaged positions where the primary contacts are disengaged and the secondary contacts are engaged, said carriage being manually movable on said rail assemblies between said extended and test positions;
- E. means defining a disengaged position for the device intermediate said extended and test positions where the primary and secondary contacts are also disengaged; and
- F. a racking mechanism mechanically assisting movement of said carriage between said test and engaged positions.

4,004,114
HORN SWITCH FOR MOTOR VEHICLES STEERING WHEELS

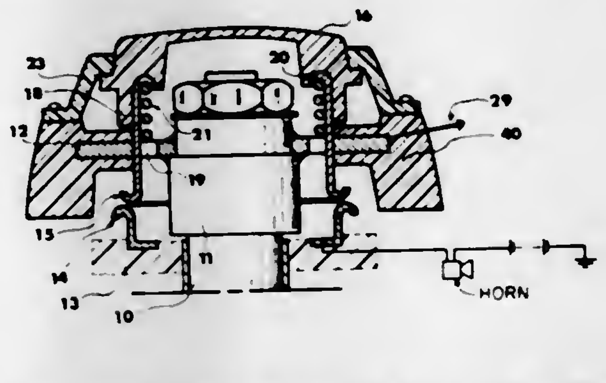
Franco Sportoletti Baduel, 20 Lungo Dora Bricca, Pianezza Torinese, Turin, Italy

Filed Apr. 24, 1975, Ser. No. 571,387

Claims priority, application Italy, May 9, 1974, 68455/74

Int. Cl.² H01H *9/00*

U.S. Cl. 200—61.56 **10 Claims**



1. A horn switch for a motor vehicle steering wheel for controlling a horn-operating circuit of the vehicle, said steering wheel having a frame including a hub and a rim rigidly interconnected by spokes, said frame having an upper side facing a driver of the vehicle and an underside, said horn switch comprising:
- a horn-operating element;
- means mounting said horn-operating element on the upper side of the steering wheel frame for rotation therewith and depression relative thereto;
- means for upwardly biasing said horn-operating element;
- a pair of opposed normally separated electrical contacts located on the underside of the steering wheel frame, one of said contacts being fixed and the other of said contacts being movable in rotation with the steering wheel frame and axially with said horn-operating element; and
- connecting leg means extending from the upper side to the lower side of the steering wheel frame to connect said horn-operating element and said other movable contact;
- said other movable contact being of annular form centered on the axis of the steering wheel such that depression of said horn-operating element causes said other movable contact to cooperate with said fixed contact to close the horn-operating circuit in any position of rotation of the steering wheel frame.

4,004,115
BUCKLES FOR VEHICLE SAFETY BELTS AND HARNESSES

Mark Edward Esner, London, England, assignor to Howard Wall Limited, London, England

Filed Sept. 19, 1975, Ser. No. 614,921

Claims priority, application United Kingdom, Nov. 13, 1974, 49043/74

Int. Cl.² H01H *3/16*; A44B *11/26*

U.S. Cl. 200—61.58 B **11 Claims**

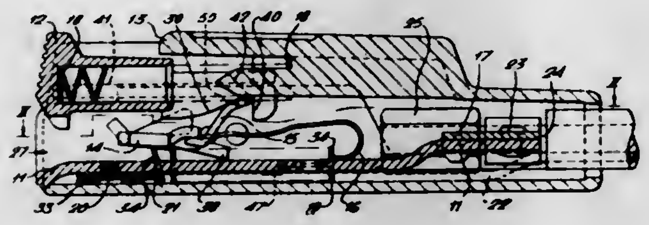
11. A buckle for use with a safety belt or harness on a vehicle comprising:
- a casing having an entrance slot and a latching mechanism and connected to the vehicle;

a plate connected to a safety belt and being adapted to be locked to said casing by said latching mechanism;

switching means mounted in said casing for activating auxiliary equipment on the vehicle, said switching means being controlled by said plate;

latch releasing means on said casing for unlocking said plate from said casing; and

ejecting means in said casing for ejecting an unlocked plate from said casing, said ejecting means including a spring mounted on said casing to be engaged by said plate when said plate is located in said casing, said spring being located closely adjacent said entrance slot so that an outward bias tending to eject said plate from said casing is applied to said plate almost as soon as said plate is inserted through said entrance slot such that an ejecting bias is applied to said plate for essentially the entire time said plate is located in said casing thereby ensuring that said plate will be completely ejected from said casing upon release of said latch to unlock said plate from said casing.



4,004,116

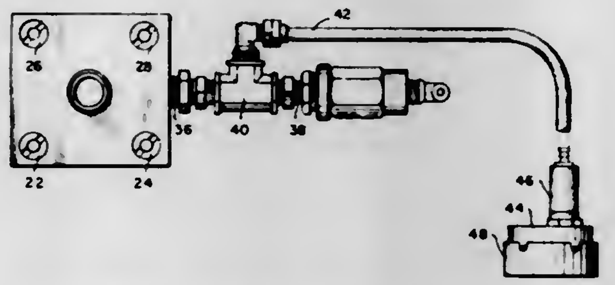
PNEUMATIC CYLINDER FOR CONTROLLING ELECTRICAL SWITCH OPERATION

Fernando Chiodini, Brooklyn, N.Y., assignor to Fenco Corporation, Newark, N.J.

Filed Apr. 9, 1975, Ser. No. 566,437

Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 R **7 Claims**



1. A pneumatic switch control comprising a pneumatic cylinder including a hollow cylinder body having a piston slidably disposed therein and a piston rod extending from said piston to the outside of said cylinder body, first drive means for moving said piston in an operative stroke from one end portion of said cylinder body to the opposite end portion thereof, second drive means for moving said piston in a return stroke from said opposite end portion of the cylinder body to said one end portion thereof, said second drive means comprising an air inlet line communicating with said one end portion of said cylinder body for supplying air under pressure into said one end portion, said switch control also comprising a by-pass air line communicating with said air inlet line, and pressure actuated switch means connected to said by-pass air line, movement of said piston in said operative stroke by said first drive means creating back pressure in said opposite end of said cylinder body with said back pressure being applied through said air inlet line and said by-pass air line to said switch means for deactuating the latter, said pressure actuated switch means also being deactuated by pressure received from air introduced through said air inlet line to move said piston in its return stroke, movement of said piston in said operative stroke by said first drive means creating back pressure in said opposite end of said cylinder body with said back pressure being applied through said air inlet line and said by-pass air line to said switch means for maintaining the latter in deactuated condition, said back pressure acting on said pressure actuated switch means ceasing when said piston reaches the end of its operative stroke and said back pressure dissipates through said air inlet line, thus actuating said pressure actuated switch, whereby said switch is actuated in response to the arrival of said piston at the end of its operative stroke.

4,004,117

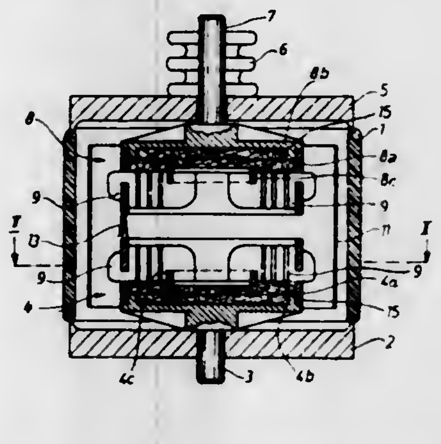
ARCING ELECTRODE, MORE PARTICULARLY FOR VACUUM SWITCHES

Joachim Amsler, Seon, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Sept. 18, 1974, Ser. No. 507,253

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **3 Claims**



1. A contact assembly for a vacuum switch comprising two electrodes facing each other for taking up arc roots, each of said electrodes including a contact stud having a contact surface and a plurality of plates having narrow surfaces facing the opposite electrode, the plates being separated by gaps whose width is equal to at least the thickness of the plate, and further electrode plates intersecting the first said electrode plates at an angle to form a honeycomb structure at least in proximity to the contact surfaces of the nearest contact stud.

4,004,118

METAL CLAD MONOPHASE SWITCHGEAR PANELS FOR HIGH VOLTAGES AND POLYPHASE SWITCHING PLANTS CONSISTING OF SUCH SWITCHGEAR PANELS

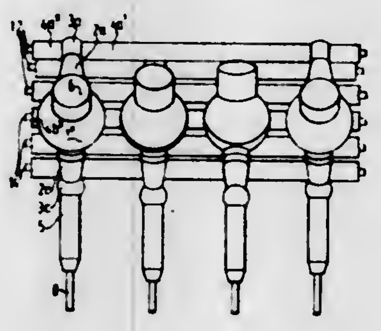
Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, both of Netherlands, assignors to COQ B.V., Utrecht, Netherlands

Filed Mar. 18, 1975, Ser. No. 559,485

Claims priority, application Netherlands, Feb. 13, 1975, 7501717

Int. Cl.² H01H *33/82*

U.S. Cl. 200—148 B **10 Claims**



1. A metal clad polyphase electric distribution and switching plant comprising a plurality of polyphase assemblies which each consist of a number of monophase switch units, and at least one metal clad polyphase busbar system for the phase-wise interconnection of the switch units of said assembly, each switch unit comprising a closed metal casing including a spherical section and at least two tubular sections attached to and extending radially with respect to said spherical section, a circuit-breaker accommodated in said spherical section, an isolator contained in each of said tubular sections of the casing, and a box for the accommodation of means to drive and to control said circuit-breaker and said isolators, said box being also attached to said spherical section, each isolator being connected to a terminal of the circuit-breaker and at least one of said isolators being connected between said circuit-breaker and a conductor of the busbar system.

4,004,119

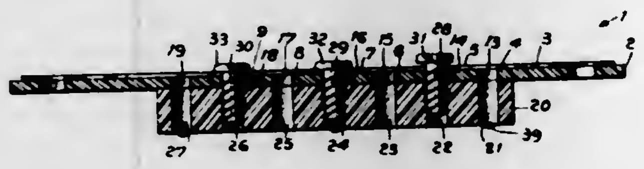
ELECTRICAL SWITCH ASSEMBLY FOR A PRINTED CIRCUIT BOARD

Marc Rene Latour, Garner, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 20, 1975, Ser. No. 606,278

Int. Cl.² H01H *19/28*

U.S. Cl. 200—158 **9 Claims**



1. An electrical switch assembly for a printed circuit board comprising:

a printed circuit board including

a dielectric substrate, and

a predetermined pattern of a plurality of conductors disposed on one surface of said substrate, a given number of said plurality of conductors each having a gap therein;

a dielectric switch block disposed adjacent to a selected surface of said substrate; and

a plurality of completely metallic screws each disposed adjacent a different one of said gaps and extending into said block, each of said plurality of screws having a head thereon that makes and breaks a connection across an associated one of said gaps when each of said plurality of screws is screwed in and out of said block.

4,004,120

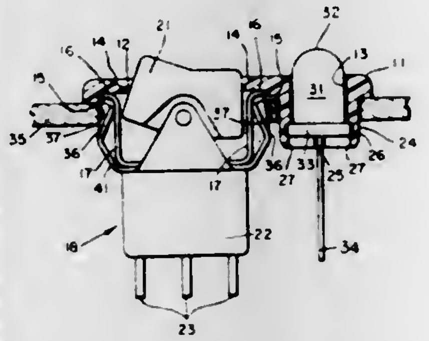
SWITCH BEZEL WITH VISUAL INDICATOR

Ivan A. Lee, E. Weymouth, Mass., assignor to C & K Components, Inc., Watertown, Mass.

Filed July 17, 1975, Ser. No. 596,598

Int. Cl.² H01H *9/00*

U.S. Cl. 200—310 **5 Claims**



1. A switch assembly adapted to be mounted to a panel, said switch assembly comprising:

a generally rectangular bezel having a top surface, a bottom surface, at least one switch opening and at least one indicator hole therethrough spaced from said switch opening, said bezel including a pair of lateral undercut slots adjacent said bottom surface on opposite sides of said switch opening and a plurality of flexible fingers arcuate in transverse shape and projecting downwardly from said bezel, surrounding and rearwardly extending said indicator hole thereby forming a receptacle, said fingers having arcuate depressions on their inner surfaces separated from the distal ends thereof by inwardly beveled surfaces;

a switch having opposed outwardly projecting bracket members engaging said lateral slots whereby said switch is removably mounted to said bezel, said switch having an actuator element projecting upwardly through said switch opening; and

a generally cylindrical visual indicator device having a radially projecting annular flange formed at the bottom end thereof, said indicator device being mounted in said indicator hole with said flange seated within said arcuate depressions in said fingers, the top of said indicator projecting upwardly through said indicator hole;

said switch assembly being adapted to be mounted to said panel, said panel having openings therein configured to align with said switch opening and said indicator hole through said bezel, whereby said bezel is positioned on the front of said panel, said switch and said visual indicator project rearwardly through respective said openings in said panel.

4,004,121

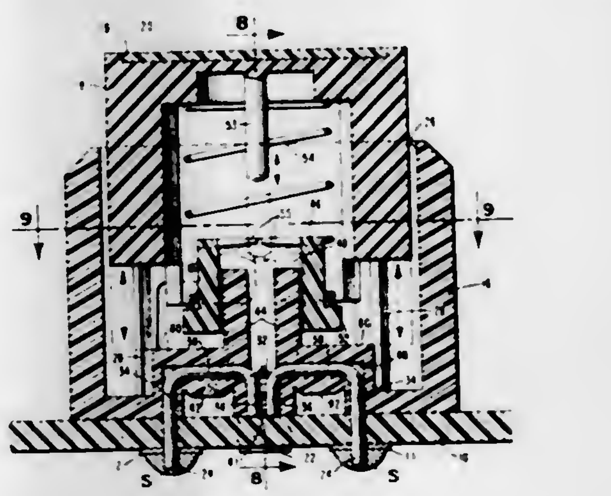
ELECTRICAL SWITCH WITH WIRE BEAM SPRING CONTACT CLOSER

Robert H. Twyford, Great Falls, Va., assignor to Mechanical Enterprises, Inc., Springfield, Va.

Filed Apr. 4, 1974, Ser. No. 458,042

Int. Cl.² H01H *13/70*

U.S. Cl. 200—275 **9 Claims**



1. A switch comprising:

a housing having a cavity therein opening upwardly from said housing;

a pair of switch contacts supported against movement by said housing and extending inwardly of said cavity;

an elongated wire beam spring in said cavity supported adjacent its ends by said housing with a center portion free to be flexed, said center portion passing above said contacts and having a normal position spaced from said contacts whereat the electric circuit between said contacts is open;

an actuator mounted in said cavity to flex said center portion of said wire beam spring from said normal position to engage said contacts upon depression of said actuator, said actuator including a plunger reciprocably mounted in the open end of said cavity with an actuator spring beneath said plunger to be compressed by said plunger and flex said center portion of said beam spring;

a spring rider interposed between said wire beam spring and said actuator spring, said rider having spaced legs engaging said wire beam spring at points along the beam spring to flex said beam spring into circuit closing engagement with said contacts;

said plunger carrying column means extending toward said spring rider and spring finger means being provided on said spring rider, said column means engaging said spring finger means at a predetermined point in travel of said plunger to apply force through said finger means to said spring rider in effecting switch actuation.

4,004,122

MULTI-ZONE MICROWAVE HEATING APPARATUS

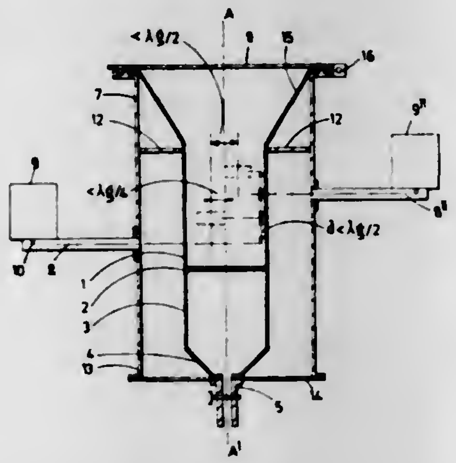
Bernard L. D. Hallier, St. Maur, La Varenne, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,097

Claims priority, application France, Nov. 6, 1973, 73.39317; Dec. 7, 1973, 73.43703

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 A **10 Claims**



1. An apparatus for processing materials by means of electromagnetic radiation comprising:

means for generating electromagnetic radiation;

a container for holding the material to be processed;

an external metal casing for housing said container having a removable cover, sides and a bottom, said bottom having a passage therethrough for providing removal of said material from the apparatus; and

an internal metal rim extending from the interior surface of the sides of said casing for at least partially limiting electromagnetic radiation to said container for the portion thereof between the top of said rim and the underside of said cover; and

a plurality of openings through said casing below said rim;

means for generating electromagnetic radiation comprising:

a plurality of microwave generators having waveguides associated therewith communicating to the interior of said container below said rim through said openings;

said container having a porous partition located therein to define a first zone thereabove within said container for processing said materials in a solid form and a second zone therebelow for processing materials in a liquid form; and

said container having a loading passage portion above said rim at least partially protected from said electromagnetic radiation, a solid form processing portion between said rim and said porous partition, a liquid processing portion located intermediate said partition and the bottom of said container and a removing passage portion communicating with the passage through the bottom of said casing.

4,004,123

METHOD OF AND SYSTEM FOR THE CONTROLLING OF AN APPARATUS FOR THE ELECTRIC DISCHARGE MACHINING OF A WORKPIECE

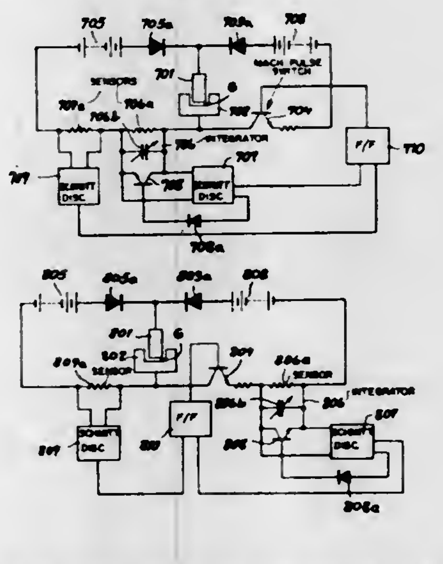
Kiyoshi Inoue, 3-16-8 Kamiyoga, Setagaya, Tokyo, Japan

Division of Ser. No. 408,382, Oct. 23, 1973, Pat. No. 3,864,541, which is a continuation-in-part of Ser. No. 272,463, July 17, 1972, Pat. No. 3,781,507, which is a division of Ser. No. 19,364, March 13, 1970, Pat. No. 3,686,461. This application Aug. 1, 1974, Ser. No. 493,772

Claims priority, application Japan, Feb. 20, 1973, 48-20341; Feb. 21, 1973, 48-21015; Mar. 3, 1973, 48-25832; May 17, 1973, 48-55019; July 26, 1973, 48-83586; July 12, 1973, 48-102208

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **8 Claims**



1. A method of controlling the machining of a workpiece by the application of machining pulses across a dielectric-swept gap between said workpiece and an electrode spacedly juxtaposed therewith, the method comprising the steps of:

switching a machining current power supply on and off in circuit with said gap to apply machining discharges thereacross;

integrating a signal representing the gap current passing through said gap after initiation of a discharge thereacross to produce a control signal; and

effecting the switching of said power supply upon the magnitude of said signal attaining predetermined value, said control signal being produced by converting a signal representing the gap current into a train of digital pulses and integrating said train of digital pulses.

4,004,124

METHOD OF FORMING A SEAM IN A BODY OUTER PANEL OF A VEHICLE

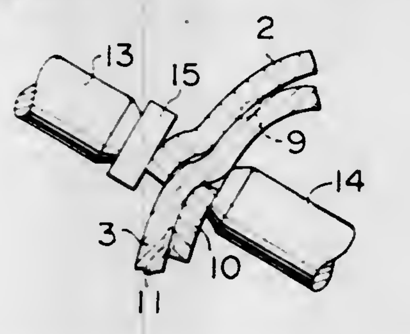
Yoneji Nakane; Toshikazu Nakamura, and Hiromichi Magota, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 13, 1975, Ser. No. 604,208

Claims priority, application Japan, Apr. 11, 1975, 50-44062

Int. Cl.² B62D *27/00*

U.S. Cl. 296—28 R **13 Claims**



1. A method of forming a seam in a body outer panel of a vehicle like an automobile, comprising the steps of displacing end portions of first and second panel plates toward the outside and inside of the panel, respectively, each of said panel plates being displaced by an amount substantially equal in thickness of a panel plate adjacent a seam to be formed, laying one of said panel plates over the other in a manner such that the outside surface of a basic portion of said first panel plate contacts the displaced end portion of said second panel plate and the inside surface of a basic portion of said second panel plate contacts the displaced end portion of said first panel plate, applying a plate piece to an inside surface portion of said first panel plate located adjacent its displaced end portion, said plate piece having substantially the same thickness as said first panel plate, connecting the overlapped portions of said two panel plates together by spot-welding under the compression and substantially removing the displaced end portion of said second panel plate.

4,004,125

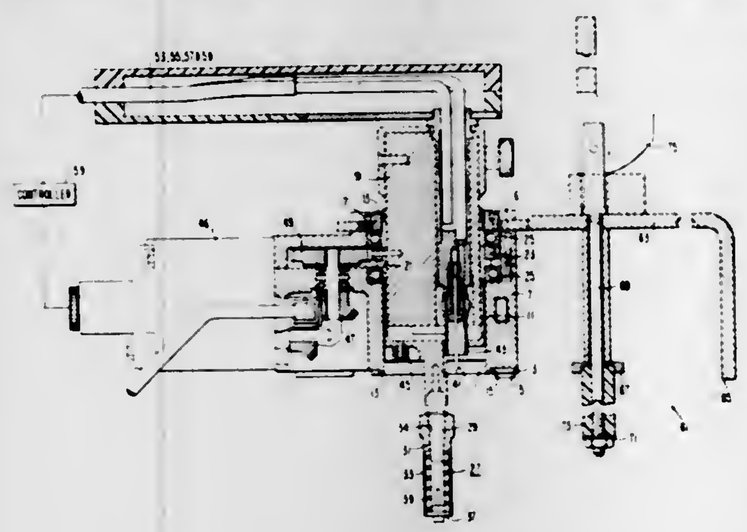
MULTIHEAD WELDING GUN

Ben B. Hood, Valrico, and Raymond H. Glatthorn, St. Petersburg, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1975, Ser. No. 604,750

Int. Cl.² B23V *9/12*

U.S. Cl. 219—125 R **10 Claims**



1. A multihead welding gun for welding tubes to a tube sheet, said multihead welding gun comprising a plurality of non-consumable electrodes, means for blanketing the area around said electrodes with a suitable gas, a plurality of housings, a plurality of rotor members, each rotor member having one of said electrodes eccentrically disposed therein, each of said rotor members being rotatably mounted and having means disposed thereon for axially aligning said rotor members with a tube, means for rotating said rotor members whereby said electrodes generally circumscribe the adjacent tube-tube sheet junctures, at least one of said housings being movable so that the axis of rotation of the associated rotor member is movable, a faceplate cooperatively associated with said housings and a backup plate generally parallel to said faceplate, means insertable in a tube which cooperates with said plates to position each electrode adjacent a tube-tube sheet juncture and lock said movable housings in a fixed position whereby the axis of rotation of the rotor members are essentially in axial alignment with the associated tube.

4,004,126

WINDSHIELD HEATING DEVICE

Premakaran T. Boaz, Southgate, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 15, 1975, Ser. No. 641,005

Int. Cl.² H05B *1/00;* E06B *7/12;* B60S *1/54*

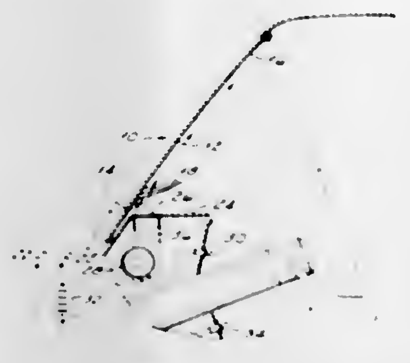
U.S. Cl. 219—203 **2 Claims**

1. A windshield heating device for a motor vehicle which comprises:

a windshield having an upper portion normally within the driver's field of vision and a lower portion normally not within the driver's field of vision;

a plurality of grid lines deposited on only said lower portion of said windshield; said lines being bonded to said windshield and being formed of a material capable of heating up when an electric current is passed therethrough;

an instrument panel in the motor vehicle adjacent said lower portion of said windshield, said instrument panel having an opening therein in juxtaposition with said grid lines on said windshield;



a blower motor including a blower device mounted in the motor vehicle;

duct means passing at least in part through said instrument panel for providing a passageway interconnecting said blower device of said blower motor with said opening of said instrument panel so that air moving through said duct means passes out through said opening of said instrument panel and over said plurality of grid lines; and

electric circuit means for supplying power to said plurality of grid lines and said blower motor.

4,004,127

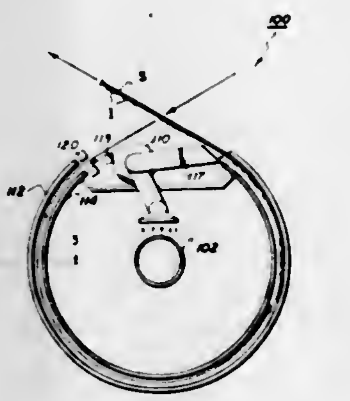
ON LINE FUSING SYSTEM

John M. Bailey, Fairport, and Raghulinga R. Thettu, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1976, Ser. No. 663,025

Int. Cl.² H05B *1/00;* G03G *15/20*

U.S. Cl. 219—216 **6 Claims**



1. An on line fusing system for fusing toner images onto sheets produced by a copier/duplicator machine comprising:

a pair of closely spaced plate members defining a sheet path along which sheets bearing loose toner images are advanced,

at least one of said plate members being made of material which is transparent to radiation,

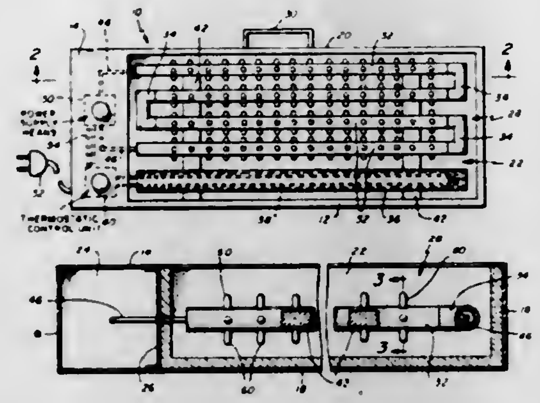
a flash lamp positioned to direct radiation towards said transparent plate member and sheet path at a predetermined time, and

blower means for directing warm air under pressure at the

inlet end of said plate members to transport the sheets along their path and crust the loose toner images on said sheets prior to said images receiving radiation from said flash lamps.

4,004,128
PORTABLE ELECTRIC RADIANT HEATER

Carlo Marchesi, 31 Winter St., Saugus, Mass. 01906
Filed Apr. 18, 1975, Ser. No. 569,485
Int. Cl.² H05B *1/02, 3/44*; **F24H** *9/18*; **F28F** *1/20*
U.S. Cl. 219—346 **11 Claims**

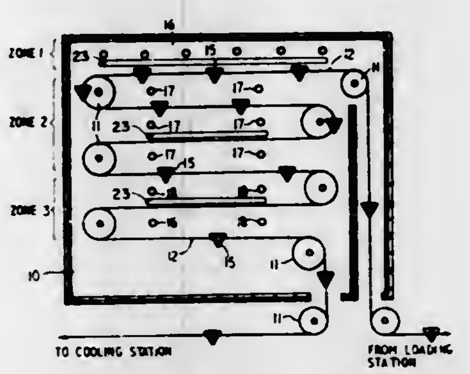


1. A heater comprising;
- a housing having means defining a heating area in the housing and a control area in the housing, said heating area of the housing having an open front,
- a hollow pipe system disposed in the heating area of the housing and arranged to radiate heat through said open front, said pipe system comprising a plurality of pipe segments each constructed of a fired clay material that rapidly absorbs heat and radiates the heat over a long time period and a plurality of protruberances radially extending from each pipe segment, means coupling said hollow pipe segments together to form a continuous internal passage,
- an electrical resistance heating conductor means extending through the continuous passage in the pipe system in spaced relation to the inner surface thereof and with the ends of the conductor means extending into the control area of the housing,
- said conductor means being disposed in each pipe segments with essentially only an air space between the inner surface of the pipe segments and conductor means,
- and an electric power supply means disposed in the control area and coupled to the ends of the conductor means, said power supply means being selectively operated to energize the conductor means to thereby heat said hollow pipe system for radiating heat through said open front.

4,004,129
FOOD PROCESSING OVEN

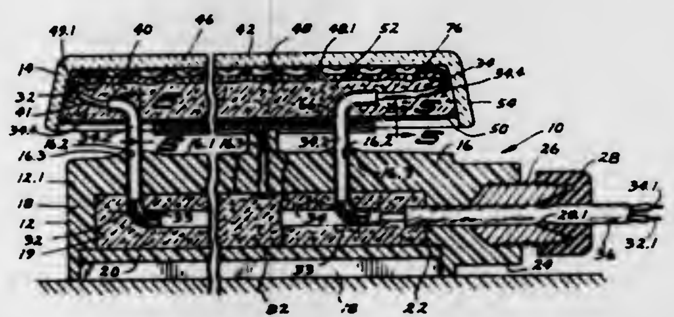
Kevin Joseph Hicks, Marrickville, Australia, assignor to Auto-Bake Pty. Limited, Marrickville, Australia
Filed Aug. 19, 1975, Ser. No. 605,958
Claims priority, application Australia, Dec. 27, 1974, 8666/74
Int. Cl.² F27B *9/06*
U.S. Cl. 219—388 **8 Claims**

1. A baffleless commercial biscuit baking oven comprising a casing, thermal insulation on said casing, two bottom openings to said casing, an endless spaced apart link-chain type conveyor passing through said openings and having a baking first section inside said casing and a loading and unloading section outside said casing, closely spaced baking trays on said conveyor, horizontally extending runs of said conveyor in said first section, electrical radiant heating elements disposed in three vertically spaced zones in said casing, first controls outside said casing determining the setting of the heating elements in the first zone, second controls outside said casing determining the setting of the heating elements in the second zone, third controls outside the casing determining the setting of the heating elements in the third zone, temperature stabilizing means including a temperature sensor inside the second zone and a switch controlling the current supply to the heater elements of the second zone in response to said temperature sensor, and means for maintaining the trays horizontal during their passage through the oven; whereby, when the oven is in use, each tray is transported downwards through the oven and a different stage of baking is performed in each of the three zones, the first zone determining the size and top color of the finished biscuit, the second zone determining the interior texture of the finished biscuit, and the third zone determines the color of the underside of the biscuit.



4,004,130
HOT PLATES

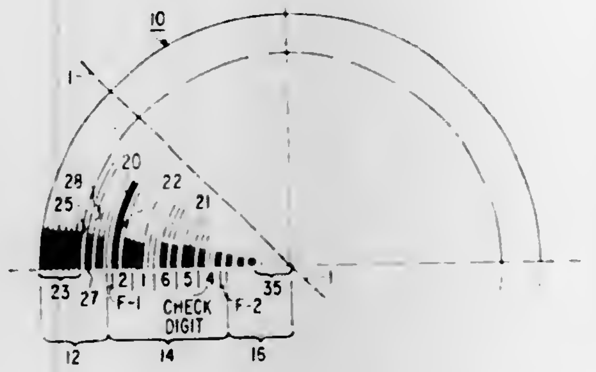
Robert S. Blackwood, Chanhassen, Minn., assignor to Fluoroware Systems Corporation, Chaska, Minn.
Filed Oct. 23, 1975, Ser. No. 625,136
Int. Cl.² H05B *3/68*
U.S. Cl. 219—459 **6 Claims**



1. A hot plate to resist hostile environments including highly corrosive chemicals, comprising:
- a base through which power wires extend;
- a horizontal heater plate overlying the base in spaced and confronting relation and including a ceramic panel to carry and transmit heat to the heating load thereon, the ceramic panel having downturned sides and edges spaced below the top face of the panel and defining a heater cavity, the heater plate having lead wires extending from the base to the heater plate and spanning the space therebetween, a bottom panel on the heater plate adjacent the downturned edges of the ceramic panel and having an opening through which said lead wires extend,
- the heater plate including a foamed epoxy filler in the heating cavity and sealed entirely around the periphery of the ceramic panel to the downturned sides thereof to exclude such corrosive chemicals from the heater cavity, the filler also providing efficient heat insulation against heat loss from the plate;
- a high temperature resisting and insulating pad in and extending entirely across the heater cavity between the downturned panel sides and lying between the filler and the ceramic panel; and
- an electric resistance heating element in the heater cavity and disposed between the pad and the ceramic panel, the heating element being pressed against and in intimate engagement with the ceramic panel and retained against the panel by pressure exerted from the filler and through the high temperature resisting pad to thereby efficiently transfer heat from the heating element to and through the ceramic panel to the heating load carried thereon.

4,004,131
ARTICLE CARRYING CODED INDICIA

John Tettemer Onell, Jr., Princeton; Angelo Pelios, Somerville; Allen Henry Simon, Hightstown, all of N.J., and Frank George Nickl, Northboro, Mass., assignors to RCA Corporation, New York, N.Y.
Division of Ser. No. 345,322, March 27, 1973. This application Oct. 24, 1974, Ser. No. 517,761
Int. Cl.² G06K *19/06*
U.S. Cl. 235—61.12 N **1 Claim**

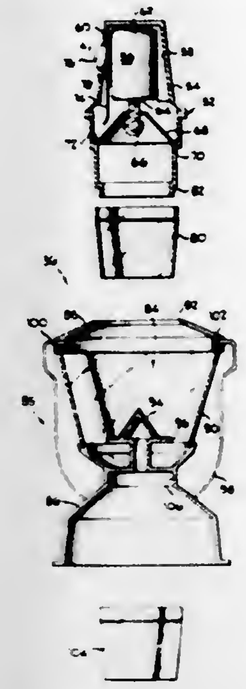


1. An article of manufacture to be read by optical scanning equipment comprising an information medium on which are a plurality of side-by-side indicators of unit width, U, which may vary from article to article, each unit width being in one or the other of two contrasting colors representing respectively binary 1's and 0's, the characteristic patterns of 1's and 0's differing along a scan line, the indicators being arranged to define a start, data, and stop portion, said start portion comprising a plurality of alternating color single unit width indicators to provide coded information corresponding to the scanning rate thereof, said data indicators being arranged so that no more than four side-by-side adjacent indicators have the same characteristics.

4,004,132
CONVERTIBLE FLASHLIGHT-LANTERN

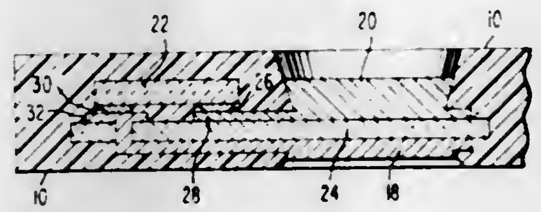
Marvin I. Glass, Chicago, and Palmer J. Schoenfield, Evanston, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Division of Ser. No. 333,745, Feb. 20, 1973. This application Oct. 21, 1974, Ser. No. 516,582
Int. Cl.² F21L *1/00, 15/08, 27/00*
U.S. Cl. 240—10.63 **3 Claims**

1. A convertible flashlight lantern, comprising, in combination: a flashlight-type lighting construction unit including a self-contained, power source, a lamp, a reflector mounted on one end of said unit generally about said lamp for directing a beam of light therefrom in a generally singular direction, and switch means for connecting said lamp to said power source for illuminating the lamp, a lantern type conversion unit comprising an upwardly tapering lantern base portion and upwardly diverging light transmitting lantern shield mounted on said base portion, an upper lantern cap mounted on said shield, said cap including a generally cylindrical aperture therein to provide access to the interior of said shield, connecting means mounted on said cap for removably connecting and holding the flashlight unit with its beam of light directed generally toward the center of the base portion, diffusion means mounted on said base portion in the path of said beam of light from the flashlight unit when the flashlight unit is connected to said cap by said connecting means for reflecting the light outwardly from the conversion unit in plural directions through said shield, and at least one removable, generally tubular, at least translucent lens member mounted on said one end of the flashlight unit for surrounding said diffusion means when the flashlight unit is connected by said connection means to said lantern cap and including a loop-type handle pivotally mounted to said lantern cap and protruding upwardly beyond the top of said flashlight when connected by said connection means.



4,004,133
CREDIT CARD CONTAINING ELECTRONIC CIRCUIT

William James Hannan, Palm Beach Gardens; Edwin Maxwell Fulcher, Lake Park; Randy Deleon Rhodes, Palm Beach Gardens, and Robert George Saenz, Palm Beach, all of Fla., assignors to RCA Corporation, New York, N.Y.
Filed Dec. 30, 1974, Ser. No. 537,439
Int. Cl.² G06K *7/06, 19/06*, **G11C** *11/44*
U.S. Cl. 235—61.7 B **13 Cialms**



12. A system useful for personal identification and credit purposes, comprising
- an article adapted to be carried by an individual and comprising an insulating substrate containing two surface terminals connected to an imbedded electronic serial memory storing an identifying binary value,
- said electronic serial memory including an address counter responsive to a clock pulse wave, a decoder responsive to the address counter, and transistor bit-storage circuits connected to said terminals and responsive sequentially to the output of the decoder, and
- means to read out the binary value from the serial memory comprising means to supply an electric current through said surface terminals to energize said memory, and means to detect said stored information as changes in said electric current.

4,004,134

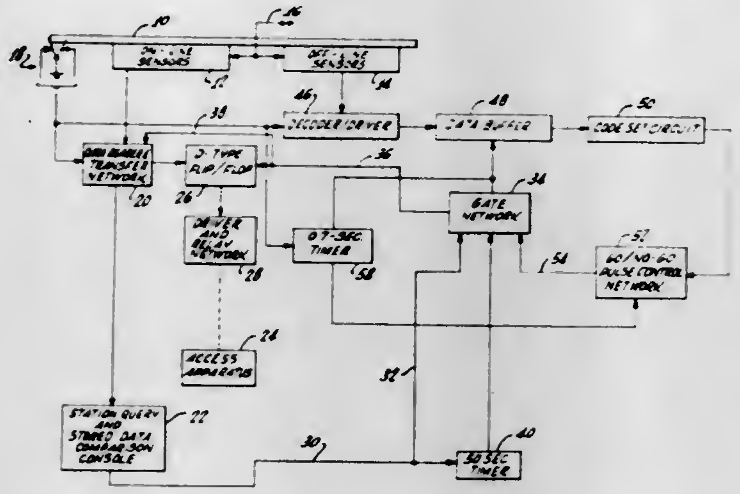
OFF-LINE MAGNETIC CARD READER SYSTEM OPERABLE AS THOUGH NORMALLY ON LINE

Rong H. Hwang, Arcadia, Calif., assignor to Rusco Industries, Inc., Los Angeles, Calif.

Filed June 17, 1975, Ser. No. 587,633

Int. Cl.² G06K *5/00, 7/08*

U.S. Cl. 235—61.7 R **5 Claims**



1. In combination:
- means for receiving a card that is magnetized in a plurality of spots,
- one predetermined spot pattern representing one set of data and a second predetermined spot pattern representing a second set of data;
- an electrically operable device;
- control means for said device;
- logic circuit means coupled to said control means and adapted to be set to condition said control means for operating said device;
- first means for detecting said first set of data from the card;
- means responsive to the data detected by said first means to set said logic circuit means so as to condition said control means for operating said device;
- means to detect inoperativeness of said setting means;
- second means for detecting said second set of data from the card;
- and means coupled to said inoperativeness detecting means and to said second means and responsive to the second set of data to set said logic circuit means so as to condition said control means for operating said device, upon detection of inoperativeness of said first-mentioned setting means.

4,004,135

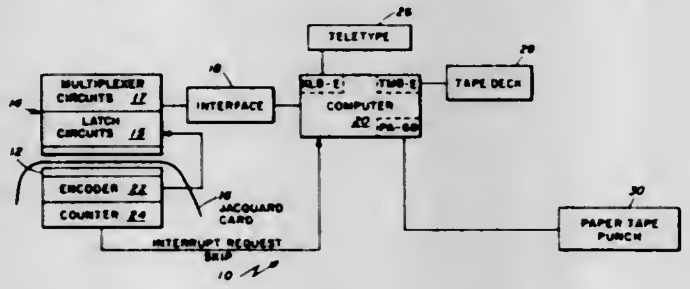
JACQUARD CARD TO MAGNETIC TAPE ARCHIVES STORAGE AND RETRIEVAL SYSTEM

Gottfried Maurer, Needham, Mass., and Emil Meier, Wadenswil, Switzerland, assignors to Viable Systems, Inc., Needham, Mass. and Gessner A.G., Wadenwil, Switzerland, part interest to each

Filed Oct. 23, 1974, Ser. No. 517,243

Int. Cl.² G06K *1/02;* **D03C** *1/00;* **D03J** *1/10*

U.S. Cl. 235—61.1 **14 Claims**



11. A method for the storage of weave information on a Jacquard card which includes:
- a. effective relative movement between a Jacquard card having a hole/no hole weave pattern therein and a sensing head;
- b. reading and converting on a hole/no hole basis to machine data at least a portion of the weave pattern on the Jacquard card;
- c. rereading the weave information of the Jacquard card;
- d. comparing the reread information with the information originally read;
- e. identifying any errors between said compared information;
- f. storing said compared information; and
- g. controlling the movement of the card and the reading and converting, and storing of the information in timed sequence.

4,004,136

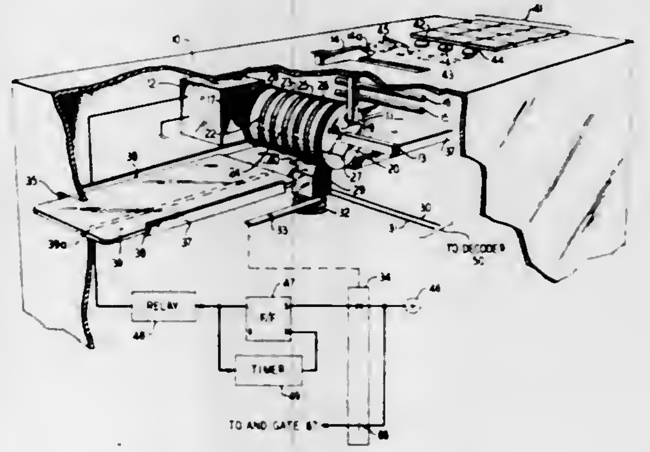
CREDIT VERIFICATION TERMINAL WITH DUAL INFORMATION SOURCES

Gabor Peter Torok, Lincroft, and John William Wesner, Jr., Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 24, 1975, Ser. No. 561,274

Int. Cl.² G06K *7/08;* **G11B** *5/00*

U.S. Cl. 235—61.11 D **17 Claims**



1. A credit verification terminal for providing, sequentially, information identifying a user of said terminal by a user code contained on a record medium and information identifying said terminal by a merchant code stored in said terminal, comprising:
- a head for reading said merchant and user codes when moved past said head, and
- dual purpose means for a) storing said merchant code in an area thereof and adapted to move said area containing said code past said head, whereby said merchant code is read, and b) moving said record medium between said head and said area, whereby said user code is read and reading of said merchant code is precluded.

4,004,137

READOUT APPARATUS FOR FREQUENCY OR PERIOD-ANALOG MEASURING SIGNALS

Gerd Schroder, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

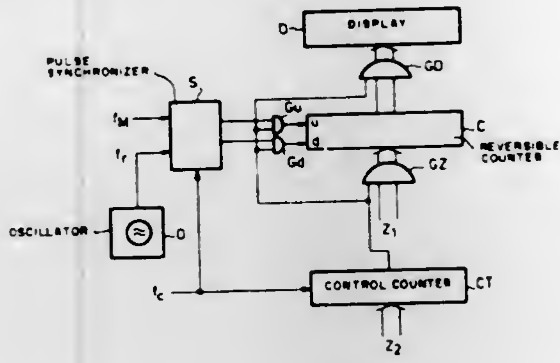
Filed Dec. 31, 1974, Ser. No. 537,690

Claims priority, application Germany, Jan. 4, 1974, 2400285

Int. Cl.² G06M *3/00*

U.S. Cl. 235—92 TF **13 Claims**

1. An apparatus for the digital readout of a physical measuring quantity represented by the frequency of a measuring pulse train comprising, a reversible counter having up and down counting input terminals, means coupled to the counter to preset it to a first count which represents a first given measuring value, means for applying a measuring pulse train whose frequency is proportional to said physical measuring quantity to the counting input terminal for one counting direction during a first time interval of adjustable length, means for applying a reference pulse train to the opposite counting input terminal of the counter during a second, equally long time interval, means for equalizing the frequency of the reference pulse train to that of the measuring pulse train which represents the first given measuring value, and means for adjusting the duration of the time intervals so that upon application of a second measuring pulse train which represents another given physical measuring value the contents of the counter at the end of the measuring period which terminates together with the last time interval represents the other measuring value, whereby the count in said counter at the end of a measuring period provides a direct readout of the value of the measuring quantity.



4,004,138

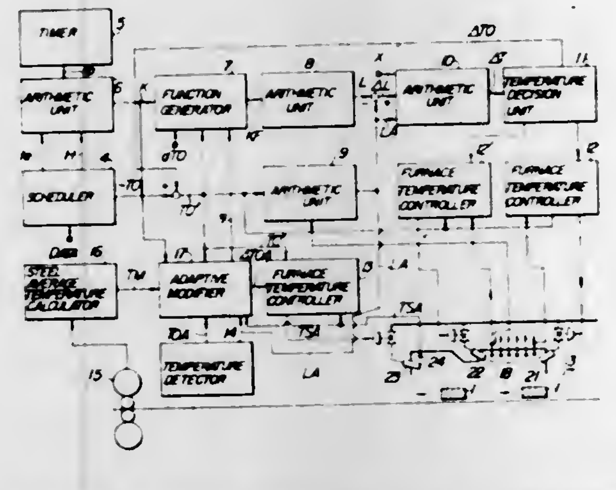
METHOD OF AND SYSTEM FOR CONTROLLING TEMPERATURE OF CONTINUOUS FURNACE

Yasuo Morooka; Mikihiko Onari, and Hidehiro Kitanosono, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 253,837, May 16, 1972, abandoned. This application May 13, 1974, Ser. No. 469,676

Int. Cl.² F27B *9/40*

U.S. Cl. 235—151.1 **10 Claims**



1. A method of controlling the temperature of a continuous furnace equipped with a preheating zone temperature controlling burner, a heating zone temperature controlling burner, and a soaking zone temperature controlling burner, including controlling the preheating zone temperature controlling burner or the heating zone temperature controlling burner to keep the distance from the entry port of the furnace to a position in the preheating or heating zone where the furnace temperature is substantially equal to a desired delivery temperature of a body to be heated at a predetermined value which is determined in accordance with at least one of the shape, size and dwell time of the body.

4,004,139

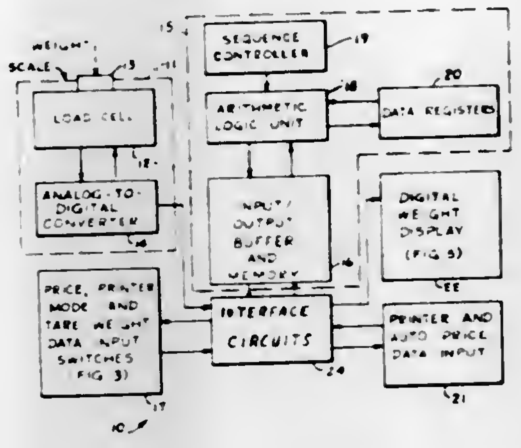
DIGITAL SCALE WITH MEANS TO SHIFT DISPLAYED WEIGHT TO SHOW FRACTION OF LEAST NORMALLY DISPLAYED GRADUATION

Donivan L. Hall, Toledo, Ohio, assignor to Reliance Electric Company, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 434,431, Jan. 18, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,162

Int. Cl.² G01G *19/413*

U.S. Cl. 235—151.33 **8 Claims**


15
WEIGHT SCALE
13
SEQUENCE CONTROLLER
19
LOAD CELL
12
ARITHMETIC LOGIC UNIT
18
20
DATA REGISTERS
ANALOG-TO-DIGITAL CONVERTER
14
INPUT/OUTPUT BUFFER AND MEMORY
16
DIGITAL WEIGHT DISPLAY (FIG 5)
22
PRICE, PRINTER MODE AND TARE WEIGHT DATA INPUT SWITCHES (FIG 3)
17
INTERFACE CIRCUITS
24
PRINTER AND AUTO PRICE DATA INPUT
21
10

5. Measuring apparatus comprising, in combination, scale means for generating a digital weight signal having a first predetermined number of digits corresponding to the weight of an article, said scale means including means for manually adjusting the digital weight signal to zero, digital weight indicator means for displaying a second predetermined number of weight digits less than the first predetermined number of weight digits, said digital weight indicator means normally displaying the second predetermined number of the most significant digits of the weight signal, means for causing said digital weight indicator means to display the second predetermined number of the least significant digits of the weight signal while said scale means is adjusted to zero whereby the zero accuracy of the scale means is displayed for accurate adjustment while zero weight is on said scale means, means for computing an article value from the second predetermined number of the most significant digits of the weight signal and a preselected price per unit weight, and means for printing an article label including the second predetermined number of the most significant digits of the weight signal and the computed value.

4,004,140

DIGITAL ATTENUATOR

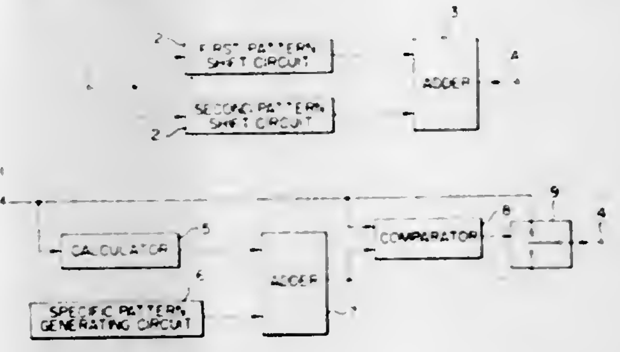
Kazuto Izumi, and Kazuo Izumi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sept. 20, 1974, Ser. No. 507,812

Claims priority, application Japan, Oct. 8, 1973, 48-113109

Int. Cl.² G06F *7/39*

U.S. Cl. 235—152 **3 Claims**


3
2
FIRST PATTERN SHIFT CIRCUIT
ADDER
4
SECOND PATTERN SHIFT CIRCUIT
2
9
8
4
CALCULATOR
5
COMPARATOR
6
ADDER
SPECIFIC PATTERN GENERATING CIRCUIT

1. A digital attenuator comprising input terminal means for receiving an input PCM signal, a pattern shift circuit con-

nected to said input terminal means for shifting signals applied thereto to the lower digit side, a specific pattern generating circuit for generating an integer pattern, an adder connected to add said integer pattern to the output of said pattern shift circuit, a comparator connected to compare the output signal of said adder with signals applied to said input terminal means, an output terminal, and a switching circuit responsive to said comparator and connected to apply the lower of the signals at said input terminal means and at the output of said adder to said output terminal.

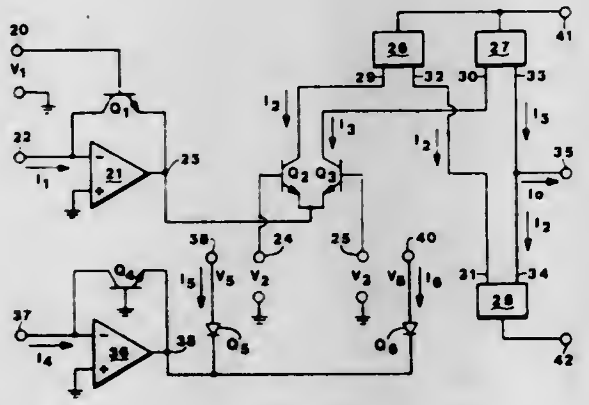
4,004,141
LINEAR/LOGARITHMIC ANALOG MULTIPLIER

Douglas R. Curtis, 1235 Wildwood Ave., Apt. 179, Sunnyvale, Calif. 94086

Filed Aug. 4, 1975, Ser. No. 601,610

Int. Cl.² G06G ***7/16, 7/24***

U.S. Cl. 235—194 **28 Claims**



1. A device for generating an output signal which is proportional to the product of two input voltages, said device comprising:

first and second semiconductor elements each having a diode junction with operating characteristics such that a current passed through said junction is substantially an exponential function of a voltage across said junction;

means for algebraically summing said two input voltages and applying said sum across the diode junction of one of said semiconductor elements,

means for applying one of said voltages across the diode junction of the other of said semiconductor elements; and

differencing means for generating a signal proportional to the difference between the currents passed through the junctions of said first and second elements, whereby said generated signal is proportional to the product of said two input voltages.

4,004,142
DEVICE FOR REGULATING THE ADJUSTMENT OF VEHICLE HEADLIGHTS

Nils Owe Pärsson, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

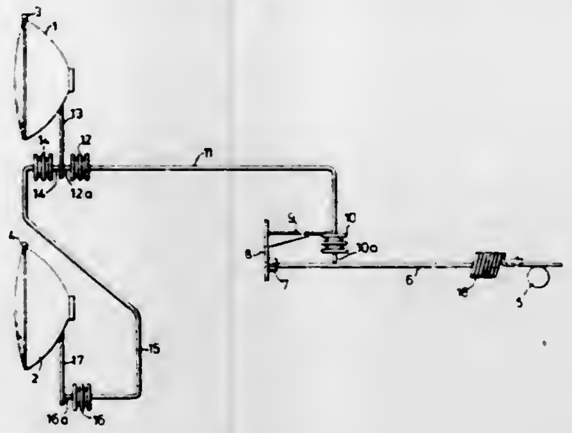
Filed Sept. 23, 1974, Ser. No. 508,717

Claims priority, application Sweden, Sept. 24, 1973, 7312947

Int. Cl.² B60Q ***1/10***

U.S. Cl. 240—7.1 LJ **2 Claims**

1. A device for automatically regulating the adjustment of headlights in motor vehicles in response to the load on the vehicle, comprising a first sensing means fixedly arranged on the vehicle for sensing the position of the vehicle body relative to means carrying rear wheels of the vehicle, a first actuating element for a first headlight, a first pipe which connects said first sensing means with said first actuating element so that a first closed system is formed, a second sensing means arranged to sense the movements initiated by the first actuating element, a second actuating element for a second headlight, and a second pipe which connects said second sensing element with said second actuating element so that a second closed system is formed, the said first and second closed systems being filled with a liquid for transmitting movement between respective sensing means and actuating elements for the regulation of the adjustment of the first and the second headlights respectively, said adjustments being regulated by pivotal movements of the headlights about fixed shafts, the first sensing means engages with an arm having one end pivotally connected to the vehicle body, and its other end arranged to move together with the rear axle of the vehicle, a portion of the arm is a closely wound helical spring with its central axis extending in the longitudinal direction of the arm, thereby making said arm flexible so as to prevent rear axle springing movements being transferred into movements regulating the adjustment of the headlights when the vehicle is driven.



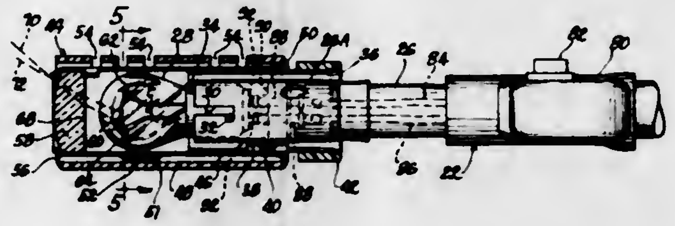
4,004,143
MEDICAL AND DENTAL LAMP

Palmer W. Good, Oak Brook; John P. Good, River Forest, and Paul R. Hinz, Berkeley, all of Ill., assignors to Good-Lite Company, Forest Park, Ill.

Filed June 27, 1975, Ser. No. 590,867

Int. Cl.² A61B ***1/06***

U.S. Cl. 240—44.15 **6 Claims**



1. A medical and dental lamp adapted to illuminate the mouth of patients comprising in combination; a flexible tube adapted to be mounted on a supporting means at one end, a handle having a tubular portion mounted on the flexible tube at the other end thereof and extending therefrom, and a light source for projecting an oval pattern including a lamp holder mounted on the handle and extending from the side thereof opposite the flexible tube, a lamp mounted on the lamp holder having an elongated thin filament, a hollow elongated sleeve, means for slidably mounting the sleeve on the handle for translation along an axis normal to the axis of the elongated filament, said means including tubular shell slidably disposed within the sleeve and mounted on the handle, said shell being spaced from the handle to provide an air passage, and said sleeve having openings therein confronting the lamp for circulation of air through the passage, over the lamp, and through the openings in the sleeve, the lamp being disposed within and directly confronting the sleeve, a convex lens mounted on the sleeve in a plane normal to the axis of the sleeve, translation of said sleeve changing the distance between the lens and the filament.

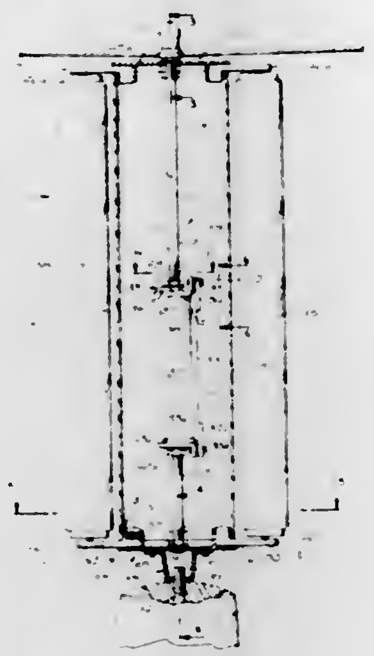
4,004,144
FLUORESCENT LIGHT UNIT

Andre L. Chako, Lancaster, Calif., assignor to A and M Whitemetal Casting, Inc., Lancaster, Calif.

Filed Aug. 22, 1975, Ser. No. 606,858

Int. Cl.² H05B ***33/02***

U.S. Cl. 240—51.11 R **17 Claims**



1. A lighting unit comprising:

a vertically extending centerpost structure;

two vertically spaced top and bottom structures connected to upper and lower portions respectively of said centerpost structure and interconnected thereby and projecting laterally therefrom; and

a generally vertically extending tube disposed about said centerpost structure in spaced relation thereto and engaged and located at its upper and lower ends by said top and bottom structures respectively;

said top and bottom structures extending laterally from said centerpost structure to the location of said tube and including lamp mounting electrical sockets projecting laterally outwardly beyond the tube to positions for mounting a plurality of generally vertical fluorescent lamps at the outside of said tube and at circularly spaced locations thereabout;

said centerpost structure including at least one fluorescent lamp electrical ballast unit connected to the rest of the centerpost structure and located vertically between said top and bottom structures and within said tube with an air circulation space provided at the outside of the ballast unit and between it and said tube;

said top and bottom structures both being open to air flow upwardly therepast at locations radially between said centerpost structure and said tube in a relation providing a continuous upflow path through which circulating air may flow first upwardly past said bottom structure, then upwardly within said tube and about said centerpost structure and said ballast unit to cool the latter, and then upwardly past said top structure and into the atmosphere.

4,004,145
NIL-LUMINANCE LIGHTING PANEL

Ignacio Goytisolo Taltavull, Calle Madrazo, 83, Barcelona, Spain

Filed Feb. 24, 1975, Ser. No. 552,148

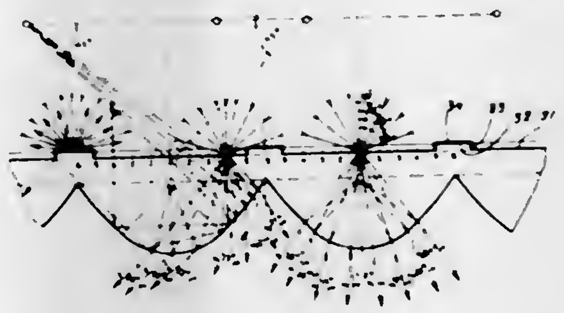
Int. Cl.² F21V ***5/00***

U.S. Cl. 240—106 R **6 Claims**

1. A low luminance lighting panel comprising:

a panel member having a light-incident surface and a light-emissive surface;

said light-emissive surface having thereon a plurality of refracting prismatic elements of partially spherical dome shape, each having a circular cross-section, an axis of symmetry, and lateral surfaces each defined by lines symmetric to said axis of symmetry, each of said lines being composed of a first circular arc having a center located above the plane of said light-incident surface of said panel member and beyond said axis of symmetry and a second arc tangential to said first arc and having a center located on said axis of symmetry and above the plane of the base of said dome shaped elements, said lateral surfaces of adjacent of said dome shaped elements intersecting so that the bases of said dome shaped elements are square shaped and arranged in orthogonal transverse rows and longitudinal columns respectively parallel to the width and the length of said panel member;



said panel member having in said light-incident surface alternate longitudinal recesses positioned to coincide with the longitudinal columns of square shaped bases of dome shaped elements, and longitudinal raised bands each having an upper surface and lateral edges, said bands positioned to coincide with the longitudinally extending intersection lines between lateral surfaces of said dome shaped elements, said recesses having planar base surfaces;

said upper surface and lateral edges of each of said bands having thereon a coating of an opaque reflecting material; and

said panel member, said refracting elements and said bands being integrally formed as a single unitary member.

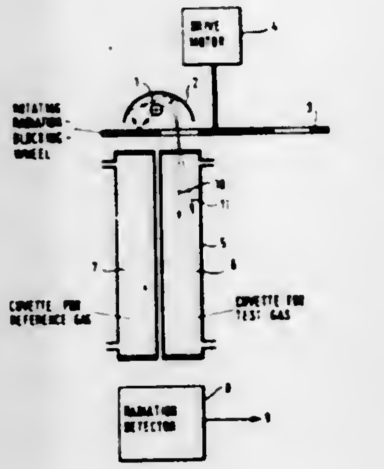
4,004,146
INFRARED GAS ANALYZING PHOTOMETER WITH CHOPPER DESIGNED TO AVOID RADIATION WASTE

Otto Blunck, Hamburg, Germany, assignor to H. Maihak A.G., Hamburg, Germany

Filed Apr. 15, 1975, Ser. No. 568,246

Int. Cl.² G01N ***21/34;*** **G01D** ***5/36***

U.S. Cl. 250—345 **15 Claims**



1. In an infrared gas analyzer, in combination, means defining a first path for reference radiation and a second path for measuring radiation; radiating means operative for emitting radiation towards both said paths simultaneously; detector means positioned at the ends of said paths for sensing the

intensity of reference and measuring radiation passing through said paths; and radiation-travel-control means operative for alternately obstructing by the interposition of material which does not transmit the emitted radiation one and then the other of said paths and during the obstructing of each path causing the radiation directed towards the obstructed path to be deflected into the unobstructed path so that such radiation is not wasted.

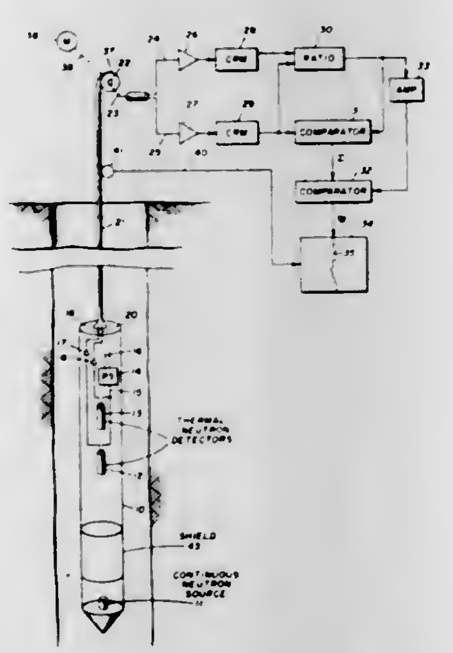
4,004,147
LOGGING SUBSURFACE FORMATIONS FOR POROSITY

Linus S. Allen, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 24, 1975, Ser. No. 616,238

Int. Cl.² G01V *5/00*

U.S. Cl. 250—264 **18 Claims**



1. A method of logging the formations traversed by a borehole for porosity, comprising the steps of:
- a. locating a source of fast neutrons within the borehole to irradiate the formations with neutrons,
- b. measuring the thermal neutron flux of the secondary radiation from the formation at two spaced-apart positions within said borehole,
- c. producing a ratio of the thermal neutron flux measured at each of said two positions,
- d. combining said ratio with the thermal neutron flux measured at one of said two spaced-apart positions in accordance with a known relationship to produce a first signal indicative of the macroscopic absorption cross section of the formation, and
- e. combining said ratio with said first signal in accordance with a known relationship to produce a second signal indicative of the porosity of the formaton.

4,004,148
ACCUMULATION MODE CHARGE INJECTION INFRARED SENSOR

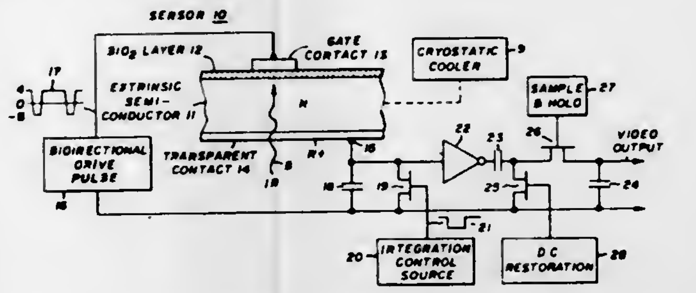
Philip E. Howard, N. Syracuse; James C. Kim, Liverpool, both of N.Y., and Hans G. Sippach, Fullerton, Calif., assignors to General Electric Company, Syracuse, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,512

Int. Cl.² G01J *1/00*; **G01T** *1/22*

U.S. Cl. 250—370 **6 Claims**

1. An infrared radiation sensor comprising:
- a. a semiconductor substrate of doped semiconductor material upon which IR illumination impinges creating mobile majority carriers and immobile sites of opposite charge,
- b. a thin insulating layer applied to one surface of said substrate,
- c. a first electrical contact applied to said insulating layer,
- d. a second electrical contact to said substrate,
- e. cryogenic means for establishing said semiconductor at a temperature providing inadequate thermal energy to ionize the dopant centers, and



- f. a source of bidirectional pulses coupled to said contacts having a first polarity for accumulating said mobile photon induced majority carriers at the oxide-semiconductor interface and a reverse polarity for injecting charges stored at the oxide-semiconductor interface into said second electrical contact.

4,004,149
APPARATUS FOR DISPLAYING IMAGE PRODUCED BY ELECTRICALLY CHARGED PARTICLE BEAM

Seishiro Sato, Hitachi; Toshihiro Furuya, Katsuta, and Yasushi Saito, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

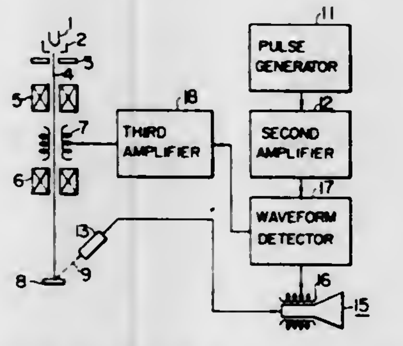
Filed Apr. 18, 1975, Ser. No. 569,293

Claims priority, application Japan, Apr. 22, 1974, 49-44524

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² H01J *3/26*

U.S. Cl. 250—397 **10 Claims**



1. An apparatus for displaying an image produced by electrically charged particle beam, comprising first deflection means for scanning a specimen bi-dimensionally with said electrically charged particle beam, detection means for detecting information signal produced by said specimen illuminated with said electrically charged particle beam, display means for displaying an image of said specimen by utilizing said information signal detected by said detection means, second deflection means provided in said display means, and wave form detection means for detecting the wave form of a deflection signal produced in said second deflection means, whereby said first deflection means is energized by the output signal from said wave form detection means.

4,004,150
ANALYTICAL MULTIPLE COMPONENT READOUT SYSTEM

Samuel Natelson, 5438 N. Artesian Ave., Chicago, Ill. 60625

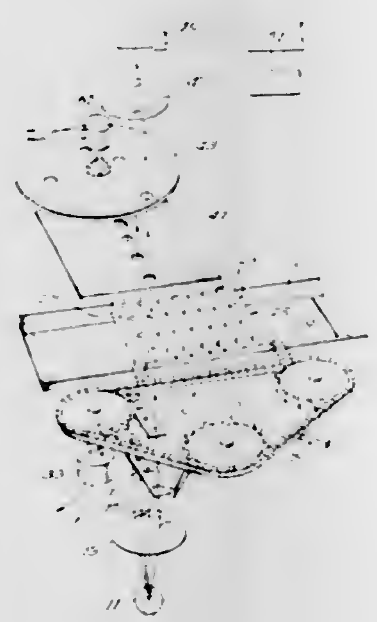
Filed May 1, 1975, Ser. No. 573,766

Int. Cl.² G01T *1/00*; **G01N** *21/26*

U.S. Cl. 250—328 **15 Claims**

1. In an analytical chemical system, an instrument for rapidly analyzing a plurality of components in a single specimen by the measurement of the light intensity emitted from a plurality of solutions using a single detector and light source, so as to translate these light intensities in terms of concentration of chemical components in these solutions, comprising

- a. a carrier and travel means, said carrier having a plurality of sample containers in rows thereon disposed to carry said containers which are to hold a specimen along a travel path by said travel means;
- b. a work station along said travel path having a light source thereat;
- c. light collimating means at said work station for collimating the light emitted from said light source to produce a first beam of the same color as said emitted light;
- d. light selection means disposed for receiving said first beam, for selecting a monochromatic beam of light from said collimated light source to produce a second beam;
- e. light isolating means for isolating a plurality of narrow third light beams from said collimated monochromatic second beam so disposed as to pass each of these third light beams in a plane through solutions in said plurality of containers so that part of the light is absorbed by samples therein and part transmitted;



- f. detector means and focusing means for focusing said transmitted third light beams so as to converge said third light beams to said detector means;
- g. interruption scanning means for scanning each of said transmitted third light beams emerging from said solutions sequentially so that said detector means receives said narrow light beams in sequence, said interruption scanning means comprising a disk rotatable about an axis, said disk having a plurality of holes at different radii from the axis of rotation of said disk, each disk positioned to interrupt said transmitted third light beams substantially perpendicular to the plane defined by said transmitted third light beams, wherein said disc sequentially scans a row of sample containers by rotating said disk with respect to said transmitted third light beams; and
- h. light reading means for translating the signals of the detector to a written record.

4,004,151
DETECTOR FOR DEEP WELL LOGGING

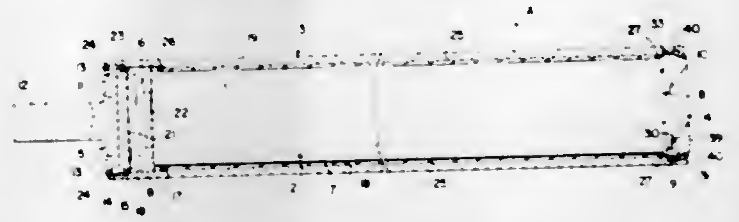
William P. Novak, 15180 Lake Ave., Middlefield, Ohio 44062

Filed May 21, 1975, Ser. No. 579,402

Int. Cl.² G01J *1/58*

U.S. Cl. 250—485 **8 Claims**

1. A hermetically sealed scintillation detector for measuring radiation at successive depths in a bore hole comprising an elongated metal cylinder containing a scintillation crystal of an alkali metal halide, said crystal being coaxial with said cylinder and extending along the length of the cylinder, a round transparent glass window within and closing one end of said cylinder and spaced from the end of said crystal by an optical coupling, said window having a tapered outer surface portion which gradually decreases in diameter in the axial direction away from said crystal, said window having a linear coefficient of thermal expansion which is at least 0.000008 inch per inch per degree Centigrade, the end portion of said cylinder having an inner tapered surface which increases in diameter from the end face of the cylinder toward the crystal



with the inside diameter of said end portion being slightly larger than the largest diameter of the window so as to be able to receive said window when the detector is assembled, and a hermetic heat-resistant epoxy resin sealing annulus bonded to and surrounding the sides of said window and bonded to the inner tapered surface of said end portion and filling the space between the sides of said window and the end portion of the cylinder.

4,004,152
APPARATUS FOR MONITORING A MOVING WEB OF MATERIAL FOR FAULTS

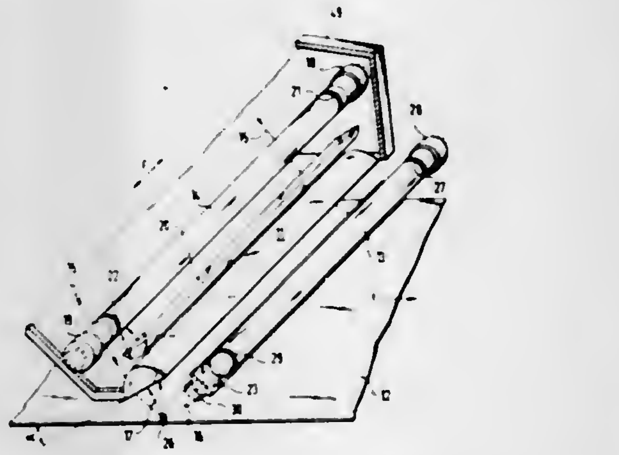
Werner Obser, Geretsried, and Gernot Pinior, Olching, both of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Germany

Filed July 7, 1975, Ser. No. 593,399

Claims priority, application Germany, July 12, 1974, 2433683

Int. Cl.² G01N *21/32*

U.S. Cl. 250—562 **14 Claims**



1. Apparatus for inspecting a substantially flat surface portion of a material for faults or aberrations which affect the remission and reflection of a light ray incident on the material, the apparatus comprising: a cylindrical lens positioned in the path of the light ray for focusing the light ray on the surface portion of the material and for intercepting light from the light ray which is remitted by the material; means for scanning the light ray over the length of the cylindrical lens to thereby scan the light ray across the surface portion of the material; a light conducting rod for capturing light from the light ray remitted by the material, the light conducting rod being positioned on the side of the cylindrical lens opposite the material so that remitted light captured by the rod first passes through the cylindrical lens; and means in light communication with at least one end face of the light conducting rod for generating an electrical output signal responsive to the remitted light captured by the rod.

4,004,153

APPARATUS FOR MONITORING A WEB OF MATERIAL

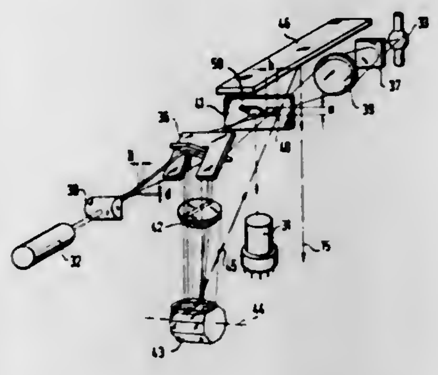
Werner Obser, Geretsried, and Gernot Pinior, Olching, both of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Germany

Filed July 7, 1975, Ser. No. 593,400

Claims priority, application Germany, July 12, 1974, 2433682

Int. Cl.² G01N *21/32*

U.S. Cl. 250—572 **22 Claims**



1. Apparatus for inspecting a substantially flat surface portion of a material for faults which affect the remission and reflection of light incident on the material, the apparatus comprising: a first light source emitting light of a relatively narrow spectral band width; a second light source remitting light of a relatively broad spectral band width; means for projecting the light from the first and second light sources onto the material in the form of first and second, overlapping each other differing light spots, respectively; first and second light sensitive means for generating output signals responsive to light received and sensed by the light sensitive means; means for directing light from the spots on the material to the light sensitive means; and means for limiting the output signals of the first and second light sensitive means to light generated by the first and second light sources, respectively.

4,004,154

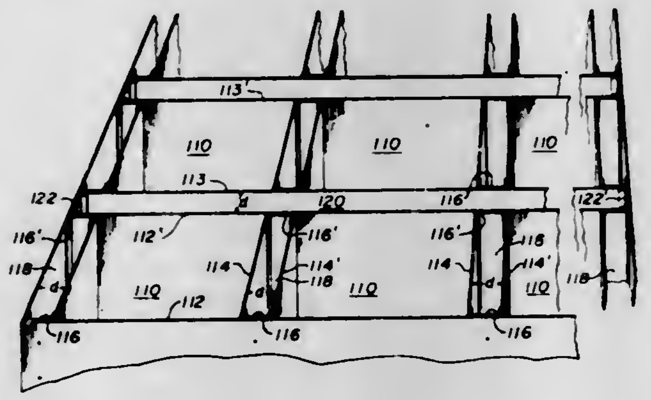
FISSIONABLE MASS STORAGE DEVICE

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 17, 1975, Ser. No. 558,767

Int. Cl.² G21F *3/00*; G21C *11/00*

U.S. Cl. 250—518 **6 Claims**



1. An apparatus for the safe yet compact storage of a plurality of fissionable masses comprising:

a. a plurality of adjacent discrete neutron absorbing open-ended shields disposed in side-by-side relationship, one of each of which is adapted to parametrically encircle one of each of said plurality of fissionable masses, said neutron absorbing shields consisting of stainless steel having a thickness in the range from .3 centimeters to 1.4 centimeters;

b. spacing means in each of two directions for spacing each of said side-by-side neutron absorbing shields from the next adjacent neutron absorbing shield by a predetermined neutron attenuation distance of at least 9.5 centimeters; and

c. hydrogenous moderating means between said adjacent discrete neutron absorbing shields for moderating neutrons which are emitted from said fissionable masses.

4,004,155

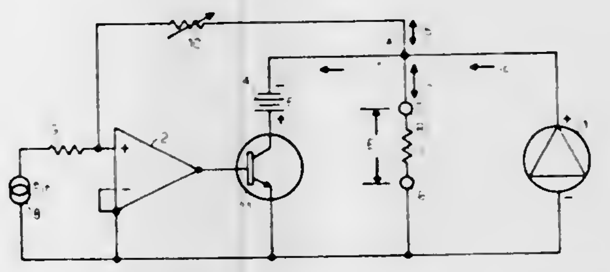
BIPOLAR REGULATED HIGH VOLTAGE POWER SUPPLY

Sarkis Nercessian, Flushing, N.Y., assignor to Forbro Design Corporation, New York, N.Y.

Filed Oct. 3, 1975, Ser. No. 619,444

Int. Cl.² H02J *3/38*

U.S. Cl. 307—52 **5 Claims**



1. In a bipolar regulated power supply, the combination of;

a pair of load terminals;

a source of first DC current of a first polarity connected through a current sensing resistor and across said load terminals;

a source of a second DC current of a polarity opposite to said first polarity connected to said load terminals through said current sensing resistor;

current control means connected in series with said source of said second current capable of controlling said second current from a value equal to a small fraction of the value of said first current to a value substantially twice the value of said first current whereby bipolar voltage or current is provided to said terminals;

wherein said control means includes; a voltage control amplifier for receiving a sample of the terminal voltage and comparing it with a first bipolar reference for controlling the voltage across said terminals in accordance with said comparison; a current control amplifier for receiving a sample of the terminal current and comparing it with a second bipolar reference for controlling the current to said terminals in accordance with said comparison; adjustable positive overvoltage control means; adjustable negative overvoltage control means; adjustable positive overcurrent control means; adjustable negative overcurrent control means;

and means for exclusively selecting control by said voltage control amplifier or said current control amplifier while retaining all four overvoltage or overcurrent control means.

4,004,156

SINGLE BUS DC CONTROL CIRCUIT

Ronald M. Schuller, 552 Treadway Blvd., Sheffield Lake, Ohio 44054

Filed Nov. 26, 1975, Ser. No. 635,332

Int. Cl.² H01H *19/64*

U.S. Cl. 307—113 **15 Claims**

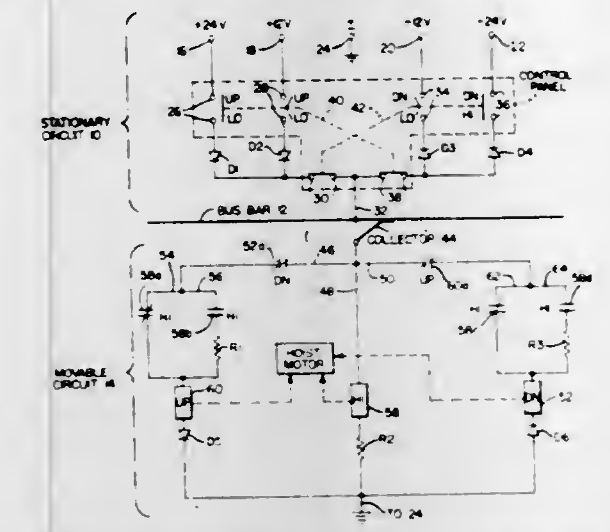
1. A DC control circuit comprising:

a bus bar;

a primary circuit including a DC voltage source of high and low positive and of high and low negative voltage, selector means operatively connected between said bus bar and said voltage source for selectively applying said high or low positive or negative voltage to said bus bar;

a secondary circuit including collector means for making electrical contact with said bus bar and a voltage polarity and voltage level responsive circuit operatively connected to said collector means including polarity means for producing an output condition indicative of the polarity of voltage applied to said bus bar and voltage level means for producing an output condition indicative of a said high or low voltage applied to said bus bar and;

means responsive to the operation of said secondary circuit for operating a device in a mode corresponding to said polarity means output condition and at a rate corresponding to said voltage level means output condition.



4,004,157

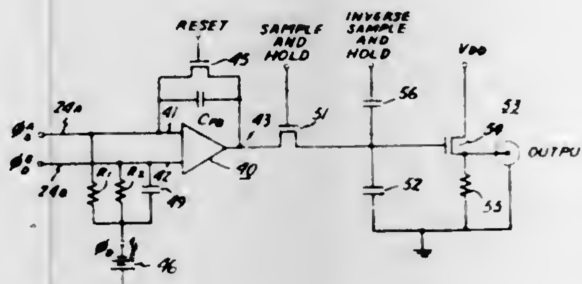
OUTPUT CIRCUIT FOR CHARGE TRANSFER TRANSVERSAL FILTER

Richard D. Baertsch; William E. Engeler, both of Scotia, and Jerome J. Tiemann, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,497

Int. Cl.² H03K *5/20*; G11C *19/28*

U.S. Cl. 307—235 C **11 Claims**



1. A transversal filter comprising

a substrate of semiconductor material of one conductivity type,

a first plurality of electrodes insulatingly overlying said substrate, each split into a first and a second part with a gap therebetween,

a second plurality of electrodes insulatingly overlying said substrate, each spaced between adjacent electrodes of said first plurality, said first and second pluralities of electrodes forming a plurality of stages of a shift register,

means for connecting the first parts of said electrodes of said first plurality to a first conductive line,

means for connecting the second parts of said electrodes of first plurality to a second conductive line,

means for introducing packets of charge representing successive samples of an analog signal into said shift register,

charge clocking means to effect the transfer of charge from storage region to storage region underlying said first and said second pluralities of electrodes including means for applying first and second phase related voltages to said first and second pluralities of electrodes respectively, said first voltage being applied to said first and said second lines, said second voltage having a predetermined periodicity,

differential sensing means connected to said first and second lines for detecting a difference in signal on said lines in response to the transfer of charge from storage regions underlying said second plurality of electrodes to storage regions underlying said first plurality of electrodes for obtaining a sum of weighted samples of said analog signal including

a high gain differential amplifier having a pair of input terminals and an output terminal, one of said input terminals being an inverting input terminal and the other being a non-inverting terminal, a first capacitor, said inverting terminal connected to said output terminal through said first capacitor and also connected to said first line, said non-inverting terminal connected to said second line,

a source of said first phase related voltage,

a first and a second charging and isolating means, said connecting said source to said first and second lines respectively to charge each of said lines to substantially the value of said first phase related voltage of said source periodically prior to the transfer of charge into the storage regions underlying said first plurality of electrodes and thereafter isolating said lines from said source,

whereby charge periodically transferred from the storage regions underlying said second plurality of electrodes to storage regions underlying said first plurality of electrodes induce different voltages on said lines and causes the voltage of the inverting terminal to follow the voltage of the non-inverting terminal by virtue of the feedback through said first capacitor and a total charge is supplied to said first capacitor which is proportional to the difference in charge delivered to said lines during said transfer of charge, said total charge appearing as a change in voltage at said output terminal.

4,004,158

KEYED COMPARATOR

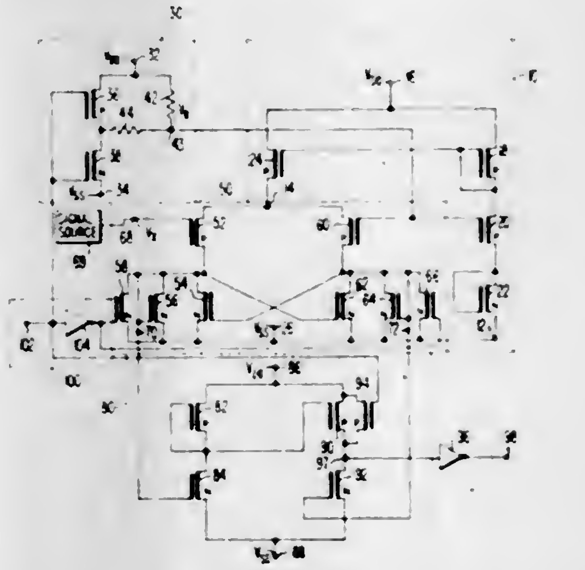
David Keith Morgan, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,912

Claims priority, application United Kingdom, Nov. 26, 1974, 51173/74

Int. Cl.² H03K *5/20*, *1/12*; H03F *3/04*

U.S. Cl. 307—235 T **6 Claims**



1. The combination of:

a comparator comprising first and second conduction paths connected in parallel between first and second terminals, two control electrodes, one coupled to each path, for controlling the impedance of the respective conduction paths, means for applying a reference signal to one electrode, means for applying the signal to be compared with the reference signal to the other electrode, output means in at least one of the paths, and a current source connected between said first and second terminals; and

means responsive to the amplitude of said reference signal for controlling the amount of current supplied by said current source to said comparator.

4,004,159

ELECTRICALLY REPROGRAMMABLE NONVOLATILE FLOATING GATE SEMI-CONDUCTOR MEMORY DEVICE AND METHOD OF OPERATION

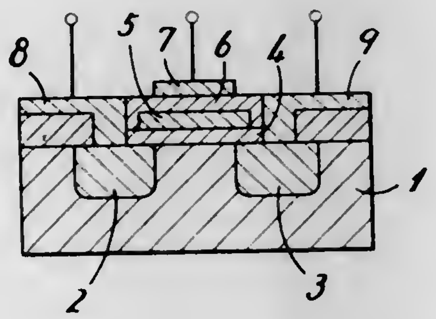
Yasuki Rai, Kyoto; Terutoshi Sasami, Osaka; Yuzuru Hasegawa, Osaka, and Masaru Okazoe, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation-in-part of Ser. No. 469,616, May 13, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,430

Claims priority, application Japan, May 18, 1973, 48-56620; Jan. 16, 1974, 49-7748

Int. Cl.^{2} H03K *5/00;* **H01L** *29/78, 27/02, 29/34*

U.S. Cl. 307—238 **9 Claims**



1. A semiconductor memory device comprising a semiconductor substrate of an N conductivity type having a main surface, source and drain regions of P conductivity type spaced apart on said main surface of said semiconductor substrate, whereby PN junctions are formed between said substrate and said source and drain regions, said junctions having a breakdown point at a determinable reverse bias voltage applied therebetween, a first insulating layer formed on said main surface of said semiconductor substrate at least in an area between said source and drain regions and having a thickness from 200A to 400A, a floating metal gate electrode formed on said first insulating layer above said area on said main surface between said source and drain regions, a second insulating layer formed on said floating metal gate electrode and having a thickness from 600A to 900A, and a second gate electrode formed, opposite to said floating metal gate electrode, on said second insulating layer, said semiconductor memory device having a change in the second gate voltage versus drain current characteristic as a function of the type and quantity of electric charge applied to said floating metal gate electrode, the thickness of said first insulating layer being greater than that at which direct tunnel conduction therethrough is dominant, said first insulating layer extending above at least one of said source and drain regions and above said area on said main surface between said source and drain regions, to provide an overlapping portion of said floating metal gate electrode at least above one of said source and drain regions with said first insulating layer therebetween, said overlapping portion of said floating metal gate electrode extending a distance less than two times the distance between said source and drain regions on said main surface, first means for selectively applying in a first operation mode a voltage of negative polarity to said one of said source and drain regions with respect to said substrate and said second gate electrode, whereby a reverse bias voltage may be applied to the PN junction between said substrate and said one of said source and drain regions, said reverse bias voltage having a value lower than said breakdown voltage of said PN junction but sufficient enough to produce an electric field of less than 10^7V/cm to permit Fowler-Nordheim tunnel conduction through said first insulating layer at said overlapping portion between said floating metal gate electrode and said one of said source and drain regions as a function of the electric field thereby applied across said first insulating layer at said overlapping portion and determined by the potential difference between the potential at said floating metal gate electrode with respect to said substrate and the potential at said one of said source and drain regions with respect to said substrate, whereby electrons move from said one of said source and drain regions into said floating metal gate electrode through said first insulating layer at said overlapping portion by Fowler-Nordheim tunnel conduction and whereby a first change in the negative direction in quantity of electric charge applied to said floating metal gate electrode results to cause a respective first change in said second gate voltage versus a drain current characteristic of said semiconductor memory device, and second means for selectively applying in a second operation mode a second voltage of the same negative polarity as that of said first voltage applying means to said second gate electrode with respect to said substrate, said second voltage having a magnitude sufficiently high to cause Fowler-Nordheim tunnel conduction through said first insulating layer above said region of said substrate on said main surface between said source and drain regions as a function of the electric field applied across the first insulating layer above said area on said main surface between said source and drain regions determined by the potential at said floating metal gate electrode with respect to said substrate and the potential at said second gate electrode with respect to said substrate, whereby electrons move from said floating metal gate electrode into said region of said substrate on said main surface between said source and drain regions through said first insulating layer above said region by Fowler-Nordheim tunnel conduction and whereby a second change in the positive direction in the quantity of electric charge applied to said first gate electrode results to cause a respective second change, in the second gate voltage versus drain current characteristic of said semiconductor memory device, said second change being in the direction opposite to said first change, the metal of said floating metal gate electrode facilitating movement of electrons from said floating metal gate electrode toward said region of said substrate on said main surface between said source and drain regions by virtue of an image force exerted between said first insulating layer and said floating metal gate electrode when said second voltage of the same negative polarity is applied to said second gate electrode with respect to said substrate.

4,004,160

SWITCHING SYSTEM TO SHORT-CIRCUIT A LOAD WITH MINIMUM RESIDUAL VOLTAGE

Klaus Streit, Tubingen; Karl Staiger, Wannweil; Gerhard Conzelmann, Leinfelden; Hartmut Seiler, Reutlingen, and Karl Nagel, Gomaringen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1974, Ser. No. 505,470

Claims priority, application Germany, Sept. 28, 1973, 2348765

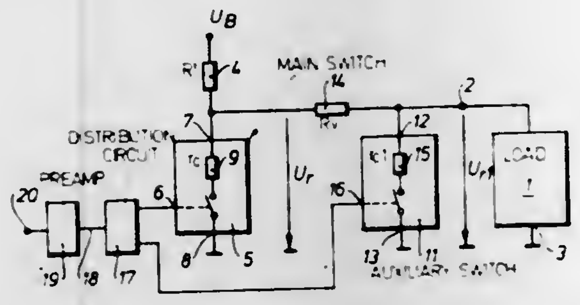
Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—253 **24 Claims**

1. Switching system to short-circuit a load (1) under command of a control signal, in which the load (1) is connected to a source (U_B), the system having a main switch (5, 105, 205, 305, 405) connected in parallel with the terminals (6, 106, 206, B) effecting opening or closing of the switch under control of said command signal applied to the control terminal, comprising

a voltage divider circuit (FIGS. 3 and 10: 14, 15; FIGS. 4, 5, 7, 8, 9, 11: 114, 115; FIG. 12: 214, 215; FIGS. 18, 19, 20: r_{CC1}, r_{CL1} - r_{CE}; FIGS. 21, 22, 23: r_{CLAB}, r_{CEB}; r_{CLBC}, r_{CEC}) including two impedance means connected across the main switch electrodes (7, 8; 107, 108; 207, 208; C, E; C_1 - E) of the main switch, the load being connected to the voltage division, or tap point of the voltage divider circuit, the impedance means of the voltage divider circuit in parallel with the load (1) being controllable between a high, or effectively open circuit value and a low value, in synchronism with open and closed circuit condition of the main switch (5, 105, 205, 305, 405), to reduce any residual voltage applied to the load (1) due to voltage drop across the main switch electrodes of the main switch upon closing of the main switch and thus effectively short-circuiting the load.

4. Switching system to short-circuit a load (1) connected to a source (U_B) having a controlled main semiconductor switch (5) having its main switching terminals (7, 8) connected in parallel with the terminals (2, 3) of the load, and having a



control terminal (6) effecting opening or closing of the control switch under control of a control signal applied to the control terminal (6), comprising

- a second semiconductor controlled switch (11) connected and controlled to switch in synchronism with said main switch (5);
- and a two-terminal impedance means (14),
- the second semiconductor controlled switch (11) having its main switching electrodes (12, 13) connected across the terminals of the load (1) and said impedance means (14) being connected between one of the main switching electrodes (12) of the second semiconductor controlled switch (11) and hence to one terminal (2) of the load, and one of the main switching terminals of the main switch (5).

4,004,161

RECTIFYING CIRCUITS

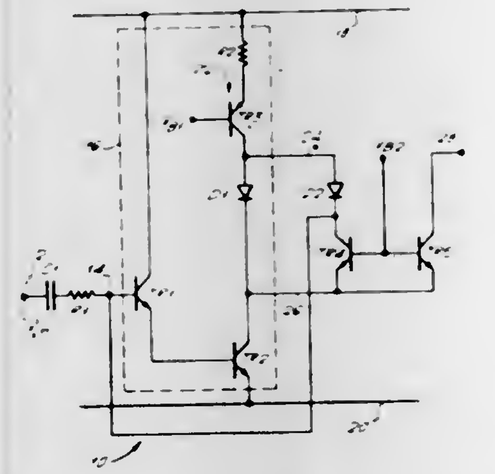
Alan Ryder, Church Crookham, near Aldershot, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Oct. 28, 1975, Ser. No. 626,144

Claims priority, application United Kingdom, Nov. 8, 1974, 48359/74

Int. Cl.^{2} H02M *7/217*

U.S. Cl. 307—261 **6 Claims**



1. A rectifying circuit comprising a high gain A.C. amplifier for receiving an A.C. input singal to be rectified, first and second rectifying means connected in respective negative feedback paths between the output of the amplifier and its input, said paths being arranged to pass respective feedback currents of opposite polarity, and current copying means responsive to the signal applied by the amplifier to one of the rectifying means to pass a current substantially proportional to the feedback current in said one rectifying means, the rectified output signal from the circuit being derived from the current copying means.

4,004,162

CLOCK SIGNAL REPRODUCING NETWORK FOR PCM SIGNAL RECEPTION

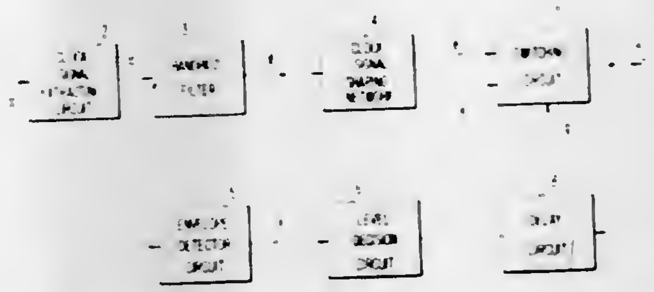
Kotaro Kato, and Haruki Takai, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jan. 22, 1976, Ser. No. 651,369

Claims priority, application Japan, Jan. 25, 1975, 50-10171

Int. Cl.^{2} H03K *3/78*

U.S. Cl. 307—269 **5 Claims**



1. A clock signal reproducing network for PCM signal reception comprising:

- a clock signal component extracting circuit for extracting the clock signal component from a received digital signal in a baseband;
- a bandpass filter connected to the output of said clock signal component extracting circuit for band-limiting the output thereof to derive a sine wave signal of the clock frequency;
- a clock shaping circuit connected to the output of said bandpass filter for shaping said sine wave signal into a square wave signal;
- an envelope detection circuit connected to the output of said bandpass filter for detecting the envelope of the output of said bandpass filter;
- a level decision circuit connected to the output of said envelope detection circuit for comparing the output level of said envelope detection circuit with a reference level;
- a switching circuit having first and second input terminals, one of the first and second inputs being selectively switched to an output terminal; and
- a delay circuit connected to said output terminal for delaying the output of said switching circuit; wherein the output of said clock shaping circuit is applied to the first input terminal of said switching circuit, the output of said delay circuit is applied to the second input terminal of said switching circuit, and said switching circuit is controlled by the output of said level decision circuit so that the first or second input is selectively led to the output terminal.

4,004,163

TIME DELAY, CHARGE, TRANSFER CIRCUIT

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 11, 1976, Ser. No. 666,116

Int. Cl.^{2} H03K *5/13, 17/56*

U.S. Cl. 307—293 **7 Claims**

1. A charge transfer circuit comprising,

first and second charge storage means,

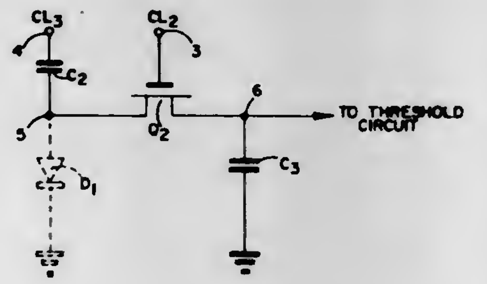
transmission gate means selectively connected between said first and second charge storage means, clock terminal means connected to the first charge storage means and to a control electrode of said transmission gate means,

a source of reference potential, and

unidirectional current conducting means,

said second charge storage means connected between said transmission gate means and said source of reference potential,

said unidirectional current conducting means connected between said first charge storage means and said source of reference potential,



said first charge storage means and said control electrode of said transmission gate means each receiving respective clock signals having an active level to charge said first charge storage means and enable said transmission gate means during a first interval of time, whereby the signal of said first charge storage means is transferred to said second charge storage means via a conduction path of said transmission gate means,

the respective clock signal of said first charge storage means remaining at the active level and the respective clock signal at said transmission gate means control electrode having an inactive level to disable said transmission gate means and thereby isolate said second charge storage means from said first charge storage means during a succeeding second interval of time, and

each of the respective clock signals at said first charge storage means and said transmission gate means control electrode having an inactive level during a succeeding third interval of time, whereby said first charge storage means is selectively discharged to said source of reference potential via the conduction path of said unidirectional current conducting means.

4,004,164

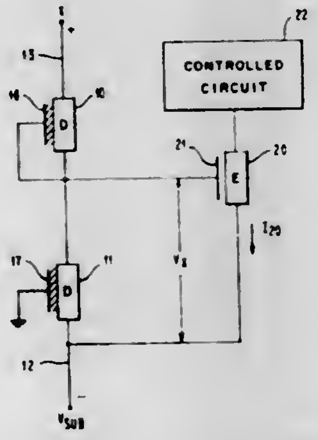
COMPENSATING CURRENT SOURCE

Hayden Clavie Cranford, Jr., Durham, and Charles Reeves Hoffman, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1975, Ser. No. 641,797

Int. Cl.^{2} H03K *1/14*; H03F *3/16, 1/30, 3/45*

U.S. Cl. 307—297 **3 Claims**



1. A field effect transistor circuit suitable for incorporation on a semiconductor substrate with other field effect transistor circuits of an analog type and in which substrate a biasing voltage is subject to variations within a tolerance range, said circuit acting to compensate for voltage changes in the inputs or outputs of said other circuits due to variations in said substrate biasing voltage and comprising:

an FET depletion type of transistor deposited in said substrate and having its source connected to the negative terminal of said substrate voltage and its gate connected to a ground level reference voltage and thereby biased in its linear region of operation,

a second depletion type transistor deposited in said substrate and having its source connected to the drain of said first FET depletion type transistor and with its drain connected to a voltage source which is positive with respect to said substrate voltage, and having its gate connected to its source or to a voltage point having a voltage lower than said source and varying with said substrate voltage whereby said second depletion transistor is biased in its saturation region,

a deposited current control device of the enhanced type of field effect transistor having its source connected to said negative terminal of said substrate voltage and its gate connected to the common node between said first and second type transistors and

a current biased circuit connected to the drain of said enhancement type transistor whereby, the current in said biased circuit is inversely related to the magnitude of said substrate voltage.

4,004,165

ULTRASONIC SIGNAL GENERATORS

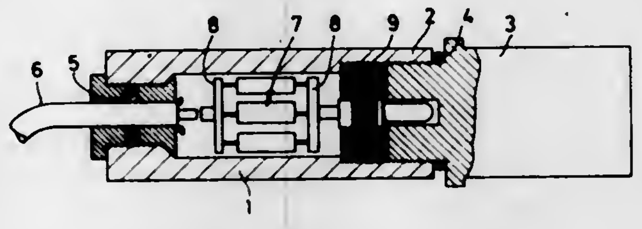
Ivo Leo Bredael, Ispra, Varese, and Fulvio Laghi, Varese, both of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Continuation of Ser. No. 454,850, March 26, 1974, abandoned. This application July 7, 1975, Ser. No. 593,212

Claims priority, application United Kingdom, Mar. 27, 1973, 14735/73

Int. Cl.^{2} H01L *41/04*

U.S. Cl. 310—8.1 **1 Claim**



1. In an ultrasonic flow detector of the kind comprising a piezoelectric crystal transducer, a pulse generator having capacitive means and switching means periodically discharging said capacitive means for generating repetitive voltage pulses for excitation of the transducer; a transmitting cable for the transmission of signals applied to and received from said transducer, said cable having a first end coupled to said transducer and a second end; a remote transmit/receive unit electrically connected to the second end of said cable and by said cable to said transducer, said remote transmit/receive unit comprising coupling means for connecting with a D.C. power source, pulse amplifier means for amplifying the signals received from the transducer, and indicator means for indicating the signals transmitted to and received from said transducer; the improvement wherein

said pulse generator is closely connected to said transducer within the same housing to provide an oscillating unit, said pulse generator dissipates relatively low power, and said oscillating unit is connected to the first end of said transmitting cable; said capacitive means of said pulse generator has a reactance substantially equal to the reactance of said crystal transducer at the resonant frequency of said transducer; and said pulse generator includes resistive means having a magnitude matching the impedance of said cable to said transducer, and voltage limiting means, said resistive means and said voltage limiting means being coupled across said transducer.

4,004,166

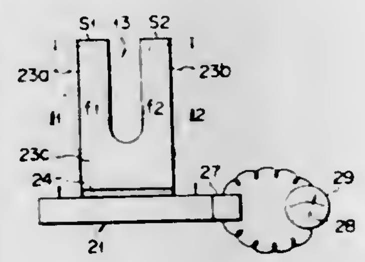
METHOD FOR STABILIZING THE VIBRATION FREQUENCY OF A TUNING FORK-TYPE QUARTZ CRYSTAL OSCILLATOR

Hozumi Nakata, Iruma, Japan, assignor to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1975, Ser. No. 557,523

Int. Cl.^{2} H01L *41/08*

U.S. Cl. 310—8.2 **3 Claims**



1. A method for stabilizing the vibration frequency of an oscillator which contains a tuning fork-type quartz crystal element comprising a pair of arms having mutually facing ends, each arm having a given size, and a common connecting section connecting the mutually facing ends of the paired arms,

the method comprising:

bonding only substantially the whole bottom surface of the common connecting section of said tuning fork-type quartz crystal element directly to a base member supporting the same by an adhesive agent;

mechanically vibrating the paired quartz crystal arms and sensing the amount of vibration energy leaking from the common connecting section of said quartz crystal element into the base member while the paired quartz crystal arms are mechanically vibrating; and

minimizing said leaking vibration energy by repeatedly adjusting the sizes of the paired quartz crystal arms.

4,004,167

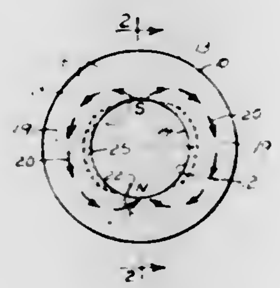
PERMANENT MAGNET STATORS

John H. Meckling, Altamonte Springs, Fla., assignor to Magna Motors Corporation, Altamonte Springs, Fla.

Filed Jan. 29, 1975, Ser. No. 545,173

Int. Cl.^{2} H02K *21/06*

U.S. Cl. 310—154 **6 Claims**



1. A stator for a dynamoelectric machine comprising a one piece annular member having an axis and a hollow extending along the axis for the reception of a rotatable member of the machine, said annular member having inner and outer peripheral surfaces which are radially offset from said axis and radially spaced apart, said annular member comprising magnetically anisotropic particles of magnetically attractable ferrite material which are embedded in a matrix of hardened synthetic plastic material, said particles being magnetically aligned and permanently magnetized along a return flux path that extends in the member between arcuate pole faces which are of opposite polarity and circumferentially spaced apart at the inner peripheral surface of the annular member, said annular member having an arcuate region of substantially uniform concentration of said particles in the matrix material and which extends along the flux path and is continuous between said pole faces, said region being located radially outwardly of the inner peripheral surface in the arcuate space between said pole faces, and said member having another region in the arcuate space between said pole faces and which is located between said arcuate region and the inner peripheral surface, such other region having a concentration of said particles which is less than the concentration thereof in said arcuate region.

4,004,168

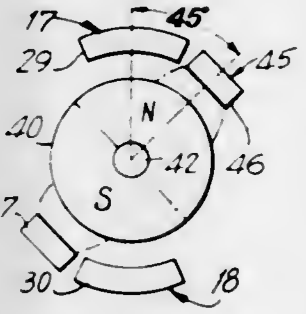
ELECTRIC ROTATING MACHINE

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Aug. 8, 1974, Ser. No. 495,928

Int. Cl.^{2} H02K *7/118*

U.S. Cl. 310—41 **12 Claims**



1. An electric rotating machine comprising, in combination:

a permanent magnet rotor having a plurality of rotor poles of opposite magnetic polarity;

pole piece means including a pair of salient stator poles in magnetic flux relationship with the rotor, the stator poles being provided with integral extensions which form the electrical terminals of the machine;

winding means for energizing the salient stator poles with magnetic flux, so that a given moment the stator poles are of opposite magnetic polarity;

means defining a return path of given reluctance for the stator pole flux; and

detend means including a pair of auxiliary pole members in magnetic flux relationship with the rotor and a magnetic return path having a reluctance lower than the given reluctance of the stator pole flux return path, each of the auxiliary pole members being angularly spaced in a given direction from an adjacent stator pole, the rotor being adapted consistently to assume a position, when the winding means is de-energized, in which each rotor pole is opposite one of the auxiliary pole members and is angularly spaced from the stator poles, said rotor consistently starting in said given direction when the winding means is energized.

4,004,169

HOLDER FOR ANCHORING LEADS TO DYNAMOELECTRIC MACHINES

Thomas Charlton, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 23, 1975, Ser. No. 570,891

Int. Cl.^{2} H02K *11/00*

U.S. Cl. 310—71 **6 Claims**

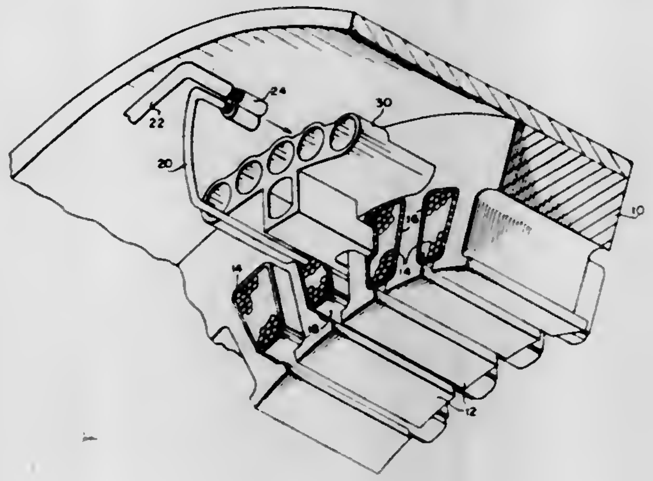
1. In a dynamoelectric machine having a stator core with a plurality of teeth between which are supported insulated con-

ductors forming a stator winding, the improvement comprising:

an insulating holder for supporting and anchoring a metallic connection member that joins the insulated wire conductor of the stator winding and a lead-in conductor;

said holder including a body with a plurality of openings therein, each of said openings being defined by a closed band of material at the entrance thereto and a slotted band of material adjacent said closed band, said slotted band terminating with a locking shoulder extending transversely into said opening for anchoring in place said connection member by pressure against the rearward surface thereof upon occurrence of a force tending to pull said conductors and connection member from said opening;

and means for securing said holder directly to the stator core.



4,004,170

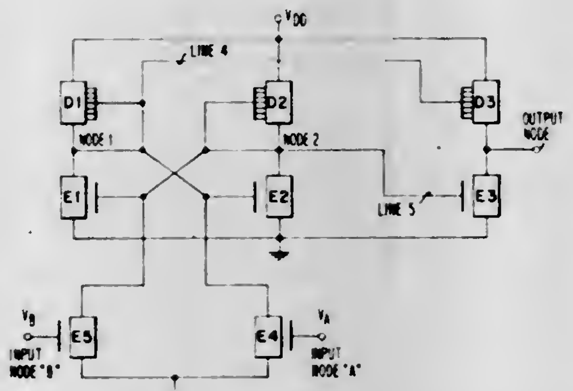
MOSFET LATCHING DRIVER

John David Henke, Catlett, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,761

Int. Cl.^{2} H03K *3/286, 3/353, 5/20, 17/56*

U.S. Cl. 307—279 **3 Claims**



1. A MOSFET latching driver circuit having a predetermined down-voltage level and a symmetrical rise-time and fall-time in its output signal waveform and a predetermined level of noise immunity, comprising:

a first depletion mode FET device serving as a load and having a drain connected to a supply voltage and a gate and a source connected to a first node;

a first enhancement mode FET device having a drain connected to said first node, a source connected to a ground potential, and a gate connected to a second node;

a second depletion mode device serving as a load and having a drain connected to said supply voltage and a gate and a source connected to said second node;

a second enhancement mode FET device having a drain connected to said second node, a source connected to said ground potential, and a gate connected to said first node;

said first and second enhancement mode and said first and second depletion mode devices comprising a bistable latching circuit;

said first depletion mode FET device and said first enhancement mode FET device having substantially the same predetermined ratio of gate width-to-length ratios as that for said second depletion mode device and said second enhancement mode device, imparting to said bistable circuit a predetermined noise immunity;

a third depletion mode FET device having a drain connected to said supply voltage, a source connected to an output node, and a gate connected to said first node;

a third enhancement mode FET device having a drain connected to said output node, a source connected to said ground potential, and a gate connected to said second node;

said third enhancement and third depletion mode devices comprising a push-pull driver circuit;

said gates of said third depletion mode and third enhancement mode FET devices having a predetermined ratio of width-to-length ratios to enable the generation of an output signal waveform having a predetermined down-voltage level by said push-pull driver circuit;

said gate of said first depletion mode FET device having a predetermined different area dimension from that of said second depletion mode FET device and said gate of said first enhancement mode FET device having a predetermined different area dimension from that of said second enhancement mode FET device to provide a predetermined different magnitude of charging current to said gate of said third depletion mode FET device, with respect to the magnitude of charging current to said gate of said third enhancement mode FET device, to compensate for a difference in the gate capacitance of said third enhancement mode and third depletion mode FET devices, thereby enabling the generation of an output signal waveform having a symmetrical rise-time and fall-time.

4,004,171

GAS-AND/OR VAPOR DISCHARGE LAMP

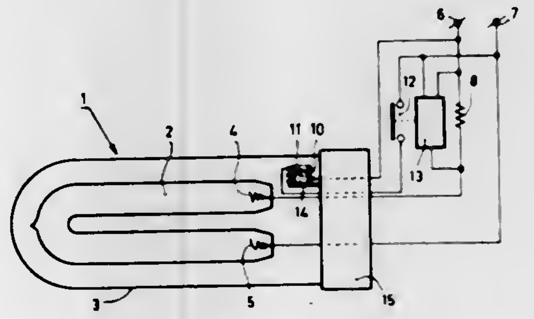
Jean Johan Heuvelmans; Hendricus Franciscus Joannes Jacobus van Tongeren, and Jan Evert Van der Werf, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,827

Claims priority, application Netherlands, Apr. 1, 1975, 7503825

Int. Cl.^{2} H01J *61/24*

U.S. Cl. 313—15 **4 Claims**



1. Gas and/or vapour discharge lamp provided with a discharge tube and an outer bulb which envelops this tube, means being present to change the heat insulation in the space between the discharge tube and the outer bulb, characterized in that this means consists of a reversible hydrogen getter which is located in the space between the discharge tube and the outer bulb of the lamp, whereby this getter releases hydrogen if its temperature increases and absorbs hydrogen if its temperature decreases.

4,004,172

GAS DISCHARGE ELECTRON GUN FOR GENERATING AN ELECTRON BEAM BY MEANS OF A GLOW DISCHARGE

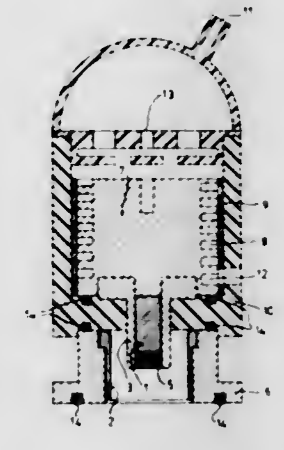
Theodorus Maria Berendina Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,615

Claims priority, application Netherlands, May 27, 1974, 7407059

Int. Cl.^{2} H01J *17/04*

U.S. Cl. 313—217 **7 Claims**



1. A gas discharge electron gun for generating an electron beam by means of a glow discharge, comprising, within an envelope, means to produce a gaseous ionizable medium, a tubular anode defining two open ends, a cathode arranged coaxially with said anode and having an active surface from which electrons are released by secondary emission in such a quantity as to form a beam composed mainly of the secondary electrons, and a conductive sleeve connected to said cathode around said active surface and projecting toward an open end of said anode.

4,004,173

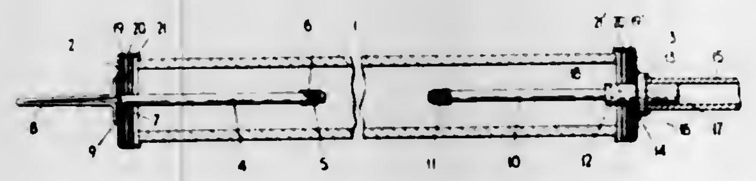
NIOBIUM ALUMINA SEALING AND PRODUCT PRODUCED THEREBY

Sydney Alfred Richard Rigden, 28, Wayside Avenue, Bushey Heath, Hertfordshire, England

Filed Dec. 27, 1965, Ser. No. 516,345

Int. Cl. H01j *5/04*

U.S. Cl. 313—317 **6 Claims**



1. A sodium vapor electric discharge lamp having a discharge envelope consisting of a tube formed of light-transmissive sintered polycrystalline alumina, which tube is closed at each end by a niobium closure member carrying an electrode, said closure member being fitted over the open end of the tube and hermetically bonded to the end surface of the tube by alloying of niobium of the closure member with a bonding medium consisting of an alloy of titanium, vanadium and zirconium in the proportions of 68% zirconium, 14% vanadium and 18% titanium by weight.

4,004,174

ROTARY ANODE STRUCTURE FOR AN X-RAY TUBE

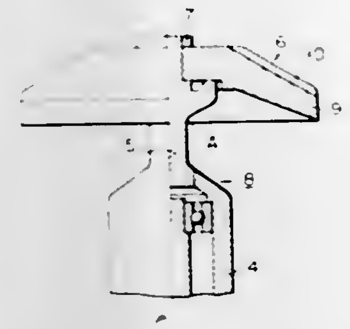
Hideo Yashiro, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 520,228

Claims priority, application Japan, Nov. 2, 1973, 48-122894

Int. Cl.^{2} H01J *35/08*

U.S. Cl. 313—330 **10 Claims**



1. A rotary anode structure for an X-ray tube comprising a rotary target including a substrate and an electron receiving layer, said substrate being made of a Mo based alloy containing in an amount of 0.5 to 2.0% by weight a metal therefor selected from the group consisting of titanium, zirconium and a mixture thereof, said electron receiving layer being made of one selected from the group consisting of tungsten and a W based alloy in which said alloy forming the substrate further includes silicon and potassium in an amount of 0.05 to 0.015% by weight.

4,004,175

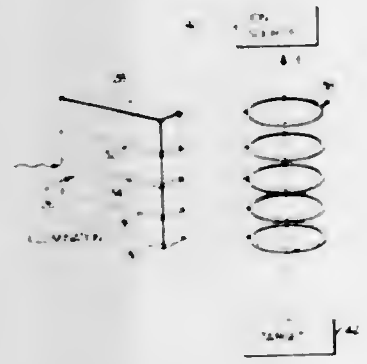
HIGH VOLTAGE PARTICLE ACCELERATOR UTILIZING POLYCRYSTALLINE FERROELECTRIC CERAMIC MATERIAL

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 533,365, Dec. 16, 1974, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Dec. 9, 1975, Ser. No. 639,023

Int. Cl.^{2} H05H *5/00*

U.S. Cl. 313—360 **6 Claims**



1. In an apparatus for accelerating charged particles including means for generating a high voltage electric field, a source of charged particles which are accelerated through said field, and a target towards which said accelerated particles are directed, the improvement wherein said means for generating a high voltage electric field comprises a substrate of a polycrystalline ferroelectric ceramic material, said substrate having been electrically polarized by the application thereacross of a voltage pulse such that said substrate displays a remanent polarization; and a source of electromagnetic radiation impinging upon the material of said substrate, whereby said substrate produces said high voltage electric field.

4,004,176

STRIPE-SHAPED COLOR SEPARATION FILTER FOR IMAGE PICKUP TUBE AND METHOD FOR MANUFACTURING THE SAME

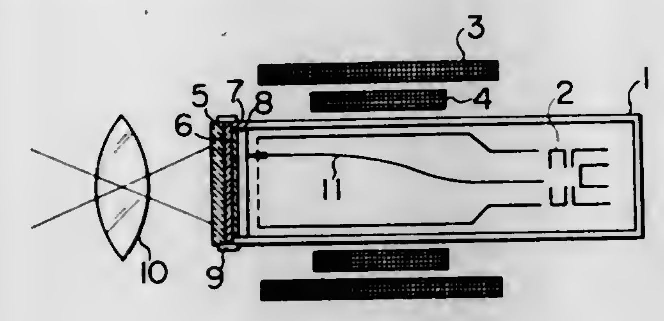
Mitsuru Otake, and Saburo Nobutoki, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 21, 1973, Ser. No. 399,745

Claims priority, application Japan, Oct. 16, 1972, 47-102672; Oct. 16, 1972, 47-102673

Int. Cl.² H01J *29/36*

U.S. Cl. 313—371 **31 Claims**



1. A stripe-shaped color separation filter for use with an image pickup tube comprising a transparent substrate serving as a window of said image pickup tube, a first group of spaced filter elements provided at predetermined positions on said substrate for preventing light of a first color from passing therethrough, and a second group of spaced filter elements provided at predetermined positions on said first group of filter elements in partially superimposed relationship for preventing light of a second color from passing therethrough, and a layer of a transparent material transparent to substantially all light provided on and between said filter elements, said layer having a surface thereof which is flat enough to be practical for use with said image pickup tube.

4,004,177

TELEVISION CAMERA TUBE TARGET SUPPORT

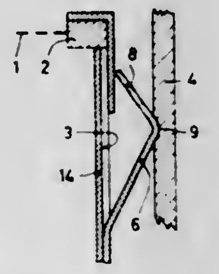
Jan Otto van Hattum, and Willem Antonius Maria Hamersma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,316

Claims priority, application Netherlands, July 25, 1974, 7410035

Int. Cl.² H01J *29/02, 31/38*

U.S. Cl. 313—390 **3 Claims**



1. A television camera tube comprising an evacuated envelope which is substantially cylindrical and has in one end an electron gun and at the other end a face plate with a photosensitive layer, in front of which layer an electrode is provided which is secured to a cylindrical sleeve which is supported in the envelope by means of resilient elements, which resilient elements are secured to the said cylindrical sleeve with one end and have such a bent shape that they press against the cylindrical sleeve with their other end, a bent part of the resilient elements between the two ends forming a point of contact which presses against the wall of the envelope, and the longitudinal orientation of the resilient elements being substantially parallel to the axis of the cylindrical sleeve and the length of the resilient elements being larger than half the length of the cylindrical sleeve, the said points of contact forming bends which engage in a recess in the wall of the envelope.

4,004,178

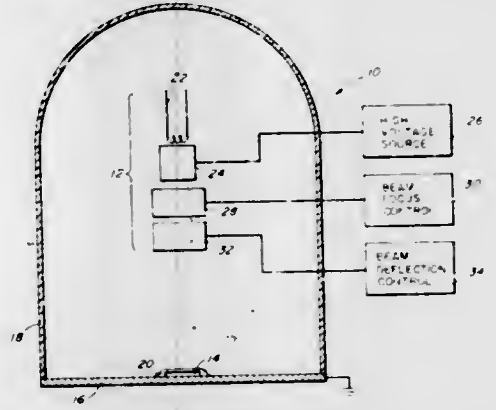
WHITE LIGHT SOURCE

Leslie A. Riseberg, Sudbury; Alexander Lempicki, Wayland; Charles Brecher, Lexington, and Herman O. Dressel, Lynnfield, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 3, 1974, Ser. No. 511,896

Int. Cl.² H01J *29/20*

U.S. Cl. 313—468 **9 Claims**



1. A source of white light comprising
a low voltage electron beam source,
a grounded anode plate toward which the low voltage electron beam is directed,
means for controlling the geometry of the low voltage electron beam on the anode, and
a quantity of material having the general formula MP_5O_{14} disposed on and in electrical contact with the anode plate at the intersection of the low voltage beam, where M is a trivalent metallic ion selected from the group consisting of: lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, yttrium, and mixtures of a plurality thereof, the material thereby emitting light in a broad spectral continuum centered in the visible portion of the electro-magnetic spectrum and exclusive of any emission associated with a transition of the trivalent metallic ion involving electrons of its 4f shell.

4,004,179

SLOW WAVE CIRCUIT HAVING SERIALLY CONNECTED CONTRAWOUND TWO-TURN HELICES

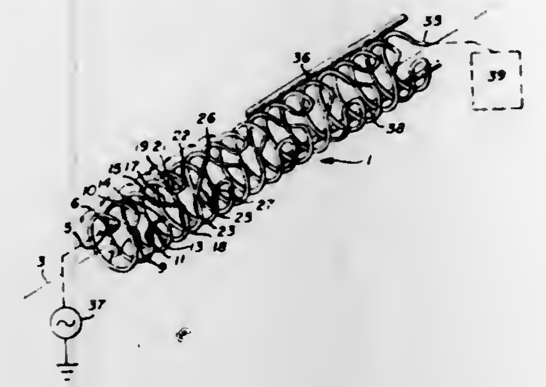
Robert Matthews Phillips, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Oct. 20, 1975, Ser. No. 623,718

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **20 Claims**

1. In combination with a microwave frequency apparatus, the slow wave structure comprising: an electrically conductive wire formed into a plurality of serially connected helices of two turns each, said helices located along a common axis;
and wherein intermediate ones of said helices extend around about said common axis in a clockwise direction and alternate ones of said helices extend around about said common axis in a counterclockwise direction to provide a series electrically conductive microwave energy propagating path that progresses serially through said helices.



4,004,180

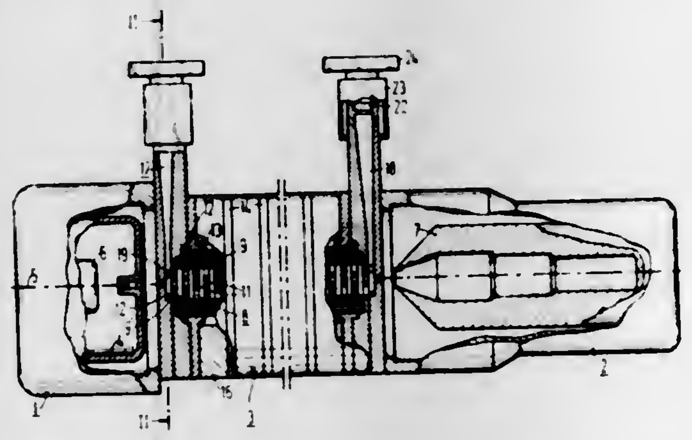
TRAVELING WAVE TUBE WITH RECTANGULAR COUPLING WAVEGUIDES

Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 9, 1975, Ser. No. 585,079

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **11 Claims**



1. In a traveling wave, particularly high-efficiency traveling field tubes having a magnetic system for the bundled guidance of an electron beam, which system surrounds a delay line comprising line cells arranged one behind the other, separated from one another by transverse walls, each of which is provided with an opening therein for the passage of the electron beam, and a coupling opening therein extending substantially in circumferential direction, with the delay line coupled, at least at one of its frontal sides with a rectangular hollow conductor whose broad side, adjacent the longitudinal axis of the delay line (line axis), extends perpendicular thereto, and which conducts at a right angle with respect to the line axis, the combination of the hollow rectangular conductor, preferably employed in connection with a spatial periodic permanent magnet system (PPM System), without loading, which has the opposite transverse walls of minimum spacing and greatest width tapering in a direction toward the delay line, with the spacing between such walls at the delay line being approximately that between adjacent transverse walls defining the respective cells, the opposite longitudinal side walls of maximum spacing and least width having opposed, inwardly directed projections forming a shield, the transverse wall of said conductor adjacent said delay line having a coupling opening therein whose open angle, with respect to the line axis is larger than the corresponding angle of the coupling openings in the transverse walls of adjacent line cells, and having the following dimensions:

$$0.1\ \lambda_o < a < 0.15\ \lambda_o$$
$$0.07\ \lambda_o < b < 0.12\ \lambda_o$$
$$0.22\ \lambda_o < c < 0.3\ \lambda_o$$
$$0.04\ \lambda_o < d < 0.07\ \lambda_o$$
$$0.22\ \lambda_o < e < 0.3\ \lambda_o$$
$$\alpha < \alpha_1 < 1.2\ \alpha$$

in which
a = thickness of the shield projections
b = width of the shield projections
c = the distance between the end wall of the hollow conductor and the remote wall of the shield projections
d = the distance between the shield projections and the coupling opening, the corner points of the arcuate shaped coupling opening remote from the line axis
e = the distance between the line axis and the remote edge of the coupling opening
α_1 = the open angle of the coupling opening at the hollow conductor
α = the open angle of the remaining coupling openings in the cell walls
λ_o = the wavelength and free space corresponding to the mean operational frequency of the traveling field tube.

4,004,181

HYPERFREQUENCY RESONANT SYSTEM FOR ACCELERATING A CHARGED PARTICLE BEAM AND A MICROTON EQUIPPED WITH SUCH A SYSTEM

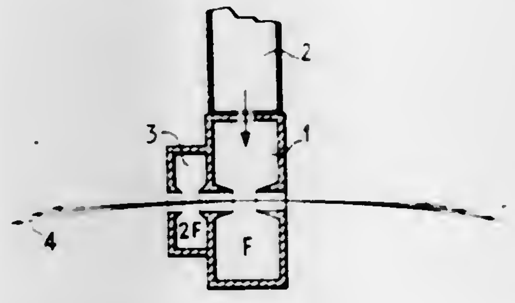
Jacques Kervizic, and Duc Tien Tran, both of Paris, France, assignors to C.G.R.-Mev., Paris, France

Filed May 6, 1975, Ser. No. 574,944

Claims priority, application France, May 10, 1974, 74.16201

Int. Cl.² H01J *25/10*

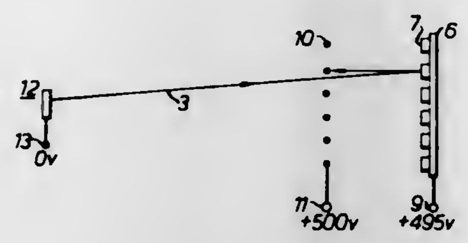
U.S. Cl. 315—5.41 **5 Claims**



1. A hyperfrequency resonant system for producing a charged electron beam in a microtron accelerator, said particle beam having substantially circular paths whose radii increase with each transit of said beam through said resonant system, said resonant system which is disposed along said beam comprising at least a plurality of first resonant cavities fixed with respect to each other tuned at a fundamental frequency F and excited at said frequency F by means of an external electromagnetic energy source, said first resonant cavity being disposed along the beam axis associated with a resonant element tuned to the harmonic frequency 2F and disposed along said beam axis and fixed with respect to said first cavities, said resonant element being excited at frequency 2F by means of said beam, the particles of which are bunched after the first passage of said beam through said resonant system.

4,004,182
OPERATION OF STORAGE TUBES HAVING SECONDARY ELECTRON EMISSIVE TARGETS

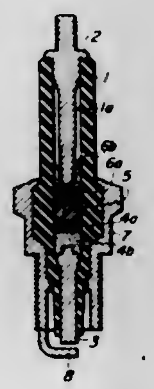
Ralph Desmond Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England
Filed May 1, 1975, Ser. No. 573,742
Claims priority, application United Kingdom, May 2, 1974, 19229/74
Int. Cl.² H01J *29/41*
U.S. Cl. 315—12 R **5 Claims**



1. A method of operating an image storage tube in which secondary electrons emitted from a secondary electron emissive target when scanned by a beam of electrons originating from an electron gun are influenced by a potential on a mesh electrode positioned between the target and the electron gun, including the steps of writing information in the form of a charge pattern onto said target by superimposing a voltage representative of said information onto a constant bias voltage applied to said target whilst said target is scanned by an electron beam of constant intensity, the value of the bias voltage with respect to the electron gun potential being such that the target exhibits a secondary electron emission ratio of less than unity, and the steps of erasing the written information, as and when required, by applying a constant bias potential to the target, the value of which is sufficiently positive with respect to the cathode potential of the electron gun as to produce a secondary electron emission ratio of greater than unity when the target is scanned, whilst a constant bias potential is applied to the said mesh electrode.

4,004,183
RESISTOR BUILT-IN SPARK PLUG

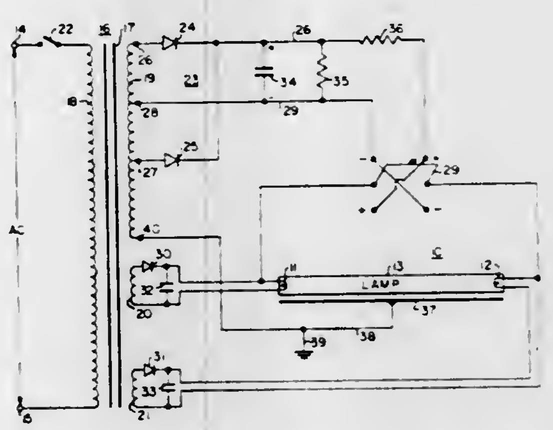
Masami Oki, Nagoya; Masatoshi Suzuki; Yasuo Nakamura, both of Kariya; Osami Kamigaito, and Hideyuki Masaki, both of Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Japan
Filed Apr. 30, 1975, Ser. No. 573,326
Claims priority, application Japan, May 10, 1974, 49-52710
Int. Cl.² H01T *1/16*
U.S. Cl. 315—58 **3 Claims**



1. A resistor built-in spark plug comprising:
an insulator provided with an axially extending bore;
a terminal nut fitted in the upper end portion of said bore;
a center electrode fitted in the lower end portion of said bore;
a resistor arranged in the central portion of said bore;
copper glass electrode layers respectively interposed between said resistor and said terminal nut, as well as between said resistor and said center electrode, wherein said resistor is made of a calcined and solidified resistor powder mixture which consists of 30 to 10 volume % of a principal resistor component powder containing tin oxide, 35 to 85 volume % of an insulating ceramic filler powder having a relatively high resistivity as compared with said principal resistor component powder, and 35 to 5 volume % of a glass powder having a softening temperature in range between 300° to 600° C; and between said resistor and said copper glass electrode layer contacting said terminal nut a copper glass electrode layer having a higher content of copper than that of said copper glass electrode layer contacting said terminal, and between said resistor and the other said copper glass electrode layer contacting said center electrode a copper glass electrode layer also having a higher content of copper than that of said copper glass electrode layer contacting said center electrode.

4,004,184
APPARATUS FOR OPERATING GASEOUS DISCHARGE LAMPS ON DIRECT CURRENT FROM A SOURCE OF ALTERNATING CURRENT

Henry Whitfield Ott, Sarasota, Fla., assignor to John Ott Laboratories, Inc., Sarasota, Fla.
Division of Ser. No. 443,825, Feb. 19, 1974, Pat. No. 3,890,540. This application June 6, 1975, Ser. No. 584,400
The portion of the term of this patent subsequent to June 16, 1992, has been disclaimed.
Int. Cl.² H05B *41/16*
U.S. Cl. 315—101 **2 Claims**

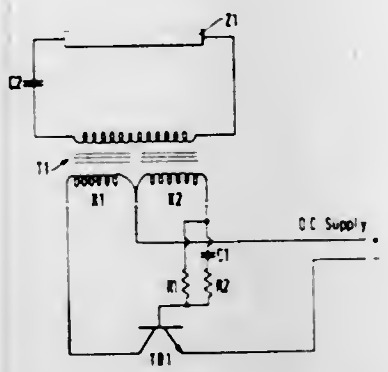


1. Apparatus for operating a gaseous discharge lamp from an AC power source so as to provide flickerless operation of the lamp, said lamp having a pair of electrodes across which a voltage is applied to start and operate the lamp and a filament heater associated with at least one of said electrodes, said apparatus comprising:

a. rectifier means having an input circuit connected to be energized by said AC power source and an output circuit connected to the lamp electrodes for operating the lamp on a DC current flowing between the electrodes,
b. a heater circuit adapted to be energized from said AC power source for supplying heater current continuously during operation of the lamp to said heater independently of the current flowing between the lamp electrodes, and
c. additional rectifying means for rectifying the current in the heater circuit whereby DC is supplied to said heater to prevent flicker of said lamp during operation.

4,004,185
ELECTRIC LIGHTING SYSTEMS

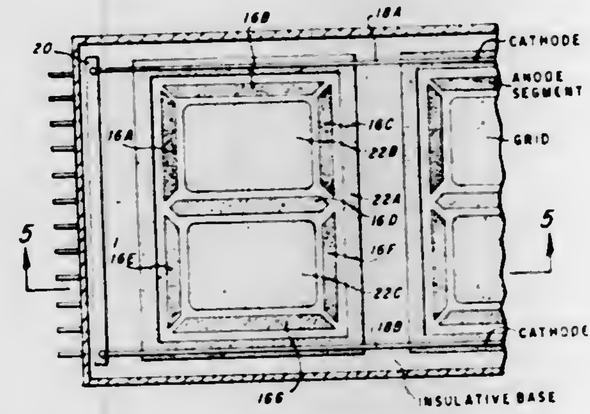
Harry Edmondson, and Walter Whittaker, both of Burnley, England, assignors to E. W. Controls Limited, Burnley, England
Filed Apr. 25, 1975, Ser. No. 571,509
Claims priority, application United Kingdom, Apr. 27, 1974, 18558/74
Int. Cl.² H05B *41/29*
U.S. Cl. 315—105 **10 Claims**



1. A method of lighting a cold cathode electric gas discharge lamp having a length of at least one foot, comprising connecting the lamp across the secondary winding of a voltage step-up transformer, energizing the primary winding of the transformer with a chopped D.C. voltage having a frequency of at least 12 kHz and a voltage which provides an output voltage from the secondary winding of the said transformer having an R.M.S. value no greater than 700 volts.

4,004,186
VACUUM FLUORESCENT DISPLAY HAVING A GRID PLATE COPLANAR WITH THE ANODE

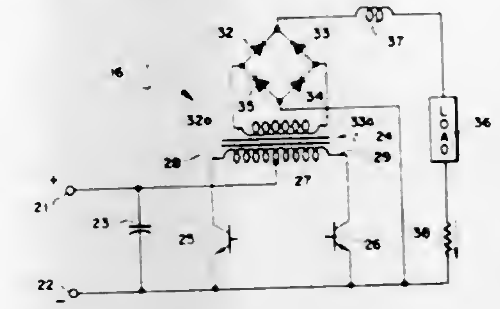
Ernest Gerald Bylander, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 1, 1975, Ser. No. 636,471
Int. Cl.² H01J *1/72, 63/06;* **H05B** *37/02*
U.S. Cl. 315—167 **7 Claims**

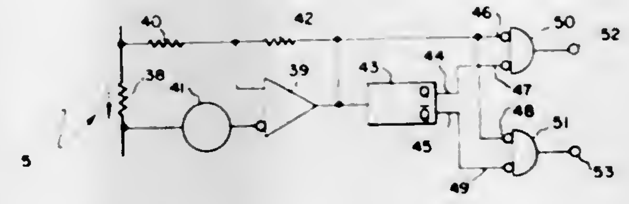


1. A character indicating tube comprising an evacuated envelope having at least one transparent side portion; an insulating base mounted within said envelope; at least one pattern of anode segments mounted on said insulating base for displaying a character, each of said anode segments having a phosphor coating thereon, said phosphor coating facing said transparent side portion; a control electrode insulated from and substantially laterally surrounding said anode segments, said control electrode being substantially coplanar with said anode segments; at least one cathode mounted in said envelope in the space between said transparent side portion and said insulating base, said at least one cathode being disposed such that the distance separating said at least one cathode and said control electrode is less than the distance separating said at least one cathode and any of said anode segments.

4,004,187
PUSH-PULL INVERTER BALLAST FOR ARC DISCHARGE LAMPS

Loren H. Walker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 516,788, Oct. 24, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,687
Int. Cl.² H05B *37/00*
U.S. Cl. 315—205 **16 Claims**





1. A push-pull ballast for an arc discharge lamp for operation from a power source either higher or lower in voltage than said lamp operating voltage comprising:
push-pull high frequency inverter means adapted to be connected to a source of unfiltered, pulsating d.c. power, said inverter means including a transformer having a center tapped primary winding and a secondary winding, a pair of controllable solid state switching devices, capable of being turned ON and OFF, said devices connected to said primary winding to cause current to flow therein, and rectifier means operatively associated with said secondary winding and a capacitor connected across said source of pulsating d.c. power, having a high impedance at the frequency of said pulsating d.c. power and low impedance at the frequency of said high frequency inverter, providing substantially no filtering at said frequency of said pulsating d.c. power,
means providing a signal proportional to the instantaneous current through the lamp, and
a control circuit, including means generating a variable reference signal, comparator means responsive to said reference signal and said signal proportional to said instantaneous current for providing an output signal when said signal proportional to said instantaneous current exceeds said reference signal by a preselected amount and means responsive to said output signal for controlling current flow alternately through each of said switching devices so that each period of conduction of one of said devices is followed by a period during which neither device is conducting and further for causing each period of conduction to terminate in response to said output signal so that said instantaneous current varies in accordance with said reference signal.

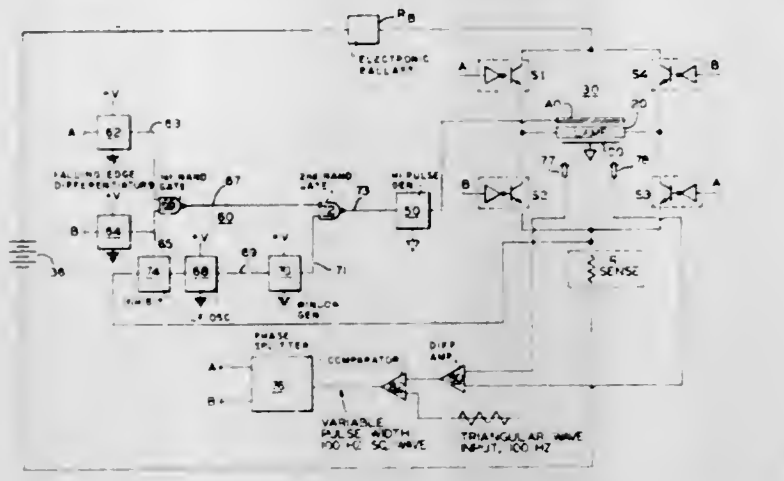
4,004,188
STARTING CIRCUIT FOR INVERTER OPERATED GASEOUS DISCHARGE LAMPS

Robert C. Cooper, Fort Wayne, Ind., assignor to General Electric Company, Carmel, Ind.
Filed Sept. 26, 1975, Ser. No. 617,014
Int. Cl.² H05B *41/22*
U.S. Cl. 315—261 **16 Claims**

1. In an electrical circuit having a semiconductor switching

inverter responsive to alternating polarity drive signals for the alternating polarity operation of a gaseous discharge lamp from a DC energy source, a circuit arrangement for starting the lamp while in the inverter circuit, comprising:

a starting aid electrode mounted in close proximity to the lamp for capacitively coupling pulse high voltage to the lamp;



a high voltage source having an output connected to the starting aid electrode for supplying a high voltage pulse to the lamp to effect starting thereof by ionization; and

means for synchronizing application of the high voltage pulse to the starting aid electrode with the turn-on of either polarity of the switching inverter while in the running inverter mode.

4,004,189

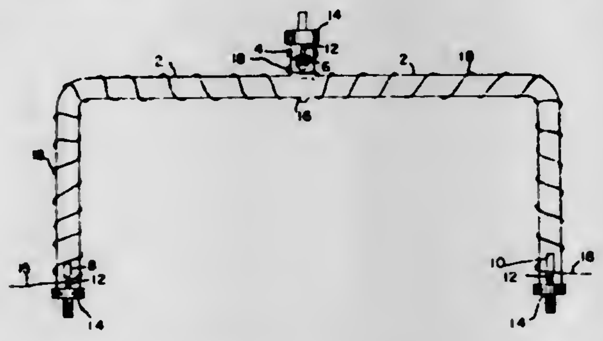
THREE-ELECTRODE SHORT DURATION FLASH TUBE

Robert J. Cosco, Amesbury; John A. Pappas, Winthrop, and Thomas A. Brewin, Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Salem, Mass.

Continuation of Ser. No. 528,826, Dec. 2, 1974, abandoned. This application June 7, 1976, Ser. No. 693,580

Int. Cl.² H01J *61/06, 61/16, 61/30;* **H05B** *41/30*

U.S. Cl. 315—335 **17 Claims**



1. A flash tube comprising:

an elongated, light-transmitting tubular envelope which is hermetically sealed;

a rare gas in said envelope;

a pair of anode electrodes in said envelope, one disposed at each end thereof;

a cathode electrode disposed in said envelope between said anode electrodes, said cathode being common to both of said anodes to thereby provide two discharge paths; and

means for providing external triggering of both of said discharge paths whereby two separate arc discharge paths are simultaneously defined through respective portions of said envelope between the common cathode and respective anodes during operation of said flash tube, whereby a shorter flash duration is provided for a flash tube envelope of given length.

4,004,190

ELECTRICAL AMPLIFIERS

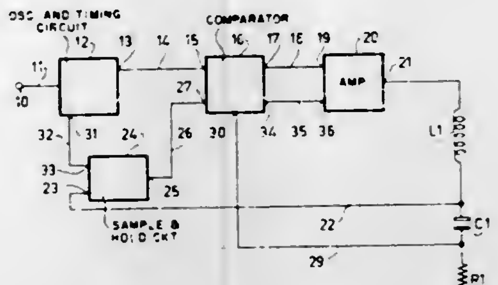
Bryan John Simpson, Selmeston near Polegate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,127

Claims priority, application United Kingdom, May 13, 1974, 20989/74

Int. Cl.² H01J *29/70*

U.S. Cl. 315—403 **9 Claims**



1. A field deflection circuit for television display apparatus having a deflection coil, said circuit comprising main amplifier means having a first input means for receiving a deflection waveform signal, second and third control input means, and an output means for coupling to said deflection coil, a first negative feedback means for feeding a signal proportional to the current through said deflection coil for said second control input of said amplifier, and said second negative feedback means for feeding a signal proportional at a given time to the output voltage of said amplifier to said third control input of said amplifier; said second feedback means comprising means for sampling said voltage at said given time during each cycle of said deflection waveform, and means for producing a feedback signal proportional to said sampled voltage, said feedback signal remaining substantially constant during the remainder of each cycle of said deflection waveform.

4,004,191

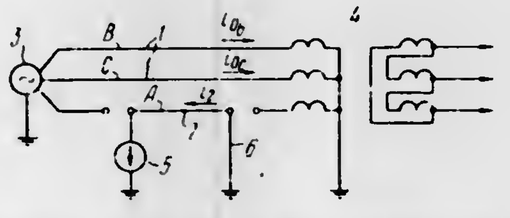
METHOD OF REDUCING CURRENT UNBALANCE IN A THREE-PHASE POWER TRANSMISSION LINE OPERATING WITH ONE FAULTY PHASE

Jury Fedorovich Koroljuk, ulitsa Tankovaya, 67, kv. 77; Lidia Petrovna Scherbakova, ulitsa Uchitelskaya, 32, kv. 3, both of, Novosibirsk; Jury Andreevich Vakulenko, ulitsa Chernyshevskogo, 132a, kv. 55, Saratov; Vladimir Nikolaevich Matrosov, ulitsa Pasadskogo, 276, kv. 3, Saratov; Viktor Demyanovich Rud, ulitsa 20 let VLKSM, 103, kv. 2, Saratov; Timofei Vasilievich Chelyshev, ulitsa Pasadskogo, 272/274, kv. 33, Saratov; Vyacheslav Viktorovich Shabashov, ulitsa Pasadskogo, 215, kv. 209, Saratov; Vladislav Vasilievich Shubnikov, ulitsa Pasadskogo, 215, kv. 167, Saratov, and Vadim Lvovich Schedrikov, ulitsa Rabochaya, 10, kv. 25, Saratov, all of U.S.S.R.

Filed May 2, 1975, Ser. No. 573,996

Int. Cl.² H02H *7/22*

U.S. Cl. 317—9 PF **5 Claims**



1. A method for reducing current unbalance in the electric system of a three-phase A.C. power transmission line operating in an incomplete phase regime using the wires of the line and transformers electrically coupled thereto, comprising the following steps:

providing an electric closed loop circuit comprising the line operating in the incomplete phase regime, a wire insulated from ground and disposed parallel to said line along the whole length thereof, and the neutrals of said transformers;

connecting into the provided electric closed loop circuit a source of alternating voltage in phase with the electric system to which said line is connected; and

selecting the corresponding phase and value of voltage of said source to obtain an increase of current flowing through the neutrals of said transformers, resulting in decreased current unbalance in the electric system.

4,004,192

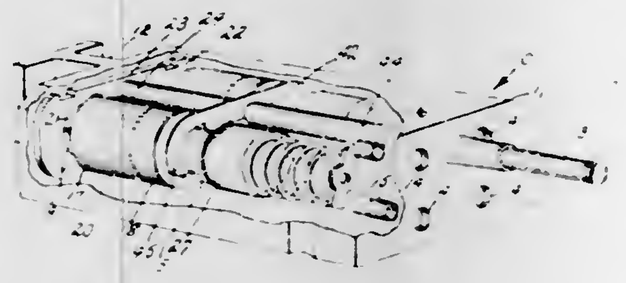
PROTECTOR MODULE FOR TELEPHONE SYSTEMS

William V. Carney, Valley Stream, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,508

Int. Cl.² H02H *3/22*

U.S. Cl. 317—16 **2 Claims**



1. In a telephone line protective module having means for conducting excessive voltage surges through an arcing device to a source of ground potential, and heat-sensitive means for conducting excessive currents to said source of ground potential, said last mentioned means serving to by-pass said arcing device upon activation of said heat-sensitive means, the improvement comprising: said module including a shaft-like plunger, coil spring means urging said plunger in a given direction, external contact means communicating with said plunger and spring for conducting current through said spring and plunger during normal operation: a grounding prong having a principal axis parallel to that of said plunger, a laterally extending grounding plate mounted substantially at one end of said grounding prong; said arcing means being axially aligned with said plunger and positioned to contact a surface of said grounding plate for electrical conduction therethrough, a laterally-extending conductor member mounted medially upon said grounding prong and extending between said arcing means and said plunger, said laterally-extending conductor member normally being free of contact with said plunger; whereby actuation of said heat-sensitive means serves to move said plunger toward said arcing means, and clamp said laterally-extending conductor member therebetween to cause conduction from said plunger to said grounding prong.

4,004,193

VOLTAGE SURGE ARRESTER WITH CAPACITIVE GRADING AND IMPROVED SPARKOVER FOR FAST IMPULSES

Ronald M. Reckard, Pittsfield, Mass., assignor to General Electric Company

Filed Mar. 17, 1975, Ser. No. 558,789

Int. Cl.² H02H *3/22*

U.S. Cl. 317—70 **3 Claims**

1. A voltage surge arrester of the type having:

a plurality of control gap units, having substantially equal sparkover voltages for slow voltage impulses;

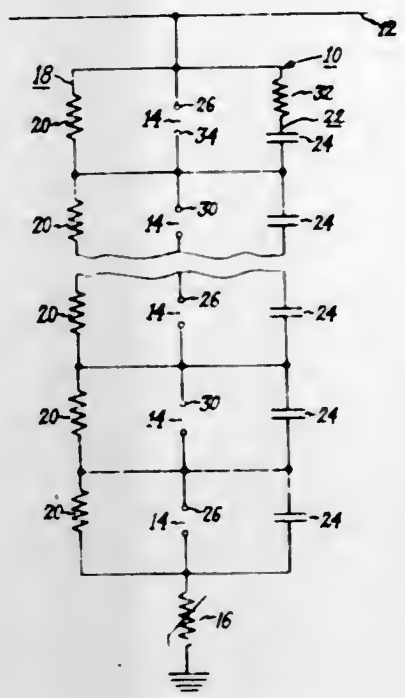
one or more varistor blocks connected in series with said gap units;

a series line of voltage grading resistors connected in parallel with said gap units, and

a series line of grading capacitor connected in parallel across successive individual units of said gap units,

wherein the improvement comprises:

at least one of said gap units also having individually connected in parallel with it, and in series with those of said



capacitors associated with said gap unit, a resistor having a substantially linear current-voltage characteristic

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4,004,194

MODULE FOR SUPPORTING CIRCUIT BOARDS

Karl Doerflinger; Hermann Renner, both of Munich, and Richard Theus, Wolfratshausen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

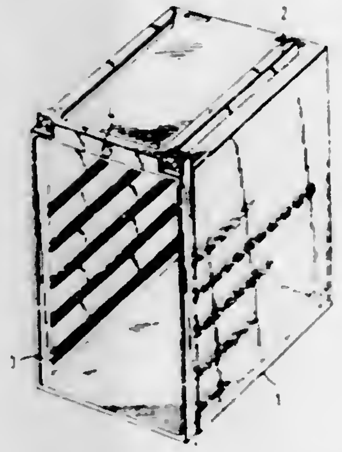
Filed Sept. 23, 1974, Ser. No. 508,639

Claims priority, application Germany, Sept. 27, 1972, 2348687

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² H05K *7/14*

U.S. Cl. 317—100 **5 Claims**



1. A module for supporting printed circuit boards therein comprising:

a top wall, a pair of side walls connected to said top wall, and a bottom wall connected to said side walls;

suspension means fixed to the outside surface of one of said walls for connecting said module into an assembly system;

support means mounted on the inside surface of said side walls for supporting printed circuit boards therein; and

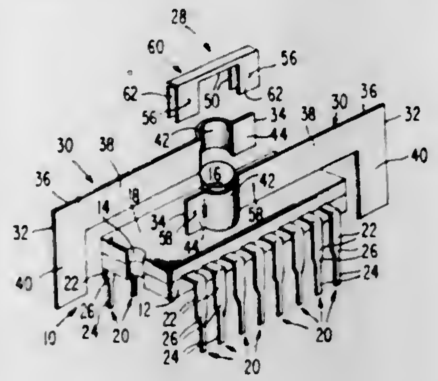
said module comprising an integral one piece unit of synthetic material, said synthetic material being metallized and having graphite incorporated therein.

4,004,195
HEAT-SINK ASSEMBLY FOR HIGH-POWER STUD-MOUNTED SEMICONDUCTOR DEVICE

George Michael Harayda, Middlesex, and Wayne Miller Austin, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,607
Int. Cl.^{2} H01L *23/40*

U.S. Cl. 317—100 **11 Claims**



1. A heat-sink assembly adapted for use with a semiconductor device adapted to be mounted on a circuit board and having a heat-conductive stud emerging from a surface of said device away from said circuit board comprising

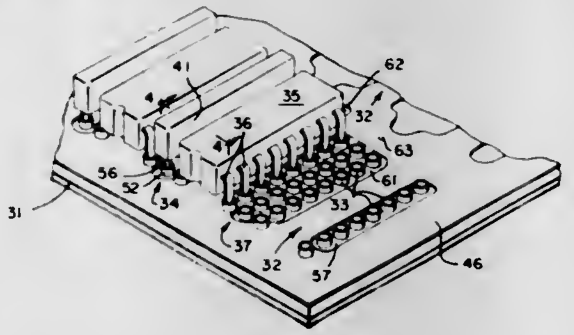
a heat-dispersing arm of heat-conductive material, said arm having one end thereof adapted for secure attachment to said circuit board, the other end thereof being shaped for semipermanent connection and thermal coupling to said stud, said arm being sufficiently bendable to allow displacement thereof from above said surface of said device for removal of said device from said circuit board after disconnecting said other end from said stud while keeping said one end securely attached to said circuit board.

4,004,196
MULTI-LAYER PANEL BOARD WITH SINGLE-IN-LINE PACKAGE FOR HIGH SPEED SWITCHING LOGIC

Leonard A. Doucet, Norton, Mass., assignor to Augat, Inc., Attleboro, Mass.

Filed Apr. 24, 1975, Ser. No. 571,429
Int. Cl.^{2} H05K *5/00*

U.S. Cl. 317—101 CC **13 Claims**



1. An improved multi-layer panel board comprising:

a first dielectric laminate;

a second dielectric laminate in face-to-face confronting relationship with said first dielectric laminate;

a first conductive plane located between said first and second dielectric laminates;

a second conductive plane on the outside of said second dielectric laminate;

a third conductive plane on the outside of said first dielectric laminate;

said panel board being formed with a plurality of dual-in-line arrays of holes therethrough, said arrays being arranged in regular parallel and end-to-end relationship over the surface of said panel board;

a plurality of single-in-line rows of holes adjacent of said dual-in-line arrays;

a socket contact mounted in each of said holes in said dual-in-line arrays of holes and in each of said single-in-line rows of holes, said socket contact having a socket projecting into said panel board from one side thereof and a contact pin extending from the opposite side of said panel board;

means connecting one of said conductive planes to at least one of said socket contacts in each of said single-in-line rows of holes; and

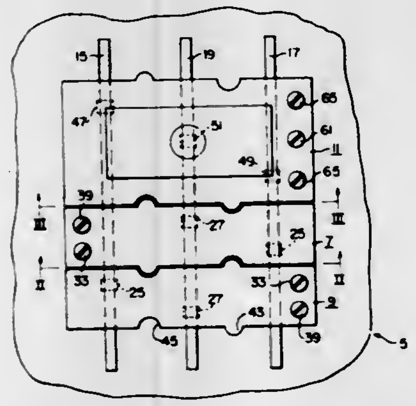
a single-in-line package having a row of electrical leads extending from one edge thereof, one of said leads being received in each of said sockets of said socket contacts in one of said single-in-line rows.

4,004,197
PANELBOARD AND CIRCUIT BREAKER COMBINATION

George F. Hawkes, Jr., La Palma, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 488,604, July 12, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,605
Int. Cl.^{2} H02B *1/04*, *1/20*

U.S. Cl. 317—119 **1 Claim**



1. A panelboard and circuit breaker combination comprising a panelboard having a pair of load bus bars and a neutral bus bar between the load bus bars, the load and neutral bus bars being coextensive and extending upright from one side of the panelboard, at least two circuit breakers mounted on the bus bars in side-by-side positions, one of the circuit breakers being releasably connected to the neutral bus bar and one of the load bus bars, the other of the circuit breakers being releasably connected to the neutral bus bar and the other of the load bus bars, each circuit breaker having a housing with a projection and a recess on each side, and the projection and recess of each circuit breaker being mutually interfitting with the corresponding recess and projection of an adjacent circuit breaker when the circuit breakers are properly connected with the bus bars.

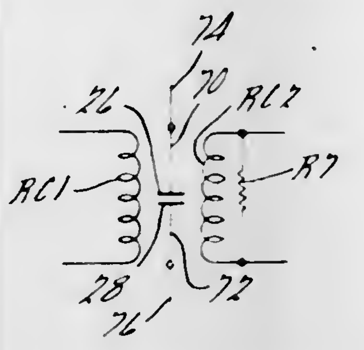
4,004,198
PRIMARY CONTROL SYSTEM FOR FURNACES AND METHOD OF MAKING THE SAME

Anthony C. Cairo, and Ronald E. Holkeboer, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 482,072, June 24, 1974, Pat. No. 3,905,748. This application June 18, 1975, Ser. No. 587,821
Int. Cl.^{2} H01H *47/00*

U.S. Cl. 317—155.5 **1 Claim**

1. The method of making a primary control system for furnaces which comprises the steps of providing a pair of resilient magnetic contact members, winding a pair of electrically insulated concentric coils with said coils having a differential in ampere turns, disposing said coils in encompassing relationship with respect to said contact members, measuring the flux generating capacity of at least one of said coils when a predetermined voltage is applied thereto, measuring and severing a length of resistance wire having a predetermined resistance per unit of length whereby when said severed wire is connected in parallel circuit across said one coil both said coils will have a predetermined flux generating capacity at a predetermined voltage sufficient to actuate said contact members, and thereafter electrically connecting said severed resistance wire to the opposite ends of said one coil.

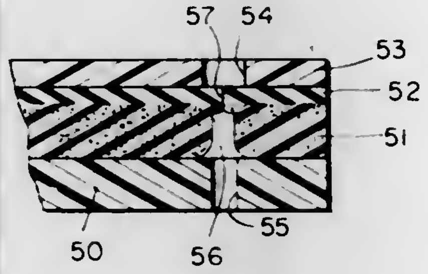


4,004,199
ELECTRICAL COMPONENT SEAL

Godfrey Roy Pearce; Kenneth Drew Beard, and Donald Lloyd Shively, all of Glasgow, Ky., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 369,279, June 12, 1973, which is a continuation of Ser. No. 136,542, April 22, 1971, which is a continuation of Ser. No. 810,972, March 27, 1969. This application May 6, 1975, Ser. No. 575,106
Int. Cl.^{2} H01G *9/00*

U.S. Cl. 317—230 **8 Claims**



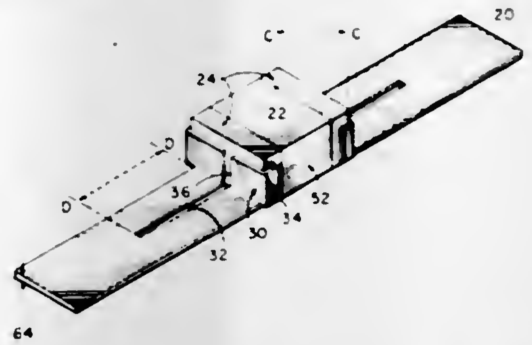
1. A seal means for closing the open end of means housing an electrical component, the seal means including a polymeric member adjacent the electrical component and having aperture means with spaced apart side walls provided therein, an uncured or incompletely cured elastomeric means adjacent the polymeric member, a cured elastomeric means adjacent the uncured or incompletely cured elastomeric means and having aperture means with abutting side walls capable of separating to open the aperture means and relieve elevated pressure associated with the electrical component and of abutting to close the aperture means when the elevated pressure is relieved and a rigid means adjacent the cured elastomeric means and having aperture means with spaced apart side walls provided therein, the aperture means in the uncured or incompletely cured elastomeric means including a portion having abutting side walls adjacent the aperture means of the cured elastomeric means and a portion having spaced apart side walls adjacent the aperture means of the polymeric member, apertures of the polymeric member and the uncured or incompletely cured elastomeric means and the cured elastomeric means and the rigid means aligned to relieve elevated pressures associated with the electrical component, the polymeric member selected from the group consisting of polyethylene, polypropylene, polybutylene, polystyrene and copolymers thereof.

4,004,200
CHIP CAPACITOR WITH SPRING-LIKE LEADS

John E. Johanson, Boonton, N.J., assignor to Johanson Manufacturing Corporation, Boonton, N.J.

Filed July 21, 1975, Ser. No. 597,870
Int. Cl.^{2} H01G *1/14*

U.S. Cl. 317—242 **4 Claims**



1. In a solid state electronic component, a ceramic chip capacitor and lead attachment assembly in combination comprising:

a substantially rectangular capacitor having electrode ends;

a metalized layer covering said electrode ends and a portion of the capacitor surfaces abutting and communicating with said electrode ends;

a tinned layer covering said metalized layer upon said electrode ends;

a conductive metallic lead strip being substantially rectangular, for each electrode end;

said metallic lead strip terminating, to interface with said tinned and metalized capacitor, in a clasping tab portion, extending beyond the width of said lead strip, bent in a perpendicular relation to embrace three surfaces of said metalized and tinned capacitor,

said tab portion, substantially encompassing said tinned electrode end, having cooperative, perpendicularly extending armatures abutting two of said metalized capacitor surfaces; and

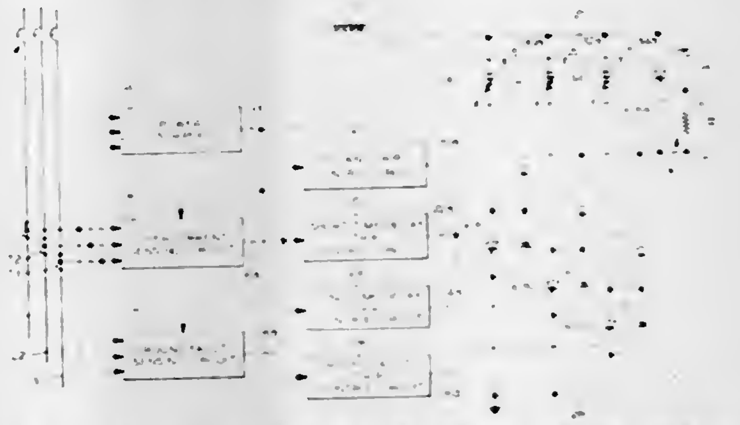
a mediately positioned longitudinal slot extending from said tab portion to approximately one-half the length of said conductive lead strip to effect and enhance the clasping action of said tabs.

4,004,201
MULTI-FUNCTION SOLID STATE TRIP UNIT WITH TRIP INDICATING MEANS

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,186
Int. Cl.^{2} H02H *7/00*

U.S. Cl. 317—33 SC **1 Claim**



1. A solid-state trip unit for an electric circuit breaker having circuit interrupting contacts whose separation is initiated by energization of a trip coil, said trip unit including, in combination:

A. a power supply electrically connected to one terminal of the trip coil;

B. means monitoring the line current flowing in an electrical power distribution circuit;

C. a first trip control circuit electrically connected to said current monitoring means and operative in response to a first abnormal line current condition;

D. a second trip control circuit electrically connected to said current monitoring means and operative in response to a second abnormal line current condition;

E. a first electronic switch connected to the other terminal of the trip coil and triggered by said first trip control circuit to draw trip coil energization current from said power supply through the trip coil upon the existence of said first abnormal line current condition;

F. a second electronic switch electrically connected in parallel to said first electronic switch and triggered by said second trip control circuit to draw trip coil energization current from said power supply through the trip coil upon the existence of said second abnormal line current condition;

G. a first indicator connected in series circuit with the trip coil and said first electronic switch and energized by trip coil energization current upon triggering of said first electronic switch to signal the existence of said first abnormal line current condition;

H. a second indicator connected in series with the trip coil and said second electronic switch and energized by said trip coil energization current upon triggering of said second electronic switch to signal the existence of said second abnormal line current condition; and

I. a common bypass circuit including the parallel combination of a third electronic switch and voltage sensing means connected between a first bus common to one side of each said indicator and a second bus separately connected to the other side of each said indicator, whereby, upon the triggering of one of said first and second electronic switches by its associated trip control circuit, said sensing means, operating in response to a voltage exceeding a predetermined threshold as occasioned by the one indicator series connected with said one electronic switch having insufficient electrical continuity to insure adequate energization of the trip coil, triggers said third electronic switch to conduct trip coil energization current around said one indicator to said one electronic switch.

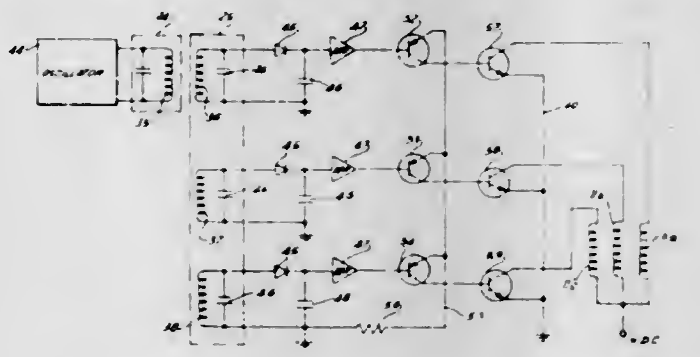
4,004,202
BRUSHLESS D.C. MOTOR

Sidney A. Davis, East Norwich, N.Y., assignor to IMC Magnetics Corporation, Westbury, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,051

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **11 Claims**



1. A brushless D.C. motor comprising a magnetic rotor, a plurality of stationary windings around said rotor, and commutator means for sequentially energizing and deenergizing said windings, said commutator means including:

a. a stationary transformer having a primary winding and a plurality of secondary windings, the number of secondary windings being equal to the number of stationary windings, said primary winding being in the form of a printed circuit board, and said secondary windings being in the form of a single printed circuit board spaced from said primary winding board,

b. an oscillator for supplying an A.C. signal to said primary winding,

c. an apertured shield between said primary winding circuit board and said secondary windings circuit board, said shield being rotatable with said rotor for passing said A.C. signal to and blocking said A.C. signal from each of said secondary windings in sequence to energize and deenergize the latter in sequence,

d. switch means associated with each of said stationary windings, and

e. means responsive to the energization and deenergization of said secondary windings for closing and opening said switch means in sequence so as to energize and deenergize said stationary windings in sequence.

4,004,203
DRIVE SYSTEMS USING A.C. MOTORS

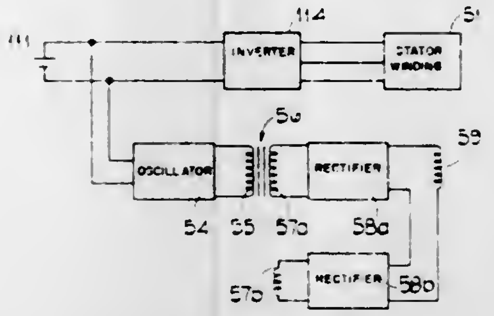
Brian John Chalmers, Bramhall, and John Phillip Gibson, Longsight, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 17, 1974, Ser. No. 533,526

Claims priority, application United Kingdom, Dec. 22, 1973, 59678/73

Int. Cl.² H02P *5/34*

U.S. Cl. 318—171 **7 Claims**



1. A drive system comprising in combination: an a.c. synchronous drive motor and an inverter circuit providing power to the motor, said inverter circuit receiving firing pulses under the control of the rotor of the motor, and said inverter circuit being capable of operating from a maximum frequency down to zero frequency, so that the motor operates synchronously from starting up to maximum speed, said motor being a brushless motor having a stator structure including a stator core mounting power windings the flow of current in which is controlled by said inverter circuit, a rotor structure, a field winding on the rotor structure, a rectifier assembly mounted on the rotor for supplying a unidirection current to the field winding, and transformer means including a primary winding and a secondary winding carried by the stator and rotor structures respectively, whereby alternating current can be supplied to said rectifier means, said stator core being provided with slots, a substantial proportion of said slots being occupied by said power windings, the remaining portion of said slots being occupied by the primary winding of said transformer means, said secondary winding comprising a pair of secondary windings electrically positioned 90° apart, said rectifier means comprising a pair of rectifier units supplying unidirectional current to said field winding.

4,004,204
METHOD FOR REGULATING THE MATERIAL SUPPLY TO A PROCESSING MACHINE HAVING AN ELECTRIC DRIVE MOTOR

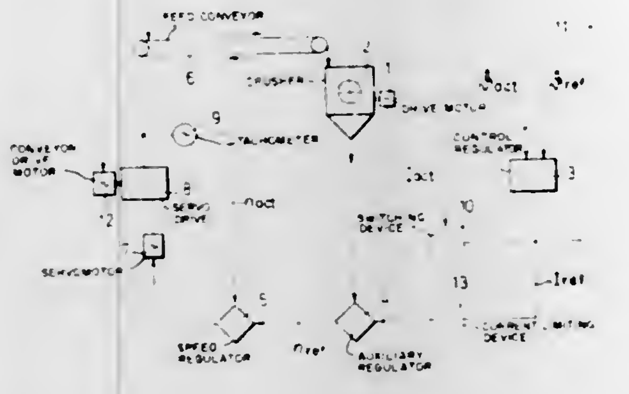
Hans Hoves, Auf der Kicken 17, 5 Cologne 80; Paul Kunath, Nibelungenstrasse 22, 5 Cologne 60, and Herbert Uttelbach, Zu den Dolinen, 56 Wuppertal 2, all of Germany

Filed Dec. 12, 1973, Ser. No. 426,636

Claims priority, application Germany, Dec. 12, 1972, 2260688

Int. Cl.² H02H *5/04*

U.S. Cl. 318—472 **11 Claims**



1. A method of regulating the material feed to a processing machine which is driven by an electric drive motor, comprising the steps of:

sensing the temperature of a drive motor winding;

generating a first signal representative of the temperature sensed;

generating a reference second signal to represent less than the maximum permissible winding temperature;

comparing the first signal with the reference second signal and providing a third signal which is a function of said first and second signals;

sensing actual motor current to provide a fourth signal;

comparing said third signal with said fourth signal and providing a fifth signal which is a function of the third and fourth signals and representing desired material feed;

sensing actual material feed to provide a sixth signal;

comparing said fifth and sixth signals and providing a seventh signal which is a function of the fifth and sixth signal;

and applying said seventh signal to the material feed drive to adjust the material feed rate.

4,004,205
HYBRID SERVO CONTROL SYSTEM

Makoto Yamamoto, Hachioji, and Hironobu Katayama, Sagamihara, both of Japan, assignors to Hitachi Electronics, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,486

Int. Cl.² G05B *1/02, 21/02*

U.S. Cl. 318—608 **15 Claims**

1. A hybrid servo control system with an integral control loop comprising:

means for producing a signal which represents the operational phase and frequency of a system to be controlled;

an analog phase comparator means for detecting a phase difference between said signal and a reference signal and producing an analog amount proportional to said detected phase difference;

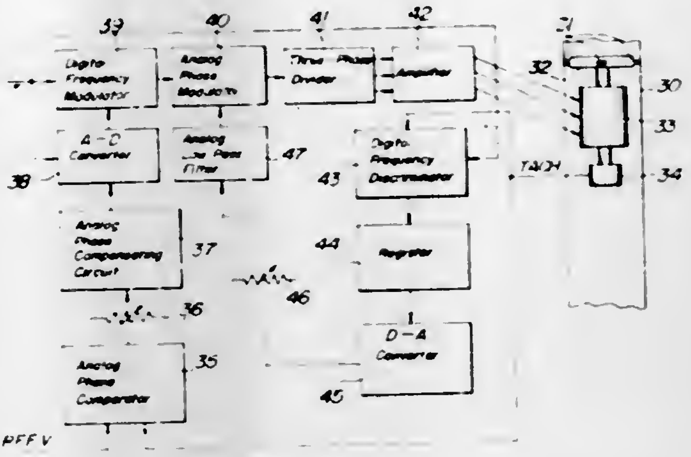
an analog-digital converter means for converting said analog amount supplied from said analog phase comparator means into a digital amount and storing said digital amount;

a clock pulse generator means for producing clock pulses of a given repetition frequency;

a digital frequency modulator means for receiving as input signals both of said digital amount supplied from said analog-digital converter and said clock pules supplied from said clock pulse generator means and having a counter which counts down said clock pulses with a count down ratio depending on said digital amount so as to produce frequency-modulated carrier pulses;

means for forming a driving signal to drive said system to be controlled from said frequency-modulated carrier pulses supplied from said digital frequency modulator;

means for supplying said driving signal to said system to be controlled;



an analog gain adjuster means arranged between said analog phase comparator means and said analog-digital converter means for adjusting the gain of said analog amount; and

an analog phase compensating circuit means arranged between said analog phase comparator means and said analog-digital converter means for compensating the phase characteristic of said analog amount.

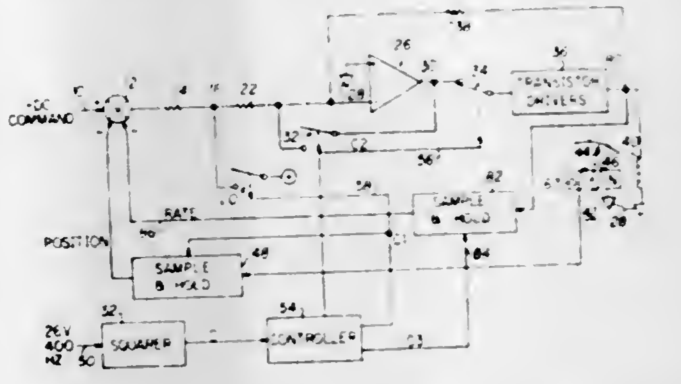
4,004,206
SERVOED INDICATING APPARATUS

Leon T. Gompert, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 415,876, Nov. 15, 1973, Pat. No. 3,934,196. This application June 30, 1975, Ser. No. 591,389

Int. Cl.² G05B *21/02*

U.S. Cl. 318—636 **3 Claims**



1. Apparatus for controlling the rate of rotation of a motor comprising, in combination:

summing means including first and second inputs and an output;

first means for applying a control input signal to the first input of said summing means;

motor means including electrical input means;

second means connected between the output of said summing means and the electrical input means of said motor means for supplying to said motor means a signal indicative of the summation of signals applied to said summing means; and

third means, connected to said summing means and said motor means, for periodically deactivating the application of signals to said motor means, for sampling the back

EMF generated by said motor means during each deactivation period after decay of the signals applied to said motor means, and for applying an indication of the sampled signal to the second input of said summing means.

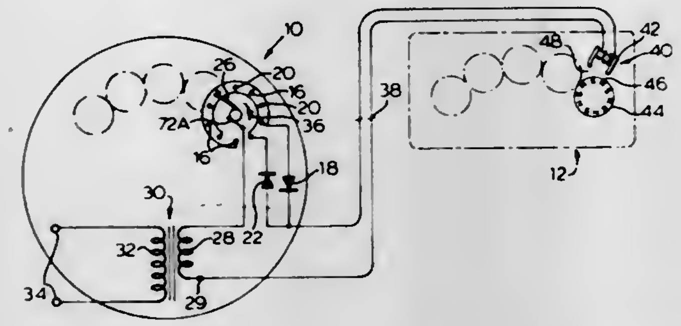
4,004,207
ROTARY SWITCH

Vernon E. Dickson, Toronto, Canada, assignor to Sangamo Electric Company, Springfield, Ill.

Filed Feb. 7, 1975, Ser. No. 547,864

Int. Cl.² G05B *11/12*

U.S. Cl. 318—695 **9 Claims**



1. A multiple contact rotary switch comprising a rotatable staff having an electrically conductive, flexible and elongated armature physically and electrically secured thereto for rotation therewith so as to sweep an area surrounding said staff, and a plurality of pins radially spaced from said rotatable staff and positioned near the outer boundary of said swept area so as to be contacted, seriatim, by the outer end of said armature remote from said staff as said staff and armature rotate, the length of said armature being at least equal to the distance from the point where it is attached to said staff to any one of said pins so that the outer end of said armature makes a wiping contact with only one pin at a time, and said outer end of said armature being bifurcated, and having two sections of unequal length with the length of both sections being sufficient to assure contact thereof with any one of said pins, and to permit the shorter section to be moved out of contact with a given pin while said longer section remains in contact with said given pin, the movement of said shorter section out of contact with said given pin causing the longer section to lose contact with said given pin, permitting said outer end of said armature to move into contact with a further one of said pins.

4,004,208
STARTING AID AND RESERVE LIGHT FOR VEHICLES

Pentti Juuse Tamminen, Otsolahdentie 6, 02100 Tapiola, Finland

Continuation-in-part of Ser. No. 425,407, Dec. 17, 1973, abandoned. This application July 18, 1975, Ser. No. 597,046

Int. Cl.² H02J *7/00*

U.S. Cl. 320—2 **13 Claims**

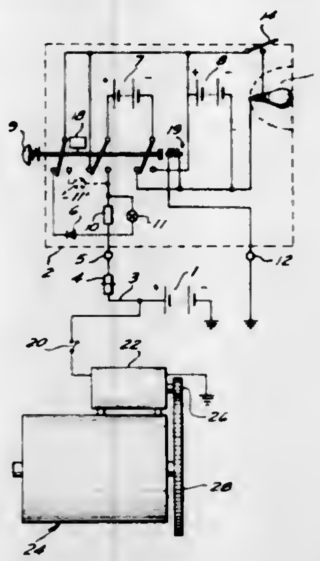
1. A starting aid for motors having a starting battery comprising

a. starting aid terminals connected to corresponding terminals of the starter battery;

b. at least two secondary batteries normally connected in parallel between said starting aid terminals, the positive terminals of said secondary batteries being connected to the positive terminal of the starter battery and the negative terminals of said secondary batteries being connected to the negative terminal of the starter battery, said secondary batteries being sealed, at least partially rechargeable batteries having a current capability substantially smaller than the starter battery;

c. a change-over switch for interrupting the parallel connection of said secondary batteries and connecting said secondary batteries in series between said starting aid terminals;

d. discharge preventing means for preventing said secondary batteries, when connected in parallel, from discharging through said starting aid terminals; and



e. discharge allowing means connecting said secondary batteries, when connected in series, with said starting aid terminals.

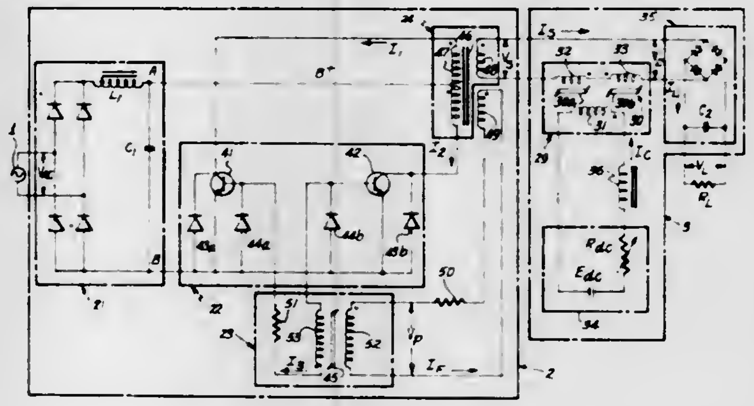
4,004,209
WIDE RANGE POWER CONVERSION SYSTEM

Harry W. Lawson, Jr., Rush, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1975, Ser. No. 570,524

Int. Cl.² H02M *7/155*

U.S. Cl. 321—2 **11 Claims**



3. A high efficiency power conversion system capable of use with AC line sources having a wide range of line voltage levels and providing a regulated current to a load comprising:

waveform generator means adapted for connection to said AC line source for converting said AC line source into an approximately constant volt-second AC signal having an approximately constant full duty cycle, a variable magnitude corresponding to said AC line voltage, and a variable frequency corresponding to said AC line voltage, but a higher frequency than said AC line source;

current limiting means connected to receive said variable magnitude and variable frequency but approximately constant volt-second and full duty cycle AC signal from said waveform generator means for limiting the current passing through said current limiting means; and

connecting means for connecting said current limiting means between said waveform generator means and a load,

wherein said current limiting means comprises first and second series connected windings, respectively wound on first and second saturable magnetic cores, and current control winding means thereon, to provide a controllable current limiter for controlling the current from said waveform generator means to the load.

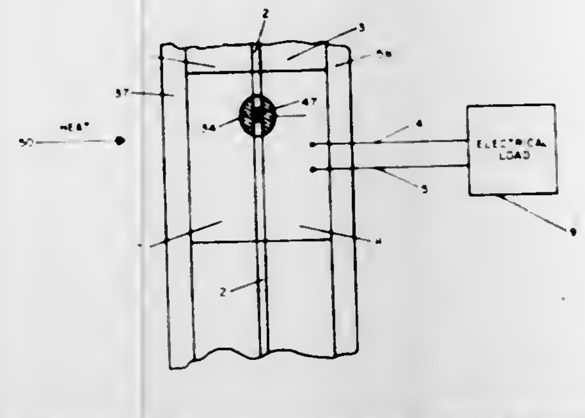
4,004,210
REVERSIBLE THERMOELECTRIC CONVERTER WITH POWER CONVERSION OF ENERGY FLUCTUATIONS

Joseph C. Yater, Autumn Lane, Lincoln, Mass. 01773

Filed Sept. 15, 1975, Ser. No. 613,207

Int. Cl.² H01L *37/00, 35/00*

U.S. Cl. 322—2 R **31 Claims**



1. A device for directly converting thermal energy to electric energy comprising:

a. a first layer comprising a plurality of first microcircuit modules with each microcircuit module having a first circuit element for converting thermal energy into electric voltage fluctuations;

b. a second layer contiguous to said first layer comprising a plurality of second microcircuit modules equal in number to said first microcircuit modules, one each of said second microcircuit modules electrically coupled to one each of said first microcircuit modules and one each of said second microcircuit modules having a circuit element for electrically coupling the voltage fluctuations across a thermal barrier; and,

c. a third layer comprising an equal plural number of third microcircuit modules as said first and second layers, said third layer being contiguous to said second layer, one each of said third microcircuit modules being electrically coupled to one each of said second microcircuit modules, said third layer being also separated from said first layer by said thermal barrier, each of said third microcircuit modules having at least one non-linear circuit for converting the electric voltage fluctuations to D.C. electric power.

24. A device for directly converting thermal energy to electric energy comprising:

a. at least one first means for directly converting thermal energy into A.C. electric voltage fluctuations said first means exposed to thermal energy from an external source,

b. at least one equal number of second means as said first means for converting said electric voltage fluctuations to D.C. electric output power; and,

c. at least an equal number of third means as each of said first or second means, said third means electrically coupling one each of said first means to one each of said second means, said third means being disposed within a thermal barrier said thermal barrier separating said first and second means.

4,004,211
COMPOUND AC GENERATOR

Masaki Takao, Hitachi, and Hideo Tatsumi, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

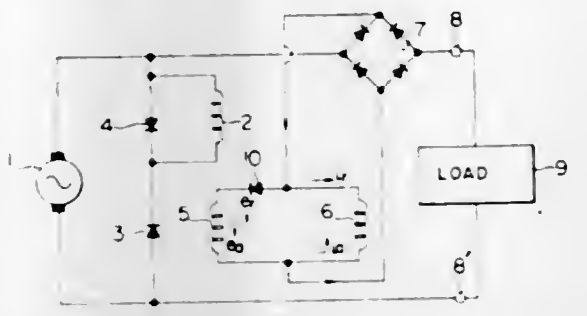
Filed Feb. 3, 1976, Ser. No. 654,908

Claims priority, application Japan, Feb. 10, 1975, 50-16227

Int. Cl.² H02P *9/10*

U.S. Cl. 322—63 **3 Claims**

1. In a compound AC generator comprising at least one pair of magnetic poles, series field windings wound on said magnetic poles, respectively, circuit means for connecting said series field windings in parallel to permit a load current of said generator to branch into parallel flowing paths therethrough, and a shunt field winding wound on at least one of said magnetic poles and in layers with the series field winding wound thereon, the improvement which comprises current block means provided in said circuit means so as to block the current flow through any one of said series field windings in a direction to increase the magnetic flux in said one series field winding due to a voltage induced into the other series field winding when a pulsating voltage is developed in the shunt field winding in layers with said other series field winding.



4,004,212
MINE DETECTOR SYSTEM

Donald E. Wortman, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1972, Ser. No. 316,598

Int. Cl.² G01V *3/00*

U.S. Cl. 324—3 **2 Claims**

1. Apparatus for detecting the presence of an explosive whose constituents are known which comprises:

a. a sample of said explosive's constituents;

b. a dual port single gamma ray source for simultaneously transmitting a gamma ray signal towards said sample and towards the area to be scanned;

c. first means for detecting the reflected radiation signals from said area under observation;

d. second means for detecting the reflected signals from said explosive sample; and

e. means for comparing the signals detected from said first and second detecting means and for giving an output indication upon the correlation of said signals.

4,004,213
SPARK GAP DETECTOR

Takayuki Kato, Nishikamo, and Satoshi Yamazaki, Nagoya, both of Japan, assignors to Toyota Jidosha Hanbai Kabushiki Kaisha, Nagoya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of Japan

Filed Oct. 31, 1974, Ser. No. 519,778

Claims priority, application Japan, Nov. 6, 1973, 48-124641

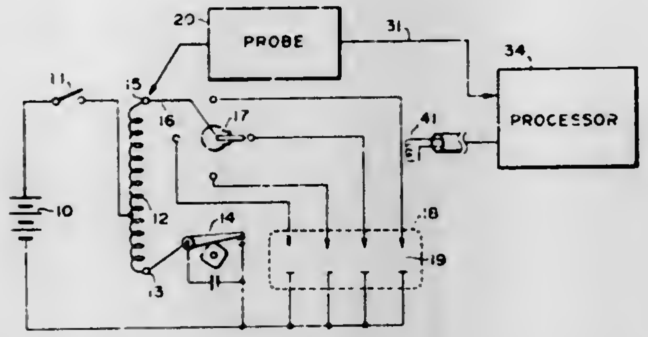
Int. Cl.² G01M *15/00*

U.S. Cl. 324—15 **13 Claims**

1. An apparatus for measuring a gap between the electrodes

of a spark plug for internal combustion engines, said apparatus comprising

probe means adapted to detect a secondary voltage from an ignition system, comprising a potential divider of resistor means, for supplying of a low-voltage signal, and first circuit means comprising comparing means, connected to said probe means, for comparing a series of said low-voltage signal from said probe means with a reference voltage having a predetermined voltage value, and detecting means, connected to said comparing means, for detecting a time duration of said low-voltage signal when said low-voltage signal is larger than said reference voltage in the absolute value as a duration of an induced discharge portion included in said secondary voltage, and second circuit means comprising indicating means, connected to said detecting means, for indicating said time duration in readable forms,



said first circuit means generating a pulse signal of rectangular waveform having a pulse width correspond to the length of the spark time of said induced discharge portion, and

said second circuit means connected to said first circuit means convert said pulse signal to a voltage signal in response to said pulse width thereof and simultaneously display said time duration as said voltage signal with each ignition signal of each cylinder of said internal combustion engine.

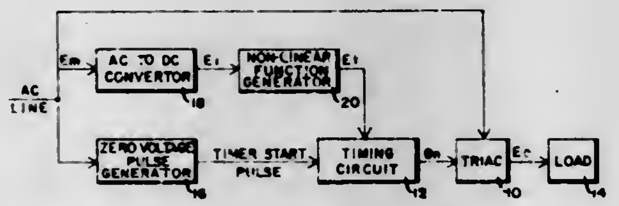
4,004,214
PHASE-CONTROLLED VOLTAGE REGULATOR

William C. Evans, Rochester, N.Y., assignor to Viva-Tech, Inc., Rochester, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,156

Int. Cl.² G05F *3/04*

U.S. Cl. 323—19 **2 Claims**



1. An r.m.s. voltage regulating apparatus for maintaining the r.m.s. voltage E_o supplied to a load from an A.C. voltage source of varying amplitude E_m at a substantially constant value, said apparatus comprising:

a. a rectifying circuit coupled to the A.C. voltage source for continuously generating a D.C. signal having an instantaneous amplitude proportional to the instantaneous peak-to-peak amplitude of said source;

b. interrupting circuit means coupled to the voltage source and said rectifying circuit for interrupting the output of the source at the start of each half cycle, the phase angle θ_n of such interruption being proportional to the instantaneous amplitude of said D.C. signal, said interrupting circuit means comprising a pulse generator for generating a first pulse at the start of each half cycle of the A.C. output of the voltage source, a timing circuit which is coupled to said rectifying circuit and said pulse generator for generating a second pulse, a predetermined time after said timing circuit receives a pulse from said pulse generator, the duration of said predetermined time being dependent exclusively upon the instantaneous amplitude of said D.C. signal and controlling the phase angle θ_n of interruption, and a normally non-conducting switching circuit, operatively coupled to said timing circuit output, said switching circuit being adapted to switch to a conducting state in response to the generation of said second pulse by said timing circuit, and to remain in a conducting state until the A.C. current through the load is substantially zero; and

c. A non-linear function generating circuit interconnecting said rectifying circuit and said interrupting circuit means for substantially compensating for the non-linearity in the relationship between the amplitude E_m of the A.C. source and said phase angle θ_n, as expressed by the equation:

$$\frac{E_o}{E_m} = \sqrt{\frac{\pi - \theta_n + \text{Sin}2\theta_n/2}{2\pi}}.$$

and for substantially compensating for a non-linearity between the timing circuit input voltage E_t and the phase angle θ_n of interruption, as expressed by the equation:

$$E_t = K(1-e^{-nwt})$$

where W is the frequency of the A.C. source and K is a constant.

4,004,215
ALTERNATING CURRENT VOLTAGE REGULATOR INCLUDING SATURABLE INDUCTOR AND MEANS TO BLOCK THE CURRENT FLOW THERETHROUGH

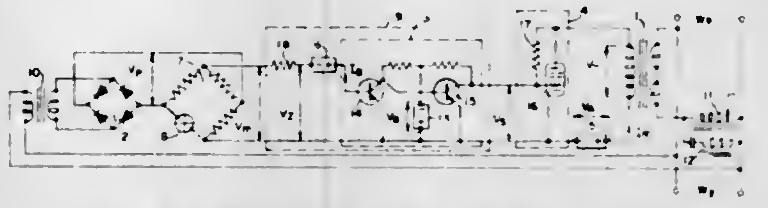
Ludomir Jawniszko, Warsaw, Poland, assignor to Zaklad Aparatury Laboratoryjno-Medycznej Zalmed, Warsaw, Poland

Continuation-in-part of Ser. No. 350,105, April 11, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,128

Claims priority, application Poland, Dec. 4, 1972, 154692

Int. Cl.² G05F *1/04*

U.S. Cl. 323—56 **11 Claims**



1. An alternating current voltage regulator comprising
a pair of input terminals to which an alternating voltage is to be applied,
a pair of output terminals to which a load may be connected,
an auto-transformer having a tap,
a transductor having a main winding, a control winding and a saturable core,
means for causing a current to flow through said control winding,
a connection from one input terminal to said tap on said auto-transformer,
a connection from the other input terminal to an end terminal of said auto-transformer by way of said main winding of said transductor,
a connection from one output terminal to the other end terminal of said auto-transformer,
a connection between said other input terminal to said other output terminal,
a source of reference voltage,
means for comparing the voltage across said output terminals with said reference voltage, and

means responsive to said comparison means for interrupting the flow of current through said control winding.

4,004,216
APPARATUS FOR DETECTING METALLIC PARTICLES IN A FLOW OF DIELECTRIC MEDIUM

Luc Yves Natens, Berchem, and Jean Martha De Gueldre, Edegem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 17, 1975, Ser. No. 559,040

Claims priority, application United Kingdom, Mar. 19, 1974, 12167/74

Int. Cl.² G01R *33/12*

U.S. Cl. 324—41 **12 Claims**

1. An apparatus for detecting the presence of metallic particles within a flowing dielectric medium, comprising a tube through which the dielectric medium is caused to flow, oscillator means oscillating at a given resonant frequency, a parallel resonant circuit excited by the electrical energy emitted by said oscillator means and producing a sinusoidal output signal, said parallel resonant circuit having a self-induction coil arranged around said tube, means for receiving the sinusoidal output signal from said circuit and producing two separate parallel sinusoidal signals, means for shaping said sinusoidal signals into separate square wave signals and for shifting one of said square wave signals 90° out of phase with the other such signal, and discriminator means to which said first and second square wave signals are applied and capable of delivering a constant amplitude output signal having an average value equal to zero when no metallic particle in the flow of said dielectric medium is present and proportionate to the displacement of said square wave signals from said 90° phase difference when a particle is detected in said flow.

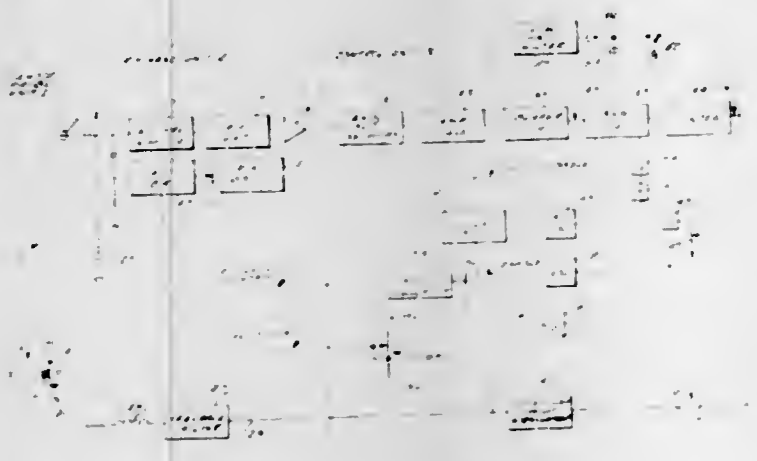
4,004,217
FLUX LOCKED LOOP

Robin P. Giffard, East Palo Alto, Calif., assignor to S.H.E. Corporation, San Diego, Calif.

Filed Oct. 31, 1975, Ser. No. 627,703

Int. Cl.² G01R *33/02*

U.S. Cl. 324—43 R **7 Claims**



1. A flux-locked loop comprising:
a squid defining an aperture through which a time-varying amount of flux is threaded;
error-signal defining means, including the squid, for producing an electrical signal having a modulation frequency component, the magnitude of the modulation frequency component defining the error signal;
the error-signal defining means including
a. biasing means coupled to the squid for causing the error-signal defining means to exhibit a periodic transfer characteristic such that the error signal varies as a periodic function of the average amount of flux threading the aperture during a cycle of the modulation frequency component,
b. modulation circuit means coupled to the squid and defining the frequency of the modulation frequency component, and
c. feedback-signal summing means coupled to the squid for controlling said average amount of flux in response to a feedback current;
feed-forward circuit means responsive to the modulation frequency component of the electrical signal for producing an analog output signal;
feedback circuit means responsive to the analog output signal for supplying the feedback current to the summing means for nulling the error signal; the feedback circuit means including a closed-loop circuit arrangement for producing the feedback current in an amount which is proportional to the analog output signal and which is substantially unaffected by disturbance inputs such as ground-loop noise.

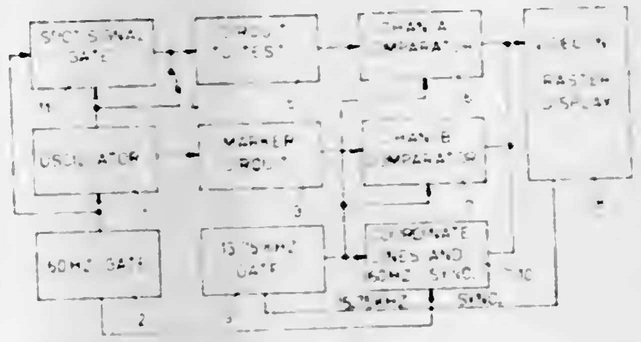
4,004,218
DEVICE FOR DISPLAYING ANALOG SIGNALS ON A RASTER SCANNING DISPLAY

George H. Baldwin, 1764 Waterdown Road, Burlington, Ontario, Canada (L7R3X5)

Filed Jan. 22, 1975, Ser. No. 543,067

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 SS **8 Claims**



1. Apparatus for displaying a time-varying signal on a raster-scanned display using in combination:
means for creating a ramp signal having an electrical waveform similar to the visual shape of the raster scanlines of said display,
means for synchronizing each cycle of said ramp signal with each succeeding raster scanline;
a member of the unijunction family having two input terminals connected separately to said time-varying signal and said ramp signal,
means to connect suitable voltages to the additional terminals of the unijunction device to make it operate as a unijunction,
means to develop a signal when current flows in the unijunction device;
means to connect the signal developed by the unijunction device to the raster-scanned display.

4,004,219

METHOD FOR MEASURING THE CONDITIONS INSIDE A METAL COVERED FURNACE DURING ITS OPERATION

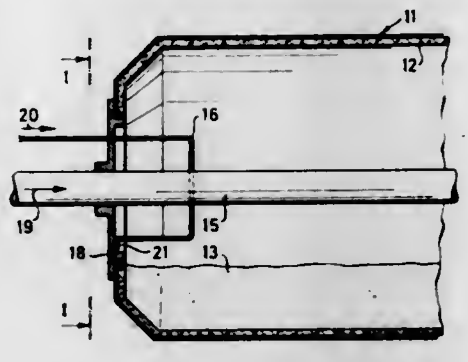
Martti Tiuri, Tapiola, and Tapio Tirkkonen, Helsinki, both of Finland, assignors to Insinooritoimisto Innotec Oy, Suomenoja, Finland

Filed Feb. 21, 1975, Ser. No. 551,851

Claims priority, application Finland, Feb. 22, 1974, 74521; Feb. 3, 1975, 750288

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 A **10 Claims**



1. A method for measuring conditions inside a cement kiln or like during its operation, the body of the kiln being comprised of a conductive shell with fire proof lining disposed therein, at one end of the kiln being disposed a transmitting antenna, the protective shell and material inside the kiln being used as a wave guide for radio frequency energy radiating from said antenna, said method including the step of measuring the prevailing field at desired spots along the length of the kiln whereby the impedance of the antenna, attenuation of radiation, the wave length or phase are usable to indicate temperature and other conditions inside the furnace.

4,004,220

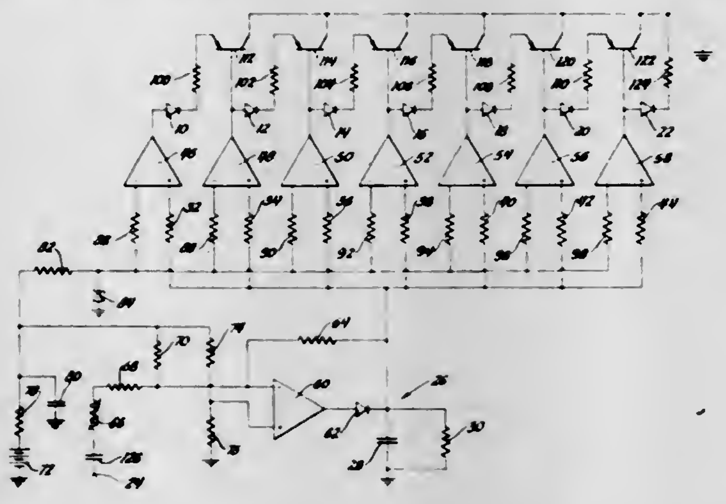
ELECTRONIC VOLTMETER

Marvin Clarence Kerber, and William Steven Traver, both of Colchester, Ill., assignors to Pulse Dynamics Corporation, Colchester, Ill.

Filed July 8, 1975, Ser. No. 594,183

Int. Cl.² G01R *19/16, 13/02*

U.S. Cl. 324—103 P **1 Claim**



1. An electronic voltmeter calibrated to develop volume unit output readings for appliance type electronic equipment comprising:

means for developing a reference voltage level;

means for detecting the peak voltage level of a monitored signal;

a plurality of operational amplifiers, each of said operational amplifiers being connected to both said means for developing a reference voltage level and said means for detecting the peak voltage level of a monitored voltage signal, and each of said operational amplifiers being operative to develop a first voltage output when the voltage from said means for detecting the peak voltage level of a monitored voltage signal is greater than the voltage from said means for developing a reference voltage level and a second voltage output when the voltage from said means for detecting the peak voltage level of a monitored voltage signal is less than the voltage from said means for developing a reference voltage level;

a plurality of light emitting diodes respectively connected to the outputs of said plurality of operational amplifiers; and

a plurality of transistors connected with said light emitting diodes for selectively and separately energizing said light emitting diodes in response to the outputs of said operational amplifiers, each of said light emitting diodes being the sole energized light emitting diode when the monitored voltage is within an associated, predetermined range.

4,004,221

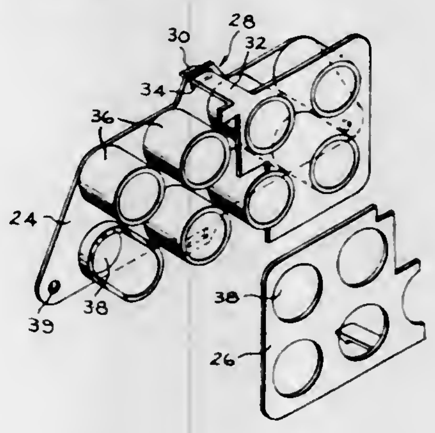
TEST DEVICE AND METHOD OF CHECKING CIRCUITRY

Marvin T. Wilson, Glendale, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 19, 1974, Ser. No. 534,556

Int. Cl.² G01R *15/00, 15/08*

U.S. Cl. 324—158 R **8 Claims**



1. An electrical test device for use in checking current carrying circuitry with an AC current measuring hook-on meter having a magnetic core wherein the test device is permanently installed on an electrical machine having a plurality of electrical conductors supplying a plurality of different electrical loads, said test device comprising: a plurality of hollow support members each supporting a set of windings, each set having a specified number of turns of at least one of the electrical conductors, and means permanently attaching the hollow support members on the electrical machine, the plurality of support members being supported in such a manner as to allow the core structure of a hook-on meter to surround the turns to provide the current measurements.

4,004,222

TEST SYSTEM FOR SEMICONDUCTOR MEMORY CELL

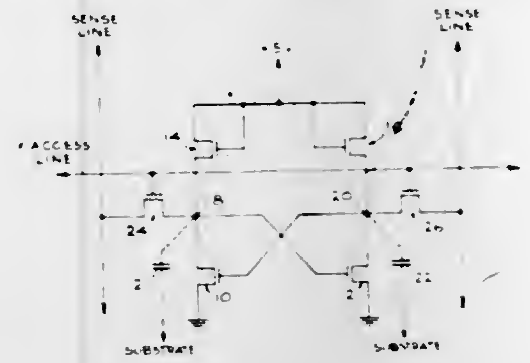
Richard E. Gebhard, Phoenix, Ariz., assignor to SEMI, Phoenix, Ariz.

Filed Nov. 20, 1974, Ser. No. 525,381

Int. Cl.² G01R *31/00, 31/26*

U.S. Cl. 324—158 R **6 Claims**

1. In a system wherein a semiconductor memory is tested by writing a test pattern therein, and thereafter reading out the test pattern to determine the ability of the memory to store data, a method of substantially shortening the interval required between writing and reading the test pattern without reducing the accuracy of the test, comprising during a test, substantially increasing the leakage currents of the stray capacitances of the cells of said memory relative to the leakage currents that occur during ambient conditions.



4,004,223

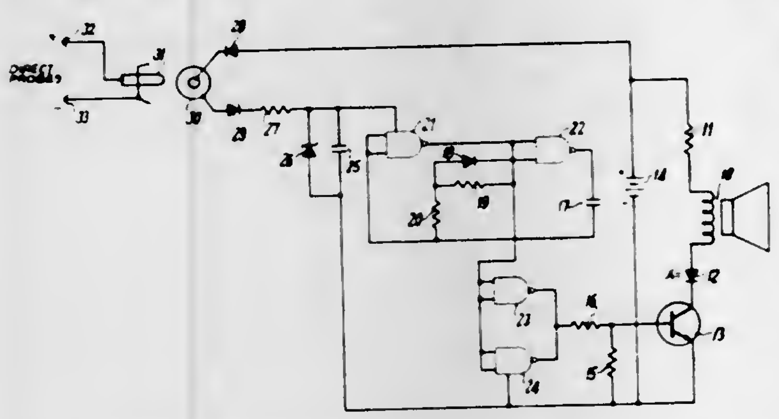
AUDIBLE RESISTANCE OR VOLTAGE TESTER

Samuel G. Cohen, 1215 Bedford Road, Pleasantville, N.Y. 10570

Filed June 16, 1975, Ser. No. 587,154

Int. Cl.² G01R *27/00*

U.S. Cl. 324—62 **9 Claims**



1. An audible testing device for testing the current, voltage or resistance of a circuit over a wide range comprising:

a power supply,

first and second input leads for connection to the circuit being tested, said first lead being coupled to the power supply,

a relaxation oscillator connected to the second input lead for filtering power therethrough,

an astable oscillator coupled to the output of the relaxation oscillator and activated thereby,

a pair of parallel gates coupled to the output of the astable oscillator to receive pulses therefrom,

switching means periodically activated by the output of the gates, and,

a speaker in series with said switching means and connected across the power supply to be activated by the switch pulses to produce an audible tone inversely proportional to the resistance or voltage or current being tested.

4,004,224

METHOD FOR FADE CORRECTION OF COMMUNICATION TRANSMISSION OVER DIRECTIONAL RADIO PATHS

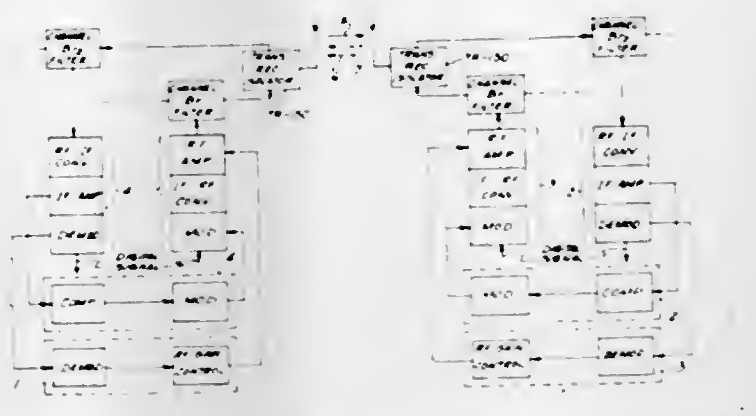
Walter Arens, and Wolfgang Noack, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 218,163, Jan. 17, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,854

Int. Cl.² H04B *7/18*

U.S. Cl. 325—2 **8 Claims**

1. A method for fade correction in a directional radio network, utilizing common-channel transmission of digital signals, for example pulse code-modulated signals, and having at least one network junction point at which several radio relay systems from diverging transmission directions meet, each of which systems utilize two-way transmission, and thus includes a transmitter and a receiver for each transmission direction, comprising the steps of so adjusting the transmission operation of the transmitters, of such systems, located at such network junction point, during fade-free conditions, that the transmission power in the respective transmission directions is relatively low, with the useful signal level being approximately 10 to 20 db greater than the common channel interference, referred to a receiver input at which the signal involved is received, monitoring the reception of the respective transmissions, and when a transmission from one of the transmitters at said junction point, in any respective transmission direction therefrom, is received with fading, adjusting the transmission power, of the transmitter transmitting the fading signal, to a relatively higher level, and thereafter correspondingly decreasing the transmission power thereof upon cessation of such fading.



4,004,225

METHOD FOR SYNCHRONIZING THE PULSE FRAMES IN TIME MULTIPLEX DATA TRANSMISSION VIA COMMUNICATION SATELLITES

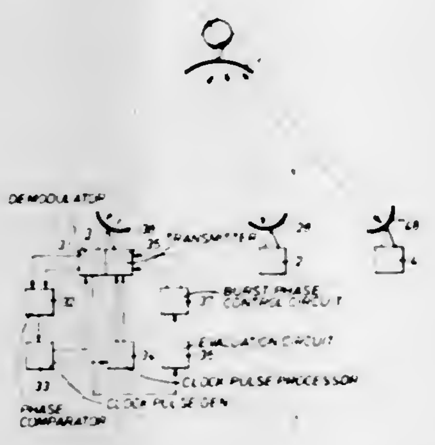
Horst Gänssmantel, Backnang, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 20, 1975, Ser. No. 579,254

Claims priority, application Germany, May 21, 1974, 2424674

Int. Cl.² H04B *7/26*

U.S. Cl. 325—4 **2 Claims**



1. A method for synchronizing the pulse frames occurring during the transmission of time multiplex pulse coded data between the stations of a multi-station communication system via the transponder of a communications satellite in which each pulse frame includes a code sequence (SRUW) periodically transmitted by one of the stations which functions as a reference station and pulse bursts transmitted in a prescribed sequence by the other stations of the system, and wherein a

plurality of the stations of the system, which plurality is less than the total number of stations of said system, are utilizable as active reference stations with only one station of said system being an active reference station at any time, comprising: causing all of said stations utilizable as reference stations to periodically transmit their own code sequences (SRUW) at the beginning of successive pulse frames; synchronizing the coded sequence from each of said stations utilizable as reference stations with the coded sequence of the presently active reference station; synchronizing the time of transmission of the pulse bursts of the other stations of said system with the code sequence of any one of said stations utilizable as a reference station; and in the event of malfunction whereby the coded sequence from the presently active reference station is not received by the stations utilizable as a reference station, changing the one of said stations utilizable as a reference station which operates as the active reference station.

4,004,226

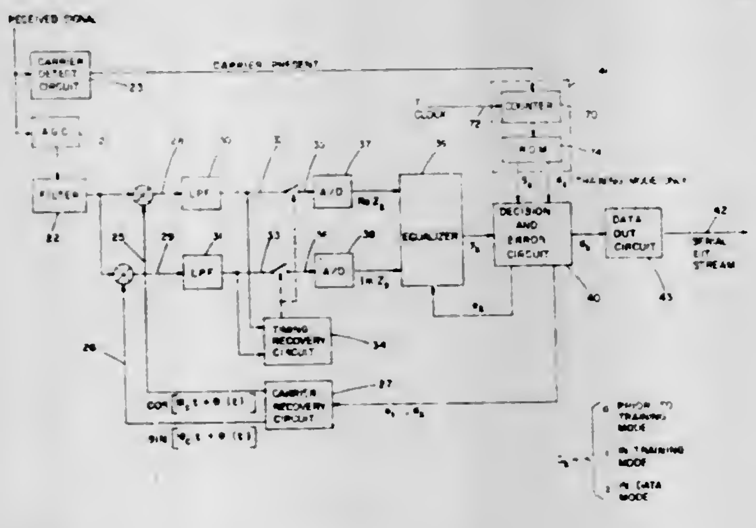
QAM RECEIVER HAVING AUTOMATIC ADAPTIVE EQUALIZER

Shahid U. H. Qureshi, Newton, and George D. Forney, Jr., Cambridge, both of Mass., assignors to Codex Corporation, Newton, Mass.

Filed July 23, 1975, Ser. No. 598,252

Int. Cl.² H04B *3/04*

U.S. Cl. 325—42 **11 Claims**



1. In a QAM receiver of the type adapted to receive bursts of signals having a bandwidth B Hz and sent at a predetermined rate of 1/T signals per second over a channel, wherein the receiver includes

- an automatic adaptive equalizer having
  - taps spaced equally apart,
  - tap coefficient circuitry for multiplying the output of each tap by a respective tap coefficient, and
  - adjustment circuitry for adjusting said tap coefficients,
- output circuitry responsive to said equalizer for providing output signals at times $kT + \tau$, $k = 0, 1, \ldots,$ where τ is a timing epoch, and
- detection circuitry for detecting the presence of an incoming burst of signals at a predetermined position in said receiver,
- that improvement wherein said taps are spaced apart by T/n seconds, where n is greater than TB, and control circuitry is provided for early actuation of said adjustment circuitry at a predetermined time dependent upon the time of said detection, to begin adjustment of said tap coefficients and hence training of said equalizer regardless of the initial value of said timing epoch, whereby the data capacity of said receiver is increased by reduction of the time required for set up of said receiver.

4,004,227

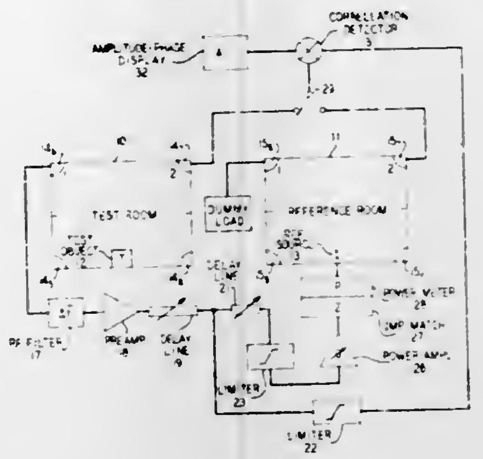
RADIO FREQUENCY INTERFERENCE (RFI) TESTING BY THE DUAL SCREEN ROOM TECHNIQUE

Kurt Ikrath, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,280

Int. Cl.² G01R *31/02*

U.S. Cl. 325—67 **11 Claims**



5. Apparatus for measuring the intensity of the radio frequency interference generated over a given frequency band by a test object, which comprises:

- first and second substantially identical screen rooms each having pick-up means disposed at corresponding locations therein;
- means in said first room for receiving said test object;
- a reference source antenna in said second room positioned to correspond to the receiving means in said first room;
- means connected to said pick-up means at a first location in said first room for filtering out all but the frequencies falling within said frequency band;
- a variable gain r.f. amplifier having its input connected to said filtering means and its output connected to said reference source antenna to energize the same; and
- means connected to said pick-up means at a second location in said first screen room and a corresponding location in said second screen room for comparing the r.f. field generated by said test object with the r.f. field generated by said reference antenna.

4,004,228

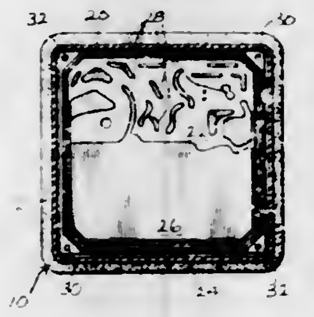
PORTABLE TRANSMITTER

Charles E. Mullett, Los Angeles, Calif., assignor to Integrated Electronics, Ltd., Hong Kong

Filed Apr. 29, 1974, Ser. No. 465,335

Int. Cl.² H04B *1/034*

U.S. Cl. 325—113 **3 Claims**



1. A portable transmitter intended to be used to broadcast a signal when actuated, said transmitter having an actuation means for use in causing the operation of said transmitter, an oscillator means for generating an RF signal in response to the actuation of said actuation means, and an antenna for radiating a signal generated by said oscillator means, in which the improvement comprises:

- said transmitter including a flat, electrically non-conductive board,
- said antenna consisting of a single electrically conductive coil located on said board adjacent to the periphery of said board and extending around the center area of said board,
- said antenna forming a part of said oscillator means and determining the frequency of operation of said oscillator means,
- the components of said actuator means and said oscillator means being located within the interior of said coil on said board and being supported on said board,
- electrical conductor means located on and supported by said board connecting the ends of said coil to said oscillator means,
- said components serving as capacitances adjacent to said antenna and within the interior of said antenna which minimizes the effect of any capacitance adjacent to the exterior of said transmitter in any location where said transmitter may be located so that said antenna will radiate effectively,
- said capacitances within said coil also serving to minimize the effect of any stray capacitances on the frequency of operation of said oscillator means.

4,004,229

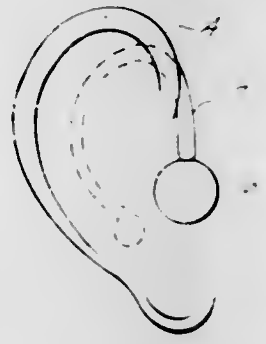
EAR ATTACHABLE MINIATURIZED RADIO RECEIVER

James R. File, El Segundo, Calif., assignor to James R. File; Henry Slate and Jack Takiff, all of Los Angeles, Calif., part interest to each

Filed Feb. 25, 1975, Ser. No. 552,858

Int. Cl.² H04B *1/08*

U.S. Cl. 325—361 **10 Claims**



1. Apparatus comprising:

- a small button adapted to fit in the ear cavity;
- a hook for attaching the botton to the ear; and
- an AM radio receiver housed in the button, the radio receiver comprising
- an antenna tuned to intercept a radio signal in the AM frequency band, the antenna having a coil wrapped around and insulated core made of barium ferrite and a capacitor connected in parallel with the coil,
- means for producing an audio signal from the radio signal intercepted by the antenna,
- means for converting the audio signal to sound waves, and
- a battery to provide power for the radio receiver.

4,004,230

CRITICAL PARAMETER RECEIVER TESTER

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

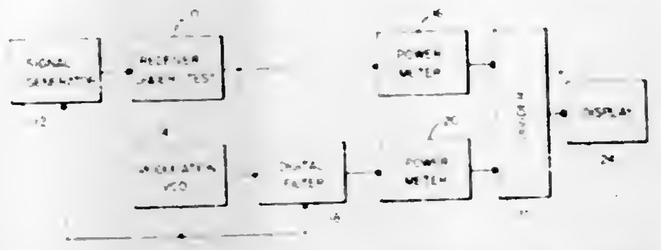
Filed Dec. 29, 1975, Ser. No. 644,410

Int. Cl.² H04B *17/00*

U.S. Cl. 325—363 **6 Claims**

2. A system for measuring critical parameters of a receiver comprising:

- a. signal generator means for generating a test signal,
- b. a receiver to be tested having its input coupled to said signal generator for receiving the test signal,
- c. a first power meter coupled to the output of said receiver for measuring the output power,
- d. filter means tuned to the frequency of said test signal coupled to the output of said receiver for allowing only signals to which it is tuned to pass,



- e. second power meter means coupled to said filter for measuring the output power,
- f. divider circuit means coupled to said first and second power meter means for providing an output signal proportional to the quotient of the output signals from said first and second power meters.

4,004,231

AFC CIRCUIT

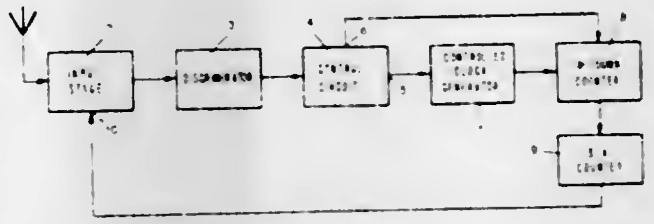
Karl Elshuber, and Laszlo Gotz, both of Freising, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 21, 1975, Ser. No. 579,653

Claims priority, application Germany, May 21, 1974, 2424613

Int. Cl.² H04B *1/16*

U.S. Cl. 325—420 **12 Claims**



1. A circuit arrangement for fine tuning a broadcast receiver to an assigned frequency, said receiver including an input stage which can be continuously tuned over a desired frequency range by a variable control voltage fed to a control input of said input stage; said tuning circuit including discriminator means for connection to the output of said input stage and adapted to produce an output signal level varying with the difference between the received frequency and said assigned frequency and having a selected nominal value when said input stage is tuned to a particular assigned transmission frequency; clock generator means responsive to a control signal determined by said discriminator means output signal for generating an output signal having a frequency that varies constantly in dependence on variations of said discriminator output signal from said nominal value; up/down counter means actuated by the output signal of said clock generator means and having a predetermined count when the discriminator output signal has that said nominal value; and digital/analog converter means for converting the count of the counter into a corresponding analog tuning voltage for connection to said control input of said input stage.

4,004,232
RADIO RECEIVER TUNING CONTROL SYSTEM

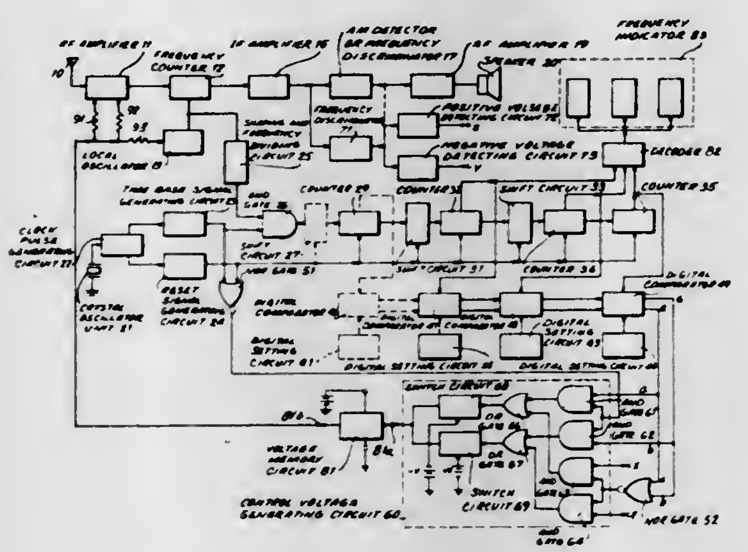
Yuji Amaya, Kobe, Japan, assignor to Fujitsu Ten Ltd., Kobe, Japan

Filed Dec. 23, 1975, Ser. No. 643,641

Claims priority, application Japan, Dec. 27, 1974, 49-148883; June 30, 1975, 50-81731

Int. Cl.^{2} H04B ***1/32***

U.S. Cl. 325—421 **12 Claims**



1. A tuning control system for a radio receiver having a tuning circuit including a variable reactance element as the turning element and a local oscillator, said tuning control system comprising

voltage circuit means for controlling the reactance of the variable reactance element of the tuning circuit of a radio receiver, said voltage circuit means having an output coupled to said variable reactance element and an input;

gate circuit means connected to the local oscillator of the tuning circuit of the radio receiver for deriving a frequency signal from said local oscillator during a specified period of time and providing said frequency signal;

counting circuit means connected to said gate circuit means for counting the frequency signal provided by said gate circuit means, said counting circuit means having output means;

digital setting circuit means for designating a preset frequency of a desired station, said digital setting circuit means having output means;

digital comparator means having input means connected to the output means of the counting circuit means and the digital setting circuit means for comparing signals in the output means of said counting circuit means and said digital setting circuit means and providing output signals indicating coincidence and non-coincidence of the signals compared thereby, said digital comparator means having output means; and

control voltage generating circuit means having input means connected to the output means of the digital comparator means and an output connected to the input of the voltage circuit means for detecting coincidence and non-coincidence indications in the output signals of said comparator means and for controlling the supply of a sweep signal to said voltage circuit means, whereby said radio receiver is automatically tuned to the desired frequency.

4,004,233
SEARCH TYPE TUNING DEVICE

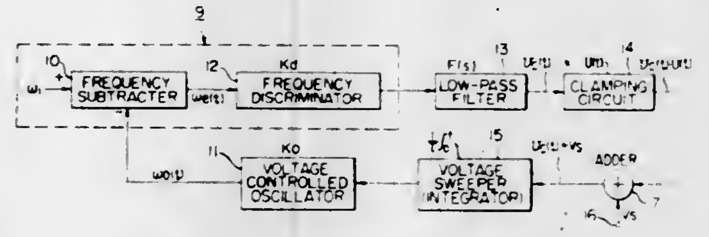
Yoichi Sakamoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,550

Claims priority, application Japan, Mar. 22, 1974, 49-32858; Mar. 22, 1974, 49-32859; July 9, 1974, 49-79572; July 9, 1974, 49-79573; July 9, 1974, 49-79574; July 9, 1974, 49-79575; July 9, 1974, 49-79576; July 9, 1974, 49-79577; July 9, 1974, 49-79578

Int. Cl.^{2} H04B ***1/32***

U.S. Cl. 325—470 **12 Claims**



1. A search type tuning device comprising

a. a voltage-controlled type oscillator stage (11) whose oscillation frequency is controlled in response to a sweep voltage applied thereto;

b. means for providing an input frequency, a frequency discriminator stage means (9) for subtracting the oscillation frequency of said oscillator (11) and said input frequency and for producing an output voltage corresponding to said difference;

c. a low-pass filter (13) connected to said frequency discriminator stage means for smoothing the output of said frequency discriminator stage means (9);

d. a sweep driving voltage source (16) providing a predetermined output voltage;

e. an adder (17), operationally connected to said sweep driving voltage both during and after the sweeping operation for linearly adding the output from said low-pass filter (13) and the output voltage from said sweep driving voltage source (16) both during and after the sweeping operation; and

f. an integrator 15 for integrating the output from said adder (17) and for applying the integrated output to said oscillator (11), said integrated output serving as a sweep voltage for controling its oscillation frequency.

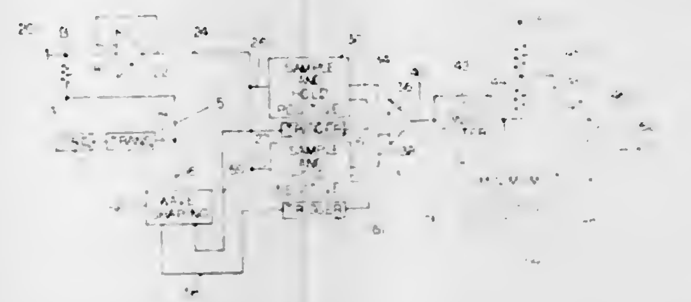
4,004,234
ARTICLE PRESENCE SENSOR

John W. Juvinall, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 23, 1975, Ser. No. 589,633

Int. Cl.^{2} G08B ***27/00***

U.S. Cl. 328—5 **7 Claims**



1. Apparatus for sensing the presence of an article which comprises, in combination:

a source of alternating current;

a high impedance resistor of at least 100 megohms value having one side thereof connected to said source of alternating current;

a metallic sensing element connected to the other side of said resistor;

a voltage follower circuit, connected to the same side of said resistor as said sensing element, for amplifying any signal generated as a result of an article being present before said sensing element;

electronic circuit means, connected to the output of said voltage follower circuit, for furnishing an output signal quantity representative of the total range of the signal from said voltage follower circuit;

said electronic circuit means including

first electronic means for sampling and holding the positive going peak of any electrical signal from said voltage follower;

second electronic means for sampling and holding the negative going peak of any electrical signal from said voltage follower; and

electronic difference means, connected to the output of both said first and second electronic means for sampling and holding, for generating an output signal quantity indicative of the peak to peak output value of said voltage follower;

electronic minimum level detection means connected to said electronic circuit means for detecting and holding the minimum value presented by said electronic circuit means during a pre-selected time period; and

electronic comparison means, connected to said minimum level detection means and to said electronic circuit means, for generating an output signal indicative of the presence of an article in response to said output signal from said electronic circuit means exceeding said minimum value by a pre-selected amount.

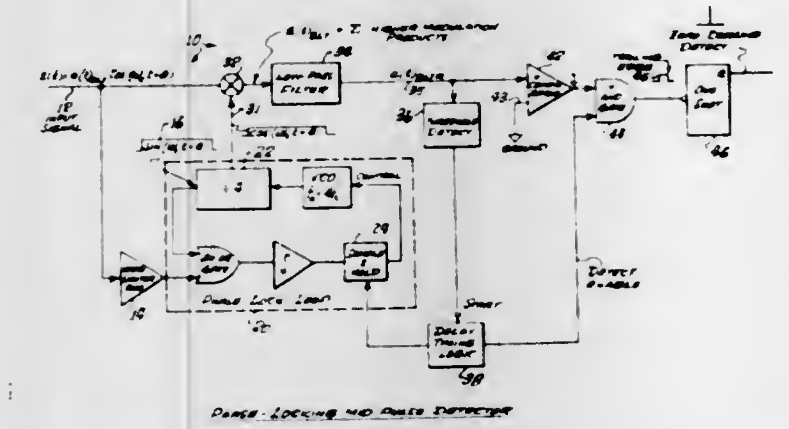
4,004,235
PHASE-LOCKING MIDPULSE DETECTOR

James L. Roberts, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,659

Int. Cl.^{2} H03B ***3/04***

U.S. Cl. 328—110 **1 Claim**



1. Apparatus, in a receiver, for detecting the mid-pulse phase reversal of an input signal $s(t) = a(t)_{BLT} \cos(\omega_c t + \theta)$, where the signal $a(t)_{BLT}$ is a modulating signal $a(t)$ after band-limiting by a transmitter and $\cos(\omega_c t + \theta)$ relates to a carrier having a frequency f_c and arbitrary phase angle θ, comprising:

a hard-limiter and amplifier whose input is connected to the input signal $s(t)$;

a phase-lock loop circuit, connected to and one of whose two inputs is the output of the hard limiter, and whose output is the signal $\cos(\omega_c t + \theta)$ hard limited:

a multiplier circuit, whose two inputs are connected to the input signal $s(t)$ and the output of the phase-lock loop, the output of the multiplier comprising the signal $a(t)_{BLT}$ plus the sum of higher modulation products,

a low-pass filter, whose input is connected to the output of the multiplier and whose output is $a(t)_{BLTR}$, which is the signal $a(t)$ as modified by the band limiting effects of the transmitter and receiver, the higher modulation products being filtered out by the low-pass filter;

a comparator, serving the function of a threshold detector, whose input is connected to the output of the low-pass filter, which senses the presence of a received pulse;

a delay timing logic circuit, whose input is connected to the output of the threshold detector, and one of whose outputs is connected, and forms the second input, to the phase-lock loop for delaying its output signal to the phase-lock loop circuit;

a zero crossing detector, whose input is connected to the output of the low-pass filter, which detects the mid-pulse zero crossing of a $a(t)_{BLTR}$, and therefore of $a(t)$;

an AND gate, whose inputs are connected to the outputs of the zero crossing detector and of the delay timing logic circuit, and whose output comprises a positive-going pulse whose trailing edge represents the mid-pulse of $a(t)_{BLTR}$; and

a one-shot, whose input is connected to the output of the AND gate, and whose output is a sharp pulse representing the mid-pulse of $a(t)$.

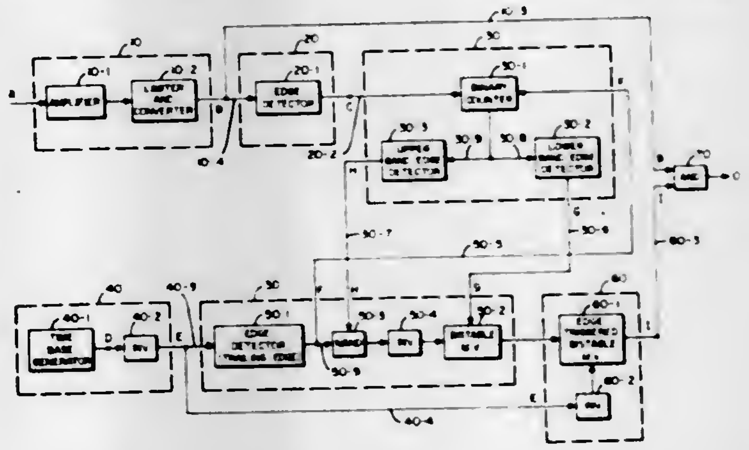
4,004,236
PROGRAMMABLE BANDPASS DIGITAL FILTER OF ANALOG SIGNAL

Carlos D. Cardon, and Lawrence P. Griffone, both of Salt Lake City, Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 29, 1975, Ser. No. 600,170

Int. Cl.^{2} H03K ***9/06***

U.S. Cl. 328—138 **10 Claims**



1. A programmable bandpass digital filter of an analog signal, comprising:

means receiving an input analog signal of a frequency F_A for generating a binary digital signal of a frequency F_A therefrom;

counting means coupled to said receiving means for counting the number of cycles N_A of said binary digital signal during a preset sample time T_S;

comparator means coupled to said counting means for determining when said number of pulses N_A is equal to a preset low N_L number of pulses and for determining when said number of pulses N_A is equal to a preset high N_H number of pulses;

programming means coupled to said comparator means for setting in said comparator means said preset low N_L number of pulses and said preset high N_H number of pulses and defining a preset bandwidth;

first memory means responsively coupled to said comparator means for generating as the alternative output signals, an output True signal or an output False signal indicating that said counting means has counted a number of pulses N_A of said binary digital signal that is within or without, respectively, said preset bandwidth;

first gating means;

means coupling said binary digital signal as a first input to said first gating means;

means coupling said first memory means to said first gating means for alternatively coupling said True output signal or said False output signal as a second input to said first gating means, said True output signal or said False output signal enabling or disabling said first gating means to provide or not to provide, respectively, as an output signal therefrom said binary digital signal.

4,004,237

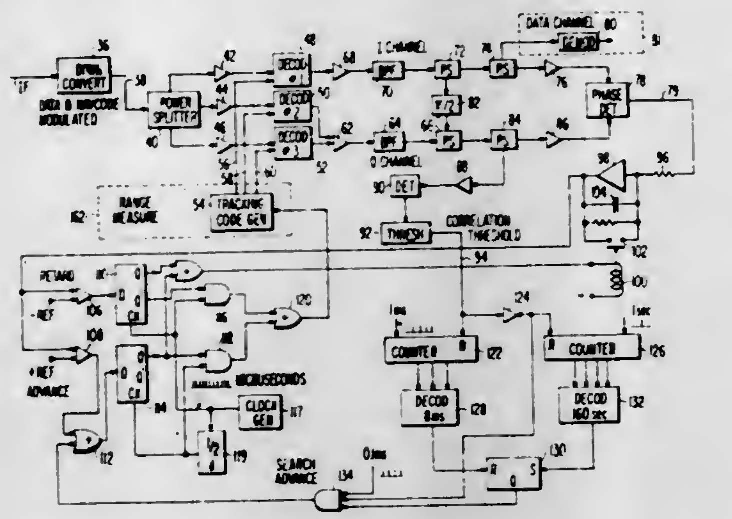
SYSTEM FOR COMMUNICATION AND NAVIGATION

Dale L. Kratzer, Meford Lakes, N.J., assignor to Harris Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 33,748, May 1, 1970, Pat. No. 3,755,816. This application Aug. 20, 1973, Ser. No. 389,796

Int. Cl.^{2} H04B *1/12*; H03B *3/04*

U.S. Cl. 328—155 **7 Claims**



1. Signal correlating apparatus comprising:

a plurality of signal channels, means for supplying received signals to three of said channels and for supplying to said three channels locally generated signals similar to said received signals and supplied to said channels in a certain phase difference relation, separate means in each channel for combining said received and local signals, and means for producing from the combined signals of said three channels a signal having substantially zero amplitude when said locally generated and received signals are in phase and having oppositely directed amplitudes when said locally generated and received signals are in oppositely out-of-phase directions respectively;

means for relating the combined signals in said channels and for generating a control signal in accordance with the relation thereof;

and means responsive to said control signal for modifying the phase of the local signals supplied to said channels.

4,004,238

METHOD AND APPARATUS FOR THE REMOVAL OF RINGING PHENOMENA FROM SIGNAL IMPULSES

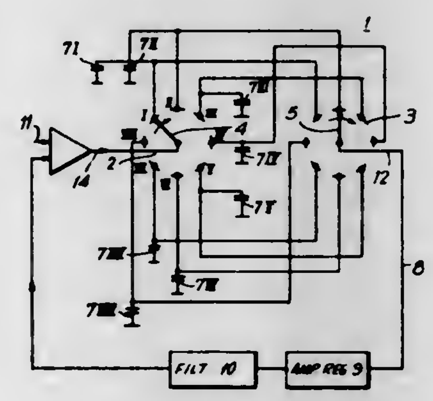
Günter Wichmann, Leimen, Germany, assignor to Eltro GmbH Gesellschaft fur Strahlungstechnik, Heidelberg, Germany

Filed Oct. 31, 1975, Ser. No. 627,917

Claims priority, application Germany, Dec. 14, 1974, 2459242

Int. Cl.^{2} H03B *1/04*

U.S. Cl. 328—165 **9 Claims**



1. A method for the removal of ringing phenomena from a signal impulse in a wide-band spectrum, said method comprising storing amounts of energy or voltage corresponding to amplitude variations of the signal impulse, interrogating said amounts in a delayed manner, and subsequently feeding back the interrogated amounts to the signal impulse for regenerating said signal impulse after having become deformed by decaying transients.

4,004,239

DISCRIMINATION CIRCUIT FOR ISOLATING DISTURBANCE SIGNALS WHICH ARE SUPERIMPOSED ON D.C. PEDESTALS

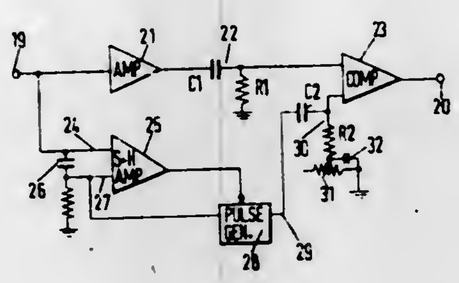
Graham Morley Clarke, Edinburgh, Scotland, assignor to Ferranti, Limited, Hollinwood, England

Filed July 18, 1975, Ser. No. 597,145

Claims priority, application United Kingdom, July 20, 1974, 32270/74

Int. Cl.^{2} H03K *9/02*

U.S. Cl. 329—109 **10 Claims**



1. A discrimination circuit arrangement comprising an input terminal arranged to receive an input signal in the form of d.c. pedestal signals on which disturbance signals may be superimposed, input signal filter means operable to remove the d.c. components of each pedestal signal except immediately adjacent to the leading edge thereof, signal generating means responsive to the leading edge of such pedestal signal to generate a replica signal having the amplitude and shape of the remaining d.c. components of the filtered pedestal signal, and control means responsive to the replica signal and to the filtered pedestal signal to eliminate the remaining d.c. components of each filtered pedestal signal, said disturbance signals being obtained at the output of the control means.

4,004,240

PHASE-SPLITTER CIRCUITS

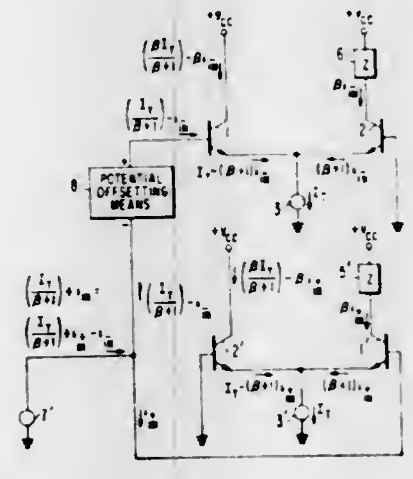
Brian Crowle, Ashford, England, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,676

Claims priority, application United Kingdom, Feb. 24, 1975, 7657/75; Jan. 27, 1976, 3063/76

Int. Cl.^{2} H03F *3/04*

U.S. Cl. 330—14 **12 Claims**



12. In combination:

first and second terminals for receiving an operating potential therebetween;

first and second transistors of the same conductivity type, each having base and emitter and collector electrodes and exhibiting a gain substantially equal to β between its base and collector electrodes, the base elctrode of said second transistor being connected to said first terminal;

output signal current utilization means having a current conductive path therethrough;

first current generator means for causing a predetermined current flow I_T between said first terminal and an interconnection of the emitter electrodes of said first and said second transistors, which current flow is independent of the potential appearing between said first terminal and said interconnection of the emitter electrodes of said first and said second transistors;

connections of said second terminal to the collector electrodes of said first and said second transistors, one of which connections is through the current conductive path through said output signal utilization means; and

second current generator means for impressing from a relatively high source impedance an input current comprising at least a signal current component between the base electrodes of said first and said second transistors, whereby responsive to said signal current component of said input signal an output signal current β times as large flows in the current conductive path through said output signal utilization means.

4,004,241

HYBRID FEEDBACK AMPLIFIER OF A PUSH-PULL TYPE

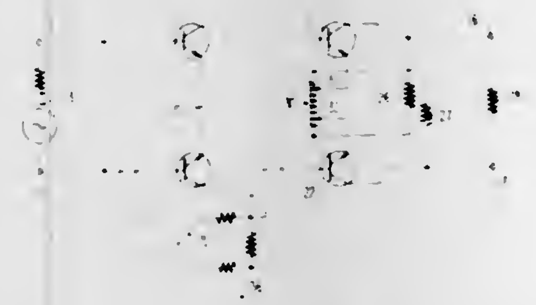
Susumu Akiyama, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 23, 1975, Ser. No. 598,470

Claims priority, application Japan, July 25, 1974, 49-85312

Int. Cl.^{2} H03F *3/26, 1/34*

U.S. Cl. 330—15 **27 Claims**



1. A feedback amplifier comprising a first and a second signal input terminal; a first and a second signal output terminal, a first and a second amplifier section of substantially same characteristics, each amplifier section having a first, a second, and a common terminal; a feedback circuit; a first terminating impedance having two ends, one end being connected to said feedback circuit at a first point of connection, the other end being connected to said first amplifier section second terminal; a second terminating impedance having two ends, one end of said second terminating impedance being connected to said feedback circuit at a second point of connection, the other end of said second terminating impedance being connected to said second amplifier section second terminal, said second terminating impedance being substantially equal to said first terminating impedance; first means connecting said first amplifier section common terminal to said second point of connection; second means connecting said second amplifier section common terminal to said first point of connection; third means connecting one of said first signal input and output terminals to said first amplifier section first terminal and to said feedback circuit; fourth means connecting a corresponding one of said second signal input and output terminals to said second amplifier section first terminal and to said feedback circuit; fifth means connecting the other of said first input and output terminals to said first amplifier section second terminal; and sixth means connecting the other of said second signal input and output terminals to said second amplifier section second terminal; said feedback circuit feeding a fraction of signals delivered from said first and second signal input terminals to said first and second signal output terminals through said amplifier sections back to said first and second signal input terminals with reversed polarity; said second, fourth, and sixth means having substantially same characteristics as said first, third, and fifth means, respectively.

4,004,242

APPARATUS FOR SUPPLYING SYMMETRICALLY LIMITED BIDIRECTIONAL SIGNAL CURRENTS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 363,600, May 24, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,635

Int. Cl.^{2} H03F *3/45*

U.S. Cl. 330—22 **12 Claims**

1. Apparatus for providing a symmetrically limited bidirectional signal current, said apparatus comprising:

means for supplying an a-c signal current superimposed on a first direct current component to form a composite signal current;

means for providing a proportional response to only those portions of said composite signal current which are of the same polarity as its first direct current component and are smaller in amplitude than twice its first direct current component, otherwise providing substantially no response, thereby to provide a limited unidirectional response current to said composite signal current;

means for supplying a second direct current component in predetermined ratio to said first direct current component; and

means for linearly combining said second direct current component with said unidirectional response current in such proportion as to obtain a response with no accompanying quiescent current component, said response being said symmetrically limited bidirectional signal current.

4,004,243

AMPLIFIER WITH CURRENT GAIN INVERSELY PROPORTIONAL TO TRANSISTOR H_{fe}

Abel Ching Nam Sheng, Morris Plains, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,479

Int. Cl.^{2} H03F *3/04*

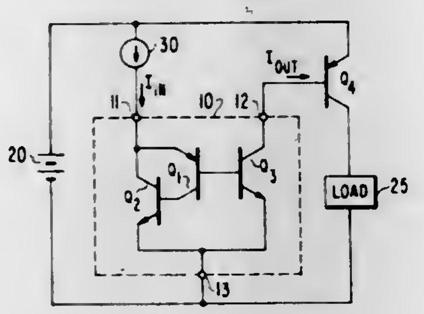
U.S. Cl. 330—22 **7 Claims**

7. A circuit for supplying quiescent base bias current to a first bipolar transistor of a first conductivity type, said first bipolar transistor having a base electrode, which circuit comprises:

a second bipolar transistor of said first conductivity type, said second transistor having base and emitter and collector electrodes;

third and fourth bipolar transistors of a second conductivity type complementary to said first conductivity type, each of said third and said fourth transistors having base and emitter and collector electrodes and exhibiting current gain similar to that of the other;

a collector-to-base feedback connection of said third transistor to condition it to accept input current applied between its collector and emitter electrodes, said feedback connection including



a common-base amplifier connection of said second transistor with its emitter electrode having the collector electrode of said third transistor connected thereto and with its collector electrode being connected to the base electrode of said third transistor; and

a base-to-base connection of said second and said fourth transistors; and

means for applying the collector current flowing through the collector electrode of said fourth transistor to the base electrode of said first bipolar transistor as the entire said quiescent base bias current.

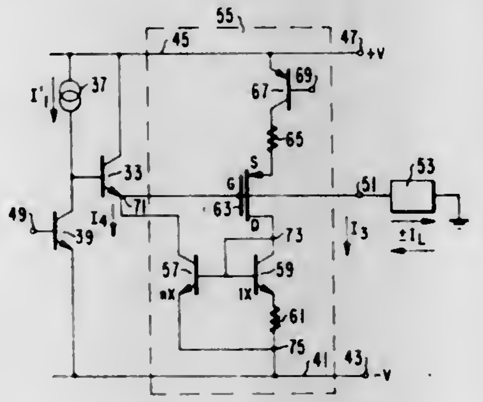
4,004,244
DYNAMIC CURRENT SUPPLY

Otto Heinrich Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,045

Int. Cl.² H03F *3/04*

U.S. Cl. 330—22 **20 Claims**



11. An amplifier comprising, in combination:

first and second terminals for an operating voltage source;

a transistor having base, emitter and collector electrodes, connected at its collector electrode to the first of said terminals;

controllable impedance means coupling said emitter electrode to said second terminal, further including means responsive to the voltage at said emitter electrode, when it approaches the voltage at said second terminal, for reducing the impedance of said controllable impedance means between said emitter electrode and said second terminal to a value such that the voltage between said two terminals reduces to lower than $1V_{be}$, $1V_{be}$ being the voltage between the base and emitter electrodes of a transistor which is necessary to support conduction through the transistor.

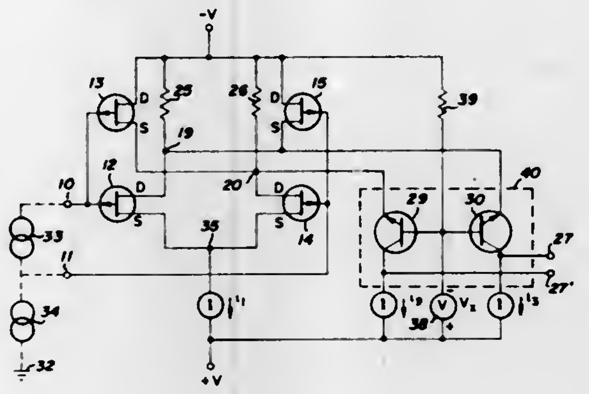
4,004,245
WIDE COMMON MODE RANGE DIFFERENTIAL AMPLIFIER

Sam S. Ochi, San Jose, and Ronald W. Russell, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 3, 1976, Ser. No. 682,287

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **8 Claims**



1. A differential amplifier having a pair of signal input terminals, at least one output terminal, and a pair of supply terminals for connecting said amplifier to the positive and negative terminals of a source of power, said amplifier comprising:

first, second, third, and fourth FETs, each having a source, a drain, and a gate electrode;

means coupling the sources of said first and second FETs together and to a source of constant current referenced to one of said supply terminals:

means coupling the drain terminals of said third and fourth FETs together and to the other of said supply terminals,

means coupling the drain of said first FET and the source of said third FET together and to a first low impedance load element,

means coupling the drain of said second FET and the source of said fourth FET together and to a second low impedance load element,

means coupling the gates of said first and said fourth FETs together and to one of said input terminals, and

means coupling the gates of said second and said third FETs together and to the other of said input terminals, whereby differential signals between said input terminals produce differential signals in said first and said second low impedance load elements and common mode signals applied to said input terminals result in virtually no load element signal response over a range that exceeds the voltage levels of both supply terminals.

4,004,246
PULSE WIDTH MODULATED SIGNAL AMPLIFIER

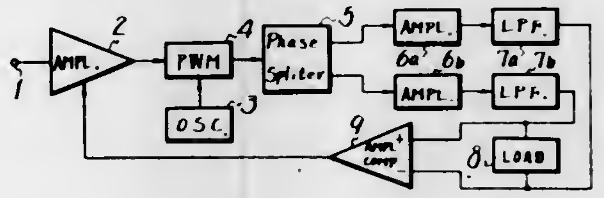
Osamu Hamada, 3-4-7 Nakamagome, Ota Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,461

Claims priority, application Japan, June 6, 1974, 49-64304

Int. Cl.² H03F *3/38*

U.S. Cl. 330—10 **9 Claims**



1. A pulse width modulated signal amplifier comprising:

a. signal input means;

b. amplifying means for amplifying an input signal from said signal input means;

c. pulse width modulating means for receiving an output signal from said amplifying means and producing a pulse width modulated signal;

d. phase splitting means for receiving said pulse width modulated signal and producing a pair of corresponding pulse width modulated signals having different polarities to each other;

e. first demodulating means for receiving one of said pair of pulse width modulated signals and demodulating to produce a first output signal having one polarity and an amplitude in response to an amplitude of said input signal;

f. second demodulating means for receiving the other of said pair of pulse width modulated signals and demodulating to produce a second output signal having the other polarity and an amplitude in response to an amplitude of said input signal;

g. a load supplied with said first and second output signals;

h. amplitude comparing means for comparing said first and second output signals in their amplitudes and producing a difference control signal in response thereto; and

i. feedback means connected to said comparing means for receiving said control signal and applying it to said amplifying means so as to balance the amplitudes of said first and second output signals with respect to one another across said load.

4,004,247
VOLTAGE-CURRENT CONVERTER

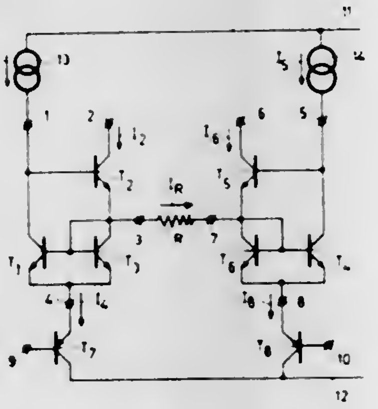
Rudy Johan Van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 11, 1975, Ser. No. 586,051

Claims priority, application Netherlands, June 14, 1974, 7407953; Mar. 27, 1975, 7503664

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **4 Claims**



1. A voltage-current converter with a balanced-voltage input and a balanced-current output, comprising:

a first current mirror circuit comprising first and second transistors, each having an emitter, base and collector, and a first semiconductor junction having an anode and cathode, said first and second transistors and said first semiconductor junction all being of a first conductivity type, said cathode of said first semiconductor junction being connected to said emitter of said first transistor, said collector of said first transistor being connected to said base of said second transistor, and said base of said first transistor being connected to said anode of said first semiconductor junction and said emitter of said second transistor;

a second current mirror circuit comprising the same elements as said first current mirror circuit;

a first current source circuit connected to said collector of said first transistor of said first current mirror circuit;

a second current source circuit connected to said collector of said first transistor of said second current mirror circuit;

a first impedance connected between said emitter of said second transistor of said first current mirror circuit and said emitter of said second transistor of said second current mirror circuit; and

third and fourth transistors each having an emitter, base and collector, said emitter of said third transistor being connected to said emitter of said first transistor of said first current mirror circuit said emitter of said fourth transistor being connected to said emitter of said first transistor of said second current mirror;

the balanced-voltage input being between said bases of said third and fourth transistors, and the balanced-current output being between said collector of said second transistor of said first current mirror circuit and said collector of said second transistor of said second current mirror circuit.

4,004,248
CONTROL OF TIMING OF LASER OPERATION

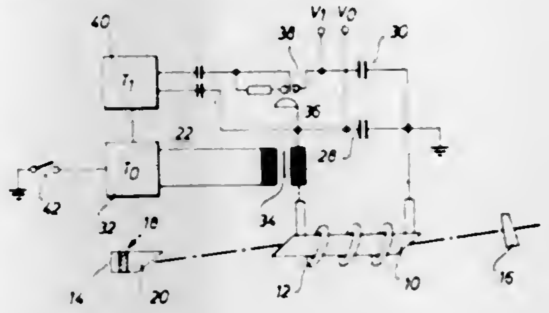
Alexander Müller, and Gerald R. Willenbring, both of Gottingen, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Mar. 5, 1975, Ser. No. 555,452

Claims priority, application Germany, Apr. 19, 1974, 2418981

Int. Cl.² H01S *3/092*

U.S. Cl. 331—94.5 P **13 Claims**



1. In the art of controlling operation of a laser, a method to decrease time jitter of laser action after occurrence of an event at a reference time (T_0), and in which the laser is stimulated to emission after having received pumping pulse light energy, comprising the steps of

applying a main pulse (24) to the laser, of lesser energy than necessary to stimulate the laser to emission; and superimposing on said main pulse, during the persistence thereof, an auxiliary pulse (26) to apply to the laser the composite of the auxiliary pulse superimposed on the main pulse, the auxiliary pulse being of sufficient energy to raise the laser above threshhold, the auxiliary pulse having a duration and energy which are small with respect to the duration and energy of the main pulse.

4,004,249
OPTICAL WAVEGUIDE LASER PUMPED BY GUIDED ELECTROMAGNETIC WAVE

Tom T. Kikuchi, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1976, Ser. No. 651,448

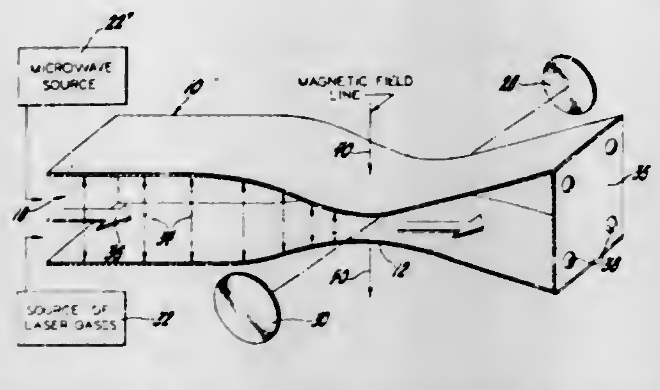
Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 P **5 Claims**

1. Means for pumping an optical waveguide laser comprising

means for generating high energy density electromagnetic waves including a tapered waveguide having a wide portion gradually diminishing to a narrow throat portion which is elongated along an axis, and a source of electromagnetic waves coupled to the wide portion so that high energy density electromagnetic waves are produced in the region of the throat portion, and

an elongated optical waveguide defined in the region of the throat portion and extending parallel to the said axis, the optical waveguide containing laser material whereby the

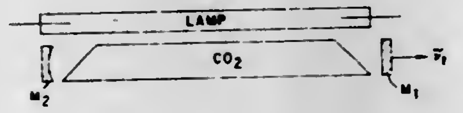


high energy density electromagnetic waves are coupled to the laser material for pumping thereof.

4,004,250
LASER ACTION BY OPTICALLY DEPUMPING LOWER STATES

William F. Krupke, Pleasanton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 26, 1975, Ser. No. 635,456
Int. Cl.² H01S *3/09, 3/22*
U.S. Cl. 331—94.5 PE **9 Claims**

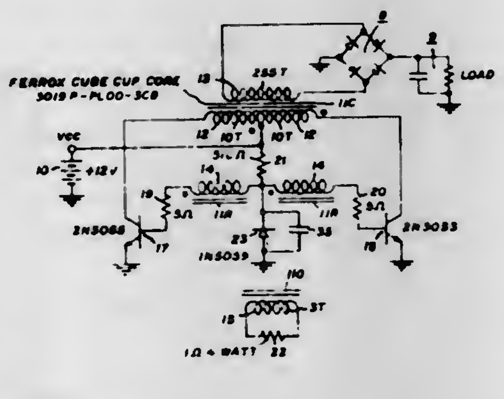


1. A method for obtaining laser action in a gaseous lasing medium contained in a resonant cavity, between an upper energy level and a lower energy level of the medium comprising the steps of: populating the upper level to a degree short of achieving an inverted population, and establishing an inverted population by transiently and selectively depumping the lower level, and stimulating the emission between the upper and lower energy levels of a laser beam via said resonant cavity.

4,004,251
INVERTER TRANSFORMER

Joseph P. Hesler, Liverpool, and Samuel M. Korzekwa, Baldwinsville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,099
Int. Cl.² H03K *3/281*
U.S. Cl. 331—113 A **10 Claims**



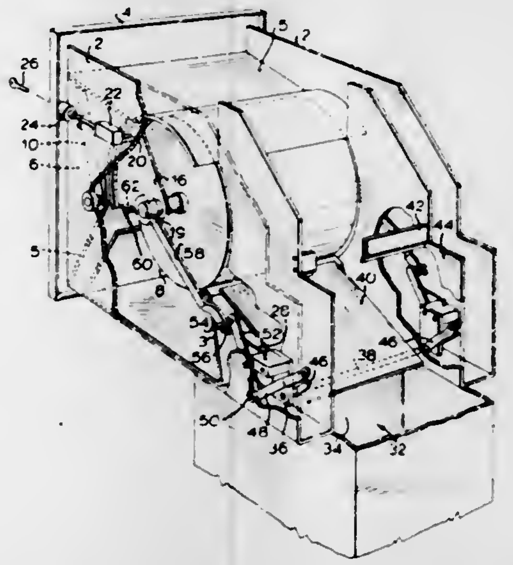
1. A transformer adapted to be coupled to a pair of switching devices to form an inverter having:

1. a core of substantially linear magnetic material providing a closed magnetic path along which a working cross-section is maintained for the principal flux, said path being divided for part of its length in two branches between which the principal flux may be steered with a relatively small magnetomotive force, said core being assembled from two members which are butted at the branch to permit encirclement of one of said branches by a preformed winding,
2. a center tapped primary power winding encircling said working cross-section, each end of which is adapted to be connected to an output electrode of one of a pair of alternately conducting electronic switches, and the center tap of which is adapted to be connected to a d.c. source to cause the principal flux in said core to alternate,
3. a secondary power winding encircling said working cross-section for deriving an alternating voltage output.
4. first control winding means adapted to be connected to said switches to cause alternate conduction, said winding encircling one branch and providing regenerative feedback during each conduction period which terminates when said one branch saturates, and
5. second control winding means encircling one of said branches for providing a magnetomotive force for causing said one branch to saturate first in each conduction period to remove the regenerative feedback before saturation of the working cross-section.

4,004,252
SAFE DEPOSIT APPARATUS, WITH SELECTIVE PLATE AND SHIELD FOR DUAL FUNCTION DEPOSITORY

Michael H. Markham, 2642 Islington Ave., and Joseph Varga, 61 Richview Road, No. 1910, both of Toronto, Ontario, Canada

Filed Oct. 14, 1975, Ser. No. 622,136
Int. Cl.² B65G *11/04*
U.S. Cl. 232—44 **4 Claims**

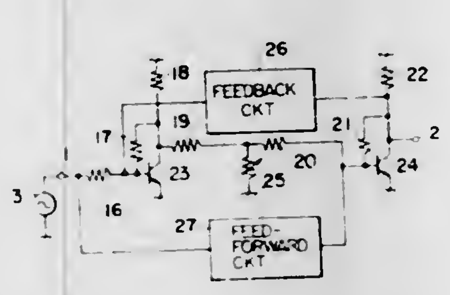


1. Safe deposit apparatus comprising means defining an opening through which deposits may be inserted, means for receiving deposits, and means for accepting deposits from said opening and discharging them into said receiving means, wherein a shield is provided mounted for movement relative to said opening defining means between a position substantially obturating said opening except for a limited aperture and a position substantially clear of said aperture, wherein the means for receiving deposits comprises two separate compartments, wherein a diverter member is located at the entrances of said compartments, means being provided operatively linking said diverter member to said shield member whereby the former is moved between positions obturating one or other of the entrances of said compartments when said shield member is moved between its obturating or non-obturating positions relative to said aperture, and wherein the means accepting deposits from the opening and discharging them into said receiving means is a rotary depository drum having a peripheral aperture movable on rotation of the drum to face said aperture or said compartments.

4,004,253
VARIABLE EQUALIZER

Yoshitaka Takasaki, Tokorozawa; Narimichi Maeda, Kodaira; Jun'ichi Nakagawa, Saitama; Kohei Ishizuka, and Yasuhiro Kita, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 18, 1975, Ser. No. 587,894
Claims priority, application Japan, June 21, 1974, 49-70239; July 5, 1974, 49-76380
Int. Cl.² H03H *7/14*
U.S. Cl. 333—28 R **25 Claims**

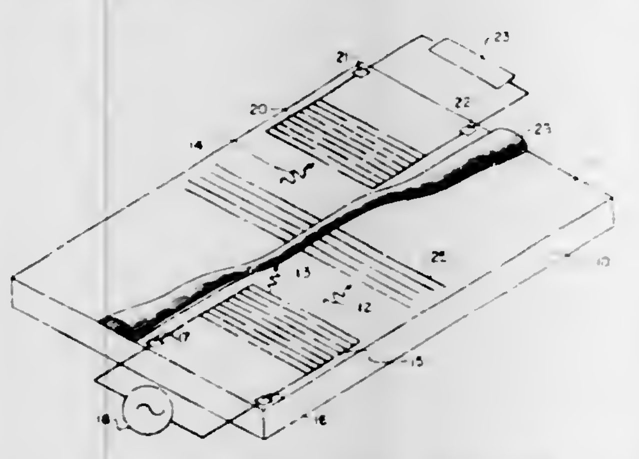


1. A variable equalizer comprising:
an input terminal to which an input signal is applied;
an output terminal from which an output signal is derived;
a first transmission network provided in the forward path from said input terminal to said output terminal;
a second transmission network provided in the feedback path from said output terminal to said input terminal, and
a third transmission network provided in the feedforward path from said input terminal to said output terminal, wherein
said first transmission network has a frequency independent transfer coefficient and said second and third transmission networks have respective frequency dependent transfer coefficients which are nearly equal in absolute value and are of opposite polarities with respect to each other.

4,004,254
SWIF WITH SIDE LOBE COMPENSATION BARRIER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 3, 1975, Ser. No. 564,940
Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/10*
U.S. Cl. 333—30 R **6 Claims**

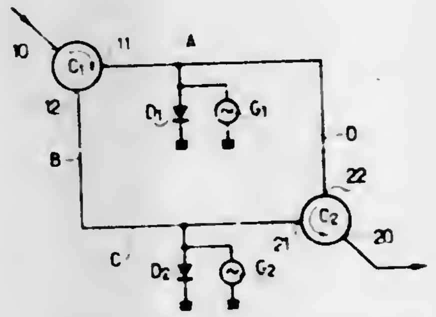


1. An acoustic surface wave device comprising:
a piezoelectric substrate defining a wave propagating surface;
a transmitting and receiving transducer pair for launching and receiving acoustic surface waves, formed at offset positions on said surface, each including a plurality of interleaved conductive fingers and defining a primary axis of propagation and reception;
a multistrip coupler, including elongated conductive elements, interposed between said transducers such that said elements are substantially parallel to said transducer fingers, converting surface waves launched by said transmitting transducer along its primary axis to waves along said primary axis of said offset receiving transducer; and
barrier means in the main energy coupling path, interposed between said transducers, reducing propagation of surface waves between said transducers along directions other than said primary axes.

4,004,255
MICROWAVE FREQUENCY PHASE MODULATOR

Roland Chapnikoff, Orsay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed July 2, 1975, Ser. No. 592,511
Claims priority, application France, July 25, 1974, 74.25934
Int. Cl.² H01P *1/18, 1/38;* **H03C** *7/02, 3/22*
U.S. Cl. 333—31 R **3 Claims**



1. A microwave phase modulator comprising first and second three-access circulators, the first accesses of the first and second circulators serving, respectively, as the input and the output access of the modulator, the second accesses being connected to one another by way of a first path having a first diode arranged therein and the third accesses being connected to one another by way of a second path having a second diode arranged therein, the two paths being of different electrical length and the two diodes being connected to voltage supplies such that they are each rendered conductive or blocked in phase opposition with each other.

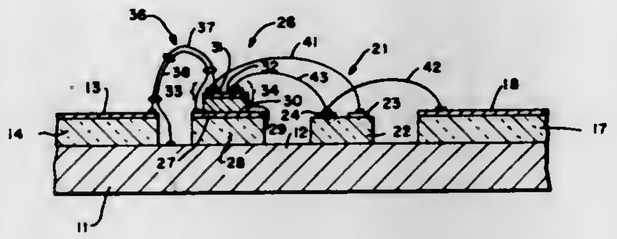
4,004,256
HIGH FREQUENCY AMPLIFIER STAGE WITH INPUT REFERENCE TRANSLATION AND OUTPUT MATCHING

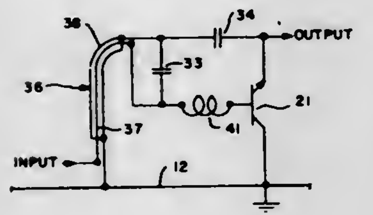
David M. Duncan, P.O. Box 97, Main Post Office, San Francisco, Calif. 94101

Continuation-in-part of Ser. No. 477,991, June 10, 1974, abandoned. This application July 16, 1975, Ser. No. 596,362
Int. Cl.² H03H *7/38*
U.S. Cl. 333—32 **12 Claims**

1. In an amplifier stage, a substrate having a generally planar surface at ground potential, a first conductor spaced from the surface of the substrate and forming therewith an input line; a second conductor spaced from the surface of the substrate and forming therewith an output line, a transistor having emitter, base and collector electrodes, the collector electrode being mounted directly on the surface of the substrate and connected electrically thereto, a transmission line having a first lead connected between the first conductor and a second one of the electrodes and a second lead connected between the substrate and the third one of the electrodes whereby input signals from the input line are applied to the second and third electrodes of the transistor, and means connecting the third electrode of the transistor to the second conductor

whereby output signals are applied to the output line from the third electrode and the collector electrode of the transistor, the third electrode being common to the input and output circuits.





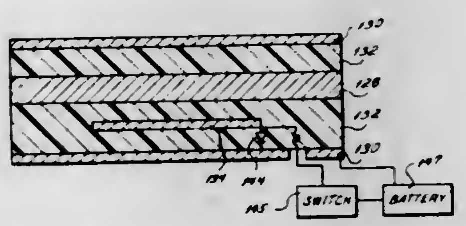
4,004,257
TRANSMISSION LINE FILTER

Robert G. Geissler, Cranford, N.J., assignor to Vitek Electronics, Inc., Middlesex, N.J.

Filed July 9, 1975, Ser. No. 594,270

Int. Cl.² H01P *1/14, 7/04, 1/20, 11/00*

U.S. Cl. 333—73 C **25 Claims**



1. A coaxial filter having two ends for insertion between transmission lines comprising an inner conductor, at least one conductive outer sheath, first insulation means separating said inner conductor from said outer conductive sheath, a section of conductive line extending longitudinally within said first insulation means laterally spaced apart from said inner conductor and electrically coupled thereto, second insulating means covering said outer sheath and coaxial terminal connectors at the opposite ends of said coaxial filter to permit said coaxial filter to be interconnected between the transmission lines, one of said terminal connectors serving as the filter output and wherein the length of the section of conductive line is approximately λ/4, wherein λ is the wavelength of the signal to be filtered by the coaxial filter.

4,004,258
POSITION INDICATING PULSE LATCHING SOLENOID

Kurt Arnold, West Caldwell, N.J., assignor to Valcor Engineering Corporation, Kenilworth, N.J.

Filed Nov. 20, 1974, Ser. No. 525,349

Int. Cl.² H01H *73/12*

U.S. Cl. 335—17 **10 Claims**

1. A position indicating solenoid comprising:

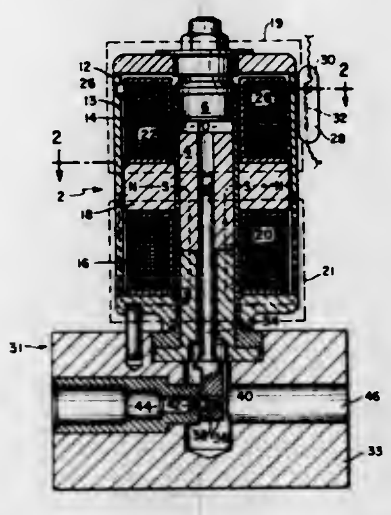
a. a housing,

b. a continuous source of magnetic flux mounted in said housing,

c. first and second alternately activated magnetic circuits contained in said housing and linked to said continuous source of magnetic flux, each of said circuits having a common magnetic member movably mounted in said housing between said first and second magnetic circuits to alternately close one of said circuits while opening the other, such movement of said common member causing the flux flow to move between said first and second circuits with said common member when said first circuit is closed by said common movable member,

d. means included in said first magnetic circuit permitting flux leakage upon activation of said circuit, and

e. sensing means mounted proximate to said flux leakage means responsive to said leakage flux for determining the position of said common movable member.



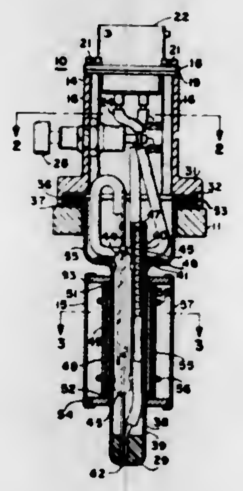
4,004,259
TEMPERATURE RESPONSIVE ELECTRIC SWITCH

Ward Barry Krause, Alexander, N.C., assignor to Square D Company, Park Ridge, Ill.

Filed June 25, 1975, Ser. No. 590,359

Int. Cl.² H01H *61/00;* **H01F** *13/00*

U.S. Cl. 335—146 **11 Claims**



1. A temperature responsive electric switch comprising: a magnet producing a magnetic field; a magnetically responsive switch element positioned in the magnetic field and movable to an open and closed position in response to the level of magnetic flux through said switch element; a compensating element formed of ferromagnetic material and having a magnetic permeability varying as a function of its temperature positioned in the magnetic field to shunt magnetic flux around the switch element at a level varying as a function of its temperature; and an adjusting element adjacent the switch element and movable to positions in the magnetic field to thereby bypass a selected portion of the magnetic flux around the switch element.

4,004,260
POWER RELAY

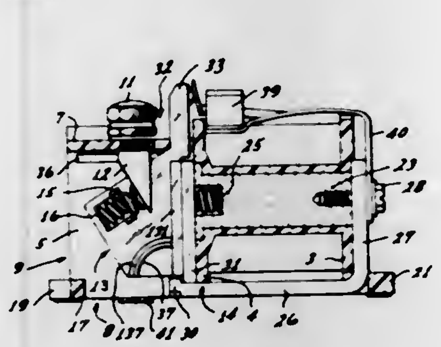
Anton Happach, Munich, Germany, assignor to Schaltbau Gesellschaft mbH, Munich, Germany

Filed June 26, 1975, Ser. No. 590,416

Claims priority, application Germany, July 12, 1974, 2433536

Int. Cl.² H01H *85/02*

U.S. Cl. 335—202 **11 Claims**



1. A relay with pivotable armature, an energizible coil, a magnetizable core, and means for changing the position of the armature when not attracted by the core, comprising:

a tubular body, open at both ends and provided with first and second end flanges, the tubular body being the carrier for the coil and receiving the core;

a top wall and two side walls integral therewith or connected thereto and extending from two opposite edges of the top wall at right angles, the top wall and the side walls extending from the first flange to define therewith a box-like enclosure having an open side opposite the first flange and an open bottom opposite the top wall;

the top wall having at least one opening, there being a contact piece fastened to the top wall at the opening and projecting through the opening into the box-like enclosure;

guide means at said side walls inside of said enclosure for pivotally supporting the armature; and

a counter contact on the armature for making contact with said contact piece and receding from the contact piece upon actuation of said armature.

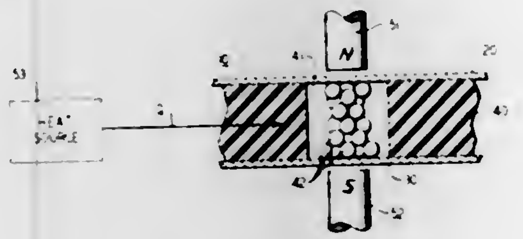
4,004,261
CONNECTION DEVICE

Alfred Simeon Klingenberg, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 11, 1975, Ser. No. 567,184

Int. Cl.² H01F *3/00*

U.S. Cl. 335—280 **8 Claims**



1. A connection device comprising:

first and second conductors each coated with a material having a melting point above 85° F;

an insulator separating the two conductors, the insulator having an aperture between the two conductors;

a plurality of magnetic balls contained within the aperture by the two conductors, each ball being coated with the material;

means for magnetically aligning the balls to establish an electrical connection between the two conductors; and

means for heating the material to its melting point, which material upon termination of heating solidifies fusing the balls and the conductors together into a permanent connection between the conductors.

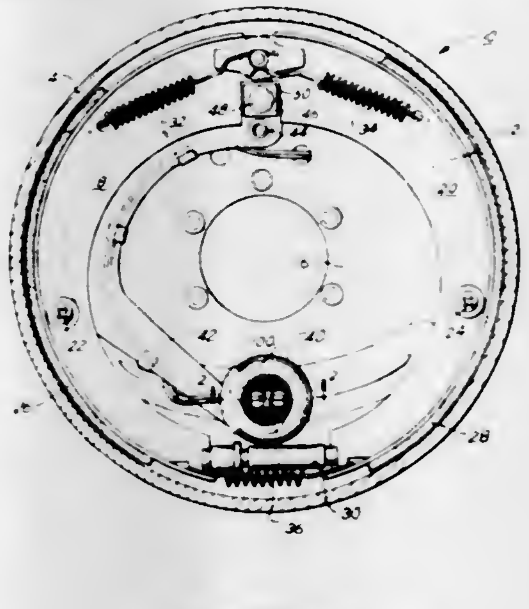
4,004,262
ELECTROMAGNET FOR PROVIDING BALANCED FRICTION FACE PRESSURES ON AN ARMATURE IN A VEHICLE ELECTRIC BRAKE SYSTEM

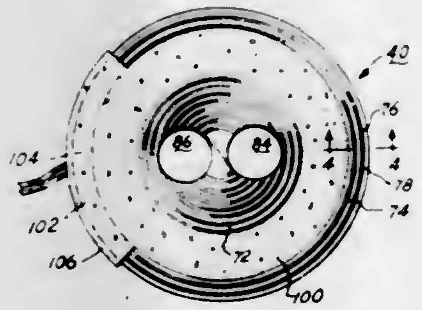
Leroy K. Grove, 512 S. Merrifield Ave., Mishawaka, Ind. 46544

Filed Mar. 11, 1975, Ser. No. 557,251

Int. Cl.² H01F *7/08;* **F16D** *65/34*

U.S. Cl. 335—281 **15 Claims**





1. An electromagnet for use in electric brakes, clutches and the like having an armature rotating relative to said electromagnet and an actuating arm attached to and restraining said electromagnet, comprising a body of low reluctance magnetic material having an inner pole and an outer pole defining a cavity and having leading and trailing edges relative to the normal forward rotation of the armature, an electric coil disposed in said cavity, said poles having planar faces for engaging the armature, with the leading edge of said outer pole which first engages the oncoming armature face having a recess therein forming a non-magnetic sector, and a nonmagnetic wear member in said cavity and recess for engaging the armature, said non-magnetic sector on the leading edge of said outer pole being of a size of at least 45° taken from a point on the center line spaced from the leading edge equal in distance to the distance from the center line to the lateral side edges at right angles to said center line.

4,004,263
PROTECTOR MODULE FOR TELEPHONE SYSTEMS

William V. Carney, Valley Stream, N.Y., assignor to Porta Systems Corporation, Syosset, N.Y.

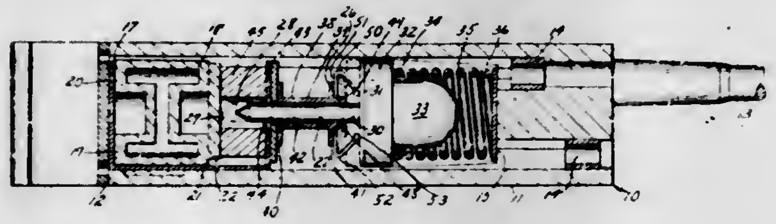
Filed June 9, 1975, Ser. No. 584,768

Int. Cl.² H01H *39/00*

U.S. Cl. 337—32 **4 Claims**

1. In a telephone line protective module of a type including means for conducting excessive voltage surges through an

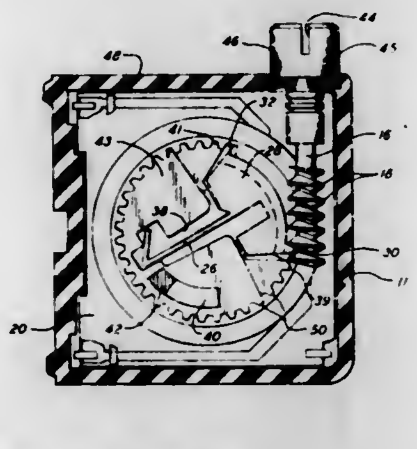
arcing device to a source of ground potential, and heat-responsive means for conducting excessive currents to said source of ground potential, the improvement comprising: means selectively providing an electrically conductive path to said source of ground potential by-passing said arcing device, upon actuation of said heat-responsive means; said means including a spring-loaded terminal member having a shaft-like plunger thereon, a relatively fixed retaining member slidably fitted relative to said plunger, said heat-responsive means interconnecting said retaining member and said plunger, and an annular compressible electrically conductive member positioned between said retaining member and a portion of said plunger to provide electrical communication therebetween, irrespective of the relative position between said plunger and said fixed retaining member.



4,004,264
VARIABLE RESISTANCE DEVICE

Ronald P. Hogue, Rowland Heights; Robert D. Hill, Jr., Santa Ana, and Paul F. Gerwitz, West Covina, all of Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,282
Int. Cl.² H01C *10/30*
U.S. Cl. 338—174 **9 Claims**

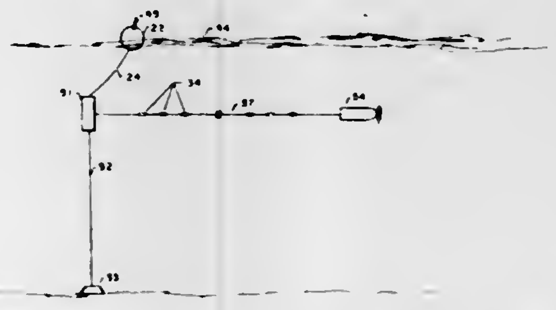


1. A variable resistor comprising:
a housing;
a substrate member of non-conductive material supported by the housing, said substrate member having a conductive track and a resistive track disposed on a first surface thereof;
movable contact means electrically connecting said resistive and conductive tracks, said contact means including a gear having a sector devoid of gear teeth, said contact means further having a groove formed on a surface thereof remote from said substrate member and disposed substantially parallel thereto;
a worm screw having a helically formed thread in engagement with said gear of said contact means, rotation of said screw causing said contact means to move along the conductive and resistive tracks;
stop means having a first portion connected to said contact means and movable therewith and a second portion connected to a fixed section of said variable resistor, said first and second portions, engaging to prevent further movement of said contact means in the same direction as the contact means approaches the ends of the conductive and resistive tracks; and
a ratchet member including a single elongated spring attached to a body portion, said body portion having two rigid legs extending therefrom, said spring being disposed within said groove formed in said remote surface of said contact means, said rigid legs being disposed within the sector of said gear, each of said legs being disposed adjacent a gear tooth defining the boundary of said sector, one of said legs being the sole element in engagement with the threads of said worm screw when said contact means reaches the end of its travel in a first direction, and the other of said legs being the sole element in engagement with the threads of said worm screw when said contact means reaches the end of its travel in a second direction.

4,004,265
SELF-PROPELLED ARRAY SYSTEM

Thomas E. Woodruff, Nashua; Samuel S. Ballard; Roger I. Saunders, both of Hollis, and Everett W. Farmer, Nashua, all of N.H., assignors to Sanders Associates, Inc., South Nashua, N.H.

Continuation-in-part of Ser. No. 494,154, Aug. 2, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,086
Int. Cl.² G01S *3/80*
U.S. Cl. 340—2 **28 Claims**



1. A hydrophone array system comprising a first cable, a plurality of hydrophones connected to said first cable and spaced apart by predetermined distances thereby forming an array, a buoyant body, a transmitter within said body, a second cable extending from said body, and means including said cables for conducting signals from said hydrophones to said transmitter characterized in that said system includes a thruster connected to one end of said first cable for urging it in a preferred direction and a member connected to the other end of said first cable for resisting the urging of said thruster and in that said first cable includes a section adjacent to said thruster which section comprises a first resilient portion and a second, signal carrying portion, said second portion being longer than said first portion, said portions being fastened to each other at each of their ends so that said second portion remains in a slack condition.

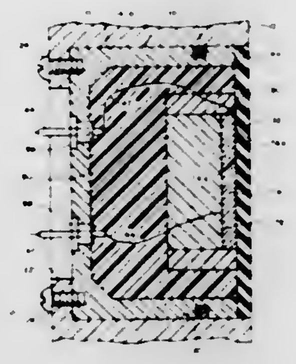
4,004,266
TRANSDUCER ARRAY HAVING LOW CROSS-COUPLING

Rufus L. Cook, and Lyles C. Adair, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1975, Ser. No. 638,013
Int. Cl.² H04B *13/00*
U.S. Cl. 340—9 **4 Claims**

1. A sonar array suitable for simultaneous transmission and reception of acoustic energy of a predetermined wavelength into and from an aqueous medium, said array including a rigid metal baffle plate having a plurality of recesses therein arranged in a predetermined pattern and a plurality of electroacoustic transducers, each received in a corresponding one of said recesses and presenting a surface substantially flush with said plate, said array being characterized by the improvement wherein each of said transducers comprises:
a rigid metal cup-shaped body having a rim surface;

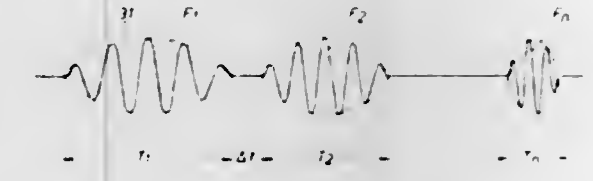
a disc-shaped piezoelectric element that is substantially one-half of said wavelength in thickness and comprises electrode means on opposite faces thereof, one of said faces being directed inwardly of said cup-shaped body and the other of said faces being directed outwardly thereof;
a substantially congruent disc of a first low acoustic impedance material cemented to the electrode means on said one of said faces of said piezoelectric element;
a cylinder of said first low acoustic impedance material surrounding and cemented to the periphery of said piezoelectric element and said congruent disc of first low acoustic impedance material;
a potting compound of a second low acoustic impedance material disposed in said cup-shaped body and surrounding said disc and cylinder in supporting relation thereto and to the piezoelectric element therein; and
an acoustic window comprising a circular layer of material having an acoustic impedance substantially matching that of water, said window being secured in overlying relation to said outwardly directed face of said piezoelectric element, to said cylinder of first low acoustic impedance material, to said second low acoustic impedance material potting compound, and to said rim surface of said cup-shaped body;
whereby the periphery and said inwardly directed face of said piezoelectric element are separated from said cup-shaped body by both of said first and second low acoustic impedance materials and adjacent ones of said transducers in said array are characterized by cross-coupling of less than about −75 db.



4,004,267
DISCRETE FREQUENCY SEISMIC EXPLORATION USING NON UNIFORM FREQUENCY SPECTRA

William Harry Mayne, San Antonio, Tex., assignor to Geosource Inc., Houston, Tex.

Continuation of Ser. No. 309,952, Nov. 28, 1972, abandoned. This application May 8, 1975, Ser. No. 575,823
Int. Cl.² G01V *1/14*
U.S. Cl. 340—15.5 TA **12 Claims**

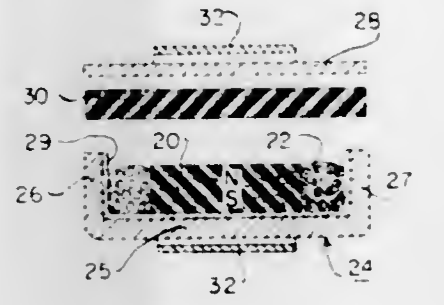


1. A method of seismic exploration to obtain a composite seismic signal having a preselected frequency spectrum which comprises:
a. transmitting a set of discrete seismic wave packets of narrow bandwidth into the earth, each of such wave packets being of different bandwidth, and having different center frequencies, wherein most of the center frequencies of the wave packets are substantially related to each other according to the values of a geometric progression within the preselected frequency spectrum and wherein the adjacent spectra of each wave packet overlap at substantially one-half amplitude values,
b. receiving and recording independently the waves returned from the earth due to each such wave packet, and
c. combining recorded waves due to each wave packet, thereby forming a composite signal having the preselected frequency spectrum.

4,004,268
IN-LINE STRESS/STRAIN DETECTOR

John C. Cook, Dallas, Tex., assignor to Teledyne Industries, Inc., Dallas, Tex.

Filed Feb. 6, 1975, Ser. No. 547,674
Int. Cl.² G01V *1/16*
U.S. Cl. 340—17 R **10 Claims**



1. A detector to be buried in a particulate medium and operative to generate signals in response to stressing of said medium and to deliver the signals to a monitoring circuit, comprising:
a. an elongated assembly comprising multiple successive signal-generating detector units connected by cable means to said monitoring circuit; and
b. each detector unit comprising multiple sets of paired opposed plates of magnetic material, the opposed plates being spaced apart in the direction of the thickness dimension of the unit at their central portions and the sets of plates having contiguous edges aligned with each other along the length dimension of the detector unit which is great as compared with its width and which edges closely approach each other to form air gaps, magnet means extending longitudinally between the central portions of the paired plates and spaced from their lateral edges and said magnet means having opposed poles spaced in the direction of the thickness dimension and located contiguous to the respective plates, a winding surrounding the width and entire length of the magnet means and disposed in the space between the lateral edges of the plates and the magnet means, and said winding being coupled to the cable means, and resilient strip means interposed between a plate of each pair and said magnet means and yieldably maintaining the air gaps by keeping the plates mutually separated at their peripheries.

4,004,269
BRAKE LINING WEAR WARNING SYSTEM

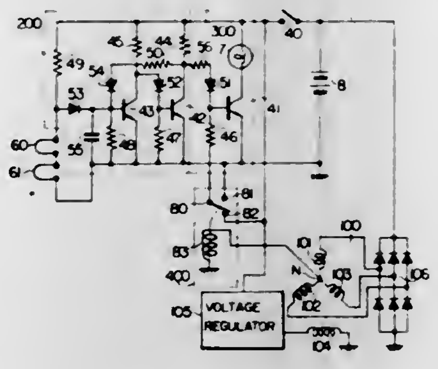
Hiroshi Arai, Toyota, and Koichi Taniguchi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed July 25, 1974, Ser. No. 491,777
Claims priority, application Japan, July 28, 1973, 48-85082
Int. Cl.² B60T *17/22*
U.S. Cl. 340—52 A **11 Claims**

1. A brake lining wear warning system for a vehicle comprising:
a. a probe for placement in a brake lining and defining a current path which becomes electrically non-conductive when said brake lining wears down to a critical value;

b. switch means for connecting and disconnecting said probe to a power supply;

c. a holding circuit including a flip-flop having first and second stable states and reset means connected to said flip-flop for causing, when operated, said flip-flop to assume said first state, means for connecting said flip-flop to said probe for causing said flip-flop to shift into said second state in response to the nonconductive condition of said probe path and to remain in that state and produce a wire breakage detection signal even if thereafter the nonconductive condition of said probe path changes to a conductive condition, said reset means including means operated by said switch means for applying a reset signal to said flip-flop to reset said flip-flop irrespective of the electric nonconductivity of said probe path when said switch means reconnects said power supply to said probe;

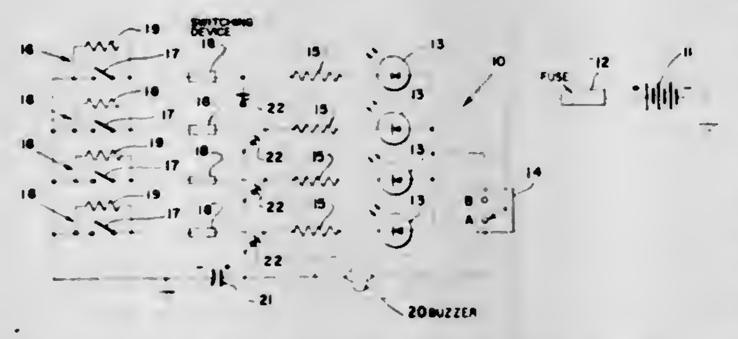


d. warning means connected to said flip-flop for giving a warning indication in response to said wire breakage detection signal, said warning means including gate means for preventing a checking means from operating on said holding circuit so as to apply a check signal only to said warning means; and

e. said checking means connected to said warning means for producing said check signal to operate, upon checking, said warning means irrespective of said probe and said holding circuit.

4,004,270
ELECTRONIC TIRE PRESSURE ALARM CIRCUITRY
William Eugene Claxton, Mogadore; James Dennis Gardner, Akron, and Marvin Lynn Janssen, North Canton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

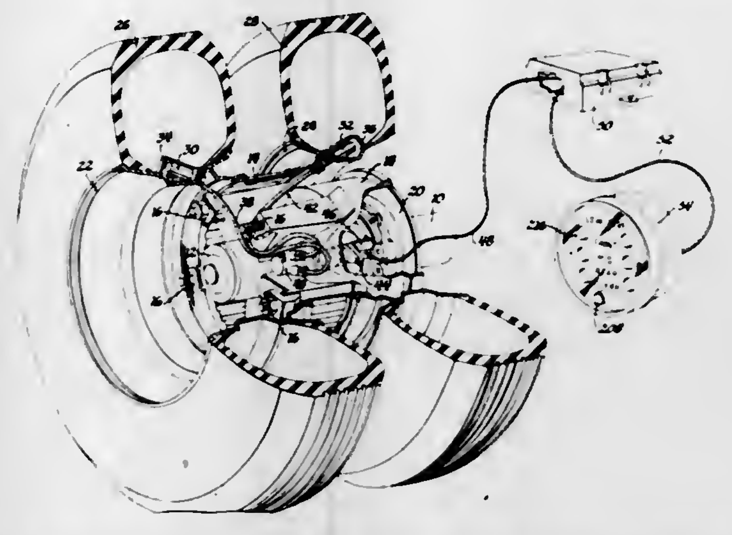
Filed Feb. 17, 1976, Ser. No. 658,786
Int. Cl.² B60C ***23/00***
U.S. Cl. 340—58 **12 Claims**



1. An electronic alarm circuit for indicating an abnormal pressure condition in a pneumatic tire on a vehicle comprising, power means providing an output signal, indicator means electrically connected to said power means to provide a first identifiable signal indicative of an abnormal pressure condition in the pneumatic tire and a second identifiable signal to test the circuit, actuation means electrically connected to said indicator means and communicating with the internal pressure of the tire to activate said indicator means to provide said first and second identifiable signals and intermittent switch means electrically connected between said indicator means and said actuation means and closing once each revolution of the tire so that said first and second identifiable signals are intermittent.

4,004,271
LOW TIRE PRESSURE WARNING SYSTEM
Harold A. Haven, Hale, and John A. Stewart, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 532,404, Dec. 13, 1974. This application Aug. 1, 1975, Ser. No. 601,319
Int. Cl.² B60C ***23/02***
U.S. Cl. 340—58 **4 Claims**

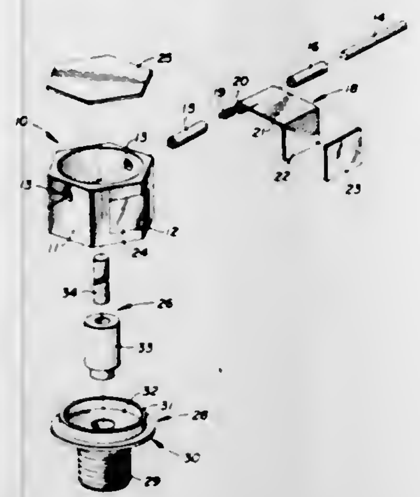


1. A pneumatic tire low pressure warning system comprising: a wheel; a pneumatic tire carried by the wheel, the tire being normally inflated to a specified pressure; a low pressure air switch, the low pressure air switch including a housing secured to the wheel and having a cavity therein exposed to the internal pneumatic tire pressure temperature, a normally closed valve unit carried on the housing and having an inlet side exposed to the internal tire pressure and having an outlet side, a bellows within the cavity, means coupling the bellows and the normally closed valve unit, the normally closed valve unit being opened when the bellows is extended, and a manually actuated equalizer valve extending through the wheel and being operable to selectively provide pneumatic communication between the bellows interior and the pneumatic tire interior and seal the bellows interior from the pneumatic tire interior, the equalizer valve being operated to provide pneumatic communication between the interior of the tire and the bellows when the tire is at the specified pressure and thereafter closed so as to establish a temperature variable reference pressure within the bellows, the bellows being extended when the air pressure in the pneumatic tire decreases to a certain level below the reference pressure within the bellows to open the normally closed valve unit; an actuator carried by the wheel external of the pneumatic tire; means pneumatically coupling the outlet side of the normally closed valve unit to the actuator, the actuator being operated by tire air supplied thereto when the normally closed valve unit is opened by the bellows; and means for sensing the operation of the actuator and providing a warning, whereby the warning represents the decrease in the pneumatic tire pressure below the manually set, temperature variable reference pressure in the bellows.

4,004,272
OPTICAL PRESSURE SWITCH
William Eugene Claxton, Mogadore, and Bruce Milan Cernik, Medina, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

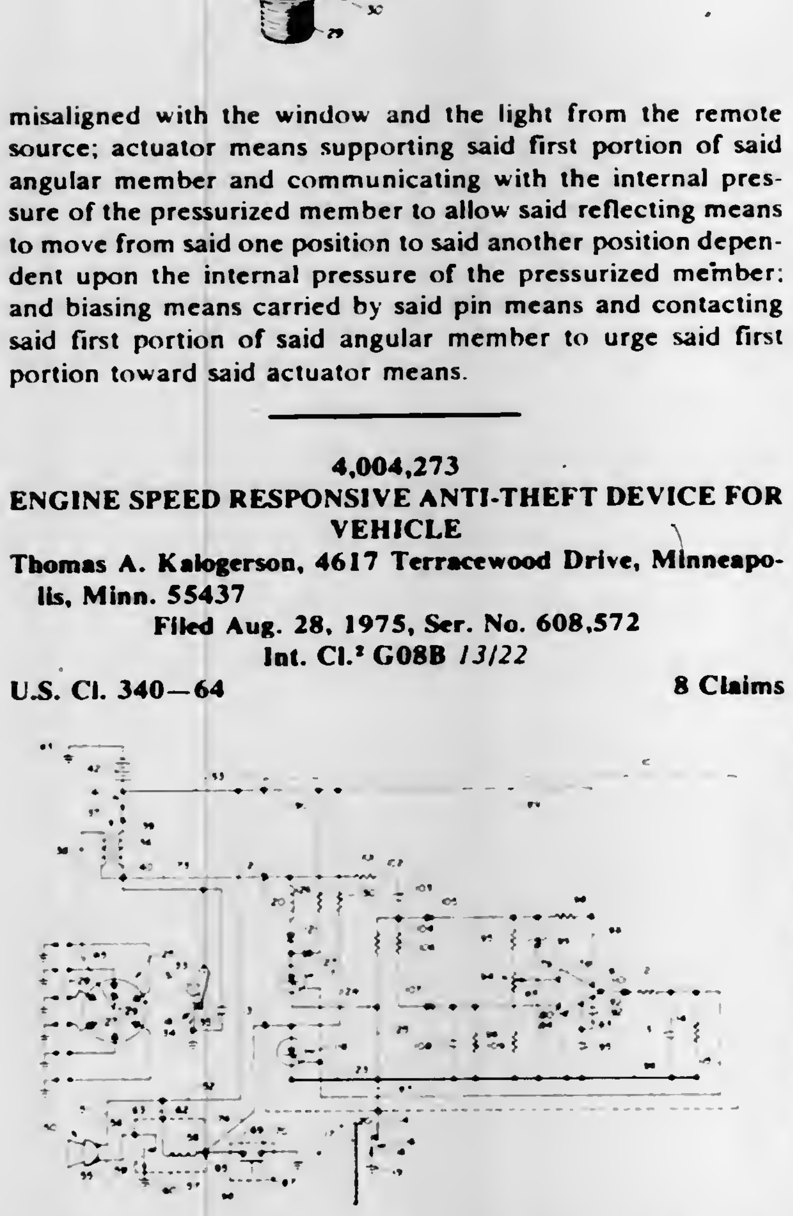
Filed July 21, 1975, Ser. No. 597,809
Int. Cl.² B60C ***23/04*****; G01D** ***5/34***
U.S. Cl. 340—58 **6 Claims**

1. Apparatus for giving an optical indication of the internal pressure condition of a pressurized member comprising a housing having a window therein; an angular member movably mounted within said housing, said angular member having a first portion angular to a second portion; reflecting means mounted on said second portion of said angular member; pin means suspending said angular member in said housing so that said reflecting means is movable from one position, aligned with the window to receive light from a remote light source and reflect the same through the window, to another position misaligned with the window and the light from the remote source; actuator means supporting said first portion of said angular member and communicating with the internal pressure of the pressurized member to allow said reflecting means to move from said one position to said another position dependent upon the internal pressure of the pressurized member; and biasing means carried by said pin means and contacting said first portion of said angular member to urge said first portion toward said actuator means.



4,004,273
ENGINE SPEED RESPONSIVE ANTI-THEFT DEVICE FOR VEHICLE
Thomas A. Kalogerson, 4617 Terracewood Drive, Minneapolis, Minn. 55437

Filed Aug. 28, 1975, Ser. No. 608,572
Int. Cl.² G08B ***13/22***
U.S. Cl. 340—64 **8 Claims**



1. An anti-theft device for a vehicle driven by an internal combustion engine having an ignition system including a plurality of igniters, a transformer having a secondary selectively connected to said igniters for energizing the same, and switching means driven by said engine for periodically interrupting the current flowing through the primary of said transformer, said device comprising:

disabling means for connection to an internal combustion engine for disabling the engine,

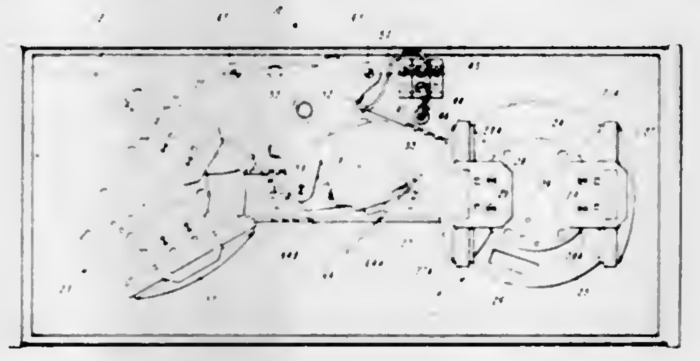
speed responsive means responsive to the speed of the engine and comprising an electronic speed sensing means adapted to be connected across such a switching means and generate a voltage dependent upon the speed with which said switching means is actuated and means responsive to said voltage connected to said disabling means and effective when said voltage exceeds a value indicative of the predetermined value of engine speed to actuate said disabling means regardless of the speed of the vehicle,

manually operable means for rendering said disabling means ineffective when the vehicle is to be driven by an authorized driver,

and means for maintaining said disabling means effective after actuation thereof until said manually operable means is operated, regardless of the time intervening until said manually operable means is operated.

4,004,274
SIGNAL LIGHT ASSEMBLY
Kenneth W. Menke, Glendale, and Michael D. Latta, Ladue, both of Mo., assignors to Public Safety Equipment, Inc., Maryland Heights, Mo.

Filed Oct. 22, 1975, Ser. No. 624,912
Int. Cl.² B60Q ***1/00***
U.S. Cl. 340—84 **9 Claims**



5. In a flashing signal light beacon for vehicle recognition, the improvement of: a base; a pair of posts fixed relative to said base and extending therefrom in spaced parallel positions; a light pod carried on each post, each pod including a frame assembly slidably disposed over each post, each frame assembly having a drive gear and means to receive and attach lamps in angularly spaced relation about said fixed post, the lamps in a first one of said frame assemblies being in a different angular orientation from the lamps in the second one of said frame assemblies; an electrical circuit connection through said fixed posts to said lamps, said rotating frame assemblies being the other side of the electrical circuit; a drive gear hub on each frame assembly; and drive means on said base operatively connected to each of said drive gear hubs to rotate said frame assemblies of each pod, the rotation of said frame assemblies directing the light from said lamps to sweep an azimuth areas of about 160° forwardly and rearwardly of the vehicle and produce from a remote position of observation within the sweep azimuth area a succession of individual bright light flashes directly from said lamps and intervals of dark between the light flashes.

4,004,275
SELF-CLOCKING DATA ENTRY UNIT SYSTEM
Richard Louis Arndt, Byron, and Thomas Richard Teal, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,446
Int. Cl.² H04Q ***5/00*****; H03K** ***1/17*****; H04J** ***3/00***
U.S. Cl. 340—168 S **11 Claims**

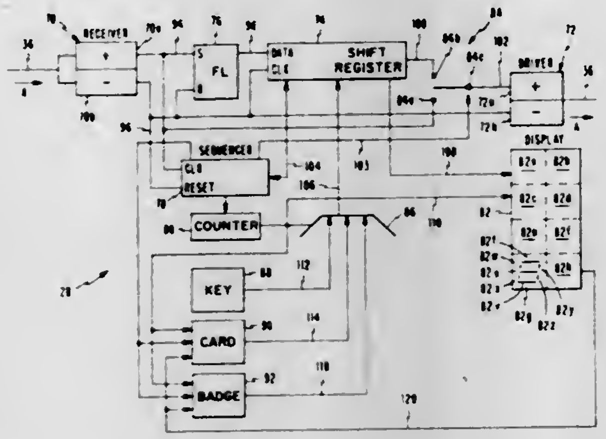
1. A data entry unit system comprising:

a central controller, a series of remote stations, a transmission line connected with said controller and connecting said remote stations together in a series, said controller being constructed to provide to said line a series of data bits in spaced time positions which are indicative of data depending on which of the data bits exist or are missing in said positions and a preceding series of control bits and a series of tag bits in time positions following each of the time positions designated for said data bits, said data bits and control bits constituting electrical excursions in one direction from a median electrical value and said tag bits constituting electrical excursions in the other direction from said median electrical value, said remote stations including:

a receiver in each of said stations receiving bits from said controller constructed to distinguish between said bits having excursions in one direction as distinguished from said bits having excursions in the other direction,

means in each of said stations in said series prior to the ultimate one of said stations for transmitting at least some of said data and control and tag bits from said receiver through the station and to said transmission line,

means in each of said stations for accumulating a field of consecutive data bits received by its said receiver from said line,



a data bit utilization means in each of said stations, and

means in each of said stations under the control of one of said control bits for shifting the data bits accumulated in the station to said data bit utilization means in the station.

9. A data entry unit station comprising:

a receiver for bits applied thereto having a first receiver part providing output signals for bit excursions in a first direction and a second receiver part providing output signals for bits applied thereto having excursions in the other direction, a shift register having a data entry terminal connected to the output of said first receiver part, a transmitter having a first transmitter part for providing output signals for excursions of bits applied thereto in said first direction and having a second transmitter part providing output signals for bits having excursions in said other direction, means connecting the output of said second receiver part with the input of said second transmitter part and switch means alternately connecting the input of said first transmitter part with the output of said shift register or with the output of said first receiver part.

4,004,276

TELEPHONE ANSWERING MACHINES

Stephen Perrin Robinson, Camberley; David Charles Evans, Woodley, and Martin Hewitt, Church Crookham, all of England, assignors to Ansafone Limited, Camberley, England

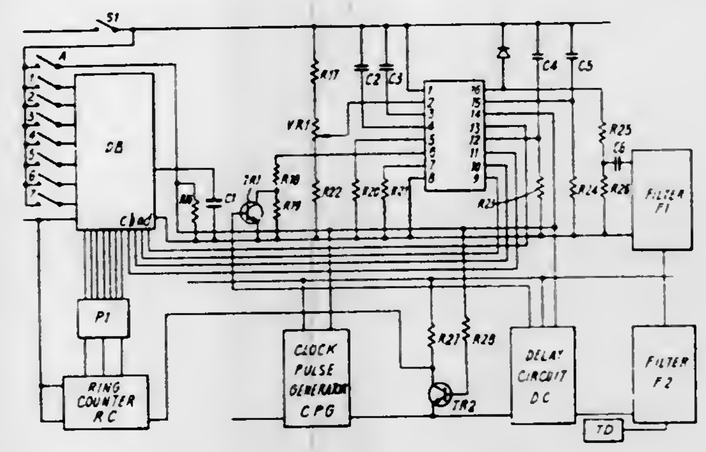
Filed July 25, 1975, Ser. No. 598,938

Claims priority, application United Kingdom, July 26, 1974, 33228/74

Int. Cl.² H04Q *9/00*

U.S. Cl. 340—171 A **14 Claims**

1. A decoder device for remotely controllable electrical equipment, the device comprising receiver means having a signal input, an output and a switching input, the receiver means being initially sensitive to a predetermined access signal comprising at least two groups of pulsed electrical signals, each group comprising at least two pulses and each pulse having a predetermined frequency different from the or each adjacent pulse in the same group, the receiver means being adapted, when the said access signal is applied to the signal input thereof, to generate a switching signal at the output thereof, and means for applying the switching signal to the switching input of the receiver means, whereby the receiver means are rendered sensitive to command signals subsequently applied thereto, each command signal comprising a group of at least two pulses, each pulse having a predetermined frequency different from the frequency of the or each adjacent pulse in the group and one pulse in the group having a frequency different from any of the frequencies in the access signal, the receiver means then being adapted, when one of the said command signals is applied thereto, to provide a predetermined output signal.



4,004,277

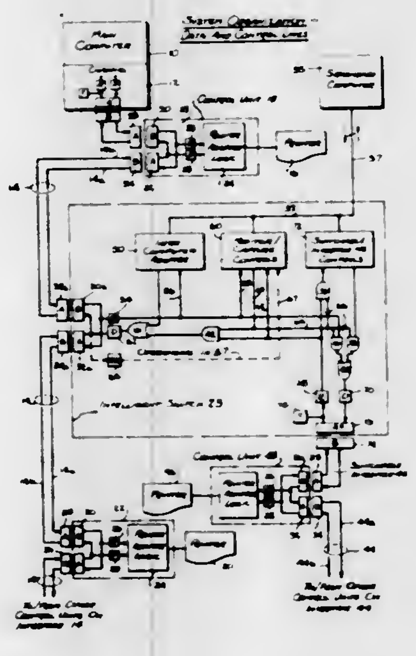
SWITCHING SYSTEM FOR NON-SYMMETRICAL SHARING OF COMPUTER PERIPHERAL EQUIPMENT

Bruce D. Gavril, 444 E. 75th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 474,196, May 29, 1974, abandoned, which is a continuation of Ser. No. 234,185, March 13, 1972, abandoned. This application May 5, 1975, Ser. No. 574,585

Int. Cl.² G06F *3/04*

U.S. Cl. 340—172.5 **119 Claims**



1. A multiprocessor computer system having at least one non-symmetrically shared item of peripheral equipment, comprising:

a main computer,

a secondary computer, and

an intelligent switch connected to said main computer and to said secondary computer, said item of peripheral equipment being connected to said intelligent switch and switchable by said intelligent switch to said main computer or to said secondary computer, said item of peripheral equipment being initially switched to said main computer,

wherein said main computer performs a predetermined first data transfer to said item of peripheral equipment, said intelligent switch comprising means for sensing said predetermined first data transfer, and

said intelligent switch switches said item of peripheral equipment from said main computer to said secondary computer in response to the completion of said predetermined first data transfer.

4,004,278

SYSTEM FOR SWITCHING MULTIPLE VIRTUAL SPACES

Shigeo Nagashima, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

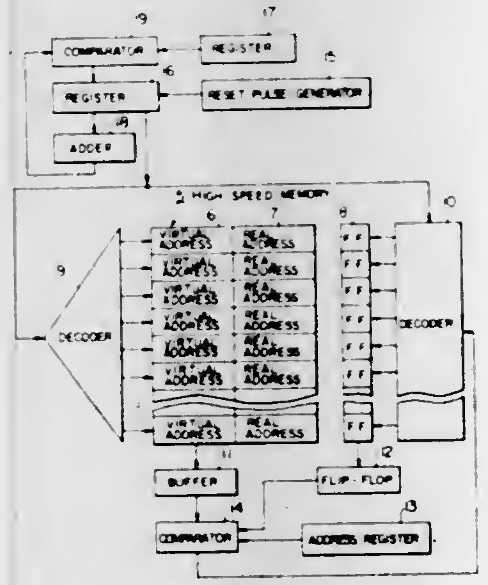
Filed Mar. 18, 1974, Ser. No. 452,138

Claims priority, application Japan, Mar. 19, 1973, 48-30969

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G06F *9/20*

U.S. Cl. 340—172.5 **6 Claims**



1. In a virtual memory system having a real space and multiple virtual spaces used in a switching mode and comprising a high speed memory for storing a plurality of address sets each including a virtual address of said virtual space and a real address of said real space corresponding to the virtual address, indicator means provided in correspondence with respective address sets in said high speed memory for indicating one of the validity and invalidity states of the corresponding address sets and extracting means connected to said high speed memory for extracting the real address corresponding to the referred virtual address from said high speed memory;

a system for switching said virtual spaces including:

addressing means connected to said high speed memory for addressing in succession the address sets in said high speed memory;

first register means for storing at least one special address;

comparing means connected to said high speed memory and said first register means for comparing the virtual address in the address set addressed by said addressing means with the special address in said first register means so as to generate an indication signal when the virtual address in the addressed address set belongs to a region delimited by the special address in which the same virtual addresses in the respective virtual spaces are translated to correspond to different real addresses; and

setting means connected to said comparing means and said indicator means for setting the invalidity state of the addressed address set to the corresponding indicator means in accordance with the indication signal from said comparing means.

4,004,279

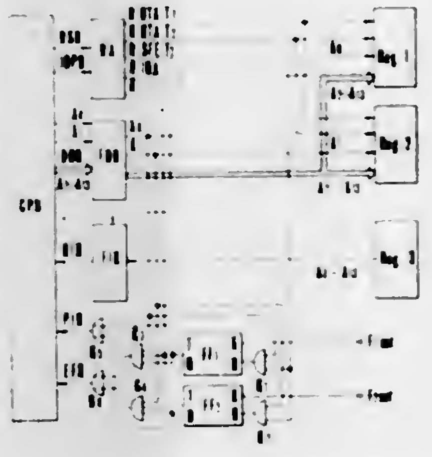
METHOD AND APPARATUS FOR CONTROLLING DATA TRANSFER BETWEEN INPUT AND OUTPUT DEVICES AND A DIRECT DIGITAL CONTROLLER

Kazuo Nezu, Hachioji, Japan, assignor to Yokogawa Electric Works, Ltd., Musashino, Japan

Continuation-in-part of Ser. No. 45,728, June 12, 1970, Pat. No. 3,710,326. This application Nov. 1, 1974, Ser. No. 520,027

Int. Cl.² G06F *3/04*; G08B *11/00*

U.S. Cl. 340—172.5 **2 Claims**



1. A direct digital controller for interfacing a plurality of operating groups with a digital computer, said computer having

an offering signal input terminal,

an answerback signal input terminal,

a data output bus for supplying digital data signals including register selecting bits,

an input and output device designating bus, and

a control signal bus,

comprising:

a plurality of output registers for each said group;

a flip-flop and set terminal input corresponding to each of said output registers, each said flip-flop operable for storing an offering signal applied to its set terminal;

a decoder circuit for each said group responsive to signals from said input and output designating bus and from said control signal bus of said digital computer to produce decode control signals upon receipt of the respective code signal for a group;

a logic circuit

for applying set signals on said flip-flops to said offering input terminal and

for applying an AND gated signal to said answerback input terminal upon coincidence of said decode control signal for said group, said register selecting bits from said data signal and a set output from the one of said flip-flops corresponding to the register selected by said data signal, thereby producing an answerback signal in said digital computer

said decode control signals providing in response to said answerback signal

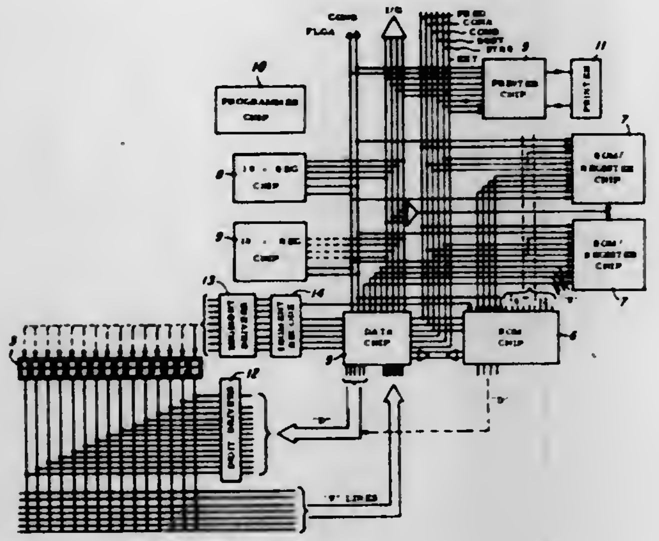
a reset signal for the selected output register,

a write in signal for entering data on said data output bus in said selected output register, and

a reset signal for the set flip-flop corresponding to said selected output register.

4,004,280
CALCULATOR DATA STORAGE SYSTEM

Jerry L. Vandierendonck, Santa Cruz, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 368,780, June 11, 1973. This application July 7, 1975, Ser. No. 593,594
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **4 Claims**

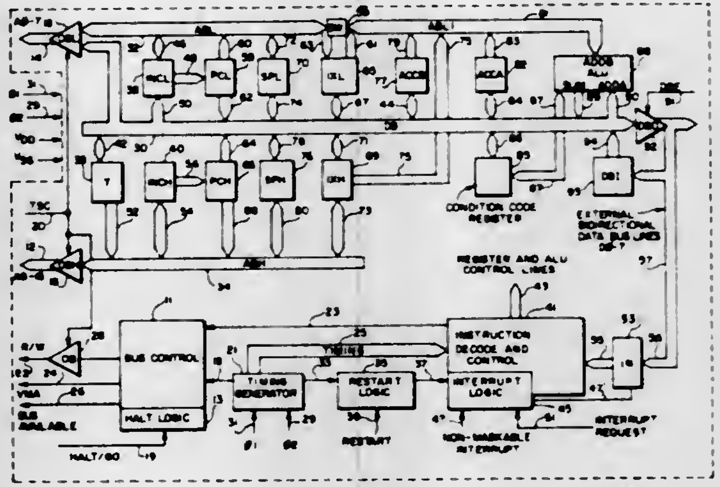


1. An electronic calculator system of the type implemented on a plurality of semiconductor chips, including a plurality of separate data registers for storing in bit-parallel, digit-serial format a plurality of multi-digit words of coded information, primary timing means for producing timing signals for sequentially addressing the separate data registers one digit at a time from least to most significant digit, flag output means for providing status information relating to a calculator mode indication and an addressing indication, data input/output means for transmitting the multi-digit data words to and from the separate data registers, the calculator system further including at least one data register chip comprising:

a. a plurality of auxiliary registers for increasing the storage capacity for the multi-digit data words;
b. control logic means responsive to the status information from the flag output means for generating first and second operations signals and a synchronization signal;
c. storage means coupled to the data input/output means for storing a first multi-digit data word transmitted from the separate data registers, the first data word comprising an input/output operation command portion and a register select portion for selecting a particular register of the plurality of auxiliary registers to be addressed;
d. selection means operatively connected to the storage means and responsive to the first data word for selecting a particular one of the separate storage registers and operatively connected to the control logic means and responsive to the first and second operation signals for data input or output, respectively;
e. register timing means for providing timing signals corresponding to the timing signals of the primary timing means for addressing the auxiliary registers corresponding to the timing signals of the timing means, in response to the synchronization signal from the control logic means; and
f. data routing means connected to the data input/output means for transmission of data to and from a selected one of the plurality of auxiliary registers, through the storage means.

4,004,281
MICROPROCESSOR CHIP REGISTER BUS STRUCTURE

Thomas H. Bennett, Scottsdale; Anthony E. Kouvoussis, and Michael F. Wiles, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.
Filed Oct. 30, 1974, Ser. No. 519,133
Int. Cl.² G06F *9/00*
U.S. Cl. 340—172.5 **6 Claims**

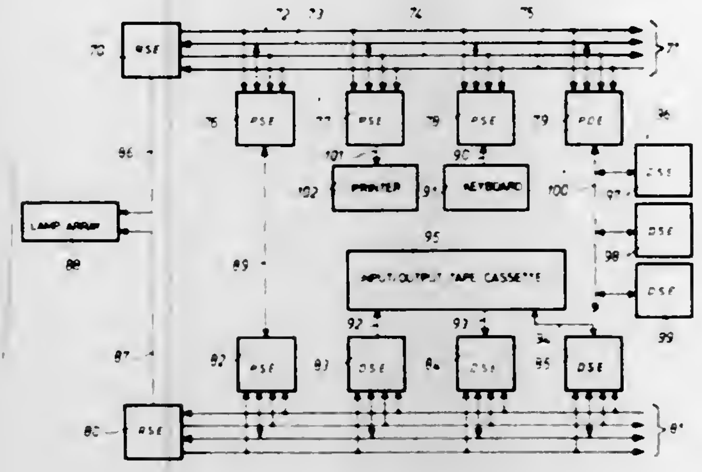


1. In a microprocessor including an address bus coupled to an address output circuit and a data bus coupled to a data input-output circuit, said microprocessor being suitable for executing a plurality of instructions stored in a memory in accordance with a plurality of machine cycles, each of said instructions including an operational code, circuitry comprising:

program register storage means coupled between said address bus and said data bus for storing an address of an operational code of a first instruction during a first machine cycle; said program register storage means including first means for transferring said address of said operational code to said address bus during said first machine cycle;
incrementor means coupled between said address bus and said data bus for receiving an address from said data bus or said address bus in response to one of said instructions;
said incrementor means including second means for transferring said address to said address bus during said first machine cycle in response to one of said instructions;
said incrementor means also including third means for incrementing said address during said first machine cycle;
said incrementor means also including fourth means for transferring said incremented address into said program register storage means during a second machine cycle;
transfer bus means coupled between said program register storage means and said incrementor means for effecting said transfer of said incremented address; and
control and timing circuitry coupled to said program register means and said incrementor means for effecting said first and second machine cycles.

4,004,282
CIRCUIT ARRANGEMENT FOR AN INTEGRATED DATA PROCESSING SYSTEM COMPOSED OF A SMALL NUMBER OF DIFFERENT CHIP TYPES WITH ALL CHIPS DIRECTLY CONNECTABLE TO A COMMON COLLECTING BUS

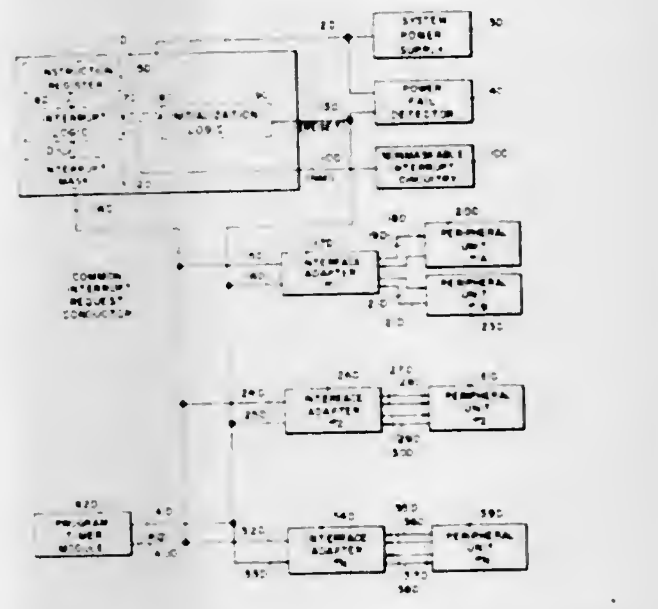
Gerald Weber, and Jürgen Sorgenfrei, both of Braunschweig, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Dec. 20, 1974, Ser. No. 535,088
Claims priority, application Germany, Dec. 22, 1973, 2364303
Int. Cl.² G06F *7/48, 13/00*
U.S. Cl. 340—172.5 **10 Claims**



1. In a circuit arrangement for an integrated data processing system, which arrangement is composed of a plurality of integrated circuit chips each carrying a plurality of circuit components interconnected to define function blocks which include first, second and third address registers, at least one further address register, a status register, a calculating register, an arithmetic-logic linkage unit, an instruction control containing a data read-only memory, a readout memory constituting a source of microprogram instructions for controlling the sequence of operation of said circuit arrangement, a read/write random access memory, and peripheral interconnection channels, the arrangement further including a collecting bus connected between the chips for interconnecting their respective function blocks, the improvement wherein said arrangement includes two such chips, with a first one of said chips constituting an arithmetic and control unit and carrying the circuit components defining said first and second address registers, said status register, said calculating register, said arithmetic-logic linkage unit, said instruction control, said read/write random access memory connected to operate as a data store, and a first one of said peripheral channels connected for selectively effecting parallel transmission of information bytes into or out of said arithmetic and control unit in dependence on the operation being performed under control of the microprogram, said first chip further carrying conductors interconnecting said function blocks on said first chip, said conductors carried on said first chip including first conductor means interconnecting said first address register and said random access memory for enabling the memory locations of said random access memory to be addressed by the content of said first address register, second conductor means interconnecting said instruction control and said second address register for enabling said instruction control to be addressed by the content of said second address register, and third conductor means interconnecting said status register and said arithmetic-logic linkage unit for enabling said status register to store information produced by said linkage unit and determining a subsequent operating sequence of said circuit arrangement, and with a second one of said chips constituting a program storage unit and carrying the circuit components defining said third address register, said at least one further address register, said readout memory, and a second one of said peripheral channels connected for selectively effecting parallel transmission of information into or out of said program storage unit in dependence on the operation being performed under control of the microprogram, said second chip further carrying conductors interconnecting said function blocks on said second chip, said conductors carried on said second chip including fourth conductor means connecting said third address register to said bus for selectively setting the stages of said third address register in parallel or supplying counting pulses to said third address register to cause it to count through a succession of binary values, and fifth conductor means interconnecting said third and further address registers to form an address stack for intermediate storage of the previous content of said third register in said further register during execution of a subprogram jump by said circuit arrangement.

4,004,283
MULTIPLE INTERRUPT MICROPROCESSOR SYSTEM

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale, Ariz.; Charles Peddle, Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.
Filed Oct. 30, 1974, Ser. No. 519,139
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **5 Claims**



1. In a digital system including a memory for storing instructions, a microprocessor for executing said stored instructions, a bidirectional data bus connected to said microprocessor, first and second peripheral units, a bidirectional peripheral data bus connected to said first and second peripheral units, and first and second interface adaptors connected between said bidirectional data bus and said bidirectional peripheral data bus for controlling transfer of data flow between said bidirectional data bus and said first and second peripheral units and generating interrupt request signals in response to interrupt requests from said first and second peripheral units, respectively, an interrupt system comprising:

an interrupt conductor for conducting said interrupt request signals connected to said microprocessor and said first and second interface adaptors;
a non-maskable interrupt conductor connected to said microprocessor;
interrupt signal generating means coupled to said non-maskable interrupt conductor for generating a priority interrupt signal on said non-maskable interrupt conductor;
interrupt logic means in said microprocessor coupled to said non-maskable interrupt conductor for causing said microprocessor to address a fixed location in said memory in response to a priority interrupt signal produced on said non-maskable interrupt conductor by one of said first and second interface adaptors, said fixed location containing an address of an interrupt routine; and

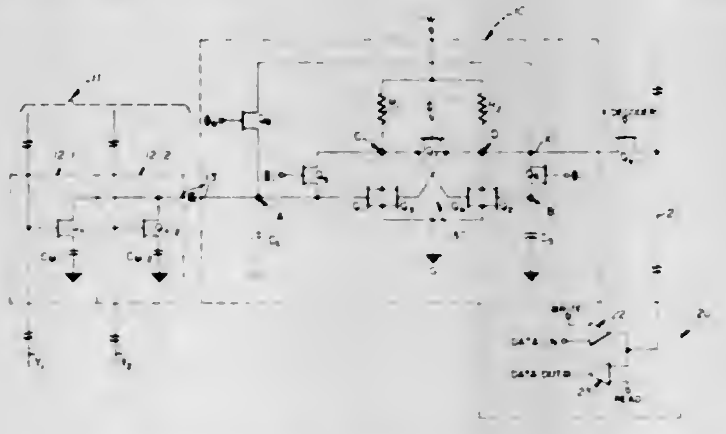
interrupt mask means in said microprocessor connected between said interrupt conductor and said interrupt logic means and coupled to said bidirectional data bus for storing digital information from said bidirectional data bus and enabling said interrupt logic means to cause said addressing of said fixed location conditionally upon said digital information in response to one of said interrupt request signals.

4,004,284

BINARY VOLTAGE-DIFFERENTIAL SENSING CIRCUITS, AND SENSE/REFRESH AMPLIFIER CIRCUITS FOR RANDOM-ACCESS MEMORIES

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 5, 1975, Ser. No. 555,482
Int. Cl.² G11C *7/06, 11/24*
U.S. Cl. 340—173 DR **7 Claims**



1. In combination with a semiconductor random-access memory circuit of the type having a plurality of memory cell capacitors that are periodically sampled by sense/refresh amplifier circuit which senses and refreshes a binary charge stored on each cell capacitor, the cell charge being either essentially zero volts or a cell charge V_M, based on the value of binary data stored in a selected cell, the sense/refresh amplifier circuit including a pair of flip-flop circuit nodes, means for equalizing the potential at said nodes prior to a cycle time t_1, and flip-flop means for sensing a difference in potential between said nodes after time t_1 and for generating a binary output voltage at one of said nodes having one of two levels set in accordance with the charge stored on the selected cell capacitor, an improved sense/refresh amplifier circuit characterized by:

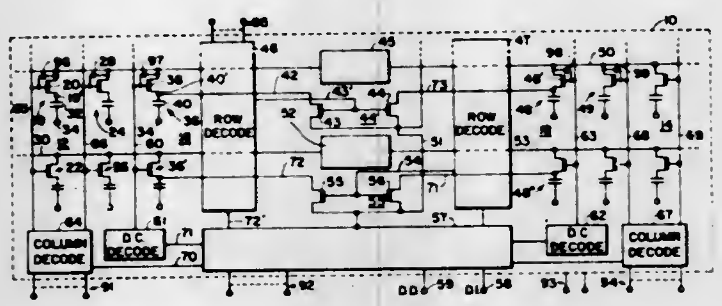
- a. a pair of matched, input field-effect transistors having their source/drain impedances connected respectively between the flip-flop circuit nodes and circuit ground;
- b. a pair of input circuit nodes connected respectively to the gates of the input transistors and normally not connected to the flip-flop circuit nodes during the sensing operation;
- c. means for presetting both of the input nodes at a common initial reference potential V_R prior to cycle time t_1, V_R being approximately midway between V_M and zero volts and being set so that the input transistors both turn ON and operate as variable resistors, the conductivity through each of which varies with applied gate voltage above or below V_R; and
- d. means for connecting the selected memory cell capacitor to one of the input nodes after time t_1 so that the conductivity through the corresponding input transis for having its gate connected to that input node varies in accordance with the cell charge to vary the potential at the corresponding flip-flop circuit node so as to trigger the flip-flop means to produce a binary output voltage in accordance with the charge stored on the selected cell capacitor.

4,004,285

READ-WRITE CIRCUITRY FOR ONE TRANSISTOR PER BIT RANDOM ACCESS MEMORY

Alan Richard Bormann, Tempe, Ariz., and Robert Tapei Yu, Sunnyvale, Calif., assignors to Motorola, Inc., Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,676
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 CA **12 Claims**



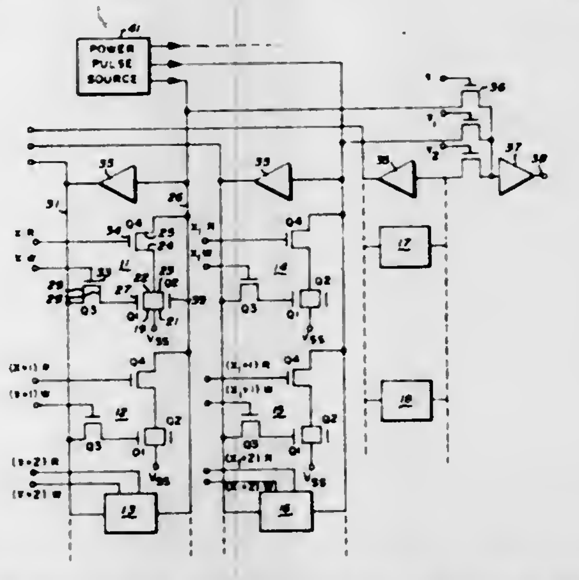
1. A semiconductor memory having a plurality of storage cells, first and second sense-write conductors coupled, respectively, to first and second groups of said storage cells, a sense amplifier circuit coupled between said first and second sense-write conductors, first and second dummy storage cells coupled, respectively, to said first and second sense-write conductors, said first and second dummy storage cells having first and second storage nodes, respectively, said semiconductor memory comprising input-output circuit means coupled to said first and second storage nodes for selectively coupling said input-output circuit means to said first and second storage nodes during a portion of a read operation or a write operation.

4,004,286

PROGRAMMABLE RANDOM ACCESS MEMORY (PRAM) INTEGRATED CIRCUIT MEMORY DEVICE

Dale A. Mrazek, Los Altos Hills, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 17, 1975, Ser. No. 541,781
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **2 Claims**



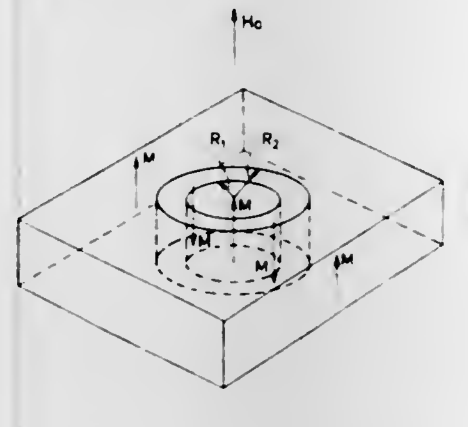
2. An integrated circuit memory cell structure comprising:
a write select transistor having a gate for coupling to a write select input, a source for coupling to the input of said cell, and a drain,
a read select transistor having a gate coupling to a read select input, a source, and a drain for coupling to the output of said cell,
a random access memory transistor having a gate coupled to the drain of said write select transistor, a source for coupling to a source of potential, and
a drain coupled to the source of said read select transistor,
and a read only memory transistor having a floating gate, a source coupled to the source of said random access memory transistor, and a drain coupled to the drain of said random access memory transistor.

4,004,287

HOLLOW MAGNETIC DOMAIN RECORDING DEVICE

Frederik Ate De Jonge; Willem Frederik Druijvesteijn, and Antonius Gerardus Hendrikus Verhulst, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 345,663, March 28, 1973, abandoned, which is a continuation of Ser. No. 165,025, July 22, 1971, abandoned. This application June 30, 1975, Ser. No. 591,705
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **8 Claims**



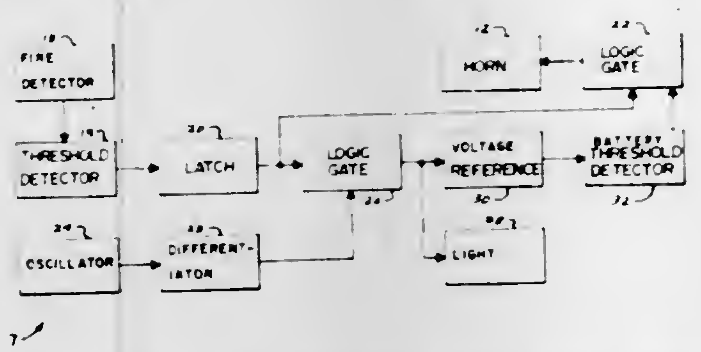
1. A recording device comprising a recording medium having a thin layer of a magnetizable material having an easily magnetizable direction which is approximately at right angles to a surface of said layer, and means for producing magnetic domains therein, said medium containing magnetic domains at least some of which have a hollow domain therein, said hollow domain being defined as a region within said magnetic domain in which the direction of the magnetization is directed opposite to said magnetic domain but the same to an external magnetic field, said medium further containing impurities for providing said medium with lattice defects so that variation of said external magnetic field is increased.

4,004,288

BATTERY OPERATED FIRE DETECTION UNIT

William Webb, Jr., Denver, Colo., assignor to Unitec, Inc., Denver, Colo.

Filed Jan. 29, 1975, Ser. No. 545,251
Int. Cl.² G08B *17/10*
U.S. Cl. 340—237 S **11 Claims**



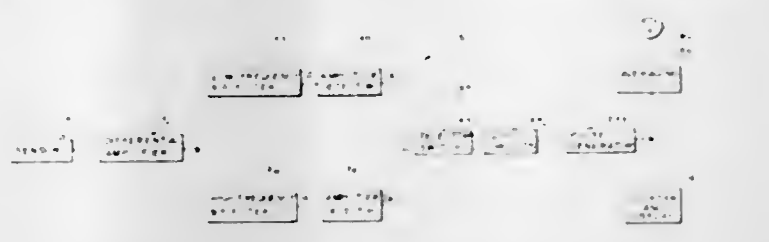
1. A fire detection unit, comprising: battery means; ionization detection means connected with said battery means and producing an output indicative of sensed smoke; threshold detection means for receiving the output from said ionization detection means and producing an output when said output from said ionization detection means exceeds a predetermined value; oscillator means; logic gate means connected to receive the output from said oscillator means and the output from said threshold detection means; light means connected to said logic gate means whereby said light means is caused to be periodically energized to indicate proper operation of said unit and continuously energized when an output is produced by said threshold detection means; and alarm means connected to said threshold detection means and connected with said battery means, said alarm means being operable independent of said oscillator means so as to be responsive to an output from said threshold detection means to provide a continuous alarm indication.

4,004,289

ACOUSTIC GRAIN FLOW RATE MONITOR

Thomas G. Kirk, Saskatoon, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 17, 1975, Ser. No. 641,663
Int. Cl.² G08B *21/00*
U.S. Cl. 340—267 R **8 Claims**



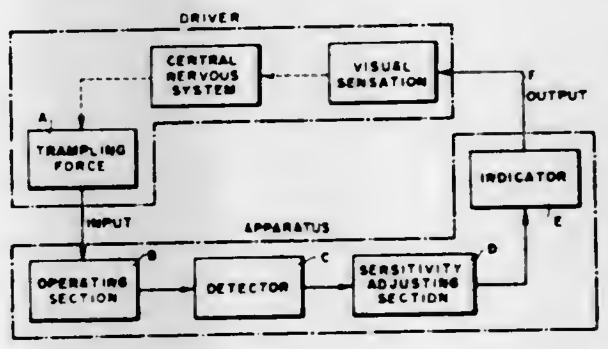
1. An apparatus for monitoring the chaff ejected from a thresher for seed loss comprising:
acousto-electric sensing means for providing an output in response to impinging chaff and seed when mounted on the thresher in the path of the ejected chaff;
filter means coupled to said sensing means for passing predetermined frequencies of said sensor signal, said frequencies being grouped in two bandwidths;
means coupled to said filter means for detecting the amplitude of the signal in each of said bandwidths; and
comparator means for receiving the output signals from the detecting means and for providing an output signal when the amplitudes of said detected output signals are in a predetermined ratio range, said comparator output signal being a function of the number of seeds ejected with the chaff.

4,004,290

METHOD AND APPARATUS FOR JUDGING PSYCHOSOMATIC CONDITION OF THE DRIVER IN MOTOR VEHICLE

Kazuo Kobayashi; Seiichi Sugiura, and Yoshimasa Oosumi, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 19, 1975, Ser. No. 605,961
Claims priority, application Japan, Aug. 28, 1974, 49-98499; Mar. 5, 1975, 50-26738
Int. Cl.² B60K *28/00*; B60T *7/14*
U.S. Cl. 340—279 **13 Claims**



1. An apparatus for judging the psychosomatic condition of the driver in a motor vehicle by requiring the driver to per-

form the stationary adjusting task of maintaining his foot pressure at a predetermined fixed level for a predetermined time interval, comprising a pedal in the driver's compartment of the motor vehicle, a pressure sensitive detector coupled to said pedal and operative to produce an electrical signal representative of the pedal force being exerted by the driver, an indicator visible to the driver in said driver's compartment and responsive to said signal for providing an indication of the pedal force being exerted by the driver, said indicator including a scale having a fixed indication thereon visible to the driver and representative of the predetermined fixed level of pedal force which is to be maintained by the driver, and a processing circuit including timer means defining said predetermined time interval, said processing circuit further including means for comparing the output signal of the detector with a preset fixed reference value during said predetermined time interval.

4,004,291

ELECTRIC SIGNAL TRANSMITTER, PREFERABLY FOR ALARM SYSTEM

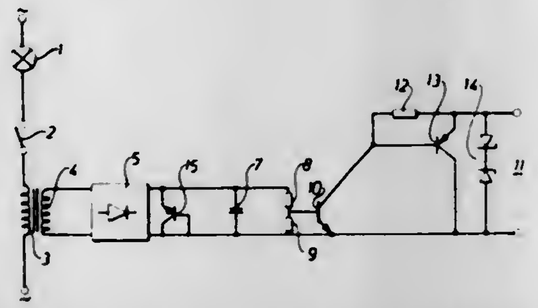
Heinz Dieter Lutzenkirchen, Trangsund, Sweden, assignor to Trapark i Kiruna Aktiebolag, Kiruna, Sweden

Filed Mar. 28, 1974, Ser. No. 455,953

Claims priority, application Sweden, Mar. 28, 1973, 7304392

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 R **4 Claims**



1. For use in supervisory alarm system, a signal transmitter means for producing a D.C. output signal whenever a manually actuatable switch, which is connected in series with a current consuming device across an A.C. power source, is closed with the voltage of said D.C. output signal being less than that of said power source, said signal transmitter means comprising: a transformer having its primary winding connected in series with said switch, said current consuming device and said A.C. power source; a rectifier connected to the secondary winding of said transformer; means for limiting the D.C. output voltage from said rectifier connected in shunt across the output of said rectifier; a smoothing condenser connected in parallel with said means for limiting; a voltage divider connected in parallel with said smoothing condenser; a first transistor having its base connected to the output of said voltage divider and whose output voltage, appearing between the emitter and collector thereof, is controlled by the output voltage of said voltage divider; and an amplifier connected to the output of said first transistor, said amplifier including a further transistor having its base connected to the collector of said first transistor and its base collector current path connected in parallel with the emitter collector current path of said first transistor, a resistor connected between the emitter and base of said further transistor, and a limiter chain for providing transient protection, and including a pair of Zener diodes connected in series opposition, connected between the emitter and collector of said further transistor.

4,004,292

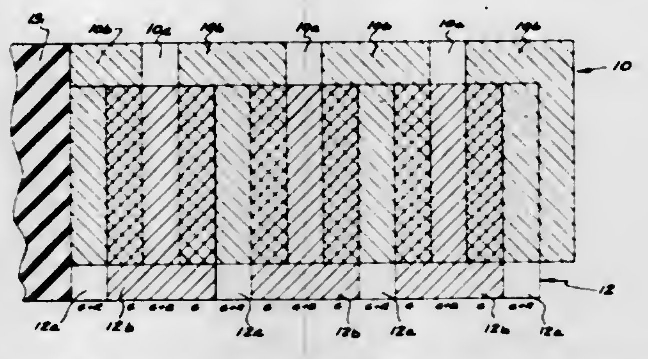
SYSTEM FOR PRODUCING CHROMA SIGNALS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Kenneth H. Vorhaben, Houston, and Phillip C. Lipoma, Dickinson, both of Tex.

Filed Sept. 12, 1975, Ser. No. 612,967

Int. Cl.² H04N *9/07*

U.S. Cl. 358—44 **6 Claims**



3. A system for producing color television signals comprising:

a. filter combination means, for periodically optically color multiplexing light from a scene to be televised, further comprising:
   i. first filter layer means including parallel periodic optically transparent stripes, all of the same width, interleaved among periodic first dichroic filter stripes opaque to a first primary color, such that said first dichroic filter stripes are each three times as wide as each said optically transparent stripes of said first filter layer means; and
   ii. second filter layer means including parallel periodic optically transparent stripes interleaved among periodic second dichroic filter stripes opaque to a second primary color, such that said second dichroic filter stripes are each three times as wide as each said optically transparent stripes of said second filter layer means, and equal in width to each of said first dichroic filter stripes, to produce the multiplex sequence in the light transmitted by said filter combination as: third and second primary colors, third primary color, third and first primary colors, third primary color; and

b. scanning television image pickup means for converting said color multiplexed light into an electronic chroma carrier signal time division multiplexed in the same color sequence as said optical color multiplexing of said light from said scene to be televised.

4,004,293

TAPE PLAYER PREAMPLIFIER CIRCUIT RESPONSIVE TO TAPE SPEED

David W. Osburn, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1975, Ser. No. 627,503

Int. Cl.² G11B *15/04*

U.S. Cl. 360—67 **3 Claims**

1. In a tape player including a pick-up head responsive to transport of a tape at a prescribed speed to develop a voltage which is accurately related to a signal recorded on the tape, and further including a tape transport mechanism which transports the tape at the prescribed speed when energized but which exhibits an inertia such that following energization of the tape transport mechanism the tape does not reach the prescribed speed until after the expiration of a start-up time period during which the voltage developed by the pick-up head is distortedly related to the signal recorded on the tape; a preamplifier circuit comprising: an input node; a first current generator for generating a first input bias current which is one of applied or withdrawn at the input node, the first current generator including a control node through which the first input bias current is directed; a second current generator for generating a second input bias current which is the other of applied or withdrawn at the input node, the second current generator including the pick-up head for effectively impressing upon the second input bias current an input signal current which corresponds to the voltage developed by the pick-up head such that the input signal current is distorted during the start-up time period; an output node; an amplifier block shiftable between an active state and an inactive state, the amplifier block operating in the active state to apply an output bias current to the output node which is an amplification of the difference between the first and second input bias currents and also operating in the active state to apply an output signal current to the output node which is an amplification of the input signal current such that the output signal current is distorted during the start-up time period, the amplifier block shifting to the active state only when the difference between the first and second input bias currents is one of greater or less than a predetermined current differential and shifting to the inactive state in which no output bias current and no output signal current are developed when the difference between the first and second input bias currents is the other of greater or less than the predetermined current differential; a load for developing an output bias voltage at the output node which corresponds to the output bias current and for developing an output signal voltage at the output node which corresponds to the output signal current such that the output signal voltage is distorted during the start-up time period; a voltage generator including a reference node at which a reference voltage is established when the tape transport mechanism is energized; and a bias current controller including a voltage-follower transistor operable when turned on to develop a bias control current between the output node and the control node at which it is algebraically summed with the first input bias current such that the difference between the first and second input bias currents at the input node is made the one of greater or less than the predetermined current differential thereby shifting the amplifier block to the active state to develop an output bias current at the output node which increases until the output signal voltage developed at the output node is raised to substantially the reference voltage established at the reference node; the bias current controller further including time delay means for preventing the voltage-follower transistor from turning on until after the expiration of the start-up time period of the tape transport mechanism thereby to avoid the production of a distorted output signal voltage at the output node.

DESIGN PATENTS

GRANTED JANUARY 18, 1977

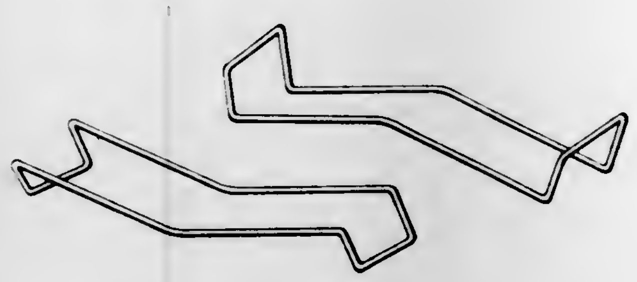
ERRATA

For CLASS	See PATENT NO.
026-001 B	243,090
026-014 A	243,091
011-152	243,112
011-156	243,113
011-023	243,114
015-104	243,116
015-127	243,117

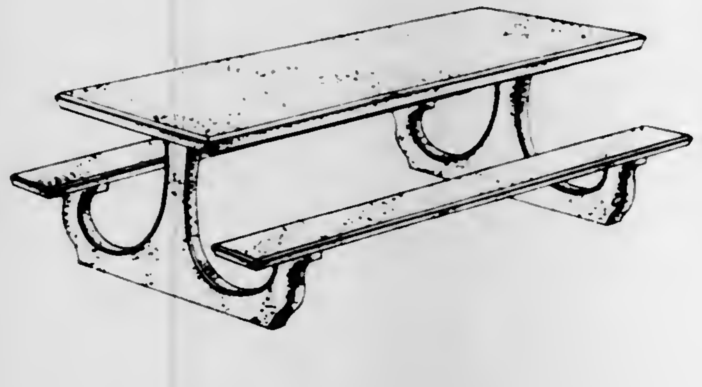
DESIGNS

JANUARY 18, 1977

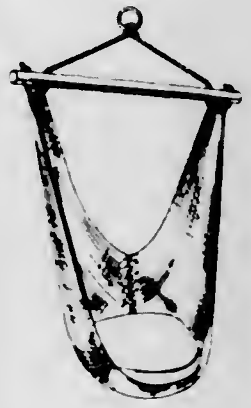
243,042
INVERTIBLE BOOKRACK
Edward G. Dorn, 145 S. Belle Ave., Palatine, Ill. 60667
Filed Apr. 10, 1975, Ser. No. 566,696
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—3



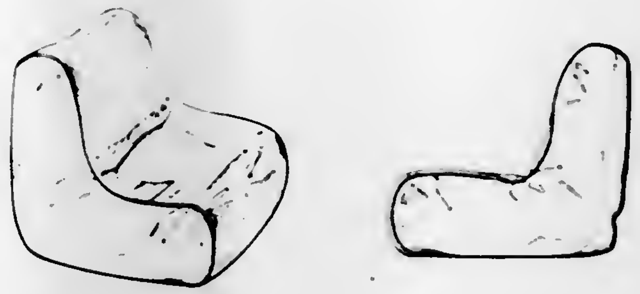
243,043
PICNIC TABLE
Albert R. Rogers, 700 Newton, Kansas City, Mo. 64125
Filed Aug. 14, 1975, Ser. No. 604,826
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—45



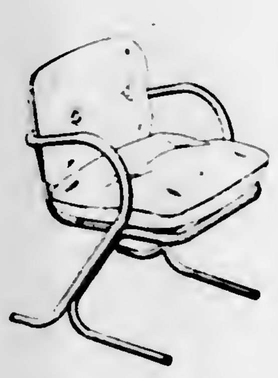
243,044
HANGING CHAIR
Richard D. Pathman, 1052 Sanchez St., San Francisco, Calif. 94114
Filed May 14, 1975, Ser. No. 577,478
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



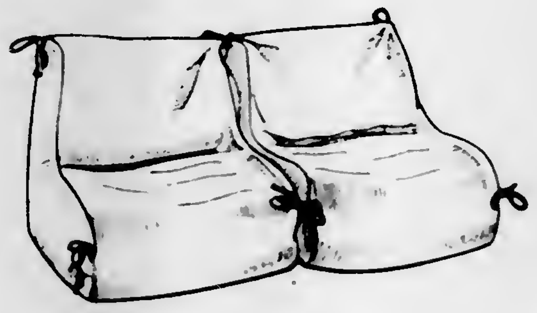
243,045
CHAIR
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 14, 1975, Ser. No. 604,580
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



243,046
LOUNGE CHAIR
Jerry Johnson, Rancho Cuerdo - Box 50, Potrero, Calif. 92063
Filed Sept. 18, 1975, Ser. No. 614,698
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



243,047
SETTEE
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed Aug. 14, 1975, Ser. No. 604,581
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61



243,048

PEGBOARD MOUNTED SUPPORT FOR DISPLAYING POWER TOOLS

Terrance Neil Touchett, Batavia, and William E. Kotzenberg, Geneva, both of Ill., assignors to McGraw-Edison Company, Elgin, Ill.

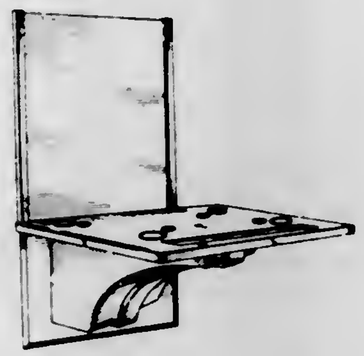
Division of Ser. No. 433,704, Jan. 16, 1974, Pat. No. Des. 238,229.

This application May 19, 1975, Ser. No. 579,299

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—132



243,049

PORTABLE SHELF FOR A TELEPHONE OR SIMILAR ARTICLE

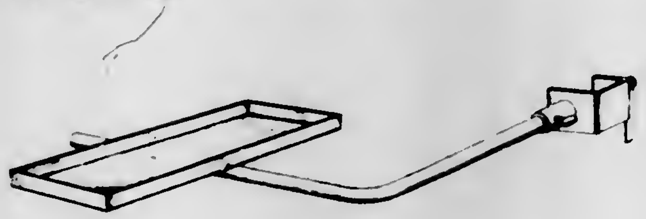
Harold L. Roberts, 7419 McWhorter Place, Annandale, Va. 22003

Filed Apr. 3, 1975, Ser. No. 565,018

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—136



243,050

PEGBOARD MOUNTED SUPPORT FOR DISPLAYING POWER TOOLS

Terrance Neil Touchett, Batavia, and William E. Kotzenberg, Geneva, both of Ill., assignors to McGraw-Edison Company, Elgin, Ill.

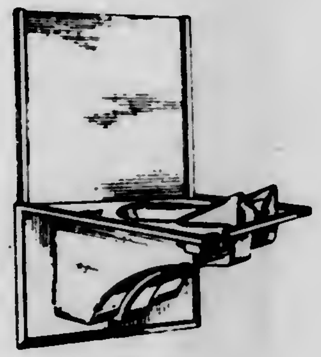
Division of Ser. No. 433, 704, Jan. 16, 1974, Pat. No. Des. 238,229.

This application May 19, 1975, Ser. No. 579,298

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—136



243,051

MULTIPLE STATION DESK

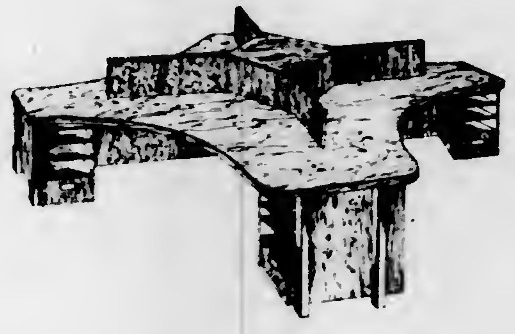
Ivan F. Goulooze, 3407 3 Mile Road, NW., Grand Rapids, Mich. 49504

Division of Ser. No. 451,963, Mar. 18, 1974, Pat. No. Des. 238,841. This application Dec. 4, 1975, Ser. No. 637,733

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—146



243,052

"CHANUKAH" CHEST

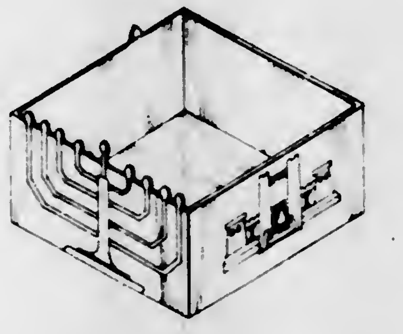
Howard L. Green, 5103 Foxcroft, Midland, Mich. 48640

Filed Nov. 22, 1974, Ser. No. 526,172

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—153



243,053

BOOKCASE OR THE LIKE

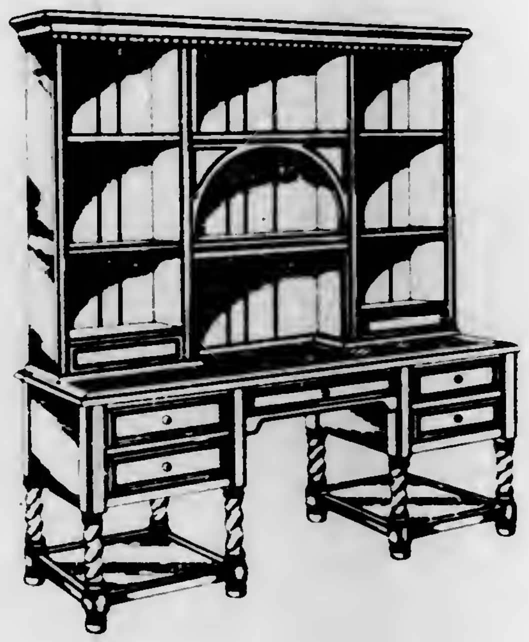
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015

Filed Apr. 23, 1974, Ser. No. 463,289

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—161



243,054

BATHTUB TREAD

Thomas J. Nelson, 3015 Theresa St. No. 10, Long Beach, Calif. 90814

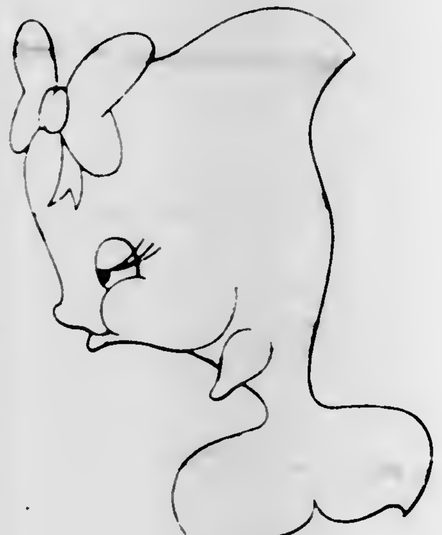
Division of Ser. No. 398,008, Sept. 17, 1973, Pat. No. Des. 239,807.

This application Sept. 2, 1975, Ser. No. 609,548

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—211



243,055

JEWELRY HANGER

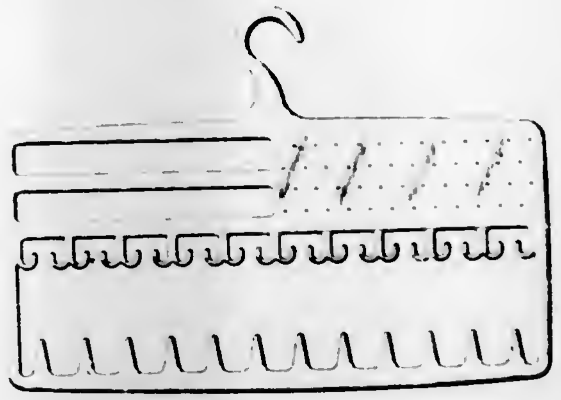
Annette Blumberg, 26 Lyon St., Apt. 11, Pawtucket, R.I. 02860

Filed Dec. 31, 1975, Ser. No. 645,828

Term of patent 14 years

Int. Cl. D6—*08, 04*

U.S. Cl. D6—247



243,056

PLATE

Karl Gosta Bertil Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden

Division of Ser. No. 439,121, Feb. 4, 1974, Pat. No. Des. 239,686.

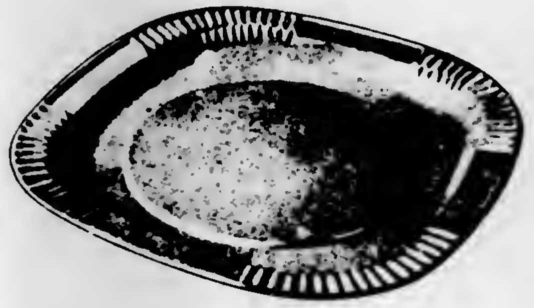
This application May 14, 1975, Ser. No. 577,228

Claims priority, application Sweden, Aug. 6, 1973, 731430; Aug. 6, 1973, 731431

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—1



243,057

COFFEEMAKER

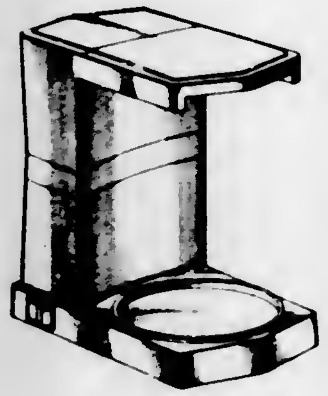
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,676

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—41



243,058

COFFEEMAKER

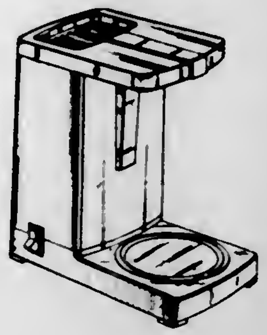
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,677

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—41



243,059

COMBINED ELECTRIC ROASTER AND BUTTERER FOR CORN

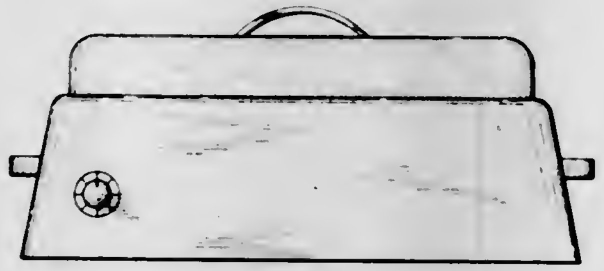
Fredrick Hoffschneider, 341 W. Colorado Ave., Grand Junction, Colo. 81501; Robert L. Hoffschneider, 2635 S. Eaton Place, Lakewood, Colo. 80227, and Richard A. Hoffschneider, 4202 S. Vrain, Denver, Colo. 80236

Filed Mar. 25, 1975, Ser. No. 561,840

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—97



243,060

SCRAPER

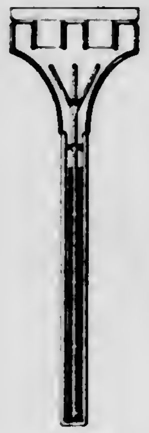
Joseph A. Graham; Reginald M. Stephenson, and Donald D. Dewar, all of Winnipeg, Canada, assignors to Atlas-Graham Industries Company Ltd., Winnipeg, Canada

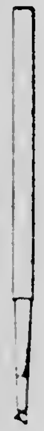
Filed Sept. 9, 1975, Ser. No. 611,661

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D7—184





243,061

SET OF FIREPLACE TOOLS AND STAND THEREFOR

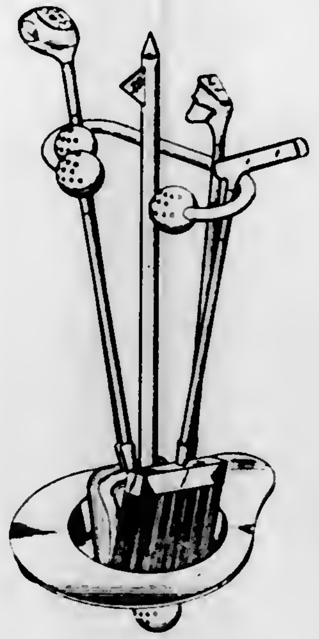
James M. Coupe, 11932 Armitage, Grandview, Mo. 64130

Filed July 28, 1975, Ser. No. 600,355

Term of patent 14 years

Int. Cl. D7—*08*

U.S. Cl. D7—206



243,062

GARDEN HOSE AND NOZZLE CONNECTOR

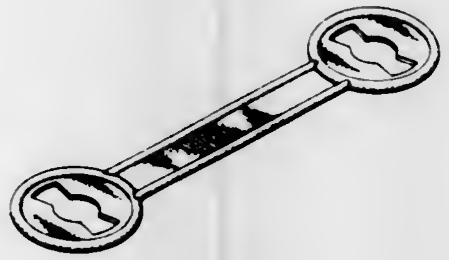
James T. Malloy, 16761 Marie Lane, Huntington Beach, Calif. 92647

Filed Aug. 7, 1975, Ser. No. 602,818

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—259



243,063

LOCKNUT

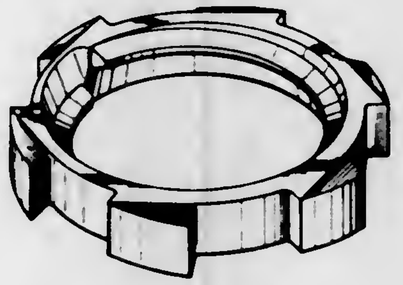
Thomas Mooney, Mount Sinai, N.Y., assignor to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed Aug. 15, 1975, Ser. No. 604,871

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—274



243,064

BOTTLE

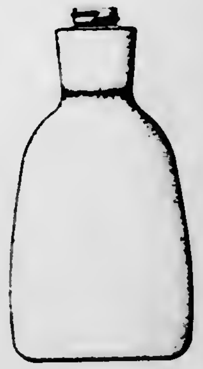
Everett C. Beeman, Wallingford, Conn., and Richard C. Speak, Fullerton, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed May 6, 1975, Ser. No. 575,108

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—137



243,065

JAR

Stanley Herbert Picker, Kingston Hill, England, assignor to Mary Quant Cosmetics Limited, England

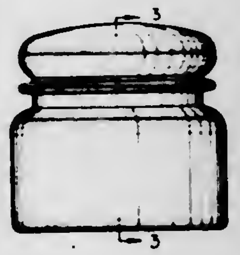
Filed Sept. 24, 1973, Ser. No. 399,872

Claims priority, application United Kingdom, Mar. 30, 1973, 961979/73

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—164



243,066

COMBINED CAP AND CONTAINER

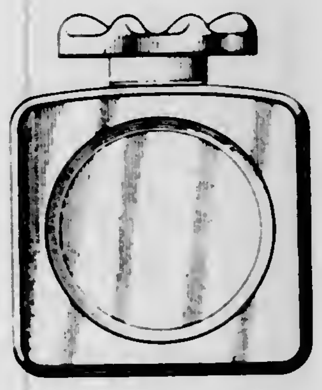
Milton J. Halsted, Orange, and David Y. Muramatsu, Santa Ana, both of Calif., assignors to Wampole Limited, Perth, Ontario, Canada

Filed Apr. 23, 1973, Ser. No. 353,249

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—168



243,067

COMBINED BOTTLE AND CAP

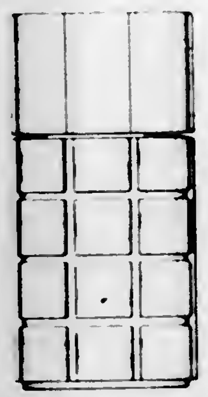
Bernard A. Mitchell, 1000 N. Lake Shore Drive, Chicago, Ill. 60611

Filed Aug. 20, 1975, Ser. No. 605,975

Term of patent 14 years

Int. Cl. D9—*02*

U.S. Cl. D9—168



243,068

MILK BOTTLE CRATE

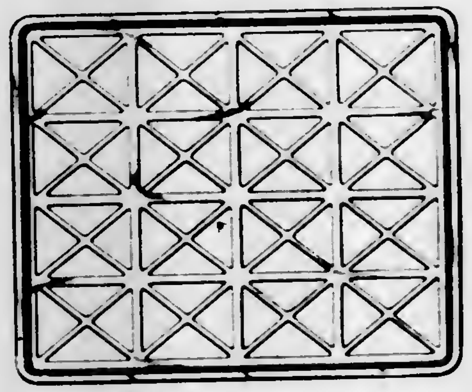
Ralph Verni, Baldwin, N.Y., assignor to Kingly Products Corporation, North Bellmore, N.Y.

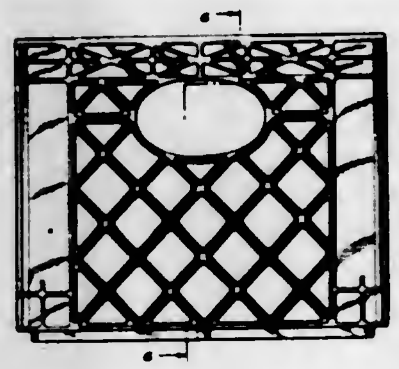
Continuation-in-part of Ser. No. 443,007, Feb. 15, 1974, abandoned. This application July 16, 1975, Ser. No. 596,436

Term of patent 14 years

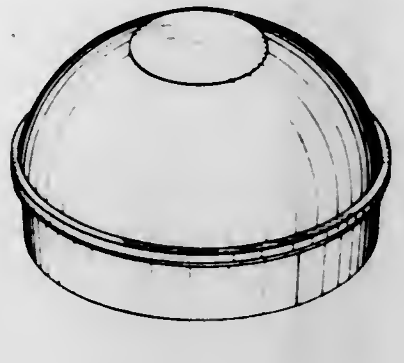
Int. Cl. D9—*04*

U.S. Cl. D9—177

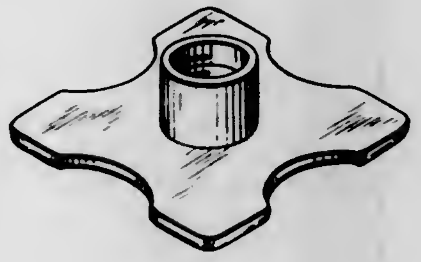




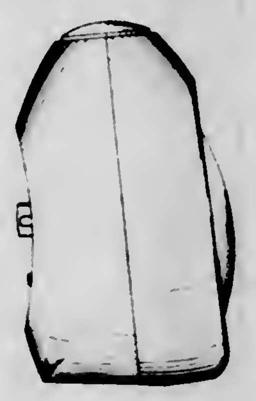
243,069
DISPLAY BOX FOR MISCELLANEOUS GOODS
Norbert Francis Igelman, 37, rue de Marnes, 92 410 Ville D'Avray, France
Filed Jan. 7, 1974, Ser. No. 431,133
Claims priority, application France, July 9, 1973, 73.1166
Term of patent 3½ years
Int. Cl. D9—*03*
U.S. Cl. D9—222



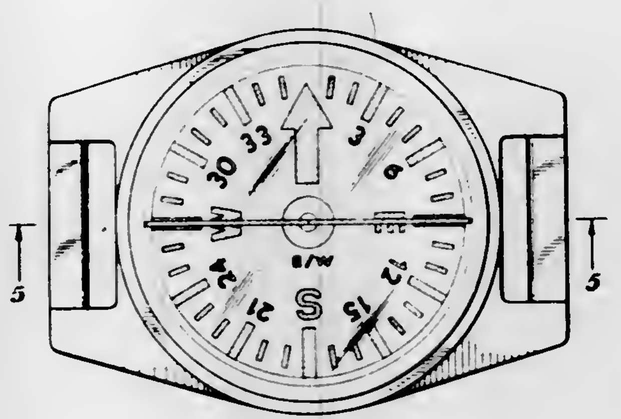
243,070
COMBINED CLOSURE AND SUPPORT FOR A CONTAINER
Alan J. Burgheimer, 29 Greenhaven Road, Rye, N.Y. 10580, and George J. Franks, 10 Crabtree Lane, Roslyn, N.Y. 11576
Filed Nov. 25, 1974, Ser. No. 527,178
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—261



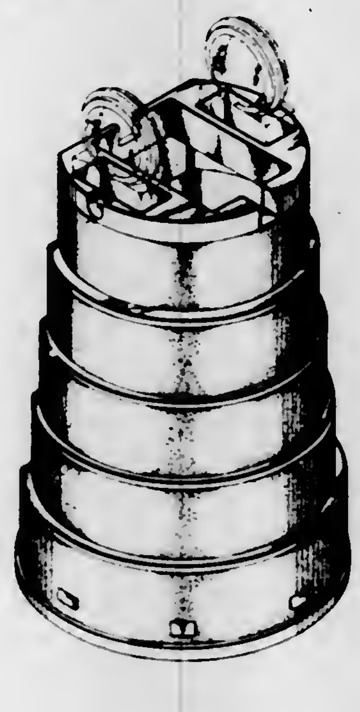
243,071
CLOCK
Ellworth R. Danz, and Roman J. Szalek, both of LaSalle, Ill., assignors to General Time Corporation, Thomaston, Conn.
Filed Dec. 17, 1974, Ser. No. 533,664
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—22



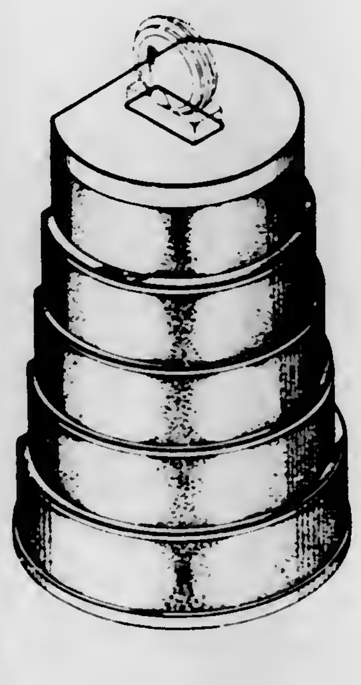
243,072
COMPASS
Dominic J. Spinosa, and John Robert Ryan, both of Wantagh, N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.
Filed July 30, 1975, Ser. No. 600,504
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—68



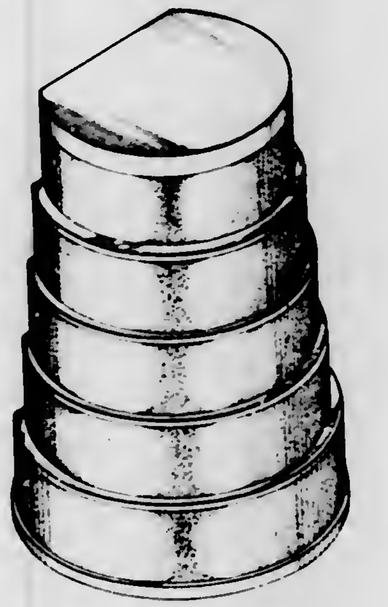
243,073
TRAFFIC CHANNELIZATION DRUM OR THE LIKE
Jack H. Kulp, San Juan Capistrano, Calif., and James M. Florsheim, Northbrook, Ill., assignors to Royal Industries, Inc., Pasadena, Calif.
Filed Apr. 19, 1976, Ser. No. 678,308
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



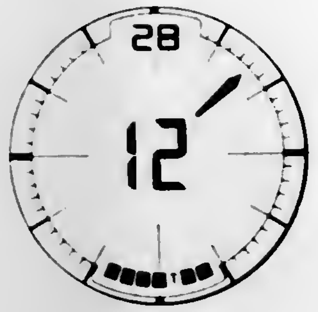
243,074
TRAFFIC CHANNELIZATION DRUM OR THE LIKE
Jack H. Kulp, San Juan Capistrano, Calif., and James M. Florsheim, Northbrook, Ill., assignors to Royal Industries, Inc., Pasadena, Calif.
Filed Apr. 19, 1976, Ser. No. 678,309
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



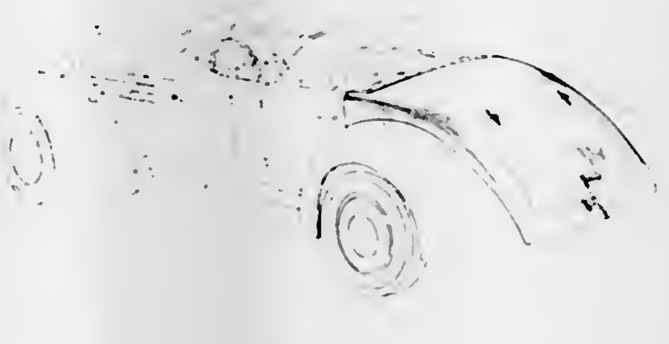
243,075
TRAFFIC CHANNELIZATION DRUM OR THE LIKE
Jack H. Kulp, San Juan Capistrano, Calif., and James M. Florsheim, Northbrook, Ill., assignors to Royal Industries, Inc., Pasadena, Calif.
Filed Apr. 19, 1976, Ser. No. 678,310
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



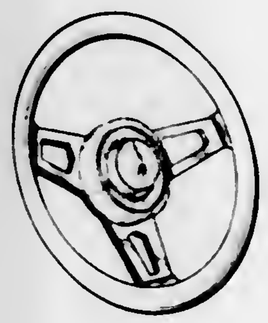
243,076
ELECTROOPTIC TIMEPIECE FACE
Harwell B. Thompson; Milton B. Sheffield, both of Cheshire, and Raymond J. Groboski, Watertown, all of Conn., assignors to Timex Corporation, Waterbury, Conn.
Filed June 11, 1975, Ser. No. 586,003
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



243,077
TRUNK COMPARTMENT FOR AN AUTOMOBILE
Glenn A. Pray, 122 S. Elm Place, Broken Arrow, Okla. 74102
Filed May 23, 1975, Ser. No. 581,424
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—156



243,078
MOTOR VEHICLE STEERING WHEEL
Peter O. Marker, 4508 Bates Drive, Yorba Linda, Calif. 92686, and Joseph F. King, 5507 Cochin Ave., Arcadia, Calif. 91006
Filed Apr. 25, 1975, Ser. No. 571,756
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—176



243,079

MOTORCYCLE FAIRING

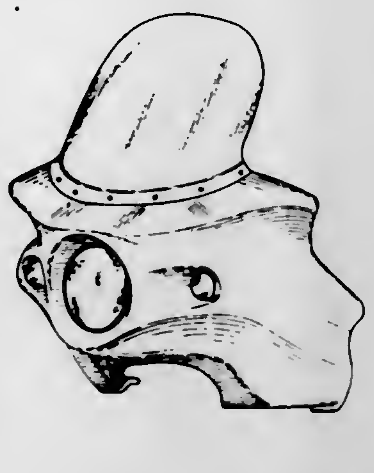
Vincent Jaeke, 1240 Harland St., Denver, Colo. 80214

Filed Aug. 20, 1975, Ser. No. 606,282

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—182



243,080

REAR VIEW MIRROR

Yorck Talbot, Eberstrasse 80, 1 West Berlin 62, Germany

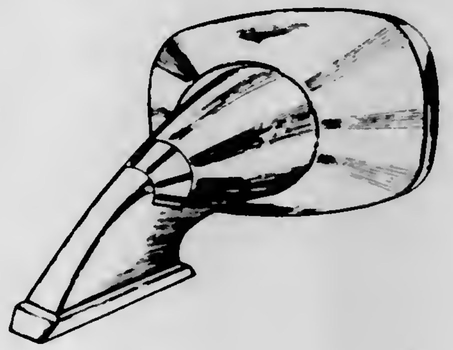
Filed Apr. 9, 1975, Ser. No. 566,333

Claims priority, application Germany, Nov. 22, 1974, 4088

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—187



243,081

REAR VIEW MIRROR

Yorck Talbot, Eberstrasse 80, 1 West Berlin 62, Germany

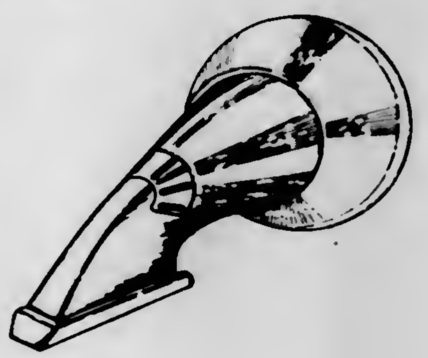
Filed Apr. 9, 1975, Ser. No. 566,332

Claims priority, application Germany, Nov. 22, 1974, 4088

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—189



243,082

ELECTRONIC FLASH UNIT

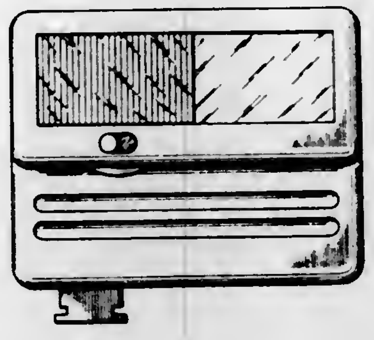
Jochen Kramer, Wolfsburg, and Claus Prochnow, Braunschweig, both of Germany, assignors to Rollei-Werke Franke & Heidecke

Division of Ser. No. 501,099, Aug. 27, 1974. This application Oct. 14, 1975, Ser. No. 621,737

Term of patent 14 years

Int. Cl. D16—*05*

U.S. Cl. D16—42



243,083

PAIR OF SPECTACLES

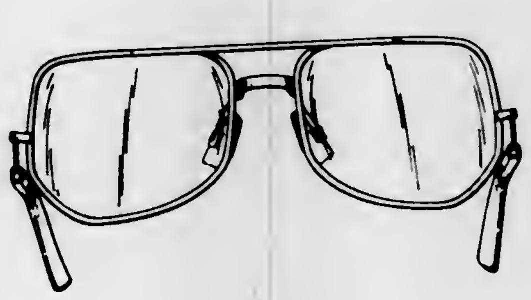
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 9, 1976, Ser. No. 656,454

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—65



243,084

PAIR OF SPECTACLES

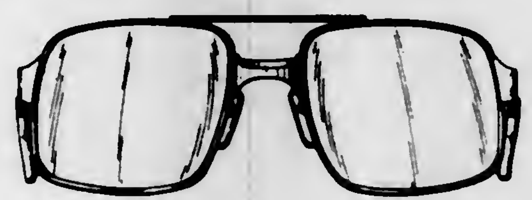
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 4, 1975, Ser. No. 601,853

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—77



243,085

BATTERY CHARGING CYCLE EDUCATIONAL BOARD

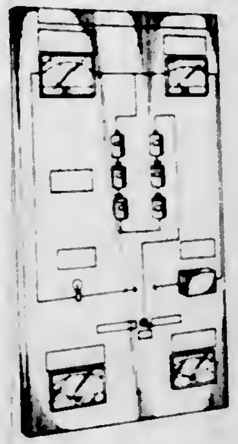
Jack N. Holcomb, P.O. Box 23130, Fort Lauderdale, Fla. 33307

Filed Oct. 15, 1974, Ser. No. 514,902

Term of patent 14 years

Int. Cl. D19—*07*

U.S. Cl. D19—64



243,086

FISHING LURE

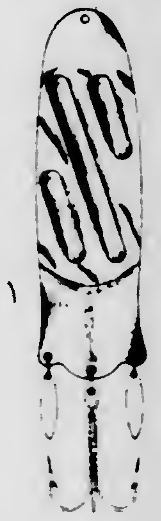
Carl Nothdurft, 22412 Lavon, St. Clair Shores, Mich. 48656

Filed Sept. 3, 1975, Ser. No. 609,971

Term of patent 14 years

Int. Cl. D22—*05*

U.S. Cl. D22—29



243,087

PUMP HANDLE

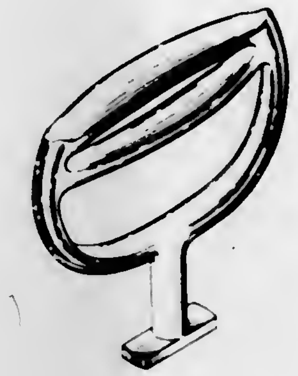
William J. Yeager, Alden, N.Y., assignor to R. E. Chapin Manufacturing Works, Inc., Batavia, N.Y.

Filed May 30, 1974, Ser. No. 474,367

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—1 A



243,088

WATER CLOSET COVER

Nancy Mardesich Halvorsen, 215 Alhambra Ave., Santa Cruz, Calif. 95060

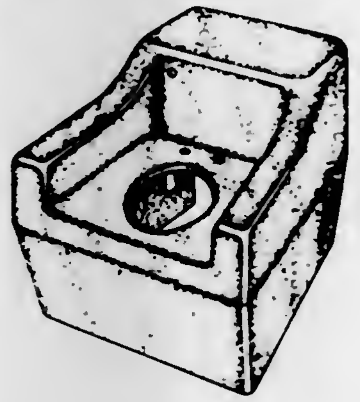
Filed Oct. 25, 1974, Ser. No. 517,956

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Term of patent 7 years

Int. Cl. D23—*02*

U.S. Cl. D23—71



243,089
WATER CLOSET COVER

Nancy Mardesich Halvorsen, 215 Alhambra Ave., Santa Cruz, Calif. 95060

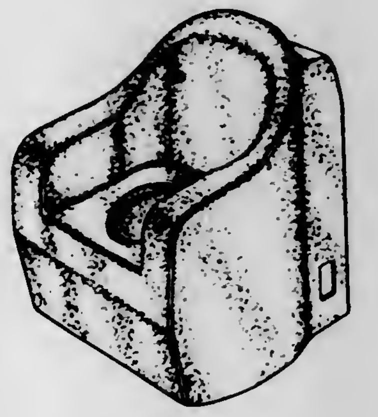
Filed Oct. 25, 1974, Ser. No. 517,957

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Term of patent 7 years

Int. Cl. D23—*01*

U.S. Cl. D23—71



243,090
CORD CONNECTOR

George J. Lawrence, North Kingstown, and Lawrence P. Mellyn, Glocester, both of R.I., assignors to General Electric Company, N.Y.

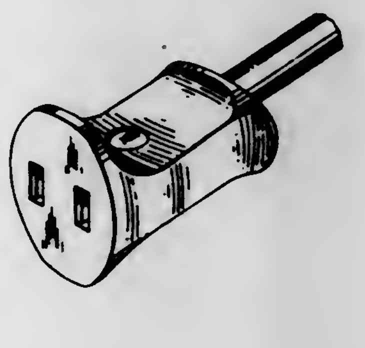
Filed Jan. 30, 1975, Ser. No. 545,265

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D26—1 B



243,091
TELEPHONE ACCESSORY

Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 16, 1974, Ser. No. 497,896

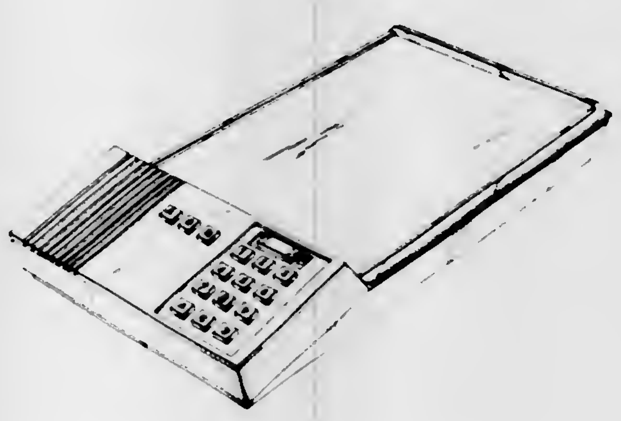
Claims priority, application Sweden, Mar. 1, 1974, 74384

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D26—14 A



243,092
FREESTANDING FIREPLACE

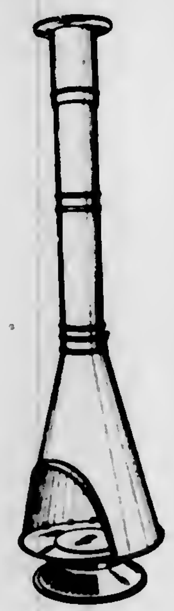
Santosh D. Sheth, Huntington, Ind., assignor to American Standard Inc.

Filed Nov. 20, 1975, Ser. No. 633,755

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—97



243,093
HANDRAIL FOR VEHICLES

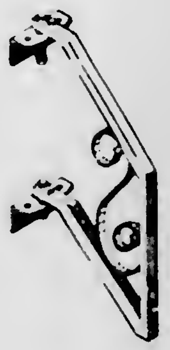
Robert L. Reynolds, 7931 Orangewood, Stanton, Calif. 90680

Filed Aug. 21, 1975, Ser. No. 606,426

Term of patent 14 years

Int. Cl. D25—*02*; D12—*99*

U.S. Cl. D25—38



243,094
CURB AND DRAIN UNIT

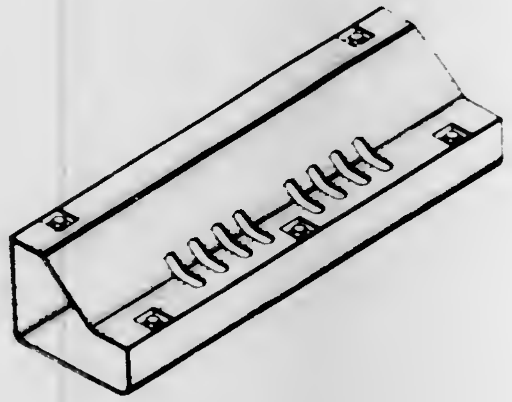
Sinzo Ito, Tokyo, Japan, assignor to Sanken Steel Co. Ltd.

Filed July 10, 1974, Ser. No. 487,363

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—73



243,095
DECORATIVE PLASTIC PANEL FOR A DOOR SURFACE

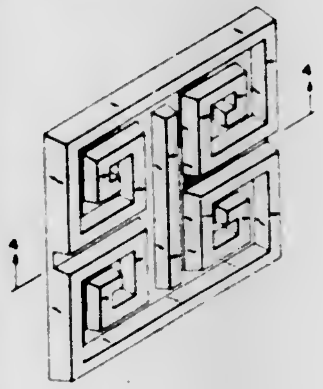
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.

Filed Dec. 16, 1974, Ser. No. 533,411

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—80



243,096
TELEPHONE

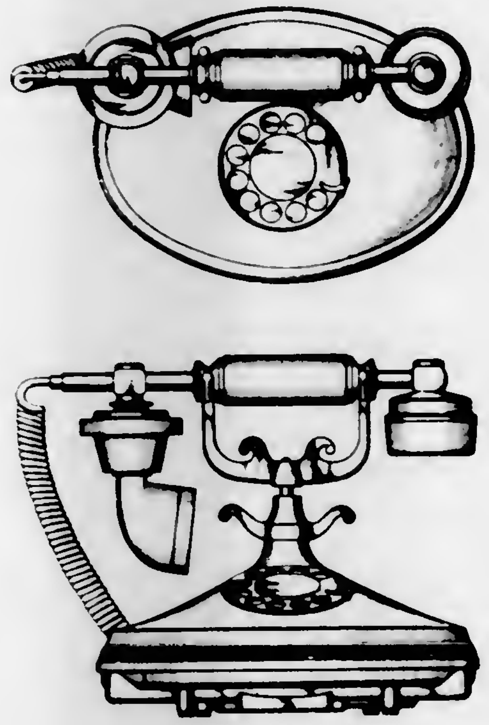
George D. Perkins, Laguna Niguel, Calif., assignor to American Telecommunications Corporation

Filed Aug. 12, 1974, Ser. No. 496,378

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D26—14 A



243,097
SPARK PLUG COVER

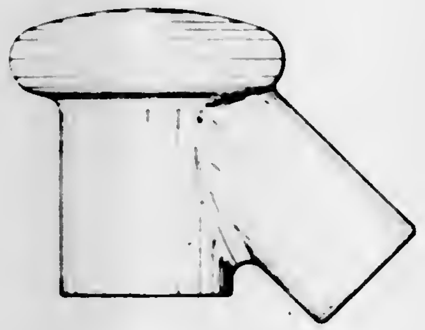
Antonio Gomes, Jr., East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed May 28, 1975, Ser. No. 581,647

Term of patent 14 years

Int. Cl. D15—*01*

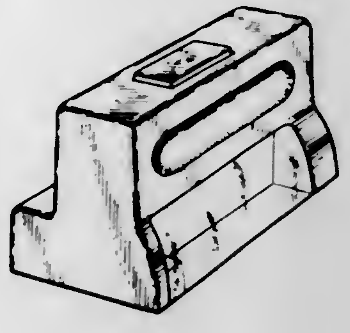
U.S. Cl. D26—1 J



243,098
HAND HELD ELECTRONIC SCANNING CAMERA PROBE

Morris A. Kohn, San Mateo, Calif., assignor to Datacopy Corporation, Palo Alto, Calif.
Filed June 30, 1975, Ser. No. 591,356
Term of patent 14 years
Int. Cl. D14—*02*

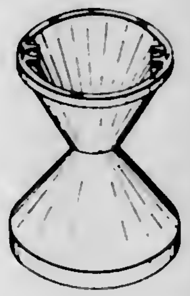
U.S. Cl. D26—5 C



243,099
WINDPROOF ASHTRAY

John Philip Moses, 1865 Pine Ridge Lane, Bloomfield Hills, Mich. 48013
Filed July 17, 1975, Ser. No. 596,720
Term of patent 14 years
Int. Cl. D27—*03*

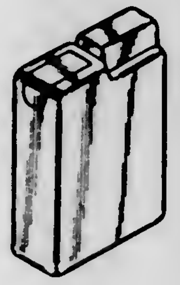
U.S. Cl. D27—10



243,100
LIGHTER

Robert Hocq, Boulogne, France, assignor to Societe Franco-Hispano-Americaine (Francispam), Saint-Gratien, France
Filed Mar. 20, 1975, Ser. No. 560,173
Claims priority, application France, Sept. 24, 1974, 74.446
Term of patent 14 years
Int. Cl. D27—*05*

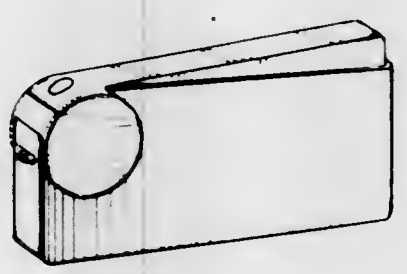
U.S. Cl. D27—42



243,101
LIGHTER

Bernd Figur, Nieder-Roden, Germany, assignor to Rowenta-Werke, GmbH, Offenbach (Main), Germany
Filed Nov. 24, 1975, Ser. No. 634,979
Claims priority, application Germany, May 30, 1975, 59869
Term of patent 14 years
Int. Cl. D27—*05*

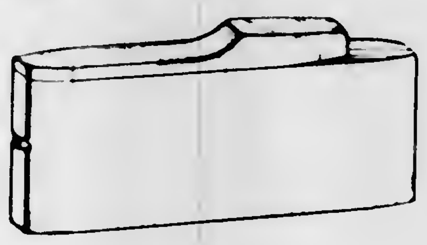
U.S. Cl. D27—42



243,102
LIGHTER

Franz Alban Stuetzer, Muhlheim (Main), and Bernd Figur, Nieder-Roden, both of Germany, assignors to Rowenta-Werke, GmbH, Offenbach (Main), Germany
Filed Dec. 8, 1975, Ser. No. 638,321
Claims priority, application Germany, June 25, 1974, 59876
Term of patent 14 years
Int. Cl. D27—*05*

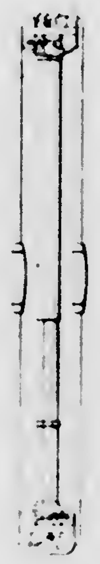
U.S. Cl. D27—42



243,103
PHYSICAL EXERCISER

Arthur Hale, London, England, assignor to Edito-Service S.A., Geneva, Switzerland
Filed Nov. 4, 1974, Ser. No. 520,886
Claims priority, application United Kingdom, May 4, 1974, 966503/74
Term of patent 14 years
Int. Cl. D21—*02*

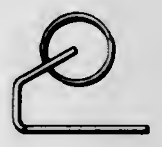
U.S. Cl. D34—5 K



243,104
GAME PLAYING PIECE

Tim Radmall, 431 Dahlia, Corona del Mar, Calif. 92625
Filed Mar. 20, 1975, Ser. No. 560,472
Term of patent 14 years
Int. Cl. D21—*01*

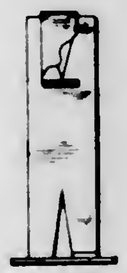
U.S. Cl. D34—5 GP



243,105
GAME PLAYING PIECE

Tim Radmall, 431 Dahlia, Corona del Mar, Calif. 92625
Filed Mar. 20, 1975, Ser. No. 560,473
Term of patent 14 years
Int. Cl. D21—*01*

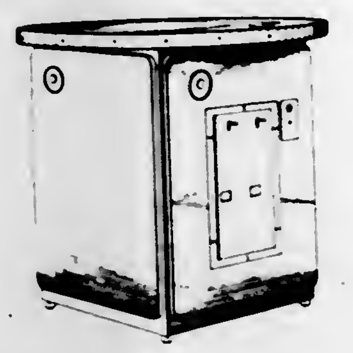
U.S. Cl. D34—5 GP



243,106
GAME CABINET

Regan L. Cheng, San Jose, Calif., assignor to Atari, Inc.
Filed Sept. 17, 1975, Ser. No. 614,015
Term of patent 14 years
Int. Cl. D21—*01*

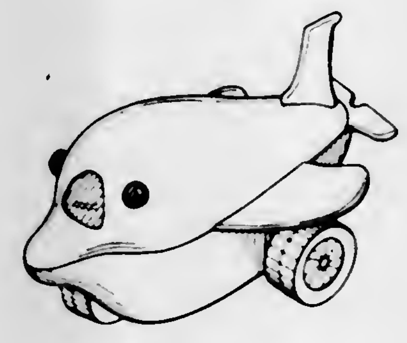
U.S. Cl. D34—5 J



243,107
SIMULATIVE TOY VEHICLE

Yim Hei Joseph Yeung, Joylite Bldg., 99 Wai Yip St., Kwun Tong, Kowloon, Hong Kong
Filed Apr. 18, 1975, Ser. No. 569,199
Term of patent 14 years
Int. Cl. D21—*01*

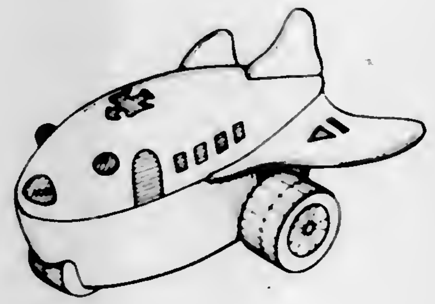
U.S. Cl. D34—15 AM



243,108
SIMULATIVE TOY VEHICLE

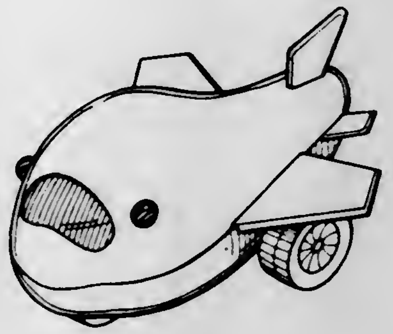
Yim Hei Joseph Yeung, Joylite Bldg., 99 Wai Yip St., Kwun Tong, Kowloon, Hong Kong
Filed Apr. 18, 1975, Ser. No. 569,197
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 AM



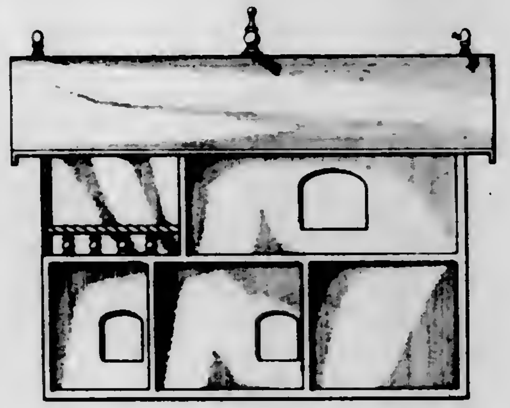
243,109
SIMULATIVE TOY VEHICLE

Yim Hei Joseph Yeung, Joylite Bldg., 99 Wai Yip St., Kwun Tong, Kowloon, Hong Kong
Filed Apr. 18, 1975, Ser. No. 569,198
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM



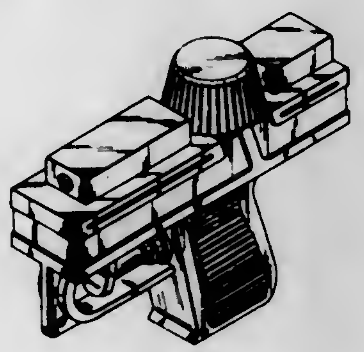
243,110
DOLL HOUSE

Roy V. Friesen, 925 E. 1700 South, Salt Lake City, Utah 84115
Filed Jan. 7, 1976, Ser. No. 647,219
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



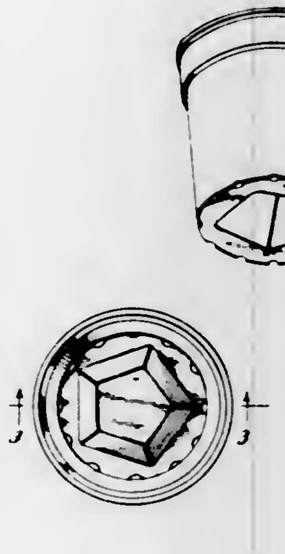
243,111
TOY WATER GUN

Francis M. L. Barthropp, West Vancouver, Canada, assignor to Barton of Canada Ltd., Burnaby, Canada
Filed June 9, 1975, Ser. No. 585,123
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 VV



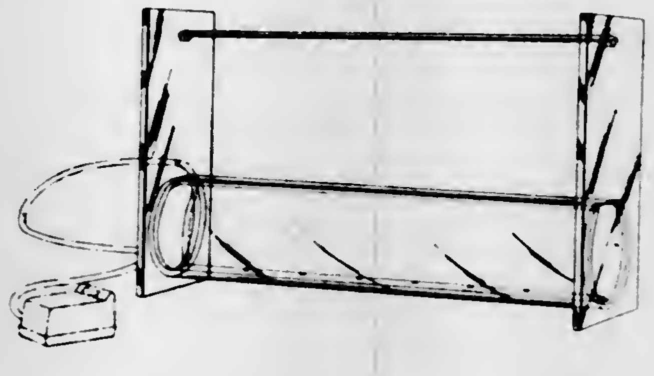
243,112
PLANT CONTAINER

Ronald John Gross, 10 Surrey Road, Mount Waverley, Victoria, Australia
Filed Nov. 11, 1974, Ser. No. 522,917
The portion of the term of this patent subsequent to Feb. 1, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



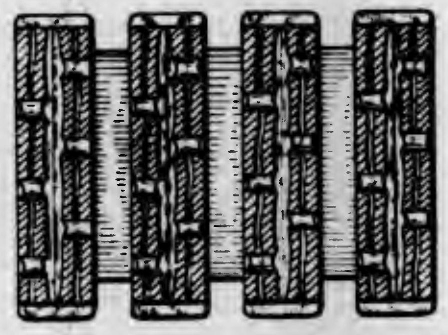
243,113
HYDROPONIC PLANTER

Michael J. Hirsch, Wayne, Pa., assignor to Hydroplanters, Inc., Wayne, Pa.
Filed Aug. 29, 1975, Ser. No. 609,011
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156



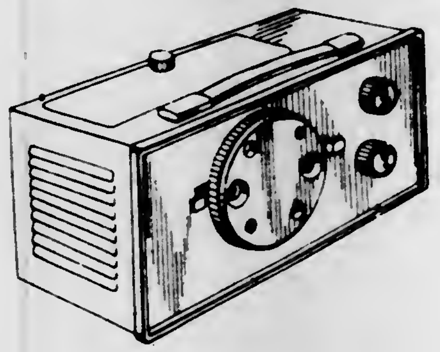
243,114
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE

Murray L. Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Sept. 24, 1975, Ser. No. 616,316
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—23



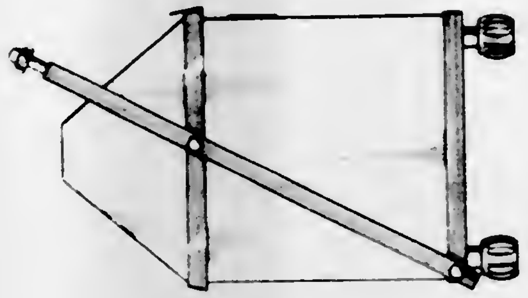
243,115
FIBER OPTIC LIGHT SOURCE

John S. Ziegler, Riverside; Donald J. Mosior, Mundelein, and Ronald L. Carroll, Evanston, all of Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sept. 19, 1975, Ser. No. 614,964
Term of patent 14 years
Int. Cl. D26—*99*; D24—*02*
U.S. Cl. D48—20 E



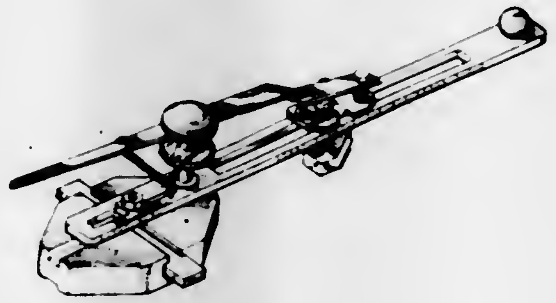
243,116
HOUSING FOR HORS D'OEUVRES OVEN

John M. Werling, 209 E. 36th St., Apt. No. 3, Kansas City, Mo. 64111
Filed Feb. 24, 1975, Ser. No. 552,442
Term of patent 14 years
Int. Cl. D7—*04*; D15—*08*
U.S. Cl. D15—104



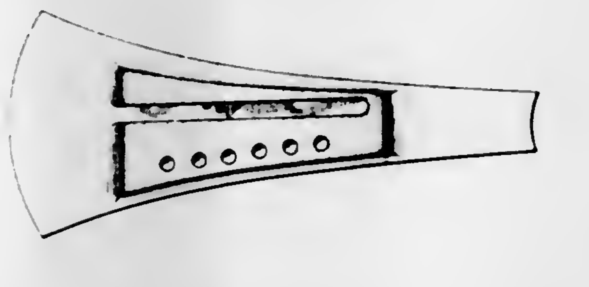
243,117
DEVICE FOR CUTTING PICTURE FRAME MAT BOARDS

Eugene T. Green, Maitland, Fla., assignor to Gene Green Associates, Inc., Maitland, Fla.
Filed May 30, 1975, Ser. No. 582,073
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—127



243,118
BRIDGE FOR GUITAR OR SIMILAR ARTICLE

Michael Kasha, Tallahassee, Fla., assignor to Norlin Music, Inc., Lincolnwood, Ill.
Filed May 12, 1975, Ser. No. 576,270
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

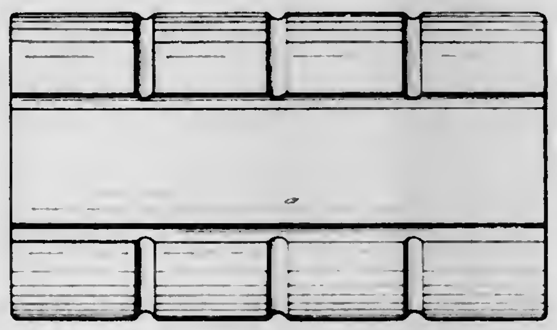


243,119
SOAP BAR

Bernard A. Mitchell, 1000 N. Lake Shore Drive, Chicago, Ill. 60611

Filed Aug. 20, 1975, Ser. No. 606,018
Term of patent 14 years
Int. Cl. D28—*02*

U.S. Cl. D73—1 A

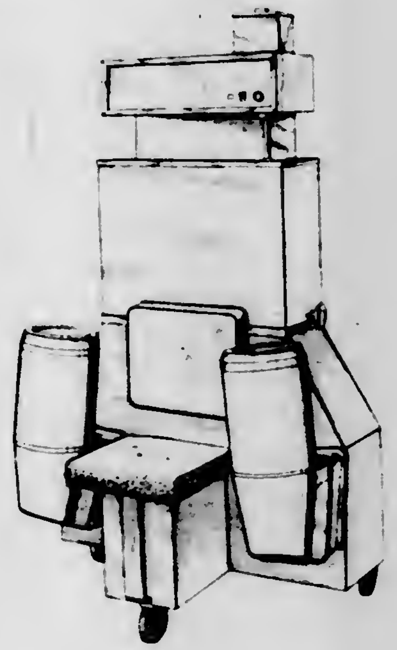


243,120
SCRUBBING APPARATUS FOR SURGICAL PREPARATION OR THE LIKE

Susumu Takabayashi, 9076 Columbine Ave., Fountain Valley, Calif. 92708

Filed Nov. 6, 1974, Ser. No. 521,467
Term of patent 14 years
Int. Cl. D24—*01*

U.S. Cl. D83—1 F

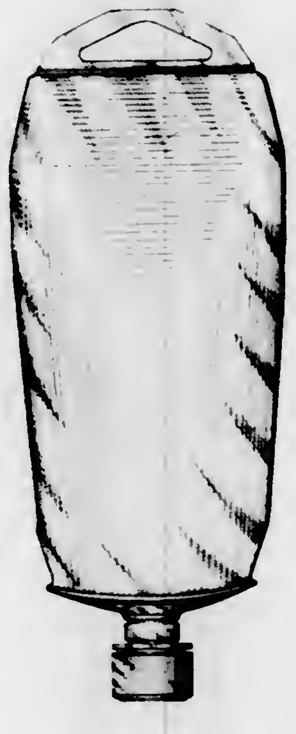


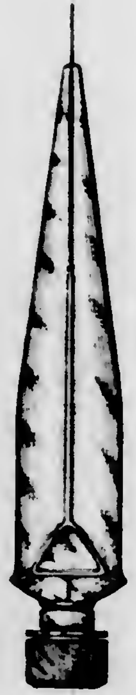
243,121
MEDICAL SOLUTION BAG

Philip G. Ralston, Jr., Buffalo Grove; Joe A. Miller, Lake Zurich, and Frank Cammarata, III, Wheeling, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 17, 1975, Ser. No. 558,981
Term of patent 14 years
Int. Cl. D24—*04*

U.S. Cl. D83—1 U



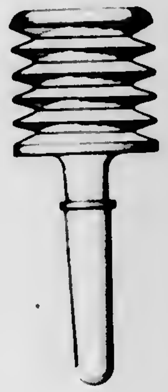


243,122
MEDICINAL APPLICATOR OR THE LIKE

Barry H. Dash, Englewood Cliffs, N.J., assignor to American Home Products Corporation (Del.), New York, N.Y.

Division of Ser. No. 468,050, May 8, 1974. This application Sept. 22, 1975, Ser. No. 615,322
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D83—12 A

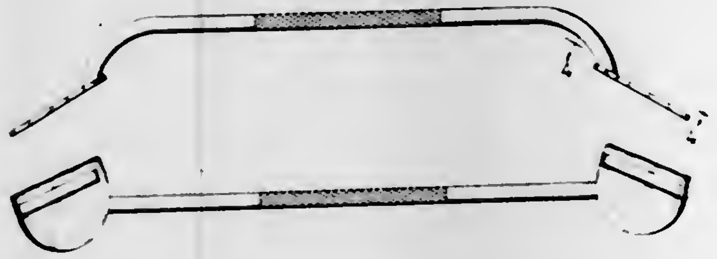


243,123
TIBIAL TEMPLATE FOR KNEE JOINT RECONSTRUCTION

George Shen; Stanley Patterson, and Carl E. Ellis, all of Warsaw, Ind., assignors to Zimmer, U.S.A. Inc.

Filed Dec. 15, 1975, Ser. No. 640,812
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D83—12 R

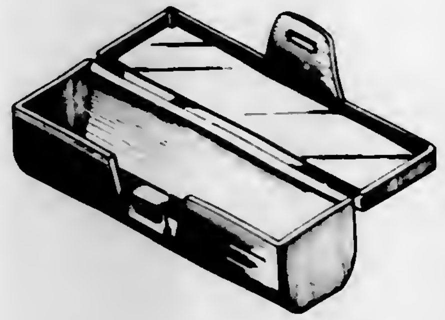


243,124
COMBINED LIPSTICK HOLDER AND MIRROR

William Horowitz, 243-20 72nd Ave., Douglaston, N.Y. 11363

Filed June 11, 1975, Ser. No. 585,982
Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D86—10 G

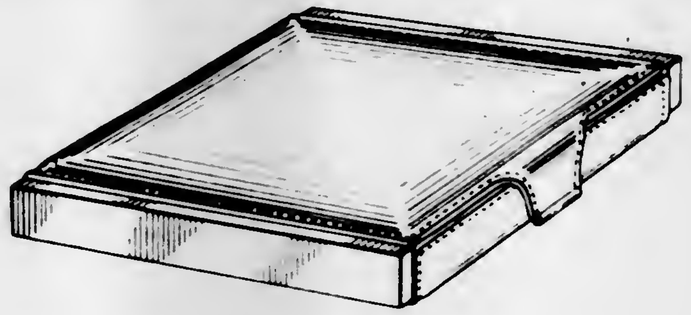


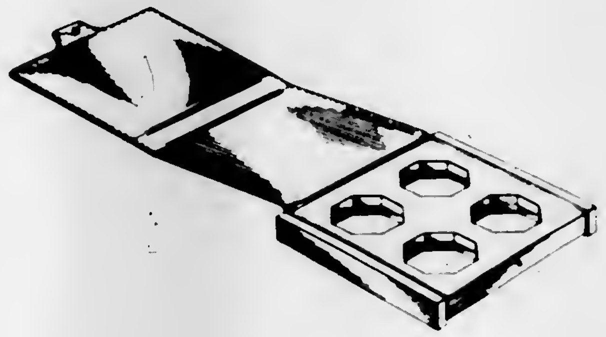
243,125
DISPLAY CASE FOR OCTAGONAL COINS

Edmund Schnitzer, 5661 Edgemore, Cote St. Luc, Montreal, Quebec, Canada

Filed Mar. 7, 1975, Ser. No. 556,274
Term of patent 3½ years
Int. Cl. D3—*02*

U.S. Cl. D87—3 B





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JANUARY, 1977

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. H. Robins Company, Incorporated: *See—*
  - Lybrand, Robert Archie, and Bell, Louis Gary, 4,003,999
  - Lybrand, Robert Archie; and Bell, Louis Gary, 4,004,002.
- A. I. C. Photo, Inc.: *See—*
  - Masuoka, Seiichi, 4,003,637.
- A. J. Shirk Roofing Company, Inc.: *See—*
  - Morris, Paul L., 4,003,553.
- A. Johnson & Co. Inc.: *See—*
  - Cascone, Paul J., 4,003,715.
- A and M Whitemetal Casting, Inc.: *See—*
  - Chako, Andre L., 4,004,144.
- A. Monforts: *See—*
  - Houben, Heinz, and Pabst, Manfred, 4,003,242.
- AB Bofors: *See—*
  - Bjorn, Lars-Erik; and Olsson, Mats Jurgen Martin, 4,003,137.
- Abbe, Jerome T. L.: *See—*
  - Kenigsberg, Irwin J., Girvan, William A.; and Abbe, Jerome T. L., 4,003,534.
- Abercrombie, William Floyd, Jr.: *See—*
  - Kunkle, Albert C., and Abercrombie, William Floyd, Jr., 4,003,819.
- Abrams, Eugene, to Solar Dynamics Corporation. Device for converting sunlight into electricity. 4,003,756, Cl. 136-89.0PC.
- ABU Aktiebolag: *See—*
  - Moosberg, Borje Sigurd, 4,003,270.
- ACCC, Inc.: *See—*
  - Aldridge, George E., 4,003,503.
- ACF Industries, Incorporated: *See—*
  - Campbell, George C., Hammonds, James C.; and Rollins, Dallas W., 4,003,319
- Acheson Industries, Inc.: *See—*
  - Cooper, Arthur William; and Rupp, Thomas Edmund, 4,003,867
- Acuff, Jerry Doyal. Vehicle sun blindness eliminator. 4,003,597, Cl. 296-97.00C.
- Adair, Lyles C.: *See—*
  - Cook, Rufus L., and Adair, Lyles C., 4,004,266.
- Adams, David. Automatic lighted level and angle finder. 4,003,134, Cl. 33-348.000.
- Adams, Don L., Sr.; and Johnson, Raymond G., Jr., to United Technologies Corporation. Heading hold logic. 4,003,532, Cl. 244-17.130
- Adams, Horst, to Panamera, A.G. Disc valve with improved seal ring. 4,003,394, Cl. 137-15.000.
- Adams Rite Products, Inc.: *See—*
  - Geer, Larry A., and Sheffer, Ralph L., 4,003,614.
- Addmaster Corporation: *See—*
  - Busch, Richard E., 4,003,267.
- Addressograph Multigraph Corporation: *See—*
  - Schulze, John Jacob, 4,003,527.
- Adebahr, Klaus; and Gomann, Jurgen, to Hauni-Werke Korber & Co., KG. Method and machine for making cigarettes or the like. 4,003,385, Cl. 131-84.00B.
- Adelstein, Gilbert W., to G. D. Searle & Co. Anti-diarrheal oxadiazoles. 4,003,904, Cl. 260-293.540.
- Aders, Thomas D.: *See—*
  - Owens, Douglas F.; and Aders, Thomas D., 4,003,320
- Aeronutronic Ford Corporation: *See—*
  - Briggs, Donald C.; and Haas, Ronald J., 4,004,067.
  - Briggs, Donald C., and Haas, Ronald J., 4,004,068.
- Aerpat A.G.: *See—*
  - Jeal, Harvey Philip, 4,003,288.
- AG-Rain Incorporated: *See—*
  - Kruse, Frederick V.; and Behrends, Deane O., 4,003,519.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
  - Sibi, Monique; and Demarly, Yves, 4,003,156.
- Agency of Industrial Science & Technology: *See—*
  - Komiya, Yoshio; Suzuki, Eiichi, and Tarui, Yasuo, 4,003,632.
- AGFA-Gevaert, A.G.: *See—*
  - Langen, Hans; Ranz, Erwin; Meyer, Rudolf; and Sobel, Johannes, 4,003,748.
- AGFA-GEVAERT N.V.: *See—*
  - Natens, Luc Yves; and De Gueldre, Jean Martha, 4,004,216.
- Agulnek, Harry: *See—*
  - Mishcon, Lester; and Agulnek, Harry, 4,003,221.
- Aidlin, Joseph W.: *See—*
  - Kessler, Saul, 4,004,064.
- Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the polymerization of ethylene. 4,004,071, Cl. 526-116.000.
- Akashi, Goro; Fujiyama, Masaaki; and Kasuga, Akira, to Fuji Photo Film Co., Ltd. Process for production of motion picture film with sound track containing p-toluenesulfonic acid and glacial acetic acid. 4,003,743, Cl. 96-4.000.
- Akimoto, Hidetoshi. *See—*
  - Hishinuma, Yukio, Akimoto, Hidetoshi, Tamura, Zensuke, and Nakajima, Fumito, 4,003,711.
- Akiyama, Susumu, to Nippon Electric Company, Ltd. Hybrid feedback amplifier of a push-pull type. 4,004,241, Cl. 330-15.000.
- A.B. Dick/Scott: *See—*
  - Gross, Frank C., 4,003,648
- Aktiebolaget Motala Verkstad. *See—*
  - Hedin, Borje Vilhelm, 4,003,687.
- Akzona Incorporated: *See—*
  - Strade, Henry A., 4,004,005
  - Yachabach, Gerald J.; and Mellon, Regis B., 4,004,106
- Alberto Culver Company: *See—*
  - Schmitt, William H., 4,004,036.
- Albright, James A., to Michigan Chemical Corporation. N-substituted tetrahalophthalimides as flame retardants. 4,003,862, Cl. 260-2.5AJ
- Aldridge, George E., to ACCC, Inc. Dispensing device for highly viscous liquids supported in inclined position. 4,003,503, Cl. 222-173.000.
- Alexandrov, Vyacheslav Sergeevich: *See—*
  - Guschin, Alexandr Evgenievich, Khokhryakov, Alexandr Andreevich, Pechko, Evgeny Yakovlevich, Obraztsov, Konstantin Ivanovich; Konstantinov, Anatoly Vasilievich; and Alexandrov, Vyacheslav Sergeevich, 4,003,105
- Alexeev, Dmitry Semenovich: *See—*
  - Tishkov, Anatoly Yakovlevich; Fedorov, Sergei Alexandrovich, Freidin, Anatoly Markovich, Latyshev, Mikhail Zakharovich; Grigoriev, Vitaly Markovich; Menshikov, Jury Alexeevich, Bovin, Andrei Andreevich, Kreimer, Vladimir Isaakovich, Chekushkin, Viktor Ananievich, Lumpov, Vladimir Petrovich; and Alexeev, Dmitry Semenovich, 4,003,831.
- Alfano, Elinor S. Revolving message holder. 4,003,471, Cl. 211-56.000.
- Allen, Linus S., to Mobil Oil Corporation. Logging subsurface formations for porosity. 4,004,147, Cl. 250-264.000.
- Allen, Robert K.: *See—*
  - Morrison, Howard J.; and Allen, Robert K., 4,003,142.
- Allen, Rudolph A. Cargo vessel low resistance bow. 4,003,325, Cl. 114-56.000.
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- Allied Chemical Corporation: *See—*
  - Hoffman, Robert Joel; Bean, Samuel Louis; Seeling, Philip, and Swaine, James William, Jr., 4,003,985
  - Huggins, Dale K., Anderson, Lowell R.; and Gefri, Fred J., 4,003,740.
  - Jones, Edward Stephen; Robinson, Martin Alvin; and Eibeck, Richard Elmer, 4,003,984.
- Allis-Chalmers Corporation: *See—*
  - Downing, Terry R., 4,003,487.
  - Swiecicki, Ignacy, 4,003,674.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Elmgren, Staffan, 4,003,697.
- Aluminium Suisse S.A.: *See—*
  - Hardt, Jean, 4,003,505.
- Aluminum Company of America: *See—*
  - DeArdo, Anthony J., 4,004,066.
  - Rolles, Rolf; Williams, James E., Jr., and Kondis, Thomas J., 4,003,872.
  - Smith, George L.; and Stineman, Milton L., 4,003,494.
- Alvares, Antonio: *See—*
  - Biglione, Gianfranco; Alvares, Antonio, and Bertazzoni, Guido, 4,003,858
- Amano Corporation: *See—*
  - Sano, Seizaburo; and Kozima, Takaaki, 4,003,307.
- Amaya, Yuji, to Fujitsu Ten Ltd. Radio receiver tuning control system. 4,004,232, Cl. 325-421.000.
- American Air Filter Company, Inc.: *See—*
  - O'Dell, Leonard J., 4,003,727.
- American Chain & Cable Company, Inc.: *See—*
  - Wentz, Edward A., 4,003,296.
- American Cyanamid Company: *See—*
  - Brand, William Wayne; and Lovell, James Byron, 4,004,019
  - Cross, Barrington, 4,003,732
  - Ebel, Robert Henry; and Lento, Louis Leonard, Jr., 4,003,851
  - Savides, Christos; and Cannelongo, Joseph Frederick, 4,003,861
  - Suen, Tzeng Jiueq; and Begala, Arthur James, Jr., 4,003,842
- American Flange & Manufacturing Co., Inc.: *See—*
  - Moller, Thomas G., 4,003,488.
- American Home Products Corporation: *See—*
  - Rakhit, Sumanas, 4,003,995.
  - Winkley, Michael W.; and Wendt, Gerhard R., 4,003,888.

- American Hospital Supply Corporation: *See—*
  - Emil, Tuncay; and Stack, Kenneth Elmer, 4,003,370.
- AMP Incorporated: *See—*
  - Reynolds, Charles Edward, 4,003,623.
- Amsler, Joachim, to Sprecher & Schuh AG. Arcing electrode, more particularly for vacuum switches. 4,004,117, Cl. 200-144.00B.
- Amsler, Kurt: *See—*
  - Audykowski, Thaddeus; and Amsler, Kurt, 4,004,054.
- Amstar Corporation: *See—*
  - Rizzuto, Anthony Benny; Skole, Richard David; Newman, Henry Harry; Hogu, Jacqueline Noailles-Benito; and Toscano, Vincent Anthony, 4,003,791.
- Anaconda Company, The: *See—*
  - Payne, Thomas F.; and Sauer, Philip D., 4,003,724.
- Andersen, Stephen Verner; and Swick, Edwin Grant, to Illinois Tool Works Inc. Apparatus for making a multifinger contact. 4,003,235, Cl. 72-326.000.
- Anderson, John S.; and Anderson, Virginia B. Scheduling board. 4,003,150, Cl. 40-64.00R.
- Anderson, Lowell R.: *See—*
  - Huggins, Dale K.; Anderson, Lowell R.; and Gefri, Fred J., 4,003,740.
- Anderson, Paul L., to Sandoz, Inc. Antihypertensive aryl pyrazolo[4,3-c]pyridazinones. 4,004,009, Cl. 424-250.000.
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- Anderson, Virginia B.: *See—*
  - Anderson, John S.; and Anderson, Virginia B., 4,003,150.
- Andersson, Allan. Combination tool. 4,003,418, Cl. 145-50.00C.
- Andrews, Donald Richard; and Leclere, Ralph Joseph, to International Business Machines Corporation. Last copy detection. 4,003,569, Cl. 271-259.000.
- Andrews, Joseph J.: *See—*
  - MacDonald, Richard A.; MacDonald, James A.; and Andrews, Joseph J., 4,003,574.
- Anheuser-Busch, Incorporated: *See—*
  - Shieh, Kenneth K., 4,003,793.
- Ansafone Limited: *See—*
  - Robinson, Stephen Perrin; Evans, David Charles; and Hewitt, Martin, 4,004,276.
- Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,003,826, Cl. 208-139.000.
- Antos, George J., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,003,957, Cl. 260-673.500.
- Aquafilter Corporation: *See—*
  - Goldstein, Jerome J., 4,003,387.
- Arai, Hiroshi; and Taniguchi, Koichi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Brake lining wear warning system. 4,004,269, Cl. 340-52.00A.
- Arai, Rikuro: *See—*
  - Suzuki, Yukimasa; and Arai, Rikuro, 4,003,348.
- Arakawa, Masao: *See—*
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  - Auge, Wolfgang; Thiem, Karl-Werner; Neeff, Rutger; Losacker, Paul; and Braden, Rudolf, 4,003,924.
- Bradley, Charles H.: *See*—
  - Carpenter, James H., Jr.; Bradley, Charles H.; and Ixer, Bernard W., 4,003,164.
- Bradley, Curtis E. Fuel regenerated non-polluting internal combustion engine. 4,003,204, Cl. 60-618.000.
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- Brady, Rupert J., to Walter Kidde & Company, Inc. Crane boom of trapezoidal boom sections having reinforcing rings. 4,003,168, Cl. 52-118.000.
- Brady, William C.; Warner, Arthur S.; and Hankinson, Harold D., to Owens-Corning Fiberglas Corporation. Apparatus for making glass fibers. 4,003,730, Cl. 65-1.000.
- Brand, William Wayne; and Lovell, James Byron, to American Cyanamid Company. Insect control compounds. 4,004,019, Cl. 424-277.000.
- Branson, Charles D., to Robertshaw Controls Company. Electric ignition system. 4,003,360, Cl. 126-39.00E.
- Braun, Daniel E.; and Harkness, Joseph R., to Briggs & Stratton Corporation. Safety device for walk-behind rotary mowers. 4,003,190, Cl. 56-10.500.
- Brecher, Charles: *See*—
  - Riseberg, Leslie A.; Lempicki, Alexander; Brecher, Charles; and Dressel, Herman O., 4,004,178.
- Bredael, Ivo Leo; and Laghi, Fulvio, to European Atomic Energy Community (Euratom). Ultrasonic signal generators. 4,004,165, Cl. 310-8.100.
- Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 3-Heterothio[(thioalkyl)thioacetyl]cephalosporanic derivatives. 4,003,893, Cl. 260-243.00C.
- Brewer, Arthur D.; and Davis, Robert A., to Uniroyal Inc.; and Uniroyal, Ltd. 2,3-Dihydro-1,4-dithiin 1,1,4,4-tetroxide antimicrobials. 4,004,018, Cl. 424-277.000.
- Brewin, Thomas A.: *See*—
  - Cosco, Robert J.; Pappas, John A.; and Brewin, Thomas A., 4,004,189.
- Brickman, W. James, to Scott Paper Company. Graft copolymerization processes. 4,003,701, Cl. 8-115.600.
- Briggs, Donald C.; and Haas, Ronald J., to Aeronutronic Ford Corporation. Rechargeable electrochemical cell. 4,004,067, Cl. 429-57.000.
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- Briggs & Stratton Corporation: *See*—
  - Braun, Daniel E.; and Harkness, Joseph R., 4,003,190.
- Brinton, Michael Brian Jervis, to R. N. L. I. (Trading) Limited. Exhaust valve assembly for preventing ingress of water to an outboard marine engine. 4,003,331, Cl. 115-17.000.
- Bristol, James A.: *See*—
  - Yale, Harry L.; and Bristol, James A., 4,003,905.
  - Yale, Harry L.; and Bristol, James A., 4,004,016.
- Bristol-Myers Company: *See*—
  - Kavadias, Gerry; and Belleau, Bernard, 4,003,922.
- British Cast Iron Research Assoc., The: *See*—
  - Middleton, William Robert, 4,003,425.
- Britt, Robert E. Discovery in adjustable thresholds and methods of making and using the same. 4,003,162, Cl. 49-468.000.
- Brodin, Eric. Device in rope hoists for limiting speed when lowering a load. 4,003,550, Cl. 254-151.000.
- Brody, Philip S., to United States of America, Army. High voltage particle accelerator utilizing polycrystalline ferroelectric ceramic material. 4,004,175, Cl. 313-360.000.
- Broeckl, Heinz; Forch, Friedrich; Freudenschuss, Otto; Keznickl, Eduard; Patels, Gottfried; and Rollenitz, Leopold, to Vockenhuber, Karl, and Hauser, Raimund. Film-handling apparatus. 4,003,645, Cl. 352-109.000.

- Brolin, Charles A., to FMC Corporation. Crane boom lattice and hoist line protection assembly. 4,003,475, Cl. 212-144.000.
- Brooks, J. Clayton: *See*—
  - Wenstrom, Richard T.; Reinke, Theodore S., Tolley, Calvert B., and Brooks, J. Clayton, 4,003,103.
- Brown Boveri-Sulzer Turbomachinery, Ltd.: *See*—
  - Zerlauth, Ferdinand, 4,003,200.
- Brown, Earl Franklin; Limb, John Ormond, and Prasada, Birendra, to Bell Telephone Laboratories, Incorporated. Video conferencing system using spatial reduction and temporal resolution. 4,004,084, Cl. 358-133.000.
- Brown, Edward Douglas: *See*—
  - Bowler, Jean; Brown, Edward Douglas; Marsham, Peter Robert, and Walker, Edward Raymond Halstead, 4,004,021.
- Brown, Michael A., to Pitney-Bowes, Inc. Rotary collator system having a cycle/stop operational mode. 4,003,566, Cl. 270-58.000.
- Brown, Michael A.: *See*—
  - Mersereau, Robert E.; and Brown, Michael A., 4,003,565.
- Bruck, Gernot Klaus. Apparatus for locally irradiating a part of a living body. 4,003,383, Cl. 128-404.000.
- Bruso, Galen: *See*—
  - Kelly, J. Joseph, III; and Bruso, Galen, 4,003,668.
- Buck, Carl J., to Johnson & Johnson. Blocked bis 2-cyanoacrylate monomers. 4,003,942, Cl. 260-464.000.
- Buckley, Betty J. Colander system for bakery products use. 4,003,522, Cl. 241-95.000.
- Buckley, Charles Omar: *See*—
  - Bunn, Julian Wilbur, Jr.; and Buckley, Charles Omar, 4,003,725.
- Buder, Eckart: *See*—
  - Winsel, August; and Buder, Eckart, 4,003,754.
- Bukalo, Alfred Iosifovich: *See*—
  - Paton, Boris Evgenievich; Lakomsky, Viktor Iosifovich; Kostyakov, Vladimir Nikolaevich, Shian, Vitaly Mikhailovich, Bukalo, Alfred Iosifovich; Lisovoi, Jury Vladimirovich; and Domrachev, Valentin Petrovich, 4,004,076.
- Bull, Elmer G.: *See*—
  - Zurolo, Gabriel J.; and Bull, Elmer G., 4,003,704.
- Bullis, Robert H.; and Wiegand, Walter J., Jr., to United Technologies Corporation. Ion collector. 4,003,254, Cl. 73-194.00F.
- Bulloch, Carl Gordon, Jr. Method of forming a spring cushion construction. 4,003,113, Cl. 29-91.100.
- Bullock, Robert L.; and Geyer, Robert P., to Standard Car Truck Company. Reinforced bolster pocket wall. 4,003,318, Cl. 105-226.000.
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  - Little, Keith W.; and Millar, Barry C., 4,003,189.
- Bunker Ramo Corporation: *See*—
  - Vladic, Daniel Peter, 4,003,625.
- Bunn, Julian Wilbur, Jr.; and Buckley, Charles Omar, to Trienco, Inc. Apparatus for purifying hydrogen gas. 4,003,725, Cl. 55-158.000.
- Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Servo steering system for vehicles, especially motor vehicles. 4,003,404, Cl. 137-627.500.
- Burger, Edward D.; Curtin, Daniel J.; and Edison, Robert R., to Atlantic Richfield Company. Method of removing contaminant from a hydrocarbonaceous fluid. 4,003,829, Cl. 208-253.000.
- Burgess, Mary T.: *See*—
  - Bartels-Keith, James R.; and Burgess, Mary T., 4,003,910.
- Burley, Richard Laurence: *See*—
  - Montgomery, Robert A. G., Jr.; and Burley, Richard Laurence, 4,003,703.
- Buros, Melvin S.; and Buros, William B., to Micr-Shield Company. Re-encoding label. 4,004,058, Cl. 428-215.000.
- Buros, William B.: *See*—
  - Buros, Melvin S.; and Buros, William B., 4,004,058.
- Busch, Richard E., to Addmaster Corporation. Cyclically operable drive transmission. 4,003,267, Cl. 74-84.00R.
- Buss, Karl-Bernd, to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Apparatus for the television reconnoitering of terrain from the air. 4,004,086, Cl. 358-109.000.
- Butka, Kemal. Mechanical pencil with lead feed responsive to writing pressure. 4,003,664, Cl. 401-67.000.
- Buzza, Edmund E.; and Sternberg, James C., to Beckman Instruments, Inc. Analysis apparatus and method of measuring rate of change of electrolyte pH. 4,003,705, Cl. 23-230.00R.
- Bylander, Ernest Gerald, to Texas Instruments Incorporated. Vacuum fluorescent display having a grid plate coplanar with the anode. 4,004,186, Cl. 315-167.000.
- Byrd, Edward E. Cam loom apparatus and method. 4,003,406, Cl. 139-80.000.
- Byron Jackson, Inc.: *See*—
  - Novotny, Rudolf J.; and Smith, Charles L., 4,003,431.
- Bystrova, Vera Ivanovna; Kirillova, Galina Konstantinovna; and Mikhailova, Galina Atkhipovna. Process for producing non-porous coating for corundum substrates. 4,004,052, Cl. 427-374.00F.
- C.A.V. Limited: *See*—
  - Chalmers, Brian John; and Gibson, John Phillip, 4,004,203.
- C.G.R.-Mev.: *See*—
  - Kervizic, Jacques; and Tran, Duc Tien, 4,004,181.
- C & K Components, Inc.: *See*—
  - Lee, Ivan A., 4,004,120.
- Cadorette, Raymond: *See*—
  - McCoy, David R.; Cadorette, Raymond; and Eckert, George W., 4,003,719.
- Caffrey, James M., Jr.: *See*—
  - Paull, Peter L.; and Caffrey, James M., Jr., 4,003,987.
- Cahn, Robert P., to Exxon Research and Engineering Company. Thermal energy storage and utilization system. 4,003,786, Cl. 176-39.000.
- Cain, Patrick J., to MTS Systems Corporation. Specimen crack stress intensity control loop for test device. 4,003,246, Cl. 73-90.000.
- Cairo, Anthony C., and Holkeboer, Ronald E., to Robertshaw Controls Company. Primary control system for furnaces and method of making the same. 4,004,198, Cl. 317-155.500.
- Calderazzo, Fausto: *See*—
  - Garibaldi, Pierpaolo, and Calderazzo, Fausto, 4,003,937.
- Callighan, Robert H., and Hawthorne, John O., to United States Steel Corporation. Novel iron oxide catalysts. 4,003,850, Cl. 252-455.00R.
- Camarero, George L. Disposable bath towel and dispensing device. 4,003,509, Cl. 225-23.000.
- Camp, Floyd E., and Hirayama, Chikara, to Westinghouse Electric Corporation. Copper extraction by arc heater. 4,003,739, Cl. 75-72.000.
- Campbell, Carl D.: *See*—
  - Kinsell, Robert C.; Noe, James C.; and Campbell, Carl D., 4,003,212.
- Campbell, George C.; Hammonds, James C., and Rollins, Dallas W., to ACF Industries, Incorporated. Tubular through sill railway hopper car. 4,003,319, Cl. 105-248.000.
- Campbell, J. Allan: *See*—
  - Babcock, John C., and Campbell, J. Allan, 4,004,003.
- Campbell, Joseph: *See*—
  - Boyko, Eugene S.; Campbell, Joseph; and Wiggins, Roger J., 4,003,788.
- Campbell, Kenneth J., to United States of America, Navy. Critical parameter receiver tester. 4,004,230, Cl. 325-363.000.
- Canadian Patents and Development Limited: *See*—
  - Caswell, Bruce F.; and Puddington, I. E., 4,003,737.
  - Donelan, A. Mark; and White, Bryan F., 4,003,256.
  - Hayes, William F.; Tanney, John W.; and Tucker, Helen G., 4,003,405.
  - Holmes, Frank E.; and Salama, Clement A. T., 4,003,126.
  - Kirk, Thomas G., 4,004,289.
- Cannelongo, Joseph Frederick: *See*—
  - Savides, Christos; and Cannelongo, Joseph Frederick, 4,003,861.
- Canon Kabushiki Kaisha: *See*—
  - Goshima, Takeshi, and Endo, Kiyonobu, 4,003,636.
- Canup, Robert E., to Texaco Inc. Means and method for controlling the occurrence and the duration of time intervals during which sparks are provided in a multicylinder internal combustion engine. 4,003,354, Cl. 123-117.00R.
- Capano, Dom: *See*—
  - Allen, William H.; and Capano, Dom, 4,003,652.
- Cappucciati, Raffaello: *See*—
  - Foglino, Giorgio; Battain, Alfio; and Cappucciati, Raffaello, 4,003,714.
- Carad, Inc.: *See*—
  - Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., 4,003,717.
- Carbonnel, Henri, to Groupement pour les Activities Atomiques et Advancees "GAAA". Gas-treatment plant for molten metal. 4,003,560, Cl. 266-217.000.
- Carborundum Company, The: *See*—
  - Carpenter, James H., Jr., Bradley, Charles H.; and Ixer, Bernard W., 4,003,164.
- Card & Co., Inc.: *See*—
  - Card, Roy T., 4,003,321.
- Card, Roy T., to Card & Co., Inc. Cut pile apparatus for staggered needle tufting machine. 4,003,321, Cl. 112-79.00R.
- Carder, Charles H., to Union Carbide Corporation. Coating and ink compositions. 4,003,751, Cl. 106-20.000.
- Carder, Charles Hobert: *See*—
  - Smith, Oliver Wendell; Carder, Charles Hobert; and Trecker, David John, 4,003,868.
- Cardon, Carlos D.; and Griffone, Lawrence P., to Sperry Rand Corporation. Programmable bandpass digital filter of analog signal. 4,004,236, Cl. 328-138.000.
- Cardone, Vincent. System for time sharing an audio amplifier. 4,004,095, Cl. 179-1.0GQ.
- Carella, Richard F. Arrow. 4,003,576, Cl. 273-106.50C.
- Carlow, Earl F.: *See*—
  - Bennett, Thomas H., Carlow, Earl F.; Peddle, Charles; and Wiles, Michael F., 4,004,283.
- Carlson, David H. J., and Urban, Peter, to Universal Oil Products Company. Mercaptan conversion process for a petroleum distillate charge stock. 4,003,827, Cl. 208-206.000.
- Carlson, Ronald H.: *See*—
  - Manganaro, James L.; and Carlson, Ronald H., 4,003,899.
- Carmichael, Richard Quentin; Bonelle, Roger George; and Hartley, John Edward, to T. I. (Group Services) Limited. Shearing tube stock. 4,003,279, Cl. 83-199.000.
- Carnahan, David A. Apparatus for the replacement of seals in a well ram type blow out preventer. 4,003,430, Cl. 166-85.000.
- Carney, William V. Protector module for telephone systems. 4,004,192, Cl. 317-16.000.
- Carney, William V., to Porta Systems Corporation. Protector module for telephone systems. 4,004,263, Cl. 337-32.000.
- Carpenter, James H., Jr., Bradley, Charles H.; and Ixer, Bernard W., to Carborundum Company, The. Workpiece treating barrel. 4,003,164, Cl. 51-13.000.

Carrier Corporation: *See—*

Hogue, Ronald P.; Hill, Robert D., Jr.; and Gerwitz, Paul F., 4,004,264.

McGrath, William L., 4,003,729.

Carroll, Charles D., to General Motors Corporation. Porous laminated sheet. 4,004,056, Cl. 428-138.000.

Carter, Glenn T.; and Paniszczyn, Thomas F., to General Dynamics Corporation. Combination airbrake and pitch control device. 4,003,533, Cl. 244-42.00D.

Carter, Robert M., to FMC Corporation. Crawler drive system. 4,003,608, Cl. 305-57.000.

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Carver, Robert G. Fishing lure. 4,003,154, Cl. 43-42.130.

Cascone, Paul J., to A. Johnson & Co. Inc. Copper-manganese-zinc brazing alloy. 4,003,715, Cl. 29-182.300.

Casey, Joseph Taggart. Portable and detachable double casement window opposing turn latch handles lock securing device. 4,003,227, Cl. 70-14.000.

Cass, Boyd E.; Coate, David W.; and Quigley, Joseph R., to Carad, Inc. Method and apparatus for recovering by-product silt fines from a slurry thereof. 4,003,717, Cl. 44-10.00R.

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Stevens, Wallace Gene; and Karstensen, Karl Wilfred, 4,003,675.

Catoul, Philippe Felix, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Apparatus for testing molten metal. 4,003,260, Cl. 73-423.00R.

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Cavender, James V., Jr., to Monsanto Company. Detoxification of aqueous waste streams containing cyanide. 4,003,833, Cl. 210-59.000.

Cecere, Anthony Robert; and McTighe, William. Earring structure. 4,003,216, Cl. 63-12.000.

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Ceresara, Sergio; Sacerdoti, Giancarlo; and Sacchetti, Nicola. Process for the production of superconductor wires or cables of Nb_3Al and superconductor wires or cables obtained thereby. 4,003,762, Cl. 148-11.50R.

Cernik, Bruce Milan: *See—*

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Chantry, William Amdor; and Conrad, Roddy Merl, to Du Pont de Nemours, E. I., and Company. Continuous spin-drawing process for preparing polyethylene terephthalate yarns. 4,003,974, Cl. 264-210.00F.

Chapman, Derek D.: *See—*

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Charlton, Thomas, to Westinghouse Electric Corporation. Holder for anchoring leads to dynamoelectric machines. 4,004,169, Cl. 310-71.000.

Chauffoureaux, Jean, to Solvay & Cie. Equipment for heating polar polymers to the temperature at which they become plastic. 4,003,554, Cl. 259-4.0AC.

Cheadle, George D.; and Dhondt, Roland O., to Union Oil Company of California. Superatmospheric pressure shale retorting process. 4,003,797, Cl. 201-28.000.

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Cherubim, Martin; Wilms, Elmar; and Arendsen, Hans, to Deutsche Texaco Aktiengesellschaft. Method of activating a supported olefin conversion catalyst. 4,003,853, Cl. 252-467.000.

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Chikaoka, Sadashi; Kawabe, Toyotaro; Miyakawa, Hisashi; and Seki, Naotoshi, to Mitsui Toatsu Chemicals, Incorporated. Treatment of water vapor generated in concentrating an aqueous urea solution. 4,003,801, Cl. 203-42.000.

Childs, William V.; and Ruehlen, Forrest N., to Phillips Petroleum Company. Electrochemical fluorination of ketones within the pores of an anode. 4,003,807, Cl. 204-59.00F.

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Chiodini, Fernando, to Fenco Corporation. Pneumatic cylinder for controlling electrical switch operation. 4,004,116, Cl. 200-82.00R.

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Christie, John S., Jr.; Hunter, Richard S.; and Jenkins, S. Upton, to Hunter Associates Laboratory, Inc. Sensing head assembly for multicolor printing press on-line densitometer. 4,003,660, Cl. 356-178.000.

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Clarke, Graham Morley, to Ferranti, Limited. Discrimination circuit for isolating disturbance signals which are superimposed on D.C. pedestals. 4,004,239, Cl. 329-109.000.

Claxton, William Eugene; Gardner, James Dennis; and Janssen, Marvin Lynn, to Firestone Tire & Rubber Company, The. Electronic tire pressure alarm circuitry. 4,004,270, Cl. 340-58.000.

Claxton, William Eugene; and Cernik, Bruce Milan, to Firestone Tire & Rubber Company, The. Optical pressure switch. 4,004,272, Cl. 340-58.000.

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Collins, Wesley A. Mechanical barrier. 4,003,161, Cl. 49-35.000

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Cooper, Arthur William, and Rupp, Thomas Edmund, to Acheson Industries, Inc. Glass mold coating dispersion of aluminum phosphate and resinous agent, pigment, stabilizer and dispersing agents 4,003,867, Cl. 260-17.500.

Cooper, Robert C., to General Electric Company. Starting circuit for inverter operated gaseous discharge lamps. 4,004,188, Cl. 315-261.000.

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Cullen, Roy H., Jackson, Joshua M.; and Jones, Terry V., to General

- Electric Company, by said Joshua M. Jackson and said Terry V. Jones. Electrical cable reeling apparatus. 4,003,456, Cl. 191-12.400.
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- David, Ed B., to E M C Energies, Inc. Fluid operated well turbopump. 4,003,678, Cl. 417-88.000.
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- Decker, Charles E., II, to Dillon Electric & Machine Co., The. Control apparatus for gripper finger shaft for printing press. 4,003,310, Cl. 101-411.000.
- De Decker, Stanely Clarence: *See*—
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- Ebel, Robert Henry; and Lento, Louis Leonard, Jr., to American Cyanamid Company. Stable alumina catalyst support, process therefor, and promoted support. 4,003,851, Cl. 252-465.000.
- Eberly, Paul E., Jr., to Exxon Research and Engineering Company. Catalyst and process for removing sulfur and metal contaminants from hydrocarbon feedstocks. 4,003,828, Cl. 208-251.00H
- Eckert, George W.: *See*—
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- Eichorn, Roger H., deceased; and by Lincoln First Bank of Rochester, executor, to Xerox Corporation. Development system. 4,003,333, Cl. 118-653.000.
- Einstein, Irving, to Astor, Ruth; and Goldberg, Estelle. Quickly attachable note pad support accessory for desk telephones. 4,004,112, Cl. 179-178.000.
- Eisele, Hermann; Glockler, Otto; and Schwammle, Rudolf, to Robert Bosch G.m.b.H. Fuel injection system. 4,003,350, Cl. 123-32.0EA.
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- Elshuber, Karl; and Gotz, Laszlo, to Texas Instruments Incorporated. AFC circuit. 4,004,231, Cl. 325-420.000.
- Elton, Richard F. Night fighter holster. 4,003,507, Cl. 224-2.00B.
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Gerding, Ronald B., to Heil Co., The. Safety apparatus for hydraulic valves in dump body mechanism. 4,003,601, Cl. 298-22.00C.

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Gilbert, Everett E., to United States of America, Army. Purification of TNT with magnesium sulfite-bisulfite mixtures. 4,003,953, Cl. 260-645.000.

Gilbert, Jeffrey F.: *See—*
- Clarke, E. Colin W.; Gilbert, Jeffrey F.; and Glew, David N., 4,003,816.

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Gilligan, William H.; and Hall, Thomas N., to United States of America, Navy. Removal of tetranitromethane from TNT plant waste gases. 4,003,977, Cl. 423-236.000.

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Girvan, William A.: *See—*
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Glaze, Thurman A., to Masiello, Grace M., a part interest. Chair mounted tray. 4,003,598, Cl. 297-194.000.

Glew, David N.: *See—*
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Goff, Otis Ward. Caser apparatus. 4,003,185, Cl. 53-61.000.

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Gomm, Walter, to Bayer Aktiengesellschaft. Process for the manufacture of cationic dyestuffs. 4,003,898, Cl. 260-247.10L.

Gompert, Leon T., to Rockwell International Corporation. Servoed indicating apparatus. 4,004,206, Cl. 318-636.000.

Good, John P.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Goren, Robert Nathan; Streifer, William; and Marks, Lawrence Morton, to Xerox Corporation. Electrophotographic halftone printing machine employing a phase screen. 4,003,649, Cl. 355-4.000.

Gorog, Istvan, to RCA Corporation. Optical communication and display system. 4,004,078, Cl. 358-83.000.

Gorsich, Richard D.; and DeWitt, William J., to Ethyl Corporation. Concentrated aqueous olefins sulfonates containing carboxylic acid salt anti-gelling agents. 4,003,857, Cl. 252-546.000.

Goshima, Takeshi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Linear image forming apparatus. 4,003,636, Cl. 350-162.00R.

Goto, Akio; Okamoto, Shigenori; Asakawa, Shigeru; and Sugiyama, Fumio, to Tokyo Shibaura Electric Co., Ltd. Bit synchronization circuit. 4,004,090, Cl. 178-69.100.

Gotta, Hans; and Schroll, Franz-Heinz, to Gerhard Collardin GmbH. Process for the production of sprayed phosphate coats on iron and steel. 4,003,761, Cl. 148-6.15R.

Gotz, Laszlo: *See—*
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Graser, Earl J., to Olinkraft, Inc. Frozen food tray. 4,003,514, Cl. 229-34.0HW.

Graser, Michael, Jr.; and Bilotta, Vincent Francis, to Technical Operations Incorporated. Optical control assembly for a color design viewer. 4,003,634, Cl. 350-162.0SF.

Gray, Darby A.; and Hall, Roger L., to Honeywell Information Systems, Inc. Type ribbon deskewing means for a type ribbon feed apparatus. 4,003,460, Cl. 197-170.000.

Gray, Frederick William; and Jervert, Jon C., to Colgate-Palmolive Company. Cleaning fabrics. 4,003,700, Cl. 8-111.000.

Grebik, Stephen J.: *See—*
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Greczin, John C., to Knitting Machinery Corporation of America. Knitting machine including rotatable hold down ring. 4,003,220, Cl. 66-9.00A.

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Greene, Marvin: *See—*
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Grise, Frederick Gerard Joseph; and Lovell, Walter Carl, to USM Corporation. Can cover openable by a spoon or the like. 4,003,495, Cl. 220-268.000.

Grisik, John J., to General Electric Company. Diffusion coating method. 4,004,047, Cl. 427-142.000.

Gristina, Anthony G., to Howmedica, Inc. Trispherical prosthetic shoulder device. 4,003,095, Cl. 3-1.910.

Griswold, Augustus W.; Haritonoff, Boris W.; and Westkirk, Angus W., to Dynak, Inc. Microfiche mounter. 4,003,779, Cl. 156-353.000.

Grobman, William, to Molins Machine Company, Inc. Apparatus having dual slotter shafts. 4,003,300, Cl. 93-58.20R.

Groome, Ernest J.; and Hamrick, Henry L., to Clupak, Inc. Method for compacting a nonwoven fabric impregnated with a thermoplastic binder. 4,003,783, Cl. 162-168.00R.

Groothuis, Gerrit Jan, to U.S. Philips Corporation. Dry-shaving apparatus with reciprocatable cutting block. 4,003,131, Cl. 30-43.920.

Gross, Frank C., to A.B. Dick/Scott. Apparatus for making electrical contact with an electrophotographic film. 4,003,648, Cl. 355-3.00R.

Gross, Franz, to Siemens Aktiengesellschaft. Traveling wave tube with rectangular coupling waveguides. 4,004,180, Cl. 315-3.500.

Gross, Jack R.: *See—*
- Richard, Harold S.; Grillmeier, Eugene L.; Gross, Jack R.; and Myers, Robert P., 4,004,089.

Grossman, Abraham. Solar panel construction. 4,003,363, Cl. 126-270.000.

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Groupement pour les Activities Atomiques et Advancees "GAAA": *See—*
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Grove, Leroy K. Electromagnet for providing balanced friction face pressures on an armature in a vehicle electric brake system. 4,004,262, Cl. 335-281.000.

Grubhofer, Norbert: *See—*
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Guerra, Mario: *See—*
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Guerrero, Benjamin Guzman, to Mattel, Inc. Sneezing doll improvement. 4,003,157, Cl. 46-118.000.

Gulbenk, Alin H., to Dow Chemical Company, The. Substituted pyridinyl methylthio or (methylsulfonyl)benzeneamines. 4,003,906, Cl. 260-294.80F.

Gulf Research & Development Company: *See—*
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Gulf & Western Manufacturing Company: *See—*
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- Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,003,667.

Gump, Klaus Hannes; and Stuetz, Dagobert Engelbert, to Celanese Corporation. Stabilization of acrylic fibers and films. 4,004,053, Cl. 427-379.000.

Gunion, James F.: *See—*
- Elsasser, Harold B.; Gunion, James F.; Huerter, Melvin L.; and Poulos, Andrew L., 4,003,558.

Gunter, Wilburn J. Coiler calender rolls. 4,003,104, Cl. 19-150.000.

Gunther, William E. Rotary engine. 4,003,351, Cl. 123-44.00R.

Gunther, Wolfgang H. H., to Xerox Corporation. Preparing waterless lithographic printing masters by ink jet printing. 4,003,312, Cl. 101-466.000.

Guschin, Alexandr Evgenievich; Khokhryakov, Alexandr Andreevich; Pechko, Evgeny Yakovlevich; Obraztsov, Konstantin Ivanovich; Konstantinov, Anatoly Vasilievich; and Alexandrov, Vyacheslav Sergeevich. Apparatus for transforming an air-fibre dispersion stream in the manufacture of homogeneous fibrous materials. 4,003,105, Cl. 19-155.000.

Gustison, Robert Lawrence. Dispersion-hardened lead alloy. 4,003,755, Cl. 429-178.000.

Gutner, Kenneth H. Wall hanging device. 4,003,539, Cl. 248-489.000.

H.L.S. Ltd., Industrial Engineering Company: *See—*
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H. Maihak A.G.: *See—*
- Blunck, Otto, 4,004,146.

Haas, Georges; Jenny, Erwin F.; and Rossi, Alberto, to Ciba-Geigy Corporation. Dicarboxylic acids and derivatives in the treatment of pain and inflammation. 4,004,026, Cl. 424-311.000.

Haas, Ronald J.: *See—*
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- Briggs, Donald C.; and Haas, Ronald J., 4,004,068.

Haber, Terry M. Watch monitor. 4,003,197, Cl. 58-50.00R.

Hachmann, Klaus; Puchta, Rolf; and Sperling, Gerhard, to Henkel & Cie G.m.b.H. Coated stabilized bleach activators, process and washing compositions. 4,003,841, Cl. 252-94.000.

Haede, Werner: *See—*
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Haehnel, Rudolf Herbert; and Graeff, Barry Lee, to Rockwell International Corporation. Strand carrier for a strand fabricating machine. 4,003,290, Cl. 87-57.000.

Haffey, John M., Jr. Football game. 4,003,580, Cl. 273-134.0CF.

Hagen, Albert; Kaiser, Theodor; and Pohler, Heinz, to Hoesch Werke Aktiengesellschaft. Method and arrangement for the production of annular articles. 4,003,121, Cl. 29-415.000.

Hager, Nathaniel E., Jr.: *See—*
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Haines, William M., to Gates Rubber Company, The. Power transmission belt. 4,003,269, Cl. 74-229.000.

Hakansson, Hakan: *See—*
- Erlandsson, Bengt; Hakansson, Hakan; Salen, Bengt; Nilsson, Per; and Ivarsson, Alf, 4,003,264.

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Hall, Donivan L., to Reliance Electric Company. Digital scale with means to shift displayed weight to show fraction of least normally displayed graduation. 4,004,139, Cl. 235-151.330.

Hall, John C., to Rockwell International Corporation. Electrode structure for electrical energy storage device. 4,003,753, Cl. 429-199.000.

Hall, Roger L.: *See—*
- Gray, Darby A.; and Hall, Roger L., 4,003,460.

Hall, Thomas N.: *See—*
- Gilligan, William H.; and Hall, Thomas N., 4,003,977.

Hallier, Bernard L. D., to International Standard Electric Corporation. Multi-zone microwave heating apparatus. 4,004,122, Cl. 219-10.55A.

Halligan, Dewey D. Dip lead former. 4,003,414, Cl. 140-1.000.

Hallock, Robert L. Clinch type fastener. 4,003,286, Cl. 85-31.000.

Halperin, Nathaniel, to Zale Corporation. Coarse focus mechanism for microscopes. 4,003,628, Cl. 350-77.000.

Hamada, Osamu. Pulse width modulated signal amplifier. 4,004,246, Cl. 330-10.000.

Hamersma, Willem Antonius Maria: *See—*
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Hammonds, James C.: *See—*
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Hamrick, Henry L.: *See—*
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Hanazono, Masanobu; and Asai, Osamu, to Hitachi, Ltd. Method for preparing thin film integrated circuit. 4,003,772, Cl. 156-656.000.

Haney, James R.; and Ruof, Edgar J., to Goodyear Aerospace Corporation. Failure warning and shut-off for anti-skid system. 4,003,607, Cl. 303-92.000.

Hankinson, Harold D.: *See—*
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Hannan, William James; Fulcher, Edwin Maxwell; Rhodes, Randy Deleon; and Saenz, Robert George, to RCA Corporation. Credit card containing electronic circuit. 4,004,133, Cl. 235-61.70B.

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Hansen, Siegfried, to Hughes Aircraft Company. Electro-hydraulic driver for deformable face plate. 4,003,640, Cl. 350-310.000.

Hanson, Waldo B.; Morrison, Ralph A.; and Tardiff, Armand L., to USM Corporation. Machines for reforming and repackaging components. 4,003,413, Cl. 140-1.000.

Happach, Anton, to Schaltbau Gesellschaft mbH. Power relay. 4,004,260, Cl. 335-202.000.
Harada, Toshio; Nakamata, Shinichi; Araki, Shiro; Nakashima, Koei; Kawasaki, Hironori; Watanabe, Kazuo; and Miura, Keiichi, to Nippon Steel Corporation; and Mitsubishi Electric Corporation. Method for compensating tail end. 4,003,229, Cl. 72-15.000.
Harayda, George Michael; and Austin, Wayne Miller, to RCA Corporation. Heat-sink assembly for high-power stud-mounted semiconductor device. 4,004,195, Cl. 317-100.000.
Hardt, Jean, to Aluminium Suisse S.A. Relief vent for pressurized cans. 4,003,505, Cl. 222-397.000.
Haring, Rolf A. Liquid outlet valve. 4,003,401, Cl. 137-599.200.
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Harris, James C.: *See—*
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Harrison, Eugene; and Williams, Edgar G., to Celanese Corporation. Die-gap adjusting means. 4,003,689, Cl. 425-466.000.
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Harvey Hubbell Incorporated: *See—*
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Hasek, Vaclav, to Elitex, Zavody textilniho strojirenstvi generalni reditalstvi. Device for withdrawing fabrics from looms. 4,003,411, Cl. 139-308.000.
Hashida, Yoshisuke; and Hibino, Tsuneo, to Konishiroku Photo Industry Co., Ltd. System for recording images received by facsimile. 4,003,651, Cl. 355-16.000.
Hashimoto, Sho: *See—*
  Kumita, Izumi; Ueda, Akiyoshi; Ohkuma, Kazuhiko; Hashimoto, Sho; Nakada, Akira; and Mizuno, Masami, 4,004,022.
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Hattori, Seizi; Inagaki, Nobuo; and Ishii, Yoshikazu, to Nippon Telegraph and Telephone Public Corporation. Method of making a magnetic oxide film with high coercive force. 4,003,813, Cl. 204-192.000.
Hauck, Frederic P.; Cimarusti, Christopher M.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. 2,3-Trans-5-[3-(amino)-2-hydroxypropoxy]-1,2,3,4-tetrahydro-3-(or 2)-amino-2-(or 3)-hydroxy-naphthalenes and salts thereof. 4,003,930, Cl. 260-570.700.
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Hawkes, George F., Jr., to Westinghouse Electric Corporation. Panelboard and circuit breaker combination. 4,004,197, Cl. 317-119.000.
Hawks, Herbert H., to Nite Hawk Enterprises, Inc. Aerial mount. 4,003,540, Cl. 248-539.000.
Hawks, Nathaniel L.; and Shively, John R., to Jones, Elmer E. Door and window closer. 4,003,102, Cl. 16-72.000.
Haws, Spencer Kim. Stalk selective harvesting machine. 4,003,193, Cl. 56-327.00A.
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Haydon, Arthur W., to Tri-tech, Inc. Electric rotating machine. 4,004,168, Cl. 310-41.000.
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Heeren, Richard H., to Teletype Corporation. Binary voltage-differential sensing circuits, and sense/refresh amplifier circuits for random-access memories. 4,004,284, Cl. 340-173.0DR.
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Heilos, Johannes; Heimberger, Werner; Lussling, Theodor; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process of preparing dicyan. 4,003,983, Cl. 423-384.000.
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Hess, Charles W., to Speco, Inc. Dual-phase meat grinder adapter. 4,003,521, Cl. 241-82.400.
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Horii, Hideharu; and Orimoto, Tadashi, to Mitsui Shipbuilding and Engineering Co., Ltd. Apparatus for assembling hull modules for shipbuilding. 4,003,326, Cl. 114-65.00R.
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Hoves, Hans; Kunath, Paul; and Uttelbach, Herbert. Method for regulating the material supply to a processing machine having an electric drive motor. 4,004,204, Cl. 318-472.000.
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Ito, Yoshinori; Nakanishi, Mutsuo; Nakakoji, Masamichi; Ikeda, Masahiko; and Ito, Tadashi, to Sumitomo Metal Industries, Ltd Welding materials for aluminum-coated steel. 4,003,766, Cl. 148-24.000.

Ivarsson, Alf: *See—*
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Iwaisako, Toshiyuki: *See—*
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Izumi, Kazuo: *See—*
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Izumi, Kazuto; and Izumi, Kazuo, to Nippon Telegraph and Telephone Public Corporation. Digital attenuator. 4,004,140, Cl. 235-152.000.

J. Aichelin, Firma: *See—*
Wunning, Joachim, 4,003,764.

J-K Mfg. Co., Inc.: *See—*
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J. Lyons & Company Limited: *See—*
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Jablonski, Charles E.: *See—*
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Jackson, Harold L., to Du Pont de Nemours, E. I., and Company. Rapid fixation of agents on flexible substrates. 4,004,048, Cl. 427-158.000.

Jackson, Jack M.; and Hartfiel, Arlynn H., to Chemical Additives Company. Water loss reduction agents. 4,003,838, Cl. 252-8.50A.

Jackson, Joshua M.: *See—*
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Cullen, Roy H.; Jackson, Joshua M.; and Jones, Terry V., 4,003,456.

Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, to Societe Anonyme dite: L'Oreal. Anti-inflammatory polymers, pharmaceutical compositions containing the same and process for producing said polymers. 4,003,990, Cl. 424-78.000.

Jaffe, James M.; and Seto, John Y. W., to General Motors Corporation. Polycrystalline silicon . pressure transducer. 4,003,127, Cl. 29-580.000.

Jaggard, William; and Scales, Allen A., to Dow Chemical Company, The. Gel-like composition for use as a pig in a pipeline. 4,003,393, Cl. 137-15.000.

Janiszewski, Kasimir. Die set with two-part leader pins and ball bearing guide. 4,003,283, Cl. 83-637.000.

Janowiecki, Richard J.; Willson, Michael C.; and Harris, Douglas H., to Monsanto Research Corporation. Plasma spraying process for preparing polycrystalline solar cells. 4,003,770, Cl. 148-174.000.

Janssen, Marvin Lynn: *See—*
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Jawniszko, Ludomir, to Zaklad Aparatury Laboratoryjno-Medycznej Zalmed. Alternating current voltage regulator including saturable inductor and means to block the current flow therethrough. 4,004,215, Cl. 323-56.000.

Jeal, Harvey Philip, to Aerpat A.G. Tubular rivet. 4,003,288, Cl. 85-77.000.

Jef's Friends: *See—*
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Jenkins, S. Upton: *See—*
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Jensen, George W., to Raymond Lee Organization, Inc., The, a part interest. Hog staple gun. 4,003,118, Cl. 29-243.560.

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Johanson, John E., to Johanson Manufacturing Corporation. Chip capacitor with spring-like leads. 4,004,200, Cl. 317-242.000.

Johanson Manufacturing Corporation: *See—*
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John Ott Laboratories, Inc.: *See—*
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Johnson, Calvin R. Convertible waler brace. 4,003,546, Cl. 249-219.00W.

Johnson, Gerald William; and Lerum, Robert David, to Spray Tech Corporation. Pump frame. 4,003,504, Cl. 222-178 000.

Johnson, Harley D. Fittings. 4,003,835, Cl. 210-232.000.

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Johnson, Raymond G., Jr.: *See—*
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Johnston, Howard, to Dow Chemical Company, The. Substituted pyridinyloxy(thio)phenyl-acetamides, -ureas and urea derivatives and herbicidal compositions and methods containing said compounds. 4,003,734, Cl. 71-94.000.

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Jones, Edward Stephen; Robinson, Martin Alvin; and Eibeck, Richard Elmer, to Allied Chemical Corporation. Production of sulfuryl fluoride. 4,003,984, Cl. 423-468.000.

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Jones, Mark A. Bass anglers fishing classic game. 4,003,578, Cl. 273-134.0AC.

Jones, Terry V.: *See—*
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Jordan, Bertram Lee; and Mitchell, John Davis, to Harrington Manufacturing Company. Tobacco harvester defoliator head having a positive stalk gripping assembly. 4,003,192, Cl. 56-27.500.

Joseph Gamell Industries, Incorporated: *See—*
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Juhas, Joseph Aloysius, to Torrington Company, The. Bearing cage and roller assembly. 4,003,609, Cl. 308-217.000.

Juillard, Michel; and Bouy, Pierre, to Rhone-Poulenc Industries. Method of obtaining a micro-porous membrane and novel product thus obtained. 4,003,818, Cl. 204-296.000.

Justice, James Conley; and Delli-Gatti, Frank A., Jr., to Coaltex, Incorporated. Method and apparatus for in-cutting and out-cutting during coal mining. 4,003,602, Cl. 299-18.000.

Juvinall, John W., to Owens-Illinois, Inc. Article presence sensor. 4,004,234, Cl. 328-5.000.

Kabushiki Kaisha Kohjin: *See—*
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Kaiser, Carl, to SmithKline Corporation. Phenoxypropanolamines. 4,004,028, Cl. 424-321.000.

Kaiser, Terrence S.; and Miller, William A., to V. W. Kaiser Engineering, Inc. Lubricated spring bearing unit. 4,003,562, Cl. 267-54.00R.

Kaiser, Theodor: *See—*
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Kalogerson, Thomas A. Engine speed responsive anti-theft device for vehicle. 4,004,273, Cl. 340-64.000.

Kamezaki, Takashi; and Iiyama, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor choke valve control device. 4,003,355, Cl 123-119.00F.

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Kandori, Toshio: *See—*
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi, Yamamoto, Nobuyuki; Doi, Haruo; Sano, Kazuya; Kandori, Toshio; and Tsuzuki, Yukikazu, 4,003,976.

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Kato, Kotaro; and Takai, Haruki, to Nippon Electric Company, Ltd. Clock signal reproducing network for PCM signal reception. 4,004,162, Cl. 307-269.000.

Kato, Takayuki; and Yamazaki, Satoshi, to Toyota Jidosha Hanbai Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Spark gap detector. 4,004,213, Cl. 324-15.000.

Kaufhold, Frederick Daniel: *See—*
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Kavadias, Gerry; and Belleau, Bernard, to Bristol-Myers Company. Synthesis of cis-1,4-cyclohexadiene dioxide. 4,003,922, Cl. 260-348.50L.

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Kawamura, Toshihito, to Toyoda Koki Kabushiki Kaisha. Loading apparatus for a machine tool. 4,003,166, Cl. 51-215.0HM.

Kawasaki, Hironori: *See—*
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Kelly, J. Joseph, III; and Bruso, Galen, to Clinton Plastics, Inc. Threaded broom pole adapter. 4,003,668, Cl. 403-287.000.

Kelly, James H., II, to General Electric Company. Method of producing color slides from black and white originals. 4,003,653, Cl. 355-77.000.

Kelsall, Dennis, to United States of America, Air Force. Triangular interferometric light-source tracker. 4,003,658, Cl. 356-110.000.

Kemp, Robert T., Jr., to United States of America, Navy. Self-limiting chemical systems for nonpolluting control of noxious pests. 4,004,000, Cl. 424-200.000.

Kempermann, Theo; and Marwede, Gunter, to Bayer Aktiengesellschaft. Vulcanization systems for rubber mixtures with light fillers. 4,003,843, Cl. 252-182.000.

Kende, Andrew S.; and Liebeskind, Lanny S. Total synthesis of steganacin and derivatives thereof. 4,003,916, Cl. 260-340.500.

Kenigsberg, Irwin J.; Girvan, William A.; and Abbe, Jerome T. L., to United Technologies Corporation. Pilot seat with lateral vibration isolation. 4,003,534, Cl. 244-122.00R.

Kenngott GmbH & Co. KG: *See—*
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Keogh, Michael John: *See—*
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Kerber, Marvin Clarence; and Traver, William Steven, to Pulse Dynamics Corporation. Electronic voltmeter. 4,004,220, Cl. 324-103.00P.

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Kersten, Siegfried: *See—*
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Kervizic, Jacques; and Tran, Duc Tien, to C.G.R.-Mev. Hyperfrequency resonant system for accelerating a charged particle beam and a microton equipped with such a system. 4,004,181, Cl. 315-5.410.

Kessler, Saul, to Aidlin, Joseph W. Protective coating for articles. 4,004,064, Cl. 428-421.000.

Keznickl, Eduard: *See—*
Broeckl, Heinz; Forch, Friedrich; Freudenschuss, Otto; Keznickl, Eduard; Patels, Gottfried; and Rollenitz, Leopold, 4,003,645.

Khalil, James E. Fishing rod mounted line-detaining device. 4,003,153, Cl. 43-25.000.

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Kieft, Alvin J.: *See—*
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Kiejzik, Paul A. Microfilm jacket microfilm feeding device and process. 4,003,187, Cl. 53-123.000.

Kikuchi, Tom T., to General Motors Corporation. Optical waveguide laser pumped by guided electromagnetic wave. 4,004,249, Cl. 331-94.50P.

Kilgore, Marshall B.: *See—*
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King, Roy L. Press frame. 4,003,305, Cl. 100-257.000.

Kinsell, Robert C.; Noe, James C.; and Campbell, Carl D., to Garrett Corporation, The. Air conditioning system for aircraft. 4,003,212, Cl. 62-91.000.

Kirillova, Galina Konstantinovna: *See—*
Bystrova, Vera Ivanovna; Kirillova, Galina Konstantinovna; and Mikhailova, Galina Atkhipovna, 4,004,052.

Kirk, Norbert A. Bicycle safety reflector. 4,003,630, Cl. 350-99.000

Kirk, Thomas G., to Canadian Patents and Development Limited. Acoustic grain flow rate monitor. 4,004,289, Cl. 340-267.00R.

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Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, to Sumitomo Chemical Company, Limited. Novel cyclopropanecarboxylates. 4,003,945, Cl. 260-468.00H.

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Klapdor, Heinrich; and Lobbe, Armin, to Gewerkschaft Eisenhutte Westfalia. Methods and apparatus for constructing tunnels. 4,003,211, Cl. 61-84.000.

Klein, Keith William; and Palmieri, Joseph Michael, to General Electric Company. One piece plastic pin fastener. 4,003,107, Cl. 24-73.00P.

Kleiner, Richard N.: *See—*
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Kliem, Peter O., to Polaroid Corporation. Photographic products with photosensitive layers of same spectral sensitivity and different speed. 4,003,744, Cl. 96-29.00D.

Klingenberg, Alfred Simeon, to Bell Telephone Laboratories, Incorporated. Connection device. 4,004,261, Cl. 335-280.000.

Kluepfel, Dieter; Sehgal, Surendra N.; and Vezina, Claude, to Ayerst McKenna and Harrison Ltd. Naphthyridinomycin antibiotics. 4,003,902, Cl. 260-268.0PC.

Kluy, Werner; Feichtinger, Hans; and Falbe, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the production of azomethines. 4,003,921, Cl. 260-347.700.

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Knoth, Dale W.: *See—*
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Knott, Jean, to I.W.S. Nominee Company Limited. Method for carbonizing cellulose materials. 4,003,702, Cl. 8-140.000.

Kobayashi, Kazuo; Sugiura, Seiichi; and Oosumi, Yoshimasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for judging psychosomatic condition of the driver in motor vehicle. 4,004,290, Cl. 340-279.000.

Koch, Karl: *See—*
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Koch, Robert E.; and Ceder, James H., to General Electric Company. Method of making current limiting fuse having a filter disposed in one end cap. 4,003,129, Cl. 29-623.000.

Koehler, Toivo, to Honeywell Inc. Ion implantation of gold in mercury cadmium telluride. 4,003,759, Cl. 148-1.500.

Koehring GmbH - BOMAG Division: *See—*
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Koenig, Karl-Heinz; Kersten, Siegfried; and Reitel, Christian, to BASF Aktiengesellschaft. Manufacture of aliphatic isocyanates. 4,003,938, Cl. 260-453.00P.

Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; and Schaefer, Dieter, to BASF Aktiengesellschaft. Device for the magnetic orientation of magnetic recording media. 4,003,336, Cl. 118-640.000.

Kohlgruber, Rolf, to Ofenbaugesellschaft Berg u. Co. m.b.H. Method of and plant for patenting steel wire bundles. 4,003,763, Cl. 148-15.000.

Kohno, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary piston internal combustion engine. 4,003,346, Cl. 123-8.130.

Kokado, Naoyuki: *See—*
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Kokusai Electric Co., Ltd.: *See—*
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Komancheck, John J.; and Todd, Robert R., to Sperry Rand Corporation. Grain distribution means for rotary combine. 4,003,384, Cl. 130-27.00T.

Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Yamamoto, Nobuyuki; Doi, Haruo; Sano, Kazuya; Kandori, Toshio; and Tsuzuki, Yukikazu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Converter for the purification of exhaust gases. 4,003,976, Cl. 423-213.500.

Komatsu, Toshiaki: *See—*
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Komissarchuk, Jury Stepanovich; Krylov, Nikolai Ivanovich; Popov, Boris Vasilievich; and Lurie, Viktor Davydovich. Machine for the hot shearing of rolled products. 4,003,282, Cl. 83-490.000.

Komiya, Hidetoshi: *See—*
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Komiya, Yoshio; Suzuki, Eiichi; and Tarui, Yasuo, to Agency of Industrial Science & Technology. Optoelectronic semiconductor device. 4,003,632, Cl. 350-160.00R.

Kommanditgesellschaft Schwarzhaupt: *See—*
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Kondis, Thomas J.: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Lee, Roy C., to Phillips Petroleum Company. Method and apparatus for maintaining the operating temperature in a device for reducing engine exhaust pollutants. 4,003,343, Cl. 123-3.000.

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Marsh, David W., II Electronic musical instrument. 4,003,284, Cl 84-1.180.

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Mathias, Christopher Neil, to Girling Limited. Sliding caliper disc brake. 4,003,453, Cl. 188-72.400.

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- Maurer, Jeffrey A. Skate board wheel brake assembly. 4,003,582, Cl. 280-11.200.
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- McGrath, William L., to Carrier Corporation. Air conditioning system having improved dehumidification capabilities. 4,003,729, Cl. 62-93.000.
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- McLeod, Cedric W.; and Hughes, Samuel J. Moulding press. 4,003,686, Cl. 425-373.000.
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- Mencacci, Samuel A.; Strasser, Jurgen H.; and Mansfield, Tom, to FMC Corporation. Retort system. 4,003,302, Cl. 99-359.000.
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- Miller, Albert Arthur, to Wilson-Miller & Co. Ltd. Multi-ratio transmission systems. 4,003,273, Cl. 74-767.000.
- Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert James, to Universal Manufacturing Corporation. Automatic capacitor winding machine and method. 4,003,112, Cl. 29-25.420.
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- Muller, Ludwig. Method of and device for anchoring a reinforcement beam to a sheet piling. 4,003,207, Cl. 61-39.000.
- Muller, Paul Adolf; and Muster, Hans, to Celfil Company Establishment. Apparatus for treating webs of filtering material for tobacco

product filters, particularly cigarette filters. 4,003,684, Cl. 425-76.000.

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Mullett, Charles E., to Integrated Electronics, Ltd. Portable transmitter. 4,004,228, Cl. 325-113.000.

Munn, David E.: *See*—
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Munsell, Robert F. Fishing tackle rack. 4,003,612, Cl. 312-245.000.

Munson, Whitney K. Hand grip unit for rubber stamps. 4,003,309, Cl. 101-406.000.

Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; Tanaka, Juntaro; and Takabe, Kunihiko, to Nissan Chemical Industries, Ltd. Process for producing myrcene. 4,003,958, Cl. 260-677.00R.

Murayama, Yoshinobu: *See*—
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Mutchnik, Melvin. Mountings for tubular metal legs. 4,003,537, Cl. 248-425.000.

Muth, William R.; Pawela, Stephen J.; and Wood, Richard G., to Velten & Pulver, Inc. Conveyor for staggering adjacent lanes of product. 4,003,466, Cl. 198-452.000.

Myers, Robert P.: *See*—
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Naegeli, Peter, to Givaudan Corporation. Octahydroazulenols. 4,003,951, Cl. 260-617.00F.

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Nagel, Karl: *See*—
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Nakada, Akira: *See*—
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Nakagawa, Jun'ichi: *See*—
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Nakamata, Shinichi: *See*—
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Nakamura, Yasuo: *See*—
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Nakane, Yoneji; Nakamura, Toshikazu; and Magota, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of forming a seam in a body outer panel of a vehicle. 4,004,124, Cl. 296-28.00R.

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Ito, Yoshinori; Nakanishi, Mutsuo; Nakakoji, Masamichi; Ikeda, Masahiko; and Ito, Tadashi, 4,003,766.

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Nakashima, Koei: *See*—
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Nakata, Hozumi, to Nihon Dempa Kogyo Co., Ltd. Method for stabilizing the vibration frequency of a tuning fork-type quartz crystal oscillator. 4,004,166, Cl. 310-8.200.

Nakatsuka, Iwao: *See*—
Tobiki, Hisao; Yamada, Hirotada; Nakatsuka, Iwao; Shimago, Kozo; Okano, Shigeru; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; and Eda, Yasuko, 4,003,887.

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Napier, Roger Paul; and Chapman, Orville L., to Mobil Oil Corporation. Selective phosphorylation process. 4,003,966, Cl. 260-971.000.

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Nassar, Jorge J.: *See*—
Beigler, Myron A.; Benken, William B.; and Nassar, Jorge J., 4,003,992.

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National Distillers and Chemical Corporation: *See*—
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National Patent Development Corporation: *See*—
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National Steel Corporation: *See*—
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Nautet, Jean Adolphe; and Catoul, Philippe Felix, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Apparatus for testing molten metal. 4,003,261, Cl. 73-423.00R.

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Newton, John E.: *See*—
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Nichols, George Frederick: *See*—
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Noranda Mines Limited: *See*—
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Norton, Morrison Kai, to Titan Trailer Corporation. Vacuum relief system for tarpaulin covered hopper trailers. 4,003,301, Cl. 98-13.000.

Novak, William P. Detector for deep well logging. 4,004,151, Cl. 250-485.000.

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Nowak, Milton; and Singer, William, to Troy Chemical Corporation. Enzyme inhibitors, uses and compositions containing same. 4,003,865, Cl. 260-17.00R.

Nygaard, Paul Andrew: *See*—
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Nyman, Frederick Russell: *See*—
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O'Brien, Donald G.; and Walker, Edward R., to D. G. O'Brien, Inc. Pressure compensated marine electrical cable apparatus. 4,003,620, Cl. 339-29.00R.

O'Brien, Patrick M.; Pittaro, Richard J.; and Walker, Philip A., to Krautkramer-Branson, Incorporated. Ultrasonic pulse-echo thickness measuring apparatus. 4,003,244, Cl. 73-67.80R.

Obser, Werner; and Pinior, Gernot, to Erwin Sick GmbH Optik-Elektronik. Apparatus for monitoring a moving web of material for faults 4,004,152, Cl. 250-562.000.

Obser, Werner; and Pinior, Gernot, to Erwin Sick GmbH Optik-Elektronik. Apparatus for monitoring a web of material. 4,004,153, Cl. 250-572.000.

Ochi, Sam S.; and Russell, Ronald W., to National Semiconductor Corporation. Wide common mode range differential amplifier. 4,004,245, Cl. 330-30.00D.

O'Connor, Arthur Herman; and McCullough, Robert Eugene, to Time Computer, Inc. Solid state ladies' wristwatch. 4,003,196, Cl. 58-4.00A.

O'Dell, Leonard J., to American Air Filter Company, Inc. Tubular filter connector. 4,003,727, Cl. 55-377.000.

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Oesterling, Erwin, to Hauni-Werke Korber & Co., KG. Apparatus for manipulating filter rod sections or the like. 4,003,277, Cl. 83-102.000.

Oetiker, Hans. Mechanism for installing hose band clamps. 4,003,238, Cl. 72-410.000.

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Ogata, Yasuhiro; and Ariyasu, Kenji, to Fuji Photo Film Co., Ltd. Method for pressure measurement. 4,003,245, Cl. 73-88.00R.

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Ohno, Masaji; Kataoka, Mutsuo; and Kawabe, Norio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 2-Hydrocinnampyl-1,3-cyclopentanediones. 4,003,936, Cl. 260-590.00C.

Ohno, Nobuo: *See*—
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Oka, Takashi; Suzuki, Syuichi; Mitsuhashi, Hilokazu; and Iwasaki, Hiroshi, to Nissan Motor Co., Ltd.; and Ikeda Bussan Company, Limited. Inflatable protector bag or vehicle safety device. 4,003,588, Cl. 280-743.000.

Okamoto, Shigenori: *See*—
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Okano, Shigeru: *See*—
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O'Keefe, George F., to Textron, Inc. Multiple station forming press with blank accelerator. 4,003,237, Cl. 72-405.000.

Oki, Masami; Suzuki, Masatoshi; Nakamura, Yasuo; Kamigaito, Osami; and Masaki, Hideyuki, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Resistor built-in spark plug. 4,004,183, Cl. 315-58.000.

Okuno, Yoshitoshi: *See*—
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- Osborn, James Richard, Jr.: *See—*
  - Fernstrom, George Arvid; and Osborn, James Richard, Jr., 4,003,195.
- Osborne, Winston G. Self-cleaning strainer. 4,003,837, Cl. 210-408.000.
- Osburn, David W., to General Motors Corporation. Tape player preamplifier circuit responsive to tape speed. 4,004,293, Cl. 360-67.000.
- O'Steen, James K., to United States of America, Navy. Fail safe centrifugal clutch. 4,003,458, Cl. 192-105.0BB.
- Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., to Continental Group, Inc., The. End closure for container. 4,003,496, Cl. 220-270.000.
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- Oswald, Alexis A.; and Valint, Paul L., Jr., to Ciba-Geigy AG. Phenylene-bis(O,S-dialkylthiophosphates). 4,003,964, Cl. 260-930.000.
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- Otake, Mitsuru; and Nobutoki, Saburo, to Hitachi, Ltd. Stripe-shaped color separation filter for image pickup tube and method for manufacturing the same. 4,004,176, Cl. 313-371.000.
- Ott, Henry Walter, to Bell Telephone Laboratories, Incorporated. Automatic impedance modification of transmission lines. 4,004,102, Cl. 179-16.00F.
- Ott, Henry Whitfield, to John Ott Laboratories, Inc. Apparatus for operating gaseous discharge lamps on direct current from a source of alternating current. 4,004,184, Cl. 315-101.000.
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- Robinson, Horace John, to FMC Corporation. Combination positioning and propelling apparatus for barges. 4,003,329, Cl. 114-242.000.
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  - Jones, Edward Stephen; Robinson, Martin Alvin; and Eibeck, Richard Elmer, 4,003,984.
- Robinson, Stephen Perrin; Evans, David Charles; and Hewitt, Martin, to Ansafone Limited. Telephone answering machines. 4,004,276, Cl. 340-171.00A.
- Robinson, William C. Carburetor system for internal combustion engine. 4,003,969, Cl. 261-145.000.
- Rockwell International Corporation: *See—*
  - Gompert, Leon T., 4,004,206.
  - Haehnel, Rudolf Herbert; and Graeff, Barry Lee, 4,003,290.
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  - Spence, John R., 4,004,163.
  - Thibault, Harrison N., 4,003,410.
  - Volpe, Richard L., 4,003,412.
- Roeder, Georg, to Messer Griesheim GmbH. Flame-cutting machine. 4,003,556, Cl. 266-48.000.
- Rogers, Melvin F., to Zenith Radio Corporation. Color television picture tubes with improved implosion protection system. 4,004,092, Cl. 358-246.000.
- Rogojew, Nikolaj Wladimir. Longitudinal-stroke internal combustion engines. 4,003,352, Cl. 123-58.00B.
- Rokudo, Nerumitu: *See—*
  - Hori, Makoto; Rokudo, Nerumitu; and Ishiguro, Toshiyuki, 4,003,518.
- Rolla, Aldo. Flat self-supporting vault for tunnel type furnaces particularly for baking bricks and tiles. 4,003,696, Cl. 432-238.000.
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- Rolles, Rolf; Williams, James E., Jr.; and Kondis, Thomas J., to Aluminum Company of America. Metal-pigmented plastic powder and process. 4,003,872, Cl. 260-37.0EP.
- Rollins, Dallas W.: *See—*
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- Romankiw, Lubomyr T.: *See—*
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- Rookus, James E. Hair raising panel for electric shavers. 4,003,130, Cl. 30-34.200.
- Rorvig, Knud, to Biofac A/S. Piglet enteritis treatment. 4,003,993, Cl. 424-104.000.
- Rose, David; Saygin, Ferdi; and Weinrich, Erwin, to Henkel & Cie G.m.b.H. Oxidation hair dyes based upon tetraaminopyrimidine developers. 4,003,699, Cl. 8-10.200.
- Rose, John Brewster: *See—*
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- Rossi, Alberto: *See—*
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- Rössler, Peter: *See—*
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- Roth, Shirley H.; and Stoy, William S., to Cities Service Company. Intumescent composition. 4,003,864, Cl. 260-2.5FP.
- Roth, Shirley H.: *See—*
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- Rovati, Luigi: *See—*
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- Rowe International Inc.: *See—*
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- Royal Continental Box Company: *See—*
  - Nigro, Paul R., 4,003,529.
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- Ryan, William J., to Ryan Ramp, Inc. Combined marine ramp transfer and mooring system. 4,003,473, Cl. 214-14.000.
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- Scala, Luciano C.; and Phillips, David C., to Westinghouse Electric Corporation. Colloidal polysulfone electrodeposition compositions. 4,003,812, Cl. 204-181.000.
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- Schaefer, Robert L., to Rockwell International Corporation. Process and apparatus for cleaning MOS-LSI die. 4,003,392, Cl. 134-30.000.
- Schaer, Glenn R.; and Trumbull, Harold E., to UOP Inc. System for electroplating a sequence of moving plate members. 4,003,805, Cl. 204-27.000.
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- Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, to Hoechst Aktiengesellschaft. Purification of crude hydrogen chloride. 4,003,723, Cl. 55-71.000.
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Schott, Charles M., Jr., to Gloucester Engineering Co. Inc. Apparatus for driving moving webs in bag making machines. 4,003,298, Cl. 93-33.00H.
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Schwartz, Louis A. Music signal conversion apparatus. 4,003,285, Cl. 84-1.240.
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Yamanaka, Masanori, to Ricoh Co., Ltd. Conveyor for transfer sheet fixing apparatus. 4,003,570, Cl. 271-265.000.

Yamano, Shigemi, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for detecting contamination of liquid. 4,003,661, Cl. 356-201.000.

Yamashita, Akio, to Matsushita Electric Industrial Co., Ltd. Color display device. 4,003,633, Cl. 350-160.0LC.

Yamashita, Gentaro; Taneda, Nobuo; Yamamoto, Kiyoshi; Matsubayashi, Toru; and Takamoto, Hiromitsu, to Teijin Limited. Process for preparing dimethyl 2,6-naphthalenedicarboxylate. 4,003,948, Cl. 260-475.0FR.

Yamashita, Shigeru, to Morishita Fishing Net Manufacturing Co., Ltd. Gill net. 4,003,289, Cl. 87-12.000.

Yamazaki, Satoshi: *See—*
Kato, Takayuki; and Yamazaki, Satoshi, 4,004,213.

Yanikoski, Florian F., to Union Special Corporation. Automatic sewing machine. 4,003,322, Cl. 112-121.120.

Yard, John S.; Herzl, Peter J.; and Evans, Daniel, to Fischer & Porter Co. Multi-range vortex-shedding flowmeter. 4,003,253, Cl. 73-194.0VS.

Yardley Products Corporation: *See—*
Ziaylek, Theodore, Jr., 4,003,287.

Yashiro, Hideo, to Tokyo Shibaura Electric Co., Ltd. Rotary anode structure for an X-ray tube. 4,004,174, Cl. 313-330.000.

Yater, Joseph C. Reversible thermoelectric converter with power conversion of energy fluctuations. 4,004,210, Cl. 322-2.00R.

Yehuda Research & Development Co., Ltd.: *See—*
Steinberg, Izchak Zevi, 4,003,663.

Yokogawa Electric Works, Ltd.: *See—*
Nezu, Kazuo, 4,004,279.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Takamatsu, Ikuo, 4,003,599.

Young, Clarence W., III. *See—*
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,003,880.
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,003,881.

Young, Elliott B., II. Anchor system. 4,003,169, Cl. 52-155.000.

Yu, Robert Tapei: *See—*
Bormann, Alan Richard; and Yu, Robert Tapei, 4,004,285.

Yumde, Yasufumi; Furuhata, Takashi; and Kawamura, Kotaro, to Hitachi, Ltd. Method and system for multiplexing signal for transmission. 4,004,082, Cl. 358-141.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. *See—*
Ohno, Masaji; Kataoka, Mutsuo; and Kawabe, Norio, 4,003,936.

Zaikonnikova, Irina Vitalievna: *See—*
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 4,004,013.

Zaklad Aparatury Laboratoryjno-Medycznej Zalmed: *See—*
Jawniszko, Ludomir, 4,004,215.

Zale Corporation: *See—*
Halperin, Nathaniel, 4,003,628.

Zane, John K.: *See—*
Reymore, Harold E., Jr.; and Zane, John K., 4,003,859.

Zappia, Anthony T., to Ball Brothers Service Corporation. Double arm push bar stacker. 4,003,464, Cl. 198-430.000

Zavod Slovenskeho narodneho povstania, narodny podnik: *See—*
Babinsky, Michal, 4,003,557.

Zehren, James N., to TRW Inc. Apparatus and method for underwater pump installation. 4,003,428, Cl. 166-.500.

Zelinski, Zenon A.: *See—*
Beer, Issie M.; and Zelinski, Zenon A., 4,003,542.

Zelli, Sante. Dolly with articulated and steerable wheels 4,003,584, Cl 280-91.000.

Zenith Radio Corporation: *See—*
DeVries, Adrian J., 4,004,254.
Rogers, Melvin F., 4,004,092

Zerlauth, Ferdinand, to Brown Boveri-Sulzer Turbomachinery, Ltd. Method and apparatus for cooling turbomachines. 4,003,200, Cl. 60-39.020.

Zharikov, Albert Nikolaevich: *See—*
Kandakov, Gennady Petrovich; and Zharikov, Albert Nikolaevich, 4,003,695.

Zhiklenkov, Viktor Konstantinovich; Ilin, Viktor Mikhailovich, Tanygin, Vitaly Matveevich; and Martynenkov, July Fedorovich. Rotary machine for manufacturing hollow articles. 4,003,231, Cl. 72-59.000.

Ziaylek, Theodore, Jr., to Yardley Products Corporation Insert of the self-tapping fluted type. 4,003,287, Cl. 85-47.000.

Zimakova, Irina Evgenievna: *See—*
Novikov, Sergei Sergeevich, Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 4,004,013.

Zlatkis, Albert: *See—*
United States of America, National Aeronautics and Space Administration; and Zlatkis, Albert, 4,003,257.

Zorn, Karl-Ludwig, to Robert Bosch G.m.b.H. Optical videodisc pickup arm with moving coil drive means. 4,004,081, Cl. 358-128.000.

Zurolo, Gabriel J.; and Bull, Elmer G., to Mark Medical Supply, Inc. Medical examination table cover system having sterilizing means therefor 4,003,704, Cl. 21-91.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan 4, 1977
B 78,315	3,982,192	Feb 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 150,142	3,981,767	Jan 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan 13, 1976	Oct. 19, 1976
B 163 463	3,981,659	Jan 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct 19, 1976
B 208,916	3,987,106	Jan 13, 1976	Oct 19, 1976
B 214,925	3,997,648	Mar 9, 1976	Dec. 14, 1976
B 223,678	3,989,159	Mar 9, 1976	Nov. 2, 1976
B 231,416	4,000,054	Mar 30, 1976	Dec. 28, 1976
B 236 342	4,001,182	Feb 10, 1976	Jan 4, 1977
B 248,240	3,983,556	Jan 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan 4, 1977
B 276,026	3,992,405	Feb 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan 4, 1977
B 279,969	3,986,073	Jan 13, 1976	Oct. 12, 1976
B 283,941	3,995,313	Feb 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct 12, 1976
B 307,698	3,993,763	Feb 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan 27, 1976	Sep 21, 1976
B 311,450	3,988,976	Mar 9, 1976	Nov. 2, 1976
B 313,280	4,003,591	Apr 6, 1976	Jan 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan 4, 1977
B 330,736	3,996,299	Feb 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan 4, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan 11, 1977
B 339,194	3,982,215	Feb 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb 3, 1976	Oct 5, 1976
B 349,370	3,989,684	Jan 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec 7, 1976
B 356,187	3,981,222	Jan 20, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep 21, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec 7, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb 24, 1976	Oct 12, 1976
B 370,309	3,989,640	Jan 20, 1976	Nov 2, 1976
B 371,912	3,995,738	Mar 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep 21, 1976
B 381,709	3,984,587	Jan 13, 1976	Oct 5, 1976
B 381,985	3,990,775	Feb 3, 1976	Nov 9, 1976
B 384,225	3,998,523	Mar 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb 24, 1976	Nov 16, 1976
B 385,024	3,994,911	Feb 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov 23, 1976
B 385,631	3,982,924	Jan 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov 23, 1976
B 386,828	3,992,440	Feb 3, 1976	Nov. 16, 1976
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan 27, 1976	Oct 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct 12, 1976
B 390,408	3,992,426	Feb 3, 1976	Nov 16, 1976
B 390,979	4,003,850	Mar 23, 1976	Jan 18, 1977
B 391,473	3,988,370	Mar 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar 9, 1976	Oct 26, 1976
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep 21, 1976
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan 4, 1977
B 396,164	3,989,590	Feb 3, 1976	Nov. 2, 1976
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb 3, 1976	Nov 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct 26, 1976
B 399,098	3,997,665	Feb 24, 1976	Dec 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan 4, 1977
B 399,908	3,983,323	Jan 13, 1976	Sep 28, 1976
B 400,871	3,988,893	Feb 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar 16, 1976	Nov 9, 1976
B 402,162	3,994,902	Mar. 2, 1976	Nov 30, 1976
B 402,328	3,995,545	Apr 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep 28, 1976
B 402,929	3,991,251	Feb 3, 1976	Nov. 9, 1976
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan 4, 1977
B 403,477	3,995,315	Feb 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb 10, 1976	Sep 21, 1976
B 403,766	3,994,834	Feb 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan 13, 1976	Sep 21, 1976
B 406,546	D 242,966	Mar 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 409,848	3,983,270	Jan 27, 1976	Sep 28, 1976
B 410,074	4,001,303	Feb 24, 1976	Jan 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec 7, 1976
B 411,471	3,982,933	Feb 17, 1976	Sep 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan 4, !977
B 411,765	3,993,428	Feb 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan 13, 1976	Sep. 21, 1976
B 413,379	4,001,325	Mar. 9, 1976	Jan 4, 1977
B 414,028	3,993,738	Feb 17, 1976	Nov 23, 1976
B 414,266	3,993,614	Feb 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb 10, 1976	Nov 9, 1976
B 415,021	3,994,173	Mar 2, 1976	Nov 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 416,257	4,001,335	Mar. 16, 1976	Jan 4, 1977
B 416,589	3,990,363	Jan 27, 1976	Nov 9, 1976
B 417,014	3,981,851	Jan 13, 1976	Sep 21, 1976
B 417,164	4,001,360	Mar 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar 9, 1976	Oct. 12, 1976
B 418,489	3,989,592	Jan 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov 9, 1976
B 423,441	3,997,137	Feb. 17, 1976-	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov 9, 1976
B 423,883	3,986,871	Jan 27, 1976	Oct 19, 1976
B 424,354	D 242,416	Feb 10, 1976	Nov. 23, 1976
B 424,989	3,990,569	Feb 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar 23, 1976	Jan 11, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec 21, 1976
B 425,588	3,985,111	Jan 13, 1976	Oct 12, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb 3, 1976	Nov 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan 20, 1976	Sep. 21, 1976
B 428,103	4,000,211	Feb 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb 17, 1976	Nov. 16, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. .3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct 5, 1976
B 474,573	3,988,375	Jan 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep 21, 1976
B 488,756	3,991,810	Mar 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb 17, 1976	Dec. 7, 1976
B 489,550	4,000,710	Mar 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb 24, 1976	Dec. 28, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec 14, 1976
B 490,647	3,985,196	Feb 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 490,946	3,993,652	Feb 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec 21, 1976
B 491,673	3,994,770	Feb 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct 19, 1976
B 496,792	3,999,959	Feb 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb 3, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan 20, 1976	Nov 9, 1976
B 498,208	4,001,480	Apr 13, 1976	Jan. 4, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov 23, 1976
B 498,205	3,989,611	Feb 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar 2, 1976	Dec 14, 1976
B 499,171	3,985,192	Jan 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar 16, 1976	Jan 4, 1977
B 499,352	3,981,391	Jan 27, 1976	Sep 21, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar 30, 1976	Dec 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb 24, 1976	Dec. 14, 1976
B 500,981	3,984,681	Jan 27, 1976	Oct 5, 1976
B 501,122	3,981,385	Feb 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb 3, 1976	Nov 23, 1976
B 501,317	3,985,643	Jan 13, 1976	Oct 12, 1976
B 501,415	3,982,051	Jan 13, 1976	Sep 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan 13, 1976	Sep 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 512,324	3,985,084	Feb 17, 1976	Oct. 12, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep 21, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan 4, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov 2, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 515,303	3,987,939	Jan 20, 1976	Oct 26, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 515,455	3,982,149	Jan 27, 1976	Sep 21, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct 5, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 516,002	3,988,638	Jan 13, 1976	Oct 26, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 516,032	3,986,634	Jan 27, 1976	Oct 19, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 516,069	3,986,208	Mar 16, 1976	Oct. 12, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,296	3,984,404	Feb 3, 1976	Oct. 5, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov 2, 1976
B 505,813	3,985,175	Jan 13, 1976	Oct. 12, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec 21, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr 6, 1976	Jan. 18, 1977
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan 18, 1977
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov 23, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 518,859	3,989,971	Feb 3, 1976	Nov 2, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 519,095	3,993,621	Feb 24, 1976	Nov 23, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct 19, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov 16, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 519,487	3,992,337	Feb 17, 1976	Nov. 16, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 519,599	3,995,350	Feb 17, 1976	Dec 7, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 519,932	3,988,618	Feb 3, 1976	Oct 26, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 519,979	3,982,067	Feb 3, 1976	Sep. 21, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov 2, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 520,075	3,989,935	Feb 24, 1976	Nov. 2, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 520,076	3,989,936	Mar. 2, 1976	Nov 2, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 508,961	3,987,477	Feb 3, 1976	Oct. 19, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 509,043	3,996,767	Feb 24, 1976	Dec. 14, 1976	B 520,277	3,995,635	Feb 17, 1976	Dec 7, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 520,341	3,992,028	Mar 16, 1976	Nov. 16, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 520,384	3,986,592	Jan 27, 1976	Oct. 19, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 520,534	3,997,119	Feb 17, 1976	Dec 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 520,543	3,986,768	Jan 27, 1976	Oct 19, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 520,546	4,001,133	Mar 2, 1976	Jan. 4, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 520,613	3,991,341	Mar 16, 1976	Nov 9, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,658	3,998,778	Mar 9, 1976	Dec. 21, 1976
B 510,346	D 242,207	Feb 10, 1976	Nov. 9, 1976	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,924	3,982,113	Jan 27, 1976	Sep. 21, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,928	3,983,617	Jan 13, 1976	Oct. 5, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar 16, 1976	Jan. 4, 1977
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec 21, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 521,044	3,983,435	Feb 24, 1976	Sep. 28, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 521,045	3,983,433	Feb 24, 1976	Sep. 28, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 521,046	3,983,434	Feb 24, 1976	Sep. 28, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 521,126	3,997,510	Feb 10, 1976	Dec. 14, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 521,127	3,996,201	Feb 17, 1976	Dec 7, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 521,128	3,997,511	Feb 10, 1976	Dec 14, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep 28, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 521,480	3,982,665	Jan 13, 1976	Sep. 28, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 521,600	3,981,458	Jan. 27, 1976	Sep 21, 1976
B 511,454	3,982,333	Feb 24, 1976	Sep. 28, 1976	B 521,612	4,000,251	Mar 9, 1976	Dec 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 521,620	3,983,749	Jan 27, 1976	Oct. 5, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 521,643	3,997,567	Mar 2, 1976	Dec 14, 1976
B 511,886	3,989,991	Feb 3, 1976	Nov. 2, 1976	B 521,711	3,989,835	Feb 10, 1976	Nov 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,793	3,996,981	Feb. 24, 1976	Dec 14, 1976	B 534,016	3,983,381	Feb 3, 1976	Sep 28, 1976
B 521,984	3,983,220	Feb 17, 1976	Sep 28, 1976	B 534,313	3,981,675	Jan 27, 1976	Sep 21, 1976
B 521,986	3,981,607	Feb 3, 1976	Sep 21, 1976	B 534,314	3,981,786	Feb 10, 1976	Sep 21, 1976
B 522,009	3,995,444	Feb 17, 1976	Dec 7, 1976	B 534,333	3,981,480	Feb 17, 1976	Sep 21, 1976
B 522,038	3,993,119	Feb 3, 1976	Nov 23, 1976	B 534,334	D 242,722	Mar 16, 1976	Dec 14, 1976
B 522,227	3,992,904	Mar 30, 1976	Nov 23, 1976	B 534,443	3,989,970	Jan 27, 1976	Nov 2, 1976
B 522,309	3,991,603	Feb 3, 1976	Nov 16, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec 7, 1976
B 522,354	3,984,959	Jan 20, 1976	Oct 12, 1976	B 534,591	3,991,141	Feb 17, 1976	Nov 9, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan 4, 1977	B 534,767	3,982,180	Feb 3, 1976	Sep 21, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec 28, 1976	B 534,991	3,983,517	Jan 27, 1976	Sep 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec 7, 1976	B 535,076	3,981,718	Jan 20, 1976	Sep 21, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec 21, 1976	B 535,209	4,001,873	Mar 16, 1976	Jan 4, 1977
B 522,577	3,982,123	Jan 27, 1976	Sep 21, 1976	B 535,256	3,999,150	Mar 23, 1976	Dec. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan 4, 1977	B 535,268	3,999,045	Mar 30, 1976	Dec. 21, 1976
B 523,696	3,986,071	Jan 13, 1976	Oct 12, 1976	B 535,386	3,981,150	Jan 13, 1976	Sep 21, 1976
B 523,885	3,981,040	Feb 17, 1976	Sep 21, 1976	B 535,391	3,981,386	Jan 27, 1976	Sep 21, 1976
B 523,952	3,988,707	Mar 23, 1976	Oct 26, 1976	B 535,411	3,990,543	Feb 24, 1976	Nov 9, 1976
B 524,026	3,992,206	Feb 10, 1976	Nov 16, 1976	B 535,437	3,997,555	Feb 24, 1976	Dec 14, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep 28, 1976	B 535,448	3,997,123	Mar 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan 13, 1976	Oct 12, 1976	B 535,466	3,981,309	Jan 27, 1976	Sep. 21, 1976
B 524,464	3,985,580	Feb 10, 1976	Oct 5, 1976	B 535,813	3,981,819	Jan 27, 1976	Sep 21, 1976
B 524,806	4,000,065	Mar 2, 1976	Dec 28, 1976	B 535,928	3,981,466	Jan 13, 1976	Sep 21, 1976
B 525,133	3,996,481	Mar 23, 1976	Dec 7, 1976	B 536,009	3,982,112	Jan 27, 1976	Sep 21, 1976
B 525,204	4,001,109	Mar 16, 1976	Jan 4, 1977	B 536,082	3,997,783	Mar 16, 1976	Dec 14, 1976
B 525,809	3,985,040	Feb 24, 1976	Oct 12, 1976	B 536,322	4,001,272	Mar 23, 1976	Jan. 4, 1977
B 525,961	3,985,557	Jan 13, 1976	Oct 12, 1976	B 536,403	3,998,341	Mar 23, 1976	Dec 21, 1976
B 526,106	3,990,073	Jan 27, 1976	Nov 2, 1976	B 536,511	3,995,989	Mar 9, 1976	Dec 7, 1976
B 526,190	3,982,129	Feb 17, 1976	Sep 21, 1976	B 536,675	3,985,773	Jan 20, 1976	Oct 12, 1976
B 526,289	3,992,641	Feb 24, 1976	Nov 16, 1976	B 536,935	3,985,729	Jan 13, 1976	Oct 12, 1976
B 526,388	3,992,017	Feb 3, 1976	Nov 16, 1976	B 537,058	4,000,969	Mar 23, 1976	Jan 4, 1977
B 526,445	3,984,978	Jan 20, 1976	Oct 12, 1976	B 537,102	3,981,829	Jan 13, 1976	Sep 21, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec 28, 1976	B 537,709	3,981,368	Jan 13, 1976	Sep 21, 1976
B 526,510	3,989,708	Jan 20, 1976	Nov 2, 1976	B 537,711	3,985,748	Jan 13, 1976	Oct 12, 1976
B 526,997	3,985,695	Jan 13, 1976	Oct 12, 1976	B 537,722	3,985,423	Feb 3, 1976	Oct 12, 1976
B 527,054	3,981,559	Feb 17, 1976	Sep 21, 1976	B 537,903	3,986,492	Jan 20, 1976	Oct 19, 1976
B 527,171	3,998,248	Mar 9, 1976	Dec 21, 1976	B 538,472	3,992,884	Feb 3, 1976	Nov 23, 1976
B 527,187	3,995,202	Feb 17, 1976	Nov 30, 1976	B 538,491	3,982,928	Feb 17, 1976	Sep 28, 1976
B 527,333	3,999,732	Mar 23, 1976	Dec 28, 1976	B 538,686	3,982,199	Jan 13, 1976	Sep 21, 1976
B 527,669	3,982,206	Jan 13, 1976	Sep 21, 1976	B 538,753	3,993,642	Feb 10, 1976	Nov 23, 1976
B 527,693	3,995,233	Feb 3, 1976	Nov 30, 1976	B 539,374	3,996,229	Mar 9, 1976	Dec 7, 1976
B 527,788	D 242,337	Feb 10, 1976	Nov 16, 1976	B 539,746	3,983,423	Feb 17, 1976	Sep 28, 1976
B 527,972	4,000,016	Mar 9, 1976	Dec 28, 1976	B 540,078	3,984,701	Jan 13, 1976	Oct 5, 1976
B 527,999	3,981,682	Feb 3, 1976	Sep 21, 1976	B 540,218	3,986,108	Feb 10, 1976	Oct 12, 1976
B 528,297	4,001,138	Mar 16, 1976	Jan 4, 1977	B 540,632	3,981,600	Jan 13, 1976	Sep 21, 1976
B 528,303	3,991,023	Feb 10, 1976	Nov 9, 1976	B 540,767	3,986,010	Mar 16, 1976	Oct 12, 1976
B 528,401	3,991,619	Feb 3, 1976	Nov 16, 1976	B 540,872	3,982,135	Jan 20, 1976	Sep 21, 1976
B 528,756	3,990,476	Feb 3, 1976	Nov 9, 1976	B 541,015	3,993,208	Jan 27, 1976	Nov. 23, 1976
B 528,761	3,982,221	Feb 10, 1976	Sep 21, 1976	B 541,376	3,981,690	Feb 17, 1976	Sep 21, 1976
B 528,962	3,989,666	Feb 24, 1976	Nov 2, 1976	B 541,415	3,982,080	Feb 3, 1976	Sep 21, 1976
B 528,966	3,989,667	Feb 24, 1976	Nov 2, 1976	B 541,464	3,995,424	Feb 17, 1976	Dec 7, 1976
B 529,156	3,989,158	Jan 13, 1976	Nov 2, 1976	B 541,496	3,982,232	Jan 27, 1976	Sep 21, 1976
B 529,194	4,000,776	Mar 23, 1976	Jan 4, 1977	B 541,517	3,986,156	Jan 13, 1976	Oct 12, 1976
B 529,659	3,996,875	Feb 24, 1976	Dec 14, 1976	B 541,710	3,994,472	Feb 24, 1976	Nov 30, 1976
B 529,836	3,994,345	Feb 3, 1976	Nov 30, 1976	B 542,135	3,986,939	Feb 10, 1976	Oct 19, 1976
B 529,974	3,987,098	Feb 17, 1976	Oct 19, 1976	B 542,158	3,981,886	Jan 13, 1976	Sep 21, 1976
B 530,174	3,993,635	Feb 24, 1976	Nov 23, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov 23, 1976
B 530,255	3,996,103	Mar 2, 1976	Dec 7, 1976	B 543,078	3,995,687	Feb 17, 1976	Dec 7, 1976
B 530,318	3,985,752	Jan 13, 1976	Oct 12, 1976	B 543,941	3,985,528	Jan 13, 1976	Oct 12, 1976
B 530,569	3,999,865	Mar 16, 1976	Dec 28, 1976	B 544,034	3,997,175	Feb 17, 1976	Dec 14, 1976
B 530,580	4,001,151	Mar 2, 1976	Jan 4, 1977	B 544,476	3,993,585	Feb 24, 1976	Nov 23, 1976
B 530,605	3,989,064	Feb 3, 1976	Nov 2, 1976	B 544,899	3,994,962	Feb 17, 1976	Nov 30, 1976
B 530,813	3,986,131	Feb 17, 1976	Oct 12, 1976	B 544,961	3,983,492	Jan 13, 1976	Sep 28, 1976
B 530,873	4,001,016	Feb 17, 1976	Jan 4, 1977	B 545,050	3,982,073	Jan 20, 1976	Sep 21, 1976
B 530,925	3,983,161	Feb 24, 1976	Sep 28, 1976	B 545,265	D 243,090	Apr 13, 1976	Jan 18, 1977
B 531,096	3,984,415	Feb 10, 1976	Oct 5, 1976	B 545,299	4,001,259	Feb 24, 1976	Jan 4, 1977
B 531,267	3,997,040	Feb 24, 1976	Dec 14, 1976	B 545,464	3,992,387	Feb 10, 1976	Nov 16, 1976
B 531,425	3,992,595	Feb 3, 1976	Nov 9, 1976	B 545,630	3,981,337	Jan 27, 1976	Sep 21, 1976
B 531,566	3,997,820	Mar 16, 1976	Dec 14, 1976	B 545,935	3,990,337	Jan 27, 1976	Nov 9, 1976
B 531,686	3,990,017	Mar 23, 1976	Nov 2, 1976	B 545,945	3,995,260	Jan 27, 1976	Nov 30, 1976
B 531,753	3,988,843	Mar 2, 1976	Nov 2, 1976	B 546,097	3,999,369	Mar 23, 1976	Dec 28, 1976
B 531,929	3,986,067	Jan 20, 1976	Oct 12, 1976	B 546,295	3,987,070	Jan 20, 1976	Oct 19, 1976
B 532,005	3,992,397	Feb 24, 1976	Nov 16, 1976	B 546,426	3,982,063	Jan 27, 1976	Sep 21, 1976
B 532,140	4,001,299	Mar 2, 1976	Jan 4, 1977	B 546,631	3,983,729	Feb 3, 1976	Oct 5, 1976
B 532,319	3,990,292	Feb 3, 1976	Nov 9, 1976	B 546,665	3,990,062	Jan 20, 1976	Nov 2, 1976
B 532,326	3,993,959	Mar 23, 1976	Nov 23, 1976	B 546,911	3,981,058	Jan 13, 1976	Sep 21, 1976
B 532,424	D 242,292	Feb 10, 1976	Nov 9, 1976	B 546,922	3,987,742	Mar 16, 1976	Oct 26, 1976
B 532,476	3,992,756	Feb 3, 1976	Nov 23, 1976	B 547,016	3,999,741	Mar 23, 1976	Dec 28, 1976
B 532,901	3,984,318	Jan 13, 1976	Oct 5, 1976	B 547,208	4,001,218	Feb 24, 1976	Jan 4, 1977
B 532,969	3,981,706	Jan 13, 1976	Sep 21, 1976	B 547,547	3,997,670	Feb 24, 1976	Dec 14, 1976
B 532,976	4,000,837	Mar 23, 1976	Jan 4, 1977	B 547,994	3,990,081	Jan 20, 1976	Nov 2, 1976
B 533,056	3,983,969	Jan 13, 1976	Oct 5, 1976	B 548,028	3,991,517	Feb 3, 1976	Nov 16, 1976
B 533,259	3,999,556	Feb 24, 1976	Dec 28, 1976	B 548,058	3,983,050	Feb 17, 1976	Sep 28, 1976
B 533,454	3,996,566	Mar 2, 1976	Dec 7, 1976	B 548,155	3,981,477	Jan 13, 1976	Sep 21, 1976
B 533,580	3,982,255	Feb 3, 1976	Sep 21, 1976	B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 533,652	4,000,196	Mar 23, 1976	Dec 28, 1976	B 548,302	3,983,414	Feb 17, 1976	Sep 28, 1976
B 533,734	3,984,799	Jan 27, 1976	Oct 5, 1976	B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 533,968	3,986,576	Jan 27, 1976	Oct 19, 1976	B 548,462	D 242,283	Feb 10, 1976	Nov 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 552,498	3,983,139	Jan. 13, 1976	Sep 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 570,615	3,998,570	Mar 23, 1976	Dec. 21, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JANUARY, 1977

NOTE — Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased (by Bosshardt-Schar, Ruth Elisabeth, legal representative); Peter, Heinrich; and Fechtig, Bruno, to Ciba-Geigy Corporation. 7-Pyridinium methyl carboxyl derivatives of 7-amino-cephalosporanic acid. Re. 29,119, Cl. 260-243.00C.

Bosshardt, Rolf, deceased: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119.

Bosshardt-Schar, Ruth Elisabeth, legal representative: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119.

Campbell, Walden Sam: *See—*
  Guy, Billy Lynn; and Campbell, Walden Sam, Re. 29,116.

Ciba-Geigy Corporation: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119.

Fechtig, Bruno: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119.

Guy, Billy Lynn; and Campbell, Walden Sam, to Kalinco, Inc. Pressure gauge. Re. 29,116, Cl. 137-227.000.

Kalinco, Inc.: *See—*
  Guy, Billy Lynn; and Campbell, Walden Sam, Re. 29,116.

Maurer, Gottfried: *See—*
  Sahatjian, Edward; and Maurer, Gottfried, Re. 29,117.

McQuestion, James H. Burial vault. Re. 29,114, Cl. 27-35.000.

Muller, Johannes: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119

Peter, Heinrich: *See—*
  Bickel, Hans; Muller, Johannes; Bosshardt, Rolf, deceased; Peter, Heinrich; and Fechtig, Bruno, Re. 29,119.

Rouverol, William S. Contact gearing. Re. 29,115, Cl. 74-462.000.

Sahatjian, Edward; and Maurer, Gottfried. Automatic spray dispenser with integrated test apparatus. Re. 29,117, Cl. 222-70.000.

Stamberger, Paul. Method of preparing polyurethanes from liquid, stable, reactive, film-forming polymer/polymer mixtures formed by polymerizing an ethylenically unsaturated monomer in a polyol. Re. 29,118, Cl. 260-2.5BE.

LIST OF PLANT PATENTEES

Biggers, Donald L. Plant of the fern family. 4,010, 1-18-77, Cl. 88.000.

LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Bookcase or the like. 243,053, 1-18-77, Cl. D6-161.000.

American Home Products Corporation (Del.): *See—*
  Dash, Barry H., 243,122.

American Hospital Supply Corporation: *See—*
  Ziegler, John S.; Mosior, Donald J.; and Carroll, Ronald L., 243,115.

American Optical Corporation: *See—*
  Johnsen, David W., 243,084.
  Shindler, Anthony, 243,083.

American Standard Inc.: *See—*
  Sheth, Santosh D., 243,092.
  Stichtenoth, Warren G., 243,095.

American Telecommunications Corporation: *See—*
  Perkins, George D., 243,096.

Andersson, Karl Gosta Bertil, to Duni Bila AB. Plate. 243,056, 1-18-77, Cl. D7-1.000.

Atari, Inc.: *See—*
  Cheng, Regan L., 243,106.

Atlas-Graham Industries Company Ltd.: *See—*
  Graham, Joseph A.; Stephenson, Reginald M.; and Dewar, Donald D., 243,060.

Barthropp, Francis M. L., to Barton qf Canada Ltd. Toy water gun. 243,111, 1-18-77, Cl. D34-15 0VV.

Barton of Canada Ltd.: *See—*
  Barthropp, Francis M. L., 243,111.

Baxter Travenol Laboratories, Inc.: *See—*
  Ralston, Philip G., Jr.; Miller, Joe A.; and Cammarata, Frank, III, 243,121.

Beeman, Everett C.; and Speak, Richard C., to United States Borax & Chemical Corporation. Bottle. 243,064, 1-18-77, Cl. D9-137.000.

Blumberg, Annette. Jewelry hanger. 243,055, 1-18-77, Cl. D6-247.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone accessory. 243,091, 1-18-77, Cl. D26-14.00A.

Burgheimer, Alan J.; and Franks, George J. Combined closure and support for a container. 243,070, 1-18-77, Cl. D9-261.000.

Cammarata, Frank, III: *See—*
  Ralston, Philip G., Jr.; Miller, Joe A.; and Cammarata, Frank, III, 243,121.

Carroll, Ronald L.: *See—*
  Ziegler, John S.; Mosior, Donald J.; and Carroll, Ronald L., 243,115.

Cheng, Regan L., to Atari, Inc Game cabinet. 243,106, 1-18-77, Cl. D34-5.00J.

Coupe, James M Set of fireplace tools and stand therefor. 243,061, 1-18-77, Cl. D7-206.000.

Cowan, Murray L., to Textron Inc. Expansible link chain for a bracelet or similar article. 243,114, 1-18-77, Cl. D11-23.000.

Danz, Ellworth R.; and Szalek, Roman J., to General Time Corporation Clock. 243,071, 1-18-77, Cl. D10-22.000. D10-22.000.

Dart Industries Inc.: *See—*
  Haynes, Rodney R., Sr., 243,045
  Haynes, Rodney R., Sr., 243,047.
  Painter, David L., 243,057.
  Painter, David L., 243,058.

Dash, Barry H., to American Home Products Corporation (Del.). Medicinal applicator or the like 243,122, 1-18-77, Cl. D83-12.00A.

Datacopy Corporation: *See—*
  Kohn, Morris A., 243,098.

Dewar, Donald D.: *See—*
  Graham, Joseph A.; Stephenson, Reginald M.; and Dewar, Donald D., 243,060.

Dorn, Edward G. Invertible bookrack. 243,042, 1-18-77, Cl. D6-3.000.

Duni Bila AB: *See—*
  Andersson, Karl Gosta Bertil, 243,056

East/West Industries, Inc.: *See—*
  Spinosa, Dominic J.; and Ryan, John Robert, 243,072.

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Ellis, Carl E.: *See—*
  Shen, George; Patterson, Stanley; and Ellis, Carl E., 243,123.

Figur, Bernd, to Rowenta-Werke, GmbH. Lighter. 243,101, 1-18-77, Cl. D27-42.000.

Figur, Bernd: *See—*
  Stuetzer, Franz Alban; and Figur, Bernd, 243,102.

Florsheim, James M.: *See—*
  Kulp, Jack H.; and Florsheim, James M., 243,073.
  Kulp, Jack H.; and Florsheim, James M., 243,074.
  Kulp, Jack H.; and Florsheim, James M., 243,075.

Franks, George J.: *See—*
  Burgheimer, Alan J.; and Franks, George J., 243,070.
Friesen, Roy V. Doll house. 243,110, 1-18-77, Cl. D34-15.0LL.
Gene Green Associates, Inc.: *See—*
  Green, Eugene T., 243,117.
General Electric Company: *See—*
  Lawrence, George J.; and Mellyn, Lawrence P., 243,090.
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Gomes, Antonio, Jr., to R. E. Phelon Company, Inc. Spark plug cover 243,097, 1-18-77, Cl. D26-1.00J.
Goulooze, Ivan F. Multiple station desk. 243,051, 1-18-77, Cl. D6-146.000.
Graham, Joseph A.; Stephenson, Reginald M.; and Dewar, Donald D to Atlas-Graham Industries Company Ltd. Scraper. 243,060, 1-18-77, Cl. D7-184.000.
Green, Eugene T., to Gene Green Associates, Inc. Device for cutting picture frame mat boards. 243,117, 1-18-77, Cl. D15-127.000
Green, Howard L."Chanukah chest"243,052, 1-18-77, Cl. D6-153.000
Grohoski, Raymond J.: *See—*
  Thompson, Harwell B.; Sheffield, Milton B.; and Grohoski, Raymond J., 243,076.
Gross, Ronald John. Plant container. 243,112, 1-18-77, Cl. D11-152.000.
Hale, Arthur, to Edito-Service S.A. Physical exerciser device 243,103, 1-18-77, Cl. D34-5.00K
Halsted, Milton J.; and Muramatsu, David Y., to Wampole Limited Combined cap and container. 243,066, 1-18-77, Cl. D9-168.000
Halvorsen, Nancy Mardesich. Water closet cover. 243,088, 1-18-77 Cl. D23-71.000.
Halvorsen, Nancy Mardesich. Water closet cover. 243,089, 1-18-77, Cl. D23-71.000.
Haynes, Rodney R., Sr., to Dart Industries Inc. Chair. 243,045 1-18-77, Cl. D6-47.000.
Haynes, Rodney R., Sr., to Dart Industries, Inc. Settee. 243,047, 1-18-77, Cl. D6-61.000.
Hirsch, Michael J., to Hydroplanters, Inc. a Pennsylvania Corporation Hydroponic planter. 243,113, 1-18-77, Cl. D11-156.000.
Hocq, Robert, to Societe Franco-Hispano-Americaine (Francispam) Lighter. 243,100, 1-18-77, Cl. D27-42.000.
Hoffschneider, Fredrick; Hoffschneider, Robert L.; and Hoffschneider, Richard A. Combined electric roaster and butterer for corn 243,059, 1-18-77, Cl. D7-97.000.
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  Hoffschneider, Fredrick; Hoffschneider, Robert L.; and Hoffschneider, Richard A., 243,059.
Hoffschneider, Robert L.: *See—*
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Holcomb, Jack N. Battery charging cycle educational board. 243,085 1-18-77, Cl. D19-64.000.
Horowitz, William. Combined lipstick holder and mirror. 243,124, 1-18-77, Cl. D86-10.00G.
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  Hirsch, Michael J., 243,113.
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Igelman, Norbert Francis. Display box for miscellaneous goods 243,069, 1-18-77, Cl. D9-222.000.
Ito, Sinzo, to Sanken Steel Co. Ltd. Curb and drain unit. 243,094, 1-18-77, Cl. D25-73.000.
Jaeke, Vincent. Motorcycle fairing. 243,079, 1-18-77, Cl. D12-182.000.
Johnsen, David W., to American Optical Corporation. Pair of spectacles. 243,084, 1-18-77, Cl. D16-77.000.
Johnson, Jerry. Lounge chair. 243,046, 1-18-77, Cl. D6-56.000
Kasha, Michael, to Norlin Music, Inc. Bridge for guitar or similar article. 243,118, 1-18-77, Cl. D56-1.00A.
King, Joseph F.: *See—*
  Marker, Peter O.; and King, Joseph F., 243,078.
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Kohn, Morris A., to Datacopy Corporation. Hand held electronic scanning camera probe. 243,098, 1-18-77, Cl. D26-5.00C.
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Kulp, Jack H.; and Florsheim, James M., to Royal Industries, Inc Traffic channelization drum or the like. 243,073, 1-18-77, Cl D10-109.000.
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Kulp, Jack H.; and Florsheim, James M., to Royal Industries, Inc Traffic channelization drum or the like. 243,075, 1-18-77, Cl D10-109.000.
Lawrence, George J.; and Mellyn, Lawrence P., to General Electric Company. Cord connector. 243,090, 1-18-77, Cl. D26-1.00B
Malloy, James T. Garden hose and nozzle connector. 243,062 1-18-77, Cl. D8-259.000.
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Mosior, Donald J. *See—*
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Painter, David L., to Dart Industries Inc Coffeemaker. 243,057, 1-18-77, Cl. D7-41.000.
Painter, David L., to Dart Industries Inc Coffeemaker. 243,058, 1-18-77, Cl D7-41.000.
Pathman, Richard D. Hanging chair 243,044, 1-18-77, Cl. D6-47.000
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Reynolds, Robert L. Handrail for vehicles 243,093, 1-18-77, Cl D25-38.000
Roberts, Harold L. Portable shelf for a telephone or similar article 243,049, 1-18-77, Cl. D6-136.000.
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Talbot, Yorck Rear view mirror. 243,081, 1-18-77, Cl. D12-189.000

Telefonaktiebolaget L M Ericsson. *See—*
  Breger, Carl-Arne, 243,091
Textron Inc.: *See—*
  Cowan, Murray Lawrence, 243,114.
Thompson, Harwell B.; Sheffield, Milton B.; and Grohoski, Raymond J., to Timex Corporation. Electrooptic timepiece face 243,076, 1-18-77, Cl. D10-126.000.
Timex Corporation: *See—*
  Thompson, Harwell B.; Sheffield, Milton B.; and Grohoski, Raymond J., 243,076.
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United States Borax & Chemical Corporation. *See—*
  Beeman, Everett C., and Speak, Richard C., 243,064
Verni, Ralph, to Kingly Products Corporation. Milk bottle crate 243,068, 1-18-77, Cl D9-177.000.
Wampole Limited *See—*
  Halsted, Milton J.; and Muramatsu, David Y., 243,066
Werling, John M. Housing for hors d'oeuvres oven 243,116, 1-18-77, Cl D15-104.000
Yeager, William J., to R E. Chapin Manufacturing Works, Inc Pump handle. 243,087, 1-18-77, Cl. D23-1.00A
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Yeung, Yim Hei Joseph. Simulative toy vehicle 243,108, 1-18-77, Cl D34-15.0AM
Yeung, Yim Hei Joseph Simulative toy vehicle. 243,109, 1-18-77, Cl D34-15.0AM
Ziegler, John S., Mosior, Donald J., and Carroll, Ronald L., to American Hospital Supply Corporation. Fiber optic light source. 243,115, 1-18-77, Cl D48-20.00E
Zimmer, U S A Inc.: *See—*
  Shen, George, Patterson, Stanley, and Ellis, Carl E., 243,123.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 18, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
409	4,003,094
CLASS 3	
1.91	4,003,095
	4,003,096
CLASS 4	
67 A	4,003,097
CLASS 5	
93 R	4,003,098
CLASS 8	
1 XB	4,003,698
10.2	4,003,699
111	4,003,700
115.6	4,003,701
140	4,003,702
CLASS 9	
1.6	4,003,099
CLASS 13	
18	4,004,076
CLASS 15	
1.7	4,003,100
303	4,003,101
CLASS 16	
72	4,003,102
CLASS 17	
71	4,003,103
CLASS 19	
150	4,003,104
155	4,003,105
CLASS 21	
56	4,003,703
91	4,003,704
CLASS 23	
230 R	4,003,705
	4,003,706
232 R	4,003,707
253 R	4,003,708
	4,003,709
267 R	4,003,710
288 F	4,003,711
288 S	4,003,712
290	4,003,714
292	4,003,713
CLASS 24	
16 PB	4,003,106
73 P	4,003,107
205.15 E	4,003,108
CLASS 27	
19	4,003,109
35	Re 29,114
CLASS 28	
72 P	4,003,110
72.11	4,003,111
CLASS 29	
25.42	4,003,112
91.1	4,003,113
125	4,003,114
156.8 R	4,003,115
182.3	4,003,715
182.7	4,003,716
243.56	4,003,118
254	4,003,119
278	4,003,120
415	4,003,121
429	4,003,122
	4,003,123
460	4,003,124
569 R	4,003,125
571	4,003,126
580	4,003,127
596	4,003,128
623	4,003,129
734	4,003,116
809	4,003,117
CLASS 30	
34.2	4,003,130
43.92	4,003,131
CLASS 32	
17	4,003,132
CLASS 33	
228	4,003,133
348	4,003,134
CLASS 34	
9	4,003,135
12	4,003,136
25	4,003,137
86	4,003,138
	4,003,139
CLASS 35	
13	4,003,140
17	4,003,141
26	4,003,142
38	4,003,143
70	4,003,144
CLASS 36	
17 PW	4,003,145
44	4,003,146
136	4,003,147
CLASS 37	
190	4,003,148
CLASS 40	
28 C	4,003,149
64 R	4,003,150
106.1	4,003,151
CLASS 42	
70 R	4,003,152
CLASS 43	
25	4,003,153
42.13	4,003,154
CLASS 44	
10 R	4,003,717
63	4,003,718
	4,003,719
76	4,003,720
CLASS 46	
79	4,003,155
118	4,003,157
120	4,003,158
189	4,003,159
CLASS 47	
58	4,003,156
	4,003,160
CLASS 49	
35	4,003,161
468	4,003,162
503	4,003,163
CLASS 51	
13	4,003,164
101 LG	4,003,165
105 SP	4,003,721
215 HM	4,003,166
CLASS 52	
92	4,003,167
118	4,003,168
155	4,003,169
173 DS	4,003,170
209	4,003,171
279	4,003,172
309.17	4,003,173
415	4,003,174
506	4,003,175
539	4,003,176
630	4,003,177
664	4,003,178
696	4,003,179
716	4,003,180
745	4,003,181
	4,003,182
CLASS 53	
31	4,003,183
32	4,003,184
61	4,003,185
88	4,003,186
123	4,003,187
126	4,003,188
198 R	4,003,189
CLASS 55	
68	4,003,722
71	4,003,723
87	4,003,724
90	4,003,726
158	4,003,725
377	4,003,727
CLASS 56	
10.5	4,003,190
14.6	4,003,191
27.5	4,003,192
327 A	4,003,193
CLASS 57	
51	4,003,194
157 F	4,003,195
CLASS 58	
4 A	4,003,196
50 R	4,003,197
152 R	4,003,198
CLASS 60	
39.02	4,003,200
39.16 R	4,003,199
262	4,003,201
385	4,003,202
537	4,003,203
618	4,003,204
646	4,003,205
CLASS 61	
1 F	4,003,206
39	4,003,207
45 D	4,003,208
48	4,003,209
84	4,003,211
105	4,003,210
CLASS 62	
78	4,003,728
91	4,003,212
93	4,003,729
124	4,003,213
340	4,003,214
476	4,003,215
CLASS 63	
12	4,003,216
	4,003,217
CLASS 64	
21	4,003,218
23	4,003,219
CLASS 65	
1	4,003,730
12	4,003,731
CLASS 66	
9 A	4,003,220
57	4,003,221
84 R	4,003,222
125 R	4,003,223
193	4,003,224
CLASS 68	
18 FA	4,003,225
CLASS 69	
1	4,003,226
CLASS 70	
14	4,003,227
58	4,003,228
CLASS 71	
92	4,003,732
94	4,003,733
	4,003,734
101	4,003,735
CLASS 72	
15	4,003,229
19	4,003,230
59	4,003,231
68	4,003,232
133	4,003,233
141	4,003,234
326	4,003,235
366	4,003,236
405	4,003,237
410	4,003,238
457	4,003,239
CLASS 73	
1 G	4,003,240
9	4,003,241
23.1	4,003,257
24	4,003,242
61.1 C	4,003,243
67.8 R	4,003,244
88 R	4,003,245
90	4,003,246
99	4,003,247
116	4,003,248
117.4	4,003,249
190 H	4,003,250
194 A	4,003,252
	4,003,256
194 E	4,003,255
194 F	4,003,254
194 VS	4,003,251
	4,003,253
290 R	4,003,258
304 C	4,003,259
423 R	4,003,260
	4,003,261
425	4,003,262
432 HA	4,003,263
557	4,003,264
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5 R	4,003,265
10.33	4,003,266
84 R	4,003,267
126	4,003,268
229	4,003,269
405	4,003,270
462	Re.29,115
501 M	4,003,271
640	4,003,272
767	4,003,273
768	4,003,274
CLASS 75	
3	4,003,736
	4,003,737
68 C	4,003,738
72	4,003,739
117	4,003,740
135	4,003,741
CLASS 81	
57.29	4,003,275
CLASS 83	
100	4,003,276
102	4,003,277
186	4,003,278
199	4,003,279
324	4,003,280
477.2	4,003,281
490	4,003,282
637	4,003,283
CLASS 84	
1.18	4,003,284
1.24	4,003,285
CLASS 85	
31	4,003,286
47	4,003,287
77	4,003,288
CLASS 87	
12	4,003,289
57	4,003,290
CLASS 89	
1.810	4,003,291
145	4,003,292
198	4,003,293
CLASS 91	
49	4,003,294
CLASS 92	
1	4,003,295
66	4,003,296
78	4,003,297
CLASS 93	
33 H	4,003,298
49 M	4,003,299
58.2 R	4,003,300
CLASS 96	
1 PE	4,003,742
4	4,003,743
29 D	4,003,744
41	4,003,745
66.3	4,003,746
75	4,003,747
84 UV	4,003,748
114.1	4,003,749
129	4,003,750
CLASS 98	
13	4,003,301
CLASS 99	
359	4,003,302
575	4,003,303
CLASS 100	
117	4,003,304
257	4,003,305
CLASS 101	
27	4,003,306
45	4,003,307
351	4,003,308
406	4,003,309
411	4,003,310
426	4,003,311
466	4,003,312
CLASS 102	
66	4,003,313
CLASS 104	
1 R	4,003,314
93	4,003,315
CLASS 105	
167	4,003,316
184	4,003,317
226	4,003,318
248	4,003,319
CLASS 106	
20	4,003,751
105	4,003,752
CLASS 108	
157	4,003,320
CLASS 112	
79 R	4,003,321
121.12	4,003,322
141	4,003,323
CLASS 113	
7 R	4,003,324
CLASS 114	
56	4,003,325
65 A	4,003,327
65 R	4,003,326
144 R	4,003,328
242	4,003,329
CLASS 115	
5 B	4,003,330
17	4,003,331
CLASS 116	
131	4,003,332
CLASS 118	
640	4,003,336
653	4,003,333
658	4,003,334
	4,003,335
CLASS 119	
3	4,003,337
	4,003,338
52 AF	4,003,339
73	4,003,340
103	4,003,341
CLASS 122	
448 R	4,003,342
CLASS 123	
3	4,003,343
	4,003,344
	4,003,345
8.13	4,003,346
	4,003,347
8.31	4,003,348
8.47	4,003,349
32 EA	4,003,350
44 R	4,003,351
58 B	4,003,352
90.23	4,003,353
117 R	4,003,354
119 F	4,003,355
122 E	4,003,356
127	4,003,357
136	4,003,358
146.5 A	4,003,359
CLASS 126	
39 E	4,003,360
120	4,003,361
121	4,003,362
270	4,003,363
271	4,003,364
	4,003,365
	4,003,366
	4,003,367
390	4,003,368
CLASS 128	
2 M	4,003,369
2.05 D	4,003,370
25 B	4,003,372
40	4,003,373
48	4,003,374
54	4,003,375
69	4,003,376
145 R	4,003,377
184	4,003,371
204	4,003,378
260	4,003,379
303.17	4,003,380
305.3	4,003,381
349 B	4,003,382
404	4,003,383
CLASS 130	
27 T	4,003,384
CLASS 131	
84 B	4,003,385
94	4,003,386
173	4,003,387
CLASS 132	
9	4,003,388
40	4,003,389
45 R	4,003,390
CLASS 134	
6	4,003,391
30	4,003,392
CLASS 136	
89 PC	4,003,756
CLASS 137	
15	4,003,393
	4,003,394
68 A	4,003,395
83	4,003,396
227	Re.29,116
493.9	4,003,397
512	4,003,398
592	4,003,399
596	4,003,400
599.2	4,003,401
624.18	4,003,402
625.41	4,003,403
627.5	4,003,404
CLASS 138	
40	4,003,405
103	4,003,407
118	4,003,408
CLASS 139	
1 R	4,003,409
80	4,003,406
207	4,003,410
308	4,003,411
449	4,003,412
CLASS 140	
1	4,003,413
	4,003,414
CLASS 141	
59	4,003,415

392	4,003,416

CLASS 144

32 R	4,003,417

CLASS 145

50 C	4,003,418

CLASS 148

1.5	4,003,759
6.15 R	4,003,761
6.2	4,003,760
11.5 R	4,003,762
15	4,003,763
16.5	4,003,764
20.3	4,003,765
24	4,003,766
105	4,003,767
108	4,003,768
121	4,003,769
174	4,003,770

CLASS 149

17	4,003,771

CLASS 152

312	4,003,419
355	4,003,420
409	4,003,421

CLASS 156

155	4,003,773
180	4,003,774
226	4,003,775
242	4,003,776
246	4,003,777
289	4,003,778
353	4,003,779
519	4,003,780
526	4,003,781
552	4,003,782
656	4,003,772

CLASS 162

168 R	4,003,783
199	4,003,784

CLASS 164

9	4,003,422
34	4,003,423
	4,003,424
58	4,003,425

CLASS 165

53	4,003,426
105	4,003,427

CLASS 166

5	4,003,428
51	4,003,429
85	4,003,430
250	4,003,431
271	4,003,432
298	4,003,433
315	4,003,434
	4,003,435

CLASS 172

41	4,003,436
59	4,003,437
	4,003,438
	4,003,439

CLASS 174

23 C	4,004,077

CLASS 175

61	4,003,440
71	4,003,441
410	4,003,442

CLASS 176

38	4,003,785
39	4,003,786
76	4,003,787
79	4,003,788

CLASS 178

18	4,004,088
22	4,004,089
69.1	4,004,090
70 R	4,004,091

CLASS 179

1 E	4,004,094
1 GQ	4,004,095
1 SC	4,004,096
2 A	4,004,097
15 AL	4,004,099
15 AS	4,004,101
15 BS	4,004,098
	4,004,100
16 F	4,004,102
18 EA	4,004,103
70	4,004,104
84 VF	4,004,105
99	4,004,106
	4,004,107
100.41 K	4,004,108
170 J	4,004,110
170 NC	4,004,109
175.1 A	4,004,111
178	4,004,112

CLASS 180

27	4,003,443
75	4,003,444
98	4,003,445
132	4,003,446
140	4,003,447

CLASS 181

33 HE	4,003,448
173	4,003,449

CLASS 182

194	4,003,450

CLASS 188

62	4,003,451
71.6	4,003,452
72.4	4,003,453
322	4,003,454

CLASS 190

8	4,003,455

CLASS 191

12.4	4,003,456

CLASS 192

45	4,003,457
105 BB	4,003,458

CLASS 195

1.8	4,003,789
28 R	4,003,790
36 P	4,003,791
63	4,003,792
66 R	4,003,793
	4,003,794
103.5 R	4,003,795
142	4,003,796

CLASS 197

1 R	4,003,459
170	4,003,460

CLASS 198

369	4,003,462
374	4,003,463
430	4,003,464
442	4,003,465
452	4,003,466
597	4,003,461

CLASS 200

50 AA	4,004,113
61.56	4,004,114
61.58 B	4,004,115
82 R	4,004,116
144 B	4,004,117
148 B	4,004,118
158	4,004,119
275	4,004,121
310	4,004,120

CLASS 201

28	4,003,797

CLASS 202

160	4,003,798
241	4,003,802
262	4,003,803

CLASS 203

2	4,003,799
9	4,003,800
42	4,003,801

CLASS 204

14 N	4,003,804
27	4,003,805
46 R	4,003,806
59 F	4,003,807
99	4,003,808
157.1 R	4,003,809
159.14	4,003,810
180 R	4,003,811
181	4,003,812
192	4,003,813
195 C	4,003,815
195 S	4,003,814
237	4,003,816
290 F	4,003,817
296	4,003,818
301	4,003,819

CLASS 206

273	4,003,467
387	4,003,468
410	4,003,469

CLASS 208

8	4,003,820
11 R	4,003,821
102	4,003,822
108	4,003,823
	4,003,824
120	4,003,825
139	4,003,826
206	4,003,827
251 H	4,003,828
253	4,003,829

CLASS 209

3	4,003,830
315	4,003,831

CLASS 210

19	4,003,832
59	4,003,833
83	4,003,834
232	4,003,835
247	4,003,836
408	4,003,837

CLASS 211

50	4,003,470
56	4,003,471

CLASS 212

3	4,003,472
39	4,003,482
59 A	4,003,474
144	4,003,475

CLASS 214

1 BB	4,003,476
	4,003,478
1 D	4,003,479
1 QB	4,003,477
14	4,003,473
	4,003,480
17 DA	4,003,481
85	4,003,483
138 E	4,003,484
450	4,003,485
	4,003,486
673	4,003,487

CLASS 215

254	4,003,488
260	4,003,489

CLASS 219

10.55 A	4,004,122
69 C	4,004,123
125 R	4,004,125
203	4,004,126
216	4,004,127
346	4,004,128
388	4,004,129
459	4,004,130

CLASS 220

22.3	4,003,490
23.4	4,003,491
62	4,003,492
267	4,003,493
268	4,003,494
	4,003,495
270	4,003,496

CLASS 221

84	4,003,497

CLASS 222

1	4,003,498
50	4,003,499
70	Re.29,117
133	4,003,500
135	4,003,501
168	4,003,502
173	4,003,503
178	4,003,504
397	4,003,505
555	4,003,506

CLASS 224

2 B	4,003,507
32 R	4,003,508

CLASS 225

23	4,003,509

CLASS 226

1	4,003,510
3	4,003,511
188	4,003,512

CLASS 228

107	4,003,513

CLASS 229

34 HW	4,003,514
51 SC	4,003,516
52 B	4,003,515

CLASS 232

44	4,004,252

CLASS 235

61.1	4,004,135
61.11 D	4,004,136
61.12 N	4,004,131
61.7 B	4,004,133
61.7 R	4,004,134
92 TF	4,004,137
151.1	4,004,138
151.33	4,004,139
152	4,004,140
194	4,004,141

CLASS 238

349	4,003,517

CLASS 239

4	4,003,518
183	4,003,519
205	4,003,520

CLASS 240

7.1 LJ	4,004,142
10.63	4,004,132
44.15	4,004,143
51.11 R	4,004,144
106 R	4,004,145

CLASS 241

82.4	4,003,521
95	4,003,522
169.2	4,003,523

CLASS 242

18 R	4,003,524
55	4,003,525
55.3	4,003,526
58	4,003,527
106	4,003,528
118.8	4,003,529

CLASS 243

20	4,003,530

CLASS 244

3.22	4,003,531
17.13	4,003,532
42 D	4,003,533
122 R	4,003,534

CLASS 248

188	4,003,535
280	4,003,536
425	4,003,537
467	4,003,538
489	4,003,539
539	4,003,540

CLASS 249

18	4,003,541
31	4,003,542
48	4,003,543
95	4,003,544
112	4,003,545
219 W	4,003,546

CLASS 250

264	4,004,147
328	4,004,150
345	4,004,146
370	4,004,148
397	4,004,149
485	4,004,151
518	4,004,154
562	4,004,152
572	4,004,153

CLASS 251

31	4,003,547
45	4,003,548

CLASS 252

8.5 A	4,003,838
25	4,003,839
62	4,003,840
94	4,003,841
175	4,003,842
182	4,003,843
299	4,003,844
301.4 R	4,003,845
316	4,003,846
350	4,003,847
427	4,003,848
442	4,003,849
455 R	4,003,850
465	4,003,851
466 PT	4,003,852
467	4,003,853
471	4,003,854
519	4,003,855
546	4,003,856
	4,003,857

CLASS 254

62	4,003,549
151	4,003,550
169	4,003,551
178	4,003,552

CLASS 256

59	4,003,553

CLASS 259

4 AC	4,003,554
54	4,003,555

CLASS 260

2.5 AC	4,003,859
2.5 AJ	4,003,861
	4,003,862
2.5 BE	Re.29,118
2.5 FP	4,003,863
	4,003,864
2.5 HA	4,003,860
2.5 HB	4,003,858
17 R	4,003,865
17.4 R	4,003,866
17.5	4,003,867
21	4,003,868
29.6 RW	4,003,870
29.6 XA	4,003,869
29.7 R	4,003,871
37 EP	4,003,872
38	4,003,873
42.18	4,003,874
45.9 NC	4,003,875
47 EN	4,003,876
47 UA	4,003,877
49	4,003,878
	4,003,879
75 R	4,003,882
	4,003,883
75 T	4,003,880
	4,003,881
112.5 LH	4,003,884
166	4,003,885
176	4,003,886
239 B	4,003,888
239.1	4,003,887
239.9	4,003,889
240 F	4,003,890
242	4,003,891
243 A	4,003,892
243 C	Re.29,119
	4,003,893
	4,003,894
	4,003,896
243 R	4,003,895
	4,003,897
247.1 L	4,003,898
248 A	4,003,899
251 R	4,003,900
256.4 N	4,003,901
268 PC	4,003,902
285	4,003,903
293.54	4,003,904
293.55	4,003,905
294.8 F	4,003,906
295 R	4,003,907
295.5 B	4,003,908
307 G	4,003,909
308 D	4,003,910
326.2	4,003,911
326.4	4,003,912
326.9	4,003,913
327 B	4,003,915
327 M	4,003,914
340.5	4,003,916
340.6	4,003,917
340.7	4,003,918
345.5	4,003,919
346.8 A	4,003,920
347.7	4,003,921
348.5 L	4,003,922
369	4,003,923
382	4,003,924
429.2	4,003,937
453 P	4,003,938
453 RZ	4,003,939
456 NS	4,003,940
463	4,003,941
464	4,003,942
465 E	4,003,944
465 H	4,003,943
468 D	4,003,946
468 H	4,003,945
471 R	4,003,947
475 FR	4,003,948
513 R	4,003,925
518 A	4,003,926
520 D	4,003,927
555 A	4,003,928
556 A	4,003,929
570 R	4,003,932
570.5 P	4,003,931
570.7	4,003,930
583 K	4,003,933
586 G	4,003,934
	4,003,935
590 C	4,003,936
590 R	4,003,949
612 R	4,003,950
617 F	4,003,951
641	4,003,952
645	4,003,953
667	4,003,954
	4,003,956
673.5	4,003,955
	4,003,957
677 R	4,003,958
837 R	4,003,959
857 F	4,003,960
874	4,003,961
884	4,003,962
897 C	4,003,963
930	4,003,964
932	4,003,965
971	4,003,966

CLASS 261

30	4,003,967
35	4,003,968
145	4,003,969
159	4,003,970

CLASS 264

9	4,003,971
40.3	4,003,972
101	4,003,973
119	4,003,758
210 F	4,003,974

CLASS 266

48	4,003,556
169	4,003,557
198	4,003,558
204	4,003,559
217	4,003,560
220	4,003,561

CLASS 267

54 R	4,003,562
100	4,003,563
108	4,003,564

CLASS 270

58	4,003,565
	4,003,566

CLASS 271

12	4,003,567
225	4,003,568
259	4,003,569
265	4,003,570

CLASS 272

56	4,003,571

CLASS 273

29 A	4,003,572
58 K	4,003,573
65 EC	4,003,574
95 A	4,003,575
106.5 C	4,003,576
134 AC	4,003,578
134 C	4,003,577
134 CF	4,003,580
148 R	4,003,579

CLASS 277

34.6	4,003,581

CLASS 280

11.2	4,003,582
43.22	4,003,583
91	4,003,584
145	4,003,585
446 B	4,003,586
637	4,003,587
743	4,003,588

CLASS 282

27.5	4,003,589

CLASS 285

110	4,003,591
336	4,003,590

CLASS 289

18	4,003,592

CLASS 292

92	4,003,593

CLASS 293

84	4,003,594

CLASS 294

19 R	4,003,595

CLASS 296

23 R	4,003,596
28 R	4,004,124
97 C	4,003,597

CLASS 297

194	4,003,598
220	4,003,599
454	4,003,600

CLASS 298

22 C	4,003,601

CLASS 299

18	4,003,602
37	4,003,603

CLASS 301

37 CD	4,003,604

CLASS 303

6 M	4,003,605
9	4,003,606
92	4,003,607

CLASS 305

57	4,003,608

CLASS 307

52	4,004,155
113	4,004,156
235 C	4,004,157
235 T	4,004,158
238	4,004,159
253	4,004,160
261	4,004,161
269	4,004,162
279	4,004,170
293	4,004,163
297	4,004,164

CLASS 308

217	4,003,609

CLASS 310

8.1	4,004,165
8.2	4,004,166
41	4,004,168
71	4,004,169
154	4,004,167

CLASS 312

100	4,003,610
244	4,003,611
245	4,003,612
293	4,003,613
320	4,003,614

CLASS 313

15	4,004,171
217	4,004,172
317	4,004,173
330	4,004,174
360	4,004,175
371	4,004,176
390	4,004,177
468	4,004,178

CLASS 314

60	4,003,615

CLASS 315

3.5	4,004,179
	4,004,180
5.41	4,004,181
12 R	4,004,182
58	4,004,183
101	4,004,184
105	4,004,185
167	4,004,186
205	4,004,187
261	4,004,188
335	4,004,189
403	4,004,190

CLASS 317

9 PF	4,004,191
16	4,004,192
33 SC	4,004,201
70	4,004,193
100	4,004,194
	4,004,195
101 CC	4,004,196
119	4,004,197
155.5	4,004,198
230	4,004,199
242	4,004,200

CLASS 318

138	4,004,202
171	4,004,203
472	4,004,204
608	4,004,205
636	4,004,206
695	4,004,207

CLASS 320

2	4,004,208

CLASS 321

	4,004,209

CLASS 322

2 R	4,004,210
63	4,004,211

CLASS 323

19	4,004,214
56	4,004,215

CLASS 324

3	4,004,212
15	4,004,213
41	4,004,216
43 R	4,004,217
57 SS	4,004,218
58.5 A	4,004,219
62	4,004,223
103 P	4,004,220
158 R	4,004,221
	4,004,222

CLASS 325

2	4,004,224
4	4,004,225
42	4,004,226
67	4,004,227
113	4,004,228
361	4,004,229
363	4,004,230
420	4,004,231
421	4,004,232
470	4,004,233

CLASS 328

5	4,004,234
110	4,004,235
138	4,004,236
155	4,004,237
165	4,004,238

CLASS 329

109	4,004,239

CLASS 330

10	4,004,246
14	4,004,240
15	4,004,241
22	4,004,242
	4,004,243
	4,004,244
30 D	4,004,245
	4,004,247

CLASS 331

94.5 P	4,004,248
	4,004,249
94.5 PE	4,004,250
113 A	4,004,251

CLASS 333

28 R	4,004,253
30 R	4,004,254
31 R	4,004,255
32	4,004,256
73 C	4,004,257

CLASS 335

17	4,004,258
146	4,004,259
202	4,004,260
280	4,004,261
281	4,004,262

CLASS 337

32	4,004,263

CLASS 338

174	4,004,264

CLASS 339

8 R	4,003,616
17 C	4,003,617
22 B	4,003,619
22 R	4,003,618
29 R	4,003,620
59 M	4,003,621
75 P	4,003,622
97 C	4,003,623
146	4,003,624
176 MP	4,003,625

CLASS 340

2	4,004,265
9	4,004,266
15.5 TA	4,004,267
17 R	4,004,268
52 A	4,004,269
58	4,004,270
	4,004,271
	4,004,272
64	4,004,273
84	4,004,274
168 S	4,004,275
171 A	4,004,276
172.5	4,004,277
	4,004,278
	4,004,279
	4,004,280
	4,004,281
	4,004,282
	4,004,283
173 CA	4,004,285
173 DR	4,004,284
173 R	4,004,286
174 TF	4,004,287
237 S	4,004,288
267 R	4,004,289
279	4,004,290
310 R	4,004,291
324 AD	4,004,085

CLASS 350

6	4,003,626
7	4,003,627
77	4,003,628
96 C	4,003,629
99	4,003,630
160 LC	4,003,633
160 R	4,003,631
	4,003,632
162 R	4,003,636
162 SF	4,003,634
166	4,003,635
286	4,003,637
293	4,003,638
294	4,003,639
310	4,003,640
	4,003,641

CLASS 351

6	4,003,642

CLASS 352

14	4,003,643
72	4,003,644
109	4,003,645
141	4,003,646
194	4,003,647

CLASS 355

3 R	4,003,648
4	4,003,649
14	4,003,650
16	4,003,651
71	4,003,652
77	4,003,653
125	4,003,654

CLASS 356

4	4,003,655
71	4,003,656
100	4,003,657
110	4,003,658
152	4,003,659
178	4,003,660
201	4,003,661
206	4,003,662
243	4,003,663

CLASS 358

44	4,004,292
60	4,004,093
83	4,004,078
109	4,004,086
113	4,004,087
125	4,004,083
128	4,004,080
	4,004,081
133	4,004,084
141	4,004,082
246	4,004,092
256	4,004,079

CLASS 360

67	4,004,293

CLASS 401

	4,003,664
259	4,003,665

CLASS 403

36	4,003,666
	4,003,667
287	4,003,668
288	4,003,669

CLASS 408

185	4,003,670

CLASS 415

1	4,003,671
71	4,003,672
80	4,003,673
116	4,003,674
150	4,003,675

CLASS 416

132 B	4,003,676
208	4,003,677

CLASS 417

88	4,003,678
246	4,003,679
269	4,003,680

CLASS 418

36	4,003,681
107	4,003,682

CLASS 423

24	4,003,975
213.5	4,003,976
236	4,003,977
237	4,003,978
239	4,003,979
261	4,003,980
335	4,003,981
351	4,003,982
384	4,003,983
468	4,003,984
512 A	4,003,985
567 A	4,003,986
570	4,003,987

CLASS 424

12	4,003,988
43	4,003,989
78	4,003,990
81	4,003,991
101	4,003,992
104	4,003,993
157	4,003,994
180	4,003,995
181	4,003,996
182	4,003,997
	4,003,998
195	4,003,999
200	4,004,000
	4,004,001
230	4,004,002
238	4,004,003
	4,004,004
243	4,004,005
245	4,004,006
246	4,004,007
248.54	4,004,008
250	4,004,009
260	4,004,010
261	4,004,011
263	4,004,012
265	4,004,013
266	4,004,014
	4,004,015
273	4,004,016
274	4,004,017
277	4,004,018
	4,004,019
278	4,004,020
	4,004,021
279	4,004,022
282	4,004,023
285	4,004,024
308	4,004,025
311	4,004,026
317	4,004,027
321	4,004,028
325	4,004,029
	4,004,030
327	4,004,031
330	4,004,032
347	4,004,033

CLASS 425

6	4,003,683
76	4,003,684
135	4,003,685
373	4,003,686
406	4,003,687
465	4,003,688
466	4,003,689
	4,003,690

CLASS 426

29	4,004,034
275	4,004,035
285	4,004,036
324	4,004,037
422	4,004,038
548	4,004,039
564	4,004,040
601	4,004,041

CLASS 427

34	4,004,042
43	4,004,043
	4,004,044
55	4,004,045
85	4,004,046
142	4,004,047
158	4,004,048
207 C	4,004,049
302	4,004,050
304	4,004,051
374 F	4,004,052
379	4,004,053
385 R	4,004,054
431	4,004,055

CLASS 428

138	4,004,056
209	4,004,057
215	4,004,058
224	4,004,059
290	4,004,060
349	4,004,061
383	4,004,062
	4,004,063
421	4,004,064
532	4,004,065
538	4,004,066

CLASS 429

57	4,004,067
	4,004,068
149	4,003,754
178	4,003,755
199	4,003,753
219	4,003,757

CLASS 431

116	4,003,691
158	4,003,692
202	4,003,693
344	4,003,694

CLASS 432

219	4,003,695
238	4,003,696
	4,003,697

CLASS 526

48	4,004,069
86	4,004,070
116	4,004,071
214	4,004,072
252	4,004,073
305	4,004,074
342	4,004,075

CLASSIFICATION OF DESIGNS

D6—	3	243,042	D7—	1	243,056		261	243,070		189	243,081		80	243,095		15 AM	243,107
	45	243,043		41	243,057	D10—	22	243,071	D15—	104	243,116	D26—	1 B	243,090			243,108
	47	243,044			243,058		68	243,072		127	243,117		1 J	243,097			243,109
		243,045		97	243,059		109	243,073	D16—	42	243,082		5 C	243,098		15 LL	243,110
	56	243,046		184	243,060			243,074		65	243,083		14 A	243,091		15 VV	243,111
	61	243,047		206	243,061			243,075		77	243,084			243,096	D48—	20 E	243,115
	132	243,048	D8—	259	243,062		126	243,076	D19—	64	243,085	D27—	10	243,099	D56—	1 A	243,118
	136	243,049		274	243,063	D11—	23	243,114	D22—	29	243,086		42	243,100	D73—		243,119
		243,050	D9—	137	243,064		152	243,112	D23—	1 A	243,087			243,101	D83—	1 F	243,120
	146	243,051		164	243,065		156	243,113		71	243,088			243,102		1 U	243,121
	153	243,052		168	243,066	D12—		243,077			243,089	D34—	5 GP	243,104		12 A	243,122
	161	243,053			243,067		176	243,078		97	243,092			243,105		12 R	243,123
	211	243,054		177	243,068		182	243,079	D25—	38	243,093		5 J	243,106	D86—	10 G	243,124
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PATENT AND TRADEMARK OFFICE NOTICES

Practice Re: Applications Involving Computer Programs

On November 18, 1976, the Court of Customs and Patent Appeals decided the cases of *In re Noll* and *In re Chatfield.* In both cases the Board of Appeals had taken the position that the claims were drawn to non-statutory subject matter under the Supreme Court's decision in *Gottschalk* v. *Benson,* 409 U.S. 63, 175 USPQ 673 (1972). The Noll application claims were drawn to an apparatus and the Chatfield application claims were drawn to a method.

The CCPA reversed the Board of Appeals in both cases. Until these decisions become final and since further review or clarification may be forthcoming, the patent examining corps will continue to examine computer programming applications in accordance with its current interpretation of the Supreme Court decision in the Benson case.

Prosecution will be resumed on all applications previously suspended under 37 CFR 1.103(b). No further programming applications will be suspended at the instance of the Office.

C. MARSHALL DANN,
Dec. 14, 1976. *Commissioner of Patents and Trademarks.*

Administrative Instructions Under the Patent Cooperation Treaty

The purpose of this notice is to make readily accessible the most recent updated draft of the Administrative Instructions which will be established under Article 58(4) and Rule 89 of the Patent Cooperation Treaty by the Director General of the World Intellectual Property Organization. Reference to the Administrative Instructions is made in the proposed changes to Parts 1, 3 and 5 of 37 CFR that relate to the implementation of the Patent Cooperation Treaty, and which will appear in the February 8, 1977 issue of the OFFICIAL GAZETTE.

The Administrative Instructions comprise 6 parts and a number of Annexes and provide instructions on various processing requirements that are not covered in detail by the Treaty or Regulations. These Administrative Instructions were drafted by the World Intellectual Property Organization of Geneva, Switzerland, which will act as the Secretariat for the International Patent Cooperation Union. The most recent fourth revised draft, document PCT/AAQ/VII/6, is dated August 16, 1976. This draft has been updated by the Patent and Trademark Office to reflect the decisions taken at the meeting of the Interim Advisory Committee for Administrative Questions held on November 1 to 8, 1976 as reflected in the final report of that session (document PCT/AAQ/VII/19). This draft is subject to further revision before promulgation.

RENE D. TEGTMEYER,
Assistant Commissioner
for Patents.

ADMINISTRATIVE INSTRUCTIONS UNDER THE PATENT COOPERATION TREATY

INTRODUCTION

Provisions of the PCT Relating to the Administrative Instructions

1. Article 58(4) of the Patent Cooperation Treaty (PCT) stipulates that: "The Regulations provide for the establishment, under the control of the Assembly, of Administrative Instructions by the Director General."

2. Rule 89 of the Regulations under the PCT, which is entitled "Administrative Instructions," reads as follows:

"89.1 *Scope*

(a) The Administrative Instructions shall contain provisions:

(i) concerning matters in respect of which these Regulations expressly refer to such Instructions;

(ii) concerning any details in respect of the application of these Regulations.

(b) The Administrative Instructions shall not be in conflict with the provisions of the Treaty, these Regulations, or any agreement concluded by the International Bureau with an International Searching Authority, or an International Preliminary Examining Authority.

"29.2 *Source*

(a) The Administrative Instructions shall be drawn up and promulgated by the Director General after consultation with the receiving Offices and the International Searching and Preliminary Examining Authorities.

(b) They may be modified by the Director General after consultation with the Offices or Authorities which have a direct interest in the proposed modification.

(c) The Assembly may invite the Director General to modify the Administrative Instructions, and the Director General shall proceed accordingly.

"89.3 *Publication and Entry Into Force*

(a) The Administrative Instructions and any modification thereof shall be published in the Gazette.

(b) Each publication shall specify the date on which the published provisions come into effect. The dates may be different for different provisions, provided that no provision may be declared effective prior to its publication in the Gazette."

Background to This Document

3. The first draft of the Administrative Instructions under the PCT was submitted to the PCT Interim Advisory Committee for Administrative Questions (hereinafter referred to as "the Interim Committee") at its third session in October 1972. Revised drafts were submitted to the subsequent sessions of the Interim Committee held in October 1973, in November 1974, in November 1975, and in November 1976.

4. Each revision incorporated the changes agreed on or requested by the Interim Committee in the previous session.

Contents of This Document

5. This document contains the fourth revised draft of the Administrative Instructions. It incorporates those amendments upon which agreement was reached at the seventh session of the Interim Committee, as well as some proposals resulting from further study and examination by the International Bureau of questions it was asked to study by the Interim Committee.

6. In order to facilitate the practical implementation of the PCT, the Administrative Instructions will be supplemented by Forms for use by the various PCT Authorities in effecting the required communications which arise in the course of procedures under the PCT. The drafts of such Forms, as revised on the basis of the comments received from the September 1974 session of the Working Group on Forms established by the Interim Committee, were submitted to the Interim Committee at its sixth session. The forms, as further revised in the light of comments made at the said sixth session or as a result of the simulated test program of PCT procedures, are contained in separate working documents.

7. Sections marked by a triple asterisk (***) are those amended by the United States Patent and Trademark Office to reflect decisions reached at the November 1–8, 1976 meeting of the PCT Interim Advisory Committee for Administrative Questions by which this draft document was considered. The final wording of these asterisked sections, as well as of the entire document will be determined by the Director General of the World Intellectual Property Organization.

ADMINISTRATIVE INSTRUCTIONS

(FOURTH REVISED DRAFT)

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ANNEX G: Forms**

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*This annex was deleted in view of an amendment to Section 406. Matters concerning publication will be discussed at a meeting of the Working Group on Publication and Drawings, Feb. 21–25, 1977.

**Except for the Request form (PCT/RO/101) and International Search Report form (PCT/ISA/210), only a listing of the forms has been included in this publication, as in many respects the content and format of the forms has not been finalized.

PART 1—INSTRUCTIONS RELATING TO GENERAL MATTERS

Section 101

Abbreviated Expressions

In these Administrative Instructions:

(i) "Treaty" means the Patent Cooperation Treaty;
(ii) "Regulations" means the Regulations under the Treaty;
(iii) "Article" means an Article of the Treaty;
(iv) "Rule" means a Rule of the Regulations;
(v) "International Bureau" means the International Bureau as defined in Article 2(xix) of the Treaty;
(vi) "International Authorities" means the receiving Offices, the International Searching Authorities, the International Preliminary Examining Authorities, and the International Bureau.

Section 102 ***

Use of the Forms

(a) The Forms annexed to these Administrative Instructions as *Annex G* (hereinafter referred to as "the Forms") are part of these Administrative Instructions.

(b) Except for slight differences in layout necessary in view of the printing of the forms in various languages, the content, format and use of the following four printed forms are obligatory:

PCT/RO/101—Request;
PCT/ISA/210—International Search Report;
PCT/IPEA/401—Demand;
PCT/IPEA/409—International Preliminary Examination Report.

(c) Except for slight differences in layout necessary in view of the printing of the forms in various languages and in view of processing needs of various offices, the content, layout and use of the following forms are obligatory when such forms are exchanged with the applicant and other International Authorities not part of the same office:

PCT/RO/103
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PCT/RO/106
PCT/RO/111
PCT/RO/112
PCT/RO/113
PCT/RO/114
PCT/RO/115
PCT/RO/116
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PCT/RO/121
PCT/RO/123
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PCT/IPEA/408
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PCT/IPEA/412
PCT/IPEA/415
PCT/IPEA/418
PCT/IPEA/419
PCT/IPEA/420

PCT/IB/301–327 and PCT/IB/329–345

(d) The notes to all forms are optional as to content, format and use.

Section 103***

Languages of the Forms

(a) The language of the forms to be used by any receiving Office shall be the same as the language in which the international application is filed, provided that the receiving Office may, in its communications to the applicant, use any other language being one of its official languages.

(b) The language or languages of the Forms to be used by any International Searching Authority shall be specified in the applicable agreement referred to in Article 16(3)(b).

(c) The language or languages of the Forms to be used by any International Preliminary Examining Authority shall be specified in the applicable agreement referred to in Article 32(3).

(d) The language of any Form used by the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language or any Form used by the International Bureau in its communications to any other International Authority shall be English or French according to the wishes of such Authority, and in its communications to the applicant it shall be English or French according to the wishes of the applicant.

Section 104

Language of Correspondence From the Applicant

(a) The language of any letter from the applicant to the receiving Office shall be the same as the language of the international application to which such letter relates. However, the receiving Office may expressly authorize the use of any other language.

(b) The language of any letter from the applicant to the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language of any letter from the applicant to the International Bureau shall be English or French at the choice of the applicant.

Section 105

Several Applicants

Where any international application indicates as applicants several persons, it shall be sufficient, for the purpose of identifying that application, to indicate, in any Form or correspondence relating to such application, the name of the applicant first named in the request.

Section 106

Common Agent for Several Applicants

In the case of several applicants, any agent designated under Rule 4.7 in the request signed by all the applicants, or appointed under Rule 90.3 in a separate power of attorney signed by all the applicants, shall be considered a common agent.

Section 107

Identification of International Authorities

(a) Whenever the nature of any communication from or to the applicant or from or to any International Authority so permits, any International Authority may be indicated in the communicaion by the two-letter code as appearing in *Annex B*.

(b) Where the International Authority is a receiving Office, an International Searching Authority or an International Preliminary Examining Authority, indication thereof shall be preceded by the letters "RO", "ISA", or "IPEA", respectively, followed by a slant (e.g., "RO/JA", "ISA/US", "IPEA/SU").

Section 108***

Correspondence Intended for the Applicant

(a) Any correspondence from an International Authority intended for the applicant, or, in the case of several applicants, the applicants, shall be addressed as follows:

(i) Where the appicant has designated or appointed one agent, correspondence shall be addressed to that agent. Where, in the case of several applicants, the applicants are represented by a common representative or a common agent, correspondence shall be addressed to that representative or that agent.

(ii) Where the applicant has designated several agents in the request, correspondence shall be addressed to the agent first mentioned therein. Where, in the case of several applicants, the applicants have designated several common agents in the request, correspondence shall be addressed to the common agent first mentioned therein.

(iii) Where the applicant has appointed several agents in one or more separate powers of attorney, correspondence shall be addressed to the agent first mentioned in the earliest filed and still valid separate power of attorney. Where, in the case of several applicants, the applicants have appointed several common agents in one or more separate powers of attorney, correspondence shall be addressed to the common agent first mentioned in the earliest filed and still valid separate power of attorney.

(b) Any correspondence from an International Authority to the applicant or his agent shall be marked with the file reference of the applicant or agent, if such identifying file reference has been indicated in the Request, provided it does not exceed ten characters.

Section 109

Notification of Authorization or Refusal of Rectification

Any International Authority which authorizes or refuses rectification of obvious errors of transcription under Rule 91 shall promptly inform the applicant of such authorization or refusal and, in the case of refusal, of the reasons therefor.

PART 2—INSTRUCTIONS RELATING TO THE INTERNATIONAL APPLICATION

Section 201***

*Dates**

Alternative A [ICIREPAT Standard]

Any date in the international application or used in any correspondence relating to the international application, shall be indicated by the Arabic number of the day, by the name of the month, and by the Arabic number of the year. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by two-digit Arabic numerals each for the number of the day, for the number of the month and for the last two numbers of the year, in that order and with a period after the digit pairs of the day and of the month (for example, "30 March 1972 (30.03.72)").

Alternative B [ISO Standard]

Any date in the international application or used in any correspondence relating to the international application, shall be indicated by the Arabic number of the year, by the name of the month, and by the Arabic number of the day. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by four-digit Arabic numerals for the number of the year and two-digit Arabic numerals each for the number of the month and for the number of the day, in that order and with a hyphen or a space before the digit pairs of the month and of the day (for example, "1972 March 30 (1972-03-30)" or "1972 March 30 (1972 03 30)").

Section 202***

Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appearing in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appearing in *Annex B* (for example, where France is the third designated State in Box V or the request form, "FR 3. France" or "FR 3. French Republic").

(b) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action.

Section 203***

Kind of Protection

(a) Where the applicant wishes his application to be treated in any designated State as an application not for a patent but for the grant of another kind of protection referred to in Article 43, he shall make the indication in the request referred to in Rule 4.12(a) by inserting the words "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition" or "utility certificate of addition," or their equivalent in the language of the international application, immediately after the indication of the said State.

(b) Where the applicant is seeking two kinds of protection under Article 44, he shall make the indication in the request referred to in Rule 4.12(b) by inserting, immediately after the indication of the said State and in the language of the international application either:

(i) any two of the following terms connected by the word "and": "patent," "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition," "utility certificate of addition;" or
(ii) any two of the terms indicated in (i), above, one of them preceded by the word "primarily" and the other by the word "subsidiarily."

Section 204***

Regional Patents

Where the applicant wishes to obtain a regional patent in respect to any designated State, he shall make the indication in the request referred to in Rule 4.1(b)(iv) by inserting the words "regional patent," or their equivalent in the language of the international application, immediately after the indication of the said State or, where an indication has been made under Section 203, after that indication provided that:

(i) where Article 4(1)(ii), third clause applies, and not all the States party to the regional treaty have been designated, the international application shall be treated as if all those States had been designated and as if the designations of all such States contained the said words, whether the said designations contained an indication of the wish to obtain a regional patent or, according to Article 4(1)(ii), fourth clause, are to be treated as containing such indication;
(ii) where the national law of any designated State contains a provision as referred to in Article 45(2), the International Bureau shall, according to Article 4(1)(ii), fourth clause, treat the designation as if it contained the said words even where the applicant failed to indicate them.

Section 205

Headings of the Parts of the Description

The headings referred to in Rule 5.1(c) should be as follows:

(i) for matter referred to in Rule 5.1(a)(i), "Technical Field";
(ii) for matter referred to in Rule 5.1(a)(ii), "Background Art";
(iii) for matter referred to in Rule 5.1(a)(iii), "Disclosure of Invention";
(iv) for mattter referred to in Rule 5.1(a)(iv), "Brief Description of Drawings";

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*Alternative A is based on ICIREPAT standards whereas Alternative B is based on ISO standards. The sequence of the latter is the reverse of the former. The solution eventually adopted should follow the practice which will prevail in the industrial property field at the time the Administrative Instructions will be promulgated.

(v) for matter referred to in Rule 5.1(a)(v), "Best Mode for Carrying out the Invention";

(vi) for matter referred to in Rule 5.1(a)(vi), "Industrial Applicability".

SECTION 206

Numbering of Claims Upon Amendment

(a) Any claim submitted after the filing date of the international application and which is not identical with the claims previously appearing in the international application shall, at the choice of the applicant, be submitted either:

(i) as an amended claim, in which case, it shall bear the same number as the previous claim it amends; that number shall be followed by the word "(amended)" or its equivalent in the language of the international application; or

(ii) as a new claim, in which case, it shall bear the next number after the highest previously numbered claim; that number shall be followed by the word "(new)" or its equivalent in the language of the international application.

(b) The deletion of any claim previously appearing in the international application shall be made by indicating the number of the previous claim followed by the word "(cancelled)" or its equivalent in the language of the international application.

SECTION 207

Common Representative Designated in the Request

If the applicants designate a common representative in accordance with Rule 4.8(a), such common representative shall be indicated on the front page of the request form. The indication of the common representative shall take the form of a statement designating the named applicant to act as the common representative on behalf of all the applicants.

SECTION 208***

Arrangement of Elements and Numbering of Sheets of the International Application

(a) In effecting the sequential numbering of the sheets of the international application in accordance with Rule 11.7, the elements of the international application shall be placed in the following order: the request, the description, the claims, the abstract, the drawings.

(b) The sequential numbering shall be effected by using three separate series of numbering, one applying to the request only and commencing with the first sheet of the request, the second commencing with the first sheet of the description and continuing through the last sheet of the abstract and the third applying to the drawings only.

PART 3—INSTRUCTIONS RELATING TO THE RECEIVING OFFICE

SECTION 301

Notification of Receipt of Purported International Application

Any receiving Office may notify the applicant of the receipt of the purported international application. The notification should indicate the date of actual receipt, the provisional file number of the purported international application referred to in Section 307(a) and the applicant's file number, if available, as well as, where useful for purposes of identification, the title of the invention.

SECTION 302

Notification of Priority Claim Considered Not to Have Been Made

Where, owing to failure to meet the requirements of Rule 4.10(b), the priority claim is, for the purposes of procedure under the Treaty, considered not to have been made, the receiving Office shall indicate that fact in the international application by marking over the box in the request form which provides for the information concerning the priority claim, the words "NOT TO BE CONSIDERED FOR PCT PROCEDURE" or its equivalent in the language of the international application. The receiving Office shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

SECTION 303

Deletion of Additional Matter in the Request

Where, under Rule 4.17(b), the receiving Office deletes ex-officio any matter contained in the request, it shall do so by placing such matter between square brackets and entering the word "DELETED," or its equivalent in the language of the international application, in the right-hand margin adjacent to the matter so placed between brackets, and shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

SECTION 304

Corrections Submitted to the Receiving Office Concerning Expressions, Etc., Not to be Used in the International Application

Where the applicant submits corrections to the receiving Office aimed at complying with the prescriptions of Rule 9.1, that Office shall, if copies of the international application have not yet been transmitted to the International Bureau and the International Searching Authority, attach copies of such corrections to the international application. If copies of the international application have already been transmitted, the receiving Office shall transmit copies of such corrections to the said Bureau and the said Authority.

SECTION 305

Identifying the Copies of the International Application

(a) Where, under Rule 11.1(a), the international application has been filed in one copy, the receiving Office shall, after preparing under Rule 21.1(a) the additional copies required under Article 12(1), mark:

(i) the words "RECORD COPY" in the upper left-hand corner of the first page of the original copy,

(ii) in the same space on one additional copy, the words "SEARCH COPY," and

(iii) in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

(b) Where, under Rule 11.1(b), the international application has been filed in more than one copy, the receiving Office shall choose the copy most suitable for reproduction purposes, and mark the words "RECORD COPY," in the upper left-hand corner of its first page. After verifying the identity of any additional copies and, if applicable, preparing under Rule 21.1(b) the home copy, it shall mark, in the upper left-hand corner of the first page of one such copy, the words "SEARCH COPY" and, in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

SECTION 306

Change in the Person, Name or Address of the Applicant

Any request for the recording of any changes in the person or name of the applicant referred to in Rule 18.5 or Rule 54.4, or of any change in the address of the applicant shall be signed by the applicant or, if the receiving Office requested such change under Rule 18.5 or Rule 54.4, by the receiving Office. The request shall indicate the name or address of the applicant for which the change is requested.

SECTION 307 ***

System of Numbering International Applications

(a) The provisional file number to be marked on papers purporting to be an international application under Rule 20.1 shall consist of the letters "PCT" followed by a slant, a

two-letter code, as in *Annex B,* indicating the receiving Office, a two-digit indication of the last two numbers of the year in which such papers were first received, a slant, and a five-digit number allotted in sequential order corresponding to the order in which the international applications are received (e.g., PCT/SU76/00001).

(b) The International application number shall be the provisional file number referred to in paragraph (a), except that, if a purported international application fails to receive a filing date under Article 11, the indication "PCT/" in the provisional international application number shall be deleted by the receiving Office by drawing a line therethrough.

SECTION 308

Marking of the Sheets of the International Application

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2(a), the provisional file number referred to in Section 307(a) in the upper right-hand corner of each sheet of each copy of the purported international application.

(b) The data to be indicated on any replacement sheet under Rule 26.4(b) shall be indelibly marked by the receiving Office, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2(a), in the upper right-hand corner of each replacement sheet.

SECTION 309

Procedure in the Case of Later Submitted Sheets

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2(a), any sheet received on a date later than the date on which sheets were first received with the date on which it received that sheet, inserted immeditely below the provisional file number referred to in Section 307(a), or the international application number referred to in Section 307(b), as the case may be.

(b) The receiving Office shall, in the case of later submitted sheets received within the time limits referred to in Rule 20.2(a)(i) and (ii),

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application;

(ii) notify the applicant of the correction effected under item (i), above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i), above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted sheets to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy and the search copy.

(c) The receiving Office shall, in the case of later submitted sheets received after the expiration of the time limits referred to in Rule 20.2(a)(i) and (ii):

(i) notify the applicant of that fact and of the date of receipt of the later submitted sheets;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted sheets to the International Bureau with the indication that such sheets are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy with the indication that such sheets are not to be taken into consideration for the purposes of international processing.

SECTION 310

Procedure in the Case of Missing Drawings

(a) Where the international application refers to drawings which in fact are not included in that application, the receiving Office shall make the indication referred to in Rule 26.6(a) by an appropriate marking of the request form.

(b) Section 309(a) shall apply also in the case of drawings received by the receiving Office on a date later than the date on which sheets were first received by that Office.

(c) The receiving Office shall, in the case of missing drawings received within the time limit referred to in Rule 20.2(a)(ii),

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application, and delete the indication made under paragraph (a) above;

(ii) notify the applicant of the correction effected under item (i), above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i), above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted drawings to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy and the search copy.

(d) The receiving Office shall, in the case of missing drawings received after the expiration of the time limit referred to in Rule 20.2(a)(iii):

(i) notify the applicant of the fact and of the date of receipt of the later submitted drawings;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted drawings to the International Bureau with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing.

SECTION 311***

Renumbering of Sheets of the International Application

(a) The receiving Office shall, subject to Section 208, sequentially renumber the sheets of the international application when necessitated by the addition of any new sheet, the deletion of entire sheets, a change in the order of the sheets or any other reason.

(b) The sheets of the international application shall be provisionally renumbered in the following manner:

(i) when a sheet is deleted, the receiving Office shall either include a blank sheet with the same number and with the word "deleted," or its equivalent in the language of the international application, below the number, or insert, in brackets, below the number of the following sheet, the number of the deleted sheet with the word "deleted" or its equivalent in the language of the international application;

(ii) when a sheet is substituted, the receiving Office shall write below the number of the new sheet the word "substitute" or its equivalent in the language of the international application;

(iii) when one or more sheets are added, each sheet shall be identified by the number of the preceding sheet followed by an oblique stroke and then by a natural number series, starting always with number one for the first sheet added after an unchanged sheet. The last added sheet shall be marked "last" beside the page number (e.g., 10/1 last: 15/1, 15/1/1, 15/1/2 last).

(c) In the cases mentioned in (i) and (iii) above, it is recommended that the receiving Office should write, below the number of the last sheet, the total number of the sheets of the international application followed by the words "TOTAL OF SHEETS" or their equivalent in the language of the international application.

SECTION 312

Notification of Decision Not To Issue Declaration that the International Application is Considered Withdrawn

Where the receiving Office, after having notified the applicant under Rule 29.4 of its intent to issue a declaration under Article 14(4), decides not to issue such a Declaration, it shall notify the applicant accordingly.

SECTION 313

Manner of Making the Necessary Annotations in the Check List

Where, under Rule 3.3(b), the receiving Office itself fills in the check list, that Office shall mark, next to such check list, the words "FILLED IN BY RO," or their equivalent in the language of the international application. Where only some of the indications are filled in by the receiving Office, the said words and each indication filled in by that Office shall be identified by an asterisk.

SECTION 314

Manner of Indicating Correction of the Priority Date or Cancellation of the Priority Claim

(a) Where, under Rule 4.10(d), the applicant corrects the erroneously indicated filing date of any earlier application, the receiving Office shall enter the corrected date in the request and draw a line through the previously entered date while still leaving it legible.

(b) Where, under Rule 4.10(d), the receiving Office cancels the declaration made under Article 8(1), that Office shall mark over the said declaration the words "CANCELLED ON REQUEST OF APPLICANT" or "CANCELLED EX OFFICIO BY RO," or their equivalent in the language of the international application, as the case may be.

SECTION 315

Notification of Non-Collection of Record Copy

Where, under Rule 22.2(d), the receiving Office has, in accordance with the applicant's wish, held the record copy at the disposal of the applicant, and the applicant has not collected that copy by the expiration of the time limit for receipt of that copy by the International Bureau, the receiving Office shall notify the applicant accordingly.

SECTION 316

Procedure in the Case Where the International Application Lacks the Prescribed Signature

Where, under Article 14(1)(a)(i), the receiving Office finds that any international application is defective in that it lacks the prescribed signature, that Office shall send to the applicant, together with the invitation to correct under Article 14(1)(b), a copy of the request part of the international application. The applicant shall, within the prescribed time limit, return said copy after affixing thereto the prescribed signature.

PART 4—INSTRUCTIONS RELATING TO THE INTERNATIONAL BUREAU

SECTION 401

Marking of Sheets of the Record Copy

The International Bureau shall, under Rule 24.1, mark the date of receipt of the record copy in the appropriate space on the request form and place the stamp of the International Bureau in the lower right-hand corner of each sheet of the record copy.

SECTION 402

Notification of Correction of the Priority Date or Cancellation of the Priority Claim

Where, under Rule 4.10(d), the correction of the priority date or the cancellation of the priority claim is effected by the International Bureau, the manner of indicating the correction or cancellation set forth in Section 314 shall apply *mutatis mutandis*. The receiving Office, in addition to the applicant and the International Searching Authority, shall be notified accordingly by the International Bureau.

SECTION 403

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

Where, under Rule 40.2(c) or 68.3(c), the International Bureau receives a request from the applicant to forward to any designated or elected Office the texts of both the protest against payment of an additional fee and the decision thereon by the International Searching Authority or the International Preliminary Examining Authority, as the case may be, it shall proceed according to such request.

SECTION 404

International Publication Number

The International Bureau shall assign to each published international application an international publication number which shall be different from the international application number. The international publication number shall be used on the pamphlet and in the Gazette entry. It shall consist of the two-letter code "WO" followed by a two-digit designation of the last two numbers of the year of publication, a slant, and a serial number consisting of five digits (e.g., WO75/12375").

SECTION 405

Special Publication Fee

(a) The special publication fee provided for in Rule 48.4 shall be ______ Swiss francs.

SECTION 406***

Pamphlets

(a) Pamphlets referred to in Rule 48.1 shall be published on a given day of each week.

(b) All pamphlets shall be of A4 size and shall be printed by offset, recto-verso.

(c) The form and particulars of the front page of the pamphlet shall be decided by the Director General.

SECTION 407

The Gazette

(a) The Gazette referred to in Rule 86 shall be of A4 size and shall be printed by offset, recto-verso.

(b) In addition to the contents specified in Rule 86, the Gazette shall contain, in respect of each published international application, the data indicated in *Annex E*.

(c) The information referred to in Rule 86.1(v) shall be that which is indicated in *Annex F*.

(d) The subscription price of the Gazette shall be ______ Swiss francs per year. The price of any single issue of the Gazette shall be ______ Swiss francs.

SECTION 408

Priority Application Number

(a) If the application number of the earlier application referred to in Rule 4.10(c) (priority application number) is furnished to the International Bureau within the prescribed time limit, that Bureau shall enter the said number in the space provided therefor in the request form.

(b) If the priority application number is furnished after the expiration of the prescribed time limit, the Internatonal Bureau shall indicate, in the international publicaton, the date on which the said number was furnished, by including on the front page of the pamphlet next to the priority application number the words "FURNISHED LATE ON . . . . (date)," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

(c) If the priority application number has not been furnished at the time of the international publication, the International Bureau shall indicate that fact by including on the front page of the pamphlet in the space provided for the priority application number the words "NOT FURNISHED AT TIME OF THIS PUBLICATION," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

SECTION 409

Notification of Priority Claim Considered Not to Have Been Made

Where the International Bureau notes that the receiving Office has failed to notify the applicant as provided in Section 302, it shall send a notification to the same effect to the applicant, the receiving Office and the International Searching Authority.

SECTION 410

Numbering of Sheets of the International Application for Purposes of International Publication

In the course of preparing the international application for international publication, the International Bureau shall sequentially renumber the sheets of the international application only when necessitated by the addition of any new sheet, the deletion of entire sheets or a change in the order of the sheets. Otherwise, the numbering provided under Section 208 shall be maintained.

SECTION 411

Notification That the Certified Copy of the Priority Document Has Not Been Submitted

Where the time limit under Rule 17.1(a) has expired and the International Bureau has not received a certified copy of the priority document, it shall notify the applicant and the designated Offices accordingly.

PART 5—INSTRUCTIONS RELATING TO THE INTERNATIONAL SEARCHING AUTHORITY

SECTION 501

Corrections Submitted to the International Searching Authority Concerning Expressions, etc., Not To Be Used in the International Application

Where the applicant submits corrections to the International Searching Authority aimed at complying the prescription of Rule 9.1, that Authority shall transmit copies of such corrections to the receiving Office and the International Bureau.

SECTION 502

Protest Against Payment of Additional Fee and Decision Thereon

The International Searching Authority shall transmit to the applicant, at the latest, together with the International search report, any decision which it has taken under Rule 40.2(c) on the protest of the applicant against the payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the designated Offices.

SECTION 503 ***

*Method of Identifying Documents Cited in the International Search Report**

Identification of any document cited in the international search report referred to in Rule 43.5(b) shall be made by indicating the following elements in the order in which they are listed:

(a) *In the case of any patent document* (patent documents being patents within the meaning of Article 2(ii) as well as published applications relating thereto):

(i) the Office that issued the document, by the two-letter code as in *Annex B*.

(ii) the kind of document, by the appropriate symbols as in *Annex C*.

(iii) the number of the document as given to it by the Office that issued it (for Japanese patent documents the indication of the year of the reign of the Emperor must precede the serial number of the patent document).

(iv) the name of the patentee or applicant

(v) the date of publication of the cited patent document as indicated thereon; and

(vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a patent document according to paragraph (a) above: JA, B, 5014535, Kanagawa, published 1975, April 8, see column 2 lines 10 to 15.)

(b) *In the case of any book or other separately issued publication:*

(i) the name of the author;

(ii) the title (including, where applicable, the number of the edition and/or volume):

(iii) the year of publication (when this coincides with the year of the international application or of the priority claim, the International Searching Authority shall endeavour to determine the month and, if necessary, the day of publication and to indicate these data in the international search report):

(iv) the name of the publisher:

(v) as far as available, the place of publication (where only the location of the publiser appears on the book or other separately issued publication, then that location shall be indicated as the place of publication); and

(vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a book or other separately issued publication according to paragraph (b) above: H. Walton, 'Microwave Quantum Theory', Volume 2, published 1973, by Sweet and Maxwell (London), see pages 138 to 192, especially pages 184–188.)

(c) *In the case of any article published in a periodical or other serial publication:*

(i) the title of the periodical or other serial publication;

(ii) the number of the volume and the date of the issue in which the article appears:

(iii) as far as available, the place of publication (where only the location of the publisher appears in the periodical or other serial publication, then that location shall be indicated as the place of publication):

(iv) the author and the title of the article and the number of the page both on which the article starts and ends; and

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of an article published in a periodical or other serial publication according to paragraph (c) above: IBM Technical Disclosure Bulletin, Volume 17, no. 5, issued 1974 October (Armonk, New York), J. G. Drop, 'Integrated Circuit Personalization at the Module Level', see pages 1344 to 1345.)

(d) *In the case of abstracts:*

(i) the identification of the document containing the abstract in the manner set forth in paragraphs (a), (b) and (c), respectively, depending upon whether the abstract is contained in a patent document, in a book or other separately issued publication, or in an article published in a periodical or other serial publication;

(ii) in the case where the abstract is not published together with the full text document which served as its basis, the identification of both abstract and full text document on the basis of whatever bibliographic data may be available in respect thereto.

(The following example illustrates the citation of an abstract according to paragraph (d)(ii) above: Chemical Abstracts, Volume 75, no. 20, issued 1971, November 15 (Columbus, Ohio, U.S.A.), D.I. Shetulov, 'Surface Effects During Metal Fatigue', see page 163, column 1, the abstract no. 120718k, Fiz.-Khim. Mekh. Mater. 1971, 7(2), 7–11 (Russ))

SECTION 504

Classification of the Subject Matter of the International Application

(a) Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols.

(b) Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system.

(c) Where the subject matter of the international application is classified both according to the International Patent Classification and to any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other.

Section 505

Indication of Citations of Particular Relevance in the International Search Report

Where any document cited in the international search report is of particular relevance, the special indication required by Rule 43.5(c) shall consist of the letter "X" placed next to the citation of the said document.

Section 506

Comments on Draft Translation of the International Application

(a) Where the applicant has made comments, within the time limits fixed by the International Searching Authority, on the draft translation referred to in Rule 48.3(b), that Authority shall notify the applicant whether it has changed the draft translation and, if so, of the changes it has made therein.

(b) Where the applicant submits comments on the draft translation after the expiration of the time limit fixed by the International Searching Authority, and that Authority changes the draft translation, it shall notify the applicant accordingly.

Section 507*** (Deleted)

Section 508***

Manner of Indicating Certain Special Categories of Documents Cited in the International Search Report

(a) Where any document cited in the international search report refers to an oral disclosure, use, exhibition, or other means referred to in Rule 33.1(b), the separate indication required by that Rule shall consist of the letter "O" placed next to the citation of the said document.

(b) Where any document cited in the international search report is a published application or patent as defined in Rule 33.1(c), the special mention required by that Rule shall consist of the letter "E" placed next to the citation of the said document.

(c) Where any document cited in the international search report is a document which defines the general state of the art, it shall be indicated by the letter "A" placed next to the citation of the said document.

(d) Where any document cited in the international search report is a document whose publication date occurred earlier than the international filing date of the international application, but later than the priority date claimed in that application, it shall be indicated by the letter "P" next to the citation of the said document.

(e) Where any document cited in the international search report is a document whose publication date occurred after the filing date or the priority date of the international application and is not in conflict with the said application, but is cited for the principle or theory underlying the invention, which may be useful for a better understanding of the invention, or is cited to show that the reasoning or the facts underlying the invention are incorrect, it shall be indicated by the letter "T" next to the citation of the document.

(f) Where any document is cited for reasons other than in paragraphs (a) through (e) above, such documents shall be identified by the letter "L" next to the citation of the said document. The International Searching Authority shall explain such citation in a notation in the International Search Report.

Section 509

Manner of Indicating the Claims to Which the Documents Cited in the International Search Report are Relevant

The claims to which cited documents are relevant shall be indicated by placing in the appropriate column of the international search report:

(i) where the cited document is relevant to one claim, the number of that claim; for example, (2) or (17);

(ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen: for example, (1–15) or (2–3);

(iii) where the cited document is relevant to one or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example, (1, 6) or (1, 7, 10);

(iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1–6, 9–10, 12–15) or (1, 3–4, 6, 9–11).

PART 6—INSTRUCTIONS RELATING TO THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Section 601

Determination Whether Applicant is Entitled to Make a Demand

(a) Where the International Preliminary Examining Authority finds that the applicant is not entitled under Article 31(2) or, where there are several applicants, that none of the applicants is entitled under Rule 54.2 to make a demand, the International Preliminary Examining Authority shall notify both the applicant or applicants and the International Bureau accordingly.

(b) Where the International Preliminary Examining Authority finds that, in the case of different applicants for different elected States, none of the applicants indicated for the purposes of a given elected State is entitled under Rule 54.3 to make a demand and that therefore the election of that State shall be considered not to have been made, the International Preliminary Examining Authority shall notify accordingly both the applicant or applicants so indicated and the International Bureau.

Section 602

Marking of Replacement Sheets and Renumbering of Sheets of the International Application

(a) The data to be indicated on any replacement sheet according to Rule 66.8(b) shall be indelibly marked by the International Preliminary Examining Authority, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2(a), in the upper right-hand corner of each replacement sheet.

(b) Section 311 applies, *mutatis mutandis,* to the renumbering of sheets of the international application.

Section 603 ***

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

The International Preliminary Examining Authority shall transmit to the applicant, at the latest together with the international preliminary examination report, any decision which it has taken under Rule 68.3(c) on the protest of the applicant against payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the elected Offices.

Section 604

Guidelines for Explanations Contained in the International Preliminary Examination Report

Explanations under Rule 70.8 shall clearly point out to which of the three criteria referred to in Article 35(2), taken separately, any cited document is applicable and shall clearly describe, with reference to the cited documents, the reasons supporting the conclusion that any of the said criteria is or is not satisfied.

ANNEX A

NAMES OF STATES

(Members of the Paris Union
as at July 15, 1976)

Short Title	Full Name
Algeria	Democratic and Popular Republic of Algeria
Argentina	Argentine Republic
Australia	Commonwealth of Australia
Austria	Republic of Austria
Belgium	Kingdom of Belgium
Benin	Benin People's Republic
Brazil	Federative Republic of Brazil
Bulgaria	People's Republic of Bulgaria
Cameroon	United Republic of Cameroon
Canada	Canada
Central African Republic	Central African Republic
Chad	Republic of Chad
Congo	People's Republic of the Congo
Cuba	Republic of Cuba
Cyprus	Republic of Cyprus
Czechoslovakia	Czechoslovak Socialist Republic
Denmark	Kingdom of Denmark
Dominican Republic	Dominican Republic
Egypt	Arab Republic of Egypt
Finland	Republic of Finland
France	French Republic
Gabon	Gabonese Republic
German Democratic Republic	German Democratic Republic
Germany (Federal Republic of)	Federal Republic of Germany
Ghana	The Republic of Ghana
Greece	Hellenic Republic
Haiti	Republic of Haiti
Holy See	Holy See
Hungary	Hungarian People's Republic
Iceland	Republic of Iceland
Indonesia	Republic of Indonesia
Iran	Empire of Iran
Iraq	Republic of Iraq
Ireland	Ireland
Israel	State of Israel
Italy	Italian Republic
Ivory Coast	Republic of the Ivory Coast
Japan	Japan
Jordan	Hashemite Kingdom of Jordan
Kenya	Republic of Kenya
Lebanon	Lebanese Republic
Libya	Libyan Arab Republic
Liechtenstein	Principality of Liechtenstein

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Luxembourg	Grand Duchy of Luxembourg
Madagascar	Malagasy Republic
Malawi	Republic of Malawi
Malta	Malta
Mauritania	Islamic Republic of Mauritania
Mauritius	Mauritius
Mexico	United Mexican States
Monaco	Principality of Monaco
Morocco	Kingdom of Morocco
Netherlands	Kingdom of the Netherlands
New Zealand	New Zealand
Niger	Republic of the Niger
Nigeria	Federal Republic of Nigeria
Norway	Kingdom of Norway
Philippines	Republic of the Philippines
Poland	Polish People's Republic
Portugal	Portuguese Republic
Republic of South Viet-Nam	Republic of South Viet-Nam
Romania	Socialist Republic of Romania
San Marino	Republic of San Marino
Senegal	Republic of Senegal
South Africa	Republic of South Africa
Southern Rhodesia	Southern Rhodesia
Soviet Union	Union of Soviet Socialist Republics
Spain	Spanish State
Sri Lanka	Republic of Sri Lanka
Sweden	Kingdom of Sweden
Switzerland	Swiss Confederation
Syrian Arab Republic	Syrian Arab Republic
Togo	Togolese Republic
Trinidad and Tobago	Trinidad and Tobago
Tunisia	Republic of Tunisia
Turkey	Republic of Turkey
Uganda	Republic of Uganda
United Kingdom	United Kingdom of Great Britain and Northern Ireland
United Republic of Tanzania	United Republic of Tanzania
United States of America	United States of America
Upper Volta	Republic of the Upper Volta
Uruguay	Eastern Republic of Uruguay
Yugoslavia	Socialist Federal Republic of Yugoslavia
Zaire	Republic of Zaire
Zambia	Republic of Zambia

ANNEX B

CODE FOR IDENTIFYING STATES AND ORGANIZATIONS*

AG	ALGERIA
AR	ARGENTINA
AU	AUSTRALIA
BE	BELGIUM
BG	BULGARIA
BR	BRAZIL
CA	CANADA
CB	ZAIRE
CF	CONGO
CH	SWITZERLAND
CI	IVORY COAST
CL	SRI LANKA
CS	CZECHOSLOVAKIA
CU	CUBA
CV	HOLY SEE
CY	CYPRUS
DA	BENIN
DK	DENMARK
DL	GERMAN DEMOCRATIC REPUBLIC
DR	DOMINICAN REPUBLIC
DT	GERMANY, FEDERAL REPUBLIC OF
EI	IRELAND
ES	SPAIN
ET	EGYPT
FL	LIECHTENSTEIN
FR	FRANCE
GA	GABON
GB	UNITED KINGDOM
GH	GHANA
GR	GREECE
HI	HAITI
HU	HUNGARY
ID	INDONESIA
IL	ISRAEL
IQ	IRAQ
IR	IRAN
IS	ICELAND
IT	ITALY
JA	JAPAN
JO	JORDAN
KA	CAMEROON
KE	KENYA
LB	LEBANON
LU	LUXEMBOURG
LY	LYBIA
MA	MOROCCO
MC	MONACO
MD	MADAGASCAR
ML	MALTA
MS	MAURITIUS
MT	MAURITANIA
MW	MALAWI
MX	MEXICO
NI	NIGER

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* The States listed are those which are members of the Paris Union. This code is, for the most part, based upon ICIREPAT recommendations.

Annex B

NL	NETHERLANDS
NO	NORWAY
NZ	NEW ZEALAND
OE	AUSTRIA
PH	PHILIPPINES
PO	POLAND
PT	PORTUGAL
RH	SOUTHERN RHODESIA
RU	ROMANIA
SF	FINLAND
SM	SAN MARINO
SN	SENEGAL
SR	SYRIAN ARAB REPUBLIC
SU	SOVIET UNION
SW	SWEDEN
TA	UNITED REPUBLIC OF TANZANIA
TD	TRINIDAD AND TOBAGO
TN	TUNISIA
TO	TOGO
TR	TURKEY
TS	CHAD
UG	UGANDA
US	UNITED STATES OF AMERICA
UV	UPPER VOLTA
UY	URUGUAY
VS	REPUBLIC OF SOUTH VIET-NAM
WN	NIGERIA
YU	YUGOSLAVIA
ZA	SOUTH AFRICA
ZB	ZAMBIA
ZR	CENTRAL AFRICAN REPUBLIC

AM	AFRICAN INTELLECTUAL PROPERTY OFFICE
EP	EUROPEAN PATENT OFFICE
IB	INTERNATIONAL PATENT INSTITUTE
WO	INTERNATIONAL BUREAU OF WIPO

NOTE

ICIREPAT is at present considering the enlargement of the ICIREPAT Standard ST.3 to include all geographical entities listed in the ISO Alpha-2 Code (ISO Standard 3166). All the geographical entities in the enlarged ST.3 should be coded according to the ISO Alpha-2 Code, except for Austria, German Democratic Republic, Germany (Federal Republic of), Finland, Ireland, Japan, Poland, Rumania and Sweden, for which the above ICIREPAT two-letter codes should be maintained.

The revised Standard ST.3 if and once adopted by the Plenary Committee of ICIREPAT, will appear in this Annex.

ANNEX C

STANDARD CODE FOR IDENTIFICATION OF DIFFERENT KINDS OF PATENT DOCUMENTS

Introduction

1. The recommendation provides for groups of letter codes in order to distinguish patent documents. The letter codes also facilitate the storage and retrieval of such documents.

2. If any Office wants to amplify the information contained in the letter code, this letter code may be optionally associated with a numerical code. The meaning of such numerical code should then be defined by each Patent Office availing itself of this option.

3. The code also provides for a letter for non-patent literature documents (N) and for documents to be restricted to the internal use of Patent Offices (X) (e.g. confidential documents, not to be disclosed outside the Office). See in this respect also SI.1 (ICIREPAT Manual pages 4.3.1.1 to 4.3.1.4).

Definitions

4. For the purposes of this recommendation, the expression "patent documents" includes patents for inventions, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, utility certificates of addition and published applications therefor.

5. For the purposes of this recommendation, the term "entry in an official gazette" means at least one comprehensive announcement in an official gazette regarding the making available to the public of the complete text, claims (if any) and drawings (if any) of a patent document.

6. For the purposes of this recommendation, the terms "publication" and "published" are used in the sense of making available

(i) a patent document to the public for inspection or supplying a copy on request

(ii) multiple copies of a patent document produced by printing or like process

Explanation: If, at a particular procedural stage, a copy of the document is first made available to the public for inspection or copying and is then, at the same procedural stage, made available in multiple copies produced by printing or like process, only a single publication is considered to have occured. If, on the other hand, multiple reproduction results from a new procedural stage, this reproduction is considered to be a further publication of the document, even if the texts at the two stages are identical.

7. According to certain national patent laws or regulations, the same patent application may be published at various procedural stages. For the purposes of this recommendation, a publication level is defined as the level corresponding to a procedural stage at which normally a document is published under a given national patent law.

Recommendation

8. It is recommended that the code:

(a) be used for the recording of the "kind of document" in machine-readable data carriers, such as 80-column punched cards, magnetic tapes, aperture cards, etc;

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(b) be used on the first page of patent documents, preferably near the document number, if these have been published in the sense of paragraph 6;

(c) be used in entries in official gazettes or, if all entries in a section of the Gazette relate to the same kind of a document at the beginning of such a section.

(d) be used for the identification of patent documents cited in "Search Reports" and "Lists of References" in patent documents (INID Number 56).

9. Code

The code is subdivided into mutually exclusive groups of letters. The groups characterize patent documents and documents specified in paragraph 3. Groups 1-5 comprise one or several letters enabling identification of documents pertaining to different publication levels.

Group 1 Use for primary or major series of patent documents

A First publication level
B Second publication level
C Third publication level

Group 2 Use for secondary series of patent documents

E First publication level
F Second publication level
G Third publication level

Group 3 Use for further series of patent documents, as the special requirements of each Office may be

H
I

Group 4 Use for medicament patent documents

M

Group 5 Use for utility model documents having a numbering series other than the documents of Group 1

U First publication level
Y Second publication level
Z Third publication level

Group 6 Other (see paragraph 3)

N Non-patent literature documents
X Documents restricted to the internal use of Offices

10. It is understood that documents resulting from a patent application and being identified as the major series will fall under Group 1 (e.g. DT Offenlegungsschrift, Auslegeschrift and Patentschrift). However, documents identified as a secondary series will fall under Group 2 (e.g. FR patent of addition under old law, US reissue). In exceptional cases of need for a further series, Group 3 is reserved for such purposes (e.g. US defensive publication). Group 4 applies only, at present, to special documents concerning the medicament patents published in France. In any country would publish similar documents, Group 4 should then be used.

11. As indicated in paragraph 2, the above letter code may optionally be associated with a numerical code to amplify the information represented by the letter code. For this numerical code only digits 1 to 9 should be used. The significance of this code will be defined by any national office applying such code and communicated to the International Bureau, which will publicize this information. The numerical code must always be interpreted in conjunction with the country code and the above letter code.

Annex C

12. As an appendix to this recommendation a list of patent documents, past and currently published, and intended to be published in the future, divided in accordance with the code, is given.

[Appendices I & II follow]

Original: STAC III No. 43d, expanded to STAC III No. 93a
Adopted by the first session of the TCC
Revised and adopted by the fifth session of the TCST
(document IC/TCST/17(73), Annex III)
Revised version amended and adopted by the tenth session of the TCC
(document IC/TCC/X/19, Annex IV)
Amended and adopted by the fifth PLC ordinary session (document IC/PLC/V/II, paragraphs 65 to 68)
Amended by the TCC at its thirteenth and fourteenth sessions
(documents IC/TCC/XIII/10 and IC/TCC/XIV/18)

Adopted by the seventh PLC ordinary session (document IC/PLC/VII/16, paragraph 30)

Appendix I

List of Patent Documents, Past and Currently Published, and Intended to be Published in the Future, Divided in Accordance with this Code

Code: A Patent Documents Numbered in Primary or Major Series - First Publication Level

Examples:	Austria	Patent Application published in the sense of paragraph 6(i)
	Belgium	Brevet d'invention/Uitvindingsoctrooi
	Belgium	Brevet de perfectionnement/Verbeteringsoctrooi
	Bulgaria	Opisanie na izobretenie po patent
	Canada	Patent
	Cuba	Patent Application published in the sense of paragraph 6(i)
	Czechoslovakia	Patent Application published in the sense of paragraph 6(i)
	Czechoslovakia	Inventors' Certificate Application published in the sense of paragraph 6(i)
	Denmark	Patent Application published in the sense of paragraph 6(i)
	Egypt	Patent specification
	Europat	Document published after 18 months
	Finland	Patent Application published in the sense of paragraph 6(i)
	France	Brevet d'invention (old law)
	France	Brevet d'invention, première et unique publication
	France	Certificat d'addition à un brevet d'invention, première et unique publication
	France	Certificat d'utilité, première et unique publication
	France	Certificat d'addition à un certificat d'utilité, première et unique publication
	France	Demande de brevet d'invention, première publication
	France	Demande de certificat d'addition à un brevet d'invention première publication
	France	Demande de certificat d'utilité, première publication
	France	Demande de certificat d'addition à un certificat d'utilité, première publication
	German Democratic Republic	Patentschrift (Ausschliessungspatent), granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic
	German Democratic Republic	Patentschrift (Wirtschaftspatent), granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic
	Germany, Federal Republic of	Offenlegungsschrift
	Hungary	Patent Application published in the sense of paragraph 6(i)
	India	Patent specification
	Ireland	Patent specification
	Italy	Brevetto per invenzione industriale
	Japan	Kokai tokkyo koho

Code: A (continued)

Examples:	Luxembourg	Brevet d'invention
	Luxembourg	Certificat d'addition à un brevet d'invention
	Netherlands	Ter inzage gelegde octrooiaanvrage
	Norway	Patent Application published in the sense of paragraph 6(i)
	Pakistan	Patent specification
	PCT	Pamphlet published after 18 months
	Poland	Opis patentovy
	Romania	Descrierea invenţiei
	Soviet Union	Opisanie izobreteniya k patentu
	Soviet Union	Opisanie izobreteniya k avtorskomy svidetelstvu
	Spain	Patente de invención
	Sweden	Patent Application published in the sense of paragraph 6(i)
	Switzerland	Auslegeschrift/Mémoire Exposé/Esposto Memoriale (Patent Application published in the sense of paragraphs 6(i) and 6(ii) pertaining to the technical fields for which search and examination as to novelty are made)
	Switzerland	Patentschrift/Exposé d'invention/Esposto d'invenzione (Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which neither search nor examination as to novelty are made)
	United Kingdom	Patent specification
	United States	Patent
	Yugoslavia	Patentni spis

Code: B Patent Documents Numbered in Primary or Major Series - Second Publication Level

Examples:	Australia	Patent specification
	Austria	Patentschrift
	Cuba	Patente de invención
	Czechoslovakia	Popis vynálezu k patentu
	Czechoslovakia	Popis vynálezu k autorskému osvědčení
	Denmark	Fremlaeggelsesskrift
	Finland	Kuulutusjulkaisu - Utläggningsskrift
	France	Brevet d'invention, deuxième publication de l'invention
	France	Certificat d'addition à un brevet d'invention, deuxième publication de l'invention
	France	Certificat d'utilité, deuxième publication de l'invention
	France	Certificat d'addition à un certificat d'utilité, deuxième publication de l'invention
	German Democratic Republic	Patentschrift (Ausschließungspatent), granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic
	German Democratic Republic	Patentschrift (Wirtschattspatent), granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic
	Germany, Federal Republic of	Auslegeschrift

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Code: B (continued)		
Examples:	Hungary	Szabadalmi leiras
	Japan	Tokkyo koho
	Netherlands	Openbaar gemaakte octrooiaanvrage
	Norway	Utlegningsskrift
	Sweden	Utläggningsskrift
	Switzerland	Patentschrift/Exposé d'invention/Esposto d'invenzione (Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which search and examination as to the novelty are made)
	United Kingdom	Amended Patent Specification
Code: C	Patent Documents Numbered in Primary or Major Series - Third Publication Level	
Examples:	Denmark	Patent
	Finland	Patentti - Patent
	Germany, Federal Republic of	Patentschrift
	Netherlands	Octrooi
	Norway	Patent
	Sweden	Patentskrift
Code: E	Patent Documents Numbered in Secondary Series - First Publication Level	
Examples:	France	Certificat d'addition à brevet d'invention (old law)
	United States	Reissue
Code: H	Patent Documents numbered in further series	
Example:	United States	Defensive publication
Code: M	Medicament Patent Documents	
Examples:	France	Brevet spécial de médicament
	France	Addition à un brevet spécial de médicament
Code: U	Utility Model Documents Numbered in Series other than the Documents of Group I - First Publication Level	
Examples:	Germany, Federal Republic of	Gebrauchsmuster
	Japan	Kokai jitsuyo shinan koho
	Spain	Utility Model Application published in the sense of paragraph 6(i)
Code: Y	Utility Model Documents Numbered in Series other than the Documents of Group I - Second Publication Level	
Examples:	Japan	Jitsuyo shinan koho
	Spain	Modelo de utilidad

[Appendix II follows]

Annex C

Appendix II

List of Patent Documents, Past and Currently Published,
broken down by issuing country and coded in accordance with the SI.8 Code

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Australia	Unexamined complete specification open to public inspection (not marked on document)		Unexamined Patent Application published in the sense of paragraph 6(i)	A	
	Patent specification		Patent published in the sense of paragraph 6(ii)	B	
Austria	Aufgebot (not marked on document but indicated as such in the Official Gazette)	Document laid open	Patent Application published in the sense of paragraph 6(i)	A	
	Patentschrift	Patent specification	Patent published in the sense of paragraph 6(ii)	B	
Belgium	Brevet d'invention/ Uitvindingsoctrooi	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
	Brevet de perfectionnement/ Verbeteringsoctrooi	Patent of improvement	Patent of improvement published in the sense of paragraph 6(ii)	A	
	Brevet d'importation/ Invoeringsoctrooi	Patent of importation	Patent of importation published in the sense of paragraph 6(ii)	A	
Bulgaria	ОПИСАНИЕ НА ИЗОБРЕТЕНИЕ ПО ПАТЕНТ (Opisanie na izobretenie po patent)	Description of invention for a patent	Patent published in the sense of paragraph 6(ii)	A	
	ОПИСАНИЕ НА ИЗОБРЕТЕНИЕ по авторско свидетелство (Opisanie na izobretenie po avtorsko svidetelstvo)	Description of invention for an author's certicate	Inventor's certificate published in the sense of paragraph 6(ii)	A	
Canada	Patent/Brevet		Patent published in the sense of paragraph 6(ii)	A	
	Reissue Patent/Brevet de redélivrance		Patent reissued and republished in the sense of paragraph 6(ii)	B	
Cuba	Publicación de la solicitud (not marked on document)	Publication of the application	Patent application published in the sense of paragraph 6(i)	A	
	Patente de invención	Patent of invention	Patent published in the sense of paragraph 6(ii)	B	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Czechoslovakia	Přihláska vynálezu (se žádostí o autorské osvědčedí)	Application for an invention asking for author's certificate	Application for inventor's certificate published in the sense of paragraph 6(i), in accordance with Law No. 84 of 01.11.1972	A	1
	Přihláska vynálezu (se žádostí o patent)	Application for an invention asking for a patent	Patent application published in the sense of paragraph 6(i), in accordance with Law No. 84 of 01.11.1972	A	2
	Patentová přihláska or Přihláska vynálezu	Patent application or Application for invention	Patent application published in the sense or paragraph 6(i) up to patent No. 149 260 (granted before the entry into force of Law No. 84 01.11.1972)	A	5
	Popis vynálezu k autorskému osvědčeni	Description of an invention for an author's certificate	Inventor's certificate published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	1
	Popis vynálezu k patentu	Description of an invention for a patent	Patent published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	2
	Popis vynálezu k autorskému osvědčeni	Description of an invention for an author's certificate	Dependant author's certificate published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	3
	Popis vynálezu k patentu	Description of an invention for a patent	Dependent patent published in the sense of paragraph 6(ii), granted in accordance with Law No. 84 of 01.11.1972	B	4
	Patentový spis	Patent specification	Patent published in the sense of paragraph 6(ii), up to No. 149 260, granted before the entry into force of Law No. 84 of 01.11.1972	B	5
Denmark	Almindelig tilgaengelig patentansøgning	Patent application accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Fremlaeggelsesskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraph 6(ii)	B	

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Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Denmark cont'd.	Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
Egypt	إدارة براءات الاختراع (Idarat bara'at alikhtirah)	Authority for Patent Delivery	Patent published in the sense of paragraph 6(ii)	A	
Finland	Julkiseksi tullut patenttihakemus (not marked on the document)	Patent application made accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Kuulutusjulkaisu - Utläggningsskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	
	Patentti-Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
France	Demande de brevet d'invention	Application for patent of invention	Patent application, first publication, published in the sense of paragraph 6(ii)	A	1
	Demande de certificat d'addition à un brevet d'invention	Application for a certificate of addition to a patent of invention	Application for a certificate of addition, first publication, published in the sense of paragraph 6(ii)	A	2
	Demande de certificat d'utilité	Application for certificate of utility	Utility certificate application, first publication, published in the sense of paragraph 6(ii)	A	3
	Demande de certificat d'addition à un certificat d'utilité	Application for a certificate of addition to a certificate of utility	Application for a certificate of addition to a utility certificate, first publication, published in the sense of paragraph 6(ii)	A	4
	Brevet d'invention	Patent of invention	Patent, first and only publication, published in the sense of paragraph 6(ii)	A	5
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent, first and only publication, published in the sense of paragraph 6(ii)	A	6

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
France cont'd	Certificat d'utilité	Certificate of utility	Utility certificate, first and only publication, published in the sense of paragraph 6(ii)	A	7
	Certificat d'addition à un certificat d'utilité	Certificate of addition to a certificate of utility	Certificate of addition to a utility certificate, first and only publication, published in the sense of paragraph 6(ii)	A	8
	Brevet d'invention	Patent of invention	Patent, second publication, published in the sense of paragraph 6(ii)	B	1
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent, second publication, published in the sense of paragraph 6(ii)	B	2
	Certificat d'utilité	Certificate of utility	Utility certificate, second publication, published in the sense of paragraph 6(ii)	B	3
	Certificat d'addition à un certificat d'utilité	Certificate of addition to a certificate of utility	Certificate of addition to a utility certificate, second publication, published in the sense of paragraph 6(ii)	B	4
	Brevet d'invention	Patent of invention	Patent (old law) published in the sense of paragraph 6(ii)	A	
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent (old law) published in the sense of paragraph 6(ii)	E	
	Brevet spécial de médicament	Special patent for medicament	Medicament patent (old law) published in the sense of paragraph 6(ii)	M	
	Certificat d'addition à un brevet spécial de médicament	Certificate of addition to a special patent for medicament	Certificate of addition to a medicament patent (old law) published in the sense of paragraph 6(ii)	M	
German Democratic Republic	Patentschrift (Ausschliessungspatent)	Patent specification(Exclusive Patent)	Exclusive Patent,granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic,published in the sense of paragraph 6(ii)	A	
	Patentschrift (Wirtschaftpatent)	Patent specification(Economic Patent)	Industrial Patent,granted in accordance with paragraph 5.1 of the Patent Amendment Act of the German Democratic Republic,published in the sense of paragraph 6(ii)	A	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
German Democratic Republic cont'd	Patentschrift (Ausschliessungspatent)	Patent specification (Exclusive patent)	Exclusive patent granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic, (2nd publication after examination as to novelty whenever this examination is effected), published in the sense of paragraph 6(ii)	B	
	Patentschrift (Wirtschaftspatent)	Patent specification (Economic patent)	Industrial patent granted in accordance with paragraph 29 of the Patent Act of the German Democratic Republic (2nd publication after examination as to novelty whenever this examination is effected), published in the sense of paragraph 6(ii)	B	
	Berichtigte Patentschrift (Ausschliessungspatent)	Corrected patent specification (Exclusive patent)	Corrected patent (Exclusive patent) published in the sense of paragraph 6(ii)	C	
	Berichtigte Patentschrift (Wirtschaftspatent)	Corrected patent specification (Economic patent)	Corrected patent (Industrial patent) published in the sense of paragraph 6(ii)	C	
Germany (Federal Republic of)	Offenlegungsschrift	Document open for inspection	Patent application published, before examination as to novelty, in the sense of paragraph 6(ii)	A	
			- 1st publication	A	1
			- 2nd publication. Modified reprint followinc A1 Offenlegungsschrift or B1 Auslegeschrift	A	2
			- 3rd publication. Modified reprint following A2 Offenlegungsschrift or B2 Auslegeschrift	A	3
	Auslegeschrift	Document laid open	Patent application published, after examination as to novelty, in the sense of paragraph 6(ii)	B	
			- 1st publication. Offenlegunaschrift not yet published	B	1
			- 2nd publication. Normally following an A1 Offenlegungsschrift or B1 Auslegeschrift	B	2

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Germany (Federal Republic of) cont'd.			- 3rd publication. Following an A2 Offenlegungsschrift or B2 Auslegeschrift	B	3
			- 4th publication. Following an A3 Offenlegungsschrift or B3 Auslegeschrift	B	4
	Patentschrift	Patent specification	Patent published in the sense of paragraph 6(ii)	C	
			- 1st publication. Offenlegungsschrift and Auslegeschrift not published	C	1
			- 2nd publication. Modified reprint normally following a B1 Auslegeschrift or C1 Patentschrift	C	2
			- 3rd publication. Normally following a B2 Auslegeschrift and an A1 Offenlegungsschrift or following a B2 Auslegeschrift with a preceding B1 Auslegeschrift as well	C	3
			- 4th publication. Following a B3 Auslegeschrift or C3 Patentschrift	C	4
			- 5th publication. Following a B4 Auslegeschrift or a C4 Patentschrift	C	5
	Gebrauchsmuster	Utility model	Utility model published in the sense of paragraph 6(ii)	U	
Hungary	Közzétett szabadalmi bejelentés	Published patent application	Patent application published in the sense of paragraph 6(i)	A	
	Szabadalmi leirás	Patent specification	Patent published in the sense of paragraph 6(ii)	B	
India	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Ireland	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Italy	Brevetto per invenzione industriale	Patent for industrial invention	Patent published in the sense of paragraph 6(ii)	A	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Japan	公開特許公報 (Kokai tokkyo koho)	Preliminary publication of patent	Patent application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	A	
	特許公報 (Tokkyo koho)	Patent publication	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	
	公開実用新案公報 (Kokai jitsuyo shinan koho)	Preliminary publication of Utility Model	Utility model application published before examination as to novelty in the sense of paragraph 6(i)	U	
	実用新案公報 (Jitsuyo shinan koho)	Utility Model publication	Utility model application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	Y	
Luxembourg	Brevet d'invention	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
	Certificat d'addition à un brevet d'invention	Certificate of addition to a patent of invention	Certificate of addition to a patent published in the sense of paragraph 6(ii)	A	
Monaco	Brevet d'invention	Patent of invention	Patent published in the sense of paragraph 6(ii)	A	
Netherlands	Terinzagelegging	Patent application laid open	Patent application published in the sense of paragraphs 6(i) and 6(ii)	A	
	Openbaarmaking	Published patent application	Patent application published after examination in the sense of paragraphs 6(i) and 6(ii)	B	
	Octrooi	Patent	Patent published in the sense of paragraph 6(ii)	C	
Norway	Alment tilgjengelige patentsöknader (not marked on the document)	Patent application accessible to the public	Patent application published in the sense of paragraph 6(i)	A	
	Utlegningsskrift	Document laid open	Patent application published after examination as to novelty in the sense of paragraph 6(ii)	B	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Norway cont'd.	Patent	Patent	Patent published in the sense of paragraph 6(ii)	C	
Pakistan	Patent specification		Patent published in the sense of paragraph 6(ii)	A	
Poland			Patent application published in the sense of paragraph 6(i)	A	
	Opis patentowy Patentu tymczasowego	Description of patent	Patent published in the sense of paragraph 6(ii)	B	
Romania	Descrierea invenţiei	Description of the invention	Patent published in the sense of paragraph 6(ii)	A	
Soviet Union	ОПИСАНИЕ ИЗОБРЕТЕНИЯ К ПАТЕНТУ (Opisanie izobreteniya k patentu)	Description of the invention for a patent	Patent published in the sense of paragraph 6(ii)	A	
	ОПИСАНИЕ ИЗОБРЕТЕНИЯ [illegible] (Opisanie izobreteniya k avtorskomu svidetelstvu)	Description of the invention for an author's certificate	Inventor's certificate published in the sense of paragraph 6(ii)	A	
Spain	Patente de invención	Patent of invention	Patent published in the sense of paragraph 6(i)	A	
	Patente de introducción	Patent of introduction	Patent of importation published in the sense of paragraph 6(i)	A	
	Certificado de adición	Certificate of addition	Certificate of addition published in the sense of paragraph 6(i)	A	
	Solicitud de Modelo de Utilidad	Application for a utility model	Utility Model Application published in the sense of paragraph 6(i)	U	
	Modelo de Utilidad	Utility Model	Utility Model published in the sense of paragraph 6(i)	Y	
Sweden	Allmänt tillgänglig patentansökan	Patent application accessible to the public	Patent Application published in the sense of paragraph 6(i)	A	
	Utläggningsskrift	Document laid open	Patent Application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	B	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
Sweden cont'd.	Patentskrift	Patent document	Patent published in the sense of paragraph 6(ii)	C	
Switzerland	Auslegeschrift/Mémoire Exposé/Esposto Memoriale	Document laid open	Patent Application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii), and pertaining to the technical fields for which examination as to novelty is made, issued since 1959	A	4
	Patentschrift/Exposé d'invention/Esposto d'invenzione	Patent specification	Patent published in the sense of paragraph 6(ii) and pertaining to the technical fields for which no examination as to novelty is made, issued since 1959	A	5
	Patentschrift/Exposé d'invention/Esposto d'invenzione	Patent specification	Patent published in the sense of paragraph 6(ii) and pertaining to technical fields for which examination as to novelty is made, issued since 1959	B	5
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Hauptpatent/Brevet principal/Brevetto principale)	Patent specification (Main patent)	Patent published in the sense of paragraph 6(ii), issued from 1888 to 1959	A	
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Zusatzpatent/Brevet additionnel/Brevetto addizionale)	Patent specification (Additional patent)	Patent of addition published in the sense of paragraph 6(ii), issued from 1907 to 1959	A	
	Patentschrift/Exposé d'invention/Esposto d'invenzione (Zusatzpatent/Brevet additionnel/Brevetto addizionale)	Patent specification (Additional patent)	Patent of addition published in the sense of paragraph 6(ii) in secondary series from 1888 to 1907	E	
United Kingdom	Patent Specification		Examined Patent Application published in the sense of paragraph 6(ii). Grant of letters Patent usually occurs 3 months after publication.	A	

Annex C

Issuing country	Kind of published patent document			Letter code	Associated numerical code (when defined)
	Designation in language of issuing country (and, if required, transliteration in Latin characters)	Translation into English (when needed)	Identification of document		
United Kingdom (cont'd)	Amended Patent Specification		Amended Specification of a Granted Patent published in the sense of paragraph 6(ii)	B	
United States	Patent		Patent published in the sense of paragraph 6(ii)	A	
	Reissue Patent		Patent reissued and republished in the sense of paragraph 6(ii)	E	
	Defensive Publication		Patent application published without examination or assertion as to novelty, in the sense of paragraph 6(i)	H	
	Defensive Publication		Patent document published in the sense of paragraph 5: Entry of an abstract of the application in the Official Gazette	H	
	Defensive Publication		Patent document published in the sense of paragraph 6(ii): Abstract of an application published in a discreet document form distinctively numbered in a numerical series unique to Defensive Publications	H	
Yugoslavia			Accepted Patent Application published in the sense of paragraph 6(i)	A	
	Patentni spis	Patent specification	Patent published in the sense of paragraph 6(ii)	B	

Annex D (Deleted) ***

ANNEX E

INFORMATION FROM PAMPHLET FRONT PAGE TO BE INCLUDED IN THE GAZETTE UNDER RULE 86.1(i)

The following information shall be extracted from the front page of the pamphlet of each published international application and shall, in accordance with Rule 86.1(i), appear in the corresponding entry of the Gazette:

1. As to the international publication:
   - 1.1 the international publication number
   - 1.2 the date of the international publication
   - 1.3 an indication whether the following items were published in the pamphlet:
     - 1.31 international search report
     - 1.32 declaration under Article 17(2)
     - 1.33 amended claims
     - 1.34 statement under Article 19(1)
     - 1.35 the essence of the comments by the applicant on the translation of the international application as referred to in Rule 48.3(b).
2. as to the international application:
   - 2.1 the title of the invention
   - 2.2 the symbol(s) of the International Patent Classification (IPC)
   - 2.3 the international application number
   - 2.4 the international filing date
3. as to any priority claim:
   - 3.1 the application number of the earlier application
   - 3.2 the date of the earlier application
   - 3.3 the country in or for which the earlier application was filed
4. as to the applicant, inventor and agent:
   - 4.1 their name(s)
   - 4.2 their mailing address(es)
5. as to the designated and elected States:
   - 5.1 their names
   - 5.2 the indication of any wish for a regional patent
   - 5.3 the indication of kind of protection sought, unless patent is sought.

ANNEX F

INFORMATION TO BE PUBLISHED IN THE GAZETTE UNDER RULE 86.1(v)

1. The time limits applicable under Articles 22 and 39 in respect of each Contracting State.

2. The list of the non-patent literature agreed upon by the International Searching Authorities for inclusion in the minimum documentation.

3. The names of the national Offices which do not wish to receive copies under Article 13(2)(c).

4. The provisions of the national laws of Contracting States concerning international-type search.

5. The text of the agreements entered into between the International Bureau and the International Searching Authorities or the International Preliminary Examining Authorities.

6. The names of the national Offices which entirely or in part waived their rights to any communication under Article 20.

7. The names of the Contracting States which are bound by Chapter II of the PCT.

8. Listing of international publication numbers grouped according to receiving Offices.

9. Listing of international publication numbers grouped according to IPC classification symbols.

10. Listing of international publication numbers grouped according to countries designated.

11. Indication of any subject matter that will not be searched or examined by the various International Searching and Preliminary Examining Authorities under Rules 39 and 67.

ANNEX G

FORMS

I. FORMS TO BE EMPLOYED BY THE RECEIVING OFFICE

Form Identification Number:	Title of Form:	Provisions pursuant to which Form is issued:
PCT/RO/101*	REQUEST	Rule 4
PCT/RO/102	NOTIFICATION CONCERNING PAYMENT OF TRANSMITTAL, SEARCH, AND INTERNATIONAL FEES	Rules 14, 15, 16
PCT/RO/103	INVITATION TO CORRECT THE PURPORTED INTERNATIONAL APPLICATION	Article 11(2)(a)
PCT/RO/104	NOTIFICATION THAT THE PURPORTED INTERNATIONAL APPLICATION IS NOT TREATED AS AN INTERNATIONAL APPLICATION	Rule 20.7(i)
PCT/RO/105	NOTIFICATION OF THE INTERNATIONAL APPLICATION NUMBER AND OF THE INTERNATIONAL FILING DATE	Rule 20.5(c)
PCT/RO/106	INVITATION TO CORRECT DEFECTS IN THE INTERNATIONAL APPLICATION	Article 14(1)
PCT/RO/107	NOTIFICATION OF NON-INCLUSION OF DRAWINGS WITH THE INTERNATIONAL APPLICATION	Article 14(2)
PCT/RO/108	INVITATION TO REQUEST RECTIFICATION	Rule 91.1(d)
PCT/RO/109	NOTIFICATION OF DECISION CONCERNING REQUEST FOR RECTIFICATION	Administrative Instructions, Section 109
PCT/RO/110	INVITATION TO CORRECT PRIORITY DATE	Rule 4.10(d)
PCT/RO/111	NOTIFICATION OF CORRECTION OR CANCELLATION OF PRIORITY CLAIM	Rule 4.10(d)
PCT/RO/112	NOTIFICATION CONCERNING EXPRESSIONS, ETC., NOT TO BE USED IN THE INTERNATIONAL APPLICATION	Rule 9
PCT/RO/113	REQUEST FOR THE RECORDING OF CHANGE IN THE PERSON, NAME, OR ADDRESS OF APPLICANT	Rules 18.5 or 54.4, Administrative Instructions, Section 306
PCT/RO/114	NOTIFICATION OF NON-COLLECTION OF RECORD COPY	Rule 22.2(d), third sentence, Administrative Instructions, Section 315
PCT/RO/115	NOTIFICATION OF INTENTION TO MAKE DECLARATION THAT INTERNATIONAL APPLICATION CONSIDERED WITHDRAWN	Rule 29.4
PCT/RO/116	NOTIFICATION OF DESIGNATIONS CONSIDERED TO BE WITHDRAWN	Rule 29.1(b)
PCT/RO/117	NOTIFICATION THAT INTERNATIONAL APPLICATION CONSIDERED TO BE WITHDRAWN	Articles 14(1), 14(3), 14(4) and Rule 29.1

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* Printed Form

PCT/RO/118	NOTIFICATION CONCERNING DOCUMENTS TRANSMITTED	Article 12(1), Rules 20.7(iv), 22.2(e), 26.4(c) and (d), 29.1(a)(i), Administrative Instructions, Sections 309(b)(iii), (c)(ii) and 310(c)(iii), (d)(ii)
PCT/RO/119	NOTIFICATION OF REFUND OF FEES	Rules 15.6 and 16.2
PCT/RO/120	INVITATION TO PAY FEE FOR PREPARATION OF COPIES	Rule 21.1(c)
PCT/RO/121	NOTIFICATION THAT PRIORITY CLAIM CONSIDERED NOT TO HAVE BEEN MADE	Rule 4.10(b), Administrative Instructions, Section 302
PCT/RO/122	NOTIFICATION OF TRANSMITTAL OF REQUESTED DOCUMENTS	Rules 20.9, 22.1(b) and 22.2(d)
PCT/RO/123	NOTIFICATION OF POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY	Rules 90.3(b) and 90.4(b)
PCT/RO/124	NOTIFICATION OF DEFECTIVE POWER OF ATTORNEY OR DEFECTIVE REVOCATION OF POWER OF ATTORNEY	Rules 90.3(c) and 90.4(b)
PCT/RO/125	NOTIFICATION OF RECEIPT OF PAPERS PURPORTING TO BE AN INTERNATIONAL APPLICATION	Administrative Instructions, Section 301
PCT/RO/126	NOTIFICATION CONCERNING LATER SUBMITTED SHEETS OR DRAWINGS	Administrative Instructions, Sections 309 and 310
PCT/RO/127	NOTIFICATION OF DECISION NOT TO ISSUE DECLARATION THAT INTERNATIONAL APPLICATION CONSIDERED WITHDRAWN	Administrative Instructions, Section 312
PCT/RO/128	INVITATION TO PAY FOR REQUESTED DOCUMENTS	Rule 20.9
PCT/RO/129	REQUEST FOR THE RECORDING OF CHANGE IN THE PERSON, NAME OR ADDRESS OF INVENTOR	
PCT/RO/130	REQUEST FOR THE RECORDING OF CHANGE IN THE NAME, OR ADDRESS OF AGENT OR COMMON REPRESENTATIVE	
PCT/RO/131	NOTIFICATION OF LACK OF SIGNATURE WITH REGARD TO CORRESPONDENCE SUBMITTED BY APPLICANT	Rules 92.1(a) and 92.1(b)
PCT/RO/132	COMMUNICATION TO THE APPLICANT IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE	

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II. FORMS TO BE EMPLOYED BY THE INTERNATIONAL SEARCHING AUTHORITY

Form Identification Number:	Title of Form:	Provisions pursuant to which Form is issued:
PCT/ISA/201	INTERNATIONAL-TYPE SEARCH REPORT	Article 15(5)
PCT/ISA/202	NOTIFICATION OF RECEIPT OF SEARCH COPY	Rule 25.1
PCT/ISA/203	DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT	Article 17(2)(a)
PCT/ISA/204	INVITATION TO COMMENT ON ABSTRACT	Rule 38.2(a)
PCT/ISA/205	NOTIFICATION OF ABSTRACT APPROVED OR ESTABLISHED	Rule 44.2(c)
PCT/ISA/206	INVITATION TO PAY ADDITIONAL FEES	Article 17(3)(a) and Rule 40.1
PCT/ISA/207	INVITATION TO COMMENT ON DRAFT TRANSLATION	Rule 48.3(b)
PCT/ISA/208	NOTIFICATION OF ACTION TAKEN CONCERNING COMMENTS ON DRAFT TRANSLATION	Administretive Instructions, Section 506
PCT/ISA/209	NOTIFICATION OF FACTS WHICH SHOULD HAVE PRECLUDED THE ACCORDING OF AN INTERNATIONAL FILING DATE	Rule 29.3
PCT/ISA/210*	INTERNATIONAL SEARCH REPORT	Article 18(1) and Rule 43
PCT/ISA/211	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF CITED DOCUMENTS	Article 20(3)
PCT/ISA/212	NOTIFICATION OF DECISION OF PROTEST	Rule 40.2(c) and Administretive Instructions, Section 502
PCT/ISA/213	NOTIFICATION OF REFUND OF SEARCH FEE	Rules 16.3 and 41.1
PCT/ISA/214	REQUEST FOR THE PRODUCTION OF PROOF	Rule 83
PCT/ISA/215	NOTIFICATION OF CERTAIN DEFECTS IN THE INTERNATIONAL APPLICATION	Rule 28.1(a)
PCT/ISA/216	INVITATION TO REQUEST RECTIFICATION	Rule 91.1(d), second sentence
PCT/ISA/217	NOTIFICATION CONCERNING REQUEST FOR RECTIFICATION	Administrative Instructions, Section 109
PCT/ISA/218	NOTIFICATION CONCERNING EXPRESSIONS, ETC. NOT TO BE USED IN INTERNATIONAL APPLICATIONS	Rule 9
PCT/ISA/219	NOTIFICATION CONCERNING DOCUMENTS TRANSMITTED	Rules 44.1, 44.3(c) and 48.3(b)
PCT/ISA/220	NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION	Rule 44.1
PCT/ISA/221	INVITATION TO PAY FOR REQUESTED COPIES OF CITED DOCUMENTS	Rule 44.3(b)
PCT/ISA/222	INVITATION TO PAY FEE FOR PREPARATION OF DRAFT TRANSLATION	Rule 48.3
PCT/ISA/223	NOTIFICATION OF LACK OF SIGNATURE WITH REGARD TO CORRESPONDENCE SUBMITTED BY APPLICANT	Rules 92.1(a) and 92.1(b)
PCT/ISA/224	COMMUNICATION TO THE APPLICANT IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE	

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* Printed Form

III. FORMS TO BE EMPLOYED BY THE INTERNATIONAL BUREAU

Form Identification Number:	Title of Form:	Provisions pursuant to which Form is issued:
PCT/IB/301	NOTIFICATION OF RECEIPT OF RECORD COPY	Rule 24.2(a)
PCT/IB/302	NOTIFICATION OF DESIGNATION	Rule 24.2(a)
PCT/IB/303	REQUEST FOR COPIES OF PAPERS	Rule 20.7(iv)
PCT/IB/304	NOTIFICATION CONCERNING SUBMISSION OF PRIORITY DOCUMENT	Rule 17.1(c) and Administrative Instructions, Section 411
PCT/IB/305	NOTIFICATION OF LATE SUBMISSION OF APPLICATION NUMBER OF EARLIER APPLICATION	Rule 4.10(c)
PCT/IB/306	NOTIFICATION OF THE RECORDING OF A CHANGE IN THE PERSON, NAME, OR ADDRESS OF APPLICANT	Rules 18.5 or 54.4 and Administrative Instructions, Section 306
PCT/IB/307	NOTIFICATION OF WITHDRAWAL BY APPLICANT	Rule 32.1(d)
PCT/IB/308	NOTIFICATION INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES	Rule 47.1(c)
PCT/IB/309	INVITATION TO PAY FOR REQUESTED COPIES OF DOCUMENTS IN FILE	Rule 94.1
PCT/IB/310	NOTIFICATION CONCERNING DOCUMENTS TRANSMITTED	Articles 13(1),(2)(b), 20(1), 25(1)(a),(b), 36(3)(a), and Rules 17.2, 66.7, 23.1(b) and 62.1(b)
PCT/IB/311	REQUEST FOR COPY OF TRANSLATION	Rule 95.1(a)
PCT/IB/312	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF TRANSLATIONS	Rule 95.1(b)
PCT/IB/313	NOTIFICATION OF CERTAIN DEFECTS IN THE INTERNATIONAL APPLICATION	Rule 28.1(a)
PCT/IB/314	INVITATION TO REQUEST RECTIFICATION	Rule 91.1(d), second sentence
PCT/IB/315	NOTIFICATION OF DECISION CONCERNING REQUEST FOR RECTIFICATION	Administrative Instructions, Section 109
PCT/IB/316	INVITATION TO CORRECT PRIORITY DATE	Rule 4.10(d)
PCT/IB/317	NOTIFICATION OF CORRECTION OR CANCELLATION OF PRIORITY CLAIM	Rule 4.10(d) and Administrative Instructions, Section 402
PCT/IB/318	NOTIFICATION THAT PRIORITY CLAIM CONSIDERED NOT TO HAVE BEEN MADE	Rule 4.10(b) and Administrative Instructions, Section 409
PCT/IB/319	NOTIFICATION OF POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY	Rules 90.3(b) and 90.4(b)
PCT/IB/320	NOTIFICATION OF DEFECTIVE POWER OF ATTORNEY OR DEFECTIVE REVOCATION OF POWER OF ATTORNEY	Rules 90.3(c) and 90.4(b)

Form Identification Number:	Title of Form:	Provisions pursuant to which Form is issued:
PCT/IB/321	NOTIFICATION OF FACTS WHICH SHOULD HAVE PRECLUDED THE ACCORDING OF AN INTERNATIONAL FILING DATE	Rule 29.3
PCT/IB/322	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF CITED DOCUMENTS	Articles 20(3) or 36(4)
PCT/IB/323	REQUEST FOR THE PRODUCTION OF PROOF	Rule 83
PCT/IB/324	NOTIFICATION OF DESIGNATIONS CONSIDERED TO BE WITHDRAWN	Rule 29.1(b)
PCT/IB/325	NOTIFICATION THAT INTERNATIONAL APPLICATION CONSIDERED TO BE WITHDRAWN BY RECEIVING OFFICE	Rule 29.1(a)(ii)
PCT/IB/326	NOTIFICATION THAT INTERNATIONAL APPLICATION CONSIDERED TO BE WITHDRAWN BY THE INTERNATIONAL BUREAU	Rule 24.2(b)
PCT/IB/327	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF DOCUMENTS IN FILE	Rule 94.1
PCT/IB/328	LATER ELECTION OF STATES	Article 31(4)(a),(6)(b) and Rule 56
PCT/IB/329	NOTIFICATION OF RECEIPT OF LATER ELECTIONS	Rule 61.1(c)
PCT/IB/330	NOTIFICATION CONCERNING PAYMENT OF SUPPLEMENT TO THE HANDLING FEE	Rule 57.2(b)
PCT/IB/331	NOTIFICATION OF ELECTION	Rule 61.2
PCT/IB/332	INFORMATION CONCERNING ELECTED OFFICES NOTIFIED OF THEIR ELECTION	Rule 61.3
PCT/IB/333	INVITATION TO CORRECT DEFECTS IN THE LATER ELECTION OF STATES	Rule 60.2
PCT/IB/334	NOTIFICATION THAT LATER ELECTIONS CONSIDERED AS NOT HAVING BEEN SUBMITTED	Rule 61.1(c)
PCT/IB/335	NOTIFICATION OF ATTEMPTED ELECTIONS	Rule 60.3
PCT/IB/336	NOTIFICATION OF DEFECTS IN DEMAND	Rule 60.1(d)
PCT/IB/337	NOTIFICATION CONCERNING AMENDMENTS OF THE CLAIMS	Rule 62.2
PCT/IB/338	NOTIFICATION OF TRANSMITTAL OF COPIES OF TRANSLATIONS	Rule 72.2
PCT/IB/339	NOTIFICATION OF WITHDRAWAL BY APPLICANT UNDER CHAPTER II OF THE PCT	Rules 75.2 and 75.3
PCT/IB/340	INVITATION TO PAY FOR REQUESTED COPIES OF TRANSLATIONS	Rule 95.1(b)
PCT/IB/341	INVITATION TO PAY FOR REQUESTED COPIES OF CITED DOCUMENTS	Articles 20(3) and Rule 44.3 or Article 36(4) and Rule 71.2
PCT/IB/342	REQUEST FOR THE RECORDING OF CHANGE IN THE PERSON, NAME, OR ADDRESS OF INVENTOR	
PCT/IB/343	REQUEST FOR THE RECORDING OF CHANGE IN THE NAME OR ADDRESS OF AGENT OR COMMON REPRESENTATIVE	
PCT/IB/344	NOTIFICATION OF LACK OF SIGNATURE WITH REGARD TO CORRESPONDENCE SUBMITTED BY APPLICANT	Rules 92.1(a) and 92.1(b)
PCT/IB/345	COMMUNICATION TO THE APPLICANT IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE	

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IV. FORMS TO BE EMPLOYED BY THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Form Identification Number:	Title of Form:	Provisions pursuant to which Form is issued:
PCT/IPEA/401*	DEMAND	Article 31
PCT/IPEA/402	NOTIFICATION OF RECEIPT OF DEMAND	Rule 61.1(b), first sentence
PCT/IPEA/403	NOTIFICATION CONCERNING PAYMENT OF THE PRELIMINARY EXAMINATION AND HANDLING FEES	Rules 57 and 58
PCT/IPEA/404	INVITATION TO CORRECT DEFECTS IN DEMAND	Rule 60.1(a)
PCT/IPEA/405	INVITATION TO RESTRICT OR PAY ADDITIONAL FEES	Article 34(3)(a) and Rule 68.2
PCT/IPEA/406	INVITATION TO COMPLY WITH REQUIREMENTS FOR SUBMISSION OF A TRANSLATION OF THE INTERNATIONAL APPLICATION	Rule 55.2
PCT/IPEA/407	NOTIFICATION THAT DEMAND CONSIDERED AS NOT HAVING BEEN SUBMITTED	Rules 55.2(d), 57.4(c) and 60.1(c)
PCT/IPEA/408	WRITTEN OPINION	Rules 66.2(a),(b) and 66.4(a)
PCT/IPEA/409*	INTERNATIONAL PRELIMINARY EXAMINATION REPORT	Article 35(1) and Rule 70
PCT/IPEA/410	REQUEST FOR THE PRODUCTION OF PROOF	Rule 83
PCT/IPEA/411	INVITATION TO REQUEST RECTIFICATION	Rule 91.1(d), second sentence
PCT/IPEA/412	NOTIFICATION CONCERNING REQUEST FOR RECTIFICATION	Administrative Instructions, Section 109
PCT/IPEA/413	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF DOCUMENTS IN FILE	Rule 94.1
PCT/IPEA/414	INVITATION TO FURNISH COPY OF PRIORITY DOCUMENT AND TRANSLATION	Rule 66.7(a),(b)
PCT/IPEA/415	NOTIFICATION CONCERNING DOCUMENTS TRANSMITTED	Rules 61.1(a), 71.1 and 71.2(c)
PCT/IPEA/416	NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT	Rule 71.1
PCT/IPEA/417	NOTIFICATION OF TRANSMITTAL OF REQUESTED COPIES OF CITED DOCUMENTS	Article 36(4)
PCT/IPEA/418	NOTIFICATION THAT APPLICANT IS NOT ENTITLED TO MAKE A DEMAND FOR INTERNATIONAL PRELIMINARY EXAMINATION	Rules 54.1, 54.2 and Administrative Instructions, Section 601(a)
PCT/IPEA/419	NOTIFICATION THAT APPLICANT IS NOT ENTITLED TO ELECT CERTAIN STATES	Rule 54.3 and Administrative Instructions, Section 601(b)
PCT/IPEA/420	NOTIFICATION OF DECISION ON PROTEST	Rule 68.3(c) and Administrative Instructions, Section 603
PCT/IPEA/421	INVITATION TO PAY FOR REQUESTED COPIES OF CITED DOCUMENTS	Rule 71.2(b)
PCT/IPEA/422	INVITATION TO PAY FOR REQUESTED COPIES OF DOCUMENTS IN FILE	Rule 94.1
PCT/IPEA/423	NOTIFICATION OF LACK OF SIGNATURE WITH REGARD TO CORRESPONDENCE SUBMITTED BY APPLICANT	Rules 92.1(a) and 92.1(b)
PCT/IPEA/424	COMMUNICATION TO THE APPLICANT IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE	

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* Printed Form

INTERNATIONAL APPLICATION UNDER THE PATENT COOPERATION TREATY

REQUEST

THE UNDERSIGNED REQUESTS THAT THE PRESENT INTERNATIONAL APPLICATION BE PROCESSED ACCORDING TO THE PATENT COOPERATION TREATY

(The following is to be filled in by the Receiving Office)
INTERNATIONAL APPLICATION No:

INTERNATIONAL FILING DATE:

(Stamp)
Name of Receiving Office and "PCT International Application"

Applicant's or Agent's File No. [9]
(Indicated by applicant if desired).

I. TITLE OF INVENTION [1]

II. APPLICANT [2] Additional information is contained in supplemental box. ☐

Name [3], [5]

Address [4], [5] (including postal code and country)

Nationality [6] (country)

Residence [7] (country)

Telephone number (if any)

Telegraphic address (if any)

Teletype address (if any)

III. INVENTOR [8] (Applicant is also the inventor ☐) Additional information is contained in supplemental box. ☐

Name [3], [5]

Address [4], [5] (including postal code and country).

IV. AGENT OR COMMON REPRESENTATIVE (IF ANY) [9] Additional information is contained in supplemental box. ☐

A. ☐ Applicant hereby appoints the following named agent or common representative to act on his behalf before the competent authorities. [9]

B. ☐ Applicant has appointed the following named agent or common representative in accompanying separate power of attorney. [9]

Name [3], [5]

Address [4], [5] (including postal code and country).

Telephone number (if any)

Telegraphic address (if any)

Teletype address (if any)

V. DESIGNATION OF STATES [10] (and possible indication of wish to obtain regional patents) [11] (and possible choice of certain kinds of protection) [12] Additional information is contained in supplemental box. ☐

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Form PCT/RO/101 (first sheet) (August 1976)

See notes on accompanying sheet

Sheet II

VI. PRIORITY CLAIM (IF ANY) [13] Additional information is contained in supplemental box. ☐

The priority of an earlier application is claimed (indicate following data):

Country (If the earlier application is regional or international application, indicate those countries [15] in which it was filed).

Filing Date [14]

Application Number [15]

If a regional or international application, indicate the national Office or intergovernmental organization with which it was filed.

VII. PARENT APPLICATION OR GRANT (IF ANY) [16] Additional information is contained in supplemental box. ☐

Designated State	Title or Treatment Desired	Title and Number of the Parent Application or Grant	Date of the Parent Application or Grant [14]

VIII. EARLIER INTERNATIONAL OR INTERNATIONAL-TYPE SEARCH (IF ANY) [17] Additional information is contained in supplemental box. ☐

An earlier ☐ (international) or ☐ (international-type) search has been requested on the following application:

Receiving Office/Country	(International) Application No.	(International) Filing Date [14]

Date of Request for the Search where the Earlier Search was an International-Type Search [14]

Number given by the International Searching Authority to the Request for Search where the Earlier Search was an International-Type Search

IX. DIFFERENT APPLICANTS FOR DIFFERENT (GROUPS OF) DESIGNATED STATES (WHERE APPLICABLE) [18]
Additional information is contained in supplemental box. ☐

Designated States	Name of Applicant

X. DIFFERENT INVENTORS FOR DIFFERENT (GROUPS OF) DESIGNATED STATES (WHERE APPLICABLE) [19]
Additional information is contained in supplemental box. ☐

Designated States	Name of Inventor

Form PCT/RO/101 (second sheet) (August 1976)

See notes on accompanying sheet

Sheet III

SUPPLEMENTAL BOX... USE THIS BOX IF ANY OF THE BOXES IS NOT LARGE ENOUGH TO CONTAIN INFORMATION TO BE FURNISHED. INDICATE THE BOXES CONTINUED IN THIS BOX BY THEIR (ROMAN) NUMERALS AND TITLE (e.g.: "II. APPLICANT (CONTINUED)")

XI. SIGNATURE OF APPLICANT [20]

XII. CHECK LIST ☐ (To be filled in by the Applicant) [21]

A. This international application contains the following number of sheets:

1. request ______________ sheets
2. description ______________ sheets
3. claims ______________ sheets
4. drawings ______________ sheets
5. abstract ______________ sheets

Total ______________ sheets

C. Figure number ________ of the drawings (if any) is suggested to accompany the abstract for publication.

D. Drawings (To be filled in by the Receiving Office)
☐ No Drawings [22]

B. This international application as filed is accompanied by the items checked below:

1. ☐ separate signed power of attorney
2. ☐ priority document
3. ☐ receipt (e.g. revenue stamps) for the fees paid
4. ☐ check for the payment of fees
5. ☐ international search report
6. ☐ international-type search report
7. ☐ document in evidence of fact that applicant is successor in title of inventor
8. ☐ other (specify)

(The following is to be filled in by the Receiving Office)

1. Date of actual receipt of the purported international application:
2. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
3. Date of timely receipt of the required corrections under Article 11 of the PCT:

(The following is to be filled in by the International Bureau)

Date of receipt of the record copy:

Form PCT/RO/101 (last sheet) (August 1976)

See notes on accompanying sheet

NOTES TO FORM PCT/RO/101

These Notes are intended to facilitate the filling in of the present form. For full information, see the text of the Patent Cooperation Treaty and the texts of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and the said texts, the latter are applicable. "Article" refers to Articles of the Treaty, "Rule" refers to Rules of the Regulations and "Section" refers to Sections of the Administrative Instructions.

1 Title of Invention (Rule 4.1 *(a)* (ii))

"The title of the invention shall be short (preferably from two to seven words when in English or translated into English) and precise." (Rule 4.3)

2 Applicant (Rule 4.1 *(a)* (iii))

"The request shall indicate the name, address, nationality and residence of the applicant or, if there are several applicants, of each of them." (Rule 4.5 *(a)*)
"Where any international application indicates as applicants several persons, it shall be sufficient, for the purpose of identifying that application, to indicate, in any Form or correspondence relating to such application, the name of the applicant first named in the request." (Section 105)
See also box IX of the present form.

3 "Names of natural persons shall be indicated by the person's family name and given name(s), the family name being indicated before the given name(s)." (Rule 4.4 *(a)*)
"Names of legal entities shall be indicated by their full, official designations." (Rule 4.4 *(b)*)

4 "Addresses shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and, in any case, shall consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. It is recommended to indicate any telegraphic and teletype address and telephone number." (Rule 4.4 *(c)*)
"For each applicant, inventor, or agent, only one address may be indicated." (Rule 4.4 *(d)*)

5 "Where any name or address is written in characters other than those of the Latin alphabet, the same shall also be indicated in characters of the Latin alphabet either as a mere transliteration or through translation into English. The applicant shall decide which words will be merely transliterated and which words will be so translated." (Rule 4.16 *(a)*)

"The name of any country written in characters other than those of the Latin alphabet shall also be indicated in English." (Rule 4.16 *(b)*)

6 "The applicant's nationality shall be indicated by the name of the State of which he is a national." (Rule 4.5 *(b)*)
See Section 202 in Note 10 below.

7 "The applicant's residence shall be indicated by the name of the State of which he is a resident." (Rule 4.5 *(c)*)
See Section 202 in Note 10 below.

8 Inventor (Rules 4.1 *(a)* *(v)* and 4.6 *(a)*)

"If the applicant is the inventor, the request, ...shall contain a statement to that effect or shall repeat the applicant's name in the space reserved for indicating the inventor." (Rule 4.6 *(b)*)
See also box X of the present form.

9 Agent or Common Representative (Rules 4.1 *(a)* (iii), 4.7 and 4.8)

"If agents are designated, the request shall so indicate, and shall state their names and addresses." (Rule 4.7)
"If there is more than one applicant and the request does not refer to an agent representing all the applicants ("a common agent"), the request shall designate one of the applicants who is entitled to file an international application according to Article 9 as their common representative." (Rule 4.8 *(a)*)
"Appointment of any agent or of any common representative within the meaning of Rule 4.8 *(a)*, if the said agent or common representative is not designated in the request signed by all applicants, shall be effected in a separate signed power of attorney (i.e., a document appointing an agent or a common representative)." (Rule 90.3 *(a)*)
"The power of attorney may be submitted to the receiving Office or the International Bureau. Whichever of the two is the recipient of the power of attorney submitted shall immediately notify the other and the interested International Searching Authority and the interested International Preliminary Examining Authority." (Rule 90.3 *(b)*)
"If the separate power of attorney is not signed as provided in paragraph *(a)*, or if the required separate power of attorney is missing, or if the indication of the name or address of the appointed person does not comply with Rule 4.4, the power of attorney shall be considered non-existent unless the defect is corrected." (Rule 90.3 *(c)*)
For Rule 4.4 see Notes 3 and 4.

"Any correspondence from an International Authority intended for the applicant, or, in the case of several applicants, the applicants, shall be addressed as follows:"
"Where the applicant has designated or appointed one agent, correspondence shall be addressed to that agent. Where, in the case of several applicants, the applicants are represented by a common representative or a common agent, correspondence shall be addressed to that representative or that agent." (Section 108 *(a)* (i))
"Where the applicant has designated several agents in the request, correspondence shall be addressed to the agent first mentioned therein. Where, in the case of several applicants, the applicants have designated several common agents in the request, correspondence shall be addressed to the common agent first mentioned therein." (Section 108 *(a)* (ii))
"Where the applicant has appointed several agents in one or more separate powers of attorney, correspondence shall be addressed to the agent first mentioned in the earliest filed and still valid separate power of attorney. Where, in the case of several applicants, the applicants have appointed several common agents in one or more separate powers of attorney, correspondence shall be addressed to the common agent first mentioned in the earliest filed and still valid separate power of attorney." (Section 108 *(a)* (iii))
"Any correspondence from an International Authority to the applicant or his agent shall be marked with the file number of the applicant or the agent, if available, provided it does not exceed ten digits." (Section 108 *(b)*)
"In the case of several applicants, any agent designated under Rule 4.7 in the request signed by all the applicants, or appointed under Rule 90.3 in a separate power of attorney signed by all the applicants, shall be considered a common agent." (Section 106)
"If there are several agents appointed by the same applicant or applicants, any act by or in relation to any of the several agents shall have the effect of an act by or in relation to the said applicant or applicants." (Rule 90.2 *(c)*)
"If the applicants designate a common representative in accordance with Rule 4.8 *(a)*, such common representative shall be indicated on the front page of the request form. The indication of the common representative shall take the form of a statement designating the named applicant to act as the common representative on behalf of all the applicants." (Section 207)

10 Designation of States (Rule 4.1 *(a)* (iv))

"Contracting States shall be designated in the request by their names." (Rule 4.9)
"The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appearing in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appearing in *Annex B* (for example, "Argentine Republic (AR)" or "Argentina (AR)"." (Section 202 *(a)*)
"The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action." (Section 202 *(b)*)
"If the applicant specifies the States to which he wishes any amount paid to be applied as designation fee, the amount shall be applied accordingly to the number of States which are covered by the amount in the order specified by the applicant." (Rule 15.5 *(a)*)
"If the applicant does not specify any such wish and if the amount or amounts received by the receiving Office are higher than the basic fee and one designation fee but lower than what is due according to the number of the designated States, any amount in excess of the basic fee and one designation fee shall be treated as designation fees for the States following the State first named in the request and in the order in which the States are designated in the request up to and including that designated State for which the total amount of the designation fee is covered by the amount or amounts received." (Rule 15.5 *(b)*)
"The designation fee for the first mentioned State belonging to a group of States for which the same regional patent is sought and which is specified under paragraph *(a)* or which is reached under paragraph *(b)* shall, for the purposes of the said paragraphs, be considered as covering also the other States of the said group." (Rule 15.5 *(c)*)

11 "The request shall, where applicable, contain: ...(iv) an indication that the applicant wishes to obtain a regional patent and the names of the designated States for which he wishes to obtain such a patent." (Rule 4.1 *(b)* (iv))
"Where the applicant wishes to obtain a regional patent in respect of any designated State, he shall make the indication in the request referred to in Rule 4.1 *(b)* (iv) by inserting the words "regional patent", or their equivalent in the language of the international application, immediately after the indication of the said State, provided that:

- (i) where Article 4 (1) (ii), third clause applies, and not all the States party to the regional treaty have been designated, the international application shall be treated as if all those States had been designated and as if the designations of all such States contained the said words, whether the said designations contained an indication of the wish to obtain a regional patent or, according to Article 4 (1) (ii), fourth clause, are to be treated as containing such indication;
- (ii) where the national law of any designated State contains a provision as referred to in Article 45 (2), the International Bureau shall, according to Article 4 (1) (ii), fourth clause, treat the designation as if it contained the said words even where the applicant failed to indicate them." (Section 204)

12 "In respect of any designated or elected State whose law provides for the grant of inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, or utility certificates of addition, the applicant may indicate, as prescribed in the Regulations, that his international application is for the grant, as far as that State is concerned, of an inventor's certificate, a utility certificate, or a utility model, rather than a patent, or that it is for the grant of a patent or certificate of addition, an inventor's certificate of addition, or a utility certificate of addition, and the ensuing effect shall be governed by the applicant's choice. For the purposes of this Article and any Rule thereunder, Article 2 (ii) shall not apply." (Article 43)
"If the applicant wishes his international application to be treated, in any designated State, as an application not for a patent but for the grant of any of the other kinds of protection specified in Article 43, he shall so indicate in the request. For the purposes of this paragraph, Article 2 (ii) shall not apply." (Rule 4.12 *(a)*)
"Where the applicant wishes his application to be treated in any designated State as an application not for a patent but for the grant of another kind of protection referred to in Article 43, he shall make the indication in the request referred to in Rule 4.12 *(a)* by inserting the words "inventor's certificate", "utility certificate", "utility model", "patent of addition", "certificate of addition", "inventor's certificate of addition" or "utility certificate of addition", or their equivalent in the language of the international application, immediately after the indication of the said State." (Section 203 *(a)*)
"In respect of any designated or elected State whose law permits an application, while being for the grant of a patent or one of the other kinds of protection referred to in Article 43, to be also for the grant of another of the said kinds of protection, the applicant may indicate, as prescribed in the Regulations, the two kinds of protection he is seeking, and the ensuing effect shall be governed by the applicant's indications. For the purposes of this Article, Article 2 (ii) shall not apply." (Article 44)
"Where the applicant is seeking two kinds of protection under Article 44, he shall make the indication in the request referred to in Rule 4.12 *(b)* by inserting, in the appropriate space provided for in the request form and in the language of the international application, either

- (i) any two of the following terms connected by the word "and": "patent", "inventor's certificate", "utility certificate", "utility model", "patent of addition", "certificate of addition", "inventor's certificate of addition", "utility certificate of addition"; or
- (ii) any two of the terms indicated in (i), above, one of them preceded by the word "primarily" and the other by the word "subsidiarily"." (Section 203 *(b)*)

13 Priority Claim (Rules 4.1 *(b)* (i) and 4.10)

14 "Any date in the international application shall be indicated by the Arabic number of the day, by the name of the month, and by the Arabic number of the year. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by two-digit Arabic numerals each for the number of the day, for the number of the month and for the last two numbers of the year, in that order and with a period after the digit pairs of the day and of the month (for example, "30 March 1972 (30.03.72)")." (Section 201)

15 " ...when the earlier application is not a regional or an international application, the country in which it was filed; when the earlier application is a regional or an international application, at least one country for which it was filed, ..." (Rule 4.10 *(b)* (i))

"If the application number of the earlier application is not indicated in the request but is furnished by the applicant to the International Bureau prior to the expiration of the 16th month from the priority date, it shall be considered by all designated States to have been furnished in time. If it is furnished after the expiration of that time limit, the International Bureau shall inform the applicant and the designated Offices of the date on which the said number was furnished to it." (Rule 4.10 *(c)*)

16 Parent Application or Grant (Rule 4.1 *(b)* (v))

"If the applicant wishes his international application to be treated, in any designated State, as an application for a patent or certificate of addition, inventor's certificate of addition, or utility certificate of addition, he shall identify the parent application or the parent patent, parent inventor's certificate, or parent utility certificate to which the patent or certificate of addition, inventor's certificate of addition, or utility certificate of addition, if granted, relates. For the purposes of this paragraph, Article 2 (ii) shall not apply." (Rule 4.13)
"If the applicant wishes his international application to be treated, in any designated State, as an application for a continuation or a continuation-in-part of an earlier application, he shall so indicate in the request and shall identify the parent application involved." (Rule 4.14)

17 Earlier International or International-Type Search (Rule 4.1 *(b)* (ii))

"If an international or international-type search has been requested on an application under Article 15 (5), the request may state that fact and identify the application (or its translation, as the case may be) by country, date and number, and the request for the said search by date and, if available, number." (Rule 4.11)

18 Different Applicants for Different (Groups of) Designated States (Rule 18.4)

"The international application may indicate different applicants for the purposes of different designated States, provided that, in respect of each designated State, at least one of the applicants indicated for the purposes of that State is entitled to file an international application according to Article 9." (Rule 18.4 *(a)*)

19 Different Inventors for Different (Groups of) Designated States (Rule 4.6 *(c)*)

"The request may, for different designated States, indicate different persons as inventors where, in this respect, the requirements of the national laws of the designated States are not the same. In such a case, the request shall contain a separate statement for each designated State or group of States in which a particular person, or the same person, is to be considered the inventor, or in which particular persons, or the same persons, are to be considered the inventors." (Rule 4.6 *(c)*)

20 Signature (Rule 4.1 *(d)*)

The signature must be that of the applicant and if there are several applicants all must sign (Rule 4.15); however, the signature may be that of the agent (Rule 2.1) where there is attached to this request a separate power of attorney appointing the agent. "Appointment of any agent or of any common representative within the meaning of Rule 4.8 *(a)*, if the said agent or common representative is not designated in the request signed by all applicants, shall be effected in a separate signed power of attorney (i.e., a document appointing an agent or a common representative)." (Rule 90.3 *(a)*)

21 Check List (Rule 3.3)

"*(a)* The printed form shall contain a list which, when filled in, will show:

- (i) the total number of sheets constituting the international application and the number of the sheets of each element of the international application (request, description, claims, drawings, abstract);
- (ii) whether or not the international application as filed is accompanied by a power of attorney (i.e., a document appointing an agent or a common representative), a priority document, a receipt for the fees paid or a check for the payment of the fees, an international or an international-type search report, a document in evidence of the fact that the applicant is the successor in title of the inventor, and any other document (to be specified in the check list);
- (iii) the number of that figure of the drawings which the applicant suggests should accompany the abstract when the abstract is published on the front page of the pamphlet and in the Gazette; in exceptional cases, the applicant may suggest more than one figure.

(b) The list shall be filled in by the applicant, failing which the receiving Office shall fill it in and make the necessary annotations, except that the number referred to in paragraph *(a)* (iii) shall not be filled in by the receiving Office." (Rule 3.3)

22 Missing Drawings (Rule 26.6)

"*(a)* If, as provided in Article 14(2), the international application refers to drawings which in fact are not included in that application, the receiving Office shall so indicate in the said application." (Rule 26.6 *(a)*)
"Where the international application refers to drawings which in fact are not included in that application, the receiving Office shall make the indication referred to in Rule 26.6 *(a)* by an appropriate marking of the request form." (Section 310 *(a)*)

THIS SHEET IS NOT PART OF THE INTERNATIONAL APPLICATION

This column for use by Receiving Office

FEE CALCULATION SHEET[1]

I. TRANSMITTAL FEE[2] .... ☐ T

II. SEARCH FEE[3] .... ☐ S

III. INTERNATIONAL FEE[4]

BASIC FEE[5]

Indicate the number of SHEETS contained in the international application ________

If the international application contains not more than 30 sheets .... $45.00 b_1

If the international application contains more than 30 sheets, add $1.00 for each sheet in excess of 30 .... ☐ b_2

Add amounts entered in boxes b_1 and b_2, and enter total in box B. This figure is the amount of the BASIC FEE. .... ☐ B

DESIGNATION FEES[6]

Indicate the number of DESIGNATED STATES for which regional patents have not been sought ________

Multiply the number of these which require transmittal of a copy of the international application[7] ________ by $14.00. .... ☐ d_1

Multiply the number of these which do NOT require transmittal of a copy of the international application[8] ________ by $12.00. .... ☐ d_2

Indicate the number of GROUPS of Designated States for which regional patents have been sought ________

Multiply the number of these which require transmittal of a copy of the international application[7] ________ by $14.00 .... ☐ d_3

Multiply the number of these which do NOT require transmittal of a copy of the international application[8] ________ by $12.00. .... ☐ d_4

Add amounts entered in boxes d_1, d_2, d_3 and d_4, and enter total in box D. This figure is the amount of the DESIGNATION FEES .... ☐ D

Add amounts entered in boxes B and D, and enter total in box I. This figure is the amount of the INTERNATIONAL FEE. .... ☐ I

IV. TOTAL OF PRESCRIBED FEES:

Add amounts entered in boxes T, S and I, and enter total in the total box. This figure is the total amount of the PRESCRIBED FEES. .... ☐ TOTAL

THE APPLICANT MAY PAY THE PRESCRIBED FEES BY [CHEQUE, POSTAL MONEY ORDER, BANK DRAFT, CASH, REVENUE STAMPS, DEBITING DEPOSIT ACCOUNT NO. ......, COUPONS, ETC.]. PAYMENT SHOULD BE MADE IN THE PRESCRIBED CURRENCY TO THE [ACCOUNT OF, ACCOUNT INDICATED BELOW OF, ORDER OF] THE RECEIVING OFFICE.

Form PCT/RO/101 (Annex) (August 1976)

See notes on reverse side

NOTES TO FORM PCT/RO/101 (ANNEX)

1 The purpose of the fee calculation sheet is to aid the applicant to identify the prescribed fees and to calculate the amounts to be paid. It is strongly recommended that the applicant complete by entering the appropriate amounts in the boxes provided and submit the fee calculation sheet at the time of filing of the international application. This will help the receiving Office to verify the calculations and to identify any error in them.

2 "Any receiving Office may require that the applicant pay a fee to it, for its own benefit, for receiving the international application, transmitting copies to the International Bureau and the competent International Searching Authority, and performing all the other tasks which it must perform in connection with the international application in its capacity of receiving Office ("transmittal fee")." (Rule 14. 1 *(a)*)

"The amount and the due date of the transmittal fee, if any, shall be fixed by the receiving Office." (Rule 14.1 *(b)*)

3 "Each International Searching Authority may require that the applicant pay a fee ("search fee") for its own benefit for carrying out the international search and for performing all other tasks entrusted to International Searching Authorities by the Treaty and these Regulations." (Rule 16.1 *(a)*)

"The search fee shall be collected by the receiving Office. It shall be payable in the currency prescribed by that Office, it being understood that, if that currency is not the same as the currency of the State in which the International Searching Authority is located, the search fee, when transferred by the receiving Office to that Authority, shall be freely convertible into the currency of the said State. As to the time of payment of the search fee, Rule 15.4 (*a*) shall apply." (Rule 16.1 *(b)*)

4 "Each international application shall be subject to the payment of a fee for the benefit of the International Bureau ("international fee") consisting of:

(i) a "basic fee, " and
(ii) as many "designation fees" as there are States designated in the international application, provided that, where a regional patent is sought for certain designated States, only one designation fee shall be due for those States." (Rule 15.1)

5 "The amount of the basic fee shall be:
(i) if the international application contains not more than 30 sheets: US $ 45.00 or 194 Swiss francs,
(ii) if the international application contains more than 30 sheets: US $ 45.00 or 194 Swiss francs plus US $ 1.00 or 4.30 Swiss francs per sheet in excess of 30 sheets." (Rule 15.2 *(a)*)

6 "The amount of the designation fee shall be:
(i) for each designated State or each group of designated States for which the same regional patent is sought which does not require the furnishing of a copy under Article 13: US $ 12.00 or 52 Swiss francs,
(ii) for each designated State or each group of designated States for which the same regional patent is sought which requires the furnishing of a copy under Article 13: US $ 14.00 or 60 Swiss francs." (Rule 15.2 *(b)*)

7 "Any designated Office may ask the International Bureau to transmit to it a copy of the international application prior to the communication provided for in Article 20, and the International Bureau shall transmit such copy to the designated Office as soon as possible after the expiration of one year from the priority date." (Article 13(1))

See Rule 15.2 *(b)* (ii) quoted in note (6) above.

The following designated Offices have asked the International Bureau to transmit to it a copy of the international application as soon as possible after the expiration of one year from the priority date: ...

The following designated Offices acting for groups of designated States have asked the International Bureau to transmit to them a copy of the international application as soon as possible after the expiration of one year from the priority date: ...

8 See Article 13 (1) quoted in note (7) above and Rule 15.2 *(b)* (i) quoted in note (6) above.

The following designated Offices do not require the International Bureau to transmit to them a copy of the international application as soon as possible after the expiration of one year from the priority date: ...

The following designated Offices acting for groups of designated States do not require the International Bureau to transmit to them a copy of the international application as soon as possible after the expiration of one year from the priority date: ...

PATENT COOPERATION TREATY
INTERNATIONAL SEARCH REPORT

IDENTIFICATION OF INTERNATIONAL APPLICATION	Applicant's or Agent's File No. [20]
International Application No. [1]	International Filing Date [1]
Receiving Office [1]	Priority Date Claimed [2]
Applicant [1]	

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched [5]

III. TITLE, ABSTRACT AND FIGURE OF DRAWING

1. The following indicated items are approved as submitted by the applicant: [6]
   ☐ Title. ☐ Abstract.
2. The texts established by this International Searching Authority of the following indicated items are set forth on a supplemental sheet: [6]
   ☐ Title. ☐ Abstract.
3. ☐ This report is incomplete as far as the abstract is concerned as the time limit for comments by the applicant on the draft prepared by this International Searching Authority has not expired. [7]
4. The figure of the drawings indicated below is to be published with the abstract: [8]
   ☐ Figure No.______as suggested by the applicant. [9]
   Figure No.______because:
   ☐ applicant failed to suggest a figure. [10]
   ☐ this figure better characterizes the invention. [10]

IV. ☐ **CERTAIN CLAIMS WERE FOUND UNSEARCHABLE** [11] (Observations on supplemental sheet)

V. ☐ **UNITY OF INVENTION IS LACKING** [12] (Observations on supplemental sheet)

Form PCT/ISA/210 (first sheet) (August 1976) See notes on accompanying sheet

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Page ...

VI. DOCUMENTS CONSIDERED TO BE RELEVANT [15]

Category *	Citation of Document, [17] with indication, where appropriate, of the relevant passages [18]	Relevant to Claim No. [19]

* Categories of cited documents: [16]

"A" (document defining the general state of the art)

"E" (earlier document but published later than the international filing date)

"O" (document referring to an oral disclosure, use, exhibition or other means)

"P" (document published prior to the international filing date but later than the priority date claimed)

"T" (later document published after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention)

"X" (document of particular relevance)

VII. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
International Searching Authority [1]	Signature of Authorized Officer [21]

Form PCT/ISA/210 (last sheet) (August 1976) See notes on accompanying sheet

Page ...

III. ☐ TITLE, ABSTRACT [8]

This International Searching Authority has established the following text of the:

☐ Title.
☐ Abstract.

Form PCT/ISA/210 (supplemental sheet) (August 1976) See notes on accompanying sheet

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Page ...

IV. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [11]

This International Search Report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ...., because they related to subject matter [13] not required to be searched by this Authority, namely:

2. ☐ Claim numbers ...., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that a meaningful international search can be carried out [14], specifically:

V. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [15]

This International Searching Authority found multiple inventions in this International Application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims of the international application for which fees were paid specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (supplemental sheet) (August 1976) See notes on accompanying shee

NOTES TO FORM PCT/ISA/210

These Notes are intended to facilitate the use of the present form. For full information, see the text of the Patent Cooperation Treaty and the texts of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and the said texts, the latter are applicable. "Article" refers to Articles of the Treaty, "Rule" refers to Rules of the Regulations and "Section" refers to Sections of the Administrative Instructions.

1 "The international search report shall identify the International Searching Authority which established it by indicating the name of such Authority, and the international application by indicating the international application number, the name of the applicant, the name of the receiving Office, and the international filing date." (Rule 43.1)

2 "The international search report shall be dated and shall indicate the date on which the international search was actually completed. It shall also indicate the filing date of any earlier application whose priority is claimed." (Rule 43.2)

3 "The international search report shall contain the classification of the subject matter at least according to the International Patent Classification." (Rule 43.3 *(a)*)
"Such classification shall be effected by the International Searching Authority." (Rule 43.3 *(b)*)
"Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols." (Section 504 *(a)*)
"Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system." (Section 504 *(b)*)
"Where the subject matter of the international application is classified both according to the International Patent Classification and to any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other. "(Section 504 *(c)*)

4 "The international search report shall list the classification identification of the fields searched. If that identification is effected on the basis of a classification other than the International Patent Classification, the International Searching Authority shall publish the classification used." (Rule 43.6 *(a)*)

5 "If the international search extended to patents, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, utility certificates of addition, or published applications for any of those kinds of protection, of States, periods, or languages, not included in the minimum documentation as defined in Rule 34, the international search report shall, when practicable, identify the kinds of documents, the States, the periods, and the languages to which it extended. For the purposes of this paragraph, Article 2 (ii) shall not apply." (Rule 43.6 *(b)*)

6 "Subject to paragraphs *(b)* and *(c)*, the international search report shall either state that the International Searching Authority approves the title and the abstract as submitted by the applicant or be accompanied by the text of the title and/or abstract as established by the International Searching Authority under Rules 37 and 38." (Rule 44.2 *(a)*)

7 "If, at the time the international search is completed, the time limit allowed for the applicant to comment on any suggestion of the International Searching Authority in respect of the abstract has not expired, the international search report shall indicate that it is incomplete as far as the abstract is concerned". (Rule 44.2 *(b)*)

8 "Where it is the International Searching Authority which, under Rule 8.2, indicates the figure or figures of the drawings to be published with the abstract, that Authority shall notify the applicant and the International Bureau accordingly." (Section 507)

9 The figure suggested by the applicant is indicated in the check list of the request; see Rule 3.3 *(a)* (iii).

10 "If the applicant fails to make the indication referred to in Rule 3.3 *(a)* (iii), or if the International Searching Authority finds that a figure or figures other than that figure or those figures suggested by the applicant would among all the figures of all the drawings, better characterize the invention, it shall indicate the figure or figures which it so considers. Publications by the International Bureau shall then use the figure or figures so indicated by the International Searching Authority. Otherwise, the figure or figures suggested by the applicant shall be used in the said publications." (Rule 8.2)

11 This part of the report is filled in only where Article 17 (2) *(b)* applies. (Where certain claims were not searched because of lack of unity of invention and non-payment of additional fees, part V—rather than this part—is filled in.) Article 17 (2) reads as follows:

"*(a)* If the International Searching Authority considers

- (i) that the international application relates to a subject matter which the International Searching Authority is not required, under the Regulations, to search, and in the particular case decides not to search, or
- (ii) that the description, the claims, or the drawings, fail to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out,

the said Authority shall so declare and shall notify the applicant and the International Bureau that no international search report will be established.

"*(b)* If any of the situations referred to in subparagraph *(a)* is found to exist in connection with certain claims only, the international search report shall so indicate in respect of such claims, whereas, for the other claims, the said report shall be established as provided in Article 18."

12 This part of the report is filled in only where, in the course of the procedure preceding the issuance of this report the International Searching Authority, having found that the international application does not comply with the requirement of unity of invention, invites the applicant to pay additional fees (see Article 17 (3) *(a)*)
"If the applicant paid additional fees for the international search, the international search report shall so indicate. Furthermore, where the international search was made on the main invention only (Article 17 (3) *(a)*), the international search report shall indicate what parts of the international application were and what parts were not searched." (Rule 43.7)

13 See Article 17 (2) *(a)* (i), quoted in note 11, above, and Rule 39 reading as follows:

"No International Searching Authority shall be required to search an international application if, and to the extent to which, its subject matter is any of the following:

- (i) scientific and mathematical theories,
- (ii) plant or animal varieties or essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes,
- (iii) schemes, rules or methods of doing business, performing purely mental acts or playing games,
- (iv) methods for treatment of the human or animal body by surgery or therapy, as well as diagnostic methods,
- (v) mere presentations of information,
- (vi) computer programs to the extent that the International Searching Authority is not equipped to search prior art concerning such programs."

14 See Article 17 (2) *(a)* (ii), quoted in note 11, above.

15 "The objective of the international search is to discover relevant prior art." (Article 15 (2))
Rule 33.1, entitled "Relevant Prior Art for the International Search," reads as follows:

"*(a)* For the purposes of Article 15 (2), relevant prior art shall consist of everything which has been made available to the public anywhere in the world by means of written disclosure (including drawings and other illustrations) and which is capable of being of assistance in determining that the claimed invention is or is not new and that it does or does not involve an inventive step (i.e., that it is or is not obvious), provided that the making available to the public occurred prior to the international filing date.

"*(b)* When any written disclosure refers to an oral disclosure, use, exhibition, or other means whereby the contents of the written disclosure were made available to the public, and such making available to the public occurred on a date prior to the international filing date, the international search report shall separately mention that fact and the date on which it occurred if the making available to the public of the written disclosure occurred on a date posterior to the international filing date.

"*(c)* Any published application or any patent whose publication date is later but whose filing date, or, where applicable, claimed priority date, is earlier than the international filing date of the international application searched, and which would constitute relevant prior art for the purposes of Article 15 (2) had it been published prior to the international filing date, shall be specially mentioned in the international search report."

16 "Where any document cited in the international search report is of particular relevance, the special indication required by Rule 43.5 *(c)* shall consist of the letter "X" placed next to the citation of the said document." (Section 505)
"Where any document cited in the international search report refers to an oral disclosure, use, exhibition, or other means referred to in Rule 33.1 *(b)*, the separate indication required by that Rule shall consist of the letter "O" placed next to the citation of the said document." (Section 508 *(a)*)
"Where any document cited in the international search report is a published application or patent as defined in Rule 33.1 *(c)*, the special mention required by that Rule shall consist of the letter "E" placed next to the citation of the said document." (Section 508 *(b)*)

"Where any document cited in the international search report is a document which defines the general state of the art, it shall be indicated by the letter "A" placed next to the citation of the said document." (Section 508 *(c)*)
"Where any document cited in the international search report is a document whose publication date occurred earlier than the international filing date of the international application, but later than the priority date claimed in that application, it shall be indicated by the letter "P" next to the citation of the said document." (Section 508 *(d)*)
"Where any document cited in the international search report is a document whose publication date occurred after the filing date or the priority date of the international application and is not in conflict with the said application, but is cited for the principle or theory underlying the invention, which may be useful for a better understanding of the invention, or is cited to show that the reasoning or the facts underlying the invention are incorrect, it shall be indicated by the letter "T" next to the citation of the document." (Section 508 *(e)*)

17 "The international search report shall contain the citations of the documents considered to be relevant." (Rule 43.5 *(a)*)
"Identification of any document cited in the international search report referred to in Rule 43.5 *(b)* shall be made by indicating the following elements in the order in which they are listed:

(a) *In the case of any patent document* (patent documents being patents within the meaning of Article 2 (ii) as well as published applications relating thereto)

- (i) the Office that issued the document, by the two-letter code as in *Annex B*;
- (ii) the kind of document, by the appropriate symbols as in *Annex C*;
- (iii) the number of the document as given to it by the Office that issued it; (for Japanese documents the indication of the year of the reign of the Emperor must precede the patent publication number);
- (iv) the date of publication as indicated on the patent document; and
- (v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a patent document according to paragraph (a) above:
JA, B, 5014535, published 1975, April 8, see column 2 lines 10 to 15.)

(b) *In the case of any book or other separately issued publication*

- (i) the name of the author;
- (ii) the title (including, where applicable, the number of the edition and/or volume);
- (iii) the year of publication (when this coincides with the year of the international application or of the priority claim, the International Searching Authority shall endeavour to determine the month and, if necessary, the day of publication and to indicate these data in the international search report);
- (iv) the name of the publisher;
- (v) as far as available, the place of publication (where only the location of the publisher appears on the book or other separately issued publication, then that location shall be indicated as the place of publication); and
- (vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a book or other separately issued publication according to paragraph (b) above:
H. Walton, 'Microwave Quantum Theory', Volume 2, published 1973, April 4, by Sweet and Maxwell (London), see pages 138 to 192.)

(c) *In the case of any article published in a periodical or other serial publication*

- (i) the title of the periodical or other serial publication;
- (ii) the number of the volume and the date of the issue in which the article appears;
- (iii) as far as available, the place of publication (where only the location of the publisher appears in the periodical or other serial publication, then that location shall be indicated as the place of publication);
- (iv) the author and the title of the article and the number of the page both on which the article starts and ends; and
- (v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of an article published in a periodical or other serial publication according to paragraph (c) above:
IBM Technical Disclosure Bulletin, Volume 17, no. 5, issued 1974 October (Armonk, New York), J. G. Drop, 'Integrated Circuit Personalization at the Module Level', see pages 1344 to 1345.)

(d) *In the case of abstracts*

- (i) the identification of the document containing the abstract in the manner set forth in paragraphs *(a)*, *(b)* and *(c)*, respectively, depending upon whether the abstract is contained in a patent document, in a book or other separately issued publication, or in an article published in a periodical or other serial publication;
- (ii) in the case where the abstract is not published together with the full text document which served as its basis, the identification of both abstract and full text document on the basis of whatever bibliographic data may be available in respect thereto."

(The following example illustrates the citation of an abstract according to paragraph *(d)* (ii) above:
Chemical Abstracts, Volume 75, no. 20, issued 1971, November 15 (Colombus, Ohio, U.S.A.), D. I. Shetulov, 'Surface Effects During Metal Fatigue' see page 163, column 1, the abstract no. 120718k, Fiz.-Khim. Mekh. Mater. 1971,7(2), 7-11 (Russ).) (Section 503)

18 "If only certain passages of the cited document are relevant or particularly relevant, they shall be identified, for example, by indicating the page, the column, or the lines, where the passage appears." (Rule 43.5 *(e)*)

19 "Citations which are not relevant to all the claims shall be cited in relation to the claim or claims to which they are relevant." (Rule 43.5 *(d)*)
"The claims to which cited documents are relevant shall be indicated by placing in the appropriate column of the international search report:

- (i) where the cited document is relevant to one claim, the number of that claim; for example, (2) or (17);
- (ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen; for example, (1-15) or (2-3);
- (iii) where the cited document is relevant to one or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example, (1,6) or (1,7,10);
- (iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1-6, 9-10, 12-15) or (1, 3-4, 6, 9-11)." (Section 509)

20 "Any correspondence from an International Authority to the applicant or his agent shall be marked with the file number of the applicant or the agent, if available, provided it does not exceed ten digits." (Section 108 *(b)*)

21 "The international search report shall be signed by an authorized officer of the International Searching Authority." (Rule 43.8)

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,610,869, P. R. Allison, FLEXIBLE HOSE END CONNECTION; **2,616,450**, Legge and Manning, PILOT CONTROLLED VALVES WITH PRESSURE SURGE RELIEF; **2,657,960**, C. H. Latimer-Needham, PISTON; **2,692,102**, Cobham, Latimer-Needham, Smith and Macgregor, APPARATUS FOR TOWING AND REFUELING AIRCRAFT IN FLIGHT; **2,692,103**, Cobham, Latimer-Needham and Macgregor, APPARATUS FOR TOWING AND REFUELING AIRCRAFT IN FLIGHT; **2,716,527**, C. H. Latimer-Needham, same; **2,728,590**, P. S. Macgregor, SELF-ENGAGING AND SELF-SEALING PIPE COUPLINGS, ESPECIALLY APPLICABLE TO FLIGHT REFUELING PURPOSES; **2,733,079**, R. F. Worlidge, same; **2,788,243**, Goodliffe and Macgregor, HOSE-REELS WITH MEANS FOR JETTISONING THE HOSE AND SEALING THE HOSE CONNECTION; **2,852,290**, R. F. Worlidge, SELF-ENGAGING AND SELF-SEALING PIPE COUPLINGS ESPECIALLY APPLICABLE TO FLIGHT REFUELING PURPOSES; **2,855,223**, P. S. Macgregor, same; **2,867,297**, Macgregor and Goodliffe, HOSE OR CABLE CARRYING WINCHES; **2,904,251**, Gellett and Macgregor, PIPE-COUPLING DEVICES; **2,905,407**, Macgregor and Goodliffe, DEVICE FOR RESILIENTLY ARRESTING THE MOVEMENT OF HOSE OR CABLE-CARRYING WINCHES; **2,953,232**, G. A. Conger, APPARATUS FOR FORMING SHAPED ARTICLES SUCH AS FOUNDRY MOLDS AND CORES; **2,972,163**, Goodliffe, Macgregor and Procter, APPARATUS FOR TRAILING A FLUID-TRANSMITTING HOSE OR TOW-LINE FROM AN AIRCRAFT, filed Apr. 28, 1976, in the United States Court of Claims, Doc. 169–76, *Flight Refueling Limited* v. *The United States.*

2,616,450. (See 2,610,869.)

2,657,960. (See 2,610,869.)

2,692,102. (See 2,610,869.)

2,692,103. (See 2,610,869.)

2,716,527. (See 2,610,869.)

2,728,590. (See 2,610,869.)

2,733,079. (See 2,610,869.)

2,788,243. (See 2,610,869.)

2,826,760, E. G. Rice, COMBINATION STOCKINGS AND PANTY; **3,675,247**, J. O. Ferrell, METHOD AND FABRICATING PANTY HOSE; **Re. 25,360**, E. G. Rice, COMBINATION STOCKINGS AND PANTY, filed Nov. 14, 1975, D.C., W.D.N.C. (Statesville), Doc. ST–C–75–52, *Tights Inc.* v. *Adams-Millis Corporation.* It is hereby ordered that this action be dismissed with prejudice, Apr. 15, 1976.

2,852,290. (See 2,610,869.)

2,855,223. (See 2,610,869.)

2,867,297. (See 2,610,869.)

2,904,251. (See 2,610,869.)

2,905,407. (See 2,610,869.)

2,928,311, I. Z. Martin, HYDROPONIC APPARATUS; **3,458,951**, same, HYDROCULTURE GRASS UNIT, filed Dec. 22, 1975, D.C. Ariz. (Phoenix), Doc. C–75–872–Phx, *S. A. Tombra* v. *Hydroculture Inc.* Stipulation and order of dismissal, June 7, 1976.

2,953,232. (See 2,610,869.)

2,961,777, Nevieel and Rosen, APPARATUS FOR THE STUDY AND TESTING PARTICIPANTS OF A STUDY PROBLEM AND A METHOD OF MAKING SAME; **2,966,830**, Neville and Mallan, TECHNIQUE AND MEANS FOR RENDERING CERTAIN MATERIAL INVISIBLE; **3,055,117**, Bernstein, Grisewood, Valkenburgh, Dwight and Neville, ARTICLE AND METHOD FOR CONCEALING A RESPONSE OR ITEM OF INFORMATION, filed Feb. 10, 1976, D.C.N.J. (Trenton), Doc. 76–250, *System Operations Inc. and Mathematica Inc.* v. *Scientific Games Development Corp. and Dittler Brothers Inc.*

2,972,163. (See 2,610,869.)

2,966,830. (See 2,961,777.)

3,034,513, W. S. Ausherman, REVERSIBLE BAR FOR THRESHING CYLINDERS; **3,208,428**, same, THRESHING CYLINDER BAR; **3,256,867**, same, RASP BAR FOR A THRESHING CYLINDER; **3,297,037**, same, CONCAVE FOR THRESHING CYLINDERS, filed Apr. 12, 1976, D.C. Kans. (Topeka), Doc. 76–56–C5, *William S. Ausherman* v. *Lee K. Stump and Ausherman Manufacturing Company Inc.*

3,055,117. (See 2,961,777.)

3,208,428. (See 3,034,513.)

3,251,514, W. L. Speicher, LIQUID DISPENSING JUG HAVING A VENTED HANDLE; **D. 199,591**, same, JUG, filed July 13, 1976, D.C., M.D. Fla. (Jacksonville), Doc. 76–486–C–J–T, *The Clorox Company* v. *No-Glug Jug Corporation.*

3,256,867. (See 3,034,513.)

3,297,037. (See 3,034,513.)

3,306,261, C. A. Purdy, FEED DELIVERY METHOD AND APPARATUS; **3,522,876**, same, CONVEYOR SYSTEM, filed July 9, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2520, *Chester A. Purdy* v. *P & D Mfg. Company Inc.*

3,313,477, G. Brown, TRANSPARENT BANK CONSTRUCTION HAVING COIN SORTING MEANS, filed Nov. 12, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2830, *Grant Co.* v. *Syndicate Products Inc. et al.* Complaint dismissed without prejudice. Final judgment on consent entered, June 19, 1972.

3,326,468, Bristow and McCloud, TANK CLEANING MACHINE EMPLOYING A PISTON ACTUATED HYDRAULIC CLUTCH; **3,637,138**, J. H. Rucker, TANK CLEANING MACHINE, filed Aug. 13, 1976, D.C. Del. (Wilmington), Doc. 76–269, *Sybron Corporation and Cloud Company* v. *Rochem Ltd.*

3,338,369, W. E. Rexford, TYPEWRITER KEY OPERATED MECHANISM AND MOUNTING AND GUIDING STRUCTURE THEREFOR; **3,724,632**, S. Kuramochi, TYPEWRITER, filed Aug. 19, 1976, D.C., S.D.N.Y., Doc. 76–C–3708–EW, *Louis Marx & Company Inc.* v. *Buddy L. Corporation.*

3,369,518, C. J. Jacobson, AQUATIC VEHICLE; **3,623,447**, same, POWERED AQUATIC VEHICLE; **3,658,026**, same, MARINE VEHICLE STEERING ASSEMBLY; **D. 226,036**, same, JET PROPELLED AQUATIC VEHICLE, filed July 14, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2239–MML, *Clayton Jacobson* v. *Kawasaki Motors Corp. et al.*

3,412,427, Flusfeder and Palmer, APPARATUS FOR MANUFACTURING DISC RECORDS; **3,702,749**, same, filed Aug. 8, 1974, D.C.N.J. (Newark), Doc. C–74–1215, *Lened Inc.* v. *Valley Metallurgical Processing Company Inc.* Stipulation of dismissal of action, Apr. 14, 1976.

3,458,951. (See 2,928,211.)

3,503,530, Burch and Bates, TRANSFER CART FOR TRANSFERRING AN ARTICLE HANDLING VEHICLE BETWEEN AISLES OF A WAREHOUSE; **3,536,299**, same, AUTOMATIC MATERIAL-UNIT STORAGE AND METHOD, filed Aug. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2964, *Clark Equipment Co.* v. *Interlake Inc.*

3,506,965, J. G. Ellis, CONCRETE SLAB JOINT CONSTRUCTION, filed Aug. 25, 1976, D.C., N.D. Tex. (Dallas), Doc. CA–3–76–1125, *Delta Metalforming Co.* v. *Andy Whiting, doing business as Twin Tool & Die Company.*

3,522,876. (See 3,306,261.)

3,531,724, G. H. Fathauer, SIGNAL-SEEKING RADIO RECEIVER; **3,873,924**, same, filed June 28, 1976, D.C., S.D. Ind. (Indianapolis), Doc. IP–76–357–C, *Masco Corporation* v. *Teabury Electronics Corporation and RCA Corp.*

3,536,299. (See 3,503,530.)

3,563,763, Schwall, Rogers and Corbin, SELF-BASTING POULTRY PRODUCTS; **3,835,223**, same, SELF-BASTING POULTRY PRODUCT AND METHOD OF PREPARATION, filed June 30, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2397, *Armour and Company* v. *Land O'Lakes.* **Same,** filed June 30, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2398, *Armour and Company* v. *Hillman's Inc. et al.*

3,623,447. (See 3,369,518.)

3,625,581, P. Frederick, COMPACT OFFICE FILING CABINET filed Nov. 7, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3812, *Supreme Equipment and Systems Corp.* v. *Interstate Industries Inc.* On stipulation, order cause of action and counterclaim dismissed with prejudice, Sept. 28, 1976.

3,637,138. (See 3,326,468.)

3,658,026. (See 3,369,518.)

3,675,247, J. O. Ferrell, METHOD AND FABRICATING PANTY HOSE, filed Apr. 30, 1976, D.C., W.D.N.C. (Statesville), Doc. ST–C–76–13, *Tights Inc.* v. *Aladdin Knit Mills Inc.* Notice of dismissal by plaintiff, it is hereby ordered that this action be dismissed pursuant to Rule 41(a)(1), June 24, 1976. **Same,** filed Apr. 30, 1976, D.C., W.D.N.C. (Statesville), Doc. ST–C–76–15, *Tights Inc.* v. *Slane Hosiery Mills Inc.* Notice of dismissal, it is hereby ordered that this action be dismissed without prejudice, July 7, 1976. **Same,** filed May 28, 1976, D.C., W.D.N.C. (Statesville), Doc. ST–C–76–17, *Tights Inc.* v. *Americal Corporation.* Ordered this complaint dismissed with prejudice, Aug. 4, 1976.

3,675,247. (See 2,826,760.)

3,683,913, Kurtz, Bidwell, Mishkin and Hallstein, UNDERWATER DRAINAGE APPARATUS WITH AIR FLOW METERS, filed Aug. 24, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–76–2719–WMB, *Deknatel Inc.* v. *Sherwood Medical Industries Inc.*

3,702,749. (See 3,412,427.)

3,724,632. (See 3,338,369.)

3,728,749, Elby and Andersen, TIRE FLOAT AND METHOD FOR FORMING SAME, filed Sept. 20, 1976, D.C., W.D. Wash. (Seattle), Doc. C–76–630M, *Topper Floats Inc.* v. *Topper Floats/Northwest Inc.*

3,835,223. (See 3,563,763.)

3,871,585, Crossman, Kenrick and LeMieux, AIR BED; **3,887,187**, same, AIR CUSHION TABLE GAME, filed Mar. 18, 1975, D.C., S.D.N.Y., Doc. 75–C–1332, *Ideal Toy Corp.* v. *Brunswick Corp.* Order and judgment dismissed without prejudice, June 22, 1976. **Same,** filed June 3, 1975, D.C., S.D.N.Y., Doc. 75–C–2599, *Ideal Toy Corporation* v. *Brunswick Corporation.* Order and judgment dismissed without prejudice, June 22, 1976.

3,873,924. (See 3,531,724.)

3,887,187. (See 3,871,585.)

Re. 25,360. (See 2,826,760.)

D. 199,591. (See 3,251,514.)

D. 226,036. (See 3,369,519.)

D. 237,758, E. L. Huffman, EYE SHADE WITH REMOVABLE CROWN, filed June 28, 1976, D.C., M.D. Fla. (Tampa), Doc. 76–512–C–T–K, *Erline L. Huffman* v. *Belleair International.* Judgment order of permanent injunction, Sept. 22, 1976.

Plant Patents 1,829, J. Gaujard, ROSE PLANT; **2,078**, H. C. Swim, ROSE PLANT; **2,474**, D. L. Armstrong, ROSE PLANT; **2,488**, Armstrong and Swim, ROSE PLANT; **2,592**, L. Lens, ROSE PLANT; **3,128**, D. L. Armstrong, ROSE PLANT; **3,303**, same; **3,322**, same; **3,348**, same; **3,440**, same; **3,525**, W. E. Lammerts, ROSE PLANT; **3,847**, H. C. Swim and A. W. Ellis, ROSE PLANT, filed May 21, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–76–1638–HP, *Armstrong Nurseries Inc.* v. *United Rose Growers Inc.*

P.P. 2,078. (See P.P. 1,829.)

P.P. 2,474. (See P.P. 1,829.)

P.P. 2,488. (See P.P. 1,829.)

P.P. 2,592. (See P.P. 1,829.)

P.P. 3,128. (See P.P. 1,829.)

P.P. 3,303. (See P.P. 1,829.)

P.P. 3,322. (See P.P. 1,829.)

P.P. 3,348. (See P.P. 1,829.)

P.P. 3,440. (See P.P. 1,829.)

P.P. 3,525. (See P.P. 1,829.)

PATENT NOTICES

Certificates of Correction for the Week of Jan. 25, 1977

Re. 29,016
D. 240,566
3,582,987
3,615,318
3,631,037
3,661,333
3,712,542
3.781,400
3,841,350
3,852,630
3,859,635
3,871,865
3,874,385
3,876.658
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3,903,025
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3,054,981
3,955,392
3,957,100
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3,962,363
3.965,202
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3,985,123
3.985,260
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3,985,990
3,986,059
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3,986.496
3,987,765
3,987,768
3,987,983
3,988.034
3,989,311
3,991,563
3,991,756
3,991,842
3,992,197

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 18, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-11-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-12-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-19-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-17-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-22-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-5-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-20-76

Expiration of patents: The patents within the range of numbers indicated below expire during January 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,919,443 to 2,923,007 inclusive
Plant Patents	Numbers 1,893 to 1,900, inclusive

REISSUES

JANUARY 25, 1977

Matter enclosed in heavy brackets[ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue These entries will be in numerical order by document publication number

Re. 29,120

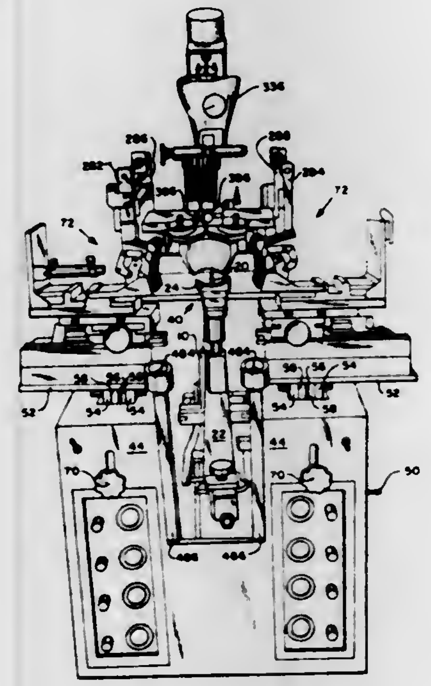
CEMENT LASTING THE SIDE AND HEEL PORTIONS OF A SHOE ASSEMBLY

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Original No. 3,945,075, dated Mar. 23, 1976, Ser. No. 578,682, May 19, 1975. Division of Ser. No. 467,522, May 6, 1974. Application for reissue May 24, 1976, Ser. No. 689,392

Int. Cl.² A43D *21/00*

U.S. Cl. 12—145 **5 Claims**



3. A method, operable on a shoe assembly formed of a last having an upper mounted thereon and an insole located on its bottom, for applying cement in the corner between a particular portion of the margin of said upper and the periphery of the corresponding portion of the insole and for wiping said margin portion against said insole comprising: providing wiping means mounted for movement, in a prescribed plane substantially parallel to the bottom of the wiping means, in a wiping stroke between a retracted position and an advanced position; providing a bar mounted for heightwise movement in a path that is at right angles to said plane; providing a shoe assembly support that is secured to and extends upwardly of the bar; so supporting the shoe assembly bottom-up on the support that said insole portion substantially lies in a plane parallel to said prescribed plane; initially retaining the wiping means in its retracted position; initially retaining the bar, together with the support, in a lower position; placing a hold-down in a working position in a prescribed location above the support wherein the bottom of the hold-down lies in a wiping plane that is substantially coextensive with the bottom of the wiping means; thereafter [yieldably raising] *applying an upwardly directed yieldable force to the bar to yieldably raise* the bar, together with the support, to cause said insole portion to bear against the hold-down and thus locate said insole portion in said wiping plane; thereafter locking the bar against the heightwise movement; thereafter moving the hold-down away from said working position to a remote position spaced from the shoe assembly whereby said insole portion is retained in said wiping plane by said locking of the bar; thereafter causing a cement applying member to have cement applying movement between a starting position and a final position along said corner past said prescribed location, the movement of the hold-down to said remote position preventing interference between the cement applying member and the hold-down during said cement applying movement; applying cement by the cement applying member into said corner during said cement applying movement; thereafter raising the cement applying member upwardly of the insole; [and] thereafter moving the wiping means through said wiping stroke to wipe said margin portion against the corresponding portion of the insole and bond said margin portion to the corresponding portion of the insole by means of the cement; *and, after the commencement of the wiping stroke, unlocking the bar to thereby enable said yieldable force to press the wiped margin portion against the bottom of the wiping means.*

Re. 29,121

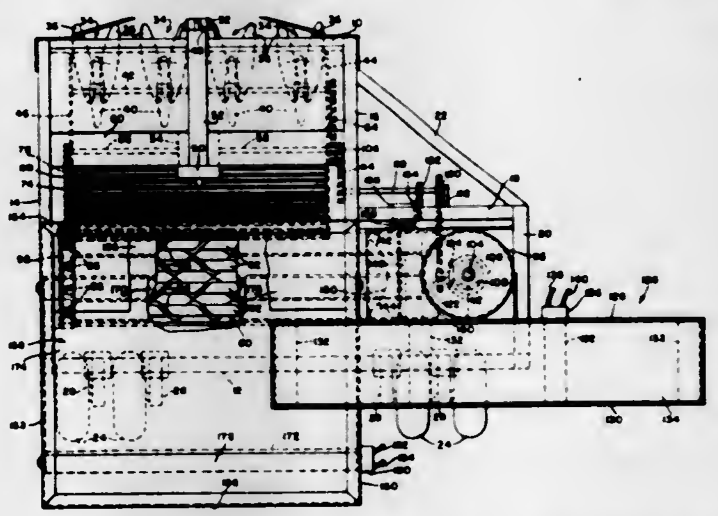
STORAGE TANK AND RECLEANING APPARATUS FOR ROOT CROP HARVESTERS

Richard Wayne Hook, Des Moines, and William Wayne Jackson, Bettendorf, both of Iowa, assignors to Deere & Company, Moline, Ill.

Original No. 3,809,164, dated May 7, 1974, Ser. No. 361,934, May 21, 1973. Application for reissue Oct. 24, 1975, Ser. No. 625,544

Int. Cl.² A01D *17/02*

U.S. Cl. 171—58 **14 Claims**



1. In combination with a root crop harvester having a mobile frame, means carried by the frame for removing roots from the ground and delivering them rearwardly, transverse cleaning conveyor means on the frame for receiving roots from the first-mentioned means and conveying them transversely to one side of the frame while simultaneously removing excess dirt therefrom, a vertically extending conveyor on said one side of the frame for receiving roots from the cleaning conveyor means and conveying the same vertically, and selectively operable means on the upper end of the vertical conveyor for directing roots elevated thereby either outwardly or inwardly relative to the frame, a root storage tank and recleaning apparatus comprising: a walled container mounted on the frame above the cleaning roll conveyor means and inwardly from the vertically extending conveyor, said container having an open top through which roots directed inwardly relative to the frame by the selectively operable means gravitate into the container, and a floor structure for the container having an opening through which roots conveyed thereto gravitate onto the cleaning conveyor, said floor having selectively operable conveyor means associated therewith for conveying roots in the container to said opening.

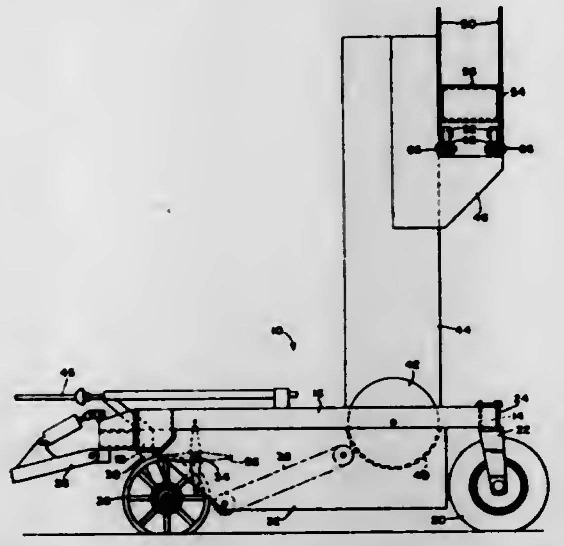
Re. 29,122
ROOT CROP HARVESTER

Richard Wayne Hook, and Richard David Zann, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Original No. 3,757,867, dated Sept. 11, 1973, Ser. No. 229,669, Feb. 28, 1972. Application for reissue Sept. 5, 1975, Ser. No. 610,870

Int. Cl.² A01D *17/02*

U.S. Cl. 171—58 **17 Claims**



1. A root crop harvesting implement including a main frame, root digging means secured across the forward end of the main frame, a generally upright auger conveyor mounted on the main frame rearwardly of the root digging means, conveyor means supported on the main frame for receiving roots from the root digging means and delivering the same to a lower root-receiving area in the auger conveyor, and a lateral conveyor mounted on the upper end of the auger conveyor in root-receiving relationship therewith and normally extending laterally outwardly to one side of the main frame to deliver roots to an outer deposit area, characterized in that the lateral conveyor is mounted on the auger conveyor for selective lateral movement inwardly from its normal position in which it extends laterally outwardly to one side of the main frame to a transport position in which its opposite ends are in generally vertical alignment with the sides of the main frame whereby the implement can be narrowed for transport.

Re. 29,123
VIBRATION ISOLATED UNITARY CAB AND CONTROL CONSOLE CONSTRUCTION FOR A TRACTOR

Donald Irwin Malm, Davenport; Craig Eugene Christie, Cedar Falls, and Claire Eugene Rojohn, Denver, all of Iowa, assignors to Deere & Company, Moline, Ill.

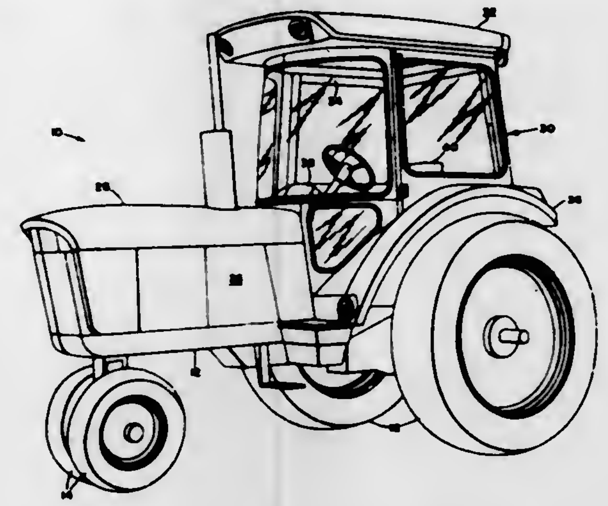
Original No. 3,656,799, dated Apr. 18, 1972, Ser. No. 28,328, Apr. 14, 1970. Application for reissue Sept. 24, 1973, Ser. No. 400,397

Int. Cl.² B62D *27/04*

U.S. Cl. 296—35 R **22 Claims**

1. In a tractor having a rigid main frame including a fore-and-aft extending portion supporting an engine and a hood overlying the engine, and including a pair of rearward transversely extending axle housings projecting outwardly from opposite sides of the main frame, the improvement comprising: a cab disposed generally above a rearward portion of the main frame; a seat mounted within the cab; a generally upright control console disposed forwardly of the seat and rearwardly of the engine and hood and carrying manually actuatable control elements, the cab and control console being connected to form a closed operator's station; a first pair of mounting brackets respectively mounted on opposite sides of the main frame rearwardly of the engine; a first pair of resilient mounting means connecting the control console to the first pair of mounting brackets; a second pair of mounting brackets respectively attached to the opposite axle housing; and a second pair of resilient mounting means connecting the cab to the second pair of mounting brackets, the first and second pairs of mounting means forming a resilient mount for the entire operator's station to isolate the operator' s station from the main frame.

20. In a tractor having a main frame, an operator's cab disposed over a portion of the frame and having a bottom structure, an operator's seat carried in the cab, and a control console disposed over the main frame and at least partially in the cab ahead of the operator's seat, the improvement comprising: first connection means connecting the console to the bottom structure to combine the two as a unitized assembly during normal operation of the tractor; second connection means, including resilient elements, mounting the assembly on and in vibration-isolated relation to the main frame; said first connection means being separable to separate the cab and console while leaving the console on the main frame; and certain of the second connection means also being separable for at least partial separation of the cab away from the tractor and console.



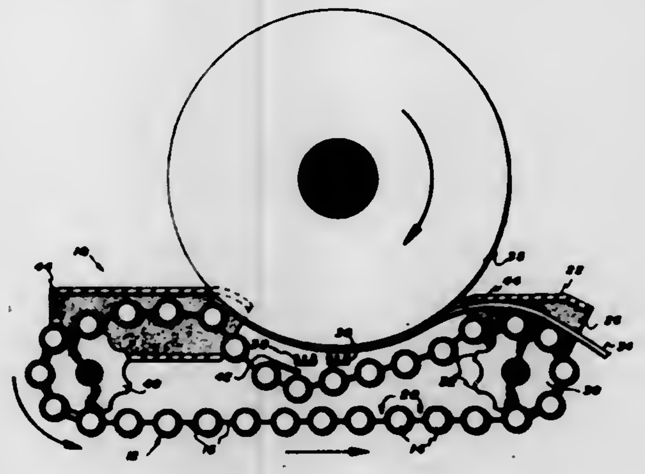
Re. 29,124
SHEET TRANSPORT SYSTEM

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,826,568, dated July 30, 1974, Ser. No. 391,196, Aug. 24, 1973. Application for reissue July 3, 1975, Ser. No. 592,834

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **7 Claims**



15. [The vacuum belt of claim 1] *An endless vacuum belt system for transporting sheets thereon, particularly suited for transporting copy sheets in electrostatographic systems, comprising:*

- *a multiplicity of independent elongated tubular vacuum chambers, each with at least one end opening;*
- *flexible interconnecting means flexibly connecting said tubular vacuum chambers in series to form a flexible integral belt with said tubular vacuum chambers, with said tubular vacuum chambers extending transverse said belt,*
- *said tubular vacuum chambers having sheet-retaining vacuum openings extending therealong;*
- *drive means for moving said belt; and*
- *vacuum means for applying a vacuum inside selected ones of said tubular vacuum chambers from said end openings thereof,*
- *wherein said tubular vacuum chambers are substantially rigid to independently transversely support said belt and any sheets thereon,* wherein said tubular vacuum chambers are individually slideably removable from said belt at said flexible interconnecting means to provide an adjustable length belt.

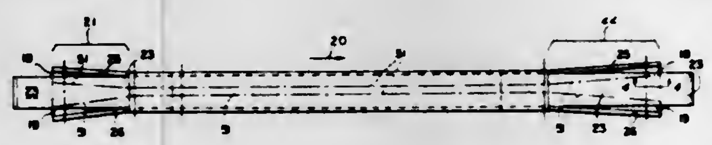
Re. 29,125
CONTINUOUS MOLDING CONVEYOR WITH SIDE CLAMPING AND RELEASE

Andrew T. Kornylak, and Charles P. Tabler, both of Hamilton, Ohio, assignors to Kornylak Corporation, Hamilton, Ohio

Original No. 3,824,057, dated July 16, 1974, Ser. No. 290,744, Sept. 20, 1972. Application for reissue June 2, 1975, Ser. No. 582,997

Int. Cl.² B29D *27/00*

U.S. Cl. 425—115 **31 Claims**



18. Apparatus for the continuous molding of a product, comprising a first endless molding conveyor means, and a second opposed endless molding conveyor means having adjacent runs through a molding zone; said first conveyor means acting as a cover belt to said second conveyor means in said molding zone, said second conveyor means being longitudinally split into at least two generally aligned endless conveyors; at least one of said separate endless conveyors having a side flange within the molding zone closing the corresponding side space between said first and second conveyor means; and means shifting said at least one of said separate endless conveyors and side flange laterally, with respect to the conveying direction in the molding zone, relative to the other of said separate endless conveyors at one of the downstream end and upstream end of the molding zone.

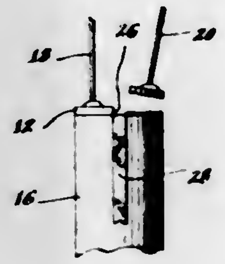
Re. 29,126
WOUND CAPACITOR

Robert Michael Stockman, Brookfield Center, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

Original No. 3,792,323, dated Feb. 12, 1974, Ser. No. 360,056, May 14, 1973. Application for reissue Dec. 24, 1975, Ser. No. 644,189

Int. Cl.² H01G *1/14*

U.S. Cl. 317—260 **11 Claims**



1. In a wound capacitor of the type having first and second conductive plates separated by a dielectric, the first plate being exposed at one end, and the second plate being exposed at the other end, of the capacitor, the improvement which comprises: at least two leads connected to the plate exposed at each end of said capacitor, said leads being secured to the plate in spaced relationship to each other, the exposed plate at each end defining a slot between said leads.

PLANT PATENTS

GRANTED JANUARY 25, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,011

ROSE PLANT

Dorothy Jean Searles Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed Feb. 25, 1976, Ser. No. 661,276

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—3 **1 Claim**

1. A new and distinct variety of rose plant of the climber class, substantially as shown and described, characterized particularly by recurrent flowers of yellow coloring starting as buds of yellow-yellow orange tonality maturing to flowers of strong yellow coloring and good petalage, borne singly and in small clusters with little color change as the flowers age, on a vigorous plant having dark green, thick, holly-like foliage resistant to blackspot and mildew and very winter-hardy.

4,012

ROSE PLANT

Dorothy Jean Searles Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed Feb. 25, 1976, Ser. No. 661,277

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by flowers of unique bicolor tonality combining red and cerise colors with yellow tone shadings on the obverse of the petals with red streaking and red and yellow coloring on the reverse, high center, spiral petal formation and by a plant of upright habit of growth having an abundance of leathery foliage starting yellow green as new and darkening on maturity.

PATENTS

GRANTED JANUARY 25, 1977

ERRATA

For CLASS	See PATENT NO.
062–018	4,004,430
084–207	4,004,484
235–061.55	4,004,729
429–059	4,004,943
429–215	4,004,944
429–244	4,004,945
429–072	4,004,946
429–017	4,004,947
260–002.58	4,005,033
260–002.5 AJ	4,005,034
260–002.5 AK	4,005,035
260–002.5 F	4,005,036
260–004 AR	4,005,037
260–017 R	4,005,038
260–017.3	4,005,039
260–017.4 SC	4,005,040
260–018 TN	4,005,041
526–259	4,005,059
423–102	4,005,061
536–066	4,005,070
424–245	4,005,083
250–527	4,005,135
426–550	4,005,139
358–195	4,005,256
358–256	4,005,257
358–112	4,005,258
358–128	4,005,259
358–128	4,005,260
358–083	4,005,261
358–168	4,005,262
358–227	4,005,263
358–145	4,005,265
354–155	4,005,458
354–156	4,005,459
354–202	4,005,460
354–204	4,005,461
354–246	4,005,462
354–307	4,005,463
354–322	4,005,464

PATENTS

GRANTED JANUARY 25, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

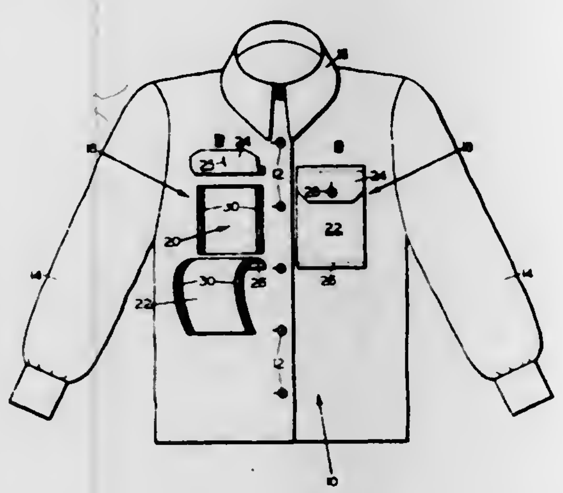
4,004,294
DISGUISED NURSING GARMENT

Louise C. Pinch, Seattle, Wash., assignor to Duane E. Oleson, Lake Oswego, Oreg.

Filed Mar. 4, 1976, Ser. No. 664,007

Int. Cl.² A41D *1/20*

U.S. Cl. 2—104 **5 Claims**



1. A disguised nursing outer garment comprising a front portion and a back portion fastened together at the tops and sides thereof to cover a woman's torso, said front portion having a pair of openings formed therein, each said opening having a bottom edge, a top edge and two side edges, respective bottom flaps attached to said front portion along said bottom edge of each said opening and adapted to swing upwardly across said opening overlapping said two side edges thereof, and fastener means on said front portion of said garment and on said bottom flaps respectively for detachably connecting each of said bottom flaps to said front portion of said garment along each side edge of a respective one of said openings, said fastener means comprising mating strips of curly pile loop and hook fastener material attached to said bottom flaps and side edges of said openings respectively so that said mating strips overlap one another continuously along the overlapping portions of said flaps and side edges of said openings when said bottom flaps are in their upward positions.

4,004,295
PROTECTIVE GLOVE CONSTRUCTED OF FLEXIBLE STRANDS OF METAL WIRE AND FIBER YARN

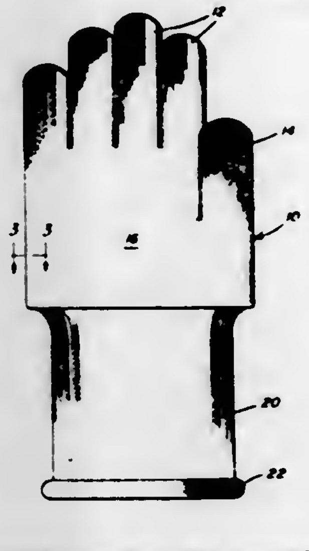
Robert M. Byrnes, Sr., 6720 N. 16th St., Omaha, Nebr. 68110

Filed Dec. 30, 1975, Ser. No. 645,477

Int. Cl.² A41D *19/00*

U.S. Cl. 2—161 R **2 Claims**

1. A glove for use by persons whose hands are subject to injury such as an operator in a meat processing plant who uses a knife during various meat cutting procedures, said glove being constructed of a flexible woven, non-woven or knitted fabric constructed of flexible aramid fiber yarn strands, such as "Kevlar", and flexible metal wire strands, said strands being associated to form a glove, said glove being substantially impenetrable by a knife or the like thereby protecting the wearer from accidental injury.



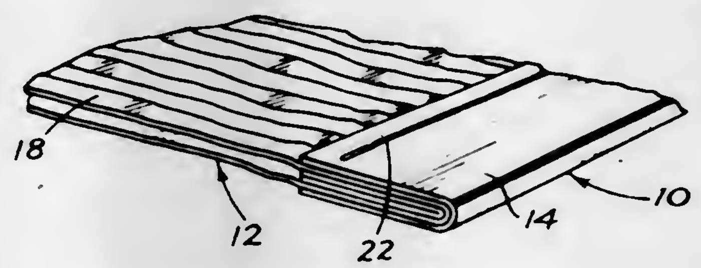
4,004,296
MULTIPLE STRIP GARMENT WITH STITCHED TAPE BORDER AND METHOD OF MANUFACTURING SAME

Walter Kandel, 4834 N. Interstate Ave., Portland, Oreg. 97201

Filed June 23, 1975, Ser. No. 589,042

Int. Cl.² A41D *1/14*

U.S. Cl. 2—211 **12 Claims**



1. A garment comprising:

a. at least one elongated, flexible strip reversely folded along its longitudinal axis to form a waist band,

b. a multiplicity of elongated, thin, flexible ribbons disposed side-by-side and reversely folded intermediate their ends, the folded portions of the ribbons being confined between the folded waist band strip and extending outwardly substantially normal thereto to form a fringe skirt having at least a double thickness of ribbons, and

c. securing means interconnecting the ribbons and strips for securing them together.

4,004,297
TROUSER CONSTRUCTION

George Polack, 66 Isabella St., Apt. 1601, Toronto, Ontario, Canada

Filed Jan. 26, 1976, Ser. No. 652,201

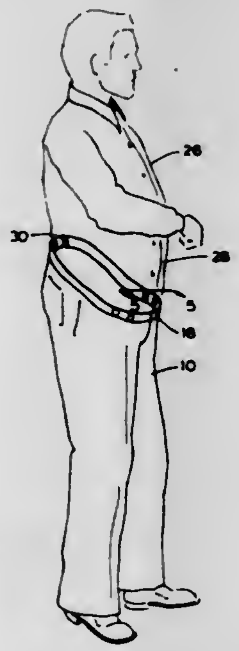
Int. Cl.² A41D *1/06;* **A41B** *9/00*

U.S. Cl. 2—227 **9 Claims**

1. Garment construction, for use in the construction of legged garments such as trousers, pyjamas, briefs, and the like said garment construction comprising;

a front panel for covering the body of the wearer from the body crease downward; said body crease being formed by the line of juncture between the legs and abdomen of the wearer when in a sitting position;

- a rear panel for covering the hips, seat, and lower back of the wearer, said front and rear panels being joined between the crotch, and along either side to form an integral garment;
- said rear panel having an upper edge which is highest at its center point, and slanting continuously and uniformly downwardly towards each side thereof, and said front panel having an upper edge at each side thereof meeting and merging with the upper edge of the rear panel, and slanting continuously and uniformly downwardly towards a lowest point at about the center of the front panel, the front panel thereby being substantially lower than the rear panel,
- a waistband extending around the upper edge of said rear and front panels and being at its highest point at the center of the rear panel, and extending in a continuously and uniformly downwardly slanting direction towards its lowest point adjacent the center of the front panel, said waistband essentially following said body crease whereby to leave the front portion of the abdomen of the wearer unconstricted by said garment, and,
- suspension means for suspending said garment, and being attachable at spaced points around the waistband, said suspension means being longer at the front than at the back.



9. Undergarment construction, for the construction of a brief or the like for clothing the lower part of the body said undergarment construction comprising;

- a front panel portion for covering the body of the wearer from the body crease downward; said body crease being formed by the line of juncture between the legs and abdomen of the wearer when in a sitting position;
- a rear panel portion for covering the hips and seat of the wearer, said front and rear panels being joined in the crotch region, and along either side whereby to provide an integral garment;
- the rear panel having a predetermined height, at about its center, and the upper edge being slanted continuously and uniformly downwardly towards each side, and the front panel having its lowest point at the center, and the upper edge being slanted continuously and uniformly upwardly towards each side, and merging with the upper edge of the rear panel, and there being waistband means extending around said upper edges of said rear and front panels, said waistband means being at its highest point at the center of the rear panel, and slanting continuously and uniformly downwardly and forwardly, being at is lowest point at the center of the front panel.

4,004,298

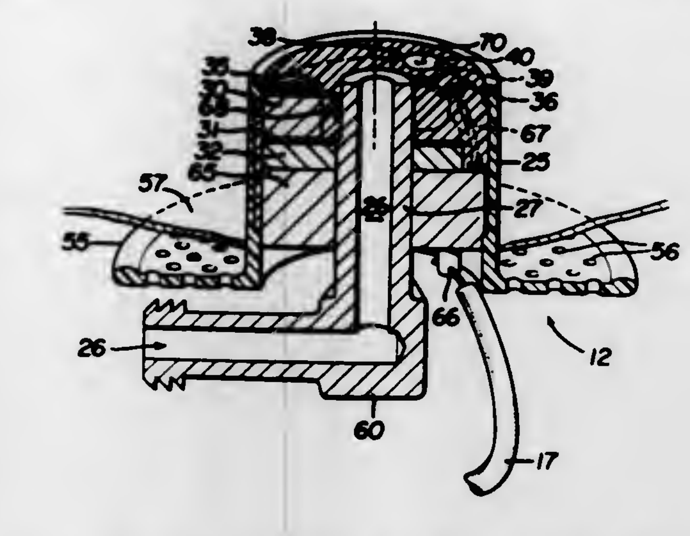
MAGNETICALLY ALIGNED RELEASABLE CONNECTOR

Paul S. Freed, Oak Park, Mich., assignor to Sinai Hospital of Detroit, Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,360

Int. Cl.² A61F *1/00*

U.S. Cl. 3—1 **7 Claims**



1. In a connector including first and second connector means each having a plurality of paths therethrough, the connector members adapted to be secured together to align the corresponding paths in each connector member, each of said connector members having a first end, the first ends of the connector members to be secured together, each of said connector members including a plurality of magnets electrically insulated from each other, the magnets in said first connector member being positioned to generate magnetic fields of a first spatially oriented pattern; the magnets in said second connector member being positioned to generate magnetic fields of a second spatially oriented pattern; at least one magnet in each connector member also being an electrical path; the improvement comprising:

- each connector member including a plate of magnetically conductive material, said plate positioned in said connector member opposed from said first end of said connector member, said plate for reducing the magnetic reluctance in each connector member
- at least one fluid path in each connector member, each fluid path having an outlet port at said connector member first end; and
- said first and second spatially oriented patterns being complementary so that the forces of magnetic attraction hold the first ends of the connector members together with the fluid path and electrical path of each connector member properly aligned, and the forces of magnetic repulsion precluding misalignment of said paths.

4,004,299

CARDIAC REPLACEMENT AND ASSIST DEVICES

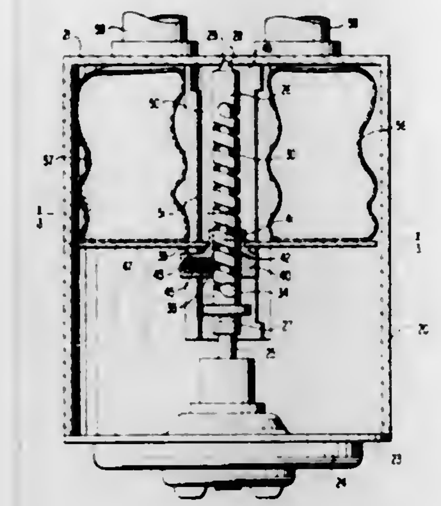
Thomas M. Runge, 2501 Galewood Place, Austin, Tex. 78703

Filed Feb. 12, 1976, Ser. No. 657,703

Int. Cl.² A61F *1/24;* **A61M** *1/03*

U.S. Cl. 3—1.7 **12 Claims**

1. A cardiac pumping unit comprising a housing, a motor connected with the housing, a rotary shaft coupled with the motor and driven thereby within the housing, said shaft having a spiral groove formed therein lengthwise and being partially roofed for the major portion of the length of the groove, said spiral groove having unroofed entrance and exit portions at its opposite ends and one end portion of the spiral groove diminishing gradually in depth adjacent one unroofed portion, a follower assembly on said rotary shaft including a spring-urged headed rider element for said spiral groove adapted to enter the groove at one unroofed portion and to leave the groove at the other unroofed portion while being cammed outwardly by the gradually diminishing depth of the groove adjacent the last-named unroofed portion, at least one pliable collapsible blood retaining sac in said housing, a disc element carried by the follower assembly and moving therewith along said rotary shaft in opposite directions to cyclically compress the sac for expelling blood therefrom followed by expansion of the sac to fill the same with blood, said follower assembly being positively driven axially on said shaft in the direction causing compression of the sac by interaction of the headed rider element and spiral groove, said follower assembly moving in the reverse axial direction on said shaft while the rider element is outside of the groove in response to filling blood pressure and volume in said sac, said partially roofed spiral groove preventing entry of the headed rider element into the groove between said unroofed entrance and exit portions, and a pair of oppositely acting one-way check valves connected with outlet and inlet means of the sac and housing.



4,004,300

FEMORAL PROSTHESIS

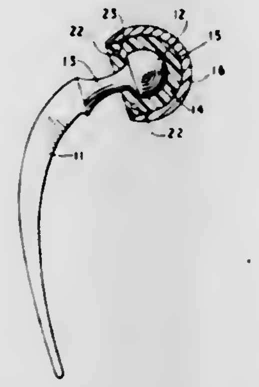
Thomas Anthony English, Westwood Close, Beverley, North Humberside, England

Filed Oct. 9, 1975, Ser. No. 621,063

Claims priority, application United Kingdom, Oct. 14, 1974, 44359/74

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.913 **10 Claims**



1. A femoral prosthesis of the type having a shank, a neck extending from the shank and fixed ball head carried by the neck, which prosthesis comprises, in combination:

- a. a split detachable liner for completely enclosing and conforming to the shape of the fixed ball head and a portion of the neck adjacent thereto, which liner includes a first screw thread on a portion of its outer surface; and
- b. a detachable ball head having a recess corresponding substantially to the outer configuration of the liner, which recess includes a second screw thread corresponding to the first screw thread such that the liner may be snugly fitted and secured within the recess by engaging the first and second screw threads.

4,004,301

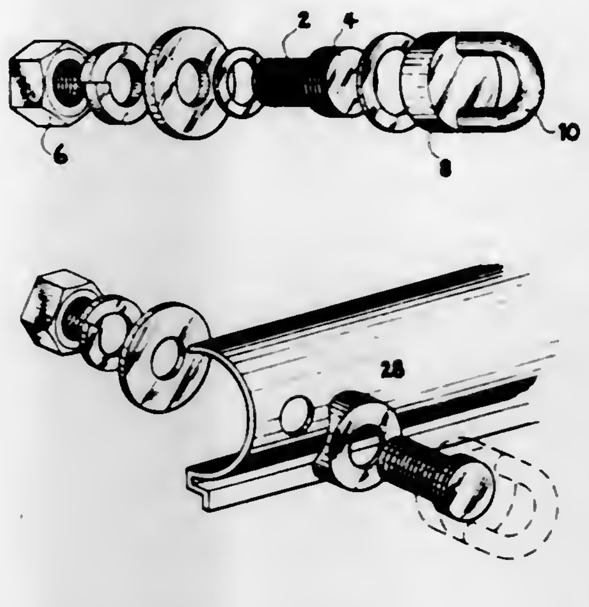
EYELET ARRANGEMENT FOR POOLS

Samuel Kaufman, 860 Pennsylvania Ave., Hagerstown, Md. 21740

Filed Aug. 4, 1975, Ser. No. 601,295

Int. Cl.² E04H *3/16, 3/18;* **F16L** *22/02*

U.S. Cl. 4—172 **2 Claims**



1. Eyelet arrangement for a swimming pool for holding a rope comprising a stem having an enlarged portion at one end and a smaller portion, the enlarged portion and at least that part of the smaller portion remote from the enlarged portion having threads on the exterior thereof, a nut threadedly engaging such end of the smaller portion, and an eye part comprising an internally threaded socket portion threadedly engaging such enlarged portion and an eye integral with the socket portion, the inwardly directed annular face of the socket portion being larger in cross section than the enlarged portion for engaging a liner between such face and the wall of the pool whereby a liner may be removed by removal of said eye part without access to such nut.

4,004,302

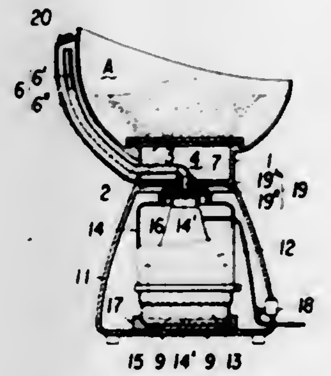
AIR-FOAM GENERATING APPARATUS FOR BATH

Sanji Hori, 9-29 Sako 6-Bancho, Tokushima, Japan

Filed May 23, 1975, Ser. No. 580,288

Int. Cl.² A47K *3/10*

U.S. Cl. 4—178 **2 Claims**



1. In a foam-bathing apparatus, an air-foam generating apparatus for use beneath a body of bathing water comprising a hollow case including a porous foam-generating plate overlying the hollow case, said porous plate including a plurality of meandering passages communicating outer and interior surface of said porous plate with the interior of said case; means for directing pressurized air into said hollow case and out through said porous plate passages for passing through the body of bathing water, said passages having diameters ranging from 0.013 mm to 0.48 mm and producing sonic waves when

pressurized air is forced through said passages so that a user's skin is subjected to both frictional and vibrational stimuli by air-foams generated beneath the surface of the body of bathing water and engaging a user's skin, said generating plate consisting of a porous porcelain material comprising sintered aluminum oxide grain vitrified (Al_2O_2) produced at a high temperature with the use of an inorganic bonding agents.

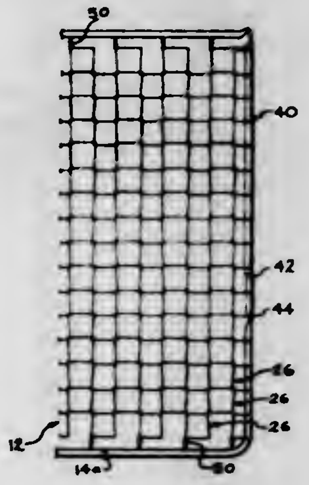
4,004,303
SPRING ASSEMBLY AND BOXSPRING UNIT INCORPORATING SAME

Jack C. Mandusky, and Neville L. Riddle, both of Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed July 21, 1975, Ser. No. 597,411

Int. Cl.² A47C *23/02*

U.S. Cl. 5—247 **2 Claims**



1. For use with a generally rectangular frame, a spring assembly comprising a plurality of individual wire spring members interconnected to form a horizontal yieldable support deck, each spring member having a plurality of side-by-side U-shaped sections, each of said U-shaped sections comprising a base portion and generally parallel leg portions terminating in transversely extending leg extensions, one of said leg extensions being integral with the leg extension of an adjacent U-shaped section on one side thereof and the other of said leg extensions being integral with the adjacent U-shaped section on the other side thereof, said spring members being interconnected so that the junctures of the base portion and the leg portions of each U-shaped section interconnect with an adjacent spring member at the junctures of the leg portions and the leg extensions of the U-shaped section to thereby enable pivotal movement of said spring members relative to each other, the leg portions of each U-shaped section being outwardly bent away from each other intermediate their ends to facilitate assembly of adjacent spring members by moving the base portions on one spring member through the spaces between the leg portions which are outwardly bent away from each other in the other spring member.

4,004,304
BOX SPRING ASSEMBLY

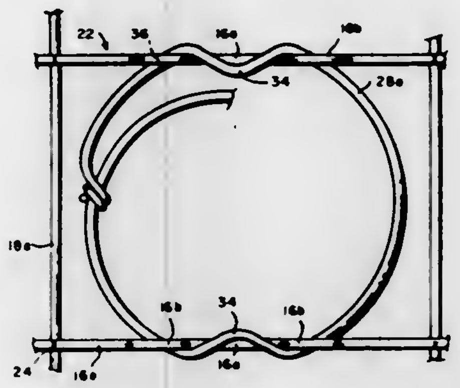
Walter Harold Kane, Auburn, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Dec. 15, 1975, Ser. No. 640,751

Int. Cl.² A47C *23/02*

U.S. Cl. 5—267 **8 Claims**

1. A spring assembly comprising a border wire to which are attached transversely and longitudinally extending pairs of crossing wires welded at their intersections, said pairs of crossing wires defining seats for attachment thereto of the end loops of coil springs characterized in that at least two opposed wires of the seats contain longitudinally spaced deviations in planes perpendicular to the seats which define in conjunction with the portions of the wire therebetween vertically spaced and longitudinally spaced bearing surfaces and the end loops contain diametrically disposed deviations of such configuration as to require relative deformation of the wires of the seat and the end loops to be interengaged and to become locked by restoration to their undeformed state and wherein the deviations in the end loops lie in the planes of the end loops such that when the end loops are sprung into engagement with the wires, the arcuate portions of the end loops pass through the deviations in the wires from one side and the deviating portions of the end loops pass between the deviations in the wires from the other side in engagement with the vertically and longitudinally spaced bearing surfaces provided by said deviating and nondeviating portions of the wires so as to prevent relative movement of the end loops perpendicularly and parallel to the plane of the grid.



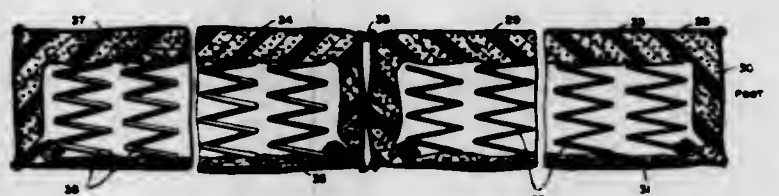
4,004,305
SLEEPER SOFA AND MATTRESS COMBINATION

Arnold D. Rubin, Highland Park, Ill., assignor to Schnadig Corporation, Chicago, Ill.

Filed Apr. 2, 1976, Ser. No. 673,086

Int. Cl.² A47C *17/14, 28/08*

U.S. Cl. 5—352 **6 Claims**



1. A sleeper sofa comprising a sofa frame, a folding mattress frame, and a folding spring mattress, the sofa frame having a deck, a pair of arms, and a back, the mattress frame including a head section having a front end and a rear end and a foot section pivotally attached to the rear end of the head section, the head section being pivotally attached to the sofa frame between the arms and being movable between a sleeping position in which the head section extends generally horizontally away from the back of the sofa frame and a sitting position in which the head section is positioned above the deck and between the arms, the foot section being pivotable between a sleeping position in which the foot section extends generally horizontally away from the rear end of the head section and a sitting position in which the foot-section overlies a rear portion of the head section, the mattress having a head section which is supported by the head section of the mattress frame and a foot section which is supported by the foot section of the mattress frame and which is hingedly attached to the head section of the mattress, the foot section of the mattress being pivotable with the foot section of the mattress frame between a sleeping position in which the foot section of the mattress is supported by the foot section of the mattress frame and a sitting position in which the foot section of the mattress overlies a rear portion of the head section of the mattress and is supported thereby, the head and foot sections of the mattress being provided with support springs of different compressibility, the springs of the foot section having greater compressibility than the springs of the head section to provide a relatively soft foot section and a relatively firm head section whereby the body of a person is supported primarily by the relatively firm head section of the mattress when the mattress and mattress frame are in their sleeping positions and a person sits on the relatively soft foot section of the mattress when the mattress and mattress frame are in their sitting positions.

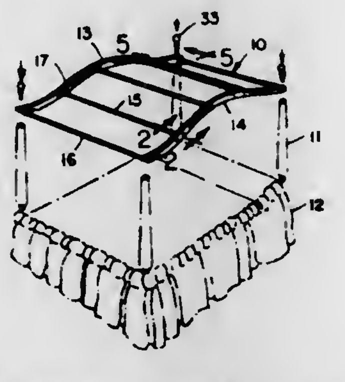
4,004,306
BED CANOPY FRAME

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Filed Nov. 12, 1975, Ser. No. 631,042

Int. Cl.² A47C *29/00*

U.S. Cl. 5—362 **5 Claims**



1. A canopy bed frame comprising two arched longitudinal members and a plurality of relatively rigid lateral members adapted to be interconnected adjacent the ends thereof to form a generally ladder-like rectangular frame, said longitudinal members being equipped with receptacles for receiving said lateral members in releasably adjustable fashion, each longitudinal member being constructed of resilient plastic material and having bottom and side walls to provide an open-topped channel shape in cross section, each receptacle being a block integrated with one side wall of an associated longitudinal member and having a bore receiving its associated lateral member, said lateral members having a circular cross section, said bottom wall being equipped with an integral upstanding projection aligned with said bore and slightly overlapping the same whereby said projection flexes to apply an upward bias to a lateral member passing by said projection to stabilize said lateral member in position.

4,004,307
COLLAPSIBLE BOAT FRAME

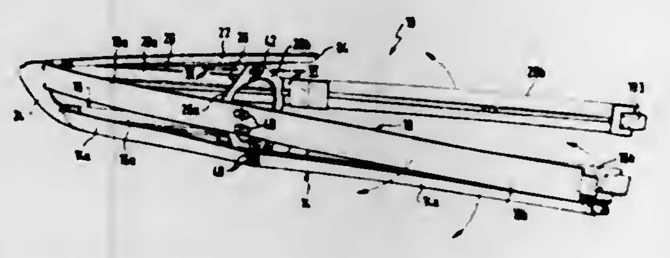
Franz Hermann, Aisingerwies, Germany, assignor to Klepper-Werke, Rosenheim, Germany

Continuation of Ser. No. 589,666, June 24, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,879

Claims priority, application Germany, July 8, 1974, 2432641

Int. Cl.² B63B *7/04*

U.S. Cl. 9—2 C **12 Claims**



1. A collapsible boat frame comprising a fore section and an aft section, each section being elongated and having a longitudinal median plane, each section including:

- a. a post located in said plane;
- b. two sets of elongated stringers extending away from said post on respective opposite sides of said plane,
  - 1. each stringer of said sets having a first longitudinal portion movably attached to said post and a second portion hingedly attached to said first portion for movement toward and away from a folded position in which said portions are elongated in a common direction and are juxtaposed transversely to said common direction,
  - 2. each set of stringers including a bottom stringer having a major longitudinal face on the first portion thereof;
- c. a rib frame including two rib frame portions hingedly connected for movement about a pivot axis substantially parallel to said plane between an operative position in which said rib frame portions extend from said plane in opposite respective directions, and an inoperative position in which said rib frame portions are adjacent said plane;
- d. a plurality of pivot means connecting said rib frame with said first stringer portions respectively for relative pivoting movement,
  - 1. said pivot means including first and second pivot means connecting said rib frame portions to said first portions of said bottom stringers respectively,
  - 2. said first and second pivot means including means for angularly moving the first bottom stringer portions relative to each other in response to movement of said rib frame portions between said operative and inoperative positions,
  - 3. said major faces of said first bottom stringer portions converging toward said plane at a predetermined angle in said operative position of the rib frame portions, and at an angle smaller than said predetermined angle in said inoperative position of the rib frame portions; and
- e. coupling means on the second portion of each stringer for releasably coupling said second portion to the second portion of the corresponding stringer in the other section, the median planes of said sections substantially coinciding when the respective stringers thereof are coupled by said coupling means.

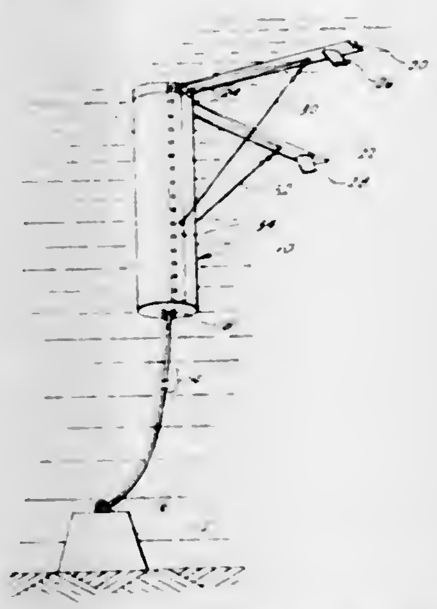
4,004,308
HYDRODYNAMIC STABILIZING DEVICE

Calvin A. Gongwer, Glendora, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Mar. 11, 1976, Ser. No. 665,994

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **6 Claims**



1. A stabilizing structure for an elongated, generally cylindrical housing to be deployed into a body of water having a current, including an anchor and tethering means connecting said housing to said anchor,

a pair of positively buoyant arms hinged to said housing near the top thereof and movable between a first position folded against the side of said housing and a second position extended outwardly from said side, said arms having an airfoil-like cross-section capable when extended into said current of imparting lift to said arms and to said housing, said arms being extended at an angle between each other with the current direction effectively bisecting said angle,

resilient means also extending outwardly along the under side of said arms, and

cable means extending outwardly from said housing toward said arms and fastened to said resilient means.

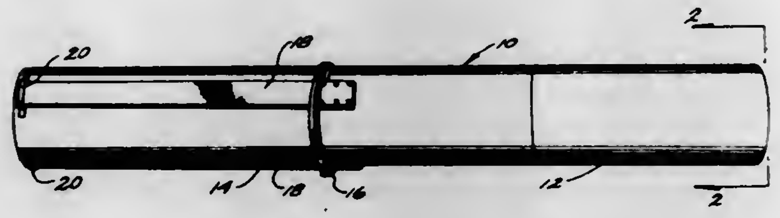
4,004,309
HYDRODYNAMIC STABILIZING DEVICE

Calvin A. Gongwer, Glendora, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Apr. 5, 1976, Ser. No. 673,770

Int. Cl.^{2} B63B *21/52*

U.S. Cl. 9—8 R **5 Claims**



1. A structure for deployment into the ocean or similar large body of water comprising

a generally cylindrical housing,

a generally cylindrical removable housing fastened to said first named housing as an extension thereof,

a plurality of brackets attached to said removable housing at the end thereof remote from its attachment to said cylindrical housing,

a releasable ring-shaped clamp securing said removable housing to said cylindrical housing,

and a plurality of fin members each of which is attached at one end to said cylindrical housing at its end nearest said ring-shaped clamp, said fin membrs extending along the length of said removable housing and secured at their opposite ends under said brackets, said fin members being formed of elongated flat strips of metal which are deformed over substantially their entire length to curve outwardly away from said cylindrical housing when not secured under said brackets;

such that when said structure is deployed in the water said clamp is released, permitting said removable housing to be separated from said cylindrical housing and said fins to spring outwardly, and means causing said cylindrical housing to rotate around its axis as it travels downwardly in the water.

4,004,310
MARKER BUOY RECOVERY AID

Albert J. Faulstich, Laurel; James B. Johnson, Silver Spring, and Gerhard B. Winkler, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,646

Int. Cl.^{2} B63C *7/26*

U.S. Cl. 9—9 **5 Claims**

1. A marker buoy attachable to a submerisible article comprising, in combination:

a buoyant housing having an interior chamber and an annular groove on the external surface;

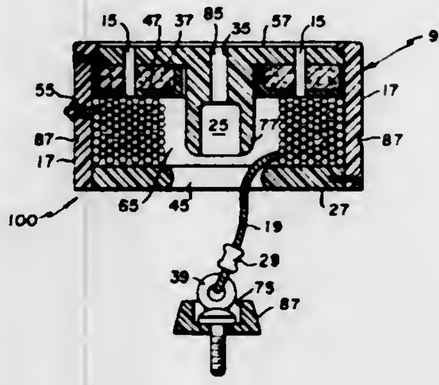
a concentrated, buoyant material attached to the top surface of said chamber to provide initial upright orientation of the upper portion of said housing when afloat;

a length of flexible cord coiled within and extending from said chamber for connecting said housing to a submersible article;

venting means including an opening in each of the upper and lower surfaces of said housing to permit water flow through said interior chamber; and

controllable attachment means for detachably securing said housing to a submersible article,

whereupon release of said housing from the submersible article, said buoyant housing and said concentrated buoyant material effect and upright orientation of said housing and a positive buoyancy, and the difference between the hydrostatic and the chamber pressures vents water through said venting means as the buoy rises to the water surface.



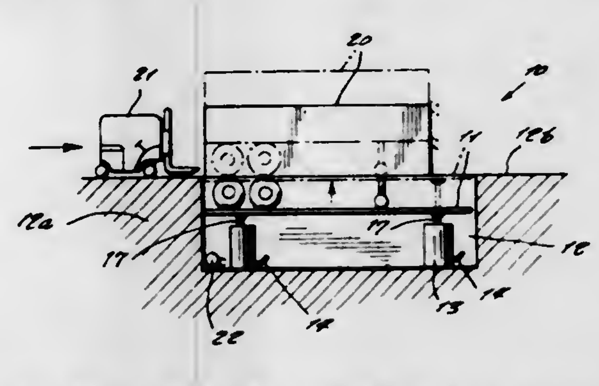
4,004,311
HYDRAULIC LOADING AND UNLOADING DOCK

Sebastian Nola, 311 E. Empire St., San Jose, Calif. 95112

Filed Nov. 12, 1975, Ser. No. 631,060

Int. Cl.^{2} E01D *1/00*

U.S. Cl. 14—71.7 **2 Claims**



1. A hydraulic loading and unloading dock, comprising in combination, an open pit formed within a reinforced concrete, a pair of hydraulic cylinders mounted upon a bottom of said pit, a horizontal platform supported upon said hydraulic cylinders, said platform being vertically movable within said pit and up to an upper edge of said pit; said platform being exchangeable with a second platform, the first said platform being adaptable for truck trailers to ride thereupon, and said second platform being provided with rails for railroad cars to travel thereupon; each said platform having a plurality of transverse panels removable from said platform so as to allow access from above down into said pit therebeneath, mounting housings being fixedly secured to an underside of said platforms, said mounting housings being connected by shafts to the upper end of piston shafts of said hydraulic cylinders; and a vertically upwardly slideable guide being supported in a vertical track along one end edge of said pit for insurance of a vehicle upon said platforms clearing an edge of said pit when being downwardly lowered into said pit; said guide side being flush with a side wall of said pit.

4,004,312
SURFACE WASHING TOOL

Donald Eason, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 5, 1976, Ser. No. 673,725

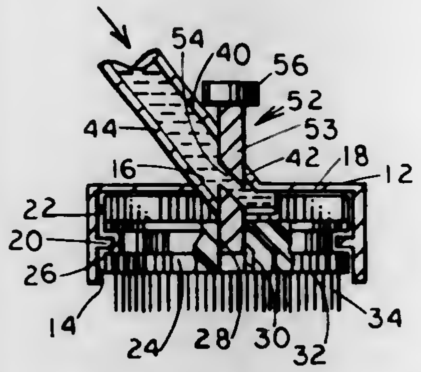
Int. Cl.^{2} A46B *13/06*

U.S. Cl. 15—29 **6 Claims**

1. A surface washing tool comprising:

a. a hollow open ended housing forming a chamber therein, said housing having a hole disposed in the closed end thereof said chamber being provided with a ridge in the walls thereof parallel to said closed side;

b. a round brush member rotatably disposed within said chamber having a central opening therein, a passage from said central opening out through the lower surface thereof, and a groove disposed in the sides of said member, said groove adapted to slideably cooperate with said ridge, said brush member also including a plurality of bristles affixed to the lower surface thereof and a plurality of fin elements affixed to the upper surface of said brush member;



c. a tube element affixed on one end over said hole to said housing, said tubing element having an aperture concentrically aligned with said hole, said tubing element being sealed on the other end and means for affixing a hose to said tubing element for communicating fluids therethrough; and

d. a valve means having a tunnel suitable for fluids therethrough adapted to be slideably retained within said hole, said opening, and said aperture, said tunnel adapted to pass fluids from said tubing element with said tunnel in the down position and adapted to spray said fluids from said tubing element against said fin elements of said brush member imparting rotation thereto.

4,004,313
SCRUBBING UNIT FOR VEHICLE-WASHING STATION

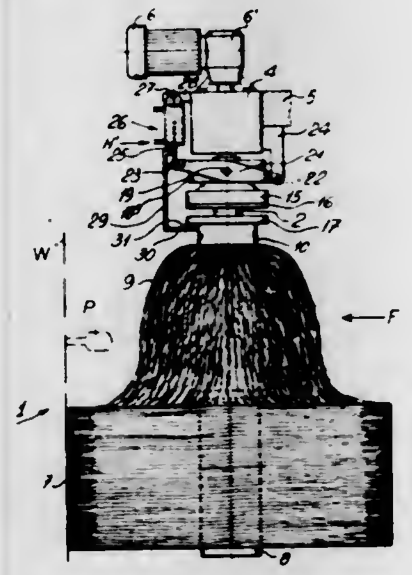
Uberto Capra, Alte Ceccato (Venice), Italy, assignor to Ceccato & C. S.p.A., Alte Ceccato (Venice), Italy

Filed Sept. 8, 1975, Ser. No. 611,254

Claims priority, application Italy, Sept. 10, 1974, 27130/74

Int. Cl.^{2} B60S *3/06*

U.S. Cl. 15—53 AB **8 Claims**



1. A vehicle-washing station provided with a support and at least one scrubbing unit engageable with an upright surface of a vehicle moving relatively to said support, said scrubbing unit comprising:

a generally vertical shaft journaled in said support;

drive means for rotating said shaft;

a lower and an upper brush section carried next to each other on said shaft, each of said brush sections having a core provided with a set of flexible bristles forming a substantially cylindrical body during rotation, the bodies of said brush sections being of substantially like diameters, the core of said lower brush section being rigid with said shaft, the core of said upper brush section being freely rotatable on said shaft;

operating means for selectively coupling said upper brush section with said shaft; and

an axially slidable member keyed to said shaft above said upper brush section and displaceable by said operating means between an idling position and a driving position, the core of said upper brush section having a formation engageable by said member in said driving position, said member being provided with an extension terminating in a brake shoe engageable with said formation for arresting said upper brush section in said idling position.

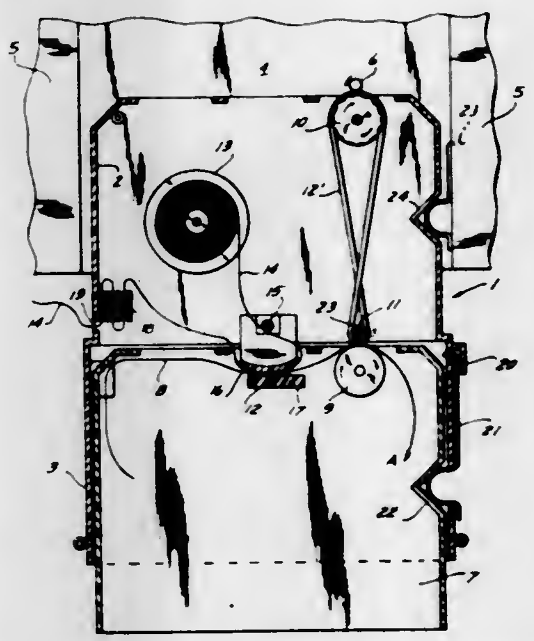
4,004,314
MAGNETIC TAPE CLEANING DEVICE

Herman D. Post, Great Neck, and Seymour Scher, East Meadow, both of N.Y., assignors to Robins Industries Corporation, Commack, N.Y.

Filed Jan. 7, 1976, Ser. No. 646,959

Int. Cl.^{2} G11B *5/00*

U.S. Cl. 15—97 R **13 Claims**



1. A tape cleaning device, particularly for cleaning magnetic tape contained in cartridges, cassettes or analogous receptacles, comprising a housing having a leading end insertable into a tape recording and playing unit having a capstan drive, and a trailing end adapted to receive a receptacle accommodating magnetic tape which is to be cleaned; motion-transmitting means adapted to be driven by said capstan drive and operative for advancing the magnetic tape in said receptacle so as to convey successive portions of the magnetic tape towards and past a predetermined location on said housing; and means for supplying a portion of cleaning tape to said predetermined location for physical contact with said advancing magnetic tape for cleaning the latter.

4,004,315
SUPPORT DEVICE FOR USE WITH A TOWEL OR THE LIKE

Elbert O. Rials, 3603 Oakhurst Drive, Midwest City, Okla. 73110

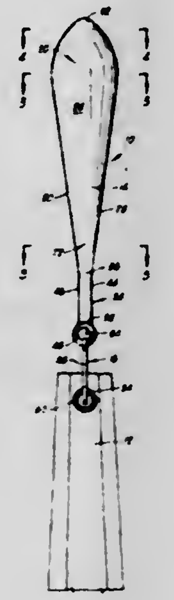
Filed Jan. 19, 1976, Ser. No. 650,431

Int. Cl.^{2} A47K *10/12*

U.S. Cl. 15—209 R **10 Claims**

1. A support device for accessibly supporting a towel in wearing apparel comprising:

a rigid panel member having a first end portion terminating in a rounded end face and having a second end portion, and having convex arcuate opposite sides and convex arcuate opposite edges extending between the first and second end portions, the opposite sides converging from the first end portion toward the second end portion, and the opposite edges converging from the first end portion toward the second end portion whereby said first end portion is thicker and wider than said second end portion;



a flexible neck portion have first and second end portions, and opposite sides and opposite edges, with the first end portion thereof connected to the second end portion of said panel member whereby said neck portion extends from said panel member;

connector means carried on the second end portion of said neck portion; and

hook means secured to said connector means for hooking said support device to a towel.

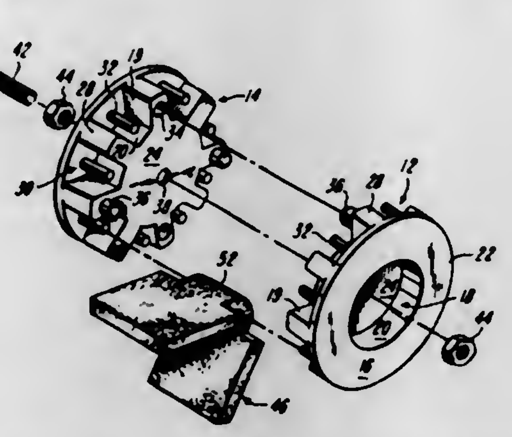
4,004,316
BUFFING AND POLISHING DEVICE

Gregory F. Ali, 2855 Locke, Beavercreek, Ohio

Filed June 13, 1975, Ser. No. 586,797

Int. Cl.² B24D *13/06*

U.S. Cl. 15—230.16 **9 Claims**



1. A buffing, polishing or like device including a hub structure comprised of a pair of substantially identical hub segments each of which includes a cylindrically configured hub portion the outer peripheral surface of which incorporates a series of circumferentially spaced, radially projected, longitudinally extending spokes and a radial flange, a plurality of pin means fixed to said flange to be generally perpendicular thereto and to extend between and in a spaced generally parallel relation to adjacent divergent side surfaces of an adjacent pair of said spokes, said segments including means for a coupling of one thereof to the other to produce said hub structure, said coupling means being arranged and configured to require a rotative movement of one said hub segments relative the other in order to achieve said coupling thereof, in the process of which said spokes, said flanges and the hub portions from which they project define a series of circumferentially spaced pockets which open outwardly from said hub structure and a plurality of strip-like buffing and polishing elements having their intermediate portions looped about the respectively associated pin means and anchored in said pockets and projected outwardly of said hub structure so formed.

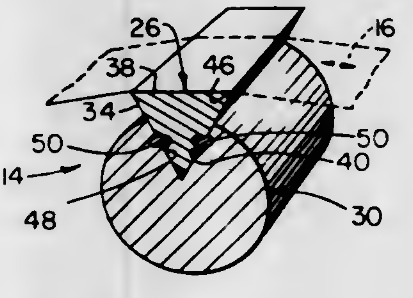
4,004,317
MOUNTING FOR SAPPHIRE BLADED TOOL

John H. Beedle, Belmont, Mass., assignor to Kybe Corporation, Waltham, Mass.

Filed Sept. 5, 1975, Ser. No. 610,626

Int. Cl.² B08B *1/02*; G11B *3/58*

U.S. Cl. 15—236 A **10 Claims**



1. A scraping device for cleaning magnetic tape comprising, in combination,

A. a triangular prism-like sapphire blade elongated between generally triangular end surfaces and having first, second and third faces extending between the end surfaces, and having scraping edges formed at the intersections of said third face with said first face and with said second face, said first and second faces each being recessed with a slot extending longitudinally between said end surfaces with the sides of the slot being spaced from the edges of the blade face,

B. a holder having a generally V-shaped groove and seatingly receiving said blade in said groove with said first and second faces in substantially contiguous abutment with the sides of said groove, each wall of said groove being recessed with a longitudinally extending slot located opposite and in communication with the slot in the contiguous face of said blade, and

C. a key filling each pair of opposed slots in said blade and in said groove to secure said blade in said holder, said key being formed of material applied in a conformable state to fill said slots and set to a substantially rigid shear-resistant state.

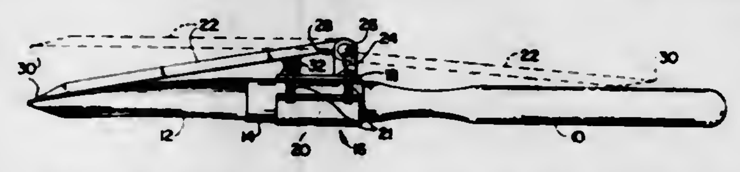
4,004,318
EDGE GUIDE ATTACHMENT FOR A PAINT BRUSH

Carl E. Balkus, Jr., 147 Deepwood Drive, Amston, Conn. 06231

Filed Sept. 25, 1975, Ser. No. 616,579

Int. Cl.² A46B *17/00*; B44D *3/22*

U.S. Cl. 15—248 R **6 Claims**



1. An edge guide for a paint brush having a handle, and bristles clamped to the handle by a collar portion, said guide comprising:

a. a clamp assembly adapted for attachment to the collar portion of the paint brush and defining a first part of a hinged joint,

b. a guard defining a second mating part of said hinged joint adjacent one end thereof, said guard having an opposite end with a free edge parallel the hinge line, which hinge line is so located that the guard is movable between an inactive position along side the handle substantially parallel thereto and a ready position along side the bristles,

c. a coil spring having one end acting on said guard in spaced relation to said hinge line and the other end acting on said clamp assembly at least when said guard is in its ready position, said one end of said spring abutting said guard when said guard is in said ready position, said other end of said spring secured to said clamp assembly,

d. said guard being movable against the force of said spring and toward the brush bristles so that said free edge of said guard provides the user with a paint shield at one side of his brush to permit him to strike a straight line of paint with his brush, and the guard being free of the spring when swung to the inactive position.

4,004,319
DRAPERY HOLDER

F. Grant Getchell, 570 Antelope Way, Eugene, Oreg. 97401

Filed July 21, 1975, Ser. No. 597,475

Int. Cl.² A47H *15/00*

U.S. Cl. 16—93 D **1 Claim**

1. A drapery holder for temporary supporting engagement with the folds of a drapery, said holder comprising in combination,

an elongate support having upper and lower surface areas,

a series of drapery engaging members in slideable engagement with said support, each of said members having an elongate upper portion and an enlarged bottom portion with upright drapery engaging surfaces on said bottom portion cooperating with like surfaces on adjacent like members to clamp drapery folds therebetween, each of said upper positions of said drapery engaging members further having an opening defined by diagonally offset upper and lower edges for contact with the upper and lower surfaces of said elongate support, said opening also defined by a downwardly inclined surface area continguous with said lower edge, reaction forces exerted in one direction by a clamped drapery fold on the lower portion of a member causing said lower edge of same to rotate about said upper edge into locked engagement with the lower surface of said support while conversely finger-tip pressure applied to the upper portion of the holder will release said lower edge permitting drapery releasing movement of the drapery engaging member along the elongate support.

4,004,320
APPARATUS FOR USE IN EVISCERATION OF POULTRY

Donald J. Scheier, and Homer A. Haynes, both of Kansas City, Mo., assignors to Gordon Johnson Company, Kansas City, Mo.

Division of Ser. No. 242,722, April 10, 1972, Pat. No. 3,802,028. This application Oct. 3, 1973, Ser. No. 403,119

Int. Cl.² A22C *21/06*

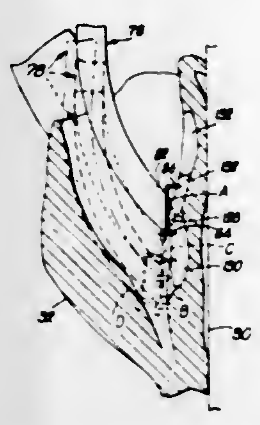
U.S. Cl. 17—11 **25 Claims**

1. In an eviscerating machine:

a support for a carcass having an access opening to the body cavity thereof;

a scrubbing tool movable into and out of said cavity through said opening; and

mechanism for reciprocating the tool through a number of scrubbing strokes after it is moved into said cavity for



detaching at least certain viscera from the carcass prior to moving the tool out of the cavity.

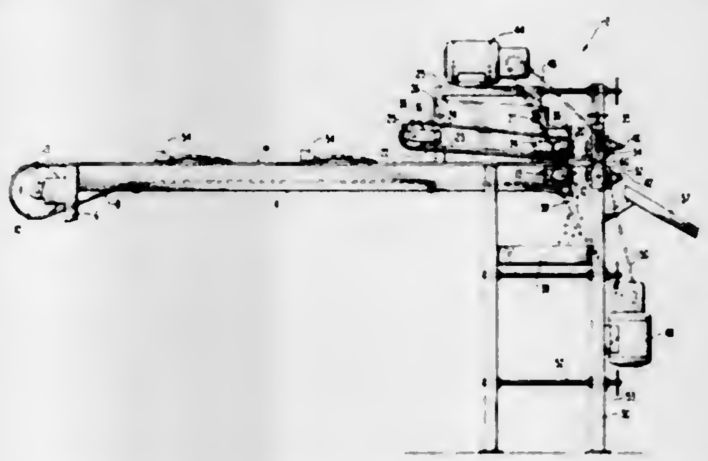
4,004,321
CRAB MEAT EXPRESSING MACHINE AND METHOD

George H. Harrison, 817 Jefferson Ave., Newport News, Va. 23607

Filed Mar. 28, 1975, Ser. No. 563,218

Int. Cl.² A22C *29/00*

U.S. Cl. 17—48 **18 Claims**



1. The method of expressing crab meat from the shell of a half body of an at least partly-cooked crab, wherein the crab has been cleaned, de-clawed, and severed in half along its fore-and-aft mid-line to expose the central cavity of the half body along a substantially vertical section opposite the fin side of the body which comprises;

moving the half body along a path with the exposed section facing contra to the direction of travel and the fin side of the body facing forwardly in the direction of travel,

and applying squeezing forces to the body by pressing the same between two opposed surfaces which converge towards one another along substantially straight lines, which forces increase gradually from the fin side towards the exposed section of the body until meat is expressed from the body through the exposed section thereof.

4,004,322
ASEPTIC SERUM COLLECTION METHOD

Rex S. Spendlove, Logan, Utah, assignor to Spendlove Laboratories, Logan, Utah

Filed Dec. 17, 1975, Ser. No. 641,391

Int. Cl.² A22C *21/04*

U.S. Cl. 17—51 **7 Claims**

1. A method for aseptically collecting blood from an animal fetus comprising the steps:

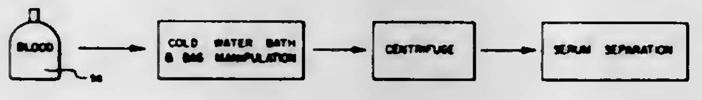
obtaining an animal fetus;

exposing the heart of the fetus;

suspending the animal fetus so that the heart is lower than a substantial portion of the fetus;

treating a portion of the heart surface to kill contaminating microorganisms;

cannulating the heart through the treated portion with an aseptic cannula; and



draining blood from the fetus through the cannula into an aseptic collection reservoir.

4,004,323

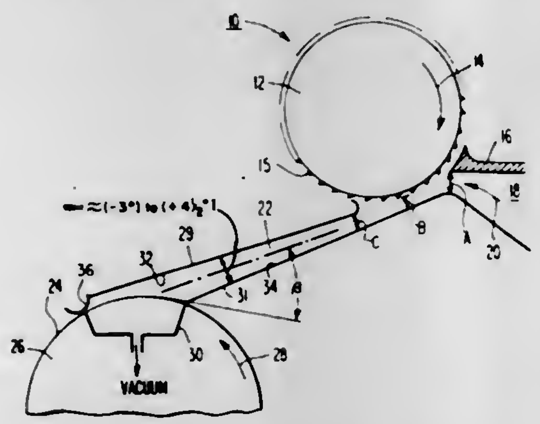
METHOD OF FORMING A NONWOVEN FIBROUS WEB

Joel Peter Gotchel, Philadelphia, Pa.; Henry James Norton, Wilmington, Del.; Aris Constantine Spengos, Wallingford, and Lawrence Vaalburg, Brookhaven, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 10, 1975, Ser. No. 566,923

Int. Cl.² D01G *25/00;* **D04H** *1/72*

U.S. Cl. 19—156.3 **10 Claims**



1. A method for forming a nonwoven fibrous web at a speed in excess of 200 ft./minute and in a basis weight range of from about 1 oz./yd.² to about 6 oz./yd.², said web including at least a preponderance by weight of short cellulosic fibers of a papermaking length less than ¼ inch, said method comprising the steps of:

A. separating fibers from a feed mat which includes at least a preponderance by weight of short cellulosic fibers of a papermaking length less than ¼ inch and entraining said fibers in a gaseous medium to form a gaseous suspension of fibers;

B. conveying the gaseous suspension of fibers in a stream to a convex forming surface while confining said stream by substantially flat front, back and side inner surfaces of a duct that is disposed at an incidence angle to said forming surface in the range of from about 10° to about 30°, and in which the front and back inner surfaces, in a direction toward the foraminous forming surface, provide an included angle in the range of less than about 3° convergence up to about 4½° divergence;

C. moving the convex forming surface at a speed in excess of 200 ft./minute; and

D. continuing to confine said stream by inner surfaces of the duct while depositing the fibers from the suspension onto the moving forming surface in the form of a nonwoven fibrous web having a basis weight in the range of from about 1 oz./yd.² to about 6 oz./yd.².

4,004,324

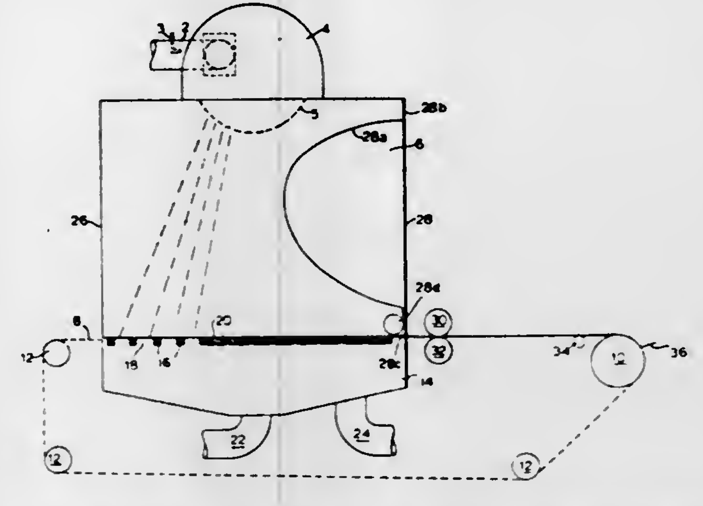
APPARATUS FOR PRODUCING FIBROUS WEBS

Frank Bridge, Bolton, and Tej Kuldip Singh, Baildon, both of England, assignors to The Associated Paper Mills Limited, London, England

Continuation-in-part of Ser. No. 842,889, July 18, 1969, abandoned. This application Mar. 13, 1972, Ser. No. 234,098

Int. Cl.² D01G *25/00*

U.S. Cl. 19—156.3 **1 Claim**



1. An apparatus for forming a fibrous web comprising a longitudinally extending foraminous fibre-receiving member, means for moving said member in said longitudinal direction, means defining an expansion chamber disposed above said fibre-receiving member; supply means for supplying a stream of fibres to said expansion chamber, said supply means being of fixed dimensions in both the longitudinal and transverse directions, said supply means being disposed in fixed geometrical relationship with said expansion chamber and initiating the passage of said fibres downwardly through said expansion chamber in downwardly progressing zones of progressively decreasing fibre density; both said expansion chamber and said fibre-receiving member being larger than said supply means in said transverse direction so that the profile of said stream of fibres progressively becomes wider in both said longitudinal and transverse directions as the fibres move downwardly; a curved baffle being disposed in said expansion chamber and projecting a convex surface inwardly and in a direction opposite to the direction of travel of said fibre-receiving member, said baffle being disposed transverse of said direction of travel, means defining a suction chamber disposed beneath said foraminous fibre-receiving member which suction chamber is larger than said supply means in both said longitudinal and transverse directions, and means for reducing the pressure in said suction chamber below that in said expansion chamber for holding the formed web on said fibre-receiving member while permitting expansion of the fibres during their downward passage through said expansion chamber.

4,004,325

KEY RING AND/OR CHAIN HOLDER

Louis H. Hubachek, 870 S. Gramercy Place, Los Angeles, Calif. 90005

Filed Aug. 6, 1975, Ser. No. 602,199

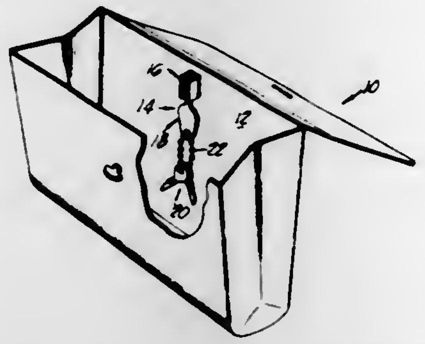
Int. Cl.² A45C *11/32*

U.S. Cl. 24—3 K **5 Claims**

1. A key holder, comprising:

a. an elongated bracket of block-like configuration arranged for surface attachment in an upright position to a support, said bracket having a key-slot extending between its ends, the key-slot including a straight slot portion opening into one face of said bracket and extending the full length thereof, and an enlarged inner slot portion communicating with the straight slot portion and having its ends terminating respectively at opposite ends of said bracket, and with one of the end openings being restricted; and

b. a key attaching member which includes a body having a shoulder for preventing passage of the body through the key-slot, an elongate neck portion extending from said shoulder and terminating in a head portion, said head and neck portions being of a size to permit movement thereof along the key-slot with the head portion in the enlarged inner slot portion and the neck portion in the straight slot portion, and being removable from the key-slot in a direction from the restricted said one end opening to the other end opening only when the shoulder is positioned for movement in a path outwardly of said face of the bracket.



4,004,326

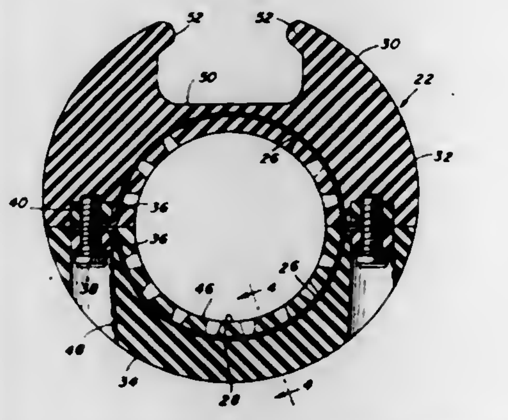
CABLE PROTECTOR

John Andrew Beavers, Tulsa, Okla., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1975, Ser. No. 643,733

Int. Cl.² F16C *1/26;* **A44B** *21/00;* **E21B** *17/10*

U.S. Cl. 24—81 CC **4 Claims**



1. Apparatus for protecting cable connected to a tubing string comprising:

a generally cylindrical elastomeric material member having a cylindrical bore adapted to encompass and be secured to a portion of the length of the tubing of the string;

said bore being eccentric with respect to the periphery of said cylindrical member and providing thickest and thinnest sections;

said cylindrical member being axially split into two portions for installation on the tubing string;

means for securing the two portions together; and

means defining a longitudinal slot in the thickest section of said member for receiving cable which slot is dimensioned so that the cable is positioned entirely therewithin.

4,004,327

SLIDE FASTENER

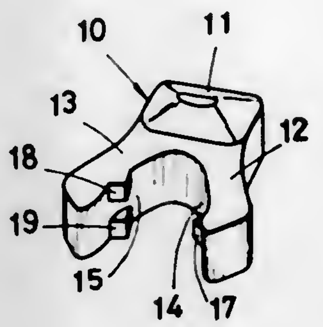
Takeo Fukuroi, Uozu, and Moriyoshi Hayashi, Kurobe, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed July 8, 1975, Ser. No. 594,053

Claims priority, application Japan, July 16, 1974, 49-84261[U]

Int. Cl.² A44B *19/06*

U.S. Cl. 24—205.13 R **1 Claim**



1. A slide fastener including a pair of oppositely disposed carrier tapes each carrying on and along one longitudinal beaded edge a series of discrete fastener elements, said fastener elements each comprising a coupling head, a pair of legs extending from the coupling head and having oppositely disposed inner wall portions, and a plurality of teeth formed integral with said legs and projecting from said oppositely disposed inner wall portions, each of said teeth including a pair of inclined faces extending from an outer edge to an inner wall portion and lying in a direction transverse to said longitudinal direction thereby forming a tooth generally triangular in shape, said tooth also having two opposite generally flat faces generally perpendicular to said inner wall, each said flat face lying in a plane generally perpendicular to said longitudinal direction, the thickness between said flat faces being smaller than said legs as measured along the longitudinal direction of said beaded edge, each of said teeth on one leg being staggered and at a predetermined pitch spacing with respect to a corresponding tooth on the other leg as measured along said longitudinal direction, said teeth being disposed in gripping engagement with said beaded edge to secure the fastener elements thereto.

4,004,328

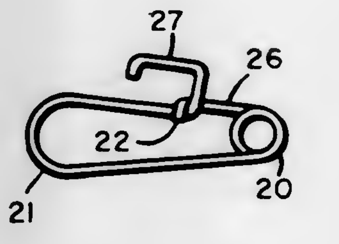
SNAP HOOK FOR FISHING TACKLE

August C. Bohn, 1423 Walnut SE., Grand Rapids, Mich. 49508, and Glenn B. Morse, 321 Fountain NE., Grand Rapids, Mich. 49503

Continuation of Ser. No. 554,478, March 3, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,584

Int. Cl.² A44B *13/02*

U.S. Cl. 24—237 **3 Claims**



1. A snap hook formed of a single length of spring wire and comprising:

a coil;

a first extension projecting tangentially from said coil and terminating in a hook configuration;

a second extension projecting tangentially from said coil, said second extension being formed into a bight and having a hook configuration complementary to that of said first extension; and an actuating extension at the free end of said second extension, said actuating extension a portion offset from and in the same plane as said second extension, the arrangement being such that depression of said offset portion moves the hook configuration of said second extension into a disengaging position relative to said hook configuration of said first extension.

4,004,329

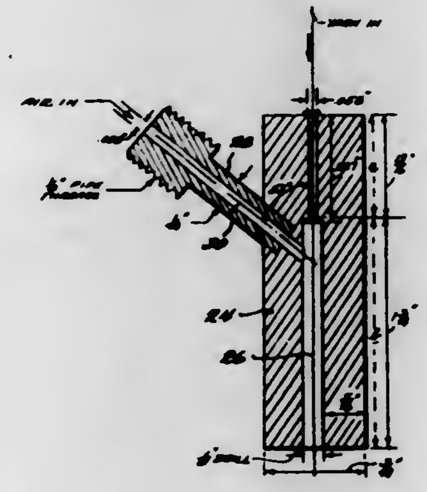
YARN INTERLACING AIR JET

Joe F. London, Jr., Greensboro, N.C., and Jean-Louis Lauber, Munchenstein, Switzerland, assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 421,850, Dec. 5, 1973, Pat. No. 3,911,655, which is a continuation of Ser. No. 217,059, Jan. 11, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,660

Int. Cl.² D02G *1/16*

U.S. Cl. 28—1.4 **3 Claims**



1. An air jet device for use in interlacing textured yarn, said device comprising a body having a cylindrical chamber of about one-eighth inch diameter formed within said body for movement of yarn therethrough, a coaxial yarn feed passage of a diameter smaller than said chamber leading into said chamber, an air inlet of a cross-section smaller than that of said chamber and having an axis which converges with respect to the axis of the chamber in the direction of yarn movement through said chamber and intersecting therewith at an angle of between 45° and 75° measured between said inlet and said passage, means for supplying air under pressure to said inlet and means for supplying yarn to said coaxial yarn feed passage.

4,004,330

TEXTILE TREATMENT APPARATUS

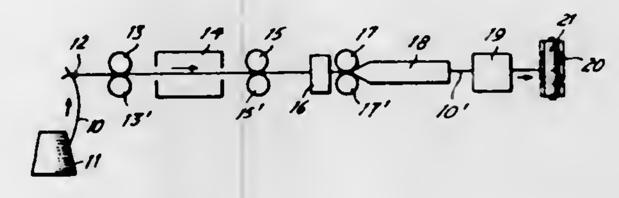
Robert K. Stanley, Media, Pa., assignor to Techniservice Division Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. No. 214,893, Jan. 3, 1972, Pat. No. 3,808,654, which is a continnation of Ser. No. 846,457, July 31, 1969, Pat. No. 3,781,952, which is a continuation-in-part of Ser. Nos. 684,230, Nov. 20, 1967, Pat. No. 3,462,815, Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, Ser. No. 606,420, Dec. 30, 1966, and Ser. No. 835,883, June 9, 1969, Pat. No. 3,559,254, said Ser. No. 684,230, and Ser. No. 678,428, each is a continuation-in-part of Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622, which is a continuation of Ser. No. 790,658, Feb. 2, 1967, Pat. No. 3,111,740, and Ser. No. 216,524, Aug. 13, 1962, abandoned, said Ser. No. 606,420, is a continuation-in-part of Ser. No. 386,489, July 31, 1964, Pat. No. 3,317,977, which is a continuation-in-part of Ser. No. 216,447, Aug. 13, 1962, Pat. No. 3,145,947, said Ser. No. 835,883, is a continuation-in-part of Ser. No. 650,762, July 3, 1967, abandoned, which is a continuation of Ser. No. 349,338, March 4, 1964, Pat. No. 3,348,283. This application July 16, 1973, Ser. No. 379,318

The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Int. Cl.² D02G *1/12*

U.S. Cl. 28—1.6 **19 Claims**



1. In apparatus for treating thermoplastic textile strands, the improvement including strand-drawing means and including also strand-crimping means immediately downstream therefrom, with strand-preheating means comprising a strand-supporting roll and roll-heating means therewithin located in advance of at least the strand-crimping means.

4,004,331

METHOD OF MANUFACTURING MULTI-WIRE OXYGEN ELECTRODE

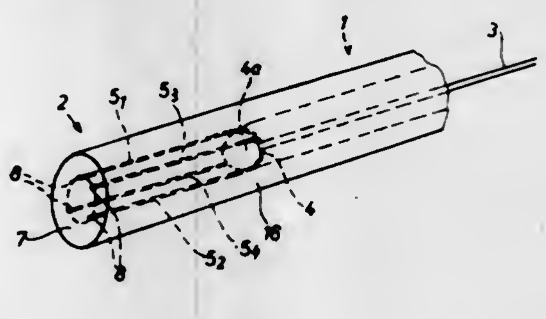
Helmut List, and George Fredericks, both of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Division of Ser. No. 555,767, March 6, 1975, Pat. No. 3,965,383. This application Feb. 19, 1976, Ser. No. 659,435

Claims priority, application Switzerland, Mar. 15, 1974, 3642/74

Int. Cl.² H01J *9/36*

U.S. Cl. 29—25.15 **8 Claims**



1. A method of manufacturing a multi-wire oxygen electrode comprising the steps of: providing a cathode wire and a round glass rod, fixedly connecting with one another the cathode wire and the round glass rod at one end while forming a substantially semi-spherical shaped transition of thinner cathode wire to thicker glass rod, providing electrode wires spanned at the transition which forms a support surface, electrically conductively connecting the electrode wires at the cathode wire, bending the electrode wires over the semi-spherical shaped transition-support surface, extending the bent electrode wires along the glass rod and bonding the electrode wire ends at the glass rod by means of an adhesive mass, inserting the cathode wire with the glass rod and the electrode wires into a glass sleeve, said glass sleeve possessing a substantially tubular-shaped tip dimensioned to receive the glass rod with the electrode wires, positioning the glass sleeve to be substantially vertical and with the tip downwardly directed, fusing together the thus positioned glass sleeve with the glass rod, and wherein the length of the glass rod and the wall thickness of the sleeve tip are selected such that during fusing the weight of the melt just compensates the surface tension forces causing a contraction of the melt and the electrode wires in the glass are neither elongated nor curved, and then cutting-off an end piece of the tip fused with the glass rod in order to obtain an electrode tip having an electrode end surface with the cross-sectional surfaces of the electrode wires located therein freely exposed.

4,004,332

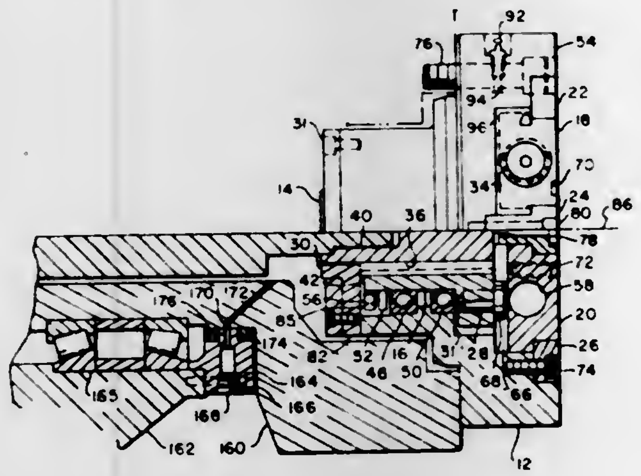
FACING HEAD

Walter W. Wawrzyniak, 39230 Gary, Mt. Clemens, Mich. 48043

Filed Dec. 18, 1975, Ser. No. 641,937

Int. Cl.² B23B *7/00, 3/26*

U.S. Cl. 29—27 C **10 Claims**



1. A facing head adapted to be secured directly to a spindle for rotation therewith, comprising a housing, means for securing the housing directly to the spindle from the front thereof, at least one slide transversely slidably supported on one end of the facing head, an actuating member positioned centrally of the facing head and cam means operable between the actuating member and slide for producing movement of the slide transversely of the facing head on movement of the actuating member axially of the facing head including a cylindrical cam member having internal helical cam teeth and external helical cam teeth on the actuating member meshed with the cam teeth on the cam member, means for restraining the actuating member from rotating relative to the housing and means operable between the cam member and slide for producing transverse movement of the slide on rotary movement of the cam member.

4,004,333

PUNCHING, CONTOURING, HANDLING APPARATUSES AND METHOD

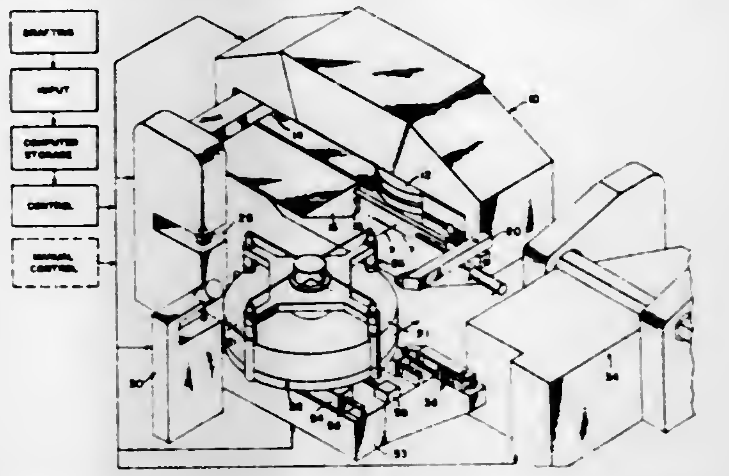
Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., City of Industry, Calif.

Division of Ser. No. 386,064, Aug. 6, 1973, Pat. No. 3,949,635, which is a continuation-in-part of Ser. No. 359,983, May 14, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,439

Int. Cl.² B23Q *1/16;* **B23D** *33/02*

U.S. Cl. 29—38 C **14 Claims**

1. Apparatus for cutting and deburring irregular peripheral shapes on self form-sustaining sheet material parts comprising powered chuck means for clamping and rotating each part, means for positioning the chuck means sequentially at loading, cutting, deburring and discharging stations, said chuck positioning means including powered means linearly translating the chuck means during simultaneous rotation of the parts identically at said cutting and deburring stations, means positioning tools at said cutting and deburring stations for engaging two parts simultaneously in a common direction relative to the chuck means for cutting and deburring the same irregular peripheral shapes on each, and control means for actuating said chuck rotating means and said linear translating means to rotate and translate the parts while in engagement with said tools at said cutting and deburring stations for cutting and deburring the same peripheral contour on the parts.



4,004,334

METHOD OF MAKING A STRUCTURAL MEMBER

Henry R. Greenley, 1435 SE. 15th St., Apt. 104, Fort Lauderdale, Fla. 33316

Division of Ser. No. 520,987, Nov. 5, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,791

Int. Cl.² B23P *17/00*

U.S. Cl. 29—155 R **3 Claims**

1. A method of making a web and chord structural member comprising.

slitting a strip of sheet material progressively along its length, each slit extending transversely from one edge of the strip across its width to a predetermined terminus point near the opposite edge, the slits being parallel and alternate slits originating at opposite sides of the strip,

forming slot sections in the strip in a pattern alternating from side to side along the edges of the strip adjacent said terminus points,

twice folding the portion of the strip between each pair of said slits to form strut members,

stretching the slitted strip to form a web of struts interconnected in head-to-tail zig-zag arrangement with the slot sections at the edges of the web aligned to accommodate a chord member,

and placing a chord member in said slot sections at each edge of the web and attaching the chord members to the web.

4,004,335

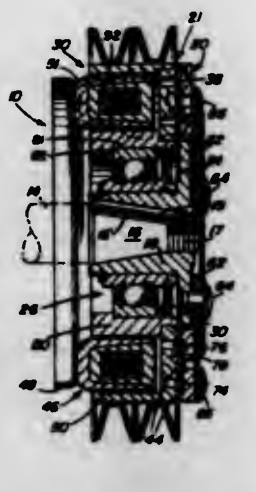
METHOD OF MAKING CLUTCH PULLEY

William C. Pierce; Samuel M. Berry, both of Dallas, and Arthur D. Johnson, Carrollton, all of Tex., assignors to Pitts Industries, Inc. (Entire), Dallas, Tex.

Filed Nov. 11, 1975, Ser. No. 630,886

Int. Cl.² B21K *1/42*

U.S. Cl. 29—159 R **12 Claims**



1. A method of making a clutch pulley assembly for an electromagnetic clutch comprising the following steps:

a. cutting a short section of tubing from a long piece of tubing to form the hub portion of said assembly,
b. machining one end of said short section of tubing to have an undercut outer edge,
c. press forming an annular disc of metal with a central aperture therein to have an outer flange extending substantially perpendicular from the outer edge of said disc
d. mounting the aperture of said disc on the undercut edge of said tubing section, and
e. die swaging the end of said tubing section so that the hub section and disc become integral and make a good strong and magnetically efficient joint.

4,004,336

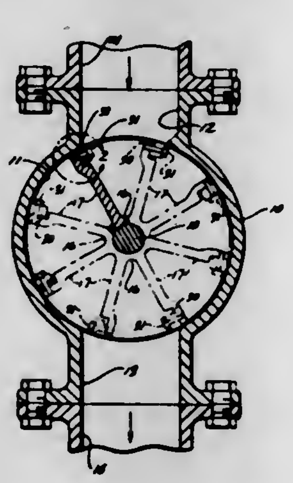
INTERCOMPARTMENT SEAL FOR ROTARY FEEDER

Forrest E. Logan, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Division of Ser. No. 388,388, Aug. 15, 1973, Pat. No. 3,913,800. This application July 28, 1975, Ser. No. 599,675

Int. Cl.² B23P *15/00, 7/00;* **G01F** *11/20*

U.S. Cl. 29—156.4 R **2 Claims**



1. In a rotary feeder having a housing that defines a cylindrical cavity with a curved peripheral surface of radius, R, a rotor mounted to rotate within the cavity, at least from compartment defining radial walls on the rotor, and a radially adjustable sealing surface mounted at the end of each radial wall, the method of establishing an intercompartment seal between the end of each radial wall and the peripheral surface of the cavity, the method comprising the following steps in the order recited:

removing the rotor from the housing cavity;
rotating the rotor while removed from the housing;
cutting a sealing surface at the end of each blade to the radius, R, while rotating the rotor to form on the end of each blade a curved sealing surface with a radius of curvature that matches the curvature of the peripheral surface;
adjusting each blade radially inward;
returning the rotor in the housing cavity; and
adjusting each blade radially outward so each blade is uniformly and closely spaced from the peripheral surface of the housing cavity by a distance which establishes controlled fluid leakage between the compartments defined by the radial walls and blades.

4,004,337

APPARATUS FOR REED SWITCH MANUFACTURE

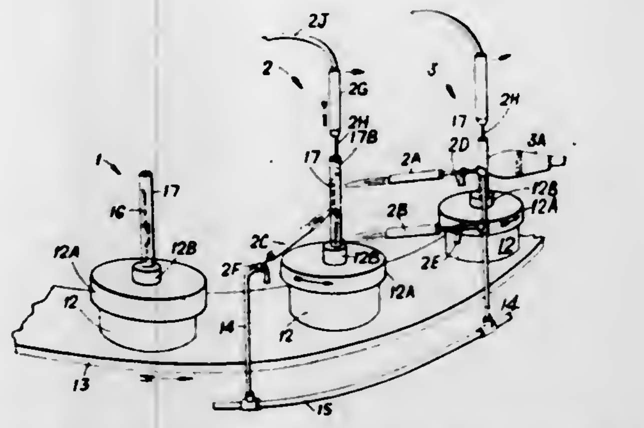
John Hill, Bickley, and Henry Turczanki, Beckenham, both of England, assignors to Comtelco (U.K.) Limited, Tonbridge, England

Division of Ser. No. 443,203, Feb. 19, 1974, Pat. No. 3,908,266. This application Apr. 29, 1975, Ser. No. 572,910

Claims priority, application United Kingdom, Feb. 20, 1973, 8276/73

Int. Cl.² H01H *11/00*

U.S. Cl. 29—756 **11 Claims**



1. Electrical sub-assembly encapsulating apparatus comprising:

at least one workhead for supporting said sub-assembly at only one end thereof in vertical co-axial alignment with a length of glass tubing, the sub-assembly being composed of at least two conductive elements rigidly but temporarily joined in a desired spatial relationship by at least one fusible and electrically conductive bridging piece, said glass tubing being of a length greater than the desired length of the capsule being formed, said glass tubing and sub-assembly having an unsupported end;
means for moving said workhead through a series of fixed work stations, pausing at each while a manufacturing operation is performed on the supported sub-assembly and glass tubing;
one or more stations having one or more burners, the flames from which are adjusted and directed toward the position said sub-assembly and tubing will occupy when pausing at that station to provide sealing of said sub-assembly and said tubing to thereby encapsulate said conductive elements within said tubing; and
means at one or more of said work stations for injecting purge gas into said tubing and including a hypodermic needle connected to a supply of pressurized purge gas and having an open end adapted to be moved into the unsupported open end of said tubing for introducing a flow of purge gas to the interior of said tubing during the sealing thereof.

4,004,338

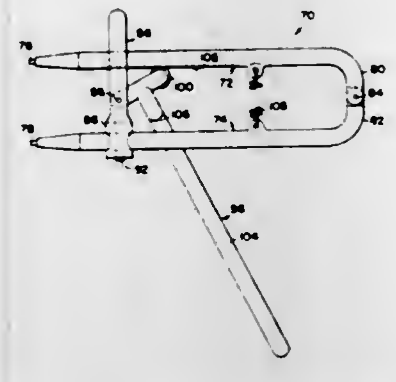
SNAP RING TOOL

Francis John Breitbach, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 4, 1975, Ser. No. 628,795

Int. Cl.² B23P *19/04*

U.S. Cl. 29—229 **4 Claims**



1. In a snap ring tool of a type including first and second elongate arms pivotally interconnected to each other and having respective free ends configured for engaging opposite ends of a snap ring for deflecting the latter upon pivotal movement of the arms; the improvement comprising: lever support means fixed to the first arm at a location between the free end of the first arm and the pivotal interconnection of the first and second arms; a lever pivotally connected to said support means and having a cam surface; said second arm including a recessed surface defining a guide for the cam surface; and the cam surface being located in such relationship to the pivotal connection of the lever with the support and to the recessed surface that the cam surface will engage the recessed surface and will cause the second arm to pivot in a first direction of movement when the lever is pivoted in a first direction of movement.

4,004,339

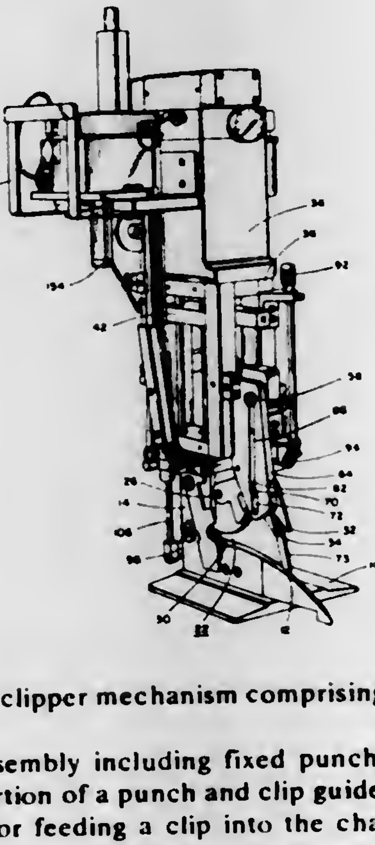
SINGLE PISTON OPERATED CLIP DEVICE

Clyde R. Velarde, Raleigh, N.C., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,581

Int. Cl.² B23P *11/00*

U.S. Cl. 29—243.56 **21 Claims**



1. An improved clipper mechanism comprising, in combination:

a. a bracket assembly including fixed punch guide means defining a portion of a punch and clip guide channel, clip feed means for feeding a clip into the channel, and die means at one end of said channel for forming a clip cooperatively with punch means;
b. reciprocal punch means mounted in the fixed punch guide means for travel in the channel between a retracted position and an extended, clip attachment position;
c. drive means for driving said punch means reciprocally between the retracted and extended positions, said drive means mounted on the bracket assembly;
d. gate means attached to the assembly for cooperation with the punch guide means to form a complete closed channel to guide a clip into cooperation with the die means, and gate means being removable from cooperation with the punch guide means forming the channel to define a throat opening for positioning material to be clipped over the die means; and
e. mechanical linkage means connecting the gate means with the drive means for retracting the gate means from cooperation with the punch guide means to expose the throat opening when the punch means are in the retracted position and for closing the gate means to form a continuous, closed channel for said clip and punch means upon operation of the drive means to transport the punch means toward the extended position, said gate means being closed prior to travel of the punch means to the extended position

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4,004,340

PROCESS OF CUTTING DEVELOPED FILM STRIPS INTO FILM SECTIONS AND OF IMMEDIATELY SUBSEQUENTLY INTRODUCING SAID FILM SECTIONS INTO SLIDE FRAMES

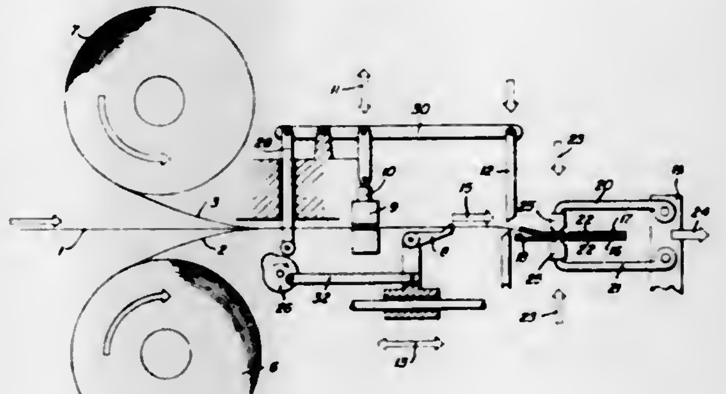
Otfried Urban, Garmisch-Partenkirchen, Germany, assignor to Gelmuplast Peter Mundt KG, Garmisch, Germany

Continuation-in-part of Ser. No. 263,202, June 15, 1972, abandoned. This application Dec. 18, 1974, Ser. No. 534,132

Claims priority, application Germany, June 25, 1971, 2131611; Oct. 28, 1971, 2153874

Int. Cl.² B23P *17/04*

U.S. Cl. 29—417 **11 Claims**



1. A process of cutting developed film strips into film sections and of immediately subsequently introducing said sections into slide frames made of plastic material supplied ready for use, comprising feeding two protective strips of transparent material on respective sides of a film strip in a series of intermittent feeding steps, said protective strips having for each feeding step at least one perforation hole which is aligned with a perforation hole of the film strip, the two protective strips sandwiching the film strip to form a sandwiched film strip, advancing said film strip in said feeding steps to a cutting device; severing the leading film section with said cutting device, gripping the film section severed by the cutting device with a plierlike gripping device and in this position, without being pivotally moved through 180°, inserting the severed section as far as to the position for projection into the internal space of an expanded frame, and releasing the expanded frame to return to its original shape to hold the film section in position for projection.

4,004,341

METHOD OF MANUFACTURING FIELD-EFFECT TRANSISTORS DESIGNED FOR OPERATION AT VERY HIGH FREQUENCIES, USING INTEGRATED TECHNIQUES

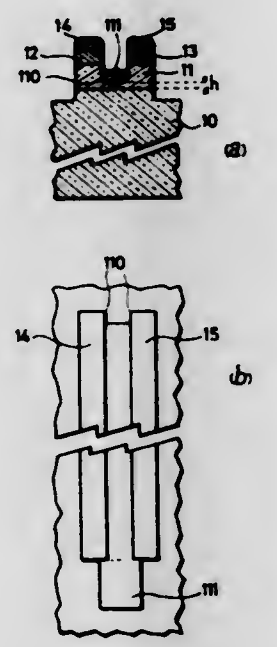
Pham Ngu Tung, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 5, 1975, Ser. No. 638,037

Claims priority, application France, Dec. 13, 1974, 74.41129

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **10 Claims**



1. A method of manufacturing field-effect transistors designed to operate at very high frequencies, using integrated circuit techniques, said method commencing from a substrate of semi-insulating material covered by a semi-conductor layer having a given conductivity type, said method comprising the following steps:

- the deposition upon said semi-conductor layer of a conductive layer designed ultimately to form the source and drain contacts;
- ion etching, over an area delimited by a metal mass protecting said contacts, and carried out by means of ions of given kind, energy and density, which bombard said semi-conductor layer;
- deposition of a protective layer which can be etched by a solvent, over an area delimited by masking and excluding the interval separating said contacts
- deposition of a metal layer upon the assembly produced in the preceding step, the thickness of said deposition being minimum over areas perpendicular to said semi-conductive layer, said layer constituting the gate in the interval separating said contacts;

electrolytic etching of said metal layer, except in the interval separating said contacts;

- elimination of said protective layer using a solvent;
- ion etching eliminating said semi-conductor layer at the locations where it is exposed.

4,004,342

FABRICATION OF ION IMPLANTED P-N JUNCTION DEVICES

Yoon Soo Park, Kettering, and Phil Won Yu, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

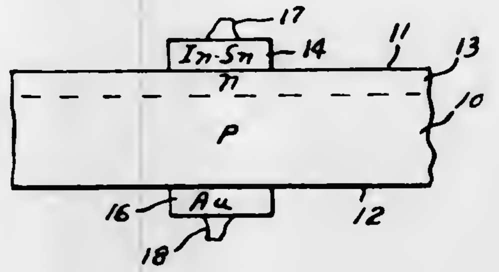
Filed Feb. 23, 1976, Ser. No. 660,521

Int. Cl.² B01J *17/00*

U.S. Cl. 29—590 **5 Claims**

1. A method of fabricating a p-n or p-i-n junction device in a p-type CuInSe$_2$ single crystal having a first (112) plane surface and a second (112) plane surface which comprises the steps of:

a. bombarding the first plane surface with cadmium, zinc, bromine or chlorine ions at an energy of 135 keV to a dose level ranging from about 10^{14} to 10^{16} per square centimeter, thereby forming an n-type layer in the crystal adjacent the first plane surfacae;



b. annealing the crystal under a vacuum at a temperature ranging from 300° to 500° C for a period of 10 to 30 minutes;

c. depositing an indium-tin alloy electrical contact on the first surface; and

d. depositing a gold electrical contact on the second surface.

4,004,343

METHOD OF MAKING CORE TUBES FOR SOLENOIDS

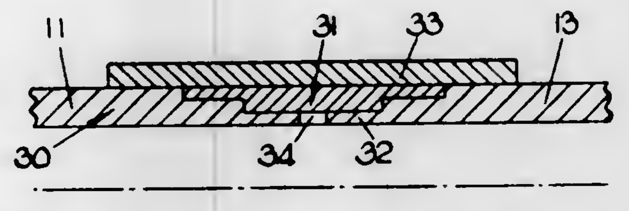
John Thomas Marsden, Lower Tean, England, assignor to Expert Industrial Controls Limited, Lount, England

Filed Apr. 15, 1975, Ser. No. 568,263

Claims priority, application United Kingdom, Apr. 18, 1974, 16898/74

Int. Cl.² H02K *15/02;* **H01F** *41/02*

U.S. Cl. 29—596 **2 Claims**



1. A method of manufacturing a core tube having a non-magnetic intermediate portion for an electro-magnetic solenoid comprising; machining a length of tube so as to form the end portions of the core tube and leaving an integral bridge between said end portions, said bridge being of thinner section so as to define a circumferential recess, centrifugally casting into said recess the non-magnetic intermediate portion of the core tube, and further machining the tube to remove said bridge, said recess being formed in the outer wall of said tube, securing a further tube to the periphery of the first mentioned tube, said further tube providing an outer wall to said recess, said bridge being apertured to permit the liquid material which when hardened will constitute said non-magnetic insert, to flow into said recess, said further tube being removed after the step of centrifugal casting.

4,004,344

DENTAL DEVICE

Gary K. Gold, 5065 Stoneboat Row, Columbia, Md. 21044, and Alan H. Hart, 3204 Hatton Road, Pikesville, Md. 21208

Continuation of Ser. No. 503,678, Sept. 6, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,290

Int. Cl.² A61C *1/10*

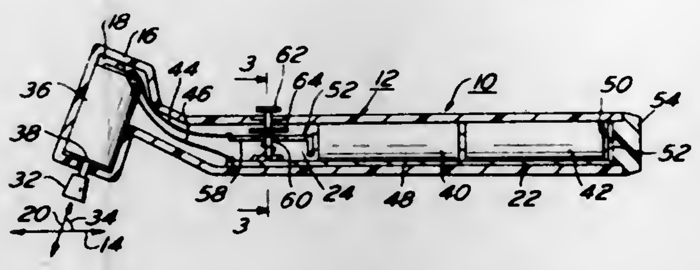
U.S. Cl. 32—27 **8 Claims**

1. A dental device for removing stains from teeth comprising:

a. a housing having a head member extending in a predetermined direction forming a first chamber and a longitudinally and linearly extended handle member forming a second chamber, said extended handle member adapted to be gripped between an operator's thumb, index and fore fingers said handle member and said head member being formed in one piece construction, said extended directions of said head and handle member forming an angle approximating 50° therebetween;

b. motor means mounted within said first chamber of said head member said first chamber being contoured to receive only said motor means;

c. electrical power means coupled to said motor means said electrical power means being mounted within said extended handle member second chamber;



d. stain removal means rotatively coupled directly to said motor means in linear alignment through rotative securement to a rigid shaft member passing through said head member of said housing, said shaft member being opposingly mounted only to said stain removal means and said motor means, said shaft member having an extended length substantially less than said head member whereby said stain removal means may be easily manipulated at varying angles when contacting said teeth; and

e. means for actuating said stain removal means in rotative displacement, said actuation means being mounted in said longitudinally extended handle member of said housing adjacent said head member in positional placement for actuation by one finger of said operator while said handle member is being gripped.

4,004,345

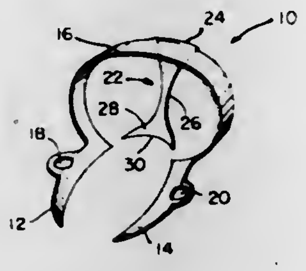
DISTAL RETRACTION CLAMP FOR RUBBER DAM

Sherman S. Ely, 11005 NE. 9th, Bellevue, Wash. 98004

Filed Nov. 17, 1975, Ser. No. 632,279

Int. Cl.² A61C *5/12*

U.S. Cl. 32—36 **15 Claims**



1. In a rubber dam retaining clamp of the type including a spring arch connecting a pair of opposed jaws for gripping respective inner and outer sides of a tooth in a dental arch adjacent the gum line, the improvement comprising arm means connected to said clamp and adapted to contact the distal area of the rearmost tooth in the arch adjacent the gum line for retracting the distal gingival tissue and overlying portion of a rubber dam through which the tooth projects.

4,004,346

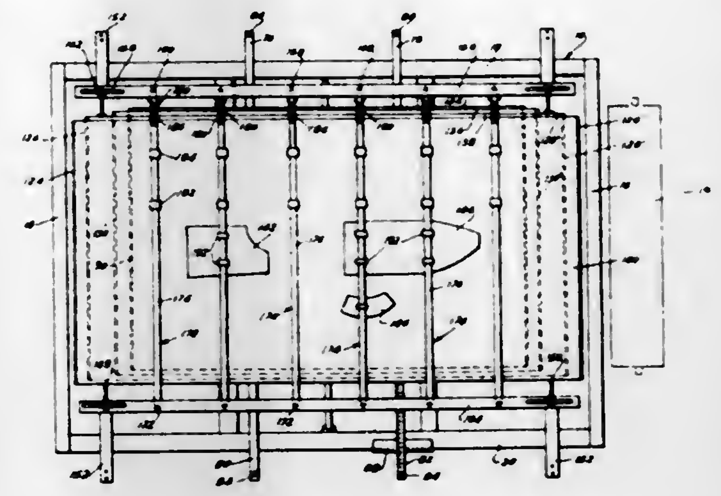
MACHINE FOR THE MULTIPLE GRADING OF PATTERNS FROM A MASTER PATTERN

William Kaufman, 4 Stonehurst Court, Pomona, N.Y. 10970

Filed July 28, 1975, Ser. No. 599,832

Int. Cl.² A41H *3/00*

U.S. Cl. 33—17 A **9 Claims**



1. A pattern grading machine comprising a support frame, a horizontally disposed table, slide means movably mounting said table on said support frame, a plurality of parallelogram linkages, a plurality of paper holding bars mounted on said parallelogram linkages for movement with said linkages relative to said support frame in varying increments of distance when table is moved, each of said paper holding bars comprising a channel bar having an open upper end, means for mounting a plurality of pattern reproducing sheets in selected corresponding pairs of said paper holding bars, with said sheets stacked in superimposed relationship over the surface of said table, and mounting means for supporting at least one master pattern section above the uppermost pattern reproducing sheet, said master pattern mounting means comprising a pair of elongated strap supports extending longitudinally of said support frame and spaced from each other on opposite sides of the central axis of said table, coupling means removably securing said strap supports to a selected pair of said paper holding bars for movement therewith, said coupling means comprising a pair of rods mounted in a selected pair of channel bars and projecting from the opposite ends thereof, a mounting member secured to each projecting end of each rod, and clamp means secured to each mounting member and engaging the respective strap support, at least one strap, means releasably mounting said strap at its opposite ends to the respective strap supports and extending transversely therebetween, said straps forming with said strap supports a rigid framework overlying said table for supporting master pattern sections thereon.

4,004,347

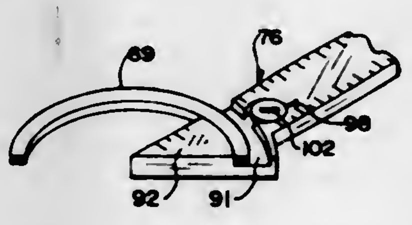
GRAPHICS INSTRUMENT

Sarah Hesse, 929 Oxford St., Berkeley, Calif. 94707, and Justin J. Shapiro, 39 Domingo Ave., Berkeley, Calif. 94705

Division of Ser. No. 452,635, March 19, 1974, Pat. No. 3,925,899. This application July 24, 1975, Ser. No. 598,781

Int. Cl.² B43L *7/06*

U.S. Cl. 33—120 **2 Claims**



1. A graphics instrument comprising an inner scale member which includes a first annulus having a circular outer periph-

ery, an outer scale member which includes a second annulus having a circular inner periphery mounted for rotation with respect to said first annulus about a common axis, first and second arms mounted on respective inner and outer scale members, said inner and outer members being formed with coplanar surfaces adapted to move over a graphics surface, said arms each having surfaces which are coplanar with said coplanar surfaces of the scale members, means forming a first graduated scale about the outer periphery of said inner member, means forming a second graduated scale about the inner periphery of said outer member in register with said first scale whereby the scale members can be positioned in a selected relative angular position, each of said arms extending radially from the respective scale members, means forming a first straight edge including a radial edge of the first arm extending along an axis which intersects the center of rotation of scale members, means forming a second straight edge including a radial edge of the second arm extending along a second axis, said first arm being formed with an arcuate groove releasably and slidably seating said second annulus, and said second arm is formed with an arcuate groove releasably and slidably seating said first annulus whereby said members may be assembled in a first configuration with the arms coplanar and in a second configuration with the members inverted and with a portion of one arm lying in a plane spaced from the other arm for alignment against a reference surface for utilizing the instrument in the manner of a T-square.

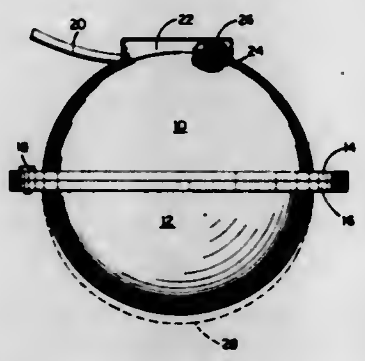
4,004,348
HIGH PRESSURE COMPASS HOUSING

John T. Fowler, and William H. Key, both of Winthrop, Mass., assignors to The Laltram Corporation, New Orleans, La.

Filed Jan. 16, 1975, Ser. No. 541,655

Int. Cl.^{2} G01C *17/06*

U.S. Cl. 33—364 **3 Claims**



1. A magnetic compass housing comprising:
first and second housing portions each having a mating peripheral flange adapted to be secured to the other;
at least one of said housing portions being formed of a resilient material being impervious to the flow of fluid therethrough and operative to expand and compress in response to differential pressure thereon;
means for attaching said mating peripheral flanges in sealing relationship to form a sealed housing interior;
a damping liquid contained within said housing interior and completely filling said interior;
said resilient housing portion being operative in the presence of a high external pressure to compress and cause the pressure of said damping liquid to increase to approximately the external pressure.

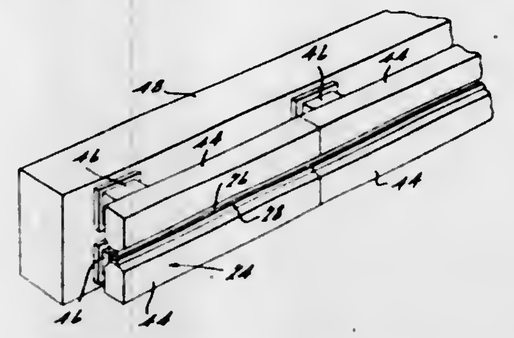
4,004,349
METHOD FOR FLUID CONVEYANCE OF ARTICLES

John W. Neumann, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Oct. 21, 1975, Ser. No. 624,547

Int. Cl.^{2} B65G *51/10*; **F26B** *3/10*

U.S. Cl. 34—10 **12 Claims**



1. A method of conveying resilient cup-shaped cylindrical articles which comprises the steps of providing a plurality of longitudinally extending members each formed with a supporting surface having a partial circular conforming transverse configuration and formed with a plurality of ports therein, orienting said members to position said supporting surfaces in opposed longitudinally extending alignment at a distance to provide clearance between the walls of an article disposed therebetween, positioning an article with its closed end disposed in the intended direction of travel between the plurality of opposed supporting surfaces, discharging a pressurized fluid from said ports in impinging relationship against the longitudinally extending exterior wall surface of the article in a manner to support the article on a cushion of fluid in spaced relationship relative to said supporting surfaces and to effect an inward deflection of the rearward portion of the article in response to the fluid pressure applied against the wall thereof imparting a converging taper on moving from the leading closed end to the trailing open end of the article and thereby imposing a force vector on the article in the direction of intended travel for propelling the article along said members.

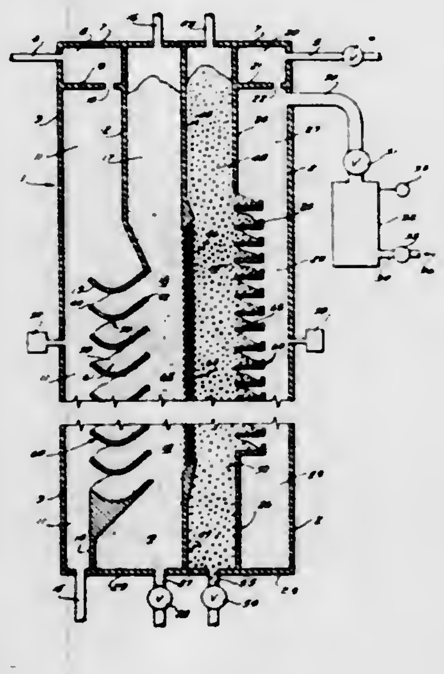
4,004,350
TREATING GAS AND FINE GRANULAR MATERIAL IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Aug. 28, 1974, Ser. No. 501,275

Int. Cl.^{2} F26B *3/00*

U.S. Cl. 34—33 **9 Claims**



1. A method of contacting gas and granular material with each other in a panel bed having loose gas-entry granular material faces supported by support members and fitted for cleaning and renewal of the faces by puffback to effect physical or chemical treatment of at least one of gas and granular material comprising:
a. arranging a first, fine granular material in a first bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members, said members having outer and inner edges with respect to the bed whereby said gas entry portions have gas entry faces substantially contiguous with said outer edges, and said first bed having gas exit portions spaced from said inner edges and said gas exit portions being supported by transversely disposed upwardly spaced louvers;
b. arranging a second coarser granular material than in (a) in a second bed next to said first bed, said second bed having a plurality of transversely disposed upwardly spaced gas exit portions separated by interposed supporting members spaced from the louvers of said first bed, said second bed having gas entry portions that are supported by said louvers and the upward spacing of said louvers being about the dimension of a particle of said coarser granular material so that said second material does not participate in the body movement of the fine granular material in the first bed that accompanies the action of puffback;
c. forwardly flowing gas in a substantially continuing flow during said treatment through the gas entry portions of said first granular material bed and outwardly from the gas exit portions of this bed and through the gas entry portions of said second granular material bed and outwardly from the gas exit portions of this second bed to effect said treatment of one of said gas and said first granular material;
d. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (c); and
e. causing said transient reverse flow to produce first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions of said second bed and said gas entry portions of said first bed, said difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time of less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of said first granular material from said gas entry faces of said first bed, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of said first granular material supported by said interposed members toward said gas entry faces of said first bed to spill a portion of said first granular material from the bed while said second granular material does not participate on account of the dimensional relationship between the upward spacing and the coarser particle.

4,004,351
GRAIN DRYING APPARATUS

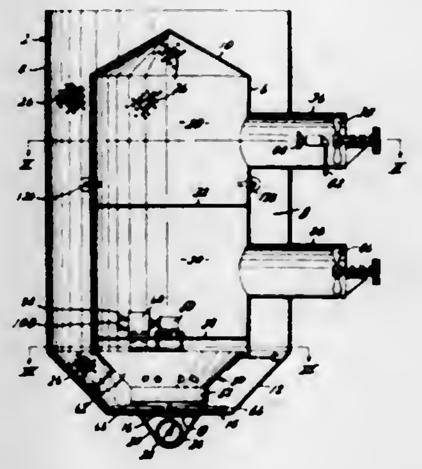
Douglas D. Sanneman; Ernest Stalder, both of Clay Center, and Robert C. Chaffee, Green, all of Kans., assignors to Gilmore-Tatge Manufacturing Co., Inc., San Francisco, Calif.

Filed July 28, 1975, Ser. No. 599,892

Int. Cl.^{2} F26B *17/00*

U.S. Cl. 34—52 **4 Claims**

1. A grain drying apparatus comprising:
a. a body assembly through which grain to be dried passes in a continuous flow pattern, said assembly including a drying zone through which said grain passes one time only,
b. means operable to pass a permeating flow of heated air through said grain within said drying zone, whereby moisture is removed from said grain, said heated air being supplied at a generally uniform rate and temperature, whereby the moisture content to which said grain is reduced within said drying zone is rendered generally inversely proportional to the temperature to which said grain is elevated within said drying zone,
c. a mechanically operable grain metering device operable to regulate the rate of flow of said grain through said drying zone, and hence its retention time within said drying zone, the retention time of the grain within the drying zone being generally inversely proportionate to the speed of operation of said metering device, and
d. modulating control means operable responsively to the temperature to which said grain is elevated in said drying zone to regulate the speed of operation of said metering device to produce a variable rate of grain flow through said drying zone such that grain is elevated to a generally uniform temperature within said drying zone despite variations in the moisture content of grain entering said drying zone, said control means comprising a hydraulic motor operable to drive said metering device and having an essentially closed operating hydraulic circuit, the operating speed of said motor being generally proportionate to the rate at which hydraulic fluid is supplied thereto, a variable delivery hydraulic pump in said circuit and operable to deliver fluid to said motor, a control valve disposed in said circuit downstream from said motor, thermostatic means responsive to the temperature attained by the grain within the drying zone to permit fluid flow through said valve generally directly proportionate to said temperature, and means operable to vary the delivery rate of said pump continuously, and being responsive to fluid pressure in said hydraulic circuit between said motor and control valve to vary the delivery rate of said pump in generally inverse ratio to said pressure.



4,004,352
GRAIN DRYING APPARATUS

Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659

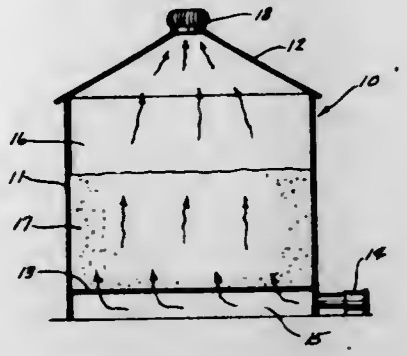
Filed Jan. 16, 1975, Ser. No. 541,384

Int. Cl.^{2} F26B *19/00*

U.S. Cl. 34—233 **5 Claims**

1. Grain bin apparatus comprising:
a bin;
a perforated floor in said bin;
a chamber on each side of said floor;
air circulating means connected to said bin for forcing air under pressure to enter one of said chambers and exhaust from an opening in the other of said chambers; and
means rotatably attached to said bin and encompassing said opening for modulating the flow of air exhausting out of said other chamber, said modulating means having a

substantially horizontally disposed fluid impervious central plate member for substantially preventing precipitation from entering the bin and a plurality of spaced turbine-shaped blades connected to said central portion and extending downwardly therefrom.



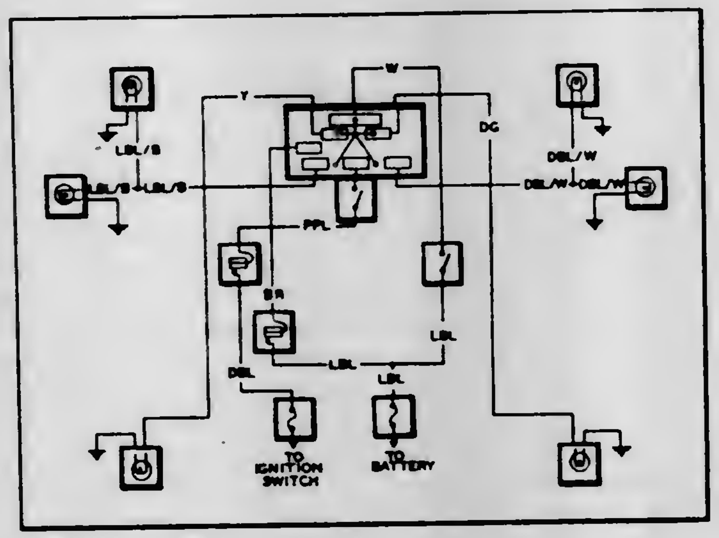
4,004,353
EDUCATIONAL DEVICE FOR LEARNING AUTOMOTIVE TROUBLE-SHOOTING

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,134

Int. Cl.² G09B *25/02*

U.S. Cl. 35—13 **5 Claims**



1. An educational kit for teaching automotive electrical wiring and automotive electrical trouble-shooting procedures comprising as integrated component parts thereof:

a. a simulator board having a surface of magnetically attractive material and including graphic indicia on the surface thereof defining a schematic diagram of an automobile electrical system,

said diagrams further including designated locations for positioning manipulative pieces bearing indicia representing electrical symbols, the indicia on said simulator board being as shown by the non-numerical indicia of FIG. 1;

b. a plurality of magnetically attractive manipulative pieces individually bearing graphic indicia on their surfaces comprising symbols representing parts of an auotmobile electrical system or symbols representing electrical connections, the indicia on said manipulative pieces being as shown by the non-numerical indicia of FIG. 3;

c. audiovisual instructional means including synchronized recordings and visual slides or filmstrips presenting information relevant to the automotive systems including information defining the relationship between the indicia on said pieces and the indicia on said simulator board;

said audiovisual instructional means further characterized in that it is periodically stopable to permit the user to perform a manipulative activity requested by the instructional means using said simulator board and said manipulative pieces, and being restartable again by the user upon completion of the activity;

d. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board;

said manipulative pieces adapted for manipulation on the simulator board and in conjunction with the simulator board indicia by the user in response to said instructional means such that the automobile electrical system and component parts and circuitry thereof can be constructed and graphically depicted, said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said pieces and said board.

4,004,354
GROUP RESPONSE ANALYZING SYSTEM

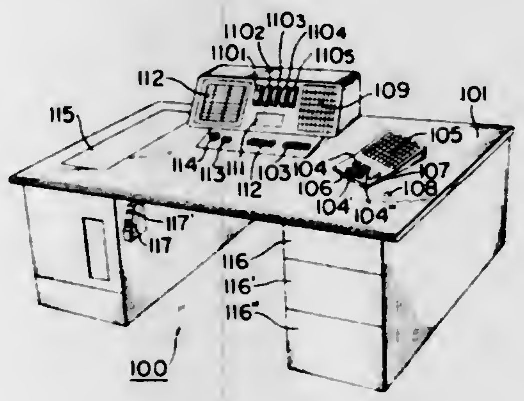
Satoshi Yamauchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1972, Ser. No. 291,620

Claims priority, application Japan, Sept. 30, 1971, 46-76737

Int. Cl.² G09B *5/14*

U.S. Cl. 35—48 R **4 Claims**



1. A group response analyzing system comprising: a central console for a questioner, a plurality of terminal response consoles for questionees, an intercommunication channel selectively connecting said central console and terminal response consoles to transmit information therebetween, said channel including an answer line for transmitting, from the terminal response consoles to the central console, responses by the questionees to each of a succession of questions posed by the questioner and a call line for transmitting, from the central console to the terminal response consoles, calls or instructions from the questioner to the questionees, scanning means for successively selecting individual terminal response consoles to cause each selected terminal response console to supply to the central console a response to a question via said answer line of the intercommunication channel and to subsequently cause each selected terminal response console to receive from the central console calls or instructions from the central console via said call line of the interconnection channel, and means for processing the responses supplied to the central console, wherein the improvement comprises:

memory means for storing indications of the responses from the terminal response consoles to a question from the central console, said responses being supplied to the central console by the terminal response consoles via the answer line of the intercommunication channel, said memory means comprising a plurality of stages, each stage associated with an individual terminal response console and storing the response supplied therefrom to the central console via said answer line of the intercommunication channel; and

control means connected to said scanning means and to said memory means for selectively preventing or permitting the selection of each terminal response console for connection to the central console via said call line of the intercommunication channel depending on the response from said terminal response console to a previous question, which response is stored in the associated stage of the memory means;

whereby the response which a terminal response console gives to a question determines whether this terminal response console will be selected or not by the scanning means for connection to the central console via said call line.

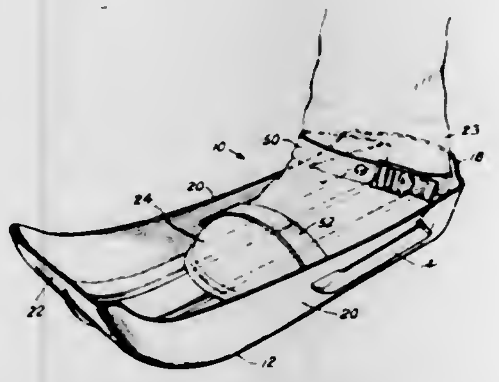
4,004,355
SHOE DEVICE AND METHOD OF ATTACHING A STRAP TO A SHOE MEMBER

Jeffrey M. Koblick, Hopkins, Minn., assignor to K-tel International, Inc., Minnetonka, Minn.

Filed May 20, 1976, Ser. No. 688,416

Int. Cl.² A43B *5/04*

U.S. Cl. 36—122 **7 Claims**



1. A shoe device comprising, in combination:

a shoe member having a first and second heel slot, at least a first and second toe slot, and a first and second intermediate slot;

a single continuous retaining strap passing outwardly through said first heel slot, inwardly through said second heel slot, outwardly through said first intermediate slot, inwardly through said first toe slot, outwardly through said second toe slot, inwardly through said second intermediate slot, outwardly through said first heel slot and inwardly through said second heel slot to define a first and second end portion and a toe-retaining loop; and

means for securing said first and second end portions of said single continuous retaining strap to define an ankle-retaining loop.

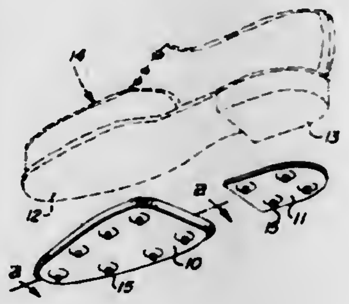
4,004,356
STUDDED SOLE AND HEEL PLATES FOR SHOES

William J. Green, Salt Lake City, Utah, assignor to James P. Watters, Bountiful, Utah

Filed Nov. 17, 1975, Ser. No. 632,221

Int. Cl.² A43B *5/00*

U.S. Cl. 36—134 **2 Claims**



1. A plate for securing to the ground engaging surface of a sole or heel of a shoe comprising:

a thin flexible plastic molded plate having a shape similar to only the ground engaging portion of the sole or heel of a shoe,

a plurality of metallic stud means molded into said plate at spaced positions on its ground engaging surface thereof,

each of said stud means comprising a dome shaped member protruding from the ground engaging surface of said plate a given distance and each having a like plane extending laterally of the longitudinal axis of the dome flush with the ground engaging surface of the plate, and

a plurality of studs one extending out of each of the dome shaped members along their longitudinal axis in a common direction for engaging the ground on which the shoe is used,

said stud means being formed integral with said dome shaped member and said plate

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4,004,357
TWO STROKE DREDGING PLANT

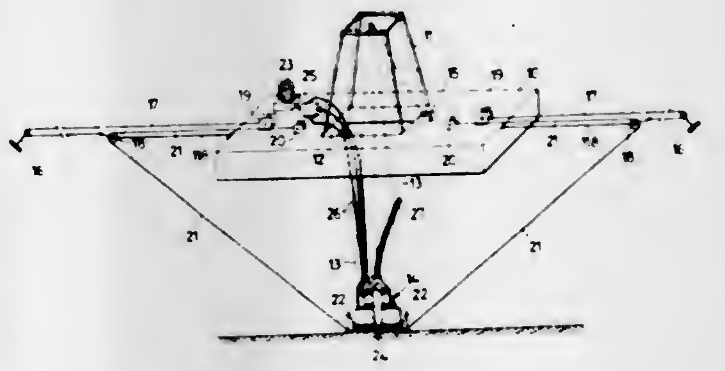
Giovanni Faldi, Via Forese Donati 27, Florence, Italy

, Filed Mar. 13, 1973, Ser. No. 340,811

Claims priority, application Italy, Mar. 17, 1972, 22024/72

Int. Cl.² E02F *3/88*

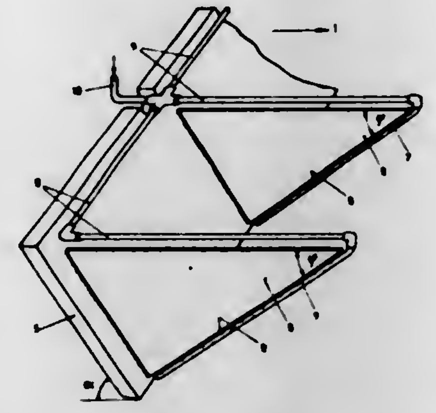
U.S. Cl. 37—58 **3 Claims**



2. A dredging plant comprising in combination disintegrating and conveying shovel means and a submerged pumping unit, said pumping unit having at least two pumping chambers, distributor means connected to said pumping chambers and thereby connecting said disintegrating and conveying shovel means to a source of compressed air via alternate ones of said pumping chambers, said pumping unit and disintegrating shovel means in assembly being adjustably suspended with respect to height from a watercraft which in operation is anchored to only two fixed points between which working strokes are carried out, the said disintegrating and conveying shovel means further comprising two shovels each of which has a working edge facing in a direction opposite from that of the other, said disintegrating and conveying shovel means further having valve means which may be stably changed over to one of two positions whereby one or the other said two shovels is connected to said pumping unit, and cables connected to each of said two shovels, each of said cables having an axis, starting from its connection with said shovels which intersects the center line of said watercraft at a point external to the watercraft itself and in operation controls the inclination of each of said shovels with respect to the vertical, with each of said cables for adjusting the inclination of the shovels being fixed at their free end to a winch for adjusting the inclination mounted on the watercraft and, for the first section starting from the watercraft towards their respective shovel, being taut both at the bow and stern of the watercraft, with vertical rod or bar means immersed in the water to a variable depth.

4,004,358
METHOD AND APPARATUS FOR DREDGING OF GROUND, PARTICULARLY SAND

Adriaan Gabriël van Os, Voorschoten, Netherlands, assignor to Stichting Speurwerk Baggertechniek, Delft, Netherlands
Filed Dec. 18, 1974, Ser. No. 533,953
Claims priority, application Netherlands, June 4, 1973, 7307773
Int. Cl.² E02F *3/92*
U.S. Cl. 37—63 7 Claims

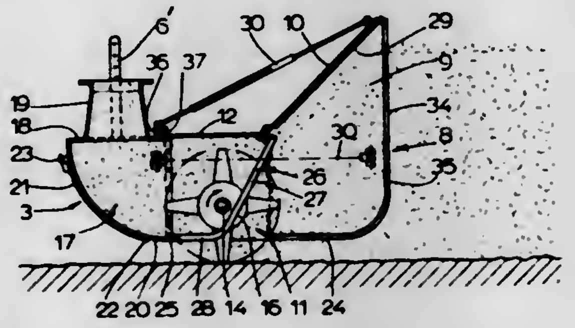


1. A method of underwater dredging in which soil or sand is loosened comprising

moving at least one cutting blade (1, 5) through the soil;
providing means at the failure slip plane arising upon movement of the cutting blade to supply an auxiliary fluid; and
supplying the auxiliary fluid in advance of the cutting blade, at the position of the failure slip plane in the soil, or sand, arising upon movement of the cutting blade (1, 5).

4,004,359
MOUTHPIECE FOR A SUCTION DREDGER

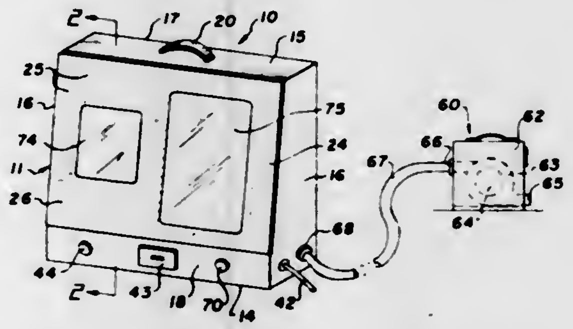
Johan Klip, Berkenwoude, Netherlands, assignor to Konijn Machinebouw B.V. and Bagger-En Constructiebedrijf Johan Klip B.V., both of Netherlands
Filed May 8, 1975, Ser. No. 575,961
Claims priority, application Netherlands, May 22, 1974, 7406867
Int. Cl.² E02F *3/88*
U.S. Cl. 37—66 16 Claims



1. A mouthpiece for a suction dredger, which is adapted to be connected via a suction line to the suction side of a pump and moved by the dredger under water in an approximately horizontal direction, said mouthpiece comprising an inlet section forwardly situated in the direction of travel, which is open on the underside and which has two rearwardly converging, upwardly extending side plates; a comminuting section connected at the rear of the inlet section and also open on the underside, said comminuting section having an upper cover plate and two side plates, an approximately horizontal positively driven cutter shaft journalled in said side plates, a plurality of comminuting members mounted on said shaft each including at least one cutting blade, the blades being uniformly spaced and mutually angularly staggered on said shaft; and a suction section connected at the rear of the comminuting section and provided with a connection which, in use, is coupled to the dredger suction line, said suction section being completely enclosed between the connections to the comminuting section and the dredger suction line, said cutting blades in a downwardly pointing position projecting downwardly beyond the lower edges of the side plates of the inlet section and beyond the leading edge of the bottom wall of the suction section, the lower edges of the side plates of the inlet section and the leading edge of the bottom wall of the suction section in a working position being disposed in a horizontal plane.

4,004,360
SELF-MASKING X-RAY VIEWING APPARATUS

Keith C. Hammond, 3237 W. 35th Ave., Vancouver, British Columbia V6N 2M9, Canada
Filed July 12, 1974, Ser. No. 488,161
Int. Cl.² G09F *13/10*
U.S. Cl. 40—106.1 6 Claims



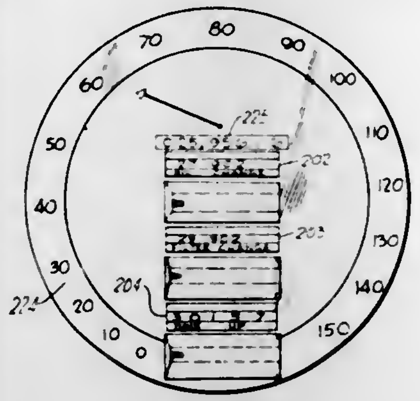
1. Apparatus for holding and illuminating an X-ray film comprising a light diffusing viewing screen having front and rear faces, said viewing screen being provided with a plurality of spaced air inlet holes extending therethrough between the front and rear faces, a grid alongside the rear face forming a network of light-confining and air-conducting chambers one in communication with each air inlet hole, suction means connected to the chambers to cause a flow of air through each air inlet hole and communicating chamber, lighting means near the grid for directing light through the chambers to the viewing screen, and shutter means associated with each chamber having means thereon which cooperates with air flowing in said chamber so that said shutter is normally supported in a light-blocking position, said X-ray film when placed on the front face of the viewing screen to be held thereon by atmospheric pressure blocking those air inlet holes within the borders of said film whereby only the shutter means in the chambers behind the blocked air inlet holes move to light-admitting positions.

4,004,361
VEHICLE OIL CHANGE, FILTER CHANGE AND TUNE UP REMINDER DEVICE

Harry H. McVeety, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Sept. 19, 1975, Ser. No. 614,896
Int. Cl.² G09F *11/02*
U.S. Cl. 40—77.6 1 Claim

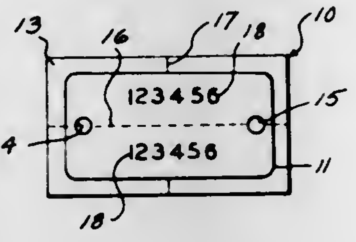
1. A vehicle oil change, oil filter change and tune up reminder device for a vehicle having a passenger compartment a dashboard with a speedometer and odometer thereon, and an engine, said reminder device comprising

a plurality of recesses formed in the dashboard in close proximity with the speedometer in the passenger compartment of a vehicle in clear view of an operator of the vehicle;
three groups of number wheels each rotatably mounted in a corresponding one of the recesses and each comprising a plurality of coaxially mounted number wheels in next-adjacent relation in units, tens, hundreds, thousands, ten thousands and hundred thousands positions, the wheels of a first of said groups being manually rotatable to indicate a mileage at which the next engine oil change is due, the wheels of the second of said groups being manually rotatable to indicate a mileage at which the next oil filter change is due, and the wheels of the third of said groups being manually rotatable to indicate a mileage at which the next engine tune up is due; and
a pair of spring-biased doors each hingedly affixed adjacent a corresponding one of the recesses for selectively closing and opening the recesses.



4,004,362
ADHESIVE WIRE MARKER

Joseph C. Barbieri, Jackson Township, Washington County, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.
Filed Sept. 29, 1975, Ser. No. 617,556
Int. Cl.² H01B *7/36*; G09F *3/10*
U.S. Cl. 40—316 2 Claims

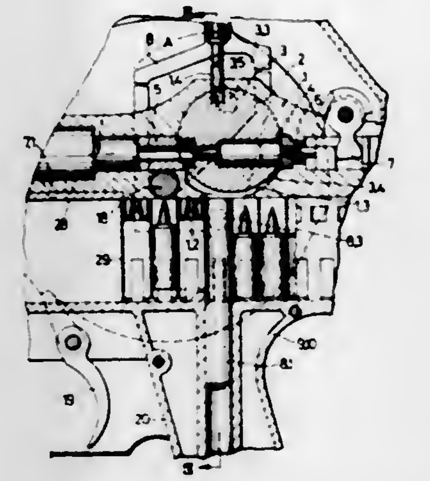


1. An adhesive wire marker assembly comprising, in combination:

a. an adhesive element having a pressure sensitive adhesive layer on one of its surfaces,
b. a backing element releasably joined to the pressure sensitive adhesive layer of the adhesive element,
c. a pair of spaced apertures extending through both the adhesive element and the backing element and adapted to receive a wire therethrough,
d. the backing element being separable from the adhesive element after a wire has been inserted through the spaced apertures and the adhesive element being foldable upon itself for joinder along the pressure sensitive adhesive layer after removal of the backing element to thereby form a flag-like marker for a wire inserted through the apertures, and
e. a perforated line defined across the adhesive element and the backing element intersecting the spaced apertures and extending through both the adhesive element and the backing element.

4,004,363
ROTATABLE CARTRIDGE CHAMBER FOR FIREARM TYPE WEAPON

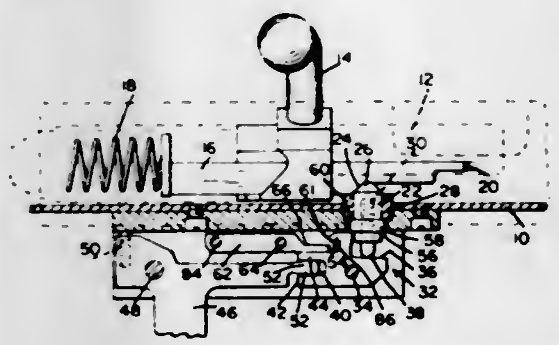
Hans Sackenreuter, Ruckersdorf, and Anton Politzer, Lauf, both of Germany, assignors to DIEHL, Nurnberg, Germany
Filed Jan. 13, 1975, Ser. No. 540,684
Claims priority, application Germany, Jan. 14, 1974, 2401543
Int. Cl.² F41C *11/00, 13/00*
U.S. Cl. 42—9 2 Claims



1. In a firearm type weapon having barrel means with bore means therein along which projectile means is impelled when the weapon is discharged, rotatable cartridge chamber housing means at the rearward end of said barrel means having a first rotated position for presenting cartridges which include said projectile means to the said bore means, said housing means comprising a drum rotatable on an axis transverse to the plane of the bore means and having chamber means therethrough for supporting the cartridges, the axis of rotation of said drum being offset laterally from the plane of the bore means, a magazine for cartridges adjacent said barrel means, and means operable in a second rotated position of the drum for transferring cartridges from said magazine to the chamber means in said drum, said drum including a peripheral recess which faces said magazine in the first rotated position of said drum and which terminates short of said chamber means, said drum having a head portion thereon between the end of said chamber means which is remote from said barrel means and the end of said recess nearest thereto.

4,004,364
ROTATABLY MOUNTED SEAR

Raymond E. Chatigny, Gardner, Mass., assignor to Harrington & Richardson, Inc., Gardner, Mass.
Filed Jan. 20, 1975, Ser. No. 542,458
Int. Cl.² F41C *19/00, 17/00*
U.S. Cl. 42—69 A 5 Claims



1. A firearm comprising a receiver, a firing pin therein, means moving the firing pin between the firing and the cocked position, and a sear temporarily holding the firing pin in the cocked position,

said sear comprising a longitudinally movable rotatable member movable in general at right angles with respect to the firing pin and engaging the same, a movable sear trip holding the sear in the cocked position of the firing pin, a trigger, and interengaging means between the trigger and sear trip for releasing the sear allowing the firing pin to move to the firing position,

spring means for yieldably holding the sear in the firing pin cocked position thereof,

the firing pin depressing the sear along its line of motion when the sear trip is released from its sear holding position,

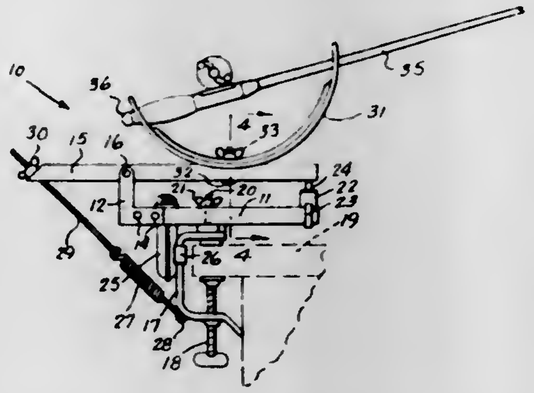
and a bushing holding the sear in position on the receiver but allowing longitudinal motion thereof.

4,004,365
SIGNALING FISHING ROD HOLDER

Lester F. Manchester, P.O. Box 1857, Clearlake Highlands, Calif. 95422

Filed July 22, 1975, Ser. No. 597,988
Int. Cl.² A01K *97/12*

U.S. Cl. 43—17 **5 Claims**



1. A fishing rod holder comprising a frame, a rod spaced above said frame in generally parallel relation thereto and pivotally secured to said frame on a transverse pivot, a generally U-shaped clamp secured to said frame in depending relation thereto, a generally arcuate bracket with a fishing rod positioned across the ends of the bracket mounted on said rod with a bolt and having an elongate slot therein to permit angular adjustment of said bracket on said rod and therefore the fishing rod, a signal switch mounted on said frame and positioned to underlie said rod, a battery actuated signal secured to said frame and electrically connected to said switch for actuating said signal upon downward movement of said rod and its attached fishing rod, and resilient means extending from said U-shaped clamp to the end of said rod opposite said switch for normally biasing said rod away from said switch to prevent actuation of said switch prior to a catch being made with said fishing rod.

4,004,366
ADJUSTABLY MOUNTED POWER FISHING REEL

Arthur E. Berry, 18645 Cambridge Drive, Lathrup Village, Mich. 48076

Filed Jan. 8, 1976, Ser. No. 647,611
Int. Cl.² A01K *97/00*

U.S. Cl. 43—27.4 **10 Claims**

1. Easily adjustable, multi-position, deep-water, power fishing-reel apparatus comprising,

an L-shaped bracket having a downwardly extending short back leg portion constituting a brace and an outwardly extending long front leg portion constituting a pole;

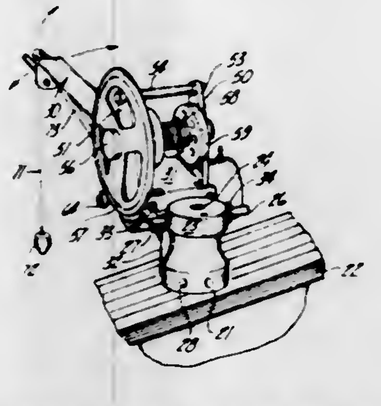
a tang on said brace remote from said pole, said tang projecting from said brace in a direction opposite to the projection of said pole;

a support mountable on a boat; a base on said support for abutting a boat; and an upstanding top portion on said support;

a transverse generally horizontal bar on said upstanding top portion of said support so as to lie spaced above a boat when said support is mounted on a boat;

said support having at least one socket aperture adjacent its said base lying spaced downwardly from said transverse bar and adapted to receive said tang on said brace;

paired stirrups extending from said bracket at a point adjacent the juncture of said brace with said pole; said stirrups extending in a direction opposite to said pole; said stirrups pivotally engaging said transverse bar so as to be swingably supported on said bar about the horizontal axis of said bar;



said bracket being swingable via said stirrups on said bar over said support from a position with said brace extending downwardly abutting said support with its said tang in said socket aperture and said pole extending in one direction (such as outwardly of a boat) to positions up to 180° opposite (such as inwardly of a boat) by pivoting said bracket and said stirrups on said bar with said pole swinging upwardly and then inwardly so that said brace swings outwardly to disengage said tang and then swings upwardly;

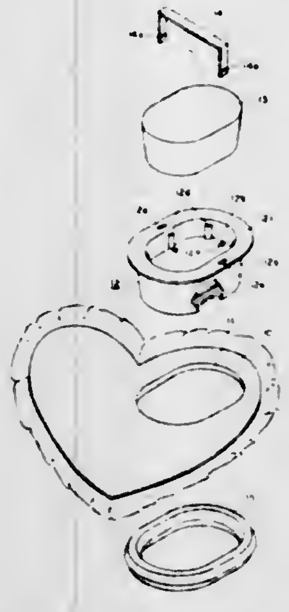
said stirrups and said tang when engaged in said socket securing said bracket against angular movement relative to said base.

4,004,367
DECORATIVE HOLDER FOR FLOWER ARRANGEMENTS

Donald L. O'Connell, Port Chester, N.Y., assignor to Floral Innovations, Inc., Port Chester, N.Y.

Filed July 11, 1975, Ser. No. 595,101
Int. Cl.² A01G *5/04*

U.S. Cl. 47—41.12 **4 Claims**



1. A decorative holder for supporting flower arrangements comprising:

a flat decorative backing piece having an opening therein;

a substantially water-confining receptacle fitting in and extending through said opening for supporting a foam block and having extension means engaging the upper surface of said backing piece;

means for retaining the foam block in a desired position in said receptacle;

and means engaging said receptacle beneath said backing piece for retaining the same in said opening.

4,004,368
AGRICULTURAL SOIL COMPOSITIONS

Paul Raymond Tully, Lowell, Mass., assignor to Cabot Corporation, Boston, Mass.

Continuation of Ser. No. 552,484, Feb. 24, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,660
Int. Cl.² A01C *1/00*

U.S. Cl. 47—58 **12 Claims**

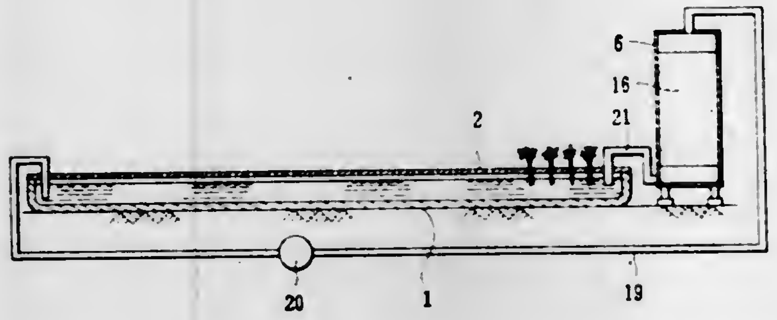
1. An agricultural soil composition comprising a mixture of (a) one part by volumme of hydrophobic finely-divided particulate metallic oxide having a BET-N_2 surface area of at least about 50 m^2/g and (b) between 15 and about 40 parts by volume of conventional soil material.

4,004,369
WATER CULTIVATION METHOD

Hisayoshi Kato, Nagoya, and Ryuhji Ueno, Kasugai, both of Japan, assignors to Nihon Jescoal Industry Co., Ltd., Japan

Filed Dec. 30, 1974, Ser. No. 537,424
Int. Cl.² A01G *31/00*

U.S. Cl. 47—62 **5 Claims**



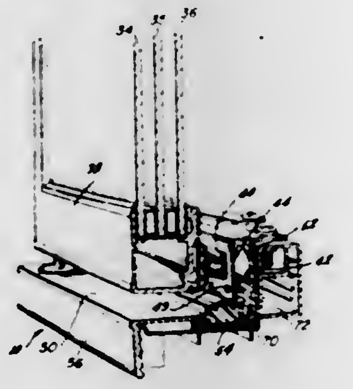
1. In a method of cultivating plants hydroponically wherein said plants are supported so that the roots of said plants are maintained in an aqueous nutrient solution and the tops of said plants are maintained above said solution whereby said plants are grown by means of water containing nutrients, substantially in the absence of soil, the improvement comprising adding activated carbon to said water, whereby organic substances harmful to said plants are adsorbed by said carbon and the growth and quality of said plants are improved.

4,004,370
INSULATED DOOR MOUNTING FRAME STRUCTURE

James J. Heaney, Glendale, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed Mar. 3, 1975, Ser. No. 554,593
Int. Cl.² E06B *7/12*

U.S. Cl. 49—70 **15 Claims**



1. A structural member for use in forming a door mounting frame for mounting into an opening in a refrigerated cabinet and within which frame a door can be operatively mounted, said structural member being a beam elongated in the longitudinal dimension and defined by its cross-section which comprises:

a. an elongated jamb portion adapted to abut the refrigerated cabinet opening;

b. an elongated buck portion extending perpendicularly from the longitudinal edge portion of said jamb portion adapted to be nearest the interior of the refrigerated cabinet, said buck portion comprising:

i. an elongated, relatively thick structural load bearing member

ii. an elongated relatively thin faceplate adapted to coact in sealing relationship with the refrigerated cabinet door, said load bearing member and faceplate being disposed in mutually spaced relationship to define a divided thermal path in said buck portion;

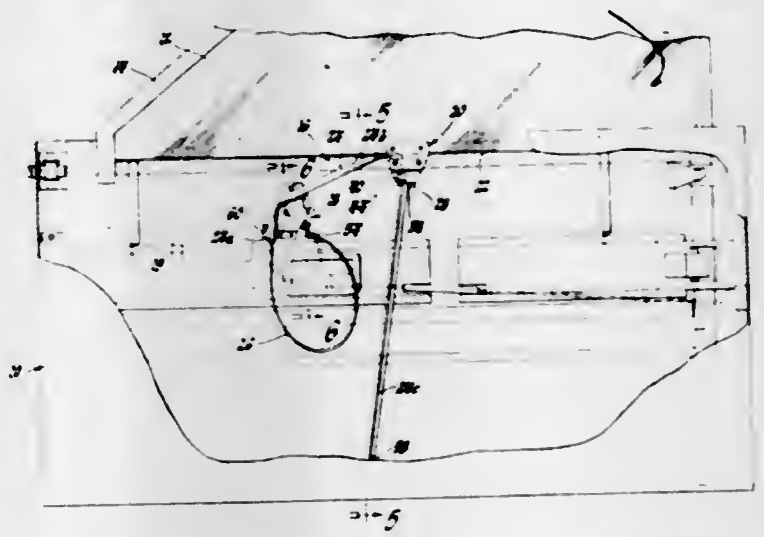
c. a thermal isolation element positioned within said structural member in the area proximate the junction of said jamb and buck portions and thermally insulating the structural member components on opposite sides thereof.

4,004,371
WINDOW REGULATOR MECHANISM

Edward G. Podolan, Utica, and Lawrence A. Surhigh, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 9, 1975, Ser. No. 575,953
Int. Cl.² E05F *11/48*

U.S. Cl. 49—352 **5 Claims**



1. For use with an automotive door having spaced inner and outer panels and a window frame, and a window pane adapted to being slidably mounted in said window frame, a window regulator mechanism comprising an actuator assembly mounted in said door on said inner panel; a bracket assembly mounted on said window pane adjacent the bottom edge thereof; a track having a slotted opening formed along the full length of one side thereof and including first, second, and third sections mounted in said door on said inner panel, said first section being secured so as to have said slotted opening positioned adjacent said actuator assembly in a forward portion of said door and extending substantially vertically downwardly from said actuator assembly, said second section being connected at one end thereof to the upper end of said first section and extending from said actuator assembly to said bracket assembly when said window pane is in a closed position in said window frame, and said third section being connected to the other end of said second section and extending downwardly therefrom in a predetermined arcuate-shaped configuration and being secured to a bottom portion of said inner panel; a plastic tape slidably mounted in said track and having one end portion thereof extending from the open end of said first track section and looped so as to be secured adjacent said actuator assembly, said plastic tape having equally-spaced perforations formed along the entire length thereof; said actuator assembly including a manually rotatable actuating shaft, a pinion gear mounted on said actuating shaft for rotation therewith, a fixed ring gear retainer, a ring gear rotatably mounted on said ring gear retainer and having internally-formed teeth meshing with said pinion gear and externally-formed sprocket teeth meshing with said perforations through said slotted opening in said track for slidably reciprocally moving said plastic tape through said first, second, and

third track sections; and said bracket assembly including a first plate member secured to said bottom edge of said window pane at a central location therealong and including a portion extending beyond said bottom edge, a second plate member secured at one end thereof to said extended portion and including a first flange portion formed on the other end thereof so as to extend substantially perpendicular to the plane of said second plate member, a first rectangular-shaped opening formed in said first flange portion, a second flange portion formed on said first flange portion adjacent an edge of said first rectangular-shaped opening so as to extend substantially perpendicular to the plane of said first flange portion, a second rectangular-shaped opening formed in said second flange portion, a flanged drive pin secured to the other end portion of said plastic tape in said third track section and extending therefrom into said second rectangular-shaped opening to drive said bracket assembly and, hence, said window pane along a path parallel to said third track section intermediate said door panels in response to manual rotation of said actuating shaft.

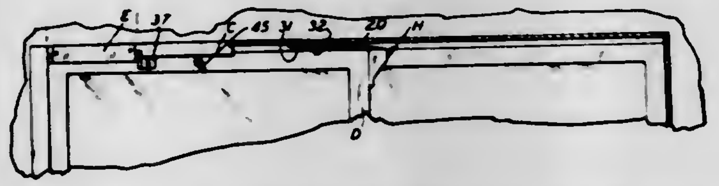
4,004,372
SLIDING DOOR CLOSER AND METHOD AND APPARATUS FOR INSTALLING THE SAME

Wallace F. Beard, Boulder City, Nev.; Jack H. Poppler, and Loren C. Kienlen, both of Nisswa, Minn., assignors to Doormaid, Inc., Nisswa, Minn.

Filed Apr. 14, 1975, Ser. No. 567,928

Int. Cl.² E05D *15/06*

U.S. Cl. 49—404 **4 Claims**



1. A cushioned door closer for a sliding door having top and bottom edges and a pair of vertical edges, one an overlapping edge and the other an abutting edge and mounted in an upper channel having a horizontal top portion spaced above the top of the door and provided with depending guide flanges which capture the upper edge portion of the door, said door closer comprising,

a closer housing with a pivot shaft therewithin attached to the upper portion of the overlapping edge of the sliding door,

a coil return spring having the coil thereof journalled on said shaft and enclosed within said housing and having a free end attachable to the horizontal top portion of the channel member in substantially concealed relation above the upper edge of the door between the depending guide flange of the channel,

means for cushioning the door during the final stages of movement under the force exerted by said return spring and including an extensible rod member with means for limiting the speed of retraction thereof,

a rod extending member mounted on said door for moving said rod into extended position whenever the door is moved into open position,

a magnet attached to one of said members and a ferrous metal magnet-engaging portion mounted on the other member in alignment with said magnet for engagement therewith to pull the extensive member into fully extended position, and

stop means for limiting the extending movement of the extensible member and the two members separating when the extensible member has been pulled into fully extended position against said stop means and thereafter the door is moved further into open position.

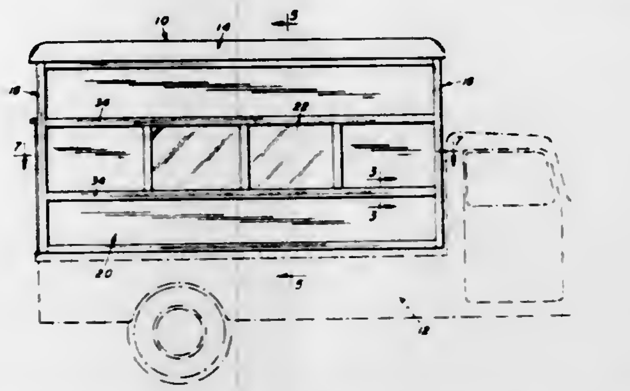
4,004,373
EXTRUSIONS FOR PARTITIONS, WALLS AND ENCLOSURES

Robert C. Eschbach, Newport Beach, and John B. Colligan, Glendale, both of Calif., assignors to Aztec Manufacturing Company, Monrovia, Calif.

Division of Ser. No. 325,461, Jan. 22, 1973, Pat. No. 3,866,381, which is a division of Ser. No. 884,812, Dec. 15, 1969, Pat. No. 3,712,005. This application Dec. 30, 1974, Ser. No. 537,477

Int. Cl.² E05D *15/06*

U.S. Cl. 49—413 **5 Claims**



1. In a sliding window unit for mounting in a partition wall;

first and second spaced, substantially identical, horizontal extrusions having H-shaped cross sections defined by inwardly and outwardly extending spaced pairs of legs defining inwardly and outwardly facing channels;

first and second spaced, substantially identical, vertical extrusions each having inwardly extending spaced legs and an outwardly extending spaced pair of legs defining first and second inwardly facing channels and a first outwardly facing channel, respectively, said horizontal and vertical extrusions being interconnected to form a rectangular window frame having a central opening;

partition securing means on the outwardly extending legs of said horizontal and vertical extrusions for securing said window frame in a partition, said outwardly facing channels being adapted to receive said partition;

first and second parallel slots formed in the adjacent inwardly extending legs forming said first channel on each of said vertical extrusions;

a sealing member disposed in each of said parallel slots, said sealing members being disposed on opposite sides of each of said first channels of said vertical extrusions;

first and second window lights mounted in said central opening of said window frame, said first light covering approximately one-half of said central opening and being mounted for horizontal motion therein along said inwardly facing channels of said first and second horizontal extrusions between open and closed positions, and said second light covering the remainder of said central opening and being fixedly mounted therein, said second light being located in said inwardly facing channels of said first and second horizontal extrusions;

track means secured in said inwardly facing channel of each of said first and second horizontal extrusions, for receiving said window lights, each said track means comprising a track web having a center and two spaced outside finger flanges of rigid material, said finger flanges forming two parallel side-by-side trackways within the inwardly facing channel of each said horizontal extrusions, said first and second window lights being mounted in separate corresponding trackways;

flexible sealing means formed at and extending from the ends of each of said finger flanges to engage opposed surfaces of said window lights;

a rigid, elongated block within each of the trackways formed in the lowermost of said first and second horizontal extrusions, said blocks each having on the upper surface thereof a longitudinal recess for receiving and supporting a corresponding window light; and

inner and outer vertical center posts, said outer post being fixedly mounted within said frame and being secured to one end of said second window light while the opposite end of said second light engages the sealing members of the first channel of the first one of said vertical extrusions whereby said second window light is secured in said frame, said inner post being movably mounted within said frame and being secured to one end of said first window light while the opposite end of said first window light is engagable with the sealing members of the first channel of the second one of said vertical extrusions when said first window light is moved to its closed position.

4,004,374
DESCALING BENT ROD WITH SEPARATED CLEANING PARTICLES

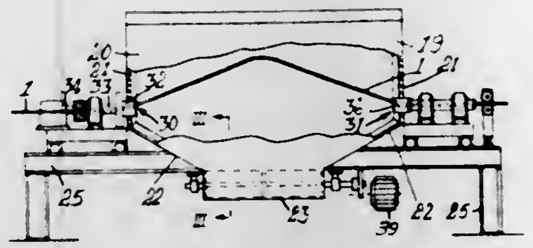
Joseph Johannes Maria Annegarn, 1 Walsh Road, Kilfenora, Benoni, Transvaal, South Africa

Filed Aug. 6, 1975, Ser. No. 602,299

Claims priority, application South Africa, Aug. 7, 1974, 74/5031

Int. Cl.² B08B *7/04*; B24C *1/00, 3/14*

U.S. Cl. 51—5 A **11 Claims**



3. Rod descaling means comprising an enclosure having spaced inlet and outlet openings therein, first means for distributing separated cleaning particles in said enclosure, second means for forming a bent portion in a rod extending between said openings and rotating the bent portion in an approximately circular path such that said bent portion strikes the particles in said enclosure, and third means for moving the rod through the enclosure between the openings and maintaining the bent portion in the enclosure.

4,004,375
APPARATUS FOR CONTINUOUS CLEANING OF A HONING TOOL

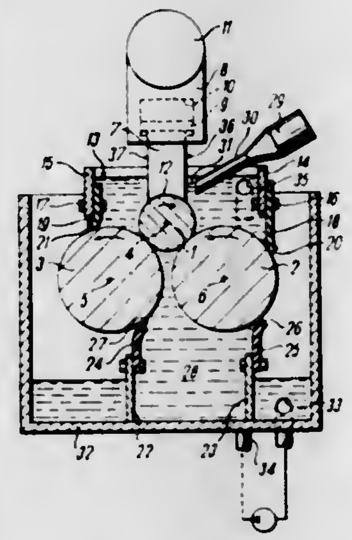
Karl Wieck, Stuttgart, Germany, assignor to Supfina Maschinenfabrik Hentzen KG, Remscheid, Germany

Filed July 25, 1975, Ser. No. 600,882

Claims priority, application Germany, July 25, 1974, 2435848

Int. Cl.² B24B *7/00*

U.S. Cl. 51—59 SS **3 Claims**



1. In a device for superfinishing a cylindrical workpiece including means for holding and supporting said workpiece and including a honing tool which contacts a cylindrical surface of said workpiece with its working surface under a predetermined pressure and including reciprocating driving means for imparting to said honing tool a reciprocating motion in a direction parallel to the axis of rotation of the workpiece, and further including ultrasonic driving means with a transmitter head for imparting an oscillatory motion to the honing tool in a direction perpendicular to the first mentioned reciprocating motion,

the improvement comprising:

container means surrounding the workpiece and the workpiece-contacting surface of the honing tool, said container means being filled with a liquid, the transmitting head of said ultrasonic driving means being immersed below the surface of said liquid; whereby said liquid serves as a medium for transmitting ultrasonic vibrations to the workpiece-contacting surface of the honing stone.

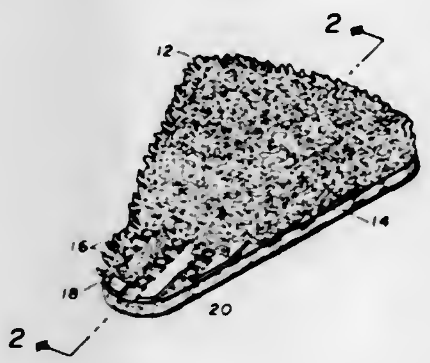
4,004,376
KITCHEN WARE CLEANING DEVICE

Edwin F. Schepp, Creve Coeur, Mo., and Ronald B. Coffey, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1974, Ser. No. 537,282

Int. Cl.² B24D *15/04*; A47L *17/04*

U.S. Cl. 51—181 R **4 Claims**



1. A laminar structure useful as a device for cleaning cooking vessels and other utensils used in food preparation, said laminar structure comprising: a molded thermoplastic brushing surface characterized by a base member from which a plurality of projections extend vertically from one face thereof at angles of from 60° to 90°, and wherein said projections are integrally fused with said base member; said laminate structure further including a non-woven, nylon mat which is bonded to the base member of said thermoplastic brushing surface on the face thereof opposite to that from which the projections extend, said non-woven, nylon mat having particles of an abrasive and soap impregnated therein.

4,004,377
MACHINE FOR FORMING A LOCATOR PIN

Richard D. Laudick, 314 E. Lyon, Lyons, Kans. 67554

Division of Ser. No. 467,464, May 6, 1974, Pat. No. 3,918,694. This application June 9, 1975, Ser. No. 585,086

Int. Cl.² B24B *47/10*

U.S. Cl. 51—232 **1 Claim**

1. A machine for making a locator pin or the like, the machine comprising:

a base rigidly mounted;

a pair of parallel rails mounted on said base;

a cam follower rigidly secured to one of said rails;

an elongated housing having ends, and movably mounted on said rails, the movement of said housing transverse to the length of said housing;

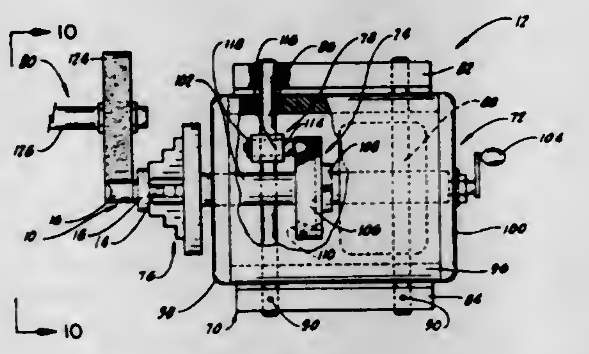
a shaft rotatably mounted in said housing and parallel to the length of said housing;

a cam mounted on said shaft, said cam having a grooved portion therein, said cam follower slidably engaged in the grooved portion of said cam;

a chuck secured to one end of said shaft for engaging the locator pin and rotating the pin thereon; and

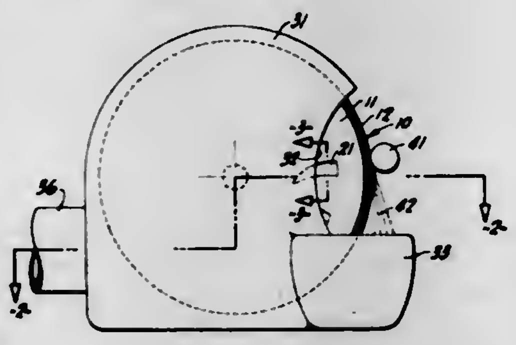
a crank or the like attached to the other end of said shaft for rotating said shaft;

said base is an elongated U-shaped base having a bottom portion and two side portions, said parallel rails mounted at the ends thereof to the side portions of said base, said rails suspending said housing between the side portions of said base, the length of said housing parallel to the side portions of said base, the ends of said housing extending outwardly from the side portions of said base, said housing encloses said cam, said cam follower, and a portion of said shaft, said grooved portion of said cam is generally annular and eliptically elongated, said cam follower includes a cam follower pin, a support block, and a leaf spring, said cam follower pin movably mounted in said support block, said support block rigidly secured to one of said rails, said cam follower pin resiliently urged into the grooved portion of said cam by one end of said leaf spring, the other end of said leaf spring attached to said support block,



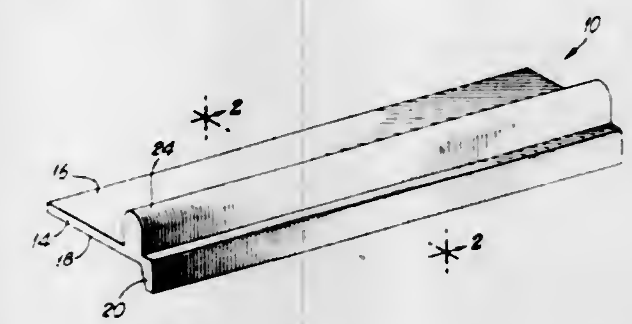
said machine for making a locator pin and constructed and adapted to in use to be used with a grinder or the like to grind the head end portion of the locator pin or the like to an annular transverse cross section.

4,004,378
GRINDING WHEEL WITH INTEGRAL BLOWER
Van Q. Maxey, Morgan Hill, Calif., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.
Filed July 18, 1975, Ser. No. 597,021
Int. Cl.^{2} B24B *55/06*; B24D *5/10*
U.S. Cl. 51—273 **9 Claims**



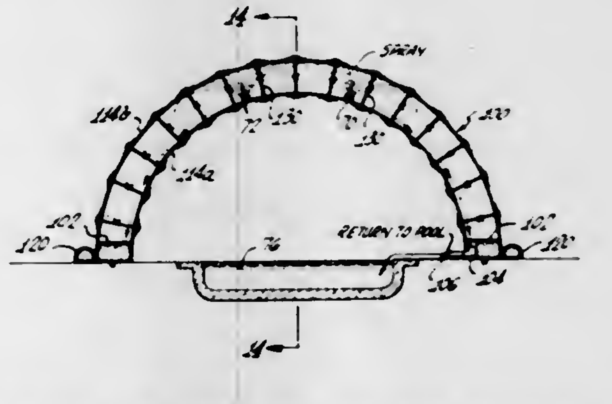
5. In a grinding wheel for removing material from a workpiece engaged by the outer periphery of the wheel: a generally cylindrical inner portion adapted to be rotated about its axis, an abrasive cutting portion disposed coaxially of the inner portion and defining the outer periphery of the wheel, and at least one blower passageway having a continuous wall extending in an axially inclined direction between axially spaced sides of the wheel for drawing air and material removed from the workpiece through the wheel when the wheel is rotated in a predetermined direction, said passageway being spaced inwardly of the outer periphery and opening through the sides of the wheel without opening through the periphery.

4,004,379
SCRATCH PREVENTER
Gerald Castagna, P.O. Box 62, Cedar Point, Ill. 61316
Filed Apr. 14, 1975, Ser. No. 568,122
Int. Cl.^{2} B24B *55/00*
U.S. Cl. 51—274 **1 Claim**



1. A scratch preventer for protection of a first automobile body panel during repair of an adjacent second body panel separated from the first panel by an elongated, narrow gap, said scratch preventer comprising: a unitary, one-piece body of substantially homogeneous, flexible, resilient, elastomeric and magnetic material; said body being magnetized for retention against the first automobile body panel solely by magnetic attraction; said body being elongated and generally panel-shaped and having a thickness small in comparison to its length and width permitting said body to be flexed; said body having a length substantially greater than its width; a lip formed integrally with said body and extending along the length of said body at one edge of said body; said lip having a thickness smaller than the gap between the first and second panels and having a width small in relation to the width of said body; and a bumper formed integrally with said body on the opposite side of said body from said lip, said bumper and lip being generally parallel with one another, and said bumper being thicker than said lip.

4,004,380
DOUBLE WALLED INFLATABLE STRUCTURES
John P. Kwake, 2507 Carob Drive, Los Angeles, Calif. 90046
Continuation-in-part of Ser. No. 304,550, Nov. 7, 1972, abandoned. This application July 8, 1974, Ser. No. 486,493
Int. Cl.^{2} E04B *1/345*
U.S. Cl. 52—2 **3 Claims**



1. A double walled inflatable enclosing structure, which comprises, in combination:

a first reinforced plastic sheet;

a second reinforced plastic sheet sealing attached to said first reinforced plastic sheet to form the roof and walls of said enclosing structure;

means for internally interconnecting said first and second reinforced plastic sheets comprising:

a. a plurality of individual, substantially non-stretchable, flexible, cord means,

b. a plurality of pairs of holes provided in said first and second reinforced plastic sheets, each hole of a pair of holes being oppositely disposed in each of said first and second reinforced sheets at variable but predetermined distances from an adjacent pair of holes,

c. the ends of each of said individual flexible cord means passing through each pair of holes and said ends being provided with enlarged ends so as to prevent their slipping inwardly through the holes whereby said plurality of cord means interconnects, and is supported entirely by, said first and second reinforced plastic sheets at the variable but predetermined distances from each other determined by the location of said plurality of said pairs of holes, and

d. a plurality of washer means provided between the enlarged ends of each of said cord means and said first and second reinforced plastic sheets to prevent tearing of the underlying holes;

means for air sealing said structure at areas adjacent the said enlarged ends of each of said cord means;

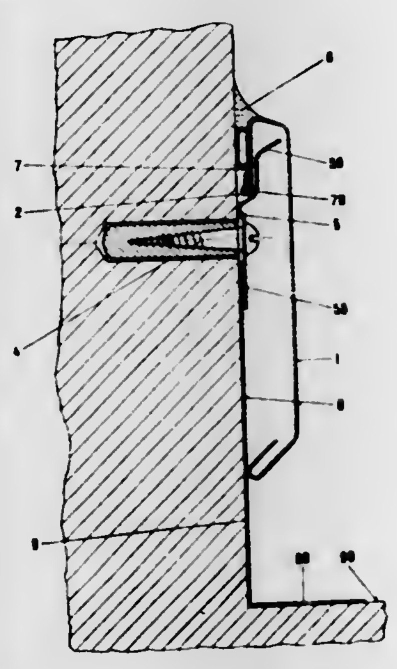
an air blower means adapted to blow air into said enclosed structure and cause it to be inflated, said plurality of flexible cord means becoming taut and determining the configuration of said enclosed structure when said enclosed structure is fully inflated and said plurality of flexible cord means lying loosely within said enclosed structure when said enclosed structure is not inflated;

fluid inlet means between said first and second reinforced plastic sheets, at at least one elevated point within said enclosing structure;

fluid supply means connected to said fluid inlet means; and

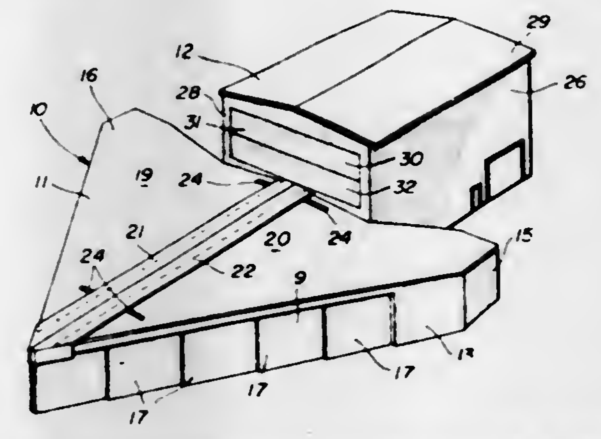
temperature-responsive valve means at a low point in said enclosure for permitting fluid, entering the fluid inlet means from said fluid supply means, to exit from said enclosing structure.

4,004,381
ARRANGEMENT FOR A PROTECTIVE COVER FOR THE EDGE OF SHEET METAL PANELS
Peter Pichler, Waldheim, and Albert Jorg, Hergiswil, both of Switzerland
Filed Feb. 27, 1973, Ser. No. 336,321
Claims priority, application Switzerland, Feb. 29, 1972, 2918/72
Int. Cl. E04d *1/36*, *13/15*
U.S. Cl. 52—60 **1 Claim**



1. A protective cover arrangement for a sheet metal panel for protecting the edge thereof lying against a wall, comprising a clamping strap extending transversely of the edge of the sheet metal panel to be protected, means for securing said clamping strap to the wall, said clamping strap including a flexible upper leg spaced from the wall, and a cover strip having an upper edge provided with a U-shaped channel bent portion received between said upper leg and the wall, said bent portion of said cover strip being provided with an elastic seal partially received in said U-shaped channel bent portion, said seal being tubular in shape having a lateral flap with said flap being received in said U-shaped channel bent portion, the space between the wall and said cover strip above said seal being filled with sealing compound the lower edge portion of said cover strip being U-shaped and extending toward the wall, said clamping strap being secured to the wall above the edge of the sheet metal panel, said clamping strap overlying the edge of the sheet metal panel in order to press the sheet metal panel against the wall, said clamping strap having approximately the same length as said cover strip.

4,004,382
HANGAR FACILITY
Carl V. Carlson, Batavia, Ill., assignor to R & D Constructors, Inc., Park Ridge, Ill.
Filed May 30, 1975, Ser. No. 582,369
Int. Cl.^{2} E04B *1/346*
U.S. Cl. 52—64 **11 Claims**



1. A hangar for storing and maintaining aircraft, said hangar comprising:

a first fixed section for housing the fuselage and wing portions of an aircraft which includes a fixed roof having an opening therein through which a tail section of an aircraft can pass when an aircraft is moved into or out of said hangar; and,

a second hangar section for housing the tail section of said aircraft said second section being contiguous to said first section and having a roof which is greater in height than the height of the roof of said first section and of a height sufficient to accommodate the height of the tail of an aircraft to be stored or maintained.

4,004,383
METHOD AND DEVICE FOR ANCHORING A STRUT
Tsuguhiko Watanabe, No. 5-13, 1-chome, Ehara-cho, Nakano, Tokyo, Japan
Filed Sept. 12, 1975, Ser. No. 612,683
Claims priority, application Japan, Nov. 8, 1974, 49-128106; May 19, 1975, 50-65922[U]; July 29, 1975, 50-104165[U]
Int. Cl.^{2} E04H *12/20*, *17/22*
U.S. Cl. 52—154 **5 Claims**

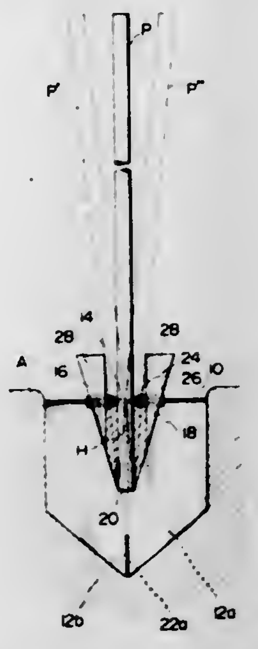
1. A method of anchoring a strut in the ground, comprising the steps of

connecting upright radial plates to the underside of a top plate provided with a hole so that said upright radial plates provide bearing surfaces resisting against side and vertical pressures;

driving said radial plates into the ground at a given location until said top plate engages and compacts the ground beneath it;

inserting the strut through the hole into the thus compacted ground until a lower end of the strut abuts against a bearing surface provided in the radial plates; and

adjusting the strut to a desired angular orientation relative to the horizontal by engaging and exerting pressure upon the strut with respective circumferentially spaced clamping means associated with at least one of the top plate and the radial plates.



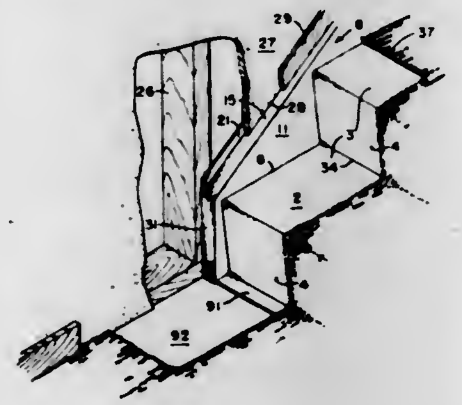
4,004,384
STAIRWAY UNIT

Murray C. Hood, Oakland, Calif., assignor to Curoco, Albany, Calif.

Filed Feb. 6, 1976, Ser. No. 655,961

Int. Cl.² E04F *11/12*

U.S. Cl. 52—188 3 Claims



1. A stairway unit comprising:

a. a single sheet metal member forming the treads and risers and having parallel side edges;

b. a pair of stringers each having a planar, vertical-face side;

c. said sheet metal member being connected at its edges only to the vertical-face sides of said stringers; and

d. a plurality of axially aligned channel-shaped brackets connected to the underside of a plurality of said treads having a laterally extending base joined on their outer sides to said treads and integrally connected downwardly extending flanges adapted for bendably engaging a furring strip.

4,004,385
BUILDING STRUCTURE USING CONCRETE BLOCKS

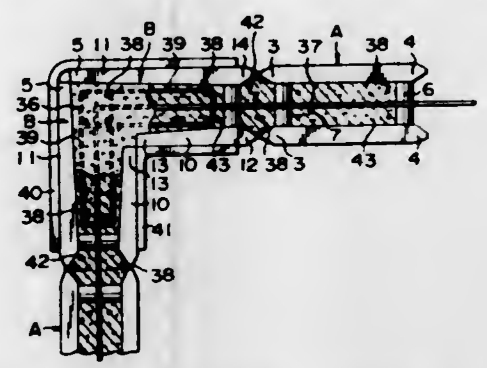
Momotoshi Kosuge, No. 834-9, Kitaishigaki, Beppu, Oita, Japan

Filed Apr. 10, 1974, Ser. No. 459,725

Claims priority, application Japan, Apr. 17, 1973, 48-46207[U]; May 8, 1973, 48-53905[U]; Apr. 26, 1973, 48-50473[U]

Int. Cl.² E04B *1/82, 2/02*

U.S. Cl. 52—259 10 Claims



1. A building structure comprising (i) a plurality of contiguous concrete blocks spaced in an end to end relationship, said blocks comprising two rectangular side boards spaced from and extending parallel to each other, each said side board having at least one V-shaped vertical edge, said V-shaped edge abutting the V-shaped edge on an adjacent block, and connecting members integrally connecting said side boards wherein the side boards of at least one of said plurality of blocks are of different lengths and have respective V-shaped vertical edges aligned with each other and wherein the shorter side board has one flat vertical edge, the height of said connecting members being less than the height of said boards, such that the top of each of said connecting members is at a lower level than the top of each of said boards; (ii) horizontally extending reinforcing bars situated within the space between said side boards above the top of said connecting members; (iii) vertically extending reinforcing bars situated within the space formed by said side boards and said connecting members; (iv) reinforcing loops positioned in the space formed by said side boards and said connecting members and surrounding said vertically extending reinforcing bars; and (v) mortar in the spaces defined by said side boards and said connecting members and all of the grooves defined by said V-shaped edges, integrally uniting members (i) - (iv).

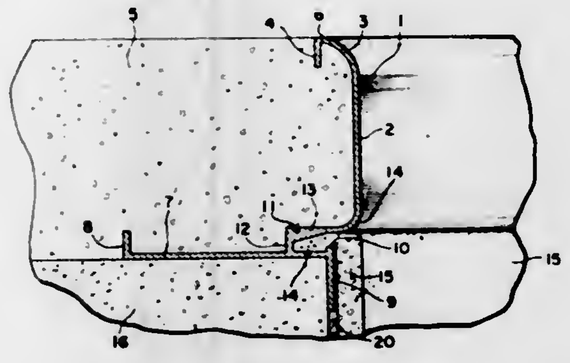
4,004,386
CONCRETE AND LINER RETAINER COPING

Harold C. Diffenderfer, 4196 Bannister, Breesport, N.Y. 14816

Filed Sept. 8, 1975, Ser. No. 611,274

Int. Cl.² E04H *12/00, 3/18*

U.S. Cl. 52—300 3 Claims



1. A concrete and liner retaining coping for mounting on the top surface of a pool wall and the like comprising:

a flat vertical wall terminating upwardly in a top arcuate curve portion curving rearwardly in a direction away from the pool and formed with a vertically downwardly depending lip substantially parallel to said vertical wall and ending in a free edge;

a horizontal portion for support on the top surface of the pool wall and extending rearwardly relative to said vertical wall and terminating at its free end in an upwardly directed vertically orientated back lip, said horizontal portion having on its opposite end a downwardly directed flange covering the edge of the top surface and an upwardly directed lip for retaining the liner,

said vertical wall terminating downwardly in a bottom arcuate curve portion curving rearwardly overlying a part of said horizontal portion and the downwardly directed flange defining a receptacle opening for receiving the liner; and

a vertical connection portion integrally joining said horizontal portion to the bottom arcuate curve portion of said vertical wall and forming the back wall of said receptacle.

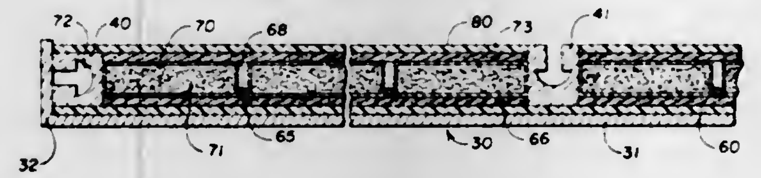
4,004,387
PANELS AND THE METHOD OF SAME FOR HOUSE CONSTRUCTION

Jerome B. Ellingson, R.R. 1, Moorhead, Minn. 56560

Filed Aug. 20, 1975, Ser. No. 606,109

Int. Cl.² E04C *1/00;* B28B *9/00;* B28H *9/02*

U.S. Cl. 52—309.3 15 Claims



8. The prefabricated panel including, an outer layer of fiberglass mat having a suitable facing material secured thereto; an inner core of insulating material extending in spaced rows across the width of the panel, a metal rod positioned in the space between each row of insulating material and secured to the insulating material and the outer layer of fiberglass mat by acrylic and filler material; and a top layer of fiberglass material secured to the insulating material and bonded thereto by an acrylic material.

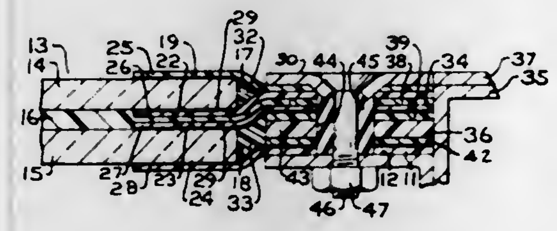
4,004,388
WINDOW PANEL EDGE CONSTRUCTION

John E. Stefanik, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 444,440, Feb. 21, 1974. This application Jan. 21, 1975, Ser. No. 542,749

Int. Cl.² E04C *1/42, 2/54*

U.S. Cl. 52—398 13 Claims



1. A window panel assembly comprising a rigid transparent sheet for mounting in an opening on a supporting structure having a mounting surface including mounting surface portions of a given contour, said sheet having a peripheral edge and a peripheral marginal major surface area on each side of said sheet adjoining said edge, portions of said peripheral marginal major surface area on one side of said sheet being adapted to be mounted in substantially coplanar alignment with said mounting surface portions, a pair of rigid molded strap members composed of a reinforced, thermosetting resin that is cured during lamination of said assembly, one of said strap members being rigidly adhered to said marginal major surface area on said one side of said sheet and extending outwardly from said edge and the other of said strap members being rigidly adhered to said marginal major surface area on the other side of said sheet and extending outwardly from said edge and said strap members being connected outwardly of said edge of said sheet in a rigid structural edge attachment member having an outer portion molded to fit on said supporting structure around said opening whereby said sheet may be fastened through said strap members to said supporting structure to form a rigid assembly with a minimum of residual stress.

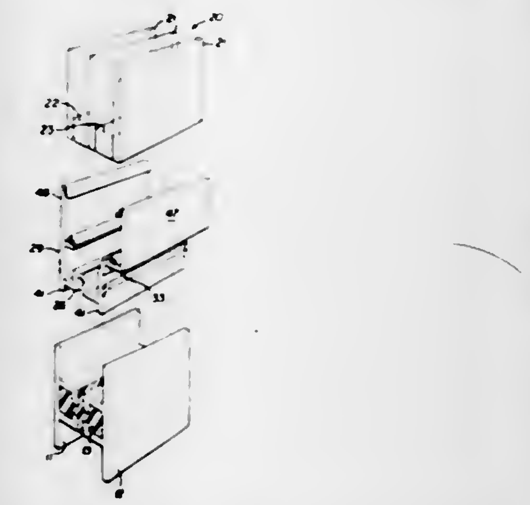
4,004,389
GLAZING ADAPTOR

Joseph DiFazio, Troy, Mich., assignor to Acorn Building Components, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 607,142, Aug. 25, 1975. This application Dec. 1, 1975, Ser. No. 636,534

Int. Cl.² E04B *1/62*

U.S. Cl. 52—398 9 Claims



1. In combination with a window frame having a frame opening of a first width, the improvement of a universal glazing adaptor to be inserted into said frame opening said first width to receive a double-pane thermally sealed glass panel or the like, said adaptor for receiving a triple-pane-thermally sealed glass panel or the like, comprising:

a rigid frame-engaging portion of double-pane width insulating material for insertion into said frame opening at least part of said frame engaging portion being wider than said first width; and

a rigid receptacle portion of triple-pane width insulating material, integral with and extending upwardly from said frame-engaging portion for receiving and frictionally retaining a triple-pane-thermally sealed glass panel;

said adaptor including a base at one end of said frame-engaging portion so that said adaptor is U-shaped in cross section, whereby when said glass panel is inserted in said receptacle portion and thereafter said frame engaging portion inserted into said frame, the frictional fit between said frame and said frame-engaging portion tightens the frictional fit between said glass panel and said receptacle portion.

4,004,390
SUPPORTING STRUCTURE WITH STRIP GRID PROFILE BARS FOR WALL OR CEILING COVERINGS

Günther Merkwitz, Freudenberg, Germany, assignor to Odenwald Faserplattenwerk G.m.b.H., Amorbach, Germany

Filed Dec. 5, 1974, Ser. No. 529,730

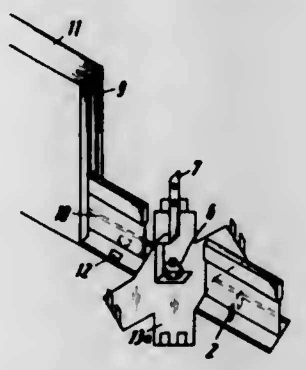
Claims priority, application Germany, July 26, 1974, 2435978

Int. Cl.² E04B *5/52*

U.S. Cl. 52—484 7 Claims

1. In a supporting structure for a suspended ceiling having

nodal plates suspended from above and provided with a plurality of radiating arm-like extension pieces supportively engaging a plurality of T-shaped strip grid profile bars, means for rigidly locking the profile bars to the respective associated extension pieces of the nodal plates, comprising a plurality of upwardly bent locking projections extending from the outward end of each of said extension pieces, and the cross-bar of the T of each of said profile bars adjacent the end thereof associated with the respective engaging extension piece being provided with an equal plurality of slots adapted to receive said projections of said respective extension piece, such that when the ends of said profile bars are disposed in overlying engagement with the respective extension pieces said projections are engageable in and extendable through and above the respective slots of the associated profile bars, the portions of said projections extending above said slots being adapted to be longitudinally bent over on the cross-bar of the T of the associated profile bar for producing a rigid connection, and each extension piece of each of said nodal plates being respectively equal in width to the cross-bar of the T of the associated profile bar said nodal plate having six of said extension pieces which are disposed in a staggered relationship, each one at 60° with respect to one another, said profile bars being adapted to support vertical panels in vertical adjustment relation thereto and characterized, in that said extension pieces extend outwardly from the boundary of a middle portion of a respective nodal plate, in that a vertical wall profile member of hexagonal cross-section is provided which is adapted to be fitted on said nodal plate so that the ends of its six walls lie on said boundary, in that at least one of said walls is provided with two outwardly-extending vertical ribs, and in that the panels associated with said profile bars are provided with vertically-extending slot-like recesses cooperatively engageable with said ribs.



4,004,391
METHOD AND A PANEL FOR PRE-FABRICATING BUILDINGS

John Herbert Keeton, P.O. Box 278, Taylor Blvd., Campbellsville, Ky. 42718

Continuation of Ser. No. 331,708, Feb. 12, 1973, abandoned. Division of Ser. No. 127,202, Mar. 23, 1971, abandoned. This application Oct. 30, 1974, Ser. No. 519,191

Int. Cl.² E04C *1/10, 1/30*

U.S. Cl. 52—584 **4 Claims**

1. A building panel for constructing building walls and the like comprising

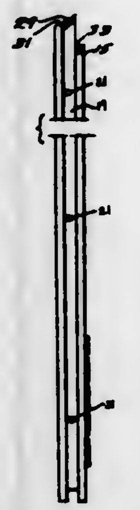
a. a first side edge comprising an elongated wall adapted to cooperate with an elongated wall of a second side edge of a like building panel,

b. a second side edge, opposite said first side edge, comprising an elongated wall adapted to cooperate with an elongated wall of a first side edge of a like building panel,

c. a tongue protrusion extending substantially along the length of said elongated wall of said first side edge, and having a plurality of spaced apart apertures disposed therein,

d. a groove extending substantially along the length of said elongated wall of said second side edge, and having a plurality of spaced projections formed on the surface thereof for cooperation with apertures in a tongue protrusion of a like building panel, and

e. locking means carried by said tongue protrusion for engaging projections of a like building panel when the latter are inserted into said apertures in said tongue protrusion and for preventing withdrawal of the projections from the apertures, said locking means comprising an elongated substantially flat slide member extending along the length of said tongue protrusion and in slidable engagement therewith, said slide member having keyhole-shaped apertures therethrough disposed opposite the apertures in said tongue protrusion, said keyhole-shaped apertures having portions of enlarged area about equal to the area of the apertures, said slide member being movable longitudinally from a first position in which the projections of a like panel may pass through said apertures to a second position in locking engagement with the projections of a like panel, said slide member having an end which extends beyond the end of said elongated wall of said first side edge so as to be accessible for actuation after tongue and groove engagement of said first side edge with a second side edge of a like panel.



4,004,392
MOLDED PLASTIC KEY MOLDED JOINT AND METHOD OF FORMING SAME

Robert W. Shepard, La Mesa, and George R. Heffner, University City, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed June 2, 1975, Ser. No. 582,596

Int. Cl.² E04C *1/10, 1/30*

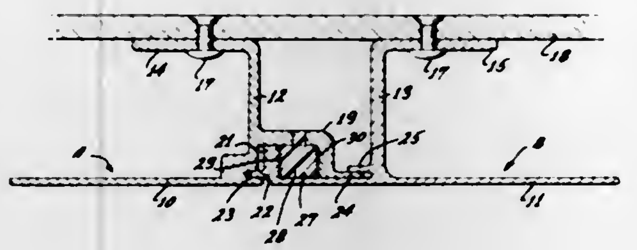
U.S. Cl. 52—436 **6 Claims**

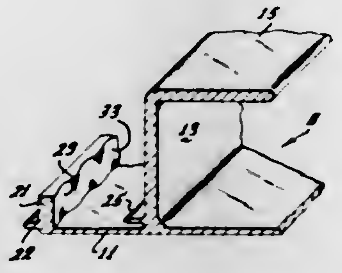
1. The method of increasing the longitudinal shear strength of a plastic key joint wherein oppositely facing, relatively overlapping, straight edge portions of two edgewise adjacent extruded metal stakes, which edge portions are interfitted to define an enclosed, straight, keyway passage therebetween, and such keyway passage is filled with flowable, hardenable key material injected therein under selected pressure, the improvement which comprises:

deforming edge portions of both of said strakes which define laterally opposite sides of such keyway passage in undulating patterns extending longitudinally of such passage prior to the introduction of the key material into the keyway, whereby the flowable key material fills the undulating patterns of the keyway, and, upon hardening, strongly resists relative movement of the two strakes longitudinally of such passage.

6. In a plastic key interlock joint joining in edge-to-edge relation, the straight sides of two relatively thin, straight, extruded, aluminum plate members of the type wherein, following an initial hooked engagement of the joined edges of the two plate members, movement of the plate members edgewise together completes the joint and opens up a key forming passage within the joint, which passage is then filled with flowable, hardening, key forming material, the improvement which comprises:

an embossed pattern formed in the portions of said strakes defining at least two opposed, otherwise straight sides of such passage, each of which patterns extends longitudinally of such passage, and varies in direction in selected sequence transversely of such passage, whereby relative displacement in shear of the two plate members lengthwise of such passage creates compressive forces on the key material located between such patterned side portions throughout a substantial portion of the entire length of such joint passage.





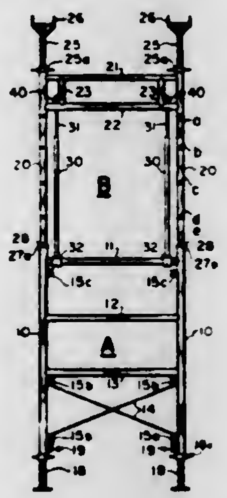
4,004,393
ADJUSTABLE HEIGHTH SHORING

Ronald G. Morris, Beaver Falls, Pa., assignor to Beaver-Advance Corporation, Ellwood City, Pa.

Filed Nov. 28, 1975, Ser. No. 636,208

Int. Cl.² E04H *12/00;* **E04G** *7/00*

U.S. Cl. 52—637 **11 Claims**



1. In an adjustable heighth scaffold having substantially rectangular upper and lower sections, each section having a pair of horizontally spaced-apart upright end frames, each end frame having a pair of tubular transversely spaced-apart upright primary supporting leg members, and the lower ends of the leg members of the upper section being adapted to telescopically adjustably fit with the upper ends of the leg members of the lower section, the improvement which comprises: a horizontal connector member integrally secured to and extending across between the pair of supporting leg members of each end frame of one of said sections adjacent an upper end portion thereof, a pair of horizontal cross-extending members integrally secured to and positioned in a vertically spaced-apart relation with respect to each other between the pair of supporting leg members of each end frame of the other of said sections adjacent an upper end portion thereof, a pair of shorter length leg members extending vertically across and being integrally secured between each said pair of cross-connecting members, each said pair of shorter length leg members being positioned in an adjacent inwardly spaced relation with respect to an associated supporting leg member of its frame, latch pin means secured on each of said shorter length leg members, a pair of cross brace members for detachably connecting each end frame of the one section with an opposite end frame of the other section, each of said cross brace members being provided with a swing bracket latching means at one end thereof and a latching arm at the other end thereof having a group of lengthwise spaced-apart latching hole portions, said swing bracket latching means being adapted to pivotally engage on said connector member of one end frame of said one section, and said latching arm being adapted to have one of its latching hole portions latch-engage said latch pin means of the opposite end frame of said other section.

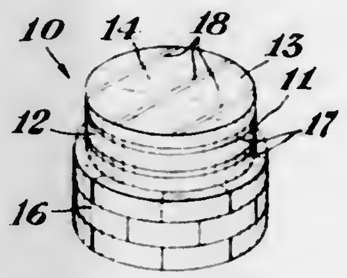
4,004,394
METHOD FOR INSULATION OF CURVED SURFACES

Robert B. Bennett, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1974, Ser. No. 514,682

Int. Cl.² E04B *2/04*

U.S. Cl. 52—741 **3 Claims**



1. A method for the fabrication of an insulated structure, the structure having an external convex curved surface to which thermal insulation is to be applied, the steps of the method consisting essentially of affixing to the convex curved surface to be insulated a plurality of sheet metal bands, at least some of the bands extending in generally parallel relationship, disposing malleable sheet metal blanks beneath the bands bending the blanks to form legs extending away from the surface, disposing a plurality of insulating panels on the curved surface to be insulated and retaining the insulating members thereon by means of bending said legs over adjacent insulating members.

4,004,395
METHOD AND MACHINE FOR THE PRODUCTION OF HINGED-LID PACKS FOR GROUPS OF CIGARETTES OR THE LIKE

Dietrich Bardenhagen, Hamburg, and Bernhard Schubert, Neubornsen, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 331,028, Feb. 9, 1973, Pat. No. 3,802,325. This application Mar. 28, 1974, Ser. No. 455,926

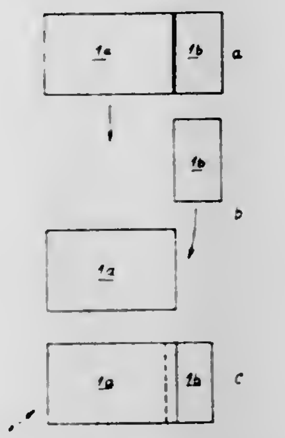
Claims priority, application United Kingdom, Feb. 11, 1972, 06569/72; Feb. 24, 1972, 08674/72

Int. Cl.² B65B *41/16*

U.S. Cl. 53—3 **13 Claims**

1. A method of producing and manipulating blanks which are to be converted into inner envelopes of packs for cigarettes of other smokers' products, comprising the steps of withdrawing a single web of flexible wrapping material from a

source and moving the web lengthwise in a predetermined direction; subdividing the web into composite rectangular blanks each of which consists of two discrete sections, including severing the web lengthwise to form only two discrete elongated strips and thereupon severing said discrete strips crosswise so that each strip yields a succession of discrete rectangular sections, each of said composite blanks consisting of a discrete section of one of said strips and a discrete section of the other of said strips and the area of each blank exceeding the area of either of said discrete sections thereof, the sections of each blank being movable in their entirety with respect to each other; moving one discrete section of each composite blank toward the other discrete section so that one section of each composite blank only partially overlaps the other section and said area of each blank is only slightly less than the combined area of the respective discrete sections; holding the web and said sections against flexing in a direction transverse to said web and to the direction of movement of said one section of each composite blank so that the length of each blank, as considered in the direction of movement of said one section, equals the combined maximum length of the respective sections minus the extent of overlap of such sections; and converting said composite blanks into inner envelopes to contain smokers' products.



4,004,396
METHOD FOR PACKING COILS OF WIRE NETTING

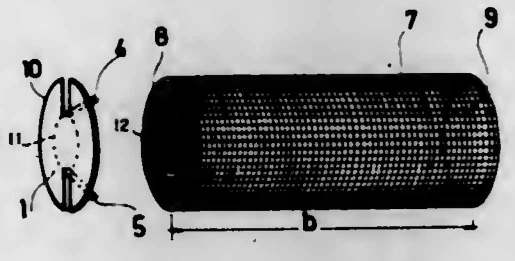
Marc Nijs, Harelbeke, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Division of Ser. No. 482,900, June 25, 1974, Pat. No. 3,929,226. This application June 24, 1975, Ser. No. 589,921

Claims priority, application United Kingdom, July 3, 1973, 31631/73

Int. Cl.² B65B *53/02*

U.S. Cl. 53—14 **6 Claims**



1. A method of packing a wire netting coil comprising:

laying over each end of said coil a protective end cover having a plurality of tongues hingedly connected thereto, said tongues being introduced into said coil in sufficient independent frictional engagement with said coil to keep said end covers in place, said frictional engagement being accomplished independently of any additional element, and

subsequently tightly enclosing said coil with the thusly affixed end covers into a packing sheet.

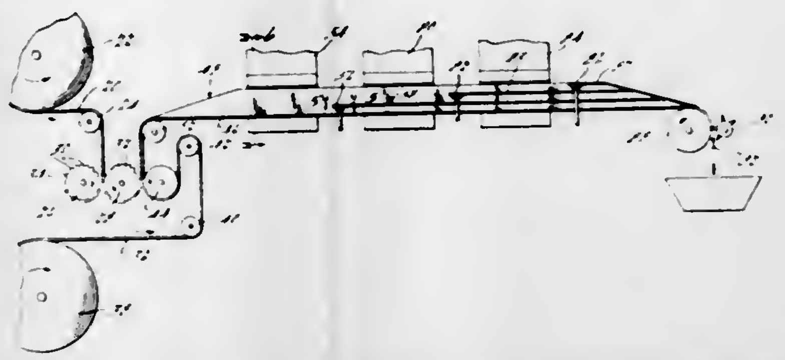
4,004,397
APPARATUS AND PROCESS FOR MAKING DISPOSABLE PACKET ASSEMBLIES

Louis S. Hoffman, Morristown, N.J.; Navinchandra J. Patel, Billerica, and George A. Flibotte, Tewksbury, both of Mass., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Oct. 24, 1975, Ser. No. 625,524

Int. Cl.² B65B *1/02, 9/04*

U.S. Cl. 53—29 **10 Claims**



1. A process for making a repetitive series of interconnected dispensing packet assemblies which comprises the steps of forming and advancing a longitudinally extending web comprised of opposed strips bonded in face-to-face relationship along transversely extending bands disposed at longitudinally spaced intervals defining a plurality of alternating first and second cavities open along their lateral edges, sealing one lateral edge of the alternating said first cavities, filling the first cavities with a first material, sealing the opposite lateral edge of the filled said first cavities forming a plurality of first packets, sealing one lateral edge of said second cavities, filling said second cavities with a second material, sealing the opposite lateral edge of the filled said second cavities forming a plurality of second packets, and severing said web into sections each comprising an interconnected first and second packet.

4,004,398
EQUIPMENT FOR PACKAGING PULVERIZED MATERIAL

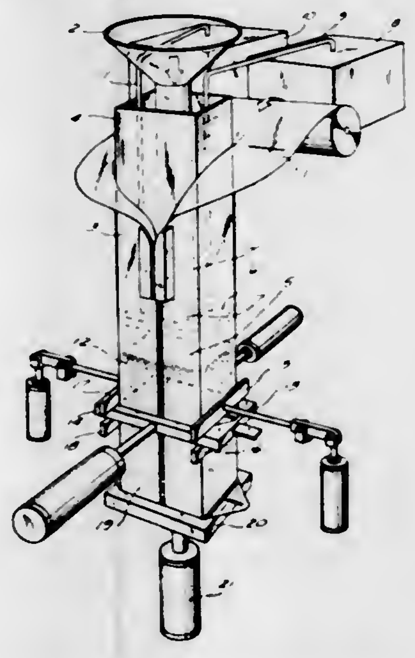
Lars Goran Larsson, and Sture Ingemar Sundberg, both of Malmo, Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Oct. 17, 1974, Ser. No. 515,661

Claims priority, application Sweden, Nov. 15, 1973, 7315471

Int. Cl.² B65B *31/04, 1/24, 9/12*

U.S. Cl. 53—112 A **13 Claims**



1. Apparatus for producing a container of pulverized material comprising a firm hollow container having an open lower end, said firm hollow container being positioned vertically, means for feeding a material which will constitute the container of pulverized material, said means feeding said material to said firm container and surrounding said firm container along at least a portion of the length thereof thereby forming a tube of said material surrounding said firm container, said portion comprising said open end, means for closing off said open end of said material constituting the container of pulverized material and supporting said closed end during the feeding of said pulverized material, a piston mounted for reciprocation within said firm container for compressing said pulverized material, said piston comprising a central opening therein, and means for closing off and opening said central opening for the passage of pulverized material therethrough toward said open end, and means for feeding said pulverized material into said firm container toward said open end, whereby the pulverized material fed to the open end of said firm container is compressed by said piston and said material constituting said container of pulverized material is formed into a container by the lowering thereof from said open end.

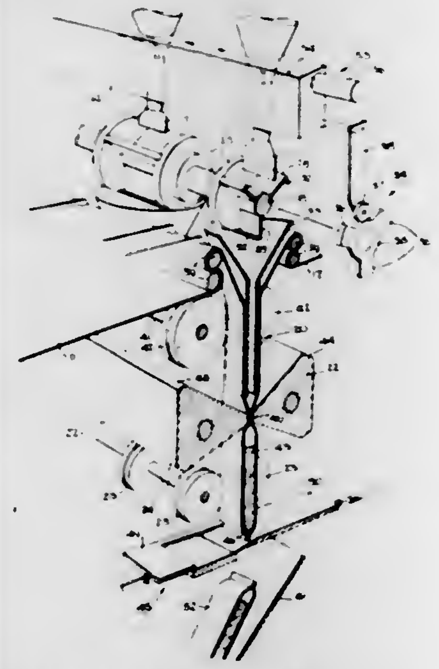
4,004,399
PACKAGING MACHINE

Denis Borrello, Poughkeepsie, N.Y., assignor to Foodways National, Inc., Hawthorne, N.Y.

Filed Mar. 13, 1975, Ser. No. 558,132

Int. Cl.² B65B *9/12;* **G01F** *11/10*

U.S. Cl. 53—180 M **21 Claims**



1. A packaging machine comprising

a hopper for receiving a supply of flowable material, said hopper having a plurality of outlet nozzles in a base thereof for outflow of a plurality of streams of the flowable material;

a rotatable dumper shaft below said hopper, said dumper shaft having a plurality of flow measuring means thereon, each said measuring means being disposed below a respective hopper outlet nozzle and including a pair of discs adjustably mounted on said shaft in coaxial relation for longitudinal movement along said shaft and a plurality of plates between said discs and radially of said shaft to define a plurality of material receiving chambers circumferentially disposed about said shaft, each said chamber being of adjustable size to receive varying amounts of material from a respective outlet nozzle;

a plurality of guide tubes, each said tube being aligned with a respective measuring means to guide a measured amount of material therethrough;

means for moving a pair of continuous sheets over said guide tubes;

means for sealing the continuous sheets to each other between and alongside said guide tubes; and

a pair of rotatable seal bars below said guide tubes for sealing the sheets to each other transversely of said guide tubes to define sequentially spaced packets containing measured amounts of the material.

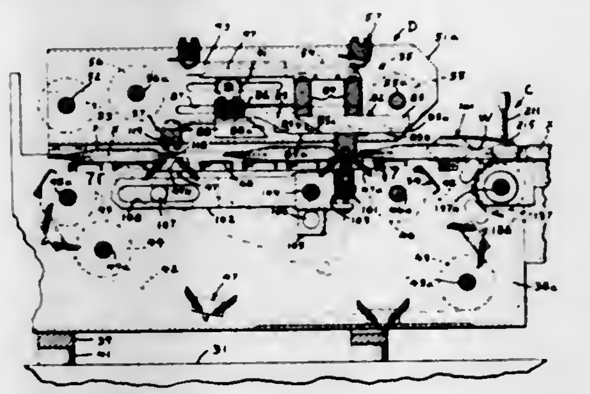
4,004,400
ARTICLE WRAPPING MACHINE

Ralph F. Anderson, and Leo Strombeck, both of Rockford, Ill., assignors to Ralph F. Anderson, Rockford, Ill.

Filed Jan. 2, 1976, Ser. No. 645,949

Int. Cl.² B65B *9/06*

U.S. Cl. 53—182 R **33 Claims**



1. In a machine for wrapping articles in an elongated strip of wrapping material and for sealing and severing the strip between adjacent articles to form separate packages, the machine including means for depositing articles on the strip at a loading station, means for folding the strip into a tube around the articles and for sealing the edges of the enfolded tube together as the strip is advanced lengthwise along a generally horizontal path past a longitudinal sealing station, endless type upper and lower jaw conveyor means having adjacent runs thereof extending lengthwise of said path, and upper and lower jaw assemblies on the respective upper and lower jaw conveyor means extending transverse thereto and spaced apart therealong a preselected distance to move in opposed pairs as the upper and lower jaw assemblies move along said adjacent runs thereof, the improvement comprising: said upper and lower jaw assemblies being spaced apart along the respective upper and lower conveyor means a pitch distance at least as long as the length of the maximum size package to be formed, main drive means operable to drive said lower and upper jaw conveyor means through a drive cycle to advance the respective upper and lower jaw assemblies at the same linear speed along the adjacent runs thereof through a distance equal to said pitch distance, adjustably presettable jaw operating means operative to press the opposed pairs of upper and lower jaw assemblies into clamping engagement with the tube during a preset portion of the drive cycle as they advance along the adjacent runs of the upper and lower jaw conveyor means a preset distance substantially less than said pitch distance to clamp the tube therebetween and advance the tube therewith a distance corresponding to said preset distance and to thereafter release the opposed pair of upper and lower jaw assemblies from clamping engagement with the tube to interrupt advance of the tube, and means for severing and sealing the tube at opposite sides of the line of severance while the tube is clamped between an opposed pair of the upper and lower jaw assemblies.

4,004,401

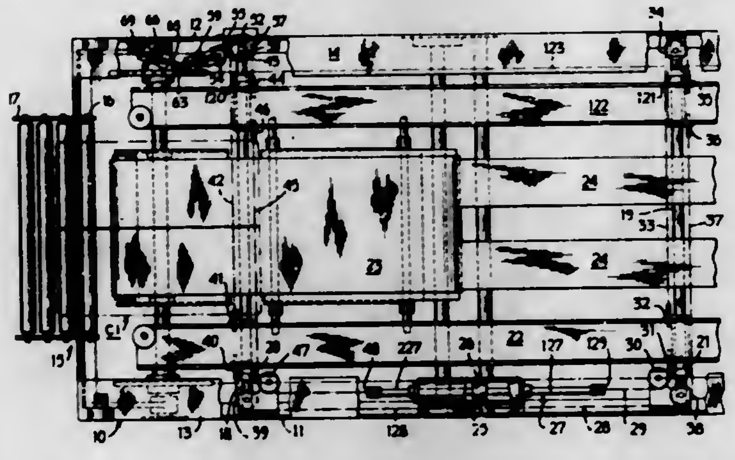
AUTOMATIC CARTON CLOSING MACHINE SIDE GUIDE RAILS HOLDING MECHANISM PROVIDING CLEARANCE FOR ALL CARTONS OF ONE ALLEGED SIZE WITH ACCOMMODATION OF SMALL DEGREES OF VARIANCES

Winton Loveland, Fort Salonga, N.Y., assignor to The Loveshaw Corporation, Deer Park, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,286

Int. Cl.^{2} B65B *7/20*

U.S. Cl. 53—374 **10 Claims**



3. In an automatic carton closing machine, adjustable holding mechanism for a pair of elongated longitudinal clamping rails which converts them to laterally spaced side guide rails extending through the machine to define a path of carton forward travel therebetween and provides sliding clearance for all loaded cartons of a group intended to be of about the same size while accommodating small degrees of variances in widths thereof, comprising

1. elastic force applying means to move said rails toward each other and alternatively apart to the relatively spaced positions that allows the forward sliding transport with ease therebetween past the machine's flaps manipulating and anchoring mechanisms of the loaded cartons of the group which are of standard width, and
2. means further spacing apart said guide rails a relatively small additive tolerance distance which also allows the forward sliding transport with ease therebetween of the loaded cartons of this group which are of widths greater than the standard width.

4,004,402

SADDLE TREE FOR RIDING SADDLES

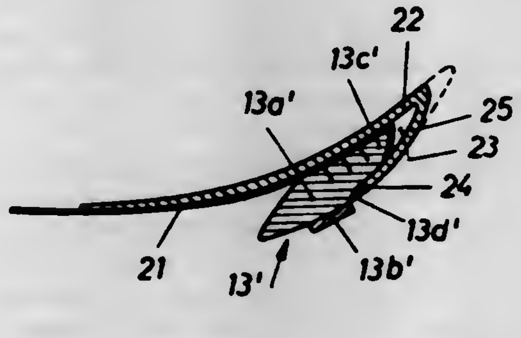
Lorenz Bischeltsrieder, Furstenfeldbruck, Germany, assignor to Stubben GmbH, Riding Equipment, Langmattring, Switzerland

Filed Mar. 4, 1975, Ser. No. 555,194

Claims priority, application Germany, Oct. 23, 1974, 2450427; Mar. 6, 1974, 2410669

Int. Cl.^{2} B68C *1/00*

U.S. Cl. 54—44 **6 Claims**



1. A saddle tree which comprises a front saddle tree member having a neck with points depending therefrom, a waist extending rearwardly from said neck, and mounting means adapted to receive cantles of different lengths and widths so that saddle trees of different sizes can be made using identical front saddle tree members, said mounting means comprising a recess in the upper surface of said front saddle tree member providing laterally extending, forward and rearward means for locating a cantle relative to said front saddle tree member; a separate cantle member seated in said recess, said cantle abutting the forward locating means and a lower surface portion thereof being configured to match said recess, thereby positioning said cantle relative to said front saddle member; and means fixing said cantle member to said front saddle tree member.

4,004,403

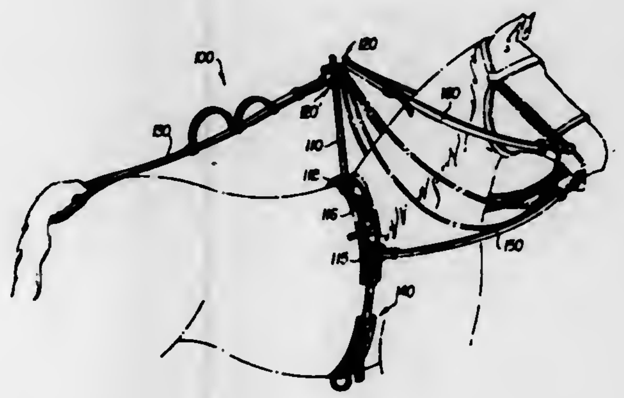
EQUINE TRAINING AID BALANCER

Woodrow Henry, II, Bobbin Hollow Farm & Tack Shop Bay Road, Amherst, Mass. 01002

Filed May 16, 1975, Ser. No. 578,100

Int. Cl.^{2} B68B *1/00*

U.S. Cl. 54—71 **1 Claim**



1. An equine training aid adapted to the equine body and having coactive relationship to a conventional double bridle, said bridle having snaffle and curb bits and reins therefor, comprising in combination therewith:

A. a check rein stanchion and yoke, disposable rearwardly adjacent the shoulders of the equine, said stanchion having plural bores disposed in vertical alignment on opposite fore and aft positions of the stanchion and said stanchion bearing opposed fore and hind check anchors, said anchors engaging the stanchion by means of set screws in vertically adjustable relation thereto and means for removably securing the stanchion and yoke to said equine;
B. a snaffle bit check rein controllably connecting the snaffle bit of the bridle to the fore check anchor of the stanchion;
C. at least two yoke rings at least one thereof upon the yoke on either side of the equine, to join the curb bit check reins from an anchor end thereof to the curb bit;
D. a flexible crupper extension for connection of the stanchion to the equine quarters; the hind check anchor and locking pin thereof retains the crupper extension to stabilize the stanchion.

4,004,404

ROTARY COMBINE WITH IMPROVED CONCAVE

Edward W. Rowland-Hill, Lancaster, and Louis R. Thomas, Jr., New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 1, 1976, Ser. No. 662,764

Int. Cl.^{2} A01D *45/02*

U.S. Cl. 56—14.6 **13 Claims**

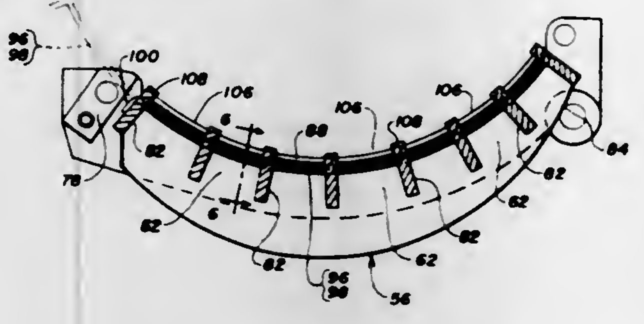
1. An axial flow type rotary combine comprising in combination:

a. a mobile frame adapted to be moved along a crop field to be harvested,
b. a header supported by the forward end of said frame and operable to cut crop material,

c. an elevator rearward of said header to receive cut crop material from said header and move it rearwardly to
d. a threshing compartment having a forward end and extending longitudinally rearwardly within said frame,
e. said threshing compartment comprising a powered rotor having rasp bars extending generally longitudinally for coaction with a concave complementary to said rotor in shape and extending generally along the lower peripheral path of the rasp bars to thresh crop material therebetween, and
f. a grain pan at a level beneath said threshing compartment to receive threshed crop material therefrom;

the improvement comprising an improved concave in which;

g. a plurality of longitudinally extending bars extend between curved end plates in transversely spaced relationship to each other,



h. a first row of curved wires extending transversely through said bars adjacent the upper edges thereof and spaced apart predetermined distances to provide a mesh pattern of openings with said bars through which threshed crop material freely passes,
i. a second row of similarly curved wires supported within holes in said bars, whereby the second row of wires are spaced to provide a greater frequency of said wires than in said first row and thereby pockets are provided between and below the wires of said first row to entrap threshed crop material and prevent damage to said material by said rotor prior to said material passing between said second row of wires and onto the grain pan of said combine.

4,004,405

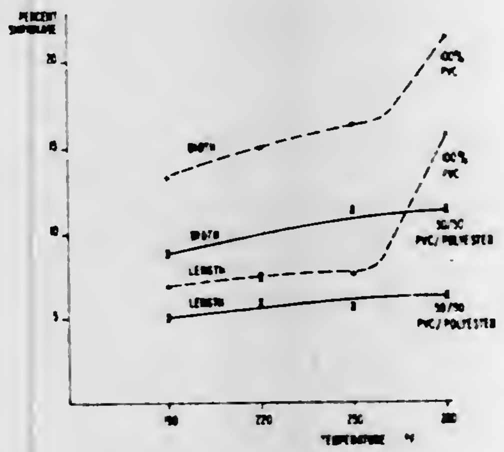
FLAME RESISTANT, THERMALLY STABLE POLYVINYL CHLORIDE-POLYESTER BLENDS

Walter Darchuk, North Little Rock, Ark., assignor to Dan River, Incorporated, Danville, Va.

Continuation-in-part of Ser. No. 232,736, March 8, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,084

Int. Cl.^{2} D02G *3/04*

U.S. Cl. 57—140 BY **7 Claims**



1. A fabric for garment use formed solely from a blended yarn consisting of not less than 50% and not more than 80% by weight of syndiotactic polyvinyl chloride textile fibers and 20 to 50% by weight polyethylene glycol terephthalate fibers spun together to provide a yarn having a thermal stability of 265° F. or more, superior spinning and finishing qualities, shrink back and flame resistance.

4,004,406

SPUN TYPE YARN AND PROCESS FOR MANUFACTURING THE SAME

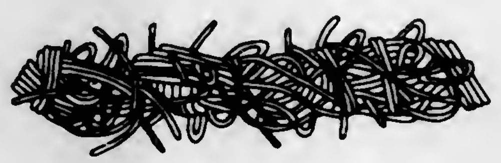
Hirotsugu Suzuki; Yo Ogawa; Yoshikazu Kikuchi, and Shinichi Kitazawa, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 16, 1975, Ser. No. 568,654

Claims priority, application Japan, Apr. 22, 1974, 49-44497; Feb. 3, 1975, 50-13358

Int. Cl.^{2} D02G *3/02, 3/26*

U.S. Cl. 57—140 R **16 Claims**



1. A yarn consisting of a fiber bundle which is substantially free from true twists and composed of continuous and discontinuous filaments being complexly intertwined with one another and comprising random bends and loops along their lengths, said yarn having a value of a parameter S of not less than 0.5 and a value of a parameter R of not more than 0.1, said parameters S and R being defined as follows:

$$S = B/A$$

$$R = C/D$$

wherein *A* is the number of fibers contained in a test piece cut at a length of 10 mm along the yarn length under a load of 500 mg/denier and having lengths in the range of not less than 10 mm but less than 12 mm, *B* is the number of fibers contained in the test piece and having lengths in the range of not less than 12 mm but less than 30 mm, *C* is the number of fibers contained in the test piece and having lengths not less than 30 mm and *D* is the number of whole fibers contained in the test piece.

4,004,407

DIGITAL DISPLAY ELECTRONIC TIMEPIECE

Kinji Fujita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 19, 1974, Ser. No. 507,511

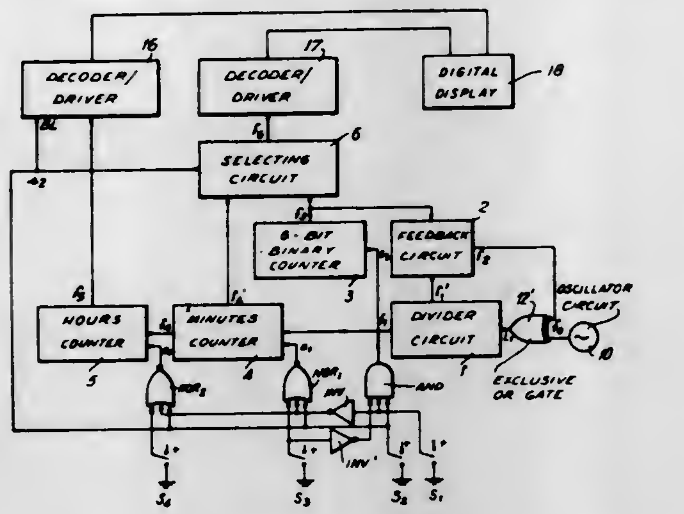
Claims priority, application Japan, Sept. 19, 1973, 48-105597

Int. Cl.^{2} G04C *3/00;* **G04B** *19/30, 27/00*

U.S. Cl. 58—23 R **9 Claims**

1. An electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider circuit means including a plurality of series-connected divider stages adapted to produce a low frequency time standard signal in response to said high frequency signal, certain of said divider stages producing time keeping signals representative of actual time in response to said low frequency time standard signal, and division ratio adjustment means coupled to said divider circuit and adapted to effect an adjustment of the frequency of the low frequency signal in response to the high frequency signal, said division ratio means producing a setting signal corresponding to the amount of adjustment, digital display means for displaying one of actual time in response to said timekeeping signals being applied thereto and the amount of division ratio adjustment in response to the division ratio adjustment setting signal being applied thereto, and selector means operable between a timekeeping mode and an adjust-

ment mode, said selector means being adapted to receive said timekeeping signals and apply same to said digital display means in said timekeeping mode and to receive said adjustment setting signal and apply same to said display means in said adjustment mode.



4,004,408

MECHANICAL IMPROVEMENT ON AN ELECTRIC ALARM CLOCK

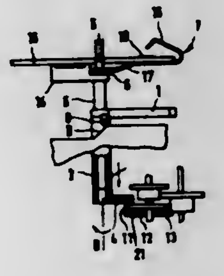
Roland Siefert, Bad Durrheim; Hans Seckinger, and Herbert Krösche, both of Schwenningen, all of Germany, assignors to Kienzle Uhrenfabriken GmbH, Schwenningen, Germany

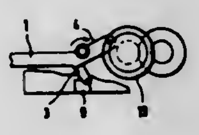
Filed Mar. 29, 1974, Ser. No. 456,250

Claims priority, application Germany, Apr. 3, 1973, 7312472[U]; Apr. 6, 1973, 7313007[U]

Int. Cl.² G04C *13/06, 21/00;* **G04B** *37/12;* **H01H** *7/08*

U.S. Cl. 58—38 R **6 Claims**





1. An alarm clock which produces an electric alarm signal and which operates in conjunction with an electric auxiliary device comprising:
- first circuit means having first switch means for producing and cancelling said signal, said first switch means including a first switch member;
- second circuit means having second switch means of energizing and de-energizing the auxiliary device;
- a single electrical contact spring forming an integral part of said two circuit means; and
- a circuit board having a circuit member thereon; said contact spring having
  - a central part thereof permanently fixed to said circuit board;
  - a first end arranged for movement into and out of circuit making contact with said first switch member; and
  - a second end arranged for movement into and out of circuit making contact with said circuit member.

4,004,409

WATCH HAVING A PIEZO ELECTRIC BUZZER MECHANISM

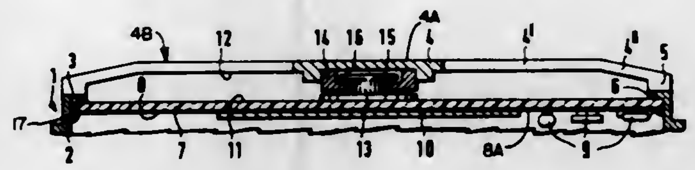
Wolfgang Ganter, Schramberg, and Albert Ginter, Lauterbach, both of Germany, assignors to Gebruder Junghans GmbH, Germany

Filed Jan. 29, 1976, Ser. No. 653,622

Claims priority, application Germany, Jan. 30, 1975, 7502680[U]

Int. Cl.² G04C *21/34;* **H01L** *27/20;* **G08B** *3/02*

U.S. Cl. 58—38 R **7 Claims**



1. In a watch having housing means, including an apertured sound transmitting portion; a diaphragm carried by said housing means; a piezo electric element carried by one surface of said diaphragm and being oscillatable in response to electrical excitation, and an excitation circuit connected between said piezo electric element and a power source for said watch for producing an excitation signal to oscillate said piezo electric element, the improvement wherein:
- said diaphragm comprises an electrically insulative material, and
- said excitation circuit being carried by said one surface of said diaphragm.

4,004,410

FLUID-TIGHT WATCHCASE AND IMPROVED RING GASKET FOR THE SAME

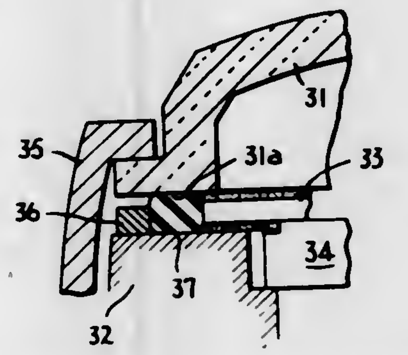
Toshiaki Kawamata, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 14, 1973, Ser. No. 424,856

Claims priority, application Japan, Dec. 16, 1972, 47-144521

Int. Cl.² G04B *37/08*

U.S. Cl. 58—90 R **5 Claims**



1. A watch glass ring gasket comprising an inner ring gasket made of an elastic, deformable material for effecting a water-tight seal in a watchcase, an auxiliary ring comprising an outer ring of rigid material circumferentially of the inner ring limiting outward deformation of the inner ring, the outer ring having a lesser thickness than the inner ring and having an upstanding projection insertable into a recess in a member cooperative with said inner ring gasket in effecting a fluid-tight seal therewith and releasably locking said ring gasket in position relative to a surface sealed by the inner ring, the inner ring having oppositely disposed sealing surface portions defining the thickness dimension thereof.

4,004,411

COUNTING MECHANISM FOR TIMEPIECE

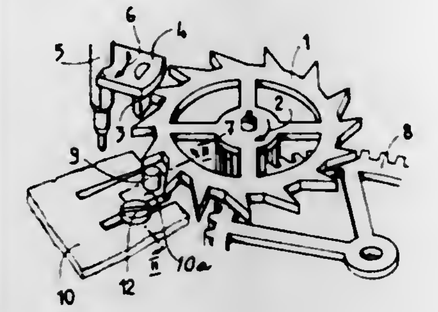
Ali Schneiter, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 25, 1976, Ser. No. 670,630

Claims priority, application Switzerland, Apr. 1, 1975, 4069/75

Int. Cl.² G04B *15/00*

U.S. Cl. 58—116 M **1 Claim**



1. Counting mechanism for timepiece having a bidirectional step by step motor, in which the rotor of the said motor cooperates directly with a counting wheel in such a way as to drive it only in one direction, this counting wheel being submitted to the action of a magnet which determines, at each step, its position while cooperating successively with each tooth of its toothing, characterized by the fact that the said magnet is carried by a resilient blade submitted to the action of an adjusting screw against which it is elastically bearing, the rotation of this screw, in one direction or in the other, permitting to move the said magnet in one direction or in the other one and to bring it closer to or farther from the plane of the counting wheel with which it cooperates, so as to permit to vary the force it exerts on the said wheel.

4,004,412

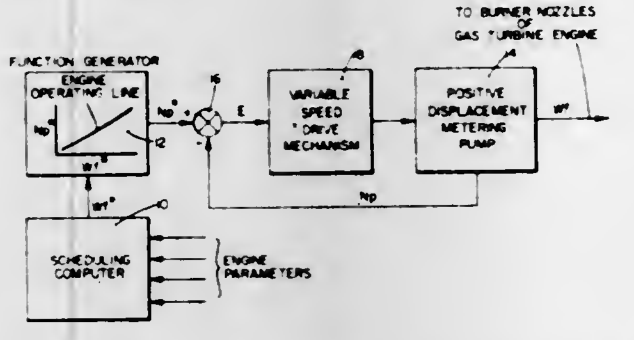
GAS TURBINE ENGINE FUEL METERING SYSTEM

Dennis G. A. Burnell, Winsted, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Dec. 20, 1974, Ser. No. 534,663

Int. Cl.² F02C *9/06*

U.S. Cl. 60—39.28 R **1 Claim**


TO BURNER NOZZLES OF GAS TURBINE ENGINE
FUNCTION GENERATOR
ENGINE OPERATING LINE
Np*
Wf*
12
Np*
16
E
VARIABLE SPEED DRIVE MECHANISM
18
POSITIVE DISPLACEMENT METERING PUMP
14
Wf
Np
Wf*
10
SCHEDULING COMPUTER
ENGINE PARAMETERS

1. A fuel control system for a gas turbine engine having burner nozzles comprising:
- a scheduling computer to sense selected engine parameters and calculate a scheduled fuel flow, the scheduling computer being adapted to generate a requested fuel flow signal;
- a positive displacement metering pump for pumping a metered flow of fuel to the burner nozzles such that both fuel flow and the pressure head across the pump increase with the speed of the metering pump;
- a variable speed drive mechanism drivingly connected to the metering pump to run the metering pump at the commanded speed;
- a speed sensing device operatively connected to the metering pump for generating a feedback signal indicative of the actual speed of the metering pump;
- means responsive to the scheduled fuel flow to generate a commanded pump speed signal which compensates for the affect on fuel flow of the variation in pressure head with pump speed such that the commanded pump speed signal requests a pump speed which delivers the scheduled fuel flow to the burner nozzles, the scheduled fuel flow responsive means comprising: a function generator for receiving the requested fuel flow signal and generating the commanded pump speed signal in approximate accordance with the following equation:

$$N_p = K\,W_f^2 + K'\,W_f - K''$$

wherein:
- N_p is pump speed;
- W_f is fuel flow;
- K, K', and K'' are constants; and
- means to sum the commanded pump speed signal and the feedback signal for directing an error signal to the variable speed drive mechanism.

4,004,413

COMBUSTIBLE MIXTURE SUPPLY SYSTEM

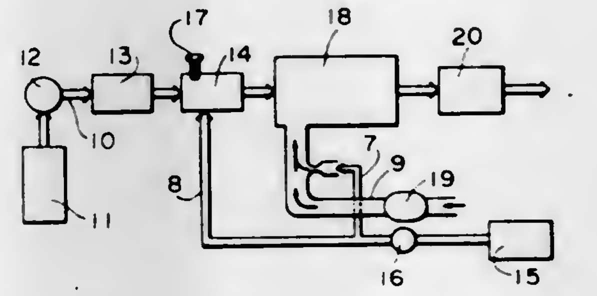
Zene Ueno, Fuchu, and Tadahiko Nagaoka, Tokorozawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 27, 1973, Ser. No. 419,193

Claims priority, application Japan, Nov. 28, 1972, 47-119198; Dec. 15, 1972, 47-144141[U]

Int. Cl.² F02C *3/20;* **F02G** *1/00*

U.S. Cl. 60—39.46 M **8 Claims**



1. A combustion engine system having a main combustion chamber, comprising a combuster connected through a first passageway to said combustion chamber, a reaction chamber communicated with said combuster through a second passageway, a source of an oxidizing agent connected through a third passageway to said reaction chamber, a main passageway opening at one end thereof into said main combustion chamber and communicated at the other end thereof with the atmosphere, a fuel source, a first fuel passageway communicated with said main passageway at one end thereof, a second fuel passageway communicated with said combuster at one end thereof, and a third fuel passageway having one end connected with the other ends of said first and second fuel passageways and the other end thereof connected with said fuel source.

4,004,414

COMBUSTION CHAMBER FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

Jean Melchior, and Thierry Andre, both of Paris, France, assignors to The Franch State, Paris, France

Filed Nov. 25, 1974, Ser. No. 526,821

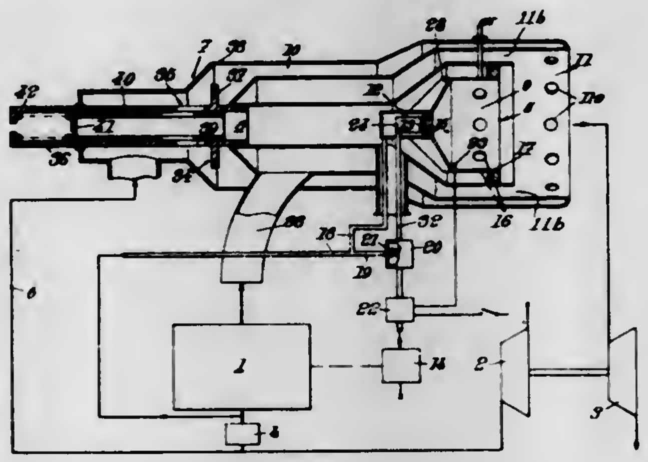
Claims priority, application France, Dec. 4, 1973, 73.43112

Int. Cl.² F02C *1/00,* **F02G** *1/00, 3/00*

U.S. Cl. 60—39.65 **23 Claims**

1. In a supercharged internal combustion engine of the expansible chamber type comprising a turbocompressor with at least one compressor and at least one turbine for driving said compressor, said engine having a combustion chamber system connected between said compressor and said turbine,

a bypass pipe communicating with the outlet of said compressor and with the turbine inlet such that said bypass pipe is in parallel air flow relation with said engine combustion chamber system, said bypass pipe being adapted and dimensioned for direct passage to the turbine of that part of the air flow delivered by the compressor which is not drawn into said engine combustion chamber, an auxiliary combustion chamber operable for reheating gases upstream of said turbine, said auxiliary combustion chamber being supplied with liquid fuel and at the same time be exhaust gases emerging from said engine combustion chamber system and by fresh air taken through said bypass pipe, said auxiliary combustion chamber comprising a tubular element having a closed end and an open end, a primary air intake conduit communicating with said bypass pipe and having an outlet arranged to introduce fresh air into the tubular element in a combustion zone in the vicinity of its closed end, an exhaust gas intake conduit communicating with the exhaust outlet of said engine combustion chamber system and having an outlet arranged to introduce the exhaust gases into the tubular element in the neighborhood of its open end at a mixing zone located downstream of said combustion zone wherein the primary air, or the products of combustion thereof with the fuel, first meet the exhaust gases, said exhaust gas conduit outlet being oriented to effect said introduction with minimum load loss and in the direction of the open end of said tubular element, and a secondary air intake conduit communicating with said bypass pipe and having an outlet arranged to introduce fresh air into the tubular element downstream of the upstream end of said mixing zone, said secondary air conduit outlet being arranged to introduce fresh air oriented in a direction transverse to the flow of the exhaust gases in said mixing zone such that the flow of secondary air into said mixing zone is opposed by the flow of the exhaust gases in said mixing zone, the combination therewith of an improved fuel injection and spraying means comprising:



liquid fuel injection port means of constant fixed orifice size and located toward the closed end of said tubular element and oriented for discharging fuel into said combustion zone solely from a given entry zone,

means for delivering pressurized liquid fuel to said port means at a rate and pressure adjustable from a minimum value to a maximum value to thereby vary the quantity of fuel discharged into said chamber via said port means,

said fixed orifice size of said port means being selected small enough for spray atomization of the fuel to the mechanically achieved at said maximum rate solely by hydraulic atomization resulting from discharge of liquid fuel under pressure via said port means into said combustion zone and large enough so that the fuel is not so mechanically atomized at said minimum rate,

air passage means opening into said tubular element at a location close to said port means and oriented to direct an impinging jet air flow against the fuel spray discharged from said port means as the same enters said combustion zone,

and means for permanently delivering spraying air to said air passage means at a speed and at a rate sufficient for the air jet flow from the air passage means to pneumatically atomize the fuel efficiently for the minimum flow rate during operation of said auxiliary combustion chamber.

4,004,415
PROPELLANT FOR LIQUID PROPELLANT GUN

Stanley E. Wood, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 11, 1974, Ser. No. 532,534

Int. Cl.² C06D *5/08*

U.S. Cl. 60—214 **3 Claims**

1. In a method for propelling a projectile from a gun wherein two liquid chemical components are injected into a chamber behind the projectile and spark ignited to produce gases which propel the projectile, the improvement residing in utilizing, as one of the components, n-octane and, as the other component, a nitric acid component selected from the group consisting of red fuming nitric acid and nitric acid-water solutions containing from 98 to 82 weight percent nitric acid and 2 to 18 weight percent water.

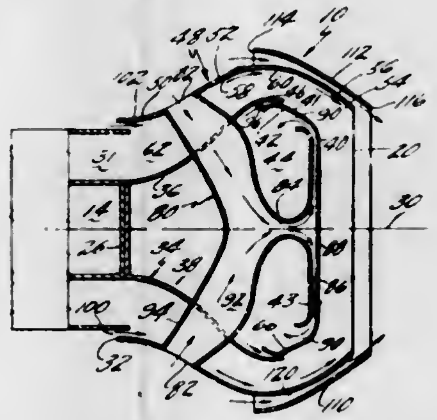
4,004,416
INFRA-RED SUPPRESSOR FOR USE WITH TURBO-SHAFT ENGINE

Armand F. Amelio, Yonkers, N.Y., and Kenneth M. Rosen, Guilford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 16, 1970, Ser. No. 19,576

Int. Cl.² F02K *3/04*

U.S. Cl. 60—264 **12 Claims**



1. An infra-red radiation suppressor adapted to be positioned downstream of a turbo-shaft engine to intercept the exhaust gas flow therefrom and to be of sufficient size to block off view into the engine outlet and being concentric about an axis and having a forward inlet end to be positioned adjacent the engine outlet and an after outlet end and including:

1. a central plug member having an outer and inner surface, a forward and after end, and including:
   - a. a forward portion having walls diverging away from said axis,
   - b. an after portion having walls converging toward said axis, and
   - c. a central portion smoothly connecting said forward portion and said after portion and cooperating therewith to form a plenum chamber therewithin and the central portion defining the maximum diameter station of said plug with a diameter larger than the engine outlet with which the suppressor is intended for use,
   - d. a circumferential extending ejector slot at substantially the maximum diameter station of the plug and opening toward the suppressor outlet,
2. an outer casing having an outer and inner surface, a forward and after end, and spaced therefrom to define an annular passageway therebetween and including:
   - a. a forward portion having walls diverging away from said axis,

   - b. an after portion having walls converging toward said axis and terminating at the casing after end to define the outlet of the suppressor therearound, and
   - c. a central portion smoothly joining said foreward portion and after portion to define the maximum diameter station of the outer casing substantially in radial alignment for the maximum diameter station of the central plug,
3. ejector means located in said annular passageway adjacent said outer casing forward end and shaped to establish communication between atmosphere and the annular passageway so that engine exhaust gases passing through the annular passageway will cause a cooling film of atmospheric air to flow along the inner surface of the outer casing due to ejector action therethrough, and
4. means defining a sealed passage between atmosphere and said ejector slot so that a cooling film of atmospheric air is caused to pass through said slot in ejector fashion and along the outer wall of the after portion of the central plug,

wherein said sealed passage extends from said outer casing, across said annular passageway, and into said plenum chamber and then along said axis to the plug after portion inner surface and then outwardly along said plug after portion inner surface to said circumferential ejector slot.

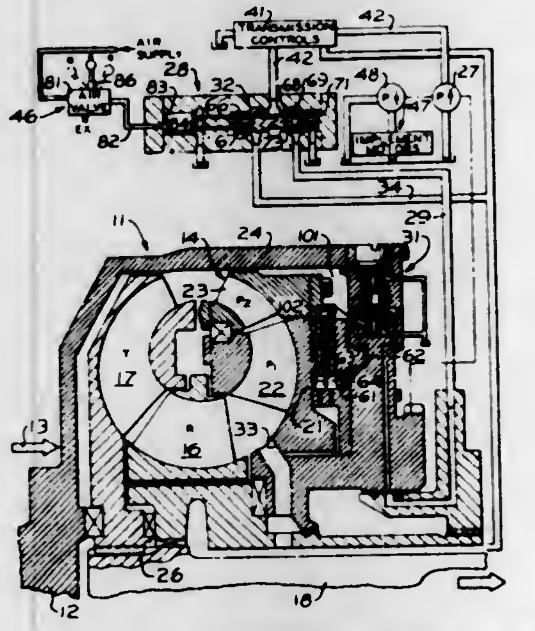
4,004,417
TORQUE CONVERTER WITH SPEED RESPONSIVE SLIP CLUTCH

Albert L. Woody, Peoria; Sidney J. Audiffred, and Howard C. Steury, both of Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 304,492, Nov. 7, 1972, Pat. No. 3,831,726, and a continuation of Ser. No. 86,793, Nov. 4, 1970, abandoned. This application May 6, 1974, Ser. No. 467,180

Int. Cl.² F16D *23/00*

U.S. Cl. 60—363 **2 Claims**



1. A torque converter including power input means, two section impeller means, stator means, turbine means and power output means and comprising connecting means arranged for connecting with two normally separately rotatable elements of the torque converter, said connecting means being hydraulically operable for varying power transmission through the converter, a source of fluid under pressure, a regulating valve associated with said source for transmitting fluid therefrom at a maximum pressure and a control valve associated with said regulating valve to receive the output fluid, said control valve having means in communication with said regulating valve and said connecting means, said control valve means being responsive to rotational speed of a member in the torque converter and pressure of the fluid metered to the connecting means to adjust the communication of the output fluid pressure to the connecting means, manual control means being operatively coupled with the regulating valve to selectively vary the maximum pressure of output fluid received by the control valve, wherein the sections of the impeller means of the torque converter comprises two elements which are connected by the connecting means, said connecting means comprising a slipping clutch, wherein the regulating valve comprises servo means for adjusting the preselected pressure of the output fluid, means for communicating a fluid signal from a portion of the converter to the servo means, the servo means being responsive to the fluid signal received from a portion of the converter and to the manual control means.

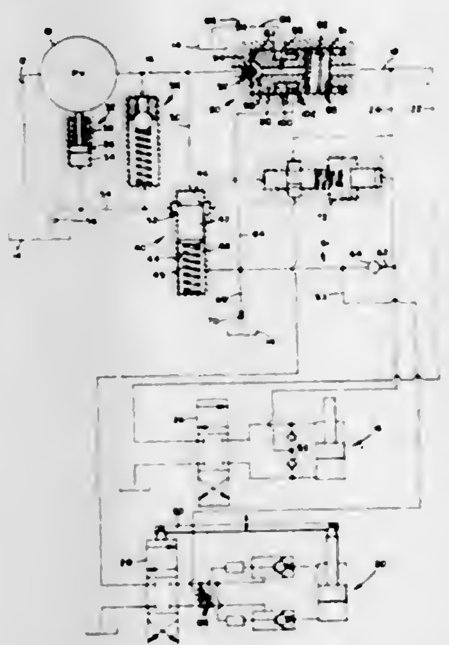
4,004,418
DEMAND COMPENSATED HYDRAULIC SYSTEM WITH FLOW SENSITIVE DEVICE

Harlan Welbert VanGerpen, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 29, 1975, Ser. No. 644,884

Int. Cl.² F16H *39/46*

U.S. Cl. 60—422 **6 Claims**



1. An improved hydraulic system of the type having a variable displacement pump with output control means biased to increase pump output fluid flow and responsive to an input of pressurized fluid to decrease pump output fluid flow, a fluid motor, an output line connected between the pump and the motor, a motor control valve interposed in the output line and having servo feedback from the motor for selectively opening and closing the output line, a control line connected between the pump and the output control means, demand valve means interposed in the control line for selectively opening and closing the control line to allow and block the input of pressurized fluid to the output control means in response to pressurized fluid in a pilot line connected to the demand valve means, said pilot line further connected to the output line between the motor control valve and the motor, wherein the improvement comprises: means operatively associated with the output line, the pilot line, and a fluid reservoir responsive to descreasing flow through the output line to connect the pilot line to the reservoir and responsive to increasing fluid flow in the output line to block the pilot line from the reservoir.

4,004,419
APPARATUS FOR CONVERTING A HYDRAULIC PRESSURE SIGNAL TO A MECHANICAL MOTION

Ralph O. Wallace, 3224 E. 30 Place, Tulsa, Okla. 74114

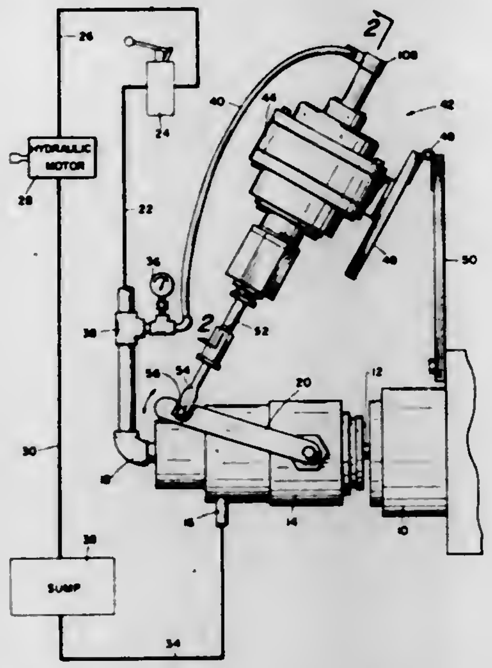
Filed Feb. 17, 1976, Ser. No. 658,410

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **12 Claims**

1. An apparatus for converting a hydraulic pressure signal to a mechanical motion, the mechanical displacement being proportional to the value of the hydraulic signal, comprising:

- a housing having a cylindrical cavity therein;
- a cylindrical diaphragm of impervious flexible material dividing the cavity into a first cylindrical chamber and a second chamber, the second chamber being defined by a truncated conical wall coaxial with the first chamber, the forward surface of the diaphragm forming the base of said conical second chamber, the housing having an opening therein coaxial with said second chamber;
- means of imparting hydraulic pressure to said first cavity and thus to the rearward surface of said diaphragm;



- a longitudinally positionable output shaft slidably received in said housing opening, the inner end of said output shaft contacting said diaphragm forward surface whereby as said diaphragm is displaced by hydraulic fluid pressure said shaft is longitudinally displaced; and
- spring means urging said shaft towards said diaphragm, said diaphragm contacting said conical wall of said forward cavity as it is moved forward by hydraulic pressure applied to the rearward surface thereof, the effective cross-sectional area of said diaphragm being thereby linearly decreased as the diaphragm is moved forwardly by increased hydraulic pressure.

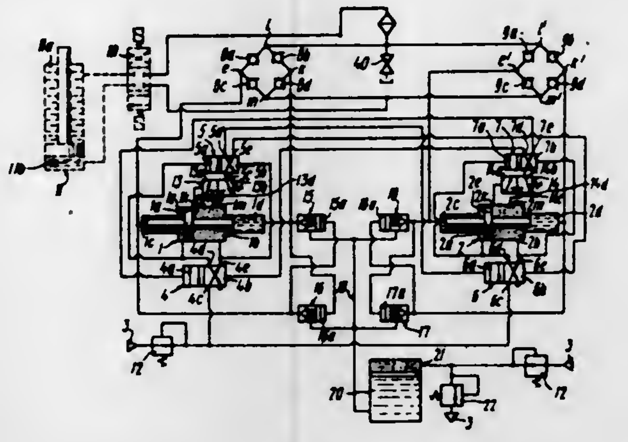
4,004,420
HYDROPNEUMATIC PUMPING ARRANGEMENT

Anatoly Nikolaevich Gavrilov, Kutuzovsky prospekt, 43, kv. 118; Eduard Moiseevich Godin, Begovaya ulitsa, 22, korpus 3, kv. 212, both of Moscow; Leonid Nikolaevich Kebets, Kuibyshevskoi oblasti, ulitsa Sverdlova, 183, kv. 45, Tolyatti; Ivan Zakharovich Beregovoi, Kuibyshevskoi oblasti, Moskovsky prospekt 46, kv. 77, Tolyatti; Vladimir Ivanovich Matskevich, Kuibyshevskoi oblasti, Moskovsky prospekt 66, kv. 45, Tolyatti; Yakov Osherovich Korf, Kuibyshevskoi oblasti, Revoljutsionnaya ulitsa 63, kv. 237, Tolyatti, and Alexandr Grigorievich Dorofeev, Kuibyshevskoi oblasti, ulitsa Stepana Razina 99, kv. 385, Tolyatti, all of U.S.S.R.

Filed Sept. 26, 1975, Ser. No. 617,057
Int. Cl.² F15B *15/18*

U.S. Cl. 60—464 **6 Claims**

1. A hydropneumatic pumping arrangement comprising: at least two double-acting hydropneumatic force multipliers having respective pistons; each having a pneumatic cylinder with two pneumatic chambers and two hydraulic chambers; two pairs of two-position directional valves in the form of cylindrical slide valves with two control chambers, an inlet passage of one directional valve in each pair of valves being in communication with an air source, and outlet passages thereof being in parallel communication with said pneumatic chambers of one force multiplier and with said control chambers of the other directional valve of the same pair of valves; outlet passages thereof being in parallel communication with said control chambers of said one directional valve of the other pair of valves for alternative communication of said pneumatic chambers with said air source in the course of travel of said pistons; interconnected hydraulic non-return valves forming two bridge circuits, one diagonal of each circuit being in communication with said hydraulic chambers of one force multiplier; hydraulic pressure and return lines communicating with the other diagonal of each circuit, for connection thereto of actuating hydraulic cylinders of the associated processing equipment; and a system for compensating working fluid flowing out of said chambers at said actuating cylinders, inlets of said system being in communication with said one diagonal of each bridge circuit.

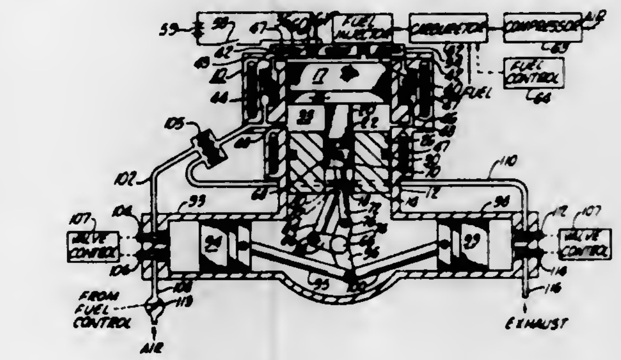


4,004,421
FLUID ENGINE

Kenneth W. Cowans, Los Angeles, Calif., assignor to Ketobi Associates, Tarzana, Calif.

Filed Nov. 26, 1971, Ser. No. 202,169
Int. Cl.² F02G *1/02*

U.S. Cl. 60—516 **15 Claims**



1. A hot gas engine system for providing work energy comprising:
- means defining a hot gas volume containing air;
- means for burning fuel in the hot gas volume comprising catalyst means disposed in communication with the interior of the hot gas volume;
- means disposed adjacent the hot gas volume for providing a high thermal gradient interior boundary thereabout;
- means in communication with the hot gas volume for varying the volume thereof in cyclic fashion;
- means defining a low temperature gas volume in communication with the hot gas volume;
- means coupled to the low temperature gas volume for substituting relatively small increments of air for corresponding increments of the air mixture therein at substantially corresponding temperature and pressure;
- adjustable air flow control means coupled to said means for substituting air;
- piston means in communication with the low temperature gas volume for varying the volume thereof in timed relation to the variations in the hot gas volume;

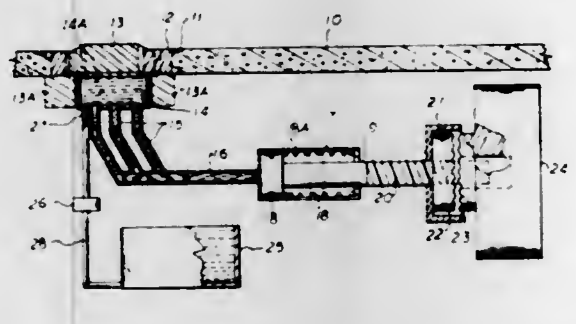
- thermal regenerator means intercoupling the hot gas volume and the lower temperature chamber to provide gas flow therebetween during changes of volume, said thermal regenerator means having a high area relative to the path length therethrough;
- means coupling to said means defining a hot gas volume for releasing thermal energy internally therein; and
- means coupled to the piston means for deriving work energy from the system.

4,004,422
METHOD AND APPARATUS FOR UTILIZING MOVING TRAFFIC FOR GENERATING ELECTRICITY AND TO PRODUCE OTHER USEFUL WORK

Wayne P. Le Van, New York, N.Y., assignor to Van Allyn, Inc., New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,650
Int. Cl.² F03G *5/00*

U.S. Cl. 60—533 **8 Claims**



1. An apparatus for producing useful work by utilizing the energy of moving traffic comprising:
- a chamber having a flexible wall portion disposed in the path of moving traffic to define a first expansible chamber,
- a cylinder,
- a conduit interconnecting said chamber into communication with said cylinder,
- said conduit having a cross-sectional area which is substantially smaller than the cross-sectional area of said chamber,
- a piston slideably disposed within said cylinder,
- said chamber and conduit defining a predetermined volume filled with a incompressible fluid which is trapped between said flexible wall portion and said piston of said first and second expansible chambers, whereby the flow of traffic over said flexible wall portion of said chamber pressurizes the trapped fluid therein to effect the displacement of said piston in response to said pressurized fluid accordingly,
- a work producing means operatively connected to said piston for translating the displacement of said piston into useful work,
- and means for restoring said piston to its initial position after the movement traffic has passed over said chamber.

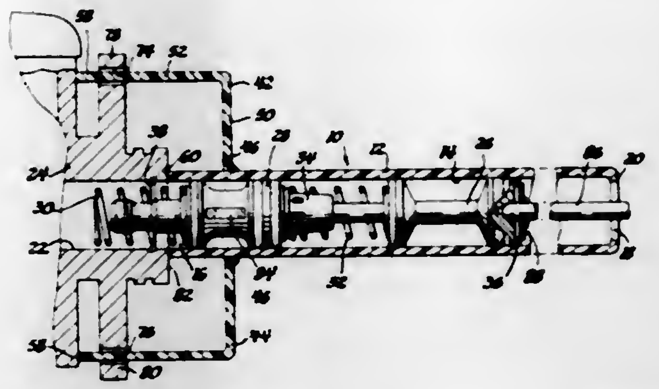
4,004,423
PACKAGE AND KIT FOR INSTALLATION OF MASTER CYLINDER INTERNAL PARTS

Gerald B. Jacoby, Dayton, and Thomas P. Mathues, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1976, Ser. No. 678,142
Int. Cl.² F15B *7/08*

U.S. Cl. 60—533 **3 Claims**

1. A prepackaged repair kit cooperable with the bore and mounting ears of a master cylinder body, said kit comprising:
- a container body for holding and facilitating insertion of a plurality of interrelated and prepositioned parts in the master cylinder body bore and having a container bore with first and second body open ends, said first open end having stop means therein for axially holding the interrelated and prepositioned parts within said container bore relative to said first open end;
- a plurality of selectively extendible locating arms having first ends fixed to said container body adjacent to but axially spaced from said second open end, and second ends positioned, when said arms are extended, axially beyond and laterally spaced from said second open end and adapted to mate selectively with bolt holes in the master cylinder body mounting ears to align said container body in an inserting position adjacent the master cylinder body bore whereby the interrelated and prepositioned parts which are prepackaged in said container bore may be pushed out of the container body through said second open end inserted into the master cylinder body bore;
- said locating arms having a folded position in which at least portions thereof lie closely adjacent said container body with said second ends being intermediate the container body open ends and extending toward said body second open end;
- and a removable cap having a rim fitting over said container body second open end and embracing at least part of said locating arms when in their folded position, said cap while fitted over said container body closing said second open end and retaining said locating arms in their folded positions.

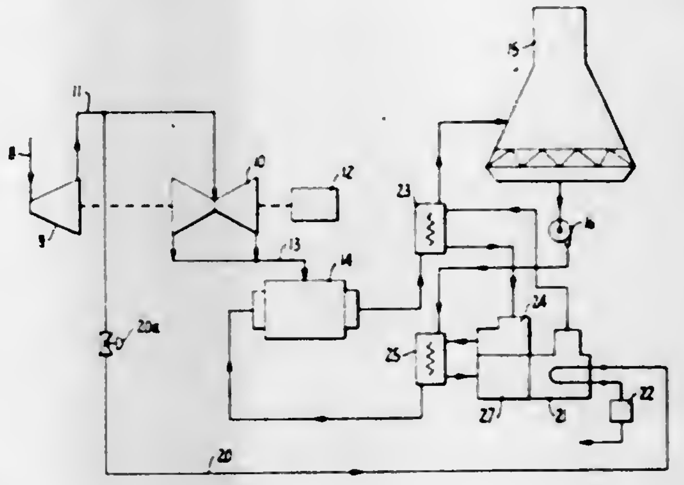


4,004,424
METHOD FOR LIMITING BACK PRESSURE ON STEAM TURBINE

Aswath Maddagiri, Concord, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed May 16, 1975, Ser. No. 578,126
Int. Cl.² F01K *13/02*

U.S. Cl. 60—646 **11 Claims**



1. An improved method for operating a steam turbine wherein a steam turbine exhaust connects to a steam condenser having a coolant circulated through a cooling tower, comprising the steps: removing steam from the steam cycle of

a turbine when the back pressure on the turbine exceeds a predetermined level; extracting heat from the steam and applying the heat to the cooling tower, thereby increasing temperatures in the cooling tower, augmenting thermal fan action, lowering the coolant temperature and limiting the back pressure on the steam turbine; and redirecting the steam back into the steam cycle when the back pressure on the turbine decreases to an acceptable level.

4,004,425
TANDEM MASTER CYLINDERS FOR HYDRAULIC BRAKING SYSTEMS

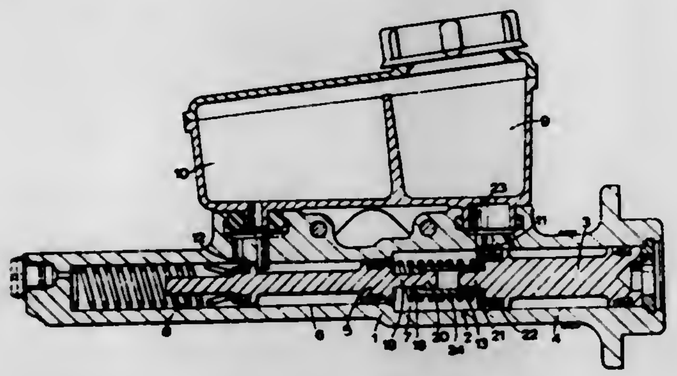
John Flory Pickering, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 7, 1975, Ser. No. 565,718

Claims priority, application United Kingdom, Apr. 19, 1974, 17347/74

Int. Cl.² B60T *11/20*

U.S. Cl. 60—562 **7 Claims**



1. A tandem master cylinder for a vehicle hydraulic braking system, the tandem master cylinder comprising a body having a longitudinal cylinder bore, a pedal-operated main piston working in said bore, a secondary piston working in said bore in a position is advance of said main piston, coupling means coupling said pistons for limited relative axial movement in both directions, and a spring acting between said pistons to urge said pistons apart, wherein said coupling means comprise a rigid sleeve having a cylinder wall and first and second oppostie ends, said first end being secured to one of said pistons against movement relative thereto and said second end being provided with an inwardly directed flange, an axial stem extending from the other of said pistons towards the said one piston and fixed relative to the said other piston, and a head carried by said stem and axially slidable in said sleeve, said sleeve being provided in the cylinder wall thereof with an opening of substantially circular outline through which said head is introduced, and a longitudinal slot connecting said opening to said second end of said sleeve, and wherein the dimensions of said opening are sufficient to allow said head to be introduced into said sleeve with the axis of said piston provided with said stem substantially at right angles to that of said sleeve, and said slot is wide enough to provide clearance for said stem when the said last mentioned piston is swung round into alignment with the said other piston.

4,004,426
THERMAL PRIME MOVER

Niklaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Continuation of Ser. No. 152,946, June 14, 1971. This application July 30, 1973, Ser. No. 383,537

Int. Cl. F01k *1/00, 3/00*

U.S. Cl. 60—659 **1 Claim**

1. A power plant comprising:

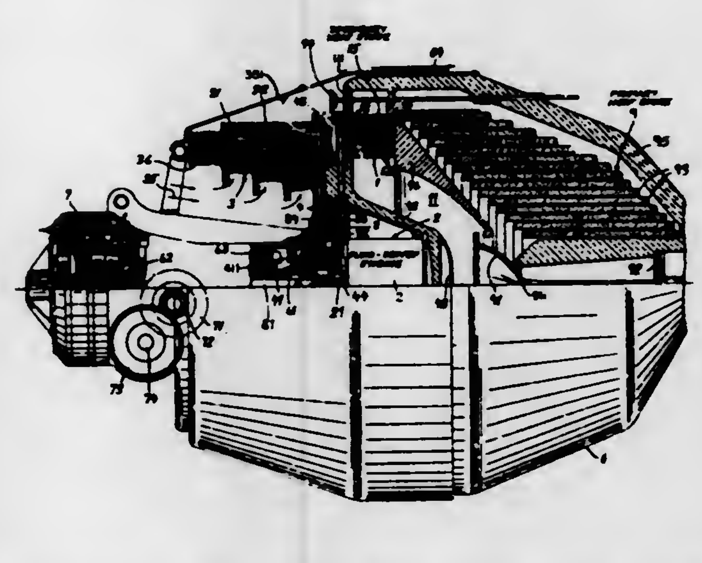
an engine adapted to be driven by the pressure of an expanding vaporizable working fluid;

heat-exchanger means fluidically linked with said engine, said heat-exchanger means including a condenser downstream of said engine and an evaporator upstream of said engine;

first conduit means for conducting said working fluid in a closed circuit through said engine and said heat-exchanger means;

second conduit means for conducting an external heat carrier through said heat-exchanger means in thermally interacting relationship with said working fluid whereby the latter absorbs heat from said carrier upstream of said engine and gives up heat to the environment downstream of said engine;

an external heat source operable to heat said carrier prior to entry thereof into said heat-exchanger means;



heat-storage means outside said closed circuit for heating said carrier prior to entry thereof into said heat-exchanger means in an inoperative state of said external heat source;

switchover means having a first and a second operating position for alternately making said external heat source and said heat-storage means effective to heat said carrier; and

transmission means for operatively coupling said engine to a load;

said condenser and evaporator being a pair of rigidly interconnected radial blowers centered on a common axis of rotation, each of said blowers including a set of tubes extending substantially parallel to said axis.

4,004,427
ENERGY CONVERSION SYSTEM

Tony W. Butler, Jr., 3224 Timmons Lane, No. 136, Houston, Tex. 77027

Filed Aug. 28, 1975, Ser. No. 608,678

Int. Cl.² F03G *7/02*

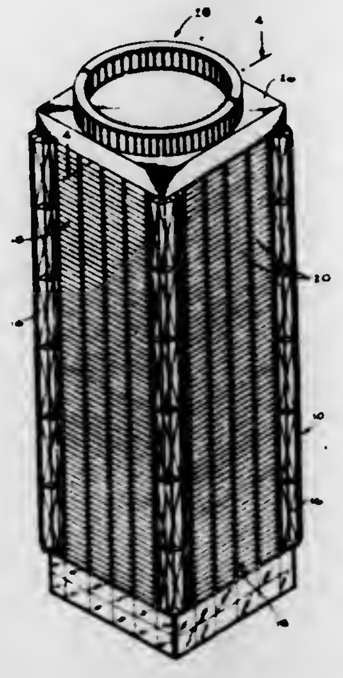
U.S. Cl. 60—698 **33 Claims**

1. An energy conversion system associated with an edifice having a generally vertical outwardly facing side surface, said system comprising:

radiation absorbing means defining a plurality of radiation receiving surfaces adjacent to said side surface but spaced from at least a major portion of said side surface of said edifice to define a flowway between said side surface and said radiation absorbing means and containing a first gaseous medium, each of said radiation receiving surfaces facing generally upwardly and each having a plurality of hollows;

a rotor rotatably mounted on said edifice above said radiation receiving surfaces and comprising a plurality of blades each having a radial component of direction and a tangential component of direction;

ducting apparatus carried by said edifice and disposed to direct said first gaseous medium from said flowway to said rotor blades to rotate said rotor; and



energy-using first operator means at least a part of which is driven by rotation of said rotor.

4,004,428
PROCESS FOR STABILIZING SOIL

Shunsuke Tazawa, and Kazuo Okabe, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,605

Claims priority, application Japan, Nov. 8, 1974, 49-128090

Int. Cl.² E02D *3/14*

U.S. Cl. 61—36 C **4 Claims**

1. In a process for stabilizing soil which comprises injecting into soil a grout mixture consisting of (A) an aqueous sodium silicate solution having a pH of at least 11 wherein the molar ratio of SiO_2/Na_2O is 3.1 to 3.3:1 and (B) an aqueous solution of at least one gelling agent selected from the group consisting of chlorides, sulfates and nitrates of aluminum, magnesium and iron, and then gelling the injected soil mixture in soil, the improvement characterized by adding (C) at least one oxy acid selected from the group consisting of citric acid, tartaric acid and lactic acid to any one of the components (A) and (B) wherein the amount of component (C) used is 0.5 to 20 moles per mole of the gelling agent in (B) and the amount of the gelling agent in (B) is 5 to 50% of the sodium silicate by weight.

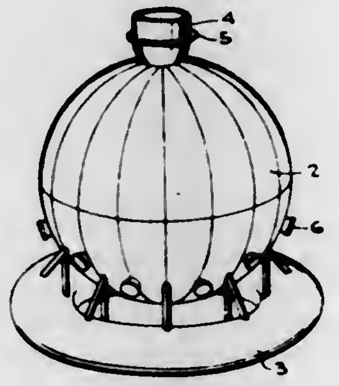
4,004,429
DEEP UNDERWATER SPHERE

William J. Mouton, Jr., 2113 Cleary Ave., Metairie, La. 70001

Filed May 1, 1974, Ser. No. 466,045

Int. Cl.² E02D *29/00*

U.S. Cl. 61—86 **6 Claims**



1. A deep underwater sphere comprising: a plurality of spherical sections; each said section having a spherical shaped frame made of a plurality of radially arranged trusses, an outer metal place and an inner metal plate, said inner and outer metal plates are both made of spherical shaped plates; selected said trusses from each of said sections being connected to selected said trusses of an adjacent said section; said plates being arranged on a respective one of said trusses frames such that both said inner and outer plates each extend over said respective frame at one end and such extended portion overlaps said trusses of said adjacent section and are welded to said adjacent section; and a concrete mixture filling the space between said inner and outer plates for serving to impart resistance to compressional forces placed on the sphere and serving as a ballast for securing the proper specific gravity for sinking of the sphere.

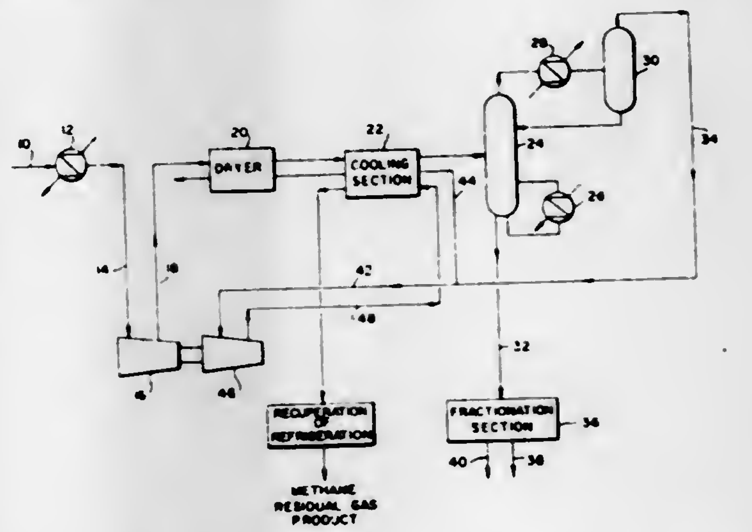
4,004,430
PROCESS AND APPARATUS FOR TREATING NATURAL GAS

Stephen M. Solomon, New York, N.Y.; Sidney Shaievitz, Livingston, N.J., and Louis Marshall, Great Neck, N.Y., assignors to The Lummus Company, Bloomfield, N.J.

Filed Sept. 30, 1974, Ser. No. 510,367

Int. Cl.² F25J *3/00*

U.S. Cl. 62—18 **10 Claims**



1. A process for treating a gaseous natural gas stream including carbon dioxide and water vapor to recover ethane, which comprises:

a. heating said gaseous natural gas stream;

b. expanding said gaseous natural gas stream;

c. passing said expanded natural gas stream through a drying section to remove water vapor;

d. introducing into a demethanizer zone said dried and expanded natural gas stream of step (c) to separate a methane-enriched gaseous stream from an ethane-enriched stream;

e. withdrawing said ethane-enriched stream from said demethanizer zone;

f. withdrawing said methane-enriched gaseous stream from said demethanizer zone; and

g. compressing at least a major portion of said methane-enriched stream to a delivery pressure by the work produced by expanding said gaseous natural gas stream.

4,004,431
CONTROL FOR COOLING UNIT

Thomas L. Hildreth, Bellevue, Ohio, assignor to The Johnson Corporation, Bellevue, Ohio

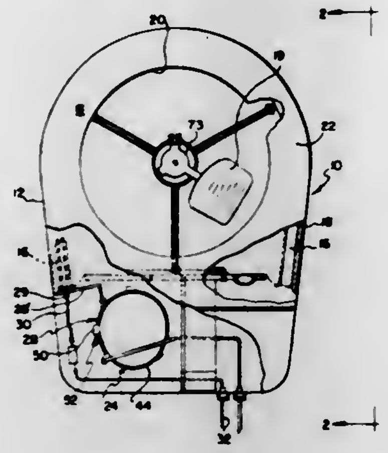
Filed May 22, 1975, Ser. No. 579,919

Int. Cl.² F25B *1/00, 31/00, 43/02*

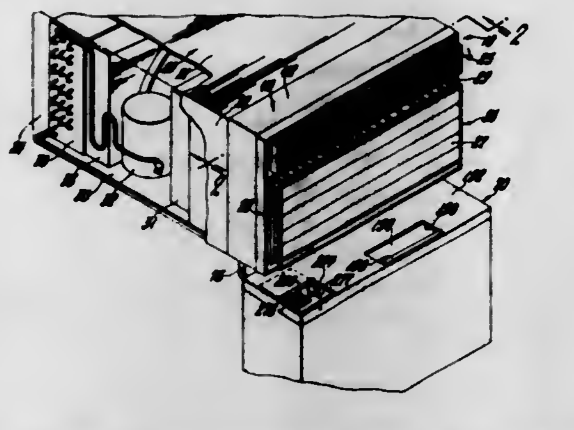
U.S. Cl. 62—228 **17 Claims**

1. In a control for a cooling unit including a compressor for compressing fluid refrigerant, said compressor being disposed in a compressor housing, and a heater means coacting with

said housing for applying heat thereto for attempting to avoid the presence of liquid refrigerant in said housing, temperature sensing means mounted on the exterior of said housing and coacting with said heater means for causing actuation of said compressor responsive to the rise of temperature of the housing to a predetermined point, said temperature sensing means being operative to cause de-energization of said compressor in the event that the temperature of the housing as sensed by said sensing means falls below said point.

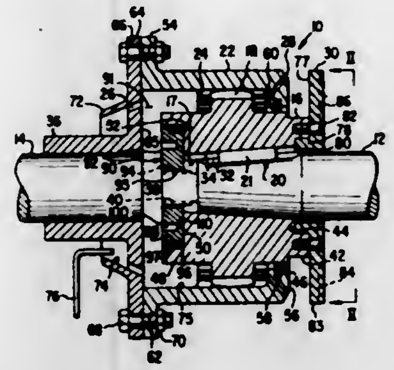


4,004,432
HUMIDIFIER KIT FOR ROOM AIR CONDITIONER
Carlito Maristela Kong, Dayton; Emerson Lee Wark, Vandalia, and Donald Clarence Ferdelman, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 18, 1975, Ser. No. 614,745
Int. Cl.² F25B *23/12*
U.S. Cl. 62—262 **4 Claims**



1. A humidifier attachment for use with a room air conditioner provided with a casing having means defining an air inlet and a conditioned air outlet on the room side thereof, fan means for flowing air into said casing through said air inlet and out of said casing through means located across the casing room side having a chamber coextensive with the conditioned air outlet, an elongated evaporation water pad assembly supported in said enclosure chamber, said assembly including an upper water distribution receptacle vertically spaced from a lower drain trough with a water pad being retained therebetween, said receptacle having a base enclosed by side walls and end walls, said base having a slot therein overlying said water pad, said slot bordered by a peripheral dike, said dike and said receptacle walls defining water channel means, conduit means for delivering water from a storage tank into said channel means, said dike being formed with a plurality of modified V-notch weirs each having a radiused notch portion to allow said weirs to achieve a predetermined head in said channel means before discharging water into said slot, whereby water is discharged uniformly from each of the weirs to said water pad, and an electrical control circuit interconnecting humidistat switch means located on said storage tank with said fan means whereby said fan means will cycle with said humidistat switch means.

4,004,433
CONTINUOUSLY LUBRICATED COUPLING
Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Apr. 24, 1975, Ser. No. 571,394
Int. Cl.² F16D *3/18;* **B61F** *15/22*
U.S. Cl. 64—9 R **2 Claims**



1. A continuously lubricated gear-type coupling for connecting a pair of substantially coaxially aligned rotatable shafts, comprising:

a hub means, having outwardly extending gear teeth, secured to an end of one of said shafts by a key means for rotation therewith;

a sleeve means surrounding said hub means, having inwardly extending gear teeth in meshing engagement with said outwardly extending gear teeth, said sleeve means including an annular metallic sealing ring means between an inturned flange portion of said sleeve means and a shoulder portion of said hub means for preventing the flow of lubricant between said flange portion and said shoulder portion;

a second hub means connecting said sleeve means to the other of said shafts forming a closed chamber within said coupling, said second hub means including an annular lip portion tapering inwardly in a direction away from said sleeve means thus forming an annular trough means on an exterior radial face of said second hub means;

a plurality of inlet port means in said exterior radial face for continuously supplying lubricant from said annular trough means to within said closed chamber;

a plurality of outlet port means in the end of said sleeve means opposite to said second hub means for removal of said lubricant from said closed chamber after said lubricant has lubricated said inwardly and outwardly extending gear teeth;

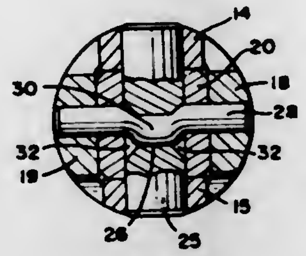
a sealing means connected to the end of said one shaft within said closed chamber for preventing gases exterior to said coupling from entering said closed chamber from between said hub means and said one shaft, said sealing means being seated within an annular recess formed in an end of said hub means and having an annular resilient sealing ring forming a gas-tight seal between said sealing means and said recess; and

an annular impeller means surrounding said one shaft and secured to an end of said hub means adjacent said sleeve means, said impeller means including radially extending means formed on a radial face thereof for propelling gases radially outward from said one shaft,

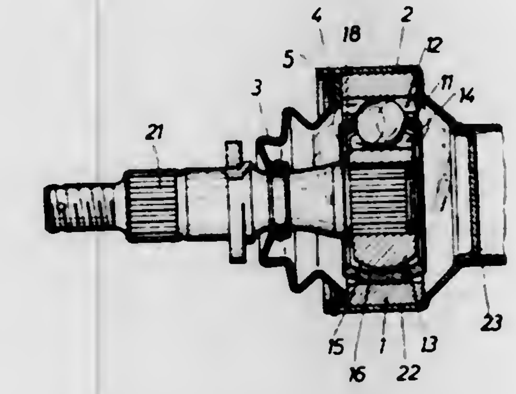
thereby preventing said gases from entering said coupling through said key means and causing corrosion thereof.

4,004,434
UNIVERSAL JOINT
Joseph M. Raby, Kettering, Ohio, assignor to Gardner-Denver Company, Dayton, Ohio
Filed Dec. 17, 1975, Ser. No. 641,543
Int. Cl.² F16D *3/26*
U.S. Cl. 64—17 R **4 Claims**

1. In a universal joint in which a pair of coupling members are arranged end-to-end and each having at one end a pair of forks in planes intersecting the planes of the forks of the other member with aligned openings therethrough, and a connecting block mounted between the forks of both pairs with intersecting bores in alignment with the fork openings, the improvement comprising a main pin extending transversely through an aligned pair of said fork openings and through said block bore and having a transversely formed generally central opening therein, said opening being axially offset from the geometric center of said pin, and a smaller cross pin received in right-angled relation to said main pin through the aligned fork pairs and through the intersecting opening of said block, said cross pin being deformed in a direction along the axis of the main pin in the region of the intersection of said pins to retain said cross pin in assembled position, the maximum extent of the transverse deformation of said cross pin at said main pin opening corresponding to the axial extent of said offset.

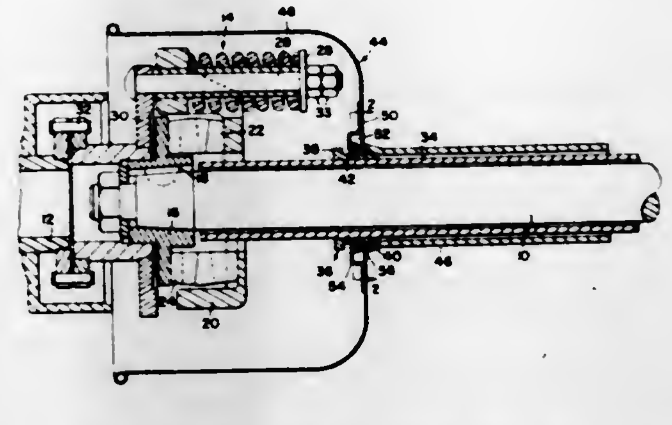


4,004,435
DEVICE FOR NON-ROTATABLY SECURING THE OUTER MEMBER OF A JOINT TO A FLANGE OR SHAFT
Wolfgang Rubin, Steinheim, Germany, assignor to Lohr & Bromkamp GmbH, Germany
Filed June 23, 1975, Ser. No. 589,582
Claims priority, application Germany, July 22, 1974, 7421287[U]
Int. Cl.² F16D *3/84, 3/30*
U.S. Cl. 64—32 R **6 Claims**



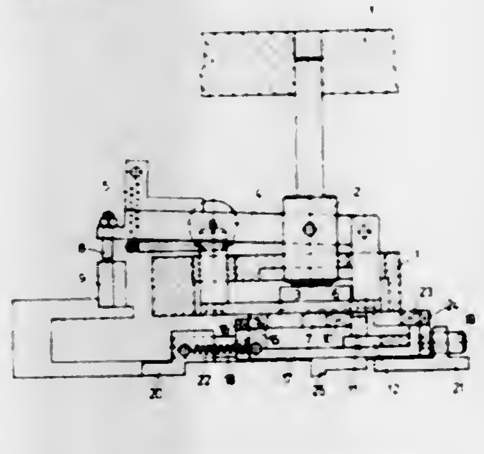
1. In a joint having an outer joint member and inner member drivingly interconnected by a plurality of torque transmitting elements, the combination of the circumference of the outer joint member having a polygonal configuration transverse to the axis of rotation of the joint, a sleeve of corresponding polygonal configuration surrounding said outer joint member and having means thereon for connecting said sleeve to one of a flange of similar polygonal configuration or to a shaft, said sleeve having means on one end thereof and detachable means on the other end thereof engaging opposed end faces of said outer joint member for securing said sleeve against axial displacement with respect to said outer joint member such that said outer joint member is non-rotatably secured by said sleeve to one of a shaft or flange connected to said sleeve, said sleeve being axially displaceable from said outer joint member when said detachable means is detached from the sleeve.

4,004,436
DRIVE LINE SAFETY SHIELD
Roger Eugene Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.
Filed July 24, 1975, Ser. No. 598,852
Int. Cl.² F16D *3/84*
U.S. Cl. 64—32 R **7 Claims**



1. In a drive line including a rotating shaft and a rotating drive component coaxially connected to the shaft, an improved safety shield comprising: a rotatable tubular shaft shield coaxially and rotatably mounted around the shaft adjacent the drive component and including an annular element on the exterior of the shaft shield having an external annular groove around its periphery; a rotatable tubular component shield having an enlarged portion at one end and a neck portion at the other and being coaxially and rotatably mounted on the shaft shield and axially shiftable thereon between a normal position, wherein the enlarged portion encompasses the drive component, and a retracted position wherein the shield is clear of the component to provide access thereto, said component shield having an internal annular groove; and a snap ring mounted in the internal component shield groove and seatable in the external groove to axially lock the component shield on the shaft shield in its normal position, the snap ring being expandable in response to the exertion of a predetermined amount of axial force on the component shield to clear the external groove and permit axial shifting of the component shield to its retracted position.

4,004,437
FLAT KNITTING MACHINE
Hans Schieber, Bopfingen; Franz Radl, Westhausen; Erich Krause, Bopfingen, and Reinhold Schimko, Wasseralfingen, all of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany
Filed Apr. 8, 1976, Ser. No. 675,089
Claims priority, application Germany, Apr. 9, 1975, 2515521
Int. Cl.² D04B *7/00, 15/36, 35/00*
U.S. Cl. 66—78 **8 Claims**



1. A flat knitting machine comprising a needle bed, a carriage traversible along the needle bed, stitch cams which can

be preset in a plurality of different positions according to a desired pattern, at least one ramp in the needle bed fixed to a slide and adapted to displace the cooperating stitch cam into a selected position, means in the carriage for clamping the stitch cam in the position into which it has been displaced by the ramp, wherein the position of said ramp is adjustable by a plurality of independently pre-adjustable set screws, a slide to which the ramp is attached is raisable by control cam means preceding knitting cams in the carriage, independently pre-adjustable set screws limit the return motion of the slide, and set screw means cooperate with separately controllable intercepting stop levers working in slots.

4,004,438
THREAD FEED DEVICE FOR A HOSIERY KNITTING MACHINE

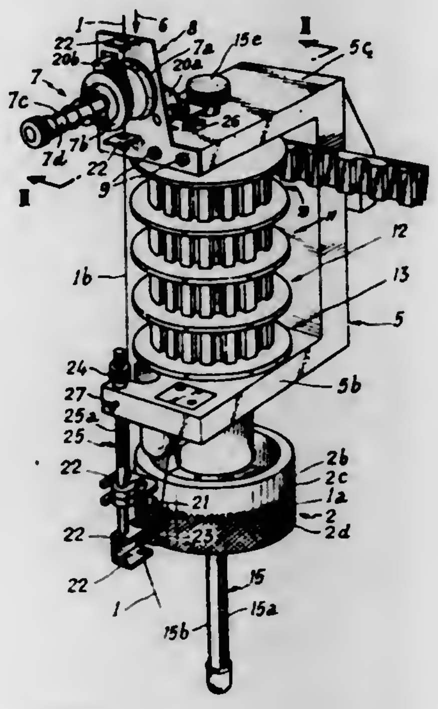
Jean-Pierre Raisin, Troyes, France, assignor to Institut Textile de France, Bouligne, France

Filed July 11, 1975, Ser. No. 595,145

Claims priority, application France, July 17, 1974, 74.24906

Int. Cl.² D04B *15/48*

U.S. Cl. 66—132 R **12 Claims**



1. A thread feed device for a hosiery knitting machine comprising a tensioning mechanism for said thread a cylindrical drum for positive drive of the thread, a shaft coaxial with said drum, an axial groove in said shaft, a projection means on said drum extending radially inwardly of said drum for engagement in said axial groove, a plurality of rotary magnetic drive members surrounding said shaft and a magnetic core on said shaft and fixed for movement therewith and means permitting axial movement of said shaft relative to said drum and said rotary magnetic drive members to selectively align said magnetic core with one of said rotary magnetic drive members.

4,004,439
PATTERN MECHANISM

Ernest Leonard Farmer, and Peter Michael Findlay, both of Leicester, England, assignors to Wildt Mellor Bromley Limited of Adelaide Works, Leicester, England

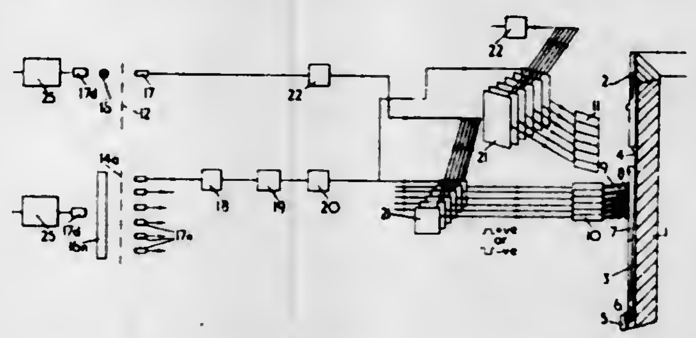
Continuation-in-part of Ser. No. 813,548, April 4, 1969, abandoned. This application Aug. 30, 1971, Ser. No. 176,166

Claims priority, application United Kingdom, Apr. 5, 1968, 16558/68; Dec. 19, 1968, 60457/68

Int. Cl.² D04B *15/78*

U.S. Cl. 66—154 A **3 Claims**

1. A pattern control arrangement for a knitting machine, comprising in combination: needles, cam means for lifting said needles, cam-engaging butts associated with said needles, butts for controlling the location of said cam-engaging butts in or out of cam-engaging position, selectors for engaging said controlling butts, a pattern band, magnetic tape or the like carrying information spots, reading means for moving said selectors into or out of butt-engaging position in accordance with said information spots on said pattern band, tape or the like, said reading means including means for providing pulses for moving said selectors into butt-engaging position when required to move into or remain in that position and also means for providing pulses to move said selectors out of butt-engaging position when required to move out of or remain out of that position, drive means for said pattern band, tape or the like, carrier means driven by said drive means and having secondary information spots thereon which are adapted to be read by the reading means to act as the source of said pulses for moving said selectors out of butt-engaging position, said selectors being arranged in groups of which one selector is to be actuated at each reading of said pattern band, tape or the like said carrier means having said secondary information spots arranged thereon in a number of rows equal to the number of selectors in each group, the reading means includes a logic amplifier for each selector, the said logic amplifier having a first input from the principal information spots on the pattern band, tape or the like and relating to the pattern, and a second input from the said secondary information spots arranged in a number of rows equal to the number of selectors in a group, the said logic amplifier being such as to give an amplified output following the detection of a second input, the polarity of the amplified outputs being controlled by the detection of the existence or otherwise of a signal at the first input, there being no amplified output if no signal is detected at the second input, an actuator operatively connected to and controlling the movement of said one selector to be actuated at each reading position of said pattern band for moving said one selector into and out of butt-engaging position, a first source of a fixed duration pulse having a predetermined magnitude and being of positive polarity, a second source of a fixed duration pulse having the same fixed duration as the pulse of said first source and having a predetermined magnitude equal to the magnitude of said pulse from said first source but being of negative polarity, said logic amplifier including means for selectively applying said positive pulse from said first source and said negative pulse from said second source to said actuator for moving said one selector into or out of butt-engaging position, respectively, or vice versa.



4,004,440
CABLE LOCK FOR SMALL APPLIANCES

William Emil Dreyer, 13818 Castle Blvd., No. 101, Silver Spring, Md. 20904

Filed Mar. 19, 1976, Ser. No. 668,562

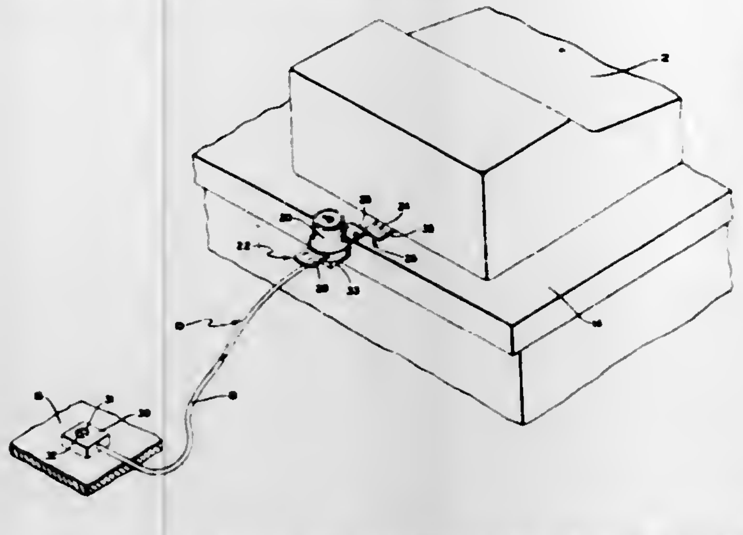
Int. Cl.² E05B *73/00*

U.S. Cl. 70—15 **11 Claims**

1. A compact device for restricting movement of an article relative to a base, comprising:

an elongated plate member, a first region of said member being secured to the bottom of said article, a second region of said member having a step-shaped portion between an upper horizontal part and a lower horizontal part adjacent said article, an exposed part of said second region extending parallel to and above a surface supporting said article;

a cable having first and second ends;



lock means attached to the first end of said cable for locking the first end to said upper horizontal part of said plate member; and

anchor means attached to the second end of said cable for securing the second end to the base.

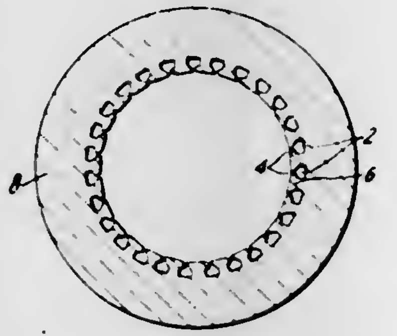
4,004,441
PROCESS FOR MODIFYING CAPILLARY GROOVES

Edward H. Leszak, Amityville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,705

Int. Cl.² B21D *53/06*

U.S. Cl. 72—75 **15 Claims**



1. A process for manufacturing tubing having longitudinal capillary grooves formed in the wall thereof in which the lands between said grooves are such that the width of the opening of the grooves is smaller than the width of the cross-section of the groove, said process comprising the steps of:

establishing relative axial rotation between the workpiece and a tool having metal deforming means; and

passing said tool along the axial length of the workpiece, said tool being positioned so that said deforming means contacts said lands between said grooves with sufficient pressure to cause a displacement of portions of the tops of said lands such that said displaced portions serve to reduce the opening of said grooves.

4,004,442
MACHINE FOR LONGITUDINAL MULTIPASS KNURLING OF PROFILES

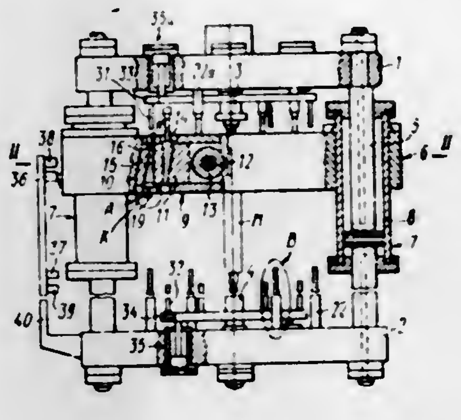
Vladimir Sergeevich Strelchenko, prospekt Lenina, 75, kv. 57, and Valery Ilich Gomlyakov, ulitsa Molodezhnaya, 62, kv. 27, both of Barnaul, U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,493

Int. Cl.² B21B *17/00*

U.S. Cl. 72—214 **5 Claims**

1. A machine for longitudinal multipass knurling of profiles, comprising: parallel stationary crossbars; slides rigidly coupling said stationary crossbars one to the other; centers for positioning a workpiece, which are mounted one opposite the other of said stationary crossbars; a movable crossbar mounted between said stationary crossbars on said slides and adapted for reciprocating motion along the axis of said centers; a knurling head mounted on said movable crossbar coaxially with said centers and having a housing wherein there are slots arranged radially with respect to the axis of said centers; sliders received in said radial slots; knurls installed in said sliders and adapted for rotation; a device for moving said sliders with said knurls in said radial slots, comprising self-braking wedges installed in pairs in each radial slot to interact



with said sliders, the same butt ends of said self-braking wedges facing in opposite directions, and stops interacting with said self-braking wedges, said stops being mounted on both said stationary crossbars, each opposite one of said self-braking wedges, the stops which interact with the lesser butt ends of said self-braking wedges being adapted for reciprocating adjustment motion along the axis of said centers and being depressed in the initial position relative to the stops interacting with the larger butt ends of said self-braking wedges.

4,004,443
DYNAMIC SEALING DEVICE FOR HIGH-TEMPERATURE AND HIGH-PRESSURE OPERATION

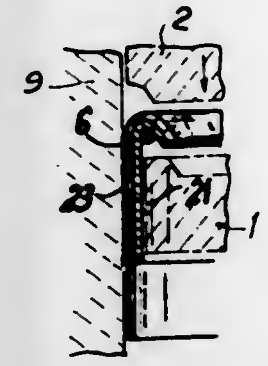
Jean Gavinet, Orsay, and Louis Segurens, Verrieres-le-Buisson, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 355,169, April 27, 1973, abandoned, which is a continuation of Ser. No. 170,648, Aug. 10, 1971, abandoned, which is a division of Ser. No. 860,539, Sept. 24, 1969, abandoned. This application Apr. 4, 1974, Ser. No. 458,056

Claims priority, application France, Oct. 16, 1968, 68.170163; July 2, 1969, 69.22376

Int. Cl.² B21C *23/00*

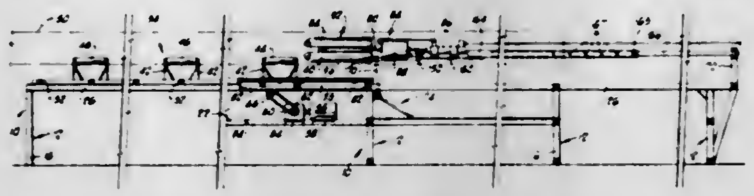
U.S. Cl. 72—253 R **2 Claims**



1. A dynamic sealing system for high-temperature and high-pressure operation in presses for hot extrusion of billets, the presses having an extrusion chamber, a billet in the chamber, a die through which the billet is forced and a ram exerting extrusion force on the billet, the dynamic sealing system being interposed between the ram and the billet in the extrusion chamber comprising first and second supporting members interengaging with clearance along a common axis of the application of a thrust on said members, a metallic O-ring seal imprisoned between said members adjacent the periphery

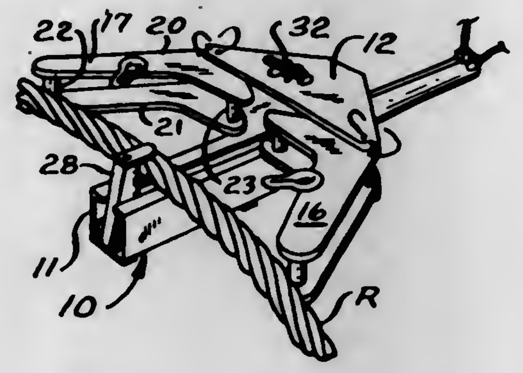
thereof, a flat bearing surface of small cross-sectional area on said first member applied against said seal and extending at right angles to said axis, an inclined bearing surface on said second member applied against said seal in the direction of the exterior of said second member, said members subjecting said seal within said clearance to permanent creep deformation under pressure toward the exterior of said members under a compressive force which is greater than said thrust in the ratio of the area of said flat bearing surface to the area of application of said members and a thin metallic cylindrical skirt terminating at one extremity in an inwardly directed and substantially annular flange covering said O-ring and extending downwardly around said first member.

4,004,444
PIPE MAINTENANCE APPARATUS
Gary M. Pollart, P.O. Box 1558, Guymon, Okla. 73942
Filed May 12, 1975, Ser. No. 576,879
Int. Cl.² B21D *1/08*
U.S. Cl. 72—370 **23 Claims**



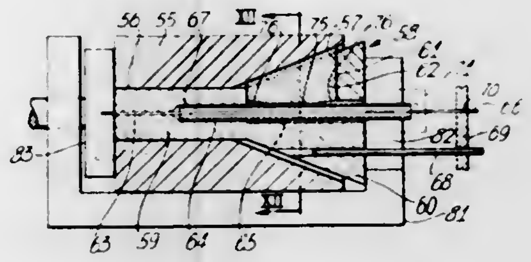
1. Apparatus for removing anomalies from pipe comprising:
an elongated framework;
a carriage reciprocally mounted on said framework;
means on said carriage for supporting an elongated pipe section over said carriage for reciprocating movement therewith; and
force exerting means positioned for partial entry into the interior of a pipe section through an open end thereof as said pipe section is carried on, and reciprocated by, said carriage, said force exerting means comprising:
  a pair of semi-cylindrical shoes each having an outer peripheral surface formed on a radius of curvature less than the radius of curvature of the wall of a pipe section from which the anomaly is to be removed; and
  means for non-manually divergently moving said shoes with respect to each other while said shoes are inside said pipe section to cause said shoes to exert a radially outwardly acting force on said pipe section by contact of the semi-cylindrical surface of at least one of said shoes with the internal wall of the pipe section.

4,004,445
ROPE BENDING DEVICE
Dean W. Larson, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.
Filed Dec. 1, 1975, Ser. No. 636,413
Int. Cl.² B21F *1/06*
U.S. Cl. 72—389 **5 Claims**



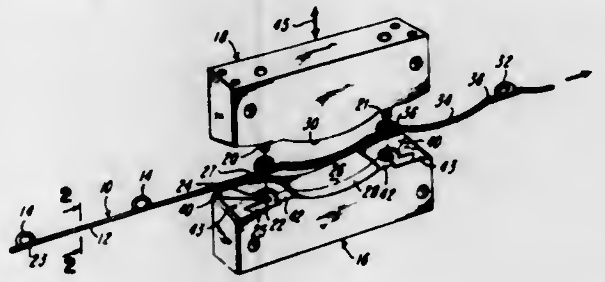
1. A device for bending wire rope comprising a frame, a pair of spaced apart, generally L-shaped arms mounted on said frame for pivotal movement in a common plane, said arms being positioned on said frame in side-by-side, opposed relation to provide a rope-receiving mouth, and a hook movably mounted on said frame for confining and pulling an intermediate portion of said rope between said arms in said plane whereby engagement of said rope with said arms pivots the same to force said rope into an eye configuration, each of said arms including a pair of spaced-apart, aligned generally L-shaped plates, and a post at each end of each arm connecting aligned ends of said plates together, said posts being spaced inwardly from the edges of said plates to provide overlapping edges to confine said rope, and means for moving said hook mounted on said frame below said arms.

4,004,446
TOOL FOR PREFORMING A SECTION OF A TUBULAR CONNECTOR
Jack Frank Dalgleish, Ottawa, and Helmut Hans Lukas, Carleton Place, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Division of Ser. No. 549,661, Feb. 13, 1975, Pat. No. 3,972,585. This application Apr. 5, 1976, Ser. No. 673,365
Int. Cl.² B21D *9/05*
U.S. Cl. 72—400 **2 Claims**



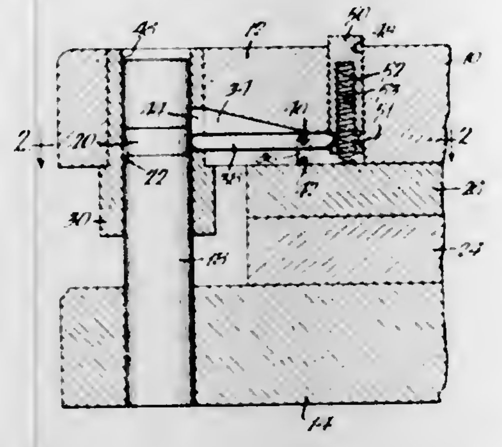
1. A tool for preforming a section of a tubular connecting member for connecting two optical fibres in end to end relationship, comprising:
holding means for holding a tubular member;
a plurality of forming members extending radially in elongated slots formed in said holding means and spaced circumferentially around said tubular member;
support means for supporting a mandrel in said tubular member and coaxial therewith, and
means for pushing said forming members radially inward towards said mandrel to deform said tubular member radially into contact with said mandrel at a plurality of positions, said forming members having a radially inward edge having a central V formation and an inclined face each end of said V formation.

4,004,447
METHOD AND APPARATUS FOR COINING AND CURVING LOOPED WIRE
Joseph W. Wantling, Wellington, Ohio, assignor to Wedge Wire Corporation, Wellington, Ohio
Filed Dec. 10, 1975, Ser. No. 639,475
Int. Cl.² B21C *37/04*
U.S. Cl. 72—414 **5 Claims**



4. The method of simultaneously curving and cross sectionally shaping a wire element with cooperating die elements, one of which includes a first working surface in the shape of a convex frustum generated about a first axis, the other of which includes a second working surface in the shape of a concave frustum generated about a second axis and inclined to said first working surface, which comprises moving said die elements relatively to compress said wire element between the frusta thereof in a direction which advances said first and second axes toward coincidence.

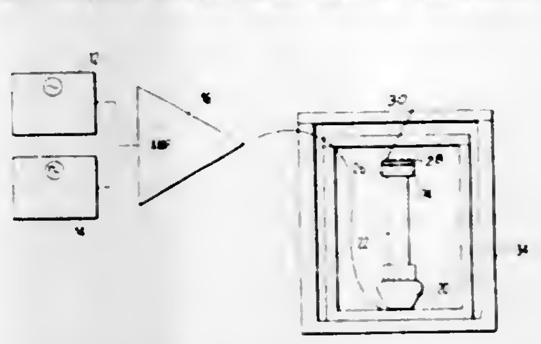
4,004,448
AUTOMATIC DIE SAFETY LOCK FOR A METAL STAMPING DIE
John W. von Holdt, 7430 N. Croname Road, Niles, Ill. 60648
Filed Aug. 14, 1975, Ser. No. 604,806
Int. Cl.² B21J *13/02*
U.S. Cl. 72—462 **12 Claims**



1. In a metal stamping die including upper and lower die assemblies and having a leader pin carried by the lower die assembly and slidably positioned in the upper die assembly, a locking mechanism for locking the upper and lower die assemblies together when the stamping die is out of press, and releasing the upper and lower die assemblies from locking engagement when the stamping die is in press, comprising:
means defining a cavity in the upper die assembly;
means defining a camming surface on the upper portion of the leader pin positioned in the upper die assembly;
a safety pin slidably disposed in a bore in the upper die assembly for sensing whether the die is in press, said safety pin projecting upwardly out of the upper die assembly when the die is out of press;
spring means associated with said safety pin normally urging said safety pin upwardly to the out of press position;
an elongated lockbar pivotally mounted in said cavity, one end of said lockbar being in engagement with said safety pin and the other end of said lockbar being engageable with said camming surface, said lockbar being movable to an in press position, an intermediate position and an out of press position; and
pivot means for pivotally supporting said lockbar in said cavity.

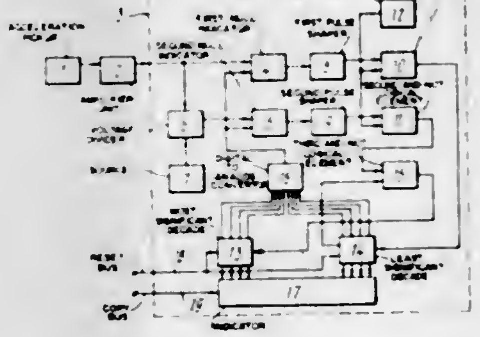
4,004,449
IMPACT SOUND STRESSING FOR SEMICONDUCTORS
Edward F. Gorey, Beacon, and Guenter H. Schwuttke, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1975, Ser. No. 591,922
Int. Cl.² G01N *3/32*
U.S. Cl. 73—12 **12 Claims**

12. Apparatus for creating micro-damage in the surface of a semiconductor wafer in a controlled amount comprising, a plurality of spherical shaped objects disposed on said surface for movement relative to said wafer and, means for vibrating



said wafer such that said vibrations cause said objects to bounce on said surface inducing micro-damage in the surface.

4,004,450
DEVICE FOR MEASURING IMPACT PULSES
Alexandr Sergeevich Yakshin, ulitsa Malaya Filevskaya, 66, kv. 104; Oleg Nikolaevich Novikov, ulitsa Kuznetsky most, 18/7, kv. 6; Dmitry Alexeevich Grechinsky, ulitsa Tolbukhina, 8, korpus 2, kv. 48; Viktor Alexandrovich Klochko, ulitsa Oktyabrskaya, 38, kv. 374, and Viktor Georgievich Rygalin, 3 Dorozhny proezd, 5, korpus 2, kv. 103, all of Moscow, U.S.S.R.
Filed Dec. 15, 1975, Ser. No. 640,710
Claims priority, application U.S.S.R., Dec. 19, 1974, 2087064
Int. Cl.² G01N *3/30;* **G01M** *7/00*
U.S. Cl. 73—12 **4 Claims**



1. A device for measuring impact pulses comprising:
an acceleration pickup provided with an output and converting the mechanical vibrations of an object into electric signals;
an amplifier unit with an input and output, said input being connected to said output of said acceleration pickup, said amplifier unit receiving said electric signals coming from said acceleration pickup; and
a meter for measuring the parameters of said impact pulse, namely its peak value, having a first input connected to said output of said amplifier unit, said meter receiving electric signals from this amplifier unit and comprising a first null-indicator whose first input serves as said first input of said meter, a voltage divider whose first input serves as a second input of said meter and is also connected to said output of said amplifier unit, a source of reference voltage having an output connected to a second input of said voltage divider, a second null-indicator having its first input connected to an output of said voltage divider, a first pulse shaper having its input connected to an output of the first null-indicator, a second pulse shaper having its input connected to an output of the second null indicator, a first AND-NOT logical element having its first input connected with an output of said first pulse shaper, a second AND-NOT logical element having its first input connected to an output of said second pulse shaper, a H.F. pulse generator having an output connected to a second input of each of said first and second

AND-NOT logical elements, a third AND-NOT logical element having its first input connected to an output of the second AND-NOT element, a most significant decade having an input and a group of outputs and being connected to a reset bus and connected by its input with an output of the third AND-NOT logical element, a least significant decade having an input, a first output, a group of outputs and being connected to said reset bus and connected by its input to an output of the first AND-NOT logical element and by the first output to a second input of third AND-NOT logical element, a digital -to- analog convertor having a first and a second group of inputs and an output and connected by its first group of inputs to said group of outputs of said most significant decade, by its second group of inputs to said group of outputs of said least significant decade and by its output to a second input of each of the first and second null-indicators, an indicator, having a first and a second group of inputs and connected to a copy bus, connected by its first and second group of inputs to said groups of outputs of said most significant and least significant decades, respectively, and indicating the measured value of said peak value of said impact pulse.

4,004,451

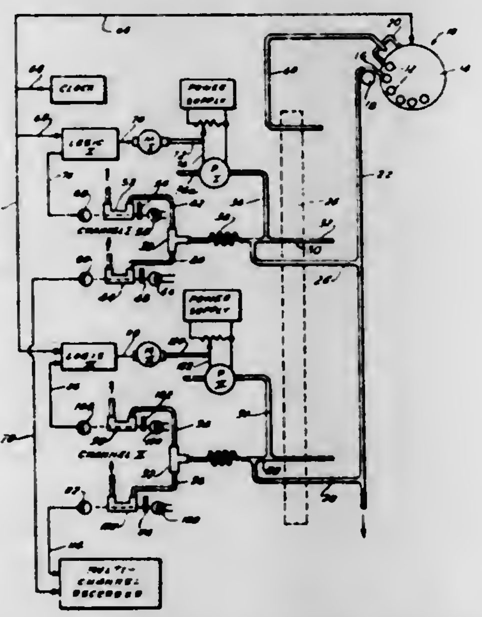
AUTOMATED TIMING OF FLUID DELIVERY IN SAMPLE ANALYSIS

Donald A. Burns, Putnam Valley, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,140

Int. Cl.² G01N *31/00*

U.S. Cl. 73—23 17 Claims



1. A method for quantitatively analyzing a constituent of a liquid sample, comprising:
- flowing in a first conduit portion toward a second conduit portion a stream including said sample at a constant volumetric rate;
- introducing at a volumetric rate continually another fluid into the stream in said first conduit portion:
- determining the velocity of said stream in one of said conduit portions and generating a signal in response thereto:
- proportionately varying said volumetric rate of said introduction of said other fluid into said first conduit portion in response to said signal to control the dwell time of said sample in said conduit portion: and
- analyzing said sample constituent in said second conduit portion.

4,004,452

AIR/FUEL RATIO SENSOR FOR AIR/FUEL RATIOS IN EXCESS OF STOICHIOMETRY

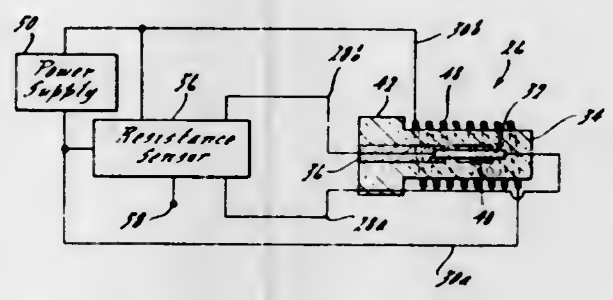
Eleftherios M. Logothetis, Birmingham; Kamlakar R. Laud, and Kwansuh Park, both of Anu Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 463,345, April 23. 1974, Pat. No. 3,933,028. This application Oct. 3, 1975, Ser. No. 619,345

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.² G01N *7/02, 31/00*

U.S. Cl. 73—23 10 Claims



6. In a system for monitoring the air/fuel ratio of the combustion mixture provided to a combustion device intended to operate under steady state conditions at a preselected air/fuel ratio wherein an exhaust gas sensor is situated within the stream of exhaust gases produced by the combustion device and is arranged to produce an electrical signal indicative of the partial pressure of oxygen in the exhaust gases and including electrical means communicating with and responsive to the sensor and arranged to generate an electrical signal indicative of the air/fuel ratio of the combustion mixture, the improvement wherein the exhaust gas sensor is comprised of a cobalt monoxide ceramic sensing element connected electrically in series with a source of electrical energy and the electrical means are arranged to respond to the current flow through said cobalt monoxide sensing element to generate an output signal having a magnitude and polarity indicative of excursion of the air/fuel ratio of the combustion mixture from a selected value in the lean regime.

4,004,453

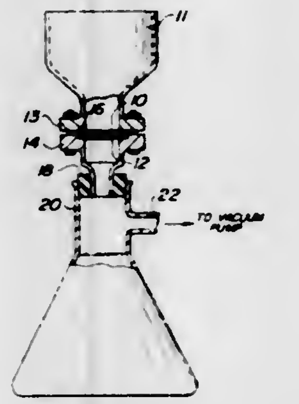
METHOD FOR DETECTING OIL IN WATER

Per T. Thyrum, 100-D Phelps Ave., New Brunswick, N.J. 08901

Filed Dec. 8, 1975, Ser. No. 638,471

Int. Cl.² G01N *33/18*

U.S. Cl. 73—61.1 R 27 Claims



1. A method for determining the presence of a first liquid of low solubility and low surface activity particulately dispersed in a second liquid, comprising:
- filtering a sample of said liquids through a porous filter element at a controlled flow rate;
- pressing a pad impregnated with an oil-soluble, water-insoluble dye against the upstream surface of the element; and
- removing said pad and observing the color stain on the surface of said element which was contiguous with said pad.

4,004,454

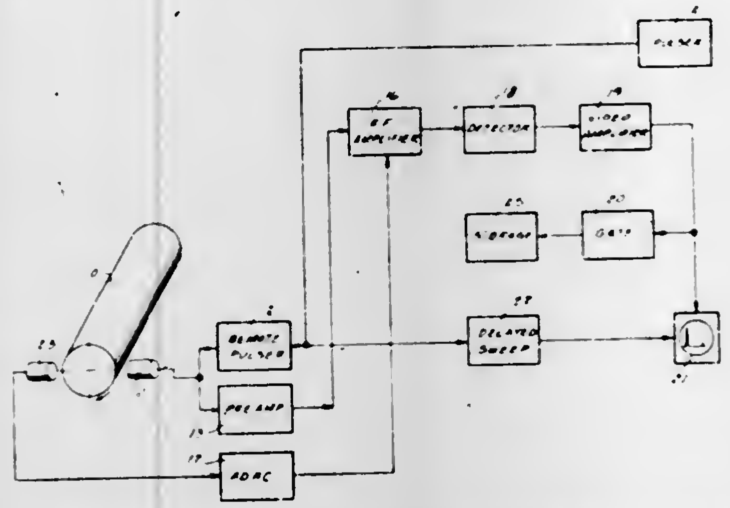
ULTRASONIC INSPECTION METHOD OF PULSE REFLECTION DEFECT DETECTION USING A THRU-TRANSMISSION AUTOMATIC DISTANCE-AMPLITUDE COMPENSATION

Istvan M. Matay, North Royalton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 7, 1975, Ser. No. 575,460

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 R 10 Claims



1. A pulse echo inspection device including a receiver having variable gain control means for testing a specimen comprising, first transducer means for periodically transmitting a signal into said specimen from one side thereof, and supplying echoes to said receiver, a second transducer means mounted on the opposite side of said specimen and receiving directly transmitted signals from said first transducer means, and an automatic distance-amplitude correcting device receiving the output of said second transducer means and producing a gain control signal which is supplied to said variable gain control means of said receiver.

4,004,455

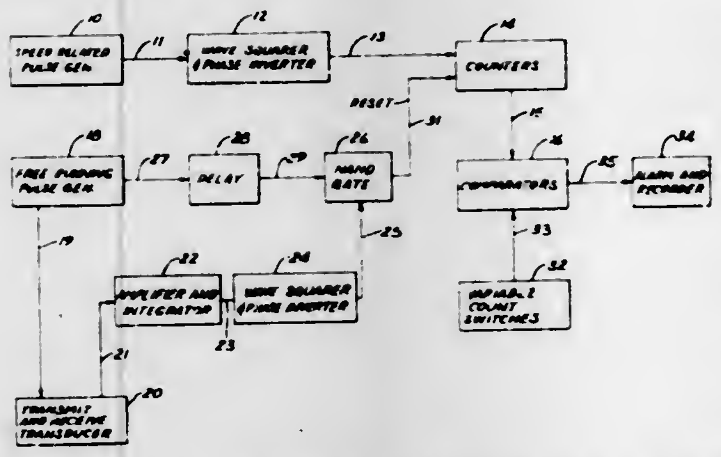
FLAW DETECTING APPARATUS FOR RAILROAD RAILS AND THE LIKE

Chester W. McKee, Flossmoor, and C. Glenn Henderson, Ottawa, both of Ill., assignors to Teleweld, Inc., Streator, Ill.

Filed May 23, 1975, Ser. No. 580,158

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.9 9 Claims



1. Apparatus for moving along a railroad rail to test and detect flaws in the railroad rail, comprising:
- means for transmitting ultrasonic signals into the rail and for receiving associated echo signals reflected from within the rail;
- means operably connected to said transmitting means for producing a trigger signal that causes said transmitting means to transmit an ultrasonic signal, said trigger signal being generated independently of the movement of the apparatus along the rail,
- means operably connected to said trigger signal producing means and said transmitting and receiving means for producing an electrical reset signal only in response to an echo signal being received at a predetermined time following the transmitting of an ultrasonic signal, said predetermined time corresponding to the time at which a transmitted ultrasonic signal which has traveled to and reflected from the bottom of the rail will have returned to the transmitting and receiving means, whereby a reset signal is generated only when an echo signal is received from the bottom of a rail;
- means for producing electrical pulses at predetermined intervals of distance as said apparatus moves along the rail;
- means connected to said pulse producing means and said reset signal producing means for counting said pulses, said counting means being reset in response to a reset signal being received; and
- means sensing the state of said counting means for producing an indication of a flaw when said count exceeds a predetermined value.

4,004,456

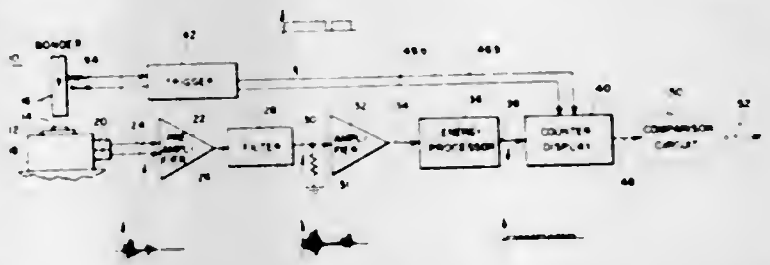
METHOD AND APPARATUS FOR THE REAL-TIME, NON-DESTRUCTIVE EVALUATION OF ADHESION BONDS USING STRESS-WAVE EMISSION TECHNIQUES

Sotirios John Vahaviolos, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,489

Int. Cl.² G01N *29/00*

U.S. Cl. 73—71.4 12 Claims



1. A method for the real-time, non-destructive evaluation of the strength of an adhesion bond the formation of which includes a compression phase using stress-wave emission techniques, comprising the steps of:
- a. measuring the stress-wave energy emitted from the bonding area during the compression phase; and
- b. determining the strength of the adhesion bond by comparing the measured stress-wave energy with a predetermined substantially linear relationship between the emitted stress-wave energy and the strength of the particular type of adhesion bond being formed.

4,004,457

COMPRESSION TESTER

Richard Eide, Minneapolis, and Gerald A. Golembeck, Lake Elmo, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

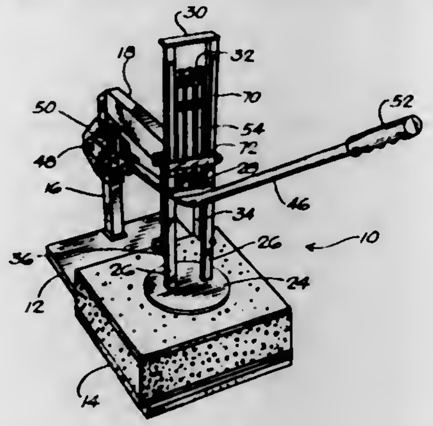
Filed Jan. 13, 1976, Ser. No. 648,768

Int. Cl.² G01N *3/08*

U.S. Cl. 73—94 6 Claims

1. In a compression tester for resilient objects comprising a supporting bed for the object to be tested, a platen movably positioned over said supporting bed, a movable frame supporting said platen, a scale for measuring the force applied by said platen to said object, an actuating arm for driving the platen

into said object, said scale having an upper end suspended from said frame and a lower end connected to said actuating arm, driving force applied to said actuating arm being transmitted through said arm to said scale, and through said scale to said frame and platen whereby driving of the platen into said object provides a reading on said scale for determination of the force applied, and means for measuring the distance of depression of the platen into the object whereby the force required for depression of the platen for a given distance can be measured.



4,004,458
ELECTROMAGNETICALLY COMPENSATED BALANCE OR DYNAMOMETER

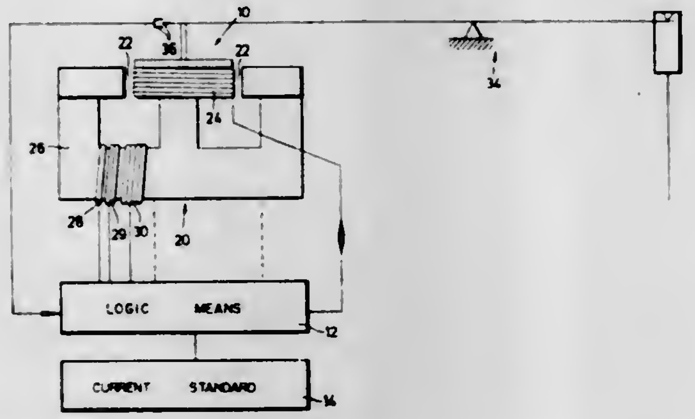
Erich Knothe, Eddigehausen; Franz Josef Melcher, Ellierode, and Christoph Berg, Gottingen, all of Germany, assignors to Sartorius-Werke GmbH (und. vorm. Gottinger Prazisionswaagenfabrik GmbH), Gottingen, Germany

Filed Mar. 5, 1976, Ser. No. 664,416

Claims priority, application Germany, Mar. 13, 1975, 2511103

Int. Cl.^{2} G01L *1/00*

U.S. Cl. 73—141 R **11 Claims**



1. An electromagnetically compensated balance or dynamometer which comprises a coil disposed in the work gap of a magnet, said magnet being an electromagnet having a soft magnet core provided with discrete groups of turns, the number of ampere turns in the groups of turns corresponding to the sequence of code values of a preselected code, either said coil or magnet being movable and being deflected out of a predetermined equilibrium position relative to the unmovable one of the magnet or coil under the influence of a force, a position indicator, logic means including a counter, the input of the counter being connected to the position indicator and the output of the counter being connectable to selected ones of the groups of turns to provide a concordance between the count held in the counter and the number of ampere turns in the selected groups of turns, and a constant current source; the position indicator; in the presence of a deflection, controlling the counter as a function of the direction of deflection, and the logic means connecting the output of the constant current source to the coil and to the particular groups of turns associated with the count held in the counter whereby the deflection is compensated and the movable one of the magnet or coil is returned to its predetermined equilibrium position and the final count held in the counter is proportional to the magnitude of the force.

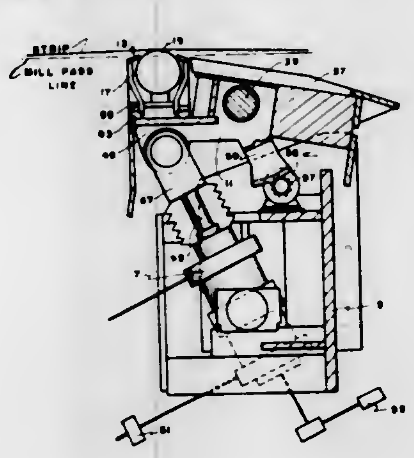
4,004,459
COMBINATION STRIP CONTACTING DEVICE FOR USE IN A ROLLING MILL

Joseph Irwin Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Apr. 14, 1976, Ser. No. 676,942

Int. Cl.^{2} G01L *5/10*

U.S. Cl. 73—144 **6 Claims**



1. A device for contacting a strip issuing relative to a rolling mill for performing separate sets of functions on said strip, such as a combined shapemeter-looper function and a shapemeter-tensiometer function, comprising:
  a frame,
  an actuator supported by said frame,
  a roller means connected to said actuator for displacement thereby in a manner to contact substantially the entire width of said strip to assume a force transmitting relationship relative thereto,
  said roller including means sensitive to the shape of said strip and for producing a representation of said shape,
  means for causing said roller means to move through a relatively large working range which corresponds to said shapemeter-looper function and for positioning said roller in a substantially fixed location relative to a strip datum position which corresponds to said shapemeter-tensiometer function, and
  means for causing said roller means to perform selectively said separate sets of functions.

4,004,460
SHIP MOVEMENT MEASUREMENT

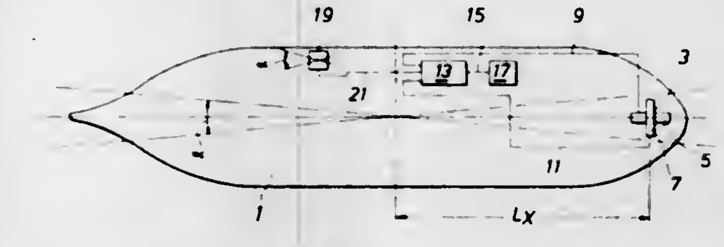
Sydney L. Whipps, Doddinghurst, England, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 14, 1975, Ser. No. 621,783

Claims priority, application United Kingdom, Oct. 24, 1974, 46032/74

Int. Cl.^{2} G01C *21/00*

U.S. Cl. 73—178 R **6 Claims**



1. Method for determining the movement of a ship comprising:
  measuring the longitudinal and lateral velocity of the ship at an aeration-free location at the bottom of the ship;
  measuring the rate-of-turn of the ship about its vertical axis;
  generating signals representing each of the measured values;
  visually displaying the magnitude of the signal representing the longitudinal velocity as a vertical displacement of a horizontal line from a neutral horizontal axis;
  visually displaying the signal representing the lateral velocity as a horizontal displacement of a vertical line from a neutral vertical axis, said displays of longitudinal and lateral velocity being superimposed and having the same horizontal and vertical scales;
  visually displaying the magnitude of the signal representing the rate-of-turn; and
  superimposing on the display of longitudinal and lateral velocity a monogram for indicating the drift angle of the vessel resulting from the longitudinal and lateral velocities.

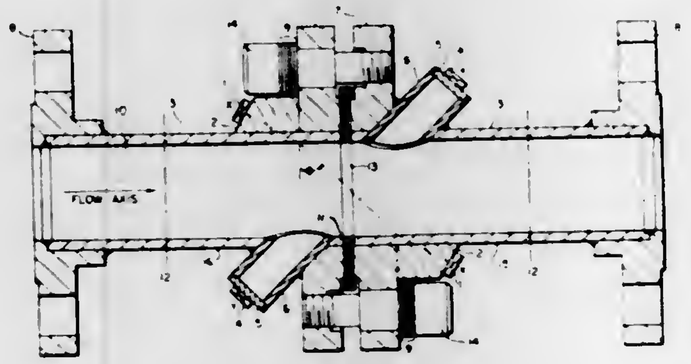
4,004,461
ULTRASONIC MEASURING SYSTEM WITH ISOLATION MEANS

Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Nov. 7, 1975, Ser. No. 629,870

Int. Cl.^{2} G01F *1/66*

U.S. Cl. 73—194 A **16 Claims**



1. An apparatus for measuring the ultrasonic response characteristics of a fluid flowing within a conduit having walls formed of a high acoustic impedance material comprising,
  a first transducer mounted on said conduit wall in a first position for transmitting a beam of ultrasonic energy through a portion of said conduit wall into said fluid;
  a second transducer mounted on said conduit wall at a second position spaced apart from said first position, said second transducer producing output signals in response to received ultrasonic energy;
  an opening in said conduit wall between said first and second positions separating said conduit into first and second separate segments, said first transducer position being located within said first segment and said second transducer position being located within said second segment, and
  a sealant material confined to the opening between the first and second segments of said conduit to seal said first and second segments together, said sealant material having an acoustic impedance low in comparison to the acoustic impedance of said conduit walls, thereby forming an acoustic mismatch to ultrasonic energy transmitted from said first segment to said second segment through the walls of said conduit.

4,004,462
TEMPERATURE TRANSDUCER

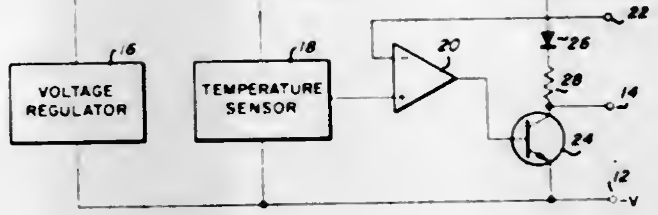
Robert C. Dobkin, Atherton, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed June 7, 1974, Ser. No. 477,323

Int. Cl.^{2} G01J *5/00*

U.S. Cl. 73—362 R **23 Claims**

1. A temperature sensor, comprising:
  a first transistor having a first parameter thereof which is proportional to temperature and to a second parameter thereof,
  a second transistor having a first parameter thereof which is proportional to temperature and to a second parameter thereof,



  means for maintaining the ratio of the value of said second parameter of said first transistor to the value of said second parameter of said second transistor constant with changes in temperature and at a value different than one, and
  means for sensing the difference between the values of said first parameters.

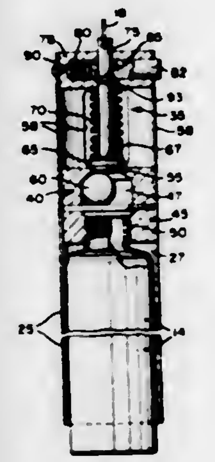
4,004,463
FLUID SAMPLING DEVICE

Carl Fredrick Puthoff, Cincinnati, and James John Gardner, Hamilton, both of Ohio, assignors to Fluid Kinetics, Inc., Fairfield, Ohio

Filed Jan. 26, 1976, Ser. No. 652,468

Int. Cl.^{2} G01N *1/12*

U.S. Cl. 73—425.4 R **9 Claims**



1. A fluid sampling device, which may be lowered by a cord into a pool of fluid to sample the fluid at a particular depth without cross contamination of the fluid sample obtained, comprising:
  housing means for holding a sample bottle to be filled with the fluid sample,
  remotely operable valve means, attached to the cord and mounted on said housing means, for positively preventing fluid from entering said bottle until said cord is abruptly jerked, and
  automatically closing valve means for sealing said bottle in response to said bottle being filled with fluid, whereby the fluid sample obtained in said bottle will not be contaminated by fluid from other levels as said sampling device is raised from said pool of fluid.

4,004,464

METHOD AND TRANSDUCER AND APPARATUS FOR SELECTIVELY MEASURING OSCILLATION COMPONENTS FROM AN OSCILLATION SPECTRUM

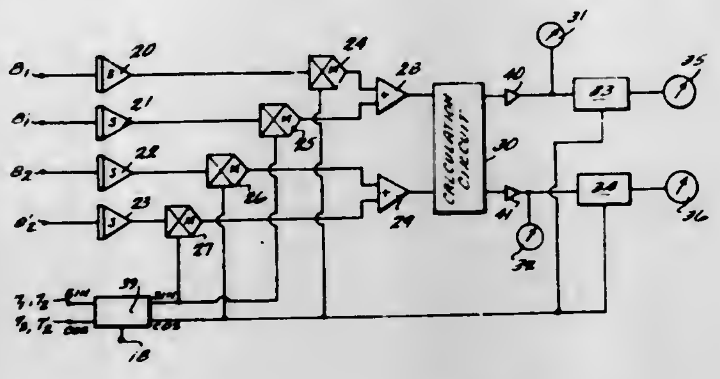
Günther Himmler, Darmstadt, Germany, assignor to Gebr. Hofmann KG Maschinenfabrik, Darmstadt, Germany

Filed Aug. 12, 1975, Ser. No. 603,970

Claims priority, application Germany, Aug. 14, 1974, 2439072

Int. Cl.² G01M *1/22*

U.S. Cl. 73—462 **9 Claims**



1. A method of selectively measuring oscillation components and oscillation vectors of a rotor in an oscillation spectrum with a transducer, comprising the steps of applying the oscillation movement to an induction device forming part of the transducer, providing a magnetic alternating field having an adjustable frequency which is kept constant at an integral multiple of the rotor frequency, producing from the operating movement of the induction device in the magnetic field an electrical alternating current voltage and integrating said voltage to produce a signal which is proportional to the amplitude of the oscillation component which is selected by the set adjustment of said constant frequency.

4,004,465

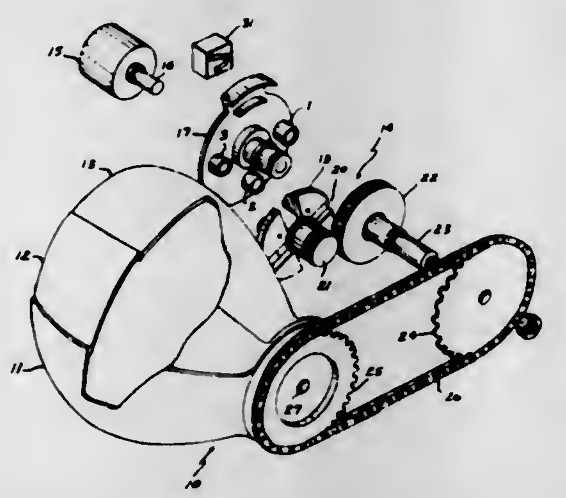
OPTICAL WINDOW PROTECTIVE SHUTTER MECHANISM

Richard A. Dinges, Resda, and Morris Weber, Sherman Oaks, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 20, 1976, Ser. No. 650,590

Int. Cl.² F16H *27/04, 55/04*

U.S. Cl. 74—84 R **9 Claims**



1. A visor-like, shutter mechanism comprising: a plurality of separate cover members mounted for pivotal movement about and progressively varying in radius relative to, a common pivot; a cover control drive means interconnected in driving relation with said shutter mechanism for respectively repositioning said separate cover members between a first, open, retracted, inactive and nested relation to each other, and a second, closed, extended and active position; said cover control drive means comprising: a reversible drive motor including a drive shaft; a Geneva-type mechanism comprising; a first drive element in operable relation to, and being driven by said drive shaft, a first driven element incorporating an output shaft, and first, periodically-effective and selectively operative interconnecting-drive actuating means disposed with, and between said first drive element and said first driven element; second, cover member - actuating means incorporating and being driven by said output shaft, and further including adjustably positionable means directly interconnected with the outermost cover member; said cover members incorporating overhanging lip portions on their forward and trailing edges respectively engageable with each other to thereby ensure the collective repositioning of all of the said cover members either to their closed or open positions when the said outermost cover member is being pivoted by said cover control drive means; and periodically-operative, locking means disposed between said first drive element and said first driven element automatically effective during the final pivoted movement of said plurality of cover members either to their closed or open positions to provide a predetermined dwell period during which the first driven element is locked in its final angularly adjusted position and the first drive element is allowed to move in angular position relative thereto in the time required to fully stop operation of the drive motor to thereby prevent any inadvertent damage.

4,004,466

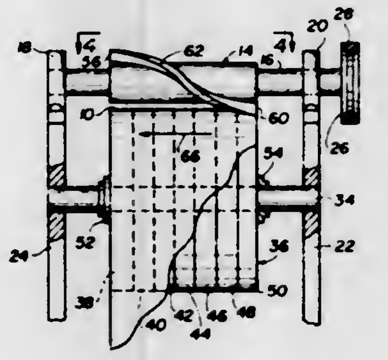
DRIVE MEANS

Louis P. Alba, 279 Highland Blvd., Brooklyn, N.Y. 11207

Filed Dec. 8, 1975, Ser. No. 638,421

Int. Cl.² F16H *7/00, 7/18;* **B65H** *25/26, 17/22*

U.S. Cl. 74—229 **14 Claims**



1. Drive means for a sheet, tape, loop, belt, etc. that will drive same in a straight path, said drive means comprising:

support means for the sheet;

rotatable drive roller means operatively arranged with respect to said support means to move said sheet therebetween,

said drive roller means having a drive surface that provides cyclic line contact back and forth across the sheet and thereby oppose forces tending to cause said sheet to wander from a straight path.

4,004,467

CONVEYOR BELTING

Michael John Kenney, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

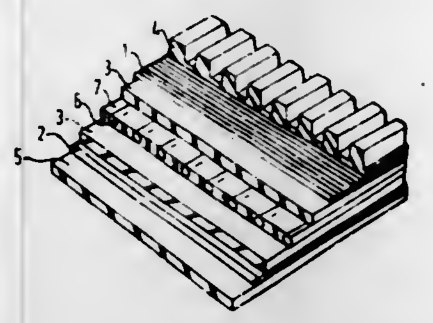
Continuation of Ser. No. 382,339, July 25, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,310

Claims priority, application United Kingdom, Aug. 3, 1972, 36219/72

Int. Cl.² F16G *5/16, 1/00, 1/22*

U.S. Cl. 74—233 **12 Claims**

1. A longitudinally flexible passenger carrying belt which is substantially rigid transversly comprising a core of flexible compounded polymeric material and at least two spaced-apart layers one on each side of the core, each layer having a plurality of high modulus transverse elements, the elements in each layer being substantially straight and individually flexible and positioned substantially at right angles to the length of the belting, the said transverse elements being bonded to a polymeric material wherein the average hardness of the compounded polymeric material of the core is at least 75 BS degrees of hardness whereby the spacing of the layers of transverse elements and the average hardness of the compounded material core confer on the belting a substantial degree of transverse rigidity.



4,004,468

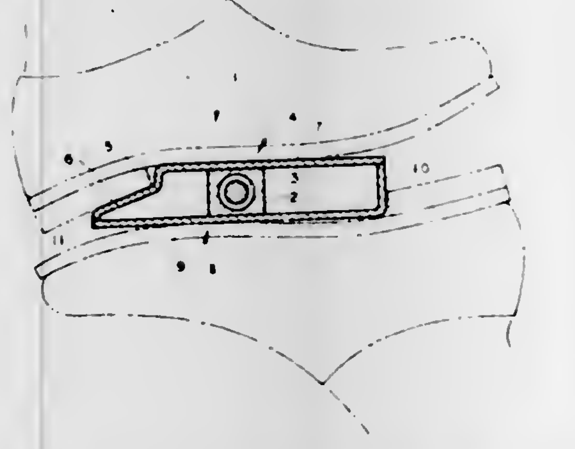
TWO-POSITION PEDAL FOR BICYCLES

Roger Owen Durham, 3944 Marathon St., Los Angeles, Calif. 90029

Filed Dec. 30, 1974, Ser. No. 537,582

Int. Cl.² B62M *3/08*

U.S. Cl. 74--594.4 **1 Claim**



1. A two-position bicycle pedal, for use by a cyclist wearing shoes with heels, comprising:

a. a pedal spindle, said pedal spindle threaded at one end to engage a bicycle crank;

b. a spindle housing rotatably supported by said pedal spindle;

c. a top plate secured to said spindle housing, said top plate having a top deck area adapted for supporting the sole of the cyclist's shoe, a heel stop adjacent said top deck area, said heel stop adapted for engaging the forward face of the heel of a cyclist's shoe, said heel stop located so as to approximately position the arch of the cyclist's foot over said pedal spindle, and a heel step adjacent said heel stop, said heel step adapted for supporting the heel of the cyclist's shoe;

d. a bottom plate secured to said spindle housing, said bottom plate having a bottom deck area adapted for supporting the sole of the cyclist's shoe, said bottom plate having a heel stop adapted for engaging the forward face of the heel of the cyclist's shoe, said heel stop located so as to position the ball of the cyclist's foot over said pedal spindle.

4,004,469

PISTON-CRANK MECHANISM FOR INTERNAL COMBUSTION ENGINES

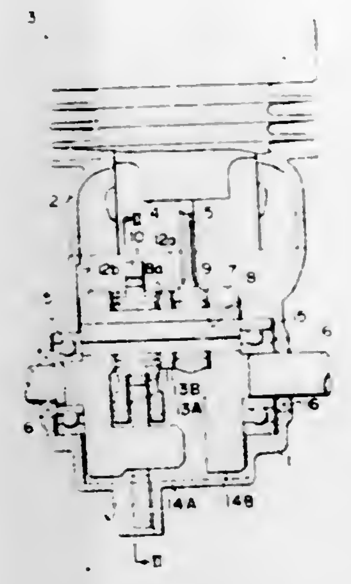
Soichiro Kosugi, Iwata, Japan, assignor to Yamaha, Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 20, 1975, Ser. No. 560,519

Claims priority, application Japan, Mar. 25, 1974, 49-33851[U]

Int. Cl.² F16F *15/26, 15/28*

U.S. Cl. 74—604 **7 Claims**



1. A piston-crank mechanism for an internal combustion engine, which comprises a piston, a crankshaft having a crank pin, a connecting rod for connecting the piston with said crank pin, an externally toothed gear disposed in side-by-side relationship with respect to the connecting rod and supported for rotation on a pin member extending axially from the crank pin, an internally toothed stationary gear having a number of teeth twice that of the external gear and meshing with the external gear, a pair of rotating balance weights provided on the external gear at the opposite sides thereof in such a manner that they will be in the lower position when the crank pin is in the top dead center, each of said rotating balance weights having substantially the same configuration and mass so that the center of gravity of said weights will lie in the plane of the external gear and thus prevent twisting moment about the support for the external gear, and revolving balance weight means provided on the crank shaft on the side opposite to the crank pin.

4,004,470

DRILLING APPARATUS FOR DRILLING SMALL DIAMETER BORE HOLES DEEP INTO THE EARTH

Theodore B. Houck, Tulsa, Okla., assignor to Parker Drilling Company, Inc., Tulsa, Okla.

Continuation of Ser. No. 445,131, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 344,090, April 23, 1973, Pat. No. 3,933,059, which is a division of Ser. No. 194,182, Nov. 1, 1971, Pat. No. 3,767,329. This application Sept. 15, 1975, Ser. No. 613,773

Int. Cl.² F16H *37/06*

U.S. Cl. 74—661 **2 Claims**

1. Apparatus for powering a drilling rig comprising:

a draw works;

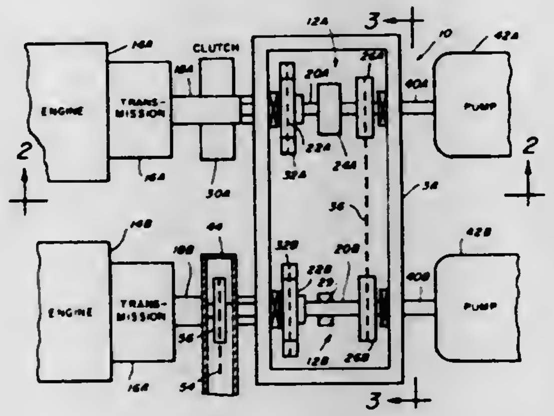
a first engine having a transmission with a first engine drive shaft;

a second engine having a transmission with a second engine drive shaft;

a draw works drive sprocket on said second engine drive shaft and means to rotatably connect said draw works drive sprocket to said draw works;

a first input shaft detachably connected to said first engine drive shaft;

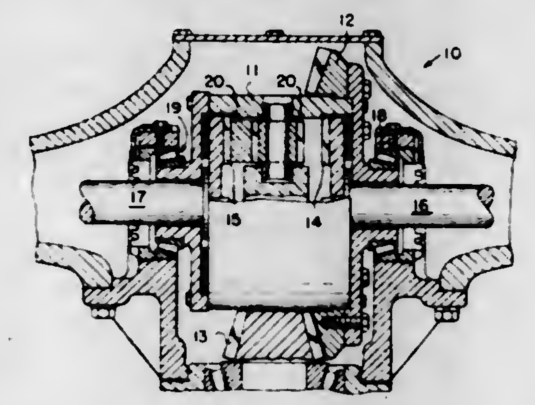
- a second input shaft detachably connected to said second engine drive shaft;
- a pump drive sprocket and a shaft coupling sprocket in tandem on said first input shaft;
- a coupling clutch in said first input shaft between said first pump drive sprocket and said shaft coupling sprocket, the clutch having an engaged position and a disengaging position;
- a pump drive sprocket and a shaft coupling sprocket in tandem on said second input shaft;
- a first pump having a pump drive shaft and a sprocket thereon;
- a second pump having a pump drive shaft and a sprocket thereon;



- a chain coupling said pump drive sprocket on said first input shaft with said first pump shaft sprocket;
- a chain coupling said pump drive sprocket on said second input shaft with said second pump shaft sprocket; and
- a chain connecting said shaft coupling sprockets of said first and second input shafts;
- said input shafts, said pump and coupling sprockets thereon, said coupling clutch, said pump drive shafts and sprockets thereon, and said chains being housed together in a power unit for transportation separate from said engines, pumps and draw works and whereby said draw works may be powered by said second engine alone when said coupling clutch is disengaged or by said first and second engines together when said coupling clutch is engaged.

4,004,471
DIFFERENTIAL WITH SPHERICAL BEARING SUPPORTED PINIONS

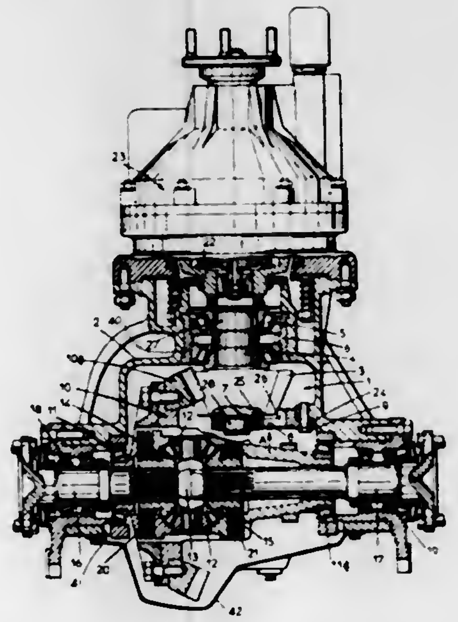
Frank E. Keske, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 28, 1975, Ser. No. 563,270
Int. Cl.² F16H *1/42, 1/44*
U.S. Cl. 74—714 **6 Claims**



1. In a differential of the type comprising a pair of opposed face gears, a rotatable carrier disposed between said face gears and a plurality of pinion gear means rotatably mounted on said carrier with at least some of said pinion gear means meshing with said face gears for differentially permitting one face gear to rotate faster than the other face gear, the invention wherein each of said pinion gear means is mounted on a separate shaft having each end thereof rotatably mounted on said carrier by a spherical bearing means for providing a crowned bearing surface area contact therein upon imposition of loads thereon during operation of said differential.

4,004,472
VEHICLE DIFFERENTIAL UNITS

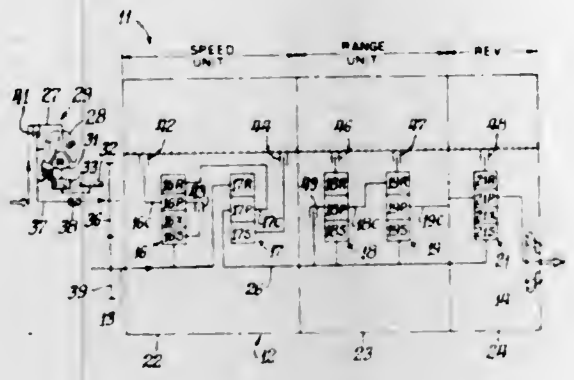
Thomas Hughes Millward, Sutton Coldfield; Terence Leslie Eustace, Birmingham, and Barrie Arthur Thompson, Aldridge, near Walsall, all of England, assignors to GKN Transmissions Limited, Birmingham, England
Filed Jan. 8, 1974, Ser. No. 431,790
Claims priority, application United Kingdom, June 23, 1973, 29928/73
Int. Cl.² F16H *1/40*
U.S. Cl. 74—713 **12 Claims**



1. A vehicle differential unit comprising a housing, first and second apertures in the housing, the second aperture being larger than the first aperture, an abutment surface on the housing located between said apertures and facing said second aperture; a removable cover for the second aperture; differential gearing in the housing and including a drive pinion mounted on a pinion shaft and spaced from the ends thereof so that the pinion is located between first and second end portions of the shaft, a crown wheel meshing with the drive pinion, a cage secured to the crown wheel, bevel pinions carried by the cage and output bevel gears meshing with the bevel pinions; an outer bearing assembly in said first aperture and in which the first end portion of the pinion shaft is supported, the first aperture being of insufficient size to allow the drive pinion to pass therethrough so that the first end portion of the shaft can only be mounted in said outer bearing by inserting the pinion and shaft into the housing through the second aperture which is of a size sufficient to pass the drive pinion; an inner bearing assembly for the second end portion of the shaft; a bearing support separate from the housing and having an aperture which receives said inner bearing assembly and an abutment surface facing said first aperture and engaged with said abutment surface on the housing, said engaged abutment surfaces being located in an arc around the rotary axis of the drive pinion shaft; releasable means securing the bearing support to the housing with said abutment surfaces in engagement so that the bearing support can be inserted into the housing through the second aperture and, after the first end portion of the pinion shaft has been received in the outer bearing assembly, the inner bearing assembly can be located on the second end portion of the shaft and the releasable means then engaged to secure the bearing support to the housing.

4,004,473
BROAD RANGE FLUID AND MECHANICAL POWER TRANSMISSION FOR VEHICLES OR THE LIKE

Shairyl I. Pearce, East Peoria; Gerald B. Ireland, Morton, and Willis E. Windish, Pekin, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 29, 1973, Ser. No. 420,063
Int. Cl.² F16H *57/10, 47/00*
U.S. Cl. 74—759 **1 Claim**

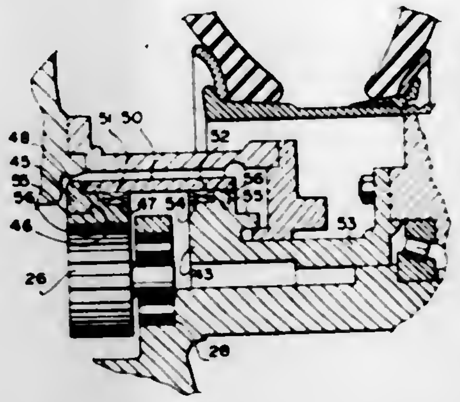


1. A transmission for connection between an engine and mechanism driven thereby comprising:

- a transmission housing,
- an input shaft, a mainshaft and an output element,
- a torque converter having a pump element with means for receiving drive from said engine and having a turbine element coupled to said input shaft, and lock-out means for selectively locking said means for receiving drive from said engine to said means for driving said input shaft to bypass said torque converter,
- a range unit planetary gearing means connected between said mainshaft and said output element and having first and second planetary gearsets and first and second brake means and a first clutch means for conditioning said gearsets to provide any selected one of a plurality of drive ratios between said mainshaft and said output element, and
- a speed unit planetary gearing means connected between said input shaft and said mainshaft and having a third planetary gearset which has a ring gear coupled to said input shaft for rotation therewith and a sun gear and at least one planet gear supported on a carrier which is coupled to said mainshaft for rotation therewith and a third brake means for selectively locking said sun gear against rotation, said speed unit planetary gearing means further having a fourth planetary gearset with a sun gear coupled to said input shaft for snychronous rotation with said input shaft and with said ring gear of said third planetary gearset, and a ring gear coupled to said carrier of said third planetary gearset to rotate synchronously therewith, and at least one secondary planet gear engaged with said sun gear of said fourth planetary gearset and at least one primary planet gear engaged with said secondary planet gear and also being engaged with said ring gear thereof, a fourth planetary gearset carrier supporting said primary and secondary planet gears, fourth brake means coupled between said fourth planetary gearset carrier and said housing for selectively locking said primary and secondary planet gears against orbital motion around said sun gear of said fourth planetary gearset, and second clutch means for locking up said speed unit planetary gearing means to cause said input shaft and said mainshaft to turn in synchronism, said second clutch means being coupled between said carrier and sun gear of said fourth planetary gearset.

4,004,474
TORQUE TRANSMITTING ASSEMBLY

Stanley H. Moore, Coquitlam, Canada, assignor to Wescan Mining Trucks & Equipment Ltd., Vancouver, Canada
Filed Jan. 6, 1975, Ser. No. 538,775
Claims priority, application Canada, Oct. 1, 1974, 210513
Int. Cl.² F16H *1/28*
U.S. Cl. 74—801 **18 Claims**



1. A torque transmitting assembly for a wheel drive train comprising a rotatable internal gear member having internal gear teeth and first annular gear means located radially outwardly from said internal gear teeth, said gear member adapted to engage driving gear means mounted within said gear member; a first cylindrical torque transmitting torsional member adapted to be rotated by said gear member, having primary annular gear means disposed about the interior of said first torsional member located substantially at one end thereof and adapted to engage said first gear means, and having secondary annular gear means disposed about the interior of said first torsional member, located substantially at the other end thereof, and axially spaced from said primary gear means; a second generally cylindrical torque transmitting torsional member having second annular gear means at only one end thereof in mating engagement with said secondary gear means, said second torsional member being rigidly connected at the other end thereof to a hub of a wheel, said second annular gear means being arranged on an outer surface of said second torsional member, an open annular space formed between the ends of said first torsional member, bearing means to support said driving means at one side thereof being disposed in said space, and whereby in operation, driving torque is transmitted from said driving gear means to said second torsional member via said first and primary gear means, said first torsional member, and said secondary and second gear means, said driving torque causing said second torsional member to rotate and thereby drive said wheel.

4,004,475
PORTABLE WRENCH FOR ROTARY MEMBERS

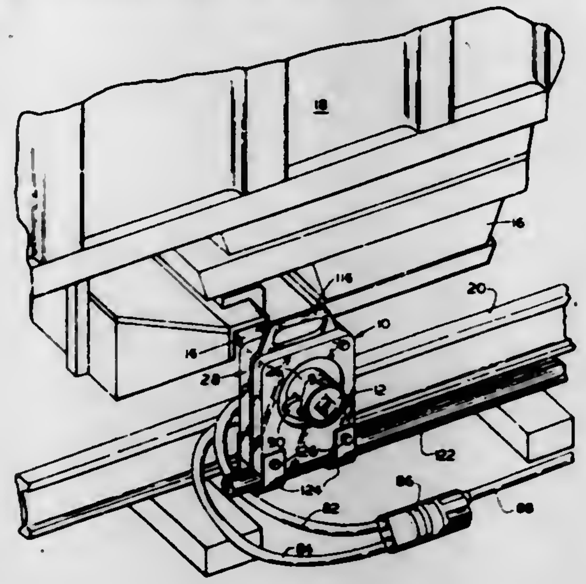
Hugh H. Pase, Cheshire, Conn., assignor to Mimco Incorporated, Cheshire, Conn.
Continuation of Ser. No. 447,007, Feb. 28, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 603,161
Int. Cl.² B25B *17/00*
U.S. Cl. 81—57.14 **12 Claims**

1. A portable high-torque wrench for rotating a cylindrical capstan having a transverse hole in the periphery thereof by which to rotate it, said wrench comprising in combination

- a frame having a central opening therein,
- a cylindrically hollow hub rotatably supported within the central opening of said frame and open at least at one end to receive and completely surround said capstan substantially within a plane of rotation disposed perpendicular to said capstan,

means for rotating said hub and

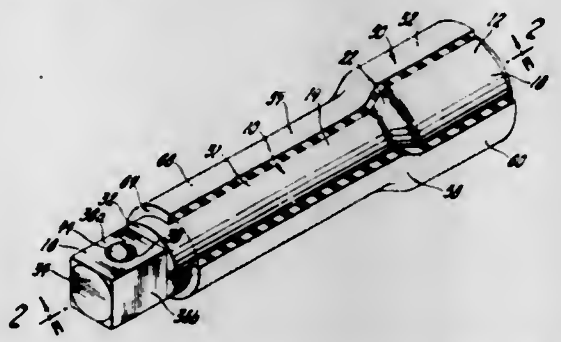
a locking dog mounted on said hub substantially in said plane of rotation and having a portion slidably movable radially into and out of said hole in said capstan for driving engagement therewith.



4,004,476
SOCKET WRENCH EXTENSION GRIP

Kenneth L. DeVrou, 1898 Newcastle Drive, Jenison, Mich. 49428

Filed July 21, 1975, Ser. No. 597,833
Int. Cl.² B25B *23/00*
U.S. Cl. 81—177 A **2 Claims**



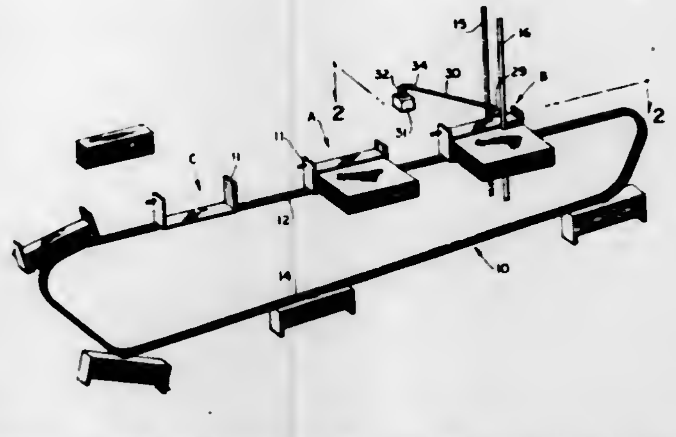
1. In combination, a socket wrench extension having a drive receiving first end portion, a shank portion, and a socket mounting second end portion and a hand grip for assisting direct manual grasping and turning of the socket wrench extension, said hand grip being tightly positioned upon said drive receiving first end portion and said shank portion of said socket wrench extension whereby said socket wrench extension can be directly manually grasped by said hand grip and manually turned.

4,004,477
FABRIC CUTTING APPARATUS

William O. Mitchell, and Billy R. Moore, both of Vidalia, Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Filed June 2, 1975, Ser. No. 582,723
Int. Cl.² B26D *1/52*
U.S. Cl. 83—23 **13 Claims**

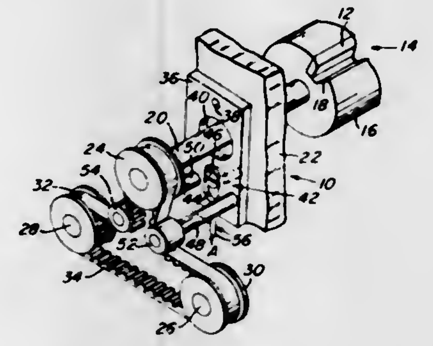
1. Apparatus for cutting a stack of pattern pieces or the like comprising a pair of band knives having a vertical portion, said vertical portions of said pair of band knives being parallel to each other and spaced apart a distance equal to the width to which the pattern pieces are to be cut, conveying means extending between said pair of band knives, at least one clamp member carried by said conveying means, said clamp member being adapted to receive a stack of fabric and including a base plate for receiving said stack of fabric, a hold-down plate removably connectable to said base plate for holding a stack of fabric on said base plate, said hold-down plate and clamp member being of a width that will pass between said pair of band knives.



4,004,478
APPARATUS FOR ADJUSTING THE POSITION OF A ROTATABLE CUTTER MECHANISM

Gaylard M. Morgan, Saxton, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Jan. 20, 1976, Ser. No. 650,630
Int. Cl.² B26D *1/56*
U.S. Cl. 83—331 **9 Claims**

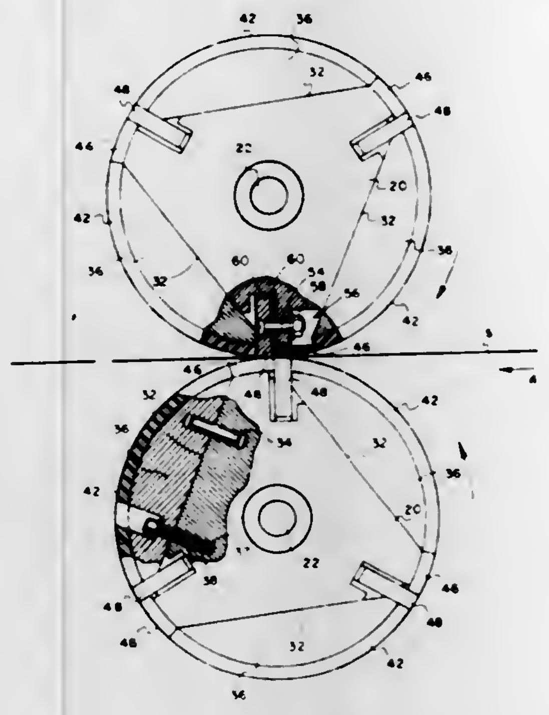


1. Apparatus for adjusting the position of a rotatable cutter mechanism comprising,
- a frame member,
- a cutter shaft rotatably supported in said frame member,
- a driven pulley nonrotatably connected to one end portion of said cutter shaft,
- a plate member pivotally connected to said frame member and having an aperture through which said cutter shaft extends,
- said plate member having a slot therein,
- a cam member eccentrically mounted for rotation on said frame member,
- said cam member positioned in said slot of said plate member and secured thereto,
- said cam member arranged to rotate in a preselected direction through a preselected angle on said frame member and thereby pivot said plate member on said frame member in a corresponding direction and through a corresponding angle,
- drive means drivingly connected to said driven pulley for rotating said driven pulley at a preselected speed, and
- rotatable means secured to said plate member and engaged to said drive means for turning said drive means upon pivotal movement of said plate member to rotate said driven pulley through a preselected angle and thereby adjust the angular position of said cutter shaft relative to the moving web.

4,004,479
SCRAP CHOPPER

Ernest Robert Bodnar, 29 Blackdown Crescent, Islington (Toronto), Ontario, Canada

Filed Feb. 5, 1975, Ser. No. 547,365
Int. Cl.² B23D *25/12*
U.S. Cl. 83—345 **5 Claims**

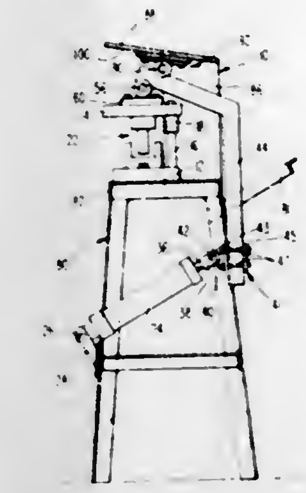


1. A rotary chopper for strip sheet material, for chopping the strip thereof into shorter lengths, said chopper comprising;
- upper and lower shaft members;
- mounting means for supporting said upper and lower shaft members parallel with one another, and drive means for driving the same in unison in opposite directions;
- a roll core member mounted on each said shaft member each said core member being of generally triangular shape in section, having three generally flat segment mounting surfaces, and three tread mounting corners;
- a blade mounting surface formed at each said corner, being oriented to lie in a predetermined plane, the planes of the three said blade mounting surfaces intersecting at about the center of said triangular shape of said core member;
- a chopper blade mounted on each said blade mounting surface, with an edge portion thereof extending outwardly beyond said tread mounting surface of said core member;
- resilient tread means mounted on each of said corners, adjacent said projecting edge portion of said blade member;
- three roll segment portions for each said core member each having generally flat interior mounting surfaces, and generally semi-cyindrical exterior tread mounting surfaces, attachment means for attaching a said segment portion on a said generally flattened surface of a said core member;
- resilient tread means attached over said semi-cylindrical tread mounting surface of each said segment portion, said resilient tread portions on said segment portions being of the same thickness, and radius of curvature as the tread portions on said corners, whereby to define a cylindrical resilient tread surface, with said edge portions of said blade members lying on the periphery of said cylindrical surface, and
- said tread portions being resilient and deflectible, in response to pressure from a blade member of an adjacent core, whereby to permit an overlapping shearing action to take place between said blade members on adjacent said core members, whereby said resilient tread portions will provide a constant frictional gripping action on said strip during chopping.

4,004,480
PRESS

Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901

Filed Jan. 21, 1976, Ser. No. 650,926
Int. Cl.² B26D *5/12*
U.S. Cl. 83—530 **13 Claims**

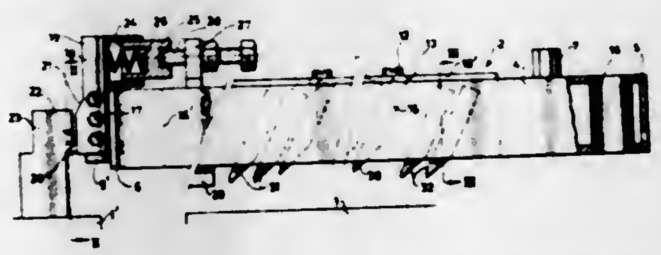


1. In a press having a fixed portion, a movable portion which moves along a preselected path of travel with respect to said fixed portion, and actuating means for transmitting force to said movable portion, an improved force amplification means comprising:
- a. lever means pivotally attached to said movable portion;
- b. fulcrum bearing surface means connected to said lever means for movement therewith; and
- c. fulcrum bearing means for engaging said bearing surface means, said fulcrum bearing means comprising:
  - i. fulcrum cradle means for allowing said bearing surface means to rotate, and
  - ii. fulcrum bearing track means for allowing said bearing surface to reciprocate along an axis which intersects said preselected path of travel.

4,004,481
DEVICE FOR MAKING A PERFORATION IN FILM MATERIAL

Paul Christian Herman van den Beld, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed June 24, 1975, Ser. No. 589,684
Claims priority, application Netherlands, June 26, 1974, 7408625
Int. Cl.² B26D *5/08*
U.S. Cl. 83—555 **6 Claims**



1. Apparatus for perforating film material such as plastic film material comprising a beam, a plurality of perforating blades having a saw-tooth shape supported on said beam, table means arranged in confronting relation to said blades for supporting the material to be perforated, means for vertically reciprocating said beam between a first operative position adjacent said table means and a second operative position spaced from said table means, suction means associated with said beam and vertically movable therewith for releasably holding at least a top layer of the material to be perforated in engagement with said blades during reciprocation of said

beam from said first to said second operative position, and means for longitudinally moving said blades relatively of said suction means and the material to be perforated during reciprocation of said beam from said first to said second operative position.

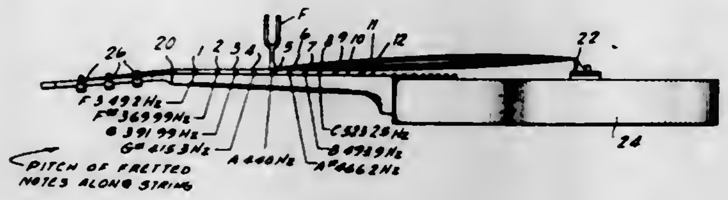
4,004,482
METHOD OF TUNING FRETTED INSTRUMENTS

Jeffery L. Yates, 3304 Owl Drive, Rolling Meadows, Ill. 60008

Filed Sept. 25, 1975, Ser. No. 616,851

Int. Cl.² G10G *7/02*

U.S. Cl. 84—455 **6 Claims**



1. A method of tuning a fretted string instrument, such, for example, as a guitar comprising the following steps:

placing the end of a vibrating tuning fork of predetermined pitch in contact with a string to be tuned;

sliding the vibrating tuning fork along the string until the pitch of the vibrating tuning fork becomes audible;

adjusting the tension of the string being tuned until the pitch of the tuning fork becomes audible at the coincident point, that is, the point at which sympathetic resonance takes place when the string being tuned is at its proper pitch.

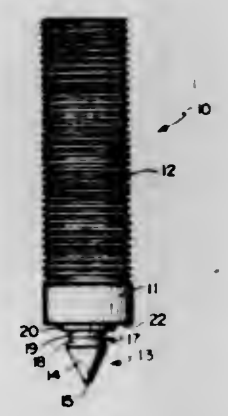
4,004,483
FASTENER FOR ATTACHMENT TO METALLIC STRUCTURES

Robert L. Hallock, 7136 NE. 8th Drive, Boca Raton, Fla. 33432

Filed Jan. 12, 1976, Ser. No. 648,212

Int. Cl.² F16B *15/00, 39/00*

U.S. Cl. 85—10 E **3 Claims**



1. A fastener having a penetrating portion for driving into metallic structures comprising a shank, a hardened penetrating portion at one end of said shank, said penetrating portion including a substantially frusto-conical tip having a penetrating point at one end and a predetermined diameter at the opposite end, a reduced neck formed at said opposite end of said tip defining an annular groove having a cross-sectional width substantially greater than the depth, the opposed ends of said neck being of substantially the same diameter, an enlargement connected to said neck and defining a first substantially radial shoulder extending outwardly therefrom for engaging the metallic structure and causing the metal thereof to flow into said annular groove and form a mechanical lock, said enlargement terminating in a second substantially radial shoulder of greater diameter than said first shoulder at said one end of said shank to stop penetration of said penetrating portion into the metallic structure, said enlargement being of a volume at least as great as and approximating the volume of said annular groove to cause the flowing metal to fill said annular groove as said second shoulder stops penetration of said penetrating portion, whereby the penetrating portion of said fastener may be driven into the metallic structure and said first shoulder causes the metal of the metallic structure to flow into the area adjacent to said neck and form a mechanical lock therewith and said second shoulder stops penetration of said penetrating portion into the metallic structure.

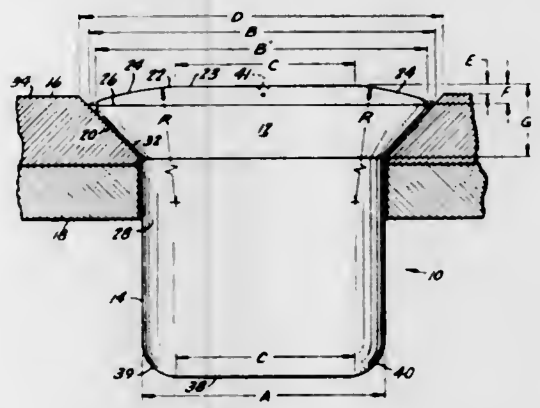
4,004,484
CROWNED FLUSH HEAD RIVET

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 475,793, June 3, 1974, Pat. No. 3,927,458, which is a continuation-in-part of Ser. No. 291,669, Sept. 25, 1972. This application Sept. 8, 1975, Ser. No. 611,023

Int. Cl.² F16B *19/04*

U.S. Cl. 85—37 **4 Claims**



1. A rivet constructed from a material which coldflows when the rivet is driven having a shank portion of a constant diameter and a connected head portion having a frusto-conical undersurface which is flared uniformly outwardly from said shank, an upper surface which is a minor portion of a filled torus in shape so that said upper surface has a central planar portion with a concentric curved portion thereabout, and an outer edge including a cylindrical portion adjacent said concentric curved portion and a radiused portion adjacent said frusto-conical undersurface, said shank portion having a constant diameter throughout a major portion of its length.

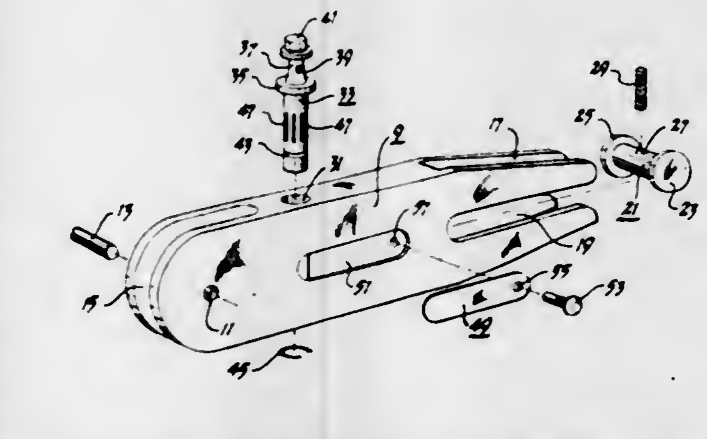
4,004,485
MECHANISM FOR ADJUSTING TENSION OF AN ELONGATED FILAMENT

Rolly R. Hiscott, Costa Mesa, Calif., assignor to Ernie Ball, Inc., Newport Beach, Calif.

Filed Aug. 11, 1975, Ser. No. 603,261

Int. Cl.² G10C *3/10*; **G10D** *3/14*

U.S. Cl. 84—207 **5 Claims**



1. A device for adjusting tension of an elongated filament of which one end thereof is coupled to a supporting structure comprising:

a lever having an opening through one end thereof adapted to be receive and rotate about a pivot shaft fixedly attached to the supporting structure adjacent the other end of the elongated filament, said lever arm having a cylindrical hole therethrough adapted to receive a tuning peg and having a recess adjacent to and intersecting said cylindrical hole;

a tuning peg having ratchet notches spaced longitudinally therearound and being rotatably mounted in said cylindrical hole in said lever arm, said tuning peg being adapted to engage and adjustably wind the other end of the elongated filament therearound as said tuning peg is rotated;

a flat spring member attached to said lever arm and extending into said recess to contact and engage said ratchet notches of said tuning peg to allow said tuning peg to rotate in one direction and to prevent the elongated filament from unwinding therefrom, whereby the tension of the elongated filament may be coarsely adjusted by rotating said tuning peg; and

adjusting means attached to the supporting structure and engaging the other end of said lever arm for rotatably position said lever arm with respect to the supporting structure to finely adjust the tension of the elongated filament.

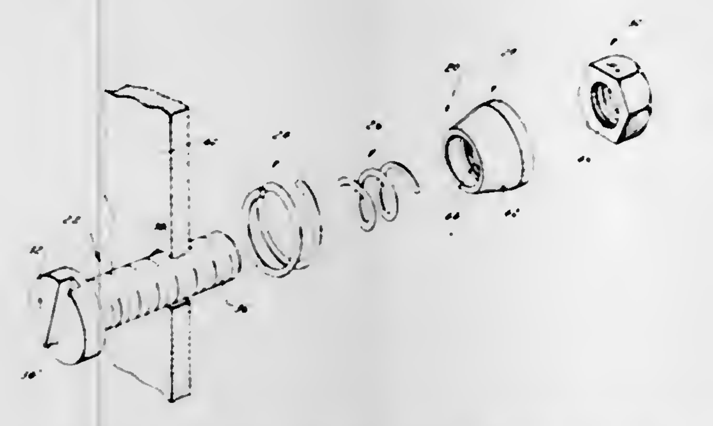
4,004,486
QUICK RELEASE FASTENER

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Dec. 8, 1975, Ser. No. 639,004

Int. Cl.² F16B *13/04*

U.S. Cl. 85—64 **6 Claims**



1. A fastener assembly for use in the blind fastening together of first and second parts having aligned apertures extending therethrough with the aperture in the second part being larger than the aperture in the first part, said fastener assembly comprising:

a stud member having a head and a relatively reduced threaded shank adapted to be projected through said aligned apertures with the head being positioned on the outer side of first part and being larger than the aperture therein;

a nut having a threaded aperture therethrough for interengagement with the threaded shank to permit relative rotation therebetween, the nut having a nose portion on its outer surface tapered toward the first part, and the nut having a smaller outer diameter than the aperture in the second part so that it can be projected therethrough with the nut located on the opposite side of the second part from the first part;

a first helical spring having a normal outer diameter larger than the aperture in the first part and smaller than the aperture in the second part assembled around said stud in engagement with the nut and the spring being expandible to have a larger outer diameter than the diameter of the aperture in the second part, the first helical spring being wound in a first direction;

a surface on the end portion of the nut facing the first and second parts adapted to receive one end of a second helical spring, the other end of the second helical spring bearing against the first part, the second spring being assembled around said stud and under compression when the fastener assembly is inserted into the first part so as to exert a constant axial force on the nut to facilitate rotation of the threaded stud with respect to the nut, the second helical spring being wound in a second direction and being wound with end projections so that the ends can bite into both the nut and the first part to facilitate prevention of rotation of the nut when the stud is rotated, the second helical spring being formed with respect to the first helical spring so that relative rotation between the nut and shank to compress the springs will place a greater load on the second helical spring than the first helical spring to further facilitate retention of the nut against rotation when the stud is rotated;

the first and second springs biasing the nut in a direction away from the first and second parts so that when the assembled shank portion of the stud and the spring and nut are inserted through the aperture in the second part with the springs extending under partial compression between the first part and the nut is restrained from rotation by the combined biasing forces of the springs, it will move axially toward the head of the stud to expand the first helical spring into engagement with the second part and retain the second part in fixed relationship with respect to the first part.

4,004,487
MISSILE FIRE-CONTROL SYSTEM AND METHOD

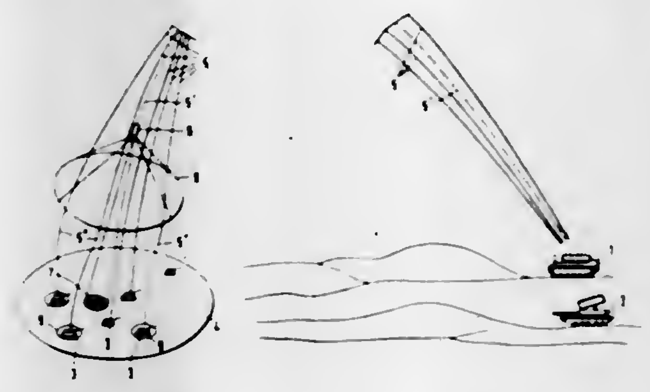
Kurt Eichweber, Holsteiner Chaussee 73-81, 2 Hamburg 61, Germany

Filed Mar. 6, 1975, Ser. No. 555,940

Claims priority, application Germany, Mar. 12, 1974, 2411790

Int. Cl.² F41F *3/04*

U.S. Cl. 89—1.815 **25 Claims**

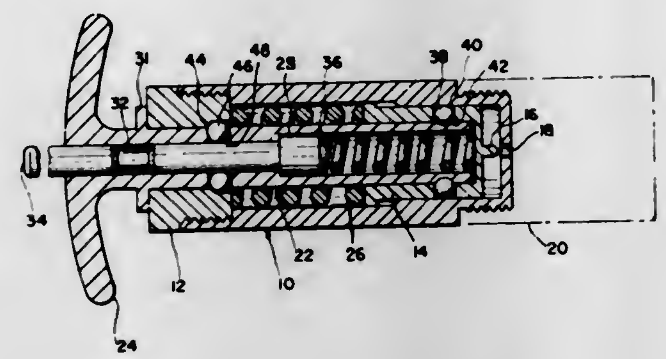


1. A method of firing a combat projectile to a selected surface target comprising the steps of aiming and firing, from a launching station, a first pilot projectile into a first preset ballistic flight trajectory providing a steep descent of the pilot projectile to prospectively impact the area of a surface target, transmitting a picture of the surface target area, including the surface target and its position relative to the prospective point of impact of the pilot projectile, to a fire-control station from the pilot projectile during its descent, displaying the transmitted picture of the surface target area, including the surface target and its said position relative to said prospective impact point, at the fire-control station, and aiming a second combat projectile at the launching station into a desired second preset ballistic flight trajectory to hit the surface target in accordance with the flight trajectory of the pilot projectile and the relative position of the surface target to said prospective impact point in the target area picture displayed at the fire-control station, and firing the aimed combat projectile.

4,004,488
DUAL-MOTION FIRING DEVICE

George B. Williams, King George County, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1975, Ser. No. 563,994
Int. Cl.² F41F *13/04*
U.S. Cl. 89—27 A **7 Claims**



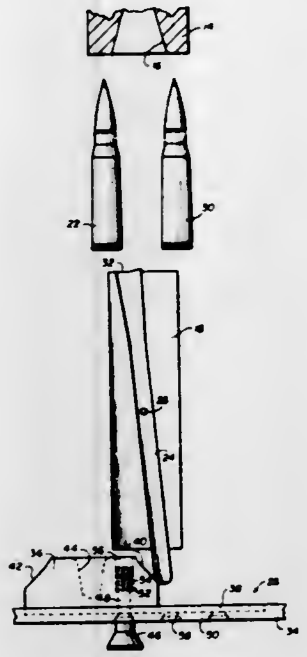
1. A dual-motion firing device comprising:
a housing having front and rear portions;
a firing mechanism substantially internal to said housing means, said firing mechanism including a sear slidable in and extending out of said housing at its rear end portion, a firing pin within said housing that slidably engages an end portion of said sear, means non-permanently locking said firing pin to said sear, and resilient means for propelling said firing pin forward when said firing pin is unlocked from said sear by movement of said sear toward said rear portion of said housing;
an arming mechanism comprising means non-permanently locking said sear to said housing means, and an arming pin slidable within said sear having an arming pin resilient means adjacent its forward end portion and extending out of said sear at its rear end portion, said arming pin being formed with means for unlocking said sear from said housing when said arming pin is moved toward said firing pin to compress said arming pin resilient means;
whereby force on the arming pin moves it into said housing causing said sear to be permanently unlocked from said housing means by interaction of the arming pin resilient means and said means for unlocking said sear, and thereafter applying a pulling force on said sear to move it out of said housing causing said firing pin to move with said sear a predetermined distance at which unlocking of said firing pin from said sear occurs and said firing pin is propelled forward by said propelling means.

4,004,489
DUAL SELECTIVE FEED MECHANISM FOR AUTOMATIC WEAPONS

Curtis D. Johnson, and Fred J. Skahill, both of Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 3, 1975, Ser. No. 628,032
Int. Cl.² F41D *9/02*
U.S. Cl. 89—33 SF **10 Claims**

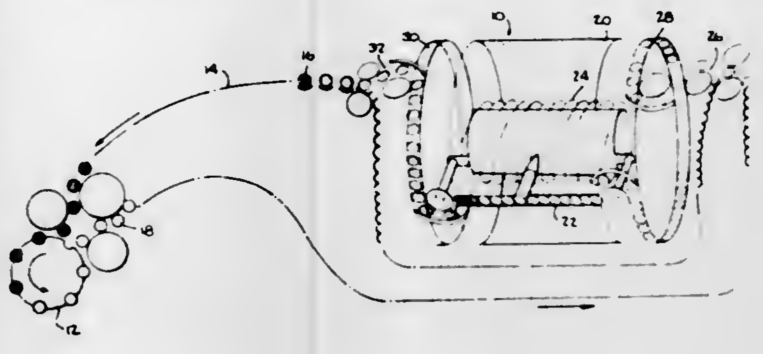
1. A dual selective feed mechanism for placing cartridges from a pair of ammunition belts into ready to feed positions and chambering cartridges from a selected belt in one of said positions to a chamber position for firing, said mechanism comprising:
a pair of feed sprocket assemblies for moving cartridges in a pair of belts into ready to feed positions,
a bolt carrier adapted to move forwardly to battery position,
a rammer pivotally mounted on said carrier and adapted to strip and chamber cartridges from either belt as said carrier moves to battery position, and selection means pivotally moving said rammer to strip and chamber cartridges from a selected belt.

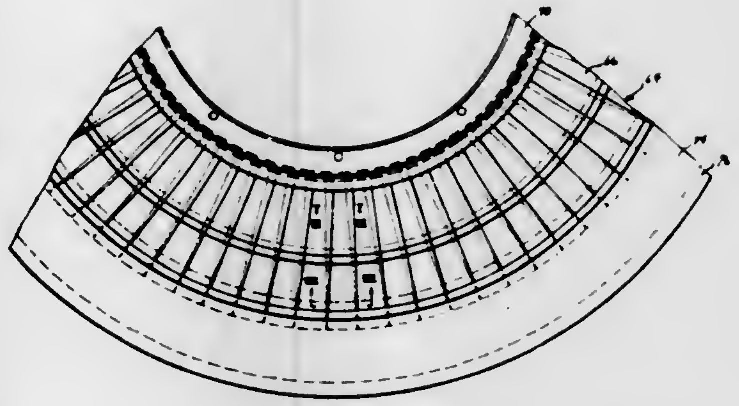


4,004,490
STRUCTURE FOR ARTICLE HANDLING SYSTEMS

Joseph Dix, Williston; Norman Campbell, and Ivar Scott Tonseth, Jr., both of Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Continuation of Ser. No. 352,007, April 17, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,834
Int. Cl.² F41D *9/06*
U.S. Cl. 89—33 D **16 Claims**



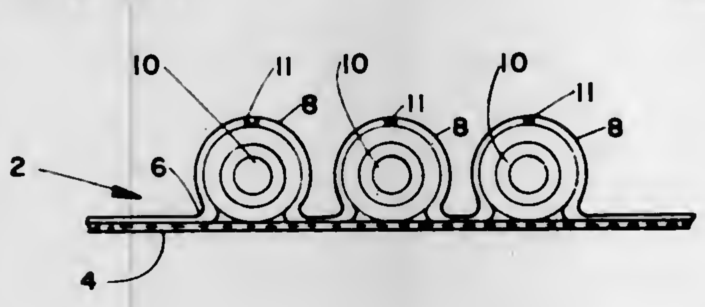


1. An article handling system for rounds of ammunition each having a necked case and a projectile comprising:
an outer drum having a plurality of mutually spaced apart, centripetally directed, longitudinally extending guides, mutually adjacent guides defining respective channels for receiving longitudinally extending rows of rounds;
an inner shaft means having a helical fin comprising an integrally continuous folded plate structure spiraling around said shaft means in a plurality of turns;
channel means spiraling around said shaft means in a plurality of turns coextensively with said fin and fastened to and between said shaft means and said fin;
a frist additional pair of respectively integrally continuous guide rings, one on each side of said fin, each respectively spiraling around said shaft means in a plurality of turns coextensive with said fin and fastened thereto at a radial distance whereat each said first guide ring bears against the neck of the case of each round.

4,004,491
PLASTIC AMMUNITION BELT

Ernest Richard Seeling, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 17, 1975, Ser. No. 614,285
Int. Cl.² F42B *39/08*
U.S. Cl. 89—35 R **3 Claims**

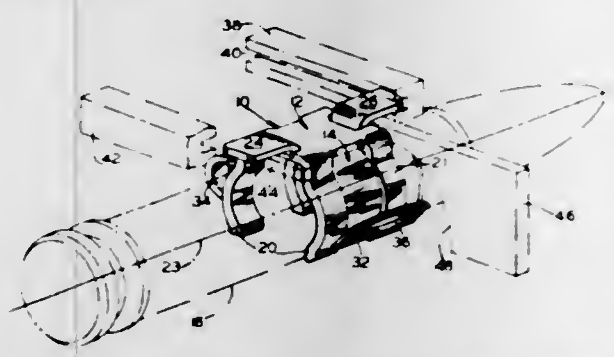


1. A cartridge belt comprising a single lower strip of cord reinforced flexible polyester material, an upper strip of polyethylene vinyl acetate film material of lighter weight than said lower strip, said upper strip being heat sealed to said lower strip in transverse spaced intervals to form a plurality of tubular cartridge receiving pockets on said strip transversely thereof, said pockets being disposed in predetermined spaced apart relation along said strip and adpated to receive cartridges therein, a longitudinal weakened area along each one of said pockets remotely disposed from said lower strip which is responsive to being torn incident to lateral removal of a cartridge therefrom.

4,004,492
DISINTEGRABLE CARTRIDGE LINK

Giulio V. Savioli, Davenport, Iowa, assignor to The United States of America, Washington, D.C.

Filed Sept. 17, 1975, Ser. No. 614,284
Int. Cl.² F42B *39/08*
U.S. Cl. 89—35 A **5 Claims**

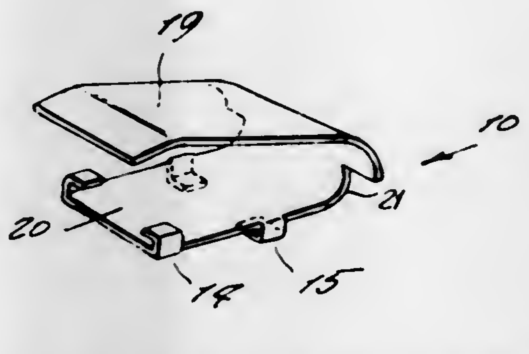


1. An articulated belt for conveying a plurality of elongate objects, said belt including:
a series of links each consisting of a holding element for engaging one of said objects and a tension element for nesting engagement with said holding element,
said holding element having a substantially planar body portion and at least a pair of flexible arcuate arms carried by said body portion on opposite sides thereof for holding engagement with one of said objects and defining therebetween a space for receiving said tension element,
said tension element having oppositely directed tab means formed thereon adapted to engage a pair of spaced-apart guide tracks, and
said tension element further having releasable securing means on either end thereof for securing said tension element to similar tension elements in an adjoining link in force-transmitting relationship so that all such force is transmitted directly through said tension element while all said gripping force is transmitted through said holding element.

4,004,493
BULLET PROOF GARMENT

Vincent Costanza, P. O. Box 294, Norristown, Pa. 19404

Filed Nov. 26, 1974, Ser. No. 517,381
Int. Cl.² F41H *1/02*
U.S. Cl. 89—36 A **4 Claims**

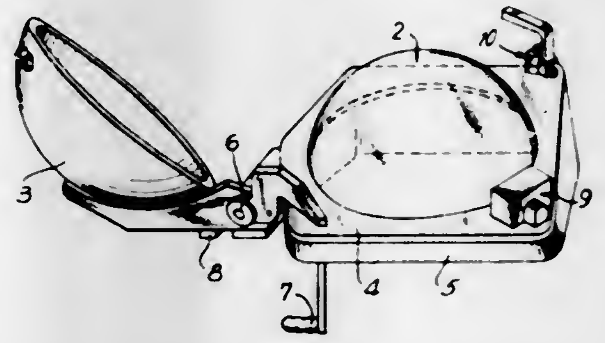


1. An armored layer adapted to be used in a bullet proof garment, said armored layer comprising a plurality of metallic plates assembled in parallel rows, said plates being aligned both vertically and horizontally in said rows, each of said plates comprising an inner panel and an outer panel, said panels being joined by a U-bend, with the outer panel overlying, but being spaced from, said inner panel, each of said U-bends being at one end of said plate, with the other end of said plate being open, with the end of the outer panel being spaced from the adjacent end of the inner panel, and with a pair of adjacent upper and lower plates being nested together, with the U-bend of one being received in the open end of the other, means pivotally linking each pair of adjacent plates in a given row, and means pivotally linking each vertically aligned pair of plates in adjacent rows, whereby the outer panel of a plate serves a spring function that receives the violent impact of a bullet, thereby absorbing the shock and repelling the bullet penetration.

4,004,494
MILITARY OBSERVATION POST

Andre Mechulam, Tarbes; Bruno M. Saintours-Payerne, St Etienne; Guillaume A. Gay-Chatain, St Etienne, and Paul R. Montjallard, St Etienne, all of France, assignors to Etat Francais, Paris, France

Filed Mar. 6, 1974, Ser. No. 448,567
Int. Cl.² F41H *5/22*
U.S. Cl. 89—36 L **13 Claims**



1. An observation post for military equipment comprising a

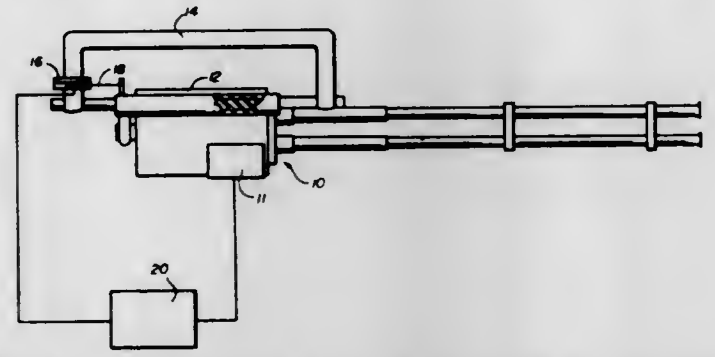
structure having an opening through which at least the head of an observer can pass, and a sealable enclosure for said opening including an inner rigid transparent cap fitted at said opening, a frame carrying said transparent cap, said frame being pivotably mounted on said structure and being sealable thereon so that said opening is covered, an outer armored hatch cover for covering said inner cap, means for selectively opening and closing the outer cover independently of the inner cap, and means supporting said frame of said transparent cap for pivotal movement between open and closed positions independently of said armored cover including a common axle about which said frame of said cap and said armored cover are respectively pivotable.

4,004,495
CONSTANT RECOIL SYSTEM

Warren B. Belfer, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1975, Ser. No. 641,198
Int. Cl.^{2} F41F *19/00*

U.S. Cl. 89—42 B **7 Claims**



1. In a recoil assembly adapted for use with an externally driven automatic weapon system including a gun tube assembly having a stationary mount and a motor for actuating operation of said system, the improvement comprising:

sensor means movable with said gun tube and capable of indicating the displacement of the gun tube in any position of recoil or counterrecoil movement, and

control means operatively responsive to said sensor means for controlling operation of said motor,

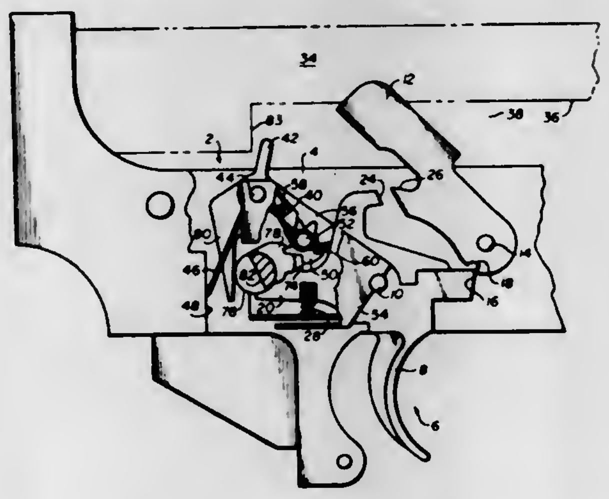
whereby the distance of recoil and counterrecoil travel of said gun tube may be controlled within predetermined limits.

4,004,496
M16A1 BURST CONTROL

Robert E. Snodgrass, Bettendorf, Iowa, and Michael N. Tyler, Illinois City, Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 28, 1976, Ser. No. 691,190
Int. Cl.^{2} F41D *11/10*

U.S. Cl. 89—129 B **11 Claims**



1. In a firearm having a receiver including a receiver housing, a pivotable trigger having a primary sear, a disconnect pivotably carried in the housing by the trigger and having a secondary sear, a pivotable hammer in the housing having primary and secondary sear receiving notches to latch the hammer in a cocked position, means normally biasing said disconnect and the secondary sear to a latching position in said seondary sear notch, and recoiling parts, the improvement comprising a burst control assembly in said housing for automatic firing of a preselected number of shots in a burst, said assembly including:

a burst sear device pivotable between a first inactive position and a second pawl activating position,

means for biasing said burst sear device to said first position,

means carried by said recoiling parts for moving said burst sear device from said first position to said second position during counter-recoil movement of said recoiling parts,

a pawl carried by said burst sear device for pivotable movement therewith as the burst sear device moves between said positions,

a ratchet wheel in said housing in position for rotation thereof by said pawl a predetermined distance from an initial position each time the burst sear device moves from said first position to said second position,

means carried by the rachet wheel for pivoting said disconnect against the bias of said disconnect biasing means to unlatch said secondary sear from said secondary sear notch each time said ratchet wheel is rotated to permit the hammer to move to its firing position, and

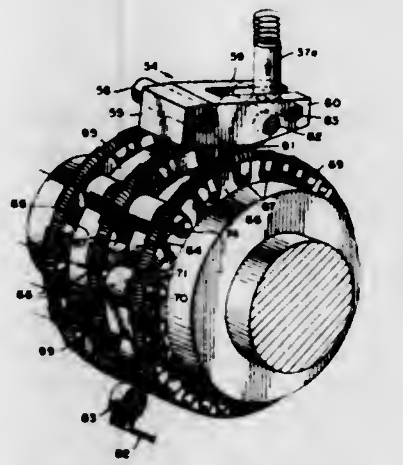
means carried by the wheel for automatically returning the wheel to its initial position each time the trigger is pivoted from a firing position to an inactive position.

4,004,497
AUTOMATIC SYSTEMS PROGRAMMER

Harold W. Scholin, Park Ridge, and Hieronim L. Lisiecki, Chicago, both of Ill., assignors to Scholin Industries, Inc., Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,489
Int. Cl.^{2} F15B *21/02*

U.S. Cl. 91—36 **14 Claims**



1. A systems programmer for automatically controlling a predetermined sequence of operations in a machine, comprising a drum mounted for rotation, a series of annular grooves on said drum having annular flanges therebetween, each of said flanges being formed with an annular groove in the periphery thereof and having a plurality of radially extending recesses therein, a series of actuatable members associated with said drum in spaced relation thereto, and positioned along the length thereof, each said member being operable to cause one of a plurality of operations to be performed when actuated, a plurality of cylindrically shaped actuator pins for said members having axially extending end portions of smaller diameter than the central portion thereof, said end portions being removably received in said recesses on said drum along the length thereof in a predetermined arrangement, each adapted to actuate a selected one of said members during rotation of said drum, an annular yieldable ring member recieved in each of said annular grooves in the periphery of said flanges for retaining said actuators therein, and means to rotate said drum.

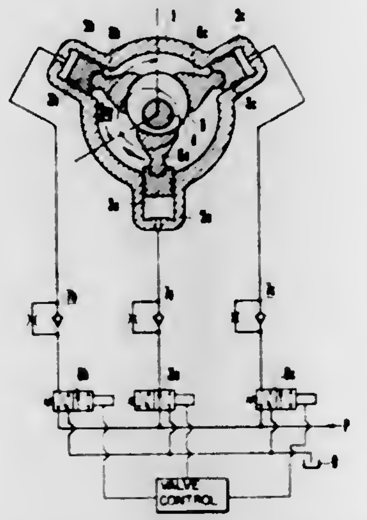
13. A systems programmer for automatically controlling a predetermined sequence of operations in a machine, comprising a drum mounted for rotation, a series of actuatable members associated with said drum in spaced relation thereto, and positioned along the length thereof, each said member being operable to cause one of a plurality of operations to be performed when actuated, a plurality of actuators for said members removably mounted on said drum along the length thereof in a predetermined arrangement, each adapted to actuate a selected one of said members during rotation of said drum, a stepping motor for rotating said drum is a step-by-step movement, a plurality of limit switches mounted in side-by-side relation along the length of said drum, each adapted to initiate a signal when actuated to operate said stepping motor to advance said drum, a second plurality of actuators removably mounted on said drum along the length thereof, each adapted to actuate one of said switches when said drum is stepped, means for pivotally mounting each of said switches for rotation between first position for actuation by one or more of said second plurality of actuators, and a second position away from said second plurality of actuators, and a locking bar operatively associated with said switches to lock a plurality of said switches simultaneously in said first position thereof.

4,004,498
HYDRAULIC MOTOR

Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Sakaki, Japan

Continuation-in-part of Ser. No. 441,919, Feb. 12, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,113
Int. Cl.^{2} F01B *3/10*

U.S. Cl. 91—476 **6 Claims**



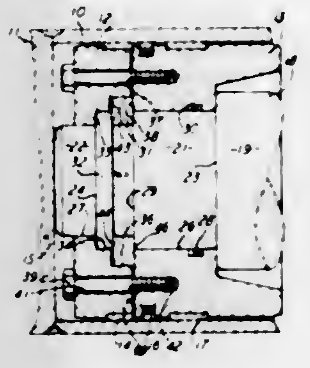
1. A hydraulic motor for intermittently rotating a crank shaft through a certain angle only which comprises a crank shaft; a plurality of hydraulic cylinders having respective pistons which are disposed in radial directions from said crank shaft at regular angular intervals, said pistons being engaged with an eccentric member means formed integrally with said crank shaft; a pressure source of oil with separate oil line means connected to each of said hydraulic cylinders; combined check and choke valve means in each of said separate oil line means wherein each combined valve means comprises a check valve operable to allow said oil from said pressure source of oil to flow in said each separate oil line means towards said each cylinder, said each combined valve means further comprising a choke valve in parallel flow relation to said check valve so as to control the flow of discharged oil in each separate oil line means from said each hydraulic cylinder; wherein said each separate oil line means further comprises an externally operated changeover valve means between said each combined check and choke valve means and said pressure source of oil, means for selectively energizing said externally operated changeover valve means to selectively connect, independently of synchronism with said crank shaft, only one of said hydraulic cylinders to said pressure source of oil while venting the oil lines from said other cylinders to an oil tank; and being characterized in that said selective connection of oil pressure to said one cylinder causes said crank shaft together with said eccentric member to selectively rotate for said certain angle only.

4,004,499
BOLT-ON PISTON ASSEMBLY

Michael J. Beck, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 17, 1975, Ser. No. 614,149
Int. Cl.^{2} F16J *1/12*

U.S. Cl. 92—257 **3 Claims**



1. A bolt-on piston assembly comprising a piston rod having an integral portion projecting radially on said rod, two endlessly circular piston pieces encircling said rod and being disposed on axially opposite sides of said portion and with said pieces each having a surface respectively faced toward said portion to be clamped relative thereto and be axially fixed relative to said rod, said piston pieces each having an outer diameter greater than the outer diameter of said portion to extend radially beyond said portion, said pieces being entirely separated from one another by a space, one of said piston pieces having a section thereof extending axially of said rod and axially over said portion, the surface of said one piston piece being in axial abutment with said portion, the axial length of said section being less than the axial length of said portion for effecting clamping of said pieces onto the projecting said portion and have said pieces without movement axially of and relative to said rod, engagement means interposed between said surface of said other piston piece and said portion, bolts extending into said piston pieces radially beyond said portion for releasably securing said piston pieces on said portion to be axially fixed relative thereto for attaching said piston pieces onto said rod, and a seal member disposed in said space between said piston pieces at the outer diameters of said piston pieces.

4,004,500
PANEL INTERLOCKING METHOD

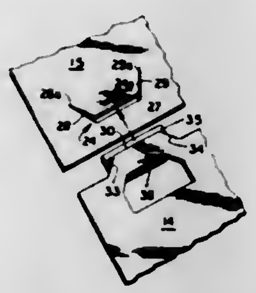
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 528,498, Nov. 29, 1974, Pat. No. 3,963,170. This application Mar. 17, 1976, Ser. No. 667,711
Int. Cl.^{2} B31F *5/02*

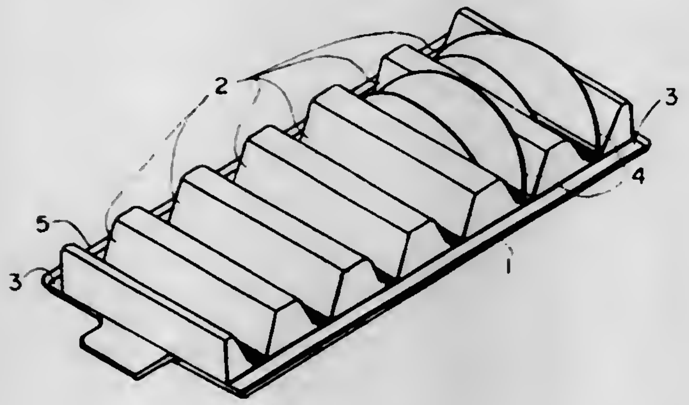
U.S. Cl. 93—1.1 **4 Claims**

1. A method of interlocking portions of a pair of panels one of which incorporates a guide tab defined by a locking slit having a base slit and a pair of spaced locking edges which diverge in a direction away from a portion of one panel and the other panel includes an edge positioning tab and an adja-

cent locking tab having angularly related side edge portions and being hinged to the other panel, the method comprising the steps of swinging said locking tab out of the plane of said other panel through an angle of approximately 180° and into flat face contacting relation with said positioning tab, moving said panels into close generally parallel relation and with said locking and positioning tabs adjacent said locking slit, inserting said positioning tab and said locking tab into said locking slit so that said positioning tab is in face contact with said guide tab, and imparting relative substantially parallel planar movement to the panels such that said locking tab enters said locking slit and swings away from said panels due to its inherent bias to interlock the panels.



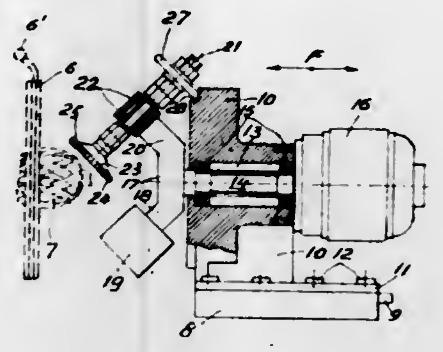
4,004,501
TACO HOLDING TRAY
Lois L. Guerrero, 84 Pukihae St., Bayshore Tower, Hilo, Hawaii 96720
Filed Dec. 29, 1975, Ser. No. 644,945
Int. Cl.^{2} A23P *1/00;* **A47J** *43/20*
U.S. Cl. 99—426 **2 Claims**



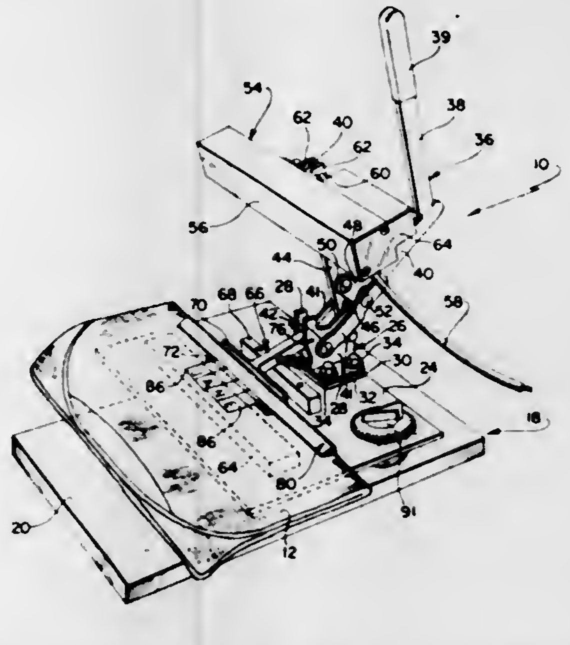
1. A taco holding tray to support "V"-shaped taco shells for filling and serving, comprising a tray having a linear trough for supporting taco shells, the length of which trough is at least as along as the length of the taco shell, said linear trough having a rounded bottom to support the normal bending radius of the formed taco shell and outwardly inclined side walls forming an open "V" of about 30° to 45°, the depth of which trough is such that the side walls will support all but enough of the sides of the taco shell for removal of the taco shell from the trough by the fingers, and an overflow catching means at each end of the trough to catch and hold excess filling material from said taco shells.

4,004,502
ARTICHOKE SHAPING MACHINE
Giordano Tomelleri, 22 Via Montorio, I-37100 Verona, Italy
Filed July 1, 1975, Ser. No. 592,211
Claims priority, application Italy, Oct. 16, 1974, 84941/74
Int. Cl.^{2} A23N *7/00;* **A47J** *17/18;* **A23N** *15/02;* **A47J** *21/00*
U.S. Cl. 99—593 **4 Claims**

1. A rotating shaping machine for shaving the bases of artichoke hearts, comprising support means, a rotatable shaft mounted in said support means, at least one arm member supported on said rotatable shaft, a rotatable knife means having a frustoconical wall diverging towards an artichoke to be prepared and having a circular cutting edge, said knife means being supported on said arm member so that the axis of said shaft is tangential to the cutting edge to impart an ovoidal shape to the bottoms of the artichoke hearts, means for rotating the knife means, means for keeping the artichoke co-axial with said shaft, and means for causing one of the knife means and the artichoke to be mutually displaced towards or away from one another.

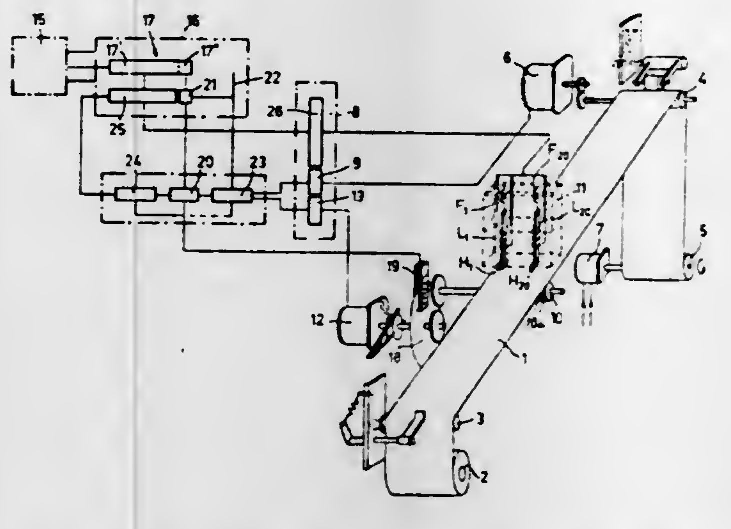


4,004,503
DEVICE FOR IMPRINTING INDICIA ON A FLEXIBLE ARTICLE
James F. Dwyer, 47 Kenyon St., Providence, R.I. 02903
Filed Jan. 3, 1975, Ser. No. 538,421
Int. Cl.^{2} B44B *5/00*
U.S. Cl. 101—9 **8 Claims**



1. A device for imprinting indicia on a flexible article, wherein the indicia is deposited on a plurality of individually preformed flexible strips, a base, a pad mounted on said base for receiving an article thereon, and defining an imprinting station, stop means mounted on said base adjacent to said pad for locating said article in an oriented imprinting position at said imprinting station, a separately formed and manually movable holder, said holder including an elongated member having longitudinally extending opposed jaws between which said flexible strips are retained, said stop means including a shelf on which said holder is removably mounted for locating said holder in adjacent relation to said flexible article and for positioning said flexible strips in overlying oriented relation on said article, a heating member mounted for movement on said base, and means for moving said heating member into positive engagement with the flexible strips and the indicia deposited thereon that overlies said pad at said imprinting station, wherein the indicia is transferred from said flexible strips by heat from said heating member onto said article.

4,004,504
ARRANGEMENT IN A PRINTER
Bengt Oscar Bruno Lundqvist, Bromma, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 340,766, March 13, 1973, abandoned, which is a continuation of Ser. No. 162,982, July 15, 1971, abandoned. This application Feb. 20, 1974, Ser. No. 443,975
Claims priority, application Sweden, July 17, 1970, 9946/70
Int. Cl.^{2} B41J *7/92*
U.S. Cl. 101—93.03 **6 Claims**



1. In a printer of the kind having a type drum with types arranged linewise around a periphery thereof, a rotatable shaft with said drum being mounted thereon, means for rotating the shaft, a number of movable hammers mounted for producing printing by impact of the hammers against the types on the drum, a respective electromagnet associated with each hammer for activating said hammer, position sensing means for producing a signal indicative of the position of the shaft and of a type which is in position for printing, said types being divisible into a plurality of categories, each category requiring a different hammer impact force for even printing, means for indicating which category the type in position for printing is in, and a memory device for storing information for selecting a type to be printed and electromagnets to be excited, the improvement comprising means for selectively exciting said electromagnets in response to information stored in the memory device, said exciting means including a source of constant current for exciting said electromagnets, and time determining means responsive to said indicating means for varying the excitation time duration of said electromagnets according to the required hammer impact force of the indicated category, said excitation time duration being less than the time required for a hammer to impact against said drum.

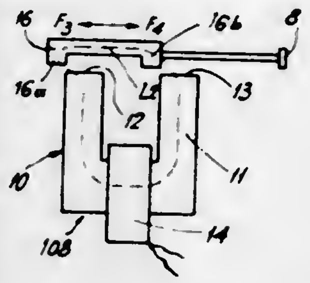
4,004,505
ELECTROMAGNETIC STRIKER MECHANISM FOR A PRINTER
Jean Georges Magnenet, Belfort, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France
Filed Nov. 5, 1974, Ser. No. 521,023
Claims priority, application France, Nov. 6, 1973, 73.39409
Int. Cl.^{2} B41J *9/02*
U.S. Cl. 101—93.48 **12 Claims**

1. An electromagnetic striker apparatus for a printer having a type carrier movable before a print support for effecting a print out of the character upon excitation of the striker comprising, in combination:

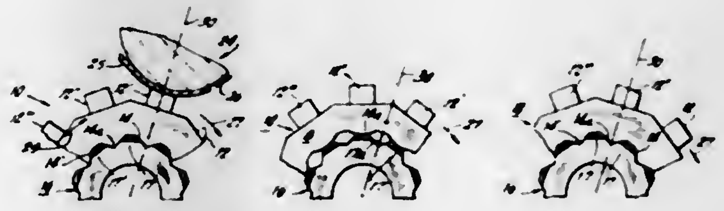
a magnetic circuit including,

magnetic core means having an electrically excitable coil supported thereon and spaced apart pole pieces having pole faces disposed in a first plane, an armature member supported on said core and having a surface disposed in a second plane parallel to said first plane, a hammer affixed to said armature member, and an air gap of constant dimension being defined between the first plane and the second plane, said armature being disposed adjacent said spaced apart pole faces,

said armature member being movable with said surface remaining in said second plane from a rest position to a strike position upon excitation of said coil whereby said hammer is caused to strike the type carrier which, in turn engages the print support in response to said armature in said strike position, means for biasing said armature member in the rest position upon removal of excitation from said coil, said magnetic circuit having a first predetermined reluctance in said rest position and a second predetermined reluctance less than said first predetermined reluctance in said strike position, whereby upon movement of said armature member from said rest position to said strike position the reluctance of said magnetic circuit is substantially reduced whenever said coil is excited without changing the dimension of the air gaps defined by said planes.



4,004,506
ENDORSER DRUM HAVING INDEXABLE SELF-ALIGNING PRINT WHEELS
George P. McInerny, Andalusia, Pa., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.
Filed Feb. 3, 1975, Ser. No. 546,621
Int. Cl.^{2} B41J *1/60*
U.S. Cl. 101—110 **22 Claims**



1. An indexable self-aligning printing assembly for mounting upon a holding means comprising:

a mounting pin immovably secured to said holding means and having an annular shaped surface having a polygonal shaped periphery having a cross-sectional configuration comprised of a plurality of spaced, radially outwardly extending projections, the outer free ends of said projections being substantially straight and being parallel to the longitudinal central axis of said pin;

an indexable print wheel being mounted on the pin and being formed of a resilient material and having a closed-loop configuration;

the exterior surface of said print wheel having a plurality of integrally formed raised indicia arranged at spaced intervals along said exterior surface and projecting outwardly therefrom;

the interior surface of said wheel having a configuration of alternating projections and grooves substantially complementary to the configuration of said pin, said wheel being mounted upon and surrounding the periphery of said pin so that the projections of said pin engage selected grooves in said print wheel;

said wheel being adapted to fit upon said pin and experiencing only minimal stretching and deformation when the projections of said pin engage the said selected grooves of said print wheel;

the resilient characteristics of said print wheel permitting said wheel to stretch and permitting the projections of said print wheel to compress when said print wheel is rotated about said pin to enable said print wheel projections to ride over the projections of said pin and to abruptly snap back to their uncompressed or rest state when the projections of said print wheel have passed over the projections of said pin to thereby incrementally index the print wheel about said pin and preventing the print wheel from slipping about said pin when said holding means is moved to urge a portion of the print member against a surface during printing, whereby the aforesaid arrangement eliminates the need for separate additional detent means.

4,004,507

ENVELOPE INDEXING HEAD AND AN INDEXING APPARATUS EQUIPPED WITH SAME

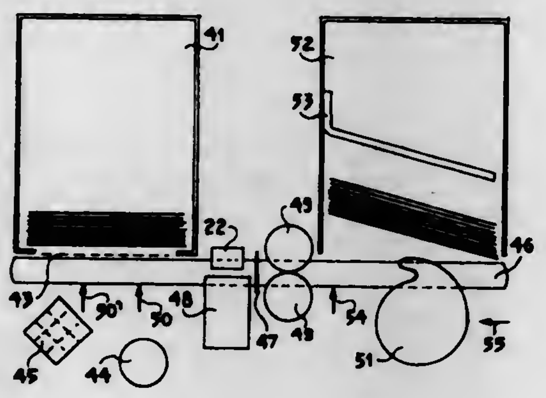
Guy Sautton, Saint Denis, France, assignor to Hotchkiss Brandt Sogeme, Paris, France

Continuation of Ser. No. 509,532, Sept. 26, 1974, abandoned. This application May 24, 1976, Ser. No. 688,986

Claims priority, application France, Oct. 2, 1973, 73.35209

Int. Cl.^{2} B41J *9/12*

U.S. Cl. 101—93.42 **6 Claims**



1. An indexing head controlled by a logic device, to print indexing marks on a postal envelope along an indexing line, which comprises:

a plurality of reciprocal elements which are mounted in a receptacle so as to be parallel and longitudinally movable, the number of said elements being the same as the number of strokes which may be printed in the course of the indexing operation, the pitch of said elements being the same as the pitch of said strokes, a forward end of each element being situated along said indexing line and having the height and width of one of said strokes;

a plurality of identical electromagnets, the number of said electromagnets being the same as the number of said elements, each of said electromagnets being mechanically connected to one of said reciprocal elements which is associated therewith, and each of said electromagnets being excitable by an individual specific winding to exert a force upon its associated element for moving said associated element longitudinally forward until it strikes against said postal envelope through the intermediary of an inking ribbon;

said inking ribbon having a portion disposed along said indexing line between said postal envelope and the forward ends of said elements; and

an assembly for receiving and holding immobile said envelope for the duration of the indexing operation, said assembly occupying with respect to said indexing line, a predetermined position with respect to the bottom and forward side of said envelope.

4,004,508

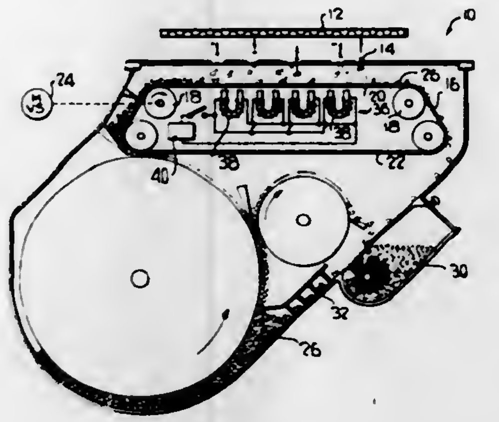
MAGNETIC STIRRING APPARATUS FOR DEVELOPER MIXTURES

Kenneth W. Rarey, South Holland, and John B. Kennedy, Jr., Oak Forest, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,261

Int. Cl.^{2} B41F *15/00*

U.S. Cl. 101—114 **11 Claims**



1. Apparatus for stirring a developer comprised of magnetic particles and non-magnetic particles, said apparatus comprising means for creating a magnetic field, means for locating said developer within said magnetic field, and means for variably controlling the field intensity of said magnetic field.

4,004,509

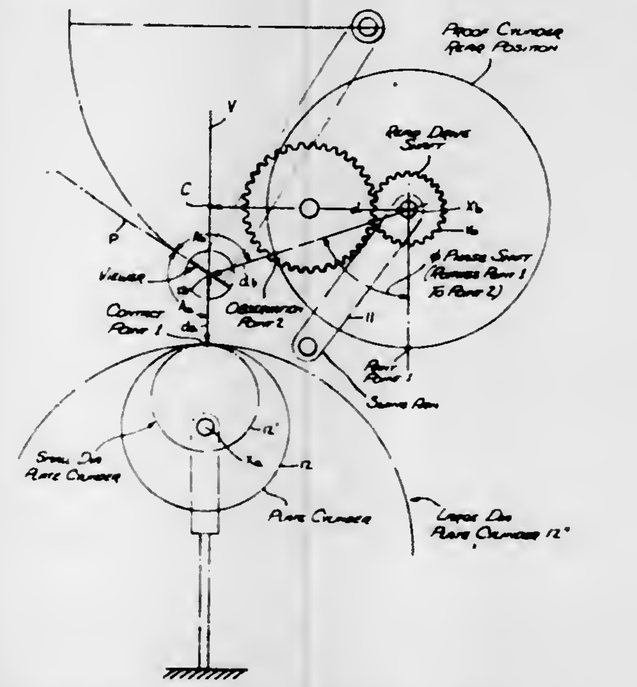
MOUNTING-PROOFING MACHINE

Lester I. Moss, Hackensack, N.J., assignor to Mosstype Corporation, Waldwick, N.J.

Filed Aug. 1, 1975, Ser. No. 601,057

Int. Cl.^{2} B41F *17/00, 13/16, 13/44*

U.S. Cl. 101—216 **12 Claims**



1. A mounting-proofing machine to facilitate mounting of flexible printing plates on a plate cylinder preparatory to operation in a flexographic printing press and to obtain proofs from these plates, said machine comprising:

A. a proofing cylinder rotatable about a horizontal axis and means to transfer the proofing cylinder from a forward-position proofing state in which it makes contact with the surface of the plate cylinder to a rear-position mounting state in which it is displaced from the plate cylinder;

B. a retractable viewer which in the mounting state is adapted to observe the surfaces of both cylinders in superposed relation; and

C. elevator means supporting said plate cylinder on an axle for rotation about a horizontal axis and adapted to raise said plate cylinder in a vertical plane which intersects the horizontal axis of the plate cylinder and the horizontal axis of the proofing cylinder in its forward position, said transfer means including a mechanism causing said proofing cylinder to undergo an angular displacement to an extent at which a point printed on the proofing cylinder in the proofing state and corresponding to the point of contact on the plate cylinder assumes an observation point in the mounting state, which in said optical viewer appears to be coincident with the contact point.

4,004,510

EQUIPMENT FOR INTRODUCTION OF A STRIP OF PAPER, CARDBOARD OR SIMILAR MATERIAL INTO A PRINTING MACHINE

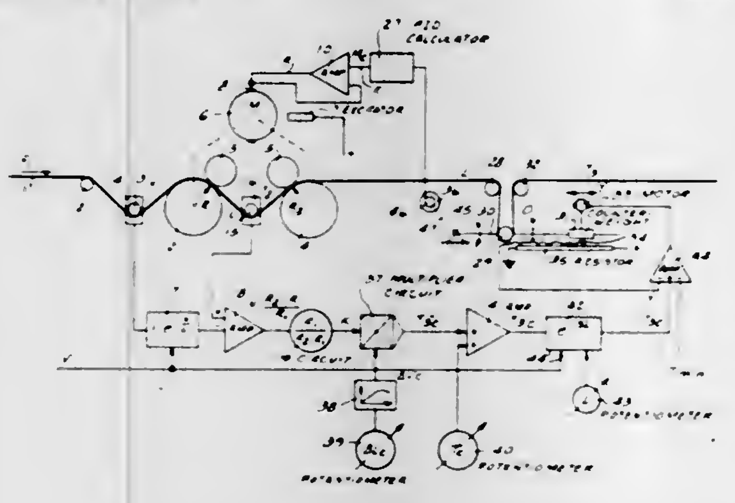
Roger Roch, Lausanne, Switzerland, assignor to J. Bobst & Fils S.A., Prilly, Switzerland

Filed Nov. 11, 1974, Ser. No. 522,706

Claims priority, application Switzerland, Nov. 13, 1973, 15914/73

Int. Cl.^{2} B41F *13/54*

U.S. Cl. 101—228 **7 Claims**



1. In an apparatus for feeding a web of material to a printing machine:

means for continually measuring the coefficient of elasticity of the web and for generating an electrical signal output in response thereto, said continually measuring means comprising means for determining an elongation of the web under given tension conditions, means for sensing said given tension conditions, calculator means for utilizing said determined elongation and said sensed tension to produce a signal which is continually indicative of the coefficient of elasticity of said web; means for utilizing said electrical signal response for developing a tension value signal; electrical-mechanical tensioning means operatively coupled to said web; and means for applying said tension value signal to said electrical-mechanical tensioning means for regulating the tension on the web in response to said coefficient of elasticity.

4,004,511

PRINTING APPARATUS

Jacobus Henricus de Groot, Noordwijkerhout, Netherlands, assignor to B.V. Korthofah, Rijnsburg, Netherlands

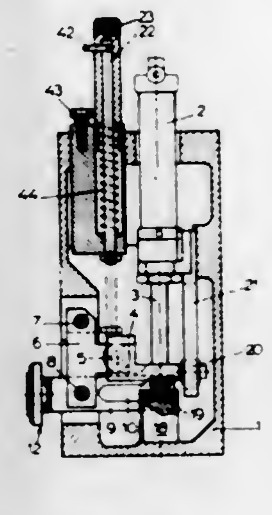
Filed Nov. 18, 1975, Ser. No. 633,163

Claims priority, application Netherlands, Nov. 25, 1974, 7415324

Int. Cl.^{2} B41K *1/42*

U.S. Cl. 101—334 **7 Claims**

1. A printing apparatus for applying markings to a plurality of moving articles, said apparatus comprising a housing, a driving rod mounted for reciprocable movement within said housing, a stamp having opposite ends and including a holder having a longitudinal slot at one of said ends, a printing head at the other end of said holder and at least one spring connecting said printing head with said holder, said printing head having an end face, coupling means for coupling said stamp with said driving rod including a cross-piece fixedly attached to said driving rod, a T-shaped link including a leg and a cross-beam, said link being pivotally suspended from a fixed point of said housing at one end of said cross-beam and being pivotally connected with said holder in the vicinity of said printing head at the other end of said cross-beam while being pivotally connected with said cross-piece at the end of said leg, and a roller fixedly arranged in said housing and engaged in said slot such that said stamp can be displaced by reciprocating movement of said driving rod between a rest position, and an operating position at right angles with said rest position, an abutment in the path of said driving rod for interrupting the downward movement of said rod before said printing head has reached an article to be imprinted, whereby outward movement of said holder due to the rotation of said link around said fixed point is likewise interrupted, so that said printing head advances by its kinetic energy to strike the article and subsequently be retracted by said spring, an ink pad constituted by a rigid porous synthetic material positioned to engage said printing head in the rest position of said stamp, an ink container, a bearing ring attached to said ink container and having an inwardly directed flange retaining said ink pad against the bottom of said ink container, and a resilient ring mounted in the end face of said printing head so as to protrude from the same and be compressed and tightly engage the flange of said bearing ring in the rest position of said stamp, whereby a suction is exerted when said stamp is displaced to the operating position to draw the ink from said ink container into said ink pad.



4,004,512

SHEET TRANSFER DRUM FOR PRINTING PRESSES

Willi Jeschke, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Nov. 13, 1975, Ser. No. 631,678

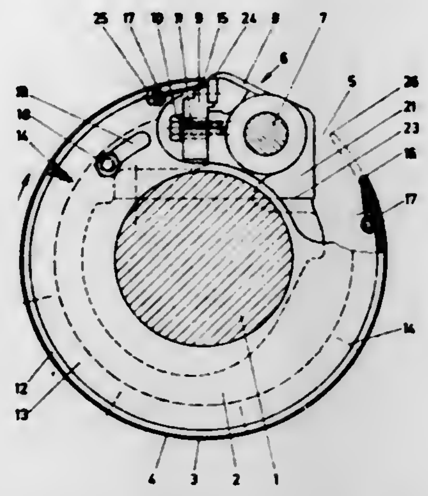
Claims priority, application Germany, May 10, 1975, 7515047[U]

Int. Cl.^{2} B41F *1/30*

U.S. Cl. 101—410 **3 Claims**

1. Sheet transfer drum for a printing press comprising a shaft, a drum body fixed to said shaft, said drum body comprising a tube segment having two ends and two longitudinal edges and respective guide rings fixed to both ends of said tube segment, said longitudinal edges of said tube segment defining a gap therebetween, a gripper assembly received in said gap and comprising, a row of grippers, gripper shaft means for carrying said row of grippers affixed thereto, and a vertically adjustable gripper bearing bar cooperating with said row of grippers for gripping a sheet to be transferred by the sheet transfer drum, bearing means received in said gap for securing said gripper assembly to said shaft, and said guide

rings being formed with respective slots extending in peripheral direction of said drum body, and threaded fasteners respectively extending through said slots and releasably securing said guide rings to said shaft, said guide rings being swingably adjustable relative to said shaft within the range of said slots.



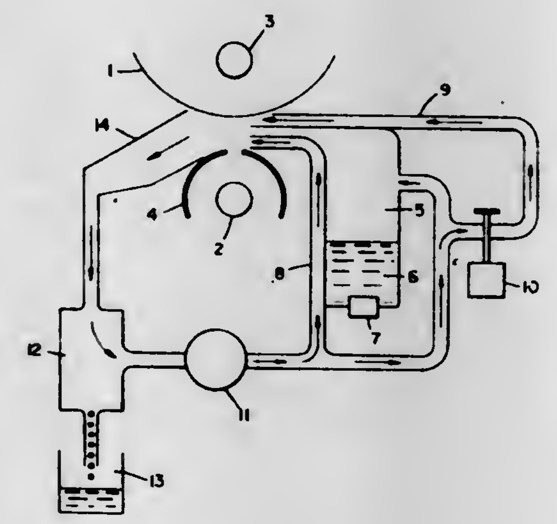
4,004,513
METHOD AND APPARATUS FOR PREVENTING INK SMEARS IN AN ELECTROSTATIC INK MIST PRINTING SYSTEM

Akinori Watanabe, and Takao Ando, both of Takasaki, Japan, assignors to Electroprint, Inc., Cupertino, Calif.

Continuation of Ser. No. 435,562, Jan. 22, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,548

Int. Cl.² B41C *1/14*

U.S. Cl. 101—426 **5 Claims**



1. In a method of printing on a recording medium utilizing a mist of liquid ink particles which are charged by ions and accelerated toward and onto the recording medium by an electrical field, the improvement comprising the step of:

selectively forming a layer of the air forwardly of, and parallel and adjacent to, the recording medium in response to the completion of the printing operation to prevent the ink mist from adhering to the recording medium while printing is not occurring.

4,004,514
ROLL RATE STABILIZED WRAP AROUND MISSILE FINS

Peter Daniels, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

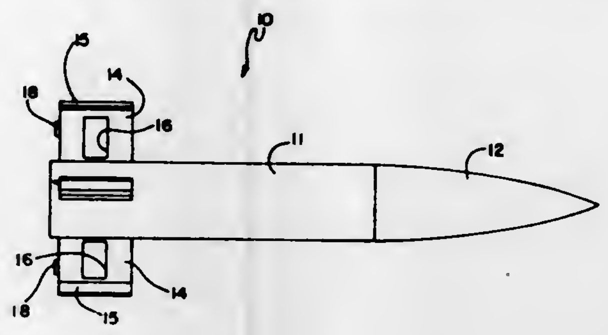
Filed Jan. 20, 1976, Ser. No. 650,639

Int. Cl.² F42B *13/32*

U.S. Cl. 102—3 **4 Claims**

1. An air dropped weapon having a warhead, tail-mounted, wrap-around fins and means for stowing and deploying the fins wherein the improvement comprises:

a fence mounted on the convex side of each fin adjacent the outer extremity thereof for balancing differential drag caused by the asymmetrical roll configuration; and



a slot provided in each fin to cause each fin to change vortices at high angles of attack whereby roll-rate stabilization is obtained.

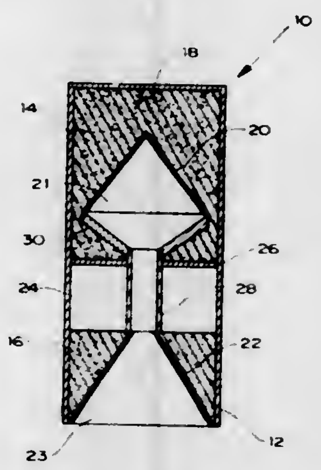
4,004,515
SEQUENTIAL JET SHAPED CHARGE

Herbert D. Mallory, China Lake, Calif., and Frank R. Marquardt, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1971, Ser. No. 109,543

Int. Cl.² F42B *3/08, 13/10*

U.S. Cl. 102—24 HC **3 Claims**



1. An explosive assembly comprising:

an elongated housing having a longitudinal axis of symmetry, an initiation end, and a terminal end;

a first shaped explosive charge supported in the initiation end of said housing and having an opening therein;

at least one additional shaped explosive charge supported in the terminal end of said housing and having an opening therethrough;

said first and additional charges being spaced apart in said housing so that a torroidal air space exists therebetween;

each said opening and space having an axis of symmetry coincident with said longitudinal axis of symmetry;

a hollow tube connecting said openings through said space; and

a torroidal metal transfer plate fastened in said assembly adjacent the base of said first charge for transferring detonation between said first and said additional charge.

4,004,516
FUZE

Clifford T. Johnson; Melvin J. McCubbin, and Thomas R. Zulkoski, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,449

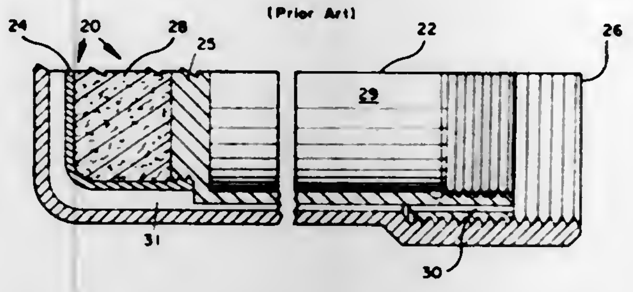
Int. Cl.² F42B *1/00*

U.S. Cl. 102—24 R **2 Claims**

1. In a booster-fuze combination wherein a booster and fuze are fastened together as a unit and inserted in a housing contained within a warhead, the improvement comprising:

said fuze being contained within a metal container having a threaded shoulder for attachment within a threaded housing and a lesser diameter threaded end portion receiving a booster cup;

an explosive booster material in said cup having a predetermined self-detonation temperature;



said booster cup being manufactured of a material which will soften and melt before the self-detonation temperature of the booster; and

a plurality of through holes bored longitudinally through said fuze container shoulder.

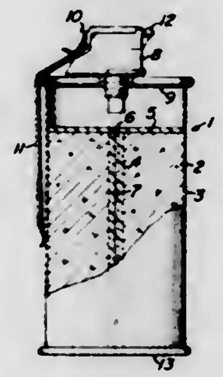
4,004,517
PYROTECHNIC MUNITION AND PROCESS

Melvin N. Gerber, Randallstown; Robert T. Cannon, Churchville, and Mitchell E. Penn, Randallstown, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,298

Int. Cl.² F42B *27/06*

U.S. Cl. 102—65 **4 Claims**



1. A munition of the pyrotechnic type comprising: a canister for containing a smoke payload; a formed smoke payload therein comprising 37 wt per cent granulated dye, 23 wt per cent potassiumchlorate, 2 wt per cent ethylene bis (isothisosemicarbazide), 16 wt per cent polyamide resin; 11.4 wt per cent plasticizer sanitisizer and 10.6 wt per cent thioexpoxy resin, a disposable payload forming mandrel; and a dispensing head.

4,004,518
SELF-FORGING FRAGMENTATION DEVICE

Lester A. Potteiger; William G. Soper, and James C. Talley, all of Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1965, Ser. No. 465,804

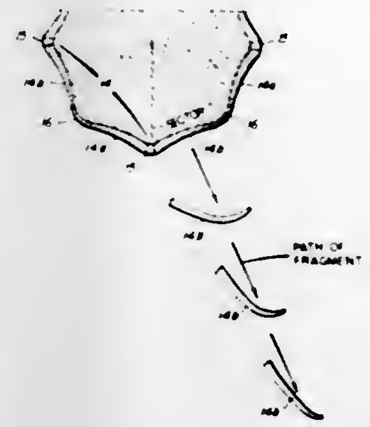
Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **7 Claims**

1. In a fragmentation-type ordnance device of a character including a thin-walled substantially polyhedral casing from which a single fragment is produced from each of the lateral faces of said casing, the improvement which comprises

a first means including an explosive charge;

a second means for initially severing said casing along a first series of alternate lateral edges and subsequently severing said casing along the remaining alternate lateral edges: acceleration said second means further imparting an accelerating force to the casing fragments thereby created to produce a greater acceleratin of the subsequently severed edges than that of said first series of edges, whereby a plurality of ribbon-like fragments are produced and wherein the leading edge of each of said fragments is one of said remaining alternate lateral edges.



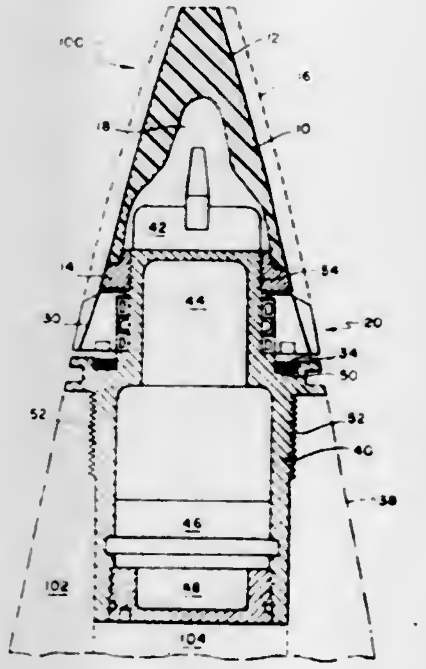
4,004,519
PROJECTILE POWER GENERATOR

Wayne J. Hopkins, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1976, Ser. No. 676,018

Int. Cl.² F42C *11/04*

U.S. Cl. 102—70.2 G **6 Claims**



1. In combination with a projectile, a fuse comprising:

a substantially cylindrical housing having one end adapted for fitment within the projectile;

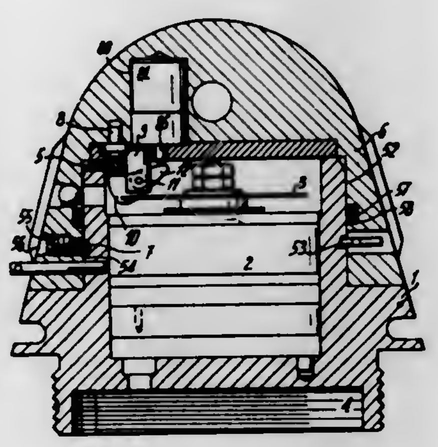
a streamlined nose portion mounted on the other end of the housing, said nose having an internal chamber;

target detection and signal processing means; and

an electrical power generator for said fuse comprising: a wind driven annulus encircling the housing and rotable about the projectiles' longitudinal axis; a plurality of fins disposed around the circumferential surface of the annulus, the surface providing a smooth continuation between the nose portion and the projectile surface to expose the fins to the passing airstream; means to rotatably attach the annulus to the housing; magnetic means disposed on the annulus; and a stator disposed within an annular groove in the housing, said stator separated from the rotor element.

4,004,520
TIME FUSE

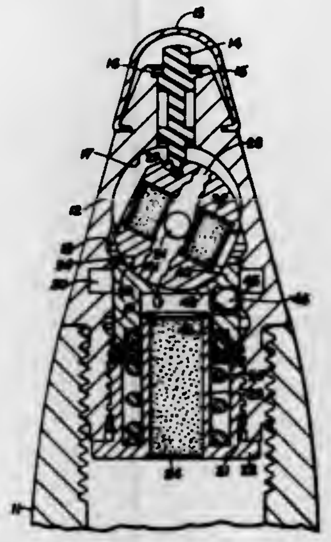
Markus Lenherr, Geneva, and Pierre Iseli, Petit-Lancy, both of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland
Filed Mar. 28, 1974, Ser. No. 456,195
Claims priority, application Switzerland, Apr. 10, 1973, 5107/73
Int. Cl.^{2} F42C *1/04, 15/24*
U.S. Cl. 102—78 **1 Claim**



1. In a time fuse suitable for a non-spinning projectile comprising a fuse body, a fuse setting member movable angularly with respect to the fuse body, a spindle subjected to the torque of a clockwork drive spring adapted to be wound by the setting member, a fuse setting disc rotationally rigid with said spindle, a catch connecting the setting member and the setting disc, and means carried by said fuse setting member for acting on the catch to disconnect the setting member and the setting disc in response to axial acceleration when the fuse is set and the projectile carrying the fuse is shot, the improvement wherein said means comprises a plunger including an extension cooperating with the catch, a socket mounted in the setting member and including a first housing, said socket and housing having an axis substantially parallel to the axis of the fuse, said plunger being slidably mounted in said first housing, means defining a second housing in the plunger coaxial to said first housing, an inertia block mounted in said second housing for movement towards the catch, a biasing spring in said second housing, said spring being of sufficient force to normally urge said inertia block away from said catch and prevent accidental release thereof, means defining at least one radial opening in said second housing, means defining a recess in the inner face of said first housing, said opening facing said recess, at least a part of the face of said recess located nearest the catch being inclined in the direction of the catch, a movable part held by the inertia block in said radial opening of said second housing and in said recess in the inner face of said first housing to lock the plunger relative to the setting member as long as the inertia block is not displaced against the action of said biasing spring by an axial acceleration of the projectile, said movable part comprising a projection on a spring in the form of a split ring, said spring held under tension by said inertia block to engage said projection in said radial opening of said second housing and in said recess in the inner face of said first housing, whereby upon such axial acceleration of the projectile, the resulting inertia causes said inertia block to overcome the force of said spring and slide rearwardly in the housing freeing said movable part from said recess and carrying said movable part and said plunger rearwardly with it causing the extension of said plunger to actuate catch (10) to disconnect said setting member and said setting disc and lock said inertia block in its retracted position in said plunger.

4,004,521
PROJECTILE FUZE

Richard S. Andrejkovics, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 1, 1976, Ser. No. 672,581
Int. Cl.^{2} F42C *1/04, 9/16*
U.S. Cl. 102—80 **3 Claims**

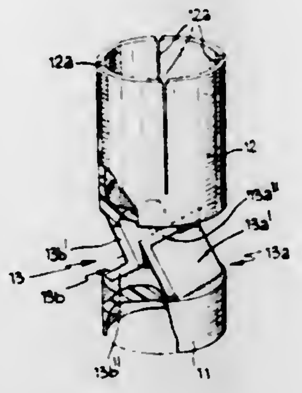


1. In a point detonating spin stabilized projectile having a fuze ogive secured in a forward portion of said projectile, a firing pin longitudinally mounted in a central forwardmost passage of said ogive, an explosive booster holder carrying a central booster charge and secured in a rearward portion of said ogive, and a rotor carrying a detonator and a plurality of peripheral rotor detent balls for rotatably mounting said rotor in said ogive intermediate said holder and said ogive passage,
a tubular rotor support slidably mounted in said ogive intermediate said rotor and holder, said support carrying a plurality of self destruct detent balls in its peripheral surface,
a compression spring carried by said holder and forwardly biasing said support,
an expandable detent positioned between said rotor and rotor support and locking said rotor in an unarmed position,
said fuze ogive having a pair of longitudinally spaced internal annular grooves for respectively receiving said rotor detent balls and self destruct detent balls upon launching and flight of said projectile, and a third ogive annular groove intermediate said spaced pair of annular grooves for reception of said expandable detent when the projectile attains predetermined rates of spin.

4,004,522
SHOT SHELL WADDING

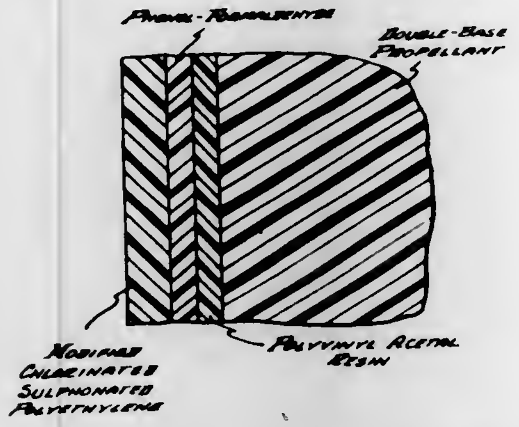
Harry Furniss, Oldham, and Jack Grindrod, Royton, Oldham, both of England, assignors to Unit Wad Limited, Werneth, Oldham, England
Filed Sept. 26, 1974, Ser. No. 509,690
Int. Cl.^{2} F42B *7/08*
U.S. Cl. 102—95 **8 Claims**

1. A shot/shell wadding having a charge containing cup, a shot-containing cup and a collapsible connection means between such cups, characterised in that the said connection means comprises a plurality of elements each extending between the said cups and each positioned for surface engagement with a respective adjacent element of the said plurality of elements upon initial collapse of the connection means to provide an increasing frictional resistance to relative motion therebetween and a consequential increasing resistance to continuing collapse.



4,004,523
SOLID PROPELLANT CHARGES

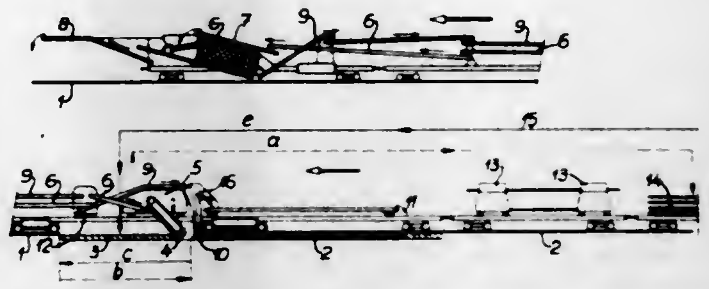
David Victor Clifford; Stephen William Bell, both c/o The Ministry of Aviation, London; Stuart Gordon, 10 Furlongs Road, Cleobury Mortimer, Shropshire, and Philip Graham Jones, 5 Rozel Avenue, Broadwater, Kidderminster, Worcestershire, all of England
Filed Oct. 26, 1966, Ser. No. 591,036
Claims priority, application United Kingdom, Oct. 27, 1965, 45505/65
Int. Cl.^{2} C06B *45/28*
U.S. Cl. 102—103 **5 Claims**



1. A combustion-inhibited solid propellant charge comprising: a solid mass of double-base propellant comprising a mixture of nitrocellulose and a liquid nitric ester, the solid mass of double-base propellant having at least one surface at which combustion is to be inhibited; a layer of a polyvinyl acetal resin bonded directly to said surface; an elastomeric combustion-inhibiting material bonded to the layer of polyvinyl acetal resin; and a layer of another resin which is compatible with the polyvinyl acetal resin and with the elastomeric combustion-inhibiting material, said other layer being selected from the group of resins consisting of epoxy resins, polyesters and formaldehyde resins and being bonded between the layer of a polyvinyl acetal resin and the elastomeric combustion-inhibiting material.

4,004,524
METHOD OF RENEWAL OF A RAILROAD TRACK AND TRAIN THEREFOR

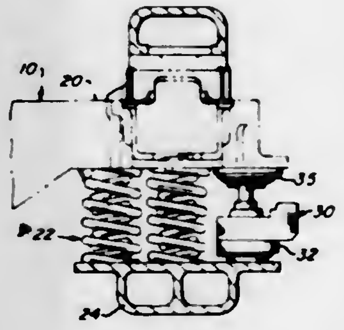
Fredy Scheuchzer, Lausanne, and Fritz Buhler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Switzerland
Filed June 20, 1975, Ser. No. 588,711
Claims priority, application Switzerland, July 11, 1974, 9596/74
Int. Cl.^{2} E01B *27/02, 27/04, 29/02, 29/05*
U.S. Cl. 104—2 **9 Claims**



4. Apparatus for renewing an old railway track and the bed therefor comprising, a train assembly having:
a. cars for transporting rails, ties and necessary hardware for renewing an old railway track and the bed thereof;
b. at least one track and rail laying lift truck means having gantries;
c. a ballast clearing means for removing ballast of a trackless bed section from which track and ties have been removed and while said train assembly is at a standstill;
d. a screener remote from the trackless bed section for screening the removed ballast to clean it;
e. means for transporting the removed ballast from said clearing means to said screener;
f. means including means for transporting cleaned ballast from said screener and respreading on said trackless bed section for rebuilding it to a desired level including metering means for automatically controlling the volume of cleaned ballast returned to said trackless bed section, and
g. means coactive with said metering means for transporting the remainder of the metered cleaned ballast and delivering it between ties laid on said trackless bed section simultaneously with return of cleaned ballast to said trackless bed section.

4,004,525
FLUID TRUCK SNUBBER

Donald Wiebe, Sewickley, and John H. Wagner, Bradfordwoods, both of Pa., assignors to A. Stucki Company, Pittsburgh, Pa.
Filed Mar. 28, 1975, Ser. No. 563,147
Int. Cl.^{2} B61F *5/06, 5/12, 5/24, 5/50*
U.S. Cl. 105—197 DH **9 Claims**



1. In a railway truck snubber assembly adapted to be interposed in a spring group intermediate a bolster member and side frame member of a railway truck assembly, the improvement comprising: a hydraulic snubber having a piston assembly telescopically movable with respect to a snubber casing, along an axis; said piston assembly having one end portion

thereof slidably received within said snubber casing; biasing means received within said casing and operative to bias said piston assembly away from said casing along said axis; other biasing means adapted to be directly interposed intermediate said snubber and one of such members to bias said snubber towards the other of such members; said other biasing means being operationally adapted to have one end portion thereof engage a piston rod of said piston assembly adjacent the other end portion thereof and to have the other end portion of said biasing means directly communicate with the one of such members; said other biasing means being operative to bias said snubber out of operative engagement with the one of such members when such railway truck assembly is normally operating in an unloaded condition; the biasing force of said other biasing means being always less than the biasing force of said biasing means; and said other biasing means and said snubber being cooperable to initiate hydraulic snubbing by said snubber substantially only when such railway truck assembly is normally operating in a loaded condition, the bias of said other means is partially overcome and said snubber is in operative engagement with both of such members.

6. In a dampened railway truck assembly selectively operable in loaded and unloaded conditions and having a hydraulic snubber interposed in the spring group intermediate a bolster member and a side frame member, the improvement comprising: said snubber including a piston assembly telescopically movable with respect to a snubber casing; biasing means received within said casing and operative to bias said piston assembly away from said casing along said axis; other biasing means directly interposed between said snubber and one of said members to bias said snubber towards the other of said members; said other biasing means having one end portion thereof engaging a piston rod of said piston assembly adjacent the other end portion thereof and having the other end portion of said other biasing means communicating directly with said one of said members; said other biasing means being operative to bias said snubber out of operative engagement with said one of said members when said railway truck assembly is normally operating in an unloaded condition; the biasing force of said other biasing means being always less than the biasing force of said biasing means; and said other biasing means and said snubber being cooperable to initiate hydraulic snubbing by said snubber substantially only when said railway truck assembly is normally operating in a loaded condition, the bias of said other means is at least partially overcome and said snubber is in operative engagement with both of said members.

4,004,526

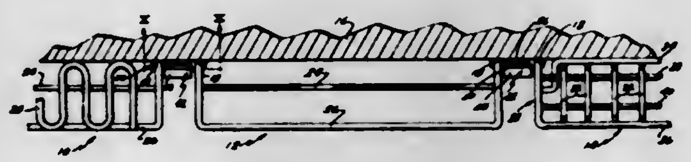
DETACHABLE RACK ANCHOR

Clarence J. King, Ludington, Mich., assignor to Straits Steet & Wire Co., Ludington, Mich.

Filed Dec. 1, 1975, Ser. No. 636,636

Int. Cl.^{2} A47B *3/00*

U.S. Cl. 108—114 **5 Claims**



1. A detachable rack and anchor assembly mountable on a vertical support surface, comprising:

a plurality of anchors adapted to be secured to the vertical support surface in a horizontally spaced relationship, said anchors each having an outer stop portion and an inner shank portion;

a rack including at each end a vertical support engaging portion;

an outer hanger attached to one of such vertical support engaging portions of said rack; and

an inner hanger attached to the outer of said vertical support engaging portions of said rack, said inner hanger and said outer hanger each engaging one of said anchors to thereby detachably mount said rack on said vertical support surface, said outer hanger including a hook portion for engaging said shank portion of one of said anchors and an integral right angled tab portion secured to one of said vertical support engaging portions of said rack so that said inverted hook portion of said outer hanger extends outwardly in a parallel spaced relationship to the vertical support surface, said inner hanger including an inverted hook portion for engaging said shank portion of another of said anchors and an integral cylindrical tab portion, said cylindrical tab portion receiving and being secured to the vertical support engaging portion of said rack, so that said inverted hook portion of said inner hanger engages the vertical support surface.

4,004,527

APPARATUS FOR CORRECTING THE MUTUAL ORIENTATION OF THE PATTERNS ON TWO LAYERS OF CLOTH

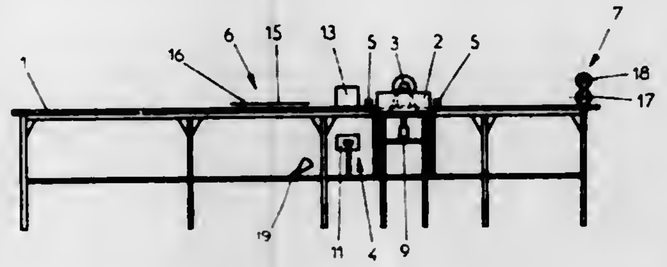
Laurent G. Acker, Bischwiller, France, assignor to Vestra-Union S.A., Paris, France

Filed Jan. 22, 1976, Ser. No. 651,597

Claims priority, application France, Jan. 30, 1975, 75.03638

Int. Cl.^{2} D05B *3/00*

U.S. Cl. 112—121.14 **5 Claims**



1. An apparatus for correcting the mutual orientation of the patterns on two layers of badly-calendered cloth, characterised in that it comprises in combination a table having a central aperture, a carriage with means for moving the carriage to-and-fro on a path transverse to the longitudinal direction of the table, a basting machine mounted upon the carriage, an optical inspection device comprising two co-operating mirrors with one of said mirrors being placed below the said central aperture at an angle of 45° to the vertical and the other of said mirrors being placed vertically with respect to the table surface and facing a laterally-placed opening in the margin of the table at the side opposite to an operator's position whereby the operator can view the patterns of the two layers of cloth and the relative positions thereof, clamping bars for temporarily clamping the cloth, a separator to extend between the two layers of cloth, and means comprising two traction rollers for drawing the cloth along on the table.

4,004,528

HEAT SINK FOR AN APPLIANCE CIRCUIT BOARD

Kenneth Douglas Adams, Madison, and Edward Walter Ostapczuk, Union, both of N.J., assignors to The Singer Company, New York, N.Y.

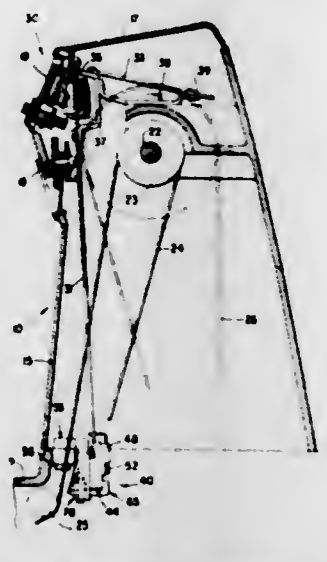
Filed Mar. 26, 1976, Ser. No. 670,779

Int. Cl.^{2} D05B *71/00*

U.S. Cl. 112—218 R **4 Claims**

1. A heat sink arrangement for an appliance having a heat conducting frame with at least one access opening to the interior thereof, and controlled by an electronic assembly including heat dissipating components disposed internally of said frame, the heat sink arrangement comprising:

heat conducting bracket means affixed to said frame of said appliance for good heat conduction thereof, said bracket means having a first surface and a second surface substantially oppositely disposed to said first surface;



heat conducting heat sink means attached to said electronic assembly and supporting said heat dissipating components for good thermal conductivity but electrically isolated therefrom, said heat sink means having a first surface disposed contiguous and congruent said first surface of said bracket means, said heat sink means having a second surface substantially oppositely disposed to said first surface of said heat sink means; and,

clamping means for pressing said bracket means to said heat sink means for good thermal conductivity and support of said electronic assembly, said clamping means having a portion thereof abutting one of said second surfaces and including a screw thread device in adjustable pressure contact with the other of said second surfaces in opposition to said portion of said clamping means, said screw thread device being accessible from an access opening.

4,004,529

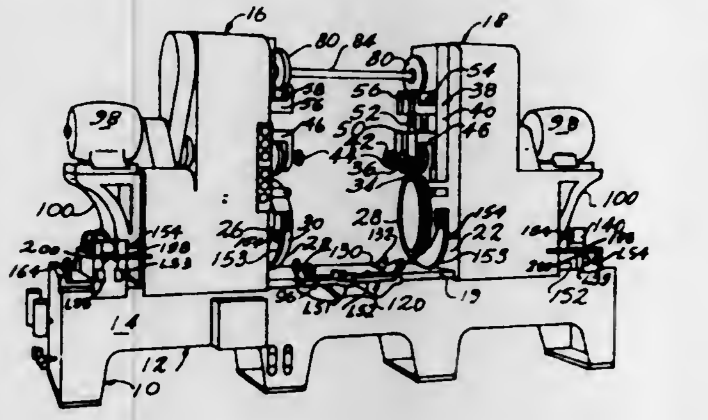
CAN HEAD SEAMING METHOD AND APPARATUS

Eugene R. Grotnes, Atlanta, Ga., assignor to Atlanta Grotnes Machine Company, Atlanta, Ga.

Filed July 14, 1975, Ser. No. 595,673

Int. Cl.^{2} B21D *39/02*

U.S. Cl. 113—58 **26 Claims**



1. In a seaming machine in which there is a base frame having a pair of seaming heads mounted in spaced relationship on said base frame for horizontal operation thereon toward or away from each other, a drum support means on said base and between said heads for supporting a drum and drum head thereon for a seaming operation, means on said frame for driving said heads to close on said respective ends of said drums, respective first and second chuck means on each of said heads for engaging a respective end of said drum and seaming means on said heads engageable with said drum for engaging thereagainst to form a seam between the drum and drum head, the improvement comprising: first and second respective independent drive means for driving a respective one of said respective chucks whereby the said respective first or second drive means drives only one respective chuck and whereby said first drive means is not connected to the second drive means until a drum is in place and then only thru the drum.

23. In a method for seaming a drum which comprises a cylindrical drum body having open ends which are provided with respective elosures in the form of drum heads and which are engaged by seaming means to form seams to attach said drum heads to said drum: supporting said drum for rotation, engaging the opposite ends of said drum with respective support chucks, rotating at least one of said chucks from a drive means to drive said drum independently of said other chuck at least initially to adjust the speed of said drum on both chucks from the drive means.

4,004,530

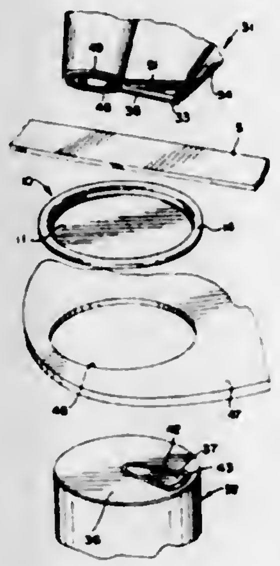
METHOD FOR MAKING AN EASY OPENING END CLOSURE FOR A CONTAINER

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 365,014, May 29, 1973, Pat. No. 3,967,749. This application Dec. 23, 1975, Ser. No. 643,647

Int. Cl.^{2} B21D *51/44*

U.S. Cl. 113—121 C **4 Claims**



1. The method of forming an easy opening end closure in a metal panel comprising the steps of placing a strip of plastic material on said panel, placing said end closure on a blanking punch, appying sufficient force on said plastic to forge the plastic and cause the metal panel to be displaced toward said bianking punch and be severed by said forged plastic to form a slit, and allowing said forged plastic to fill said slit.

4,004,531

DRILLING SYSTEM FOR DEEP WATER OFFSHORE LOCATIONS

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 470,685, May 16, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,346

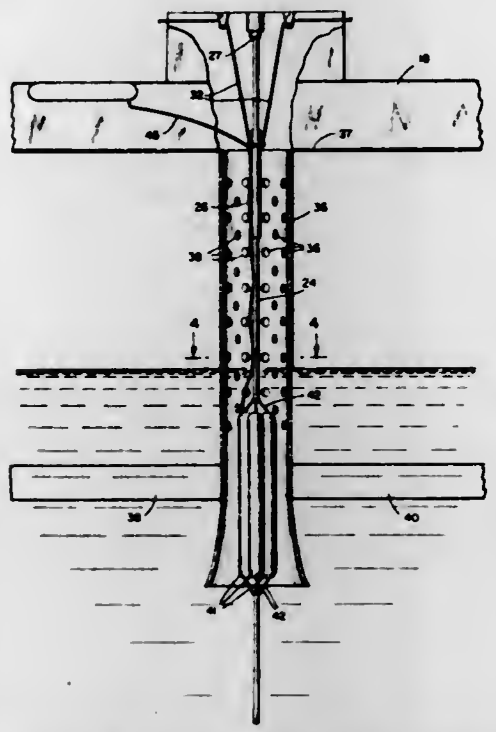
Int. Cl.^{2} B63B *35/44*

U.S. Cl. 114—256 **11 Claims**

1. The combination with a semisubmersible drilling vessel adapted for operating in an offshore body of water, said vessel having a work deck supported above the water's surface by a plurality of substantially vertically disposed upright columns which are spaced apart to permit passage of water and waves therebetween when said vessel is floatably stationed at an offshore working site, a drill string riser depending from said vessel and extending to the floor of said body of water to accommodate a drill string therethrough, of:

shielding means surrounding the upper end of said drill string riser to protect the latter from contact with waves which pass through said spaced apart support legs, which shielding means comprises;

an elongated open ended caisson depending downwardly from said vessel to a sufficient water depth, and being



spaced outwardly from the said riser to define an annular space therebetween whereby to form a protective zone about said drill string riser upper end,

said elongated caisson having a series of perforations formed in the walls thereof to permit passage of water therethrough and to maintain the water level within said caisson consistent with the level of water external thereto.

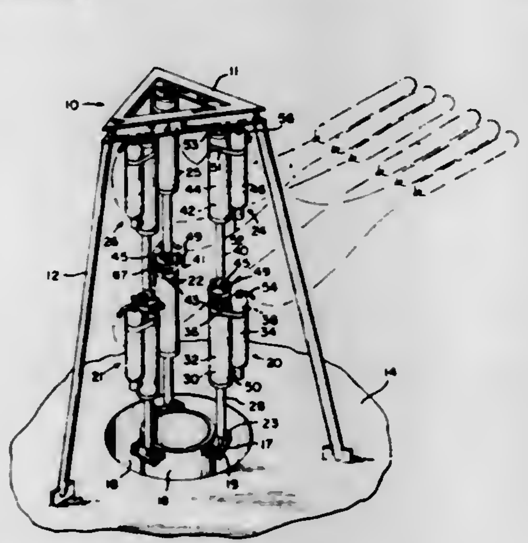
4,004,532
RISER TENSION SYSTEM FOR FLOATING PLATFORM

Thomas J. Reynolds, Lake Stevens, Wash., assignor to Western Gear Corporation, Everett, Wash.

Filed May 5, 1975, Ser. No. 574,378

Int. Cl.² B63B *35/44*

U.S. Cl. 114—256 **23 Claims**



1. In combination;

a floating platform,

a load in the water below said platform,

an active heave compensator system, and

a back-up heave compensator system, one of said systems being supported by said platform and giving support to the other said system, the other said system being operatively connected between the load and the platform supported system.

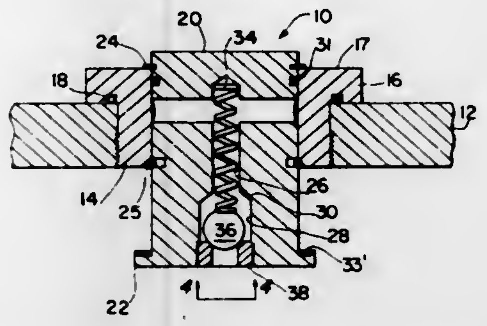
4,004,533
SCUTTLING VALVE

Lionel L. Woolston, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,891

Int. Cl.² B63G *8/22*; B63B *21/52*; F16K *24/04*

U.S. Cl. 114—16 E **12 Claims**



1. A valve assembly for controlling the entry of fluid into a controlled volume comprising:

a valve housing attachable to a surface defining the controlled volume;

a piston member slidably positioned within said housing and having a flow passage therein, said member in fluid communication with the controlled volume; and

a ball valve within said flow passage and movable between a first, non-sealing position and a second, fluid sealing position,

said piston member responsive to pressure within the controlled volume to move outwardly within said housing to place said flow passage in fluid communication with the ambient environment, and

said ball valve responsive to pressure within the controlled volume to move from said first position to said second position to seal the controlled volume, and returning to said first position upon removal of pressure to permit entry of fluid into the controlled volume.

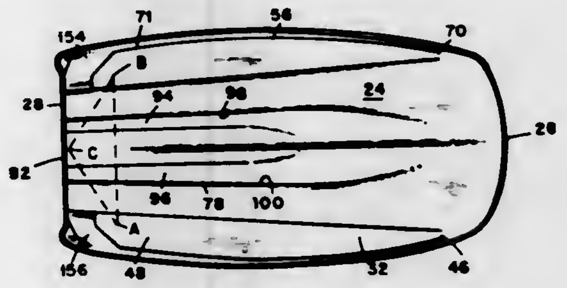
4,004,534
BOAT HULL

Darris E. Allison, Rte. 4, Box 1, Louisville, Tenn. 37777

Filed Nov. 28, 1975, Ser. No. 636,029

Int. Cl.² B63B *1/20*

U.S. Cl. 114—274 **5 Claims**



1. A boat hull comprising a generally elongated body portion including bow means and transom means, first and second elongated sponson means depending from said body portion along the opposite side margins of said body portion and defining elongated running surfaces, said first and second sponson means terminating at their respective aft ends at a location forward of said transom means, but rearwardly of the transverse midplane of said hull, third elongated sponson means depending from said body portion at a location centrally thereof in substantial alignment with the longitudinal centerline of said body portion and defining an elongated running surface that extends beyond the aft terminal ends of said first and second sponson means to the approximate location of said transom means, said first and third sponson means in combination with said body portion defining a first elongated tunnel means extending along a substantial portion of the length of said body portion in general alignment with said longitudinal centerline of said body portion but displaced laterally thereof, said second and third sponson means in combination with said body portion defining a further elongated tunnel means extending along a substantial portion of the length of said body portion in general alignment with said longitudinal centerline of said body portion but displaced laterally thereof and on the opposite side of said longitudinal centerline as said first tunnel means, each of said first and further tunnel means being open at its respective forward and aft ends for the flow of fluid therealong and reducing in cross-sectional area from the forward end of said hull toward the aft end of said hull.

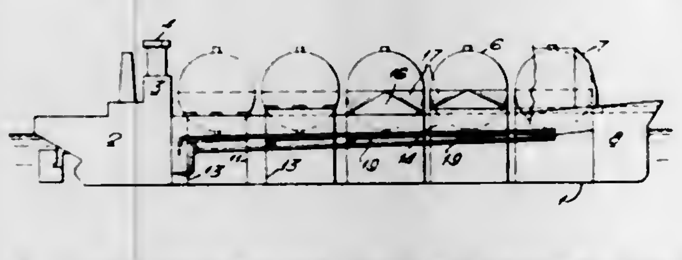
4,004,535
VESSEL COMPRISING A HULL FOR TRANSPORTING COOLED LIQUEFIELD GAS

Per Jorgen Oiern, Oslo, and Knut Helge Osmundsvaag, Lierbyen, both of Norway, assignors to A/S Akers Mek. Verksted, Oslo, Norway

Continuation of Ser. No. 396,327, Sept. 11, 1973, abandoned. This application June 12, 1975, Ser. No. 586,175

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 A **8 Claims**



1. A vessel having an upper deck and having at least one container for the transportation of cooled, liquefied gas or the like, comprising: at least one center cargo hold located below the deck of the vessel; said center hold including interconnected longitudinal and transverse bulkheads and a support frame interconnected with said bulkheads and located at a top portion of said center hold, said bulkheads forming side walls of said frame and said support frame having an open top portion; and side tanks extending down from the deck and extending transversely outwardly of said center hold and said frame; said container being supported by said frame and the lower portion of said container extending downwardly within said open top portion of said frame.

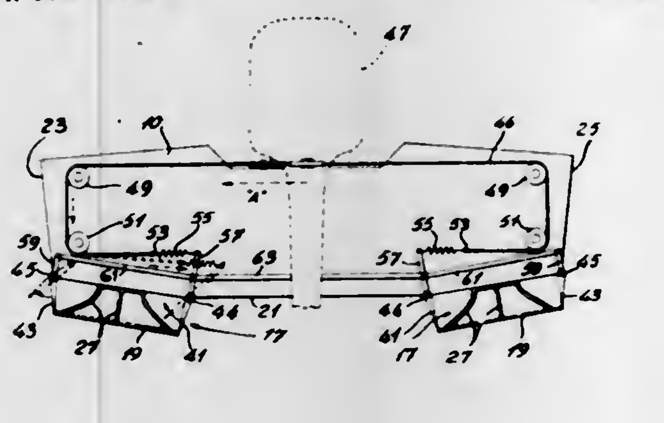
4,004,536
ANTI-SKID BOAT

Claude Bernier, 1203 Boul. Mont-Royal, West Montreal, Quebec, Canada H2V 2H7

Filed Mar. 17, 1975, Ser. No. 559,337

Int. Cl.² B63H *25/08*

U.S. Cl. 114—144 R **40 Claims**



1. A boat having a hull, and means on each side of the hull to reduce the tendency of the boat to drift out during a turn in either direction, the means on the right side of the hull biting into the water and reducing the tendency of the boat to drift out in a direction toward the left side during a turn to the right side and the means on the left side of the hull biting into the water and reducing the tendency of the boat to drift out in a direction toward the right side during a turn to the left side, each said means including: an elongated vane extending substantially longitudinally of said hull, and means for supporting said elongated vane in relatively closely spaced relationship from said hull over a major portion of the length thereof, whereby said vane and said hull form therebetween an elongated, substantially longitudinally extending, relatively narrow slot through which water can flow laterally outwardly from beneath the central portion of the hull during a turn of the boat.

4,004,537
STEERING MECHANISM

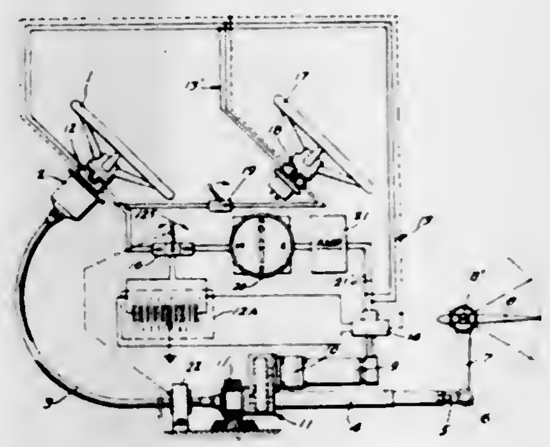
Sven Walter Nilsson, Partille, Sweden, assignor to SKF Nova A.B., Goteborg, Sweden

Filed May 14, 1976, Ser. No. 686,539

Claims priority, application Sweden, May 16, 1975, 7505626

Int. Cl.² B63H *25/20, 25/24*

U.S. Cl. 114—144 R **9 Claims**



1. In a steering system of the class comprising a steering member movable to exert a steering effect, rotatable means responsive to rotation thereof for moving said steering member to produce said steering effect, and manually-operable steering control means for effecting control of the rotation of said rotatable means in response to changes in the position of said steering control means, the improvement comprising

motor means;

double-acting free-wheeling clutch means,

said clutch means comprising primary drive means, free wheel means, and releasable coupling means for rendering said primary drive means responsive to rotational drive applied thereto in either direction to rotate said free wheel means, and for rendering said free wheel means rotatable substantially free of said primary drive means in either direction with respect to said primary drive means,

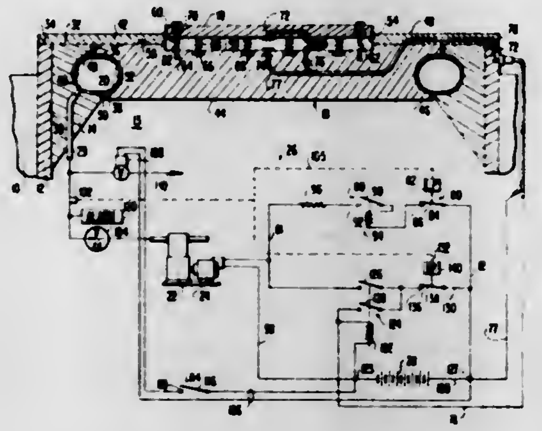
means connecting said free wheel means to said manually-operable steering control means and to said rotatable means to provide a direct rotational connection between them; and

means connecting said motor means to said primary drive means to drive it in rotation when said motor means is operating;

whereby both said motor means and said manually-operable steering control means are drivingly connected to said rotatable means except at times when said free wheel means is rotated with respect to said primary drive means, said steering control means at said times being operable to drive said rotatable means substantially independently of said motor means.

4,004,538
WAVE RESPONSIVE HATCH COVER LOCKING AND SEALING MECHANISM

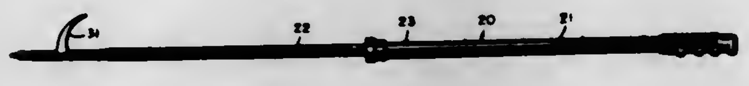
Marten Leonard Schoonman, 906 N. Elam Ave., Greensboro, N.C. 27408
Filed Mar. 19, 1976, Ser. No. 668,381
Int. Cl.² B63B *19/12*
U.S. Cl. 114—201 R **6 Claims**



1. In a marine cargo vessel or the like having a deck extending horizontally across the hull of the vessel and defining with the hull at least one cargo storage compartment, a hatchway member within said deck forming a cargo compartment access opening, a hatch member overlying said cargo compartment access opening, and having a surface portion opposing a surface portion of said hatchway member and defining an interface therebetween, a hollow inflatable gasket carried by one of said members on said surface and facing the opposing surface of said other member, a recess within said opposing surface of said other member, and means for fluid pressurizing said gasket to cause a portion of said gasket upon inflation to position itself within said recess and to seal and lock said members together at said interface, the improvement comprising: means carried by said hatch cover responsive to water pressure for actuating said fluid pressurizing means, and wherein said hatch cover water pressure means for operating said fluid pressurizing means comprises wave sensor switch means and said means for fluid pressurizing said gasket comprises a pump, a first conduit fluid connecting said pump to said gasket, a drive motor mechanically coupled to said pump, a voltage source and circuit means connecting said voltage source, said motor and said switch means in series.

4,004,539
MARINE IMPLEMENT

Harry J. Wesson, 237 River St., Manistee, Mich. 49660
Filed Sept. 22, 1975, Ser. No. 616,160
Int. Cl.² B63B *21/04*
U.S. Cl. 114—221 R **7 Claims**

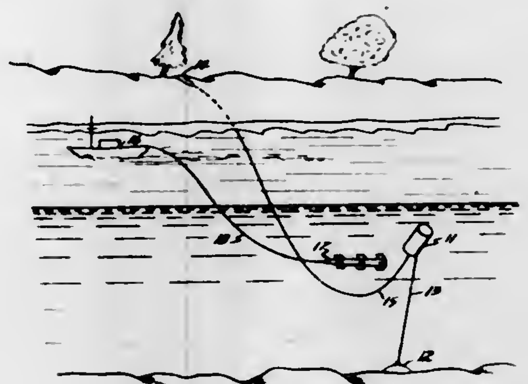


1. A marine implement including a boat hook having an elongated handle portion extending along a handle axis, a hook portin extending laterally from said axis, and a prod portion extending parallel to said axis on the opposite side of said hook portion from said handle portion, wherein the improvement comprises:

coupling means on said prod portion coaxial therewith, including a threaded portion, said prod portion having a point extending substantially beyond said coupling means; and
at least one attachment engageable with said coupling means, and having a socket in which part of said prod portion is receivable.

4,004,540
GALVANIC DETECTOR FOR DETECTING THE CUTTING OF A COMMAND WIRE

Francis J. Higgins, Panama City, Fla.; Charles T. McGraw, Atlanta, Ga., and Edward L. Sanderson, Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 10, 1968, Ser. No. 698,097
Int. Cl.² G01V *3/02, 9/00*
U.S. Cl. 114—244 **10 Claims**

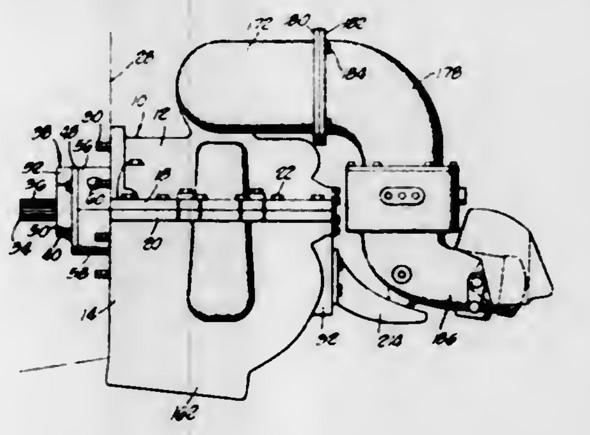


1. An apparatus for indicating the presence and cutting of an electrical wire located within an aqueous medium in contiguous disposition with the floor thereof, comprising:

a cutting assembly, adapted for being towed by a predetermined tractor vehicle along the floor of said aqueous medium, having at least one sharpened metallic blade and at least one reference electrode of the same metallic material as said sharpened metallic blade disposed within said aqueous medium in close proximity therewith but electrically insulated therefrom;
means connected to said cutting assembly for the towing thereof by said tractor vehicle, said towing means including a plurality of electrical conductors, one of which is electrically connected to said sharpened metallic blade, and another of which is connected to said one reference electrode; and
means connected to said electrical conductors for utilizing the pulses of galvanic current which flows between said sharpened metallic blade and the aforesaid one reference electrode and within said electrical conductors as a result of the contact of said sharpened metallic blade with the aforesaid electrical wire.

4,004,541
JET BOAT PUMP

Hasan F. Onal, Denver, Colo., assignor to Hydro-Tech Corporation, Denver, Colo.
Continuation of Ser. No. 382,374, July 25, 1973, abandoned. This application July 28, 1975, Ser. No. 599,535
Int. Cl.² B63H *11/04, 11/10*
U.S. Cl. 115—12 R **11 Claims**

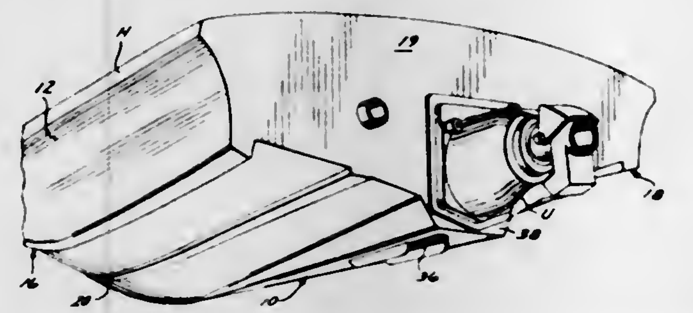


1. A pump for propelling a boat, comprising

a pump housing having inlet passage means for receiving water and outlet passage means for discharging water;
a pump shaft rotatably mounted in said pump housing; and
an impeller mounted concentrically on said pump shaft in said housing, said impeller being in communication with said inlet passage means and said outlet passage means;
said outlet passage means including an outlet channel, a nozzle operably joined with said outlet channel to allow rotation of said nozzle about a substantially vertical axis and about a substantially horizontal axis perpendicular to the center line of the boat, and support means comprising a support bracket mounted on said housing and having a track extending in a front to rear direction, a ball positioned in said track, and a socket on the nozzle holding said ball.

4,004,542
WATERJET PROPELLED PLANING HULL

William H. Holmes, 931 Sunset Drive, Costa Mesa, Calif. 92627
Continuation-in-part of Ser. No. 341,886, March 16, 1973, abandoned. This application June 3, 1975, Ser. No. 583,283
Int. Cl.² B63H *11/02*
U.S. Cl. 115—14 **3 Claims**

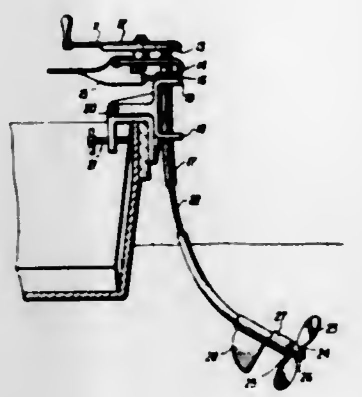


1. A planing boat hull for use with a waterjet propulsion unit having a downwardly-facing water intake and a rearwardly directed discharge nozzle, said boat hull comprising:

a generally flat V-shaped bottom;
a depending support pod extending forwardly from the transom of said hull, said support pod having a flat underside and a pair of upwardly extending sidewalls, said support pod receiving the lower portion of said waterjet propulsion unit, with the water intake of said unit being provided at the underside of said support pod;
a pair of depending stabilizing strakes extending longitudinally along the major length of said hull from the transom thereof, with the inwardly-facing side surfaces of said strakes being substantially vertically extending so as to provide lateral resistance against sideward movement of said hull during forward travel thereof, the flat underside of said support pod primarily supporting the weight of said boat at planing speeds of said boat, but with said pod extending into the water sufficiently so that the discharge nozzle of said propulsion unit is below the water level at planing speeds; and
a pair of intermediate depending strakes which extend longitudinally along said bottom of the hull, said intermediate strakes being disposed between the opposite sides of said support pod and the stabilizing strakes whereby an air cushion is generated between the spaces separating each intermediate strake and the inwardly facing side of the stabilizing strake proximate thereto, and with the outer sides of said intermediate strakes being generally vertically extending so as to provide additional lateral resistance against sideward movement of said hull during forward travel thereof.

4,004,543
MANUALLY OPERATED PROPELLING APPARATUS FOR A BOAT

Zesely B. T. Cox, Redmond Road, Rome, Ga. 30161
Filed Mar. 4, 1975, Ser. No. 555,120
Int. Cl.² B63H *16/14*
U.S. Cl. 115—24 **15 Claims**

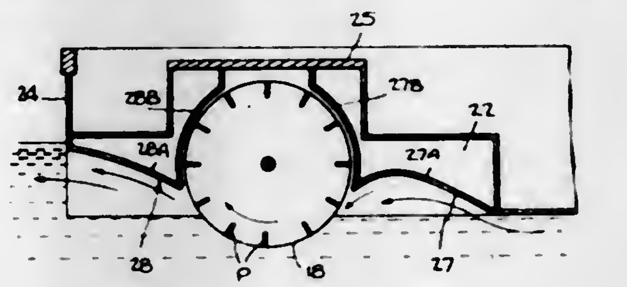


1. A manually operated propelling apparatus for a boat comprising:

a. a clamp for attaching the propelling apparatus to the transom of a boat,
b. a propeller shaft housing attached to said clamp;
c. a sun gear driving arrangement, wherein the interior member is the driven gear and the exterior member is the drive gear having internal gear teeth and having a flange which covers the internal gear teeth of said drive gear and which covers a substantial portion of the gear teeth of said driven gear, attached to one end of said propeller shaft housing; and
d. a flexible propeller shaft within said propeller shaft housing attached to said sun gear arrangement at one end and to a propeller at the other end.

4,004,544
TWIN TURBINE-WHEEL DRIVEN BOAT

John J. Moore, 44 W. 77th St., New York, N.Y. 10024
Filed Dec. 24, 1975, Ser. No. 644,057
Int. Cl.² B63H *5/04*
U.S. Cl. 115—50 **10 Claims**



1. A rudderless motorboat comprising.

A. a hull having a stern board, a keel and a pair of longitudinally-extending tunnels indented in the bottom of the hull and symmetrically disposed in the stern section of the hull with respect to the keel and extending through the stern board;
B. a turbine wheel rotatably mounted in each of said tunnels at a position intermediate the inlet and outlet thereof, only the lower segment of each wheel projecting below the bottom of the hull, said wheels functioning to propel the boat and also functioning as traction wheels to carry the boat over submerged bodies to prevent it from running aground, each wheel being formed by a pair of discs and circumferentially arranged paddle blades bridging said discs;
C. inlet and outlet baffle means disposed within each tunnel

on the inlet side and outlet side of the wheel and contoured to admit water passing through the longitudinally-extending tunnel to the propelling segment of the wheel and to discharge water therefrom toward the stern board; the baffle means otherwise conforming to the periphery of the wheel to prevent recirculation of the water;

D. an inboard engine; and

E. means operatively coupling said engine to said wheels whereby said wheels may be concurrently driven to propel said boat or differentially driven to steer said boat without the need for a rudder.

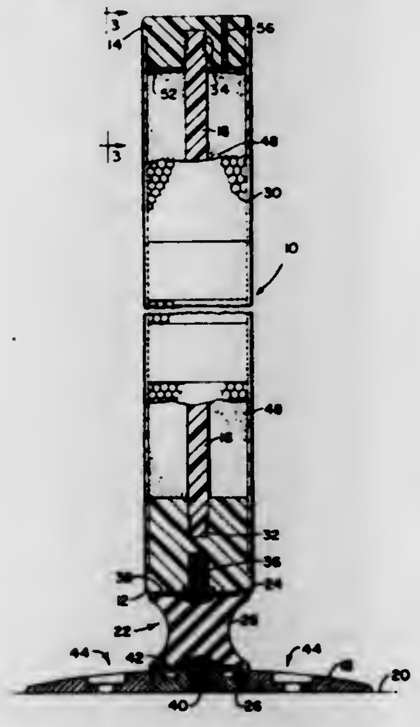
4,004,545
BOUNDARY MARKER

John Francis O'Donnell, Peoria, Ill., assignor to G.L.P. Company, Peoria, Ill.

Continuation-in-part of Ser. No. 560,187, March 20, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,161

Int. Cl.² E01F *9/10*

U.S. Cl. 116—63 P **15 Claims**



1. A boundary marker, comprising

a base member adapted to be attached to a fixed support surface,

a substantially rigid elongate hollow cylindrical pole member having first and second end caps adapted to close the respective ends of said cylindrical pole member,

a substantially rigid rod member within said cylindrical pole member and interconnecting said first and second end caps,

said cylindrical pole member being filled with a solidified foam between said end caps and around said rod member, and

a solid unitary flexible support member interconnecting said base member and said first end cap.

4,004,546
ILLUMINATED INDICATOR GAUGE

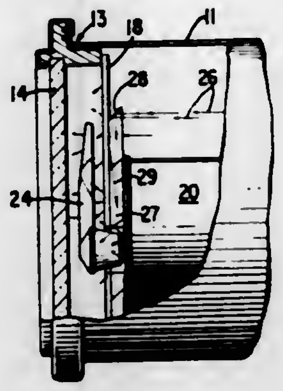
Philip W. Harland, Perkasie, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed May 2, 1975, Ser. No. 573,920

Int. Cl.² G01D *13/04, 13/22*

U.S. Cl. 116—129 L **6 Claims**

1. In an illuminated indicator instrument, the combination of a casing having an open end closed by a viewing window, a translucent dial spaced inwardly of said window, said dial having indicia thereon, a movement within said casing inwardly of said dial and a pointer between said dial and window operatively connected to said movement, a light source within said casing toward the rear thereof and laterally of said movement, and a light conducting prism between said movement and said dial having a beveled surface at an upper edge thereof spaced from the edge of said dial to receive light directly from said light source, said beveled surface reflecting light transversely therethrough by said beveled surface and a portion of said dial receiving light directly from said source and passing light directly therethrough to illuminate the pointer and dial.



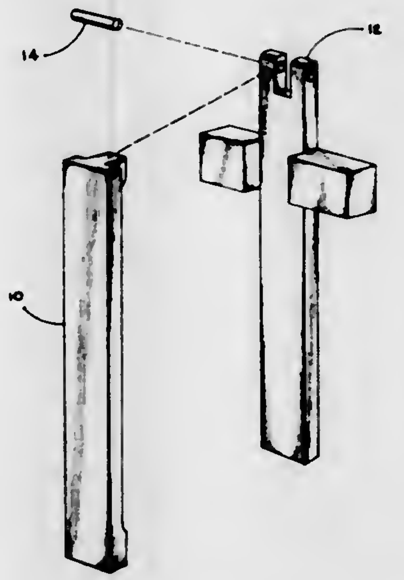
4,004,547
CHRISTIAN DOOR KNOCKER

James M. Todd, North Ridgeville, Ohio, assignor to Reigning Spirit of Truth, North Ridgeville, Ohio

Filed May 9, 1975, Ser. No. 576,097

Int. Cl.² G10K *1/10*

U.S. Cl. 116—148 **1 Claim**



1. A door knocker comprising: (a) an elongated base for mounting on the outer surface of a door said base consisting of a transverse piece having an outer surface and a recessed portion and an upright piece having a back face abutting the outer surface of the door, a front face and a top; and (b) a knocker element having a knocking surface and an outer surface, said knocker element being disposed longitudinally coextensive to the front face of the upright piece and having one end connected to the top half of the upright piece for swinging movement of the knocker element toward and away from the upright piece of the base and within the recessed portion of the transverse piece to strike the front face of the upright piece with the knocking surface, wherein the outer surface of the transverse piece and the outer surface of the knocking element are in the same plane.

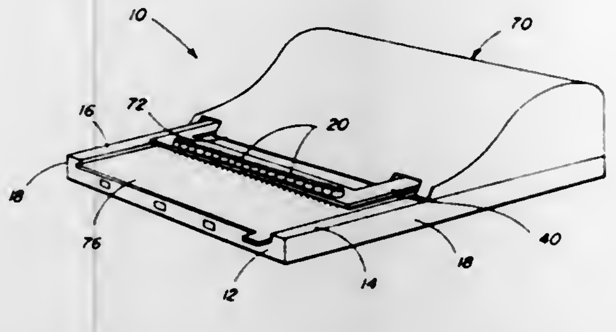
4,004,548
CHROMATOGRAPHIC SPOTTER

Frank M. Smola, and Henri E. Breton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 592,704, July 2, 1975, abandoned. This application Sept. 15, 1975, Ser. No. 613,382

Int. Cl.² B05C *1/02*

U.S. Cl. 118—58 **13 Claims**



1. In an apparatus for simultaneously applying a plurality of small spots of solution to a substrate, the apparatus including supporting means for supporting the substrate in a generally planar orientation, a plurality of containers each having a reservoir portion and a tip portion provided with a capillary exit passage fluidly connected to the reservoir portion,

a mounting member having a plurality of apertures, each of said containers being mounted in one of said apertures,

and means for repeatedly moving said tip portions into momentary contact with the same area of the substrate;

the improvement wherein at least the tip portion of said each container and said member are mounted with respect to each other so as to permit substantial relative axial movement between said tip portion and the member aperture when the member is urged toward the substrate and the container contacts the substrate, whereby contact pressure between said container and said substrate is minimized.

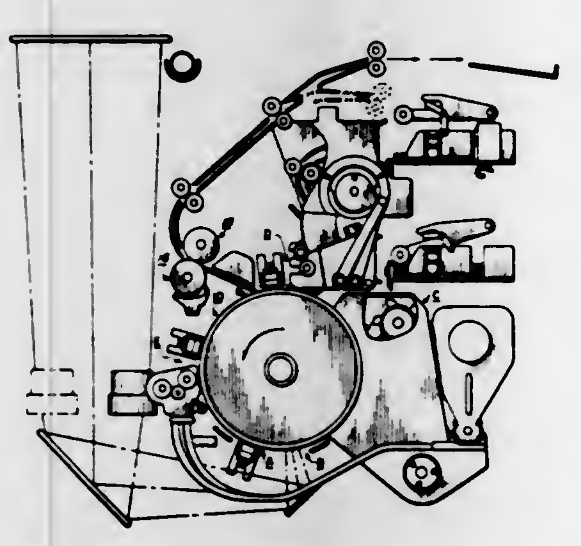
4,004,549
ROLL FUSER

Miles Davis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 10, 1975, Ser. No. 630,378

Int. Cl.² B05C *11/00*

U.S. Cl. 118—60 **6 Claims**



1. Roll fuser apparatus for fixing toner images to support material including a heated fuser structure and a resilient backup member cooperating with said heated fuser structure to form a nip through which said support material passes with the toner images carried thereby contacting the heated fuser structure wherein:

said heated fuser structure comprises a rigid conductive core;

an elastomeric layer affixed to the outer surface of said rigid core and impregnated with release agent material;

means disposed internally of said rigid core for elevating the temperature of the surface of said elastomeric layer to a degree sufficient for softening toner of said toner images; and

said rigid core having a non-uniform cross section adjacent its outer surface and said elastomeric layer having a non-uniform cross section adjacent its inner surface, said non-uniform cross sections being complementary one to the other whereby said elastomeric layer comprises alternately thick and thin portions wherein the thick portions are adapted to provide a greater quantity of release agent material than the thin portions and the thin portions are sufficiently thin to provide minimal impedance to thermal energy flowing from within said core to the outer surface of said elastomeric layer.

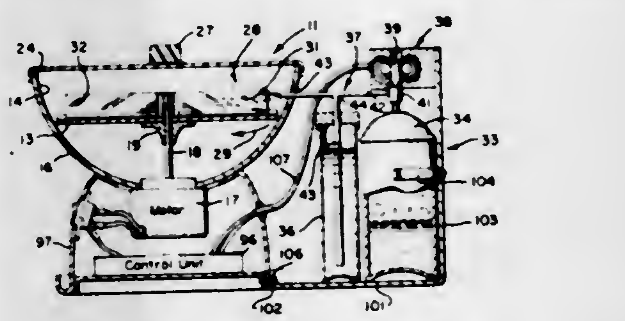
4,004,550
APPARATUS FOR PREPARING MICROSCOPE SLIDES

Ronald D. White, 6466 Saipan St., Cypress, Calif. 90630, and John F. Gibson, 543 Cerritos Ave., Long Beach, Calif. 90802

Continuation of Ser. No. 419,947, Nov. 29, 1973, abandoned. This application Apr. 4, 1975, Ser. No. 565,149

Int. Cl.² B05C *11/10, 5/00*

U.S. Cl. 118—314 **5 Claims**



1. An apparatus for automatically preparing microscope slides having blood smear specimens or the like on a face thereof comprising:

a base;

rotatable slide carrier means rotatably mounted on an axis on said base and including a planar support surface substantially perpendicular to said axis and having a plurality of slide holder means thereon for receiving and removably holding a corresponding plurality of specimen slides in which the faces thereof are substantially perpendicular to the planar support surface;

electrical motor drive means for rotating said carrier means relative to said base;

spray means disposed adjacent said rotating carrier means and stationary with respect to said base for producing an atomized spray of a slide preparation solution in the proximity of the rotating slides to cause the atomized solution to be deposited on the faces of the slides over the specimen when the slide is brought into register with the spray means, said spray means including a spray nozzle having a spray axis positioned relative to said carrier means such that the nozzle axis lies in a plane substantially parallel to the plane of the support surface and that the portion of the spray pattern produced by the nozzle which lies within the parallel plane of the nozzle is located within the lateral confines of the slide which intercepts the spray pattern, said nozzle forming a time varying acute angle with the slide brought into register therewith so that said spray moves across the face of the slide during the movement of the latter;

electrically operated spray actuator means associated with said spray means for selective actuation thereof to produce said spray; and electrical control means including a timing means connected to said motor drive means and to said spray actuator means for selective timed energization thereof including a timed spray mode in which said motor drive means and said spray actuator means are jointly energized and a timed drying mode in which only said motor drive means is energized.

4,004,551
BREEDING AQUARIUM HAVING FILTERING CHAMBER THEREIN

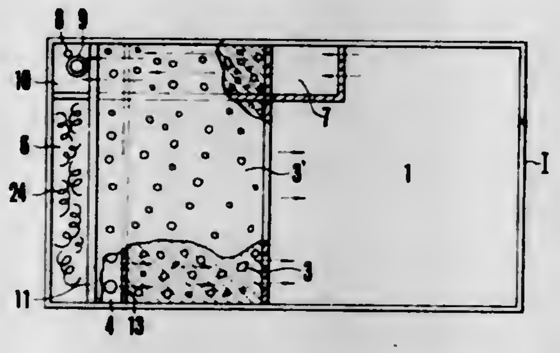
Yukio Kato, No. 2-1, Hanegi 2-chome, Setagaya, Tokyo, Japan

Filed May 23, 1975, Ser. No. 580,142

Claims priority, application Japan, Jan. 30, 1975, 50-12979; Jan. 30, 1975, 50-12978; Jan. 30, 1975, 50-12977

Int. Cl.^{2} A01K *63/00*

U.S. Cl. 119—5 **9 Claims**



1. An aquarium, comprising a rectangularly block shaped tank having a bottom, substantially vertical side walls and substantially vertical end walls, a first substantially vertical partition plate coextensive in width with said end walls and spaced from said one side wall and defining a vertically elongated feed chamber with said one side wall on one side, said tank defining a breeder chamber on the opposite side of said partition plate from said one side wall, a second angled substantially vertical perforated second partition plate disposed alongside said first partition plate in said breeder chamber and having a first wall portion much shorter than and spaced away from said first partition plate and a second top portion extending from the top of said first wall portion to said first partition plate and enclosing an open spaced chamber between said second partition plate and said first partition plate, at least one third partition plate having openings therethrough and being coextensive in width with said end walls and spaced from said second partition plate in the direction of the opposite one of said side walls and being much shorter in height than said first partition plate and defining a filtering chamber at least partly overlying said second top portion and partly extending laterally of said first wall portion, a filtering material in said filtering chamber, a water lift tube disposed in said feed and having a bottom opening spaced upwardly from the bottom of said tank and a top opening spaced downwardly from the top of said tank, a fluid blast tube connected from the exterior of said tank into the lower portion of said lift tube and providing a blast of fluid into said tube whereby to produce an upward flow therein and the discharge of liquid at the top of said lift tube into said feed chamber, said feed chamber communicating adjacent its lower end with said free spaced chamber so that the increased head in said feed space produced by said blast tube causes a flow into said free space and upwardly and horizontally through said filtering chamber and through the openings in said third partition plate in accordance with the resistance of the filtering material in said filtering chamber, and means defining a reflex flow path adjacent the bottom of said tank for flow of liquid from said breeding chamber, through said filtering chamber and into said feed chamber adjacent the lower end thereof.

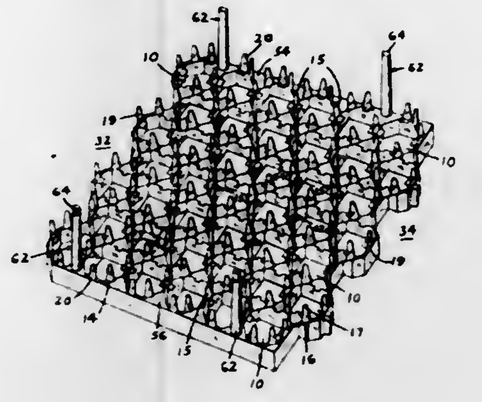
4,004,552
EGG INCUBATING TRAY WITH RAÇK AND SLIDE

Gerd Levin, Ernst August Str. 13A, Hamburg 52, Germany

Continuation-in-part of Ser. No. 480,294, June 17, 1974, abandoned. This application June 9, 1975, Ser. No. 584,739

Int. Cl.^{2} A01K *41/00*

U.S. Cl. 119—43 **30 Claims**



1. An egg incubating tray comprising:

means defining a plurality of parallel rows of egg cells, said rows being positioned to longitudinally offset the cells in alternate rows by substantially half the length of a cell from the cells in other proximate rows,

an extremost egg cell in said alternate rows projecting by substantially half the length of a cell beyond the extremost cell in the other proximate rows to define a jagged edge of said tray,

said jagged edge defined such that a second egg incubating tray having a jagged edge interfits with said egg incubating tray with the extremost egg cells in said alternate rows fitting between extremost projecting egg cells in said second egg incubating tray and the extremost projecting egg cells in said second egg incubating tray fitting between the extremost egg cells in said alternate rows.

4,004,553
HEAT TREATING APPARATUS FOR LIQUIDS

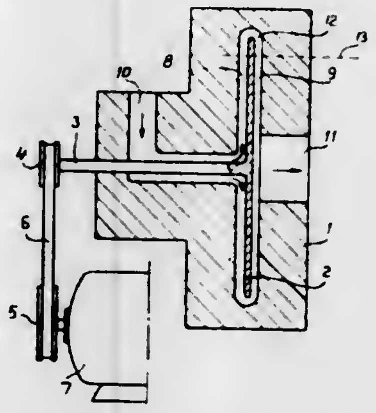
Lennart Arvid Stenstrom, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 19, 1975, Ser. No. 559,664

Claims priority, application Sweden, Mar. 25, 1974, 74039637

Int. Cl.^{2} F22B *3/06*

U.S. Cl. 122—26 **20 Claims**



1. Apparatus for heat treatment of a liquid at a predetermined temperature, the apparatus comprising at least two members and driving means for rotating at least one of the members relative to the other around a rotational axis, said members forming between them a narrow passage extending around the rotational axis and serving for through-flow of said liquid, said driving means being operable to effect relative movement between the walls defining the narrow passage, whereby liquid flowing through the passage is heated by internal friction in the liquid, said passage, as viewed in a section along the rotation axis, having a liquid inlet spaced from said axis and extending from said inlet, via a point spaced a greater distance from said axis than is said inlet, to a liquid outlet located closer to said axis than is said point, the apparatus being characterized in that one of said members is heat conducting and operable to transfer heat from liquid situated in the passage, and which has passed the passage part farthest from said axis, to liquid also situated in the passage but which is on its way to the passage part farthest from said axis, said members being formed so that most the temperature rise of the liquid flowing through said passage is caused by heat transfer through said heat conducting member, and so that the liquid is heated by internal friction substantially in a small part of the passage located farthest from the rotation axis, thereby providing for a rapid and uniform heat treatment of liquid at high temperature, including heating and subsequent cooling of the liquid.

4,004,554
FUEL CONVERTING METHOD AND APPARATUS

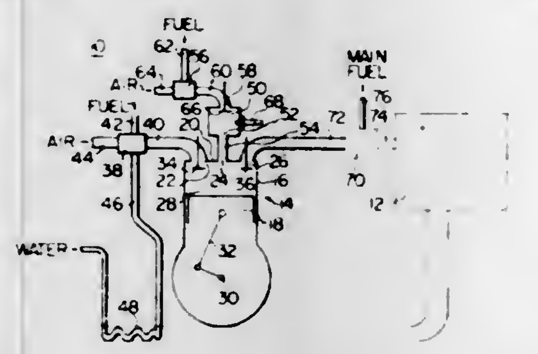
Katuaki Kosaka, Tokyo; Zene Ueno, Fuchu, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 20, 1975, Ser. No. 551,382

Claims priority, application Japan, Feb. 26, 1974, 49-22677

Int. Cl.^{2} F02B *43/08*

U.S. Cl. 123—3 **11 Claims**



1. A method of converting a fuel into a free hydrogen containing gas, comprising the steps of filling a first space with a base mixture of fuel, oxidant and water having a predetermined ratio to each other, compressing said base mixture, filling separately a second space with a combustible mixture of fuel and oxidant having a predetermined ratio to each other, igniting said combustible mixture to produce a flame, spurting said flame into said compressed base mixture, causing conversion of said base mixture into a free hydrogen containing gas and expansion of said free hydrogen containing gas by heat of said flame, making said free hydrogen containing gas perform work during expansion of said gas, accumulating said work performed by said free hydrogen containing gas as power for compressing said hase mixture.

4,004,555
ROTARY PISTON INTERNAL COMBUSTION ENGINE HAVING A HEAT TRANSFER PHASE

Dragan Bukatarevic, 75, Lionel Road, Brentford, Middlesex, England

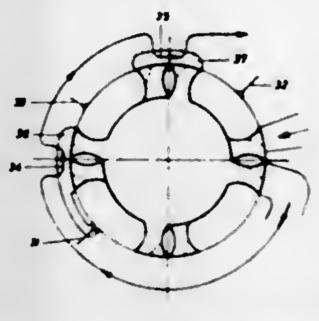
Filed Mar. 17, 1975, Ser. No. 558,739

Claims priority, application Yugoslavia, Apr. 1, 1974, 898/74

Int. Cl.^{2} F02B *53/00*

U.S. Cl. 123—8.05 **6 Claims**

1. A rotary internal combustion engine comprising an annular cylinder; two co-axial rotors; at least three equi-spaced pistons carried by each rotor and alternately disposed in the cylinder; inlet means, exhaust means and ignition means; rotor constraining means for constraining the rotors, in use, to undergo cyclic counterphased variations in speed such that the pistons of the two rotors alternately approach and recede from each other and the expansion, exhaust, induction and compression phases of a combustion cycle can be carried out between the pistons making use of the inlet, exhaust and ignition means; means for providing at least one charge-transfer phase in the combustion cycle between induction of a charge and its compression; a transfer port disposed in said cylinder through which each charge transfer past a given piston is effected by a following piston as the given piston is moving slowly in the course of its speed variation, the number of charge transfer phases in each combustion cycle being equal to the number by which the number of pistons on each rotor exceeds two; and at least one exhaust-heat exchanger for the passage therethrough of the transferred charge, the said rotor constraining means including a mainshaft coaxial with the rotors; at least one mainshaft gear eccentrically mounted on the mainshaft; a plurality of intermediate shafts; intermediate gears mounted on the intermediate shafts and meshing with the said at least one mainshaft gear; phase-control shafts connected to be driven by the rotors; phase-control gears mounted on the phase-control shafts and meshing with the intermediate gears; the speed relation between rotors and mainshaft being $x:1$ where x is the number of pistons in each rotor, and each intermediate shaft, while free bodily to approach and recede from the axis of the mainshaft as it rotates, being maintained at a constant axial spacing from said at least one mainshaft gear on the one hand and the respective phase control shaft on the other hand.



4,004,556
ROTARY INTERNAL COMBUSTION ENGINE OF AXIALLY SLIDING VANE TYPE

Rolf Alfons Pfeiffer, 144 Quebec Ave., Toronto, Ontario, Canada M6P-2T7

Continuation-in-part of Ser. No. 68,613, Sept. 1, 1970, abandoned. This application Feb. 16, 1973, Ser. No. 333,010

Claims priority, application Germany, Sept. 8, 1969, 1945388

Int. Cl.^{2} F02B *55/14;* **F01C** *1/00;* **F04C** *17/00;* **F01C** *21/00*

U.S. Cl. 123—8.45 **5 Claims**

1. A rotary machine which comprises.

i. a stator housing including axially spaced apart first and second side walls with opposed radially extending annular surfaces of spaced corresponding annular and generally sinusoidal configuration in the direction of the rotary axis thereof having a substantially constant axial separation;

ii. an inner wall extending between said first and second side walls of said stator housing and having a cylindrical peripheral outer surface;

iii. an outer wall extending between said first and second side walls of said stator housing and having a cylindrical peripheral inner surface generally parallel to said cylindrical peripheral outer surface of said inner wall;

iv. a rotary shaft journalled in said stator housing for rotation therein;

v. rotor means connected to said rotor shaft and extending from said inner wall to said outer wall and between said first and second side walls of said stator housing in axially spaced apart disposition thereto so as to define with said

  a. annular surfaces of said first and second side walls of said stator housing, with said

  b. cylindrical peripheral outer surface of said inner wall and with said

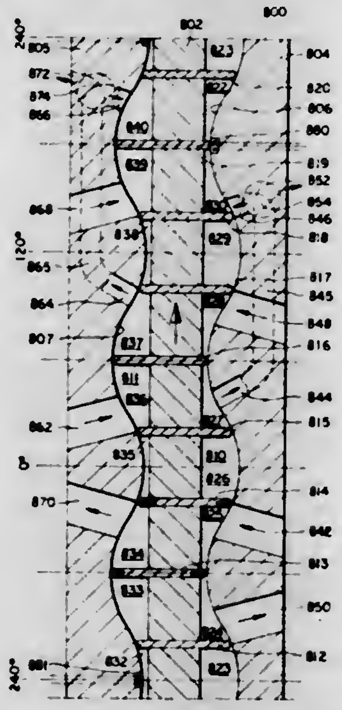
c. cylindrical peripheral inner surface of said outer wall, first and second continuous and essentially mutually isolated stator chambers on opposite axial sides of said rotor body;

vi. a plurality of vanes axially movably supported in said rotor means and extending between said annular surfaces of said first and second side walls of said stator housing and between said cylindrical peripheral outer surface of said inner wall and said cylindrical peripheral inner surface of said outer wall to divide each of said first and second stator chambers into a plurality of essentially mutually isolated compartments;

vii. a fluid inlet passage in said stator housing and in fluid communication with at least one of said stator chambers for the sequential supply of a fluid material to individual ones of said compartments of said stator chamber on rotation of said rotor means in said stator housing; and

viii. a fluid discharge passage in said stator housing and spaced apart from said fluid inlet passage and in fluid communication with said stator chamber for the sequential discharge of fluid material from individual ones of said compartments of said stator chamber;

whereby, on rotation of said rotor means within said stator housing, said vanes and said rotor means undergo relative axial movement to cause variation in the volumes of said



compartments of said stator chamber and to cause, in turn, fluid material introduced sequentially into said compartments of said stator chamber through said fluid inlet passage to be discharged sequentially from said compartments of said stator chamber through said fluid discharge passage; and in which each of said first and second side walls of said stator housing is formed with three said complete and generally sinusoidal configurations, each said side wall including first, second and third crest disposed in close proximity to but axially spaced apart from said rotor means, which machine additionally includes a first ignition means operatively associated with said stator chamber in general proximity to the third crest of said first side wall and in which a discharge passage and a first inlet passage communicate with said stator chamber on opposite sides of said first crest and in which a second discharge and a second inlet passage communicate with said stator chamber on opposite sides of said second crest and in which a third inlet passage communicates with said stator chamber at said third crest, said second discharge passage at said second crest and said third inlet passage at said third crest being in fluid communication through a transfer passage extending through said stator housing whereby on rotation of said rotor means fluid material being introduced sequentially into said compartments of said stator chamber through said first inlet passage and discharged through said second discharge passage into said transfer passage and fresh fluid material being introduced into said compartments through said second inlet passage with subsequent further supply of said fluid material from said transfer passage through said third inlet passage so as to increase the volume of fluid material supplied to said compartments, said fluid material being discharged through said first discharge passage, whereby said stator chamber can operate on a 4-stroke cycle.

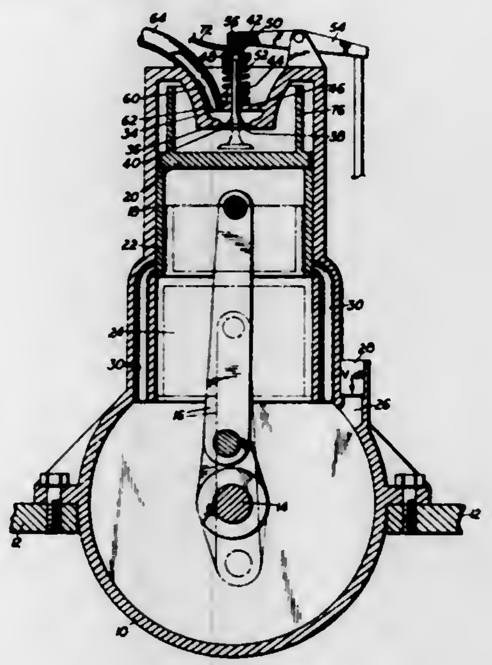
4,004,557
PISTON-CYLINDER ASSEMBLY

Otto H. Acker, Box 2, Washougal, Wash. 98671

Filed June 4, 1975, Ser. No. 583,684

Int. Cl.² F02D *39/04*

U.S. Cl. 123—65 VC **1 Claim**



1. A piston-cylinder assembly for internal combustion engines comprising a cylinder having cylinder walls and means defining a top firing chamber, a crankcase communicating with said cylinder, a drive shaft in said crankcase, a piston in said cylinder operably connected to said drive shaft and arranged for reciprocating movement in said cylinder between upper and lower positions, a cup-like extension in said cylinder depending into said firing chamber, said piston having a top end wall, a depending skirt portion integral with said end wall and an upwardly extending tubular baffle integral with said end wall, said tubular baffle being of smaller diameter than said piston but of larger diameter than said cup-like extension whereby to receive the latter in the upper position of said piston, valve means mounted in said extension and cooperating with said cylinder for controlling the inlet of fuel and for scavenging exhaust gases, air passageway means extending from said crankcase to an upper portion of said cylinder which is above the top end wall of said piston and in the area of said baffle in said down position of said piston, and valve controlled air inlet means in said crankcase.

4,004,558
HYDRAULIC LASH ADJUSTER OIL METERING VALVE

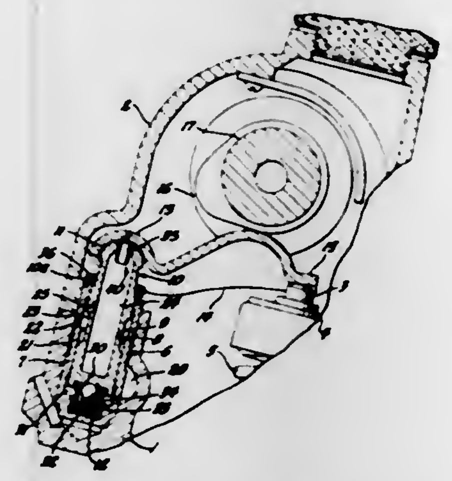
Elias W. Scheibe, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 2, 1975, Ser. No. 609,600

Int. Cl.² F01M *9/10*

U.S. Cl. 123—90.35 **3 Claims**

1. In a hydraulic lash adjuster, a cylindrical outer dash pot body, a hollow plunger telescopically received in said outer dash pot body with one end of said plunger extending outward from said outer dash pot body, said one end terminating in a semi-spherical end having an axial extending passage means therethrough to the interior of said plunger, the interior of said plunger constituting a reservoir for supplying fluid to said outer dash pot body inwardly of said plunger and for delivery out through said passage and, a metering valve for controlling flow from the interior of said plunger outward through said passage, the improvement wherein said passage means includes a first bore portion extending from the outer surface of said semi-spherical end, a second bore portion of a smaller diameter than said first bore portion, said first bore portion and said second bore portion meeting coaxially with an intervening inclined shoulder providing a valve seat and, wherein said metering valve includes an annular head with a depending, hollow shank extending from one side thereof, said shank having a first shank portion next adjacent said head of a predetermined axial length greater than the axial length of said passage and having an outside diameter less than the inside diameter of said second bore portion to provide an oil metering passage between said first shank portion and the inside diameter of said second bore portion, said shank further having a second shank portion next adjacent the free end thereof, said second shank portion having a major outside diameter greater than the inside diameter of said second bore portion, said head being of a diameter larger than the outside diameter of said first portion of said shank, both the diameter of said head and said major outside diameter of said second shank portion being less than the diameter of said first bore portion.



4,004,559
ALARM DEVICE FOR USE IN EXHAUST GAS RECIRCULATING SYSTEM

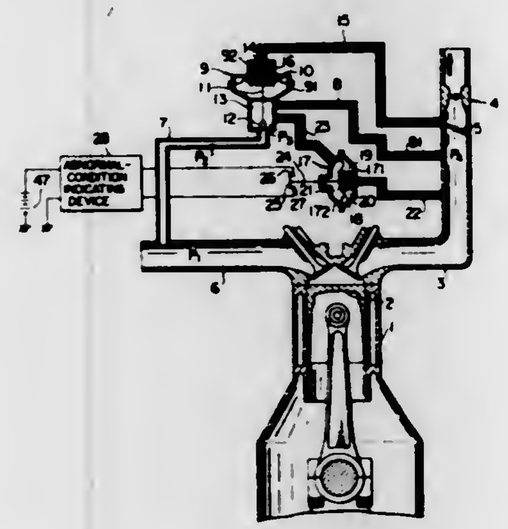
Tomo Itoh, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 5, 1974, Ser. No. 521,095

Claims priority, application Japan, Nov. 9, 1973, 48-125305

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. In an exhaust gas recirculating system including an exhaust gas recirculating passage for introducing a final portion of an exhaust gas from an internal combustion engine into a suction system of an engine and an exhaust gas control valve driven by action of a negative pressure in the vicinity of a throttle valve for metering the exhaust gas in the recirculating passage, an alarm means for detecting abnormal exhaust gas recirculation in the recirculating system and issuing an alarm signal comprising:

means for comparing pressures between the recirculating passage portion downstream from said control valve and the suction system of an engine,

means for detecting actuation of said control valve driven by action of a negative pressure applied to said control valve,

signal control means operable in response to signals from said comparing means and said detecting means, and

abnormal recirculation indicating means associated with said control signal whereby said control signal means actuates said abnormal recirculation indicating means both when an excess exhaust gas is recirculated and when no exhaust gas is recirculated at a time when recirculation is desired

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4,004,560
INTERRUPTER FOR THE IGNITION SYSTEM OF INTERNAL COMBUSTION ENGINES

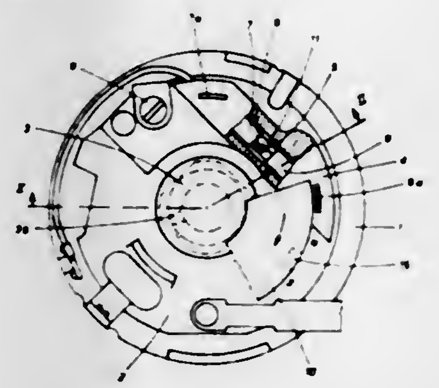
Josef-Heinrich Brungsberg, Ludenscheid, Germany, assignor to Brown, Boveri & Cie A. G., Mannheim, Germany

Continuation of Ser. No. 432,367, Jan. 10, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 621,918

Claims priority, application Germany, Jan. 18, 1973, 2302287

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **1 Claim**



1. An interrupter for ignition systems of internal combustion engines including

a. a fixed, normally open reed-type switch having a pair of relatively movable contacts enclosed in a gas-tight envelope for controlling the primary circuit of an ignition coil;

b. a rotatable magnet system for operating said reed-type switch, said magnet system having a plurality of spaced alternating zones of opposite magnetic polarity;

c. a shaft supporting said magnet system arranged at right angles to the axis of said reed-type switch;

d. a pair of magnetizable reed-energizing elements each having one end immediately adjacent to one of said pair of contacts of said reed-type switch and another end remote from said pair of contacts of said reed-type switch and immediately adjacent to the trajectory of said zones of opposite magnetic polarity of said rotatable magnet system; wherein the improvement comprises in that

e. the rotatable magnet system is substantially in the shape of a toroid consisting of magnetic particles and an insulating binder therefor and radially magnetized so as to form a plurality of sectors each having opposite polarities on opposite ends thereof, contiguous of said plurality of sectors being separated from each other by intervening non-magnetic sectors, said reed-type switch opening and closing during said plurality of sectors of opposite magnetic polarity of said magnet system passes the ends of said reedenergizing elements;

- f. said reed-type switch is housed for itself inside a separate socket of insulating material totally enclosing said reed-type switch except the ends of said reed-energizing element, said socket having a pair of slots forming passageways narrowly surrounding and positioning said reed-energizing elements, said reed-energizing elements and said passageways being bent so that the ends of said reed-energizing elements are situated above said reed-type switch in a cylindrical surface juxtaposed to the lateral surface of said rotatable magnet system; and
- g. said socket further supporting a pair of terminals for connecting said reed-type switch into an electric circuit.

4,004,561
IGNITION SYSTEM

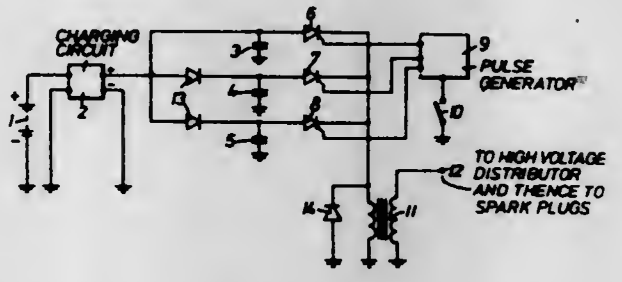
Klaus-Dietrich Thieme, Wedel, Holstein, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 14, 1972, Ser. No. 288,989

Claims priority, application Germany, Sept. 14, 1971, 2145790; Feb. 25, 1972, 2209006; Feb. 25, 1972, 2209007; Feb. 25, 1972, 2209008

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CB **9 Claims**



1. In a high voltage capacitor ignition system having capacitive storage means for storing energy required for developing fuel ignition pulses for the spark plugs of an engine, the system further including charging circuit means connected between the capacitive storage means and a battery for charging the capacitive storage means, ignition transformer means, and switching means coupled between the capacitive storage means and the transformer means for temporarily discharging the capacitive storage means via the transformer means to develop pulses therein for application to each such spark plug in succession, the improvement wherein: said capacitive storage means comprise a plurality of capacitors each connected to receive charging current from said charging circuit means; and said switching means comprise a plurality of thyristors each coupled between a respective one of said capacitors and a common input of said transformer means and arranged to be fired at successive time intervals to discharge said capacitors in succession to apply a succession of fuel ignition pulses to each spark plug, the succession of pulses thus establishing an effective fuel ignition spark duration proportional to the number of said capacitors, each of said thyristors including a firing electrode and a pair of current-carrying electrodes, and said switching means further comprising firing pulse generator means including a clock pulse generator for producing a plurality of successive clock pulses, and means, including shift register means having a clock pulse input operatively coupled to said clock pulse generator means for receiving the clock pulses produced thereby, for feeding each of the successive pulses to the firing electrode of a respective one of said thyristors so that each of said thyristors is fired in turn.

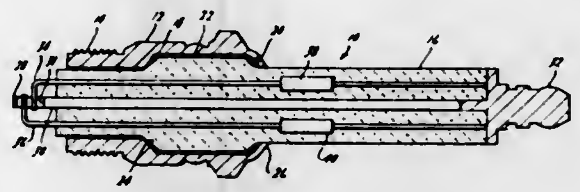
4,004,562
MULTIPLE AIR GAP SPARK PLUG HAVING RESISTIVE ELECTRODE COUPLING

William G. Rado, and Allen H. Turner, both of Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1974, Ser. No. 536,665

Int. Cl.² H01T *13/20*

U.S. Cl. 123—169 MG **8 Claims**



1. A spark plug device for generating a spark within the combustion chamber of a combustion engine comprising in combustion:

a conductive housing means having a generally cylindrical configuration with a threaded portion on an end thereof adapted for attachment to the engine;

an insulting member disposed within said housing;

a first electrode member extending generally through said insulating member and insulated thereby from the housing means and adapted on one end for electrical communication with a source of electrical energy and adapted on another end for sparking;

a second electrode member extending from the threaded end portion of said housing means and arranged to provide a portion thereof, adapted for sparking, in confronting relation to the end of said central electrode adapted for sparking;

a third electrode means positioned intermediate said first and second electrode means cooperative with said first electrode member to define a first air gap and cooperative with said second electrode member to define a second air gap, said second air gap being generally colinear with said first air gap; and

high resistance coupling means electrically conductively connected to said third electrode means arranged to provide a high resistance electrical connection between said third electrode means and the source of electrical energy whereby said first and second air gaps will break down electrically in sequence.

4,004,563
SPARK IGNITION ENGINE USING LEAN AIR-FUEL MIXTURE

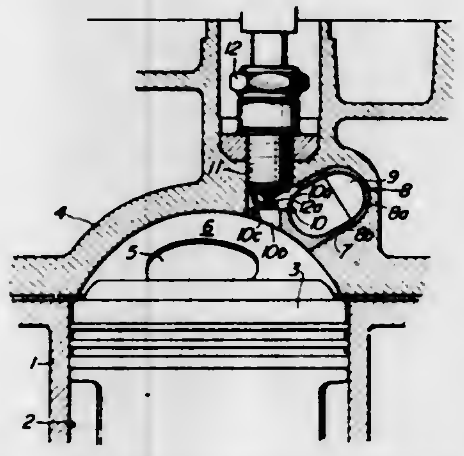
Norihiko Nakamura, Mishima, and Fujio Nakayama, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 26, 1974, Ser. No. 527,301

Claims priority, application Japan, Aug. 24, 1974, 49-97354

Int. Cl.² F02B *19/12*

U.S. Cl. 123—191 S **6 Claims**



1. An internal combustion engine comprising a cylinder, a cylinder head attached to one end of said cylinder, a piston

slidably fitted within said cylinder, a main combustion chamber defined between the inner surface of said cylinder head and the top surface of said piston, a recess provided on the inner surface of said cylinder head, an auxiliary chamber element securely fitted into said recess and defining therein an auxiliary combustion chamber, a passage means communicating said auxiliary combustion chamber with said main combustion chamber, and a spark plug having its spark gap exposed in said passage means, whereby a part of the air-fuel mixture sucked into said main combustion chamber is pushed through said passage means into said auxiliary combustion chamber in the compression stroke and ignited by said spark plug and the flame thus produced burns through said passage means the air-fuel mixture in said main combustion chamber, the improvement in which said passage means comprises a first passage which opens into said auxiliary combustion chamber and a second passage which opens into said main combustion chamber, said first and second passages intersecting at an angle with each other.

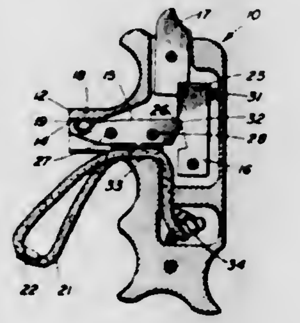
4,004,564
BOW STRING RELEASE

Leon H. Castonguay, Wheelright, Mass., assignor to Astratronics, Inc., Wheelwright, Mass.

Filed June 26, 1975, Ser. No. 590,637

Int. Cl.² F41C *19/00*

U.S. Cl. 124—35 A **6 Claims**



1. A bow string release, comprising:

- a. a housing,
- b. a nib moveably mounted in the housing between a first position in which a bow string is held and a second position in which the bow string is released, the nib being biased by the bow string toward the second position when the bow string is released, the nib being mounted on a nib bar and the nib bar being pivotally mounted to the housing,
- c. a lock mechanism mounted in the housing, the locking mechanism including a sear and an actuator, extremely small movement of the actuator causing extremely small movement of the sear from a lock position in which the nib is held in its first position by the sear to a release position in which the nib is released by the sear, the nib bar carrying the nib at one end, being pivoted at an intermediate portion and carrying an edge at a second end, wherein the sear bar is mounted in the housing for movement away from the nib bar, the sear bar having a sear which overlap the edge of the nib bar from time to time to hold the nib bar from pivoting, the amount of overlap being extremely short and the sear being moveable away from the edge with the sear bar to end the overlap between the sear and the edge, the sear bar having a first end, a second end and an intermediate portion and being pivotally mounted in the housing by its first end, with the sear on its intermediate portion, and wherein the actuator has a first end, an intermediate portion and a second end, and the actuator being pivotally mounted in the housing at its intermediate portion with its first end engaging the second end of the sear bar and its second end extending outwardly of the housing.

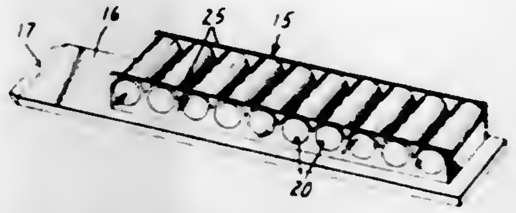
4,004,565
CLIP FOR SUPPLYING IMPLANT PROJECTILES

Earl Lee Fischer, Bentonville, Ark., and Jay W. Gould, III, Bloomington, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1975, Ser. No. 567,495

Int. Cl.² F41C *25/00*

U.S. Cl. 124—45 **18 Claims**



1. A clip for hygienic ballistic implant projectiles containing a biologically active material comprising:

a rectangular structure having a plurality of chambers with parallel axes and indexing means associated with each of said chambers for use in registering said chambers in a gun and indexing the chambers seriatim,

ballistic implant projectiles containing a biologically active material positioned in said chambers, and

mechanically rupturable sealing means at each end of each of said chambers for individually isolating each of said chambers from the ambient environment and so that a device may penetrate the sealing means at one end of a chamber and force the projectile through the sealing means and out the chamber at the other end of the chamber.

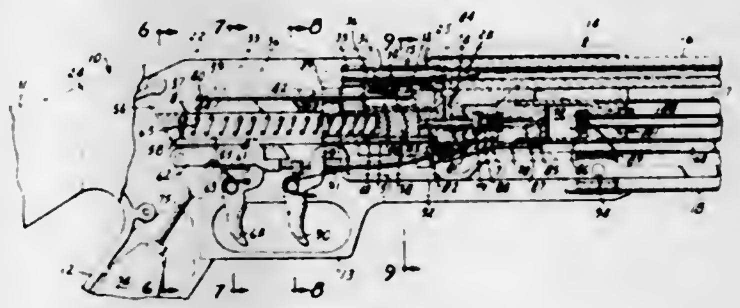
4,004,566
CLIP AND INDEXING MECHANISM FOR A GAS-OPERATED GUN

Earl Lee Fischer, Bentonville, Ark., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1975, Ser. No. 567,496

Int. Cl.² F41B *11/00*

U.S. Cl. 124—59 **10 Claims**



1. A gun comprising:

a housing,

a barrel on said housing for receiving a projectile;

a breechblock for sealing one end of the barrel, said breechblock being reciprocally mounted in said housing and having obturator means for placing the projectile in the barrel;

hammer means movable within said housing for firing a said projectile, said hammer means being moved to the cocked position upon reciprocation of the breechblock;

indexing means for advancing a clip in said housing to position successive chambers with projectiles therein in alignment with said barrel and the path of said obturator means, and

disabling means to prevent operation of said indexing means to advance said clip upon subsequent reciprocation of said breechblock when said hammer means is in said cocked position, whereby said clip cannot be advanced by said indexing means and additional projectiles placed in the barrel until the first projectile is fired.

4,004,567

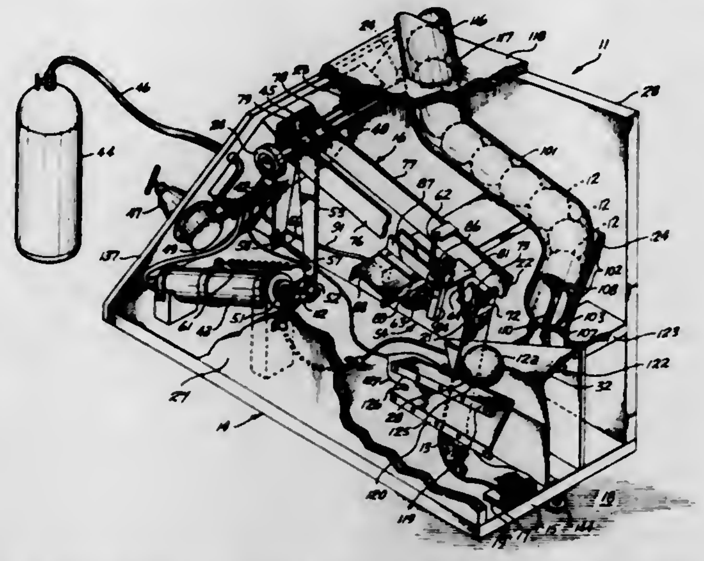
APPARATUS AND METHOD FOR AUTOMATICALLY PROPELLING GAME BALLS FOR PRACTICE

Michael L. Henderson, 3505 E. John, Seattle, Wash. 98102

Filed June 6, 1975, Ser. No. 584,619

Int. Cl.^{2} F41B *11/00*

U.S. Cl. 124—61 **16 Claims**



1. An apparatus for propelling tennis balls with spin so as to simulate the action of a tennis ball delivered by a spin imparting tennis racket stroke, comprising in combination:

- support means for providing a support;
- an elongate, pliable, ball propelling member having longitudinally spaced apart portions and defining a ball engaging and propelling surface thereon lying between said portions;
- member tensioning means mounted on said support means and connected to said portions of said member for differentially displacing said member portions relative to said support means to flex said member between a slackened, looped condition and a tensioned, generally straightened condition and simultaneously cause longitudinal displacement of said surface of said member relative to said support means;
- control means operatively associated with said member tensioning means for operating said tensioning means to repetitively displace said member portions to repetitively flex said member;
- ball feeding means adapted for receiving a plurality of tennis balls for successively feeding the balls one at a time to said surface of said member each time said member is disposed in said slackened, looped condition; and
- said ball engaging and propelling surface of said member being selected to effect frictional engagement with the exterior surface of each tennis ball when fed into contact therewith so as to impart spin to such tennis ball in reaction to said longitudinal displacement of said surface of said member as said member simultaneously propels the ball by reason of the flexure of said member toward said tensioned, straightened condition.

13. A method of propelling balls comprising:

- disposing longitudinally spaced apart portions of an elongate pliable member in an initial relatively proximate relationship to cause said member to assume a slackened, looped condition between said portions;
- disposing a ball in a launching position adjacent an inwardly curved surface of said member lying between said portions when said member is in said slackened, looped condition;
- displacing said member portions differentially with respect to said launching position of said ball and toward a relatively distal relationship to flex said member to a tensioned, generally straightened condition propelling said ball outwardly from said surface and simultaneously spinning said ball; and
- wherein said step of displacing said member portions includes the sub-steps of:
- producing a pneumatically powered force;
- storing said pneumatically powered force in an energy storage means operatively connected to said member;
- releasing an impulse of energy from said energy storage means; and
- applying said impulse of energy from said storage means to said member to effect said step of displacing said member portions.

4,004,568

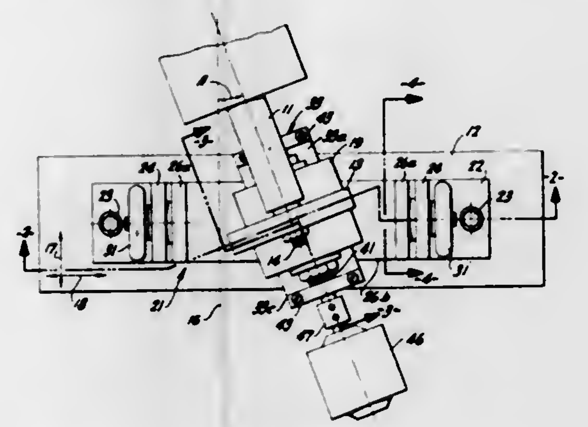
METHOD AND APPARATUS FOR DRESSING REGULATING WHEELS FOR CENTERLESS GRINDERS

Van Q. Maxey, Morgan Hill, Calif., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed July 18, 1975, Ser. No. 597,022

Int. Cl.^{2} B24B *17/02, 53/04*

U.S. Cl. 125—11 TP **12 Claims**



1. In a method for dressing a regulating wheel for use in a centerless grinding machine wherein the regulating wheel is mounted for rotation about an axis inclined at a predetermined angle relative to the axis of a grinding wheel for holding workpieces against the peripheral cutting edge of the grinding wheel and feeding the workpiece in a direction parallel to the axis of said grinding wheel, the steps of: rotating a dressing wheel about an axis inclined relative to a reference axis by an angle corresponding to the predetermined angle, orienting the axis of the regulating wheel in a plane parallel to the axis of the dressing wheel, rotating the regulating wheel about its axis, and effecting relative movement of the rotating wheels in a direction parallel to the reference axis with the outer periphery of the dressing wheel engaging the outer periphery of the regulating wheel for dressing the same.

4,004,569

METHOD AND APPARATUS FOR REMOVING SET MORTAR FROM RECOVERED BUILDING BRICKS

Paul B. Stephens, 1234 South Wabash Ave., Chicago, Ill. 60605

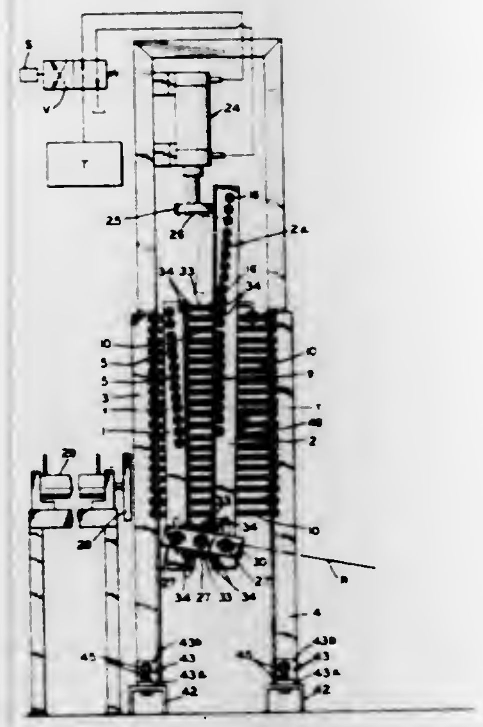
Filed May 19, 1975, Ser. No. 578,628

Int. Cl.^{2} B28D *1/00*

U.S. Cl. 125—26 **17 Claims**

1. A method of removing set mortar from a used building brick which has opposite side faces, opposite edge faces, and opposite end faces, and comprising:

- forcing a used brick, by pressure applied to one end, to travel endwise in one direction, along a predetermined path having four sides, each of which, at each location along its length, is in fixed relation to the other sides, and, as the brick travels along said path, progressively with the travel thereof, applying components of non-yieldable reactive forces to mortar on all of said side and edge faces concurrently, said components being in directions both across and endwise of said path and, in the general planes of each of the associated side and edge faces, respectively, crosswise and endwise thereof;
- during said travel of the brick along said path, progressively increasing said components of reactive forces, after initial application thereof, until the mortar is dislodged or is disintegrated; and



- continuing the travel of the brick and removal of mortar from said side and edge faces until the mortar thereon is removed substantially to its full thickness from the entire side faces and edge faces, respectively.

4,004,570

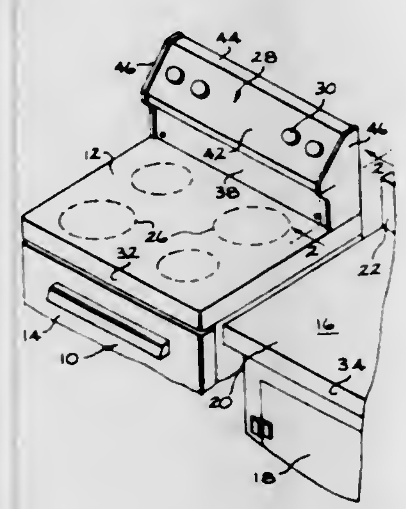
ADJUSTABLE FASTENING MEANS BETWEEN RELATED MEMBERS

Kermit B. Keeling, Sr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 16, 1975, Ser. No. 613,810

Int. Cl.^{2} A47J *49/00;* **F24C** *3/12*

U.S. Cl. 126—214 B **9 Claims**



1. An appliance having a top working surface and an adjustably mounted control housing supported thereon, said control housing being a generally hollow box-like configuration, an adjustable locking means located within the control housing for holding it in place, the locking means including a movable mounting bracket for joining the control housing to the working surface for movement within a given range of positions, the locking means also including a combined generally vertically movable clamp and a generally horizontally movable cam that is capable of acting therewith, and adjusting means cooperating with the cam for shifting it either back or forth, the combined clamp and cam including cooperative inclined means such that whenever the cam moves horizontally, a resultant vertical movement occurs of the clamp, the clamp including flange means for engaging or disengaging the working surface.

4,004,571

ISOMERIZATION FOR PHOTOCHEMICAL SOLAR ENERGY STORAGE

Robert E. Schwerzel, and Richard A. Nathan, both of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed June 30, 1975, Ser. No. 592,030

Int. Cl.^{2} F24J *3/02;* **F24H** *7/00*

U.S. Cl. 126—270 **5 Claims**

1. A process for photochemical collection, storage, and retrieval of solar energy, which process comprises the steps of:

a. exposing a valence isomerizable compound, which is responsive to absorbing solar energy in the visible light spectrum while dissolved, dispersed, or both, in a liquid medium, to solar energy radiation for a time converting by means of an intramolecular cyclization a significant portion thereof to a strained ring structure of higher energy content;

b. retaining the strained ring structure of higher energy content until energy release is desired therefrom; and

c. heating the strained ring structure of higher energy content to a temperature initiating exothermal conversion thereof to its initial molecular structure with release of heat in excess of that requisite for initiating and continuing the conversion and with the heat in excess thereof available for useful thermal energy applications.

4,004,572

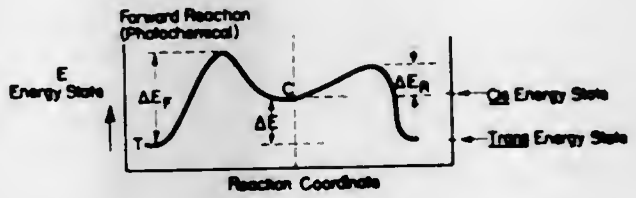
SOLAR ENERGY COLLECTION AND RETRIEVAL EMPLOYING REVERSIBLE PHOTOCHEMICAL ISOMERIZATION

Richard A. Nathan; Robert E. Schwerzel; Albert H. Adelman, all of Columbus, and Robert E. Wyant, Delaware, all of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed June 30, 1975, Ser. No. 592,029

Int. Cl.^{2} F24H *7/00;* **F24J** *3/02*

U.S. Cl. 126—270 **13 Claims**



1. A process for photochemical collection and retrieval of solar energy, which process comprises the steps of:

a. exposing to solar radiation the trans-isomer of a geometrical isomerizable compound for a time sufficient to convert a significant portion thereof to its cis-isomer with the trans-isomer dissolved and/or dispersed in an aqueous liquid medium comprised of at least 50 percent by volume of water, which trans-isomer of the compound possesses the properties of undergoing geometrical isomerization to the cis-isomer upon exposure to light wavelengths between 350 nm and 1200 nm with an absorbance maxima of said light for the cis-isomer at a shorter wavelength than the absorbance maxima of the trans-isomer having the properties of an absorbance maxima lying between the wavelengths of 350 nm and 800 nm;

b. heating the cis-isomer to a temperature initiating a triggering of an exothermal conversion thereof to the trans-isomer with released thermal energy obtained; and

c. containing the exothermal conversion of cis-isomer to trans-isomer through utilization of a portion of the released thermal energy and without additional heat added thereto and with another portion of the released thermal energy transferred from the region of exothermal conversion for availability for useful thermal energy application.

4,004,573

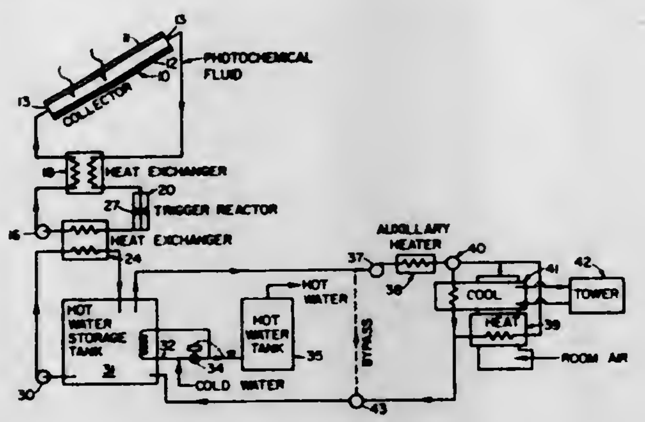
PROCESS AND APPARATUS FOR SOLAR ENERGY COLLECTION AND RETRIEVAL

Donald H. Frieling; Sherwood G. Talbert, and Richard A. Nathan, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 23, 1975, Ser. No. 643,829

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **13 Claims**



1. For collection, retrieval, and utilization of solar energy, a process comprising the steps of:

- a. exposing to solar radiation an isomer of an isomerizable compound contained in a fluid within a collector means adapted for transmission of the solar radiation to the fluid, which isomer is capable of and undergoes isomerization to a higher energy level isomer upon said exposing to the solar energy;
- b. passing the fluid, now containing higher energy level isomer, from the collector means into and through a first heat exchanger to elevate its temperature by transfer thereto of sensible heat from the fluid containing the isomer subsequently flowed into and through the collector means for said exposing;
- c. flowing the fluid, containing the higher energy level isomer and now at an elevated temperature, from the first heat exchanger into a trigger-reactor means capable of initiating and maintaining and which initiates and maintains conversion of the higher energy level isomer to the isomer with exothermic release of thermal energy in excess of an amount of thermal energy requisite for maintaining the conversion;
- d. concurrently and/or immediately subsequent to said conversion, passing the fluid within the trigger-reactor means into and through a second heat exchanger to transfer sensible heat therefrom and to elevate the temperature of a material adapted for storage at an elevated temperature until desiring sensible heat thereof for a useful purpose; and,
- e. after passing through the second heat exchanger, passing the fluid through the first heat exchanger to transfer sensible heat therefrom to the fluid containing higher energy level isomer before the subsequently flowing of the fluid into the collector means for said exposing.

4,004,574

SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT WITH SUN-FOLLOWER AND SOLAR ENERGY SENSING POWER CONTROL AND METHOD

Irwin R. Barr, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.

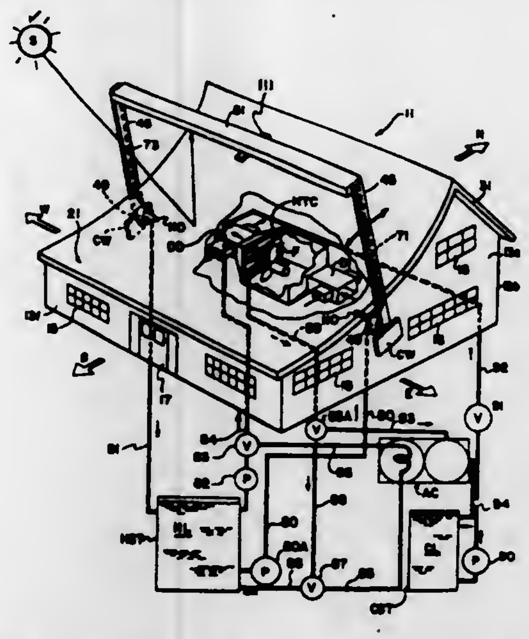
Filed Nov. 20, 1974, Ser. No. 525,545

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **13 Claims**

1. A solar energy concentrating and collecting arrangement, comprising

- a generally upwardly facing concave generally semi-cylindrical reflector-concentrator having a longitudinal axis,
- and a movable solar energy collector mounted for movement above said reflector-concentrator, in a direction transverse to said longitudinal axis,
- differential solar energy-sensing means disposed on said movable collector for movement therewith and in effectively transversely centered relation relative to the effective longitudinal center line of said movable collector and having a differential energy-sensing direction oriented transversely of said longitudinal axis of said reflector-concentrator,
- and means for moving said collector transversely of said longitudinal axis extent of said semi-cylindrical reflector-concentrator as a function of solar energy sensed by said differential energy-sensing means.



4,004,575

APPARATUS FOR LOADING BLOOD EXTRACTING DEVICES

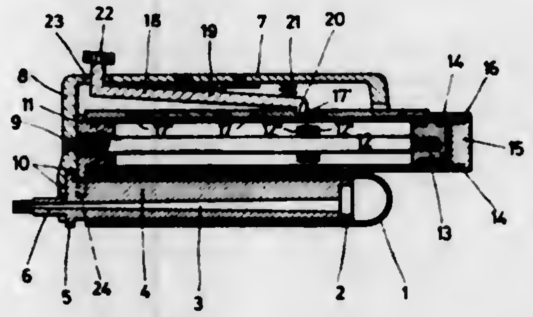
Walter Sarstedt, Numbrecht, Rommelsdorf, Germany, assignor to Walter Sarstedt Kunststoff-Spritzgusswerk, Nuembrecht, Rommelsdorf, Germany

Filed Mar. 27, 1975, Ser. No. 562,613

Claims priority, application Germany, Apr. 2, 1974, 2415835

Int. Cl.² A61B *5/14*

U.S. Cl. 128—2 F **9 Claims**



1. An apparatus for loading blood extracting devices comprising:

- a casing means;
- a pneumatic means connected to said casing means and adapted to assume a manually biased, partially evacuated state and an unbiased less evacuated state;
- a locking means for locking said pneumatic means in said biased partially evacuated state; and,
- a blood extracting device attached to said casing means and to said pneumatic means and adapted to extract blood when said pneumatic means moves from said biased state to said unbiased state.

4,004,576

DIRECT INDICATOR DEVICE FOR DETERMINING THE CARDIAC OUTPUT FLOW RATE ACCORDING TO THE THERMODILUTION METHOD

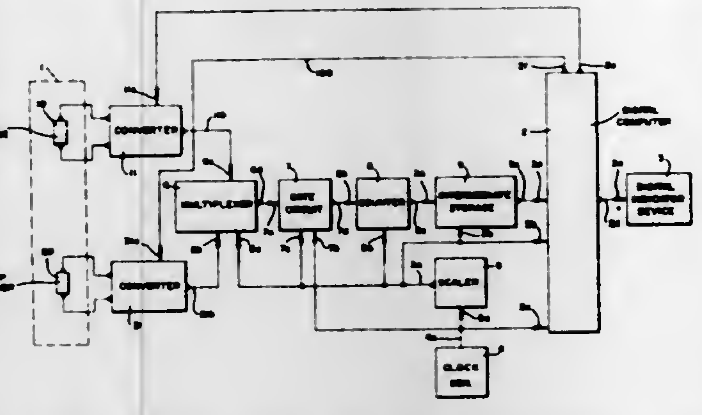
Hermann Gähwiler, Zurich, and Hansjörg Schlaepfer, Winkel, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Apr. 28, 1975, Ser. No. 571,976

Claims priority, application Switzerland, May 24, 1974, 7100/74

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 F **6 Claims**



1. A direct indicator device for the determination of the cardiac output according to the thermodilution method, comprising two temperature sensors adapted to be connected to the blood circulation of a patient for the respective determination of the inlet temperature and the dilution temperature of a liquid injected into the blood circulation of the patient, the temperature of the injected liquid deviating from the blood temperature, a clock generator having an output, a scaler having an input and an output, the output of the clock generator being connected with the input of the scaler for forming a control signal, two temperature-pulse frequency converters, each of said temperature-pulse frequency converters having first input means second input means and an output, one of the temperature sensors being connected with the first input means of one of the converters, the other of the temperature sensors being connected with the first input means of the other converter, a multiplexer having a first input, a second input, a third input and an output, the output of the one converter being connected with the first input of the multiplexer, the output of the other converter being connected with the second input of the multiplexer, the third input of the multiplexer constituting a control input being connected with the output of the scaler for the alternate switching-through of a signal from the first input and the second input of the multiplexer to the output of such multiplexer as a function of time of the control signal, a gate circuit having a first input, a second input and a third input, the first input of the gate circuit being connected with the output of the multiplexer, the second input of the gate circuit being connected with the output of the clock generator, and the third input of the gate circuit being connected with the output of the scaler, the gate circuit having an output at which appears the clock rate of the clock generator as a function of time of the control signal and the signal at the output of the multiplexer, a counter having a first input, a second input and an output, the first input of the counter being connected with the output of the gate circuit, an intermediate storage having a first input, a second input and an output, the output of the counter being connected with the first input of the intermediate storage, the second input of the counter and the second input of the intermediate storage each defining a respective control input and being connected with the output of the scaler for the summation of the clock repetition rate delivered to the counter and for the storage thereof as a function of time of the control signal, a digital computer having a first input, a second input and a third input and at least one output, a digital indicator device having an input connected with the output of the digital computer, the first input of the digital computer being connected with the output of the intermediate storage, the second input of the digital computer being connected with the output of the clock generator and the third input of the digital computer being connected with the output of the scaler.

4,004,577

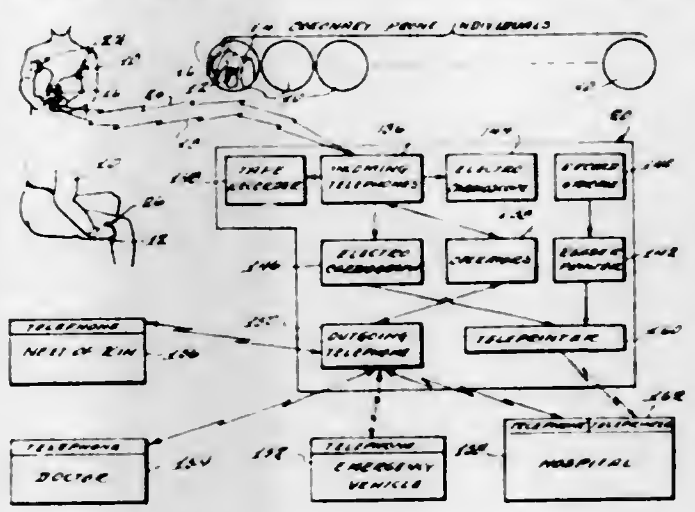
METHOD OF TREATING HEART ATTACK PATIENTS PRIOR TO THE ESTABLISHMENT OF QUALIFIED DIRECT CONTACT PERSONAL CARE

Stanley J. Sarnoff, Bethesda, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Continuation of Ser. No. 311,835, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 296,841, Oct. 12, 1972, Pat. No. 3,870,035, which is a continuation of Ser. No. 55,647, July 17, 1970. This application July 15, 1974, Ser. No. 488,434

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R **10 Claims**



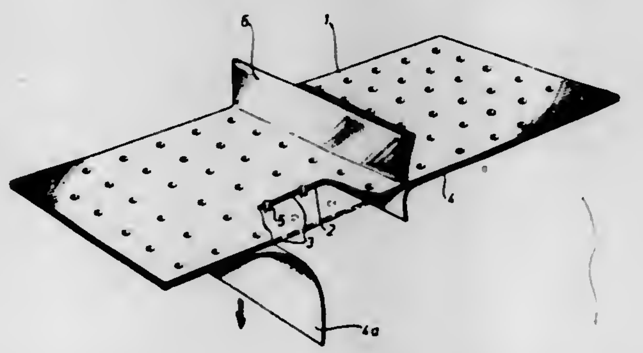
1. A method of participating in the pre-hospital phase treatment of coronary prone individuals by any one of said individuals and/or non-qualified persons in direct contact therewith at a time during the early minutes or hours after the onset of heart attack symptoms, each of which individuals has been previously provided with (1) a plurality of separate injectors suitable for self-administration under the disconcerting circumstances present during the aforesaid time, each containing a liquid dosage of a different medicament non-intravenously injectable into the individual effecting the self-administration of the injector, each of which medicaments (a) when so injected is generally effective to reduce the incidence of adverse cardiac conditions, such as ectopic beats, when the existing heart beat condition is within a different predetermined portion of the total range of heart beat conditions which may exist during an attack, and (b) may be inadvisable or unwise to inject when such heart beat conditions are outside the predetermined portion of the total range in which the medicament is effective as aforesaid, and (2) a diagnosing device having electrode means operable to be simply and conveniently disposed in operative relation to an individual for sensing the electrical impulses which trigger the heart beat and battery operated signal producing means operable when said electrode means is disposed in said operative relation to produce ECG signals indicative of the sensed heart beat conditions of the individual, said method comprising the steps of:

1. maintaining in a readily accessible and producible form medical history information of each of said individuals including standing orders by each individual's doctor as to an indicated medicament to be administered based upon an indicated range portion of the heart beat conditions of the individual existing at the time of an attack,
2. establishing at a central station communication by telephone with any one of said individuals experiencing heart attack symptoms,
3. receiving at said central station over the established telephone communication information as to the identity of the individual experiencing heart attack symptoms.

4. obtaining access to the maintained medical history information including said standing orders applicable to the identified individual,
5. producing the medical history information of the identified individual including the standing orders applicable thereto for utilization in formulating a qualified response,
6. receiving ECG signals over the established telephone communication which are (a) produced by the signal producing means of the device with said electrode means in operative relation to the individual experiencing heart attack symptoms and (b) transmitted over the established telephone communication,
7. producing the received ECG signals for utilization in formulating a qualified response,
8. utilizing the produced medical history information including said standing orders and the produced ECG signals to formulate a qualified response at the central station, such as would be arrived at by the individual's doctor, based upon the standing orders of the individual's doctor, and
9. transmitting from the central station over the established telephone communication the aforesaid qualified response.

4,004,578
EXPENDABLE ELECTRO-CARDIOGRAPH ELECTRODE

Kjell Hubert Palmius, Spanga, Sweden, assignor to Salve S.A., Fribourg, Switzerland
Filed May 14, 1975, Ser. No. 577,405
Claims priority, application Sweden, Sept. 10, 1974, 7411404; Jan. 22, 1975, 7500659
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 E **19 Claims**

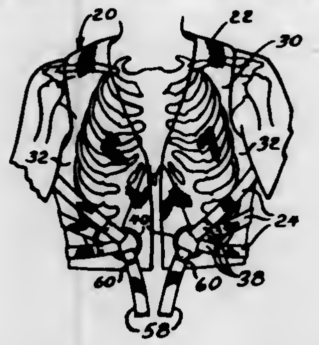


1. An expendable electrode for electrocardiographic measurements comprising a thin pliable metallic sheet-like carrier member adaptable to flexibly conform to the shape of the body part on which it is to be applied and having means for attachment of means for conducting signals from said carrier member to electrocardiographic equipment, said carrier member having one side adapted to be applied to the body part and another side facing away therefrom, said one side being provided with a plurality of regularly distributed spikes devised to penetrate into the skin and a coating of an adhesive compound adapted to adhere to the body, said coating and spikes being completely covered by at least one pull-off protective foil thick enough to entirely embed said spikes.

4,004,579
RESPIRATORY ASSIST DEVICE

Richard G. Dedo, 8629 La Losa Drive, West, Jacksonville, Fla. 32217
Filed Oct. 8, 1975, Ser. No. 620,647
Int. Cl.² A61H *31/00*
U.S. Cl. 128—28 **20 Claims**

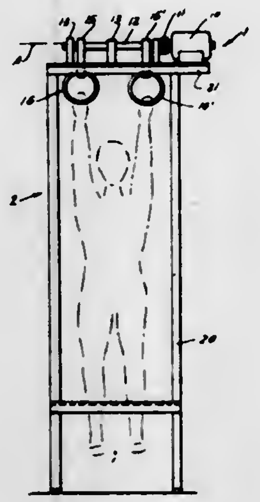
1. A respiratory assist device, comprising:
a garment of flexible material extending around the lower region of a wearer's rib cage;
a plurality of elongated compression straps retained on the garment, said straps having separate sets of circumferential side portions located on the garment adjacent opposed sides of the wearer and disposed to cover the lower region of the wearer's rib cage when the garment is worn, and having the separate sets of end portions extending from said side portions toward a location intermediate said side portions when the garment is worn; and



means for effectively separately joining different sets of said end portions on each side, whereby the joining means may be pulled to compress the lower region of the wearer's rib cage and facilitate expiration.

4,004,580
VIBRATORY MASSAGE APPARATUS

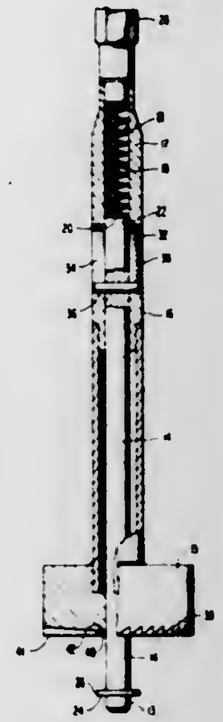
David Knobel, Spittel 38, CH 8762 Schwanden, Switzerland
Filed Aug. 7, 1975, Ser. No. 602,894
Claims priority, application Switzerland, Aug. 7, 1974, 10798/74
Int. Cl.² A61H *1/00*
U.S. Cl. 128—32 **10 Claims**



1. A vibratory massage apparatus comprising:
a pair of hand grips;
means for suspending said grips next to one another in an overhead position allowing a person to hang free by his hands from said grips; and
drive means including a motor for vertically limitedly reciprocating said grips with sufficient force to vibrate a person hanging by his hands from said grips, said motor having a shaft carrying a pair of eccentrics, each of said grips being mounted on a respective eccentric.

4,004,581
TOOL FOR FORMING A BED IN A HIP BONE TO RECEIVE AN ARTIFICIAL ACETABULUM

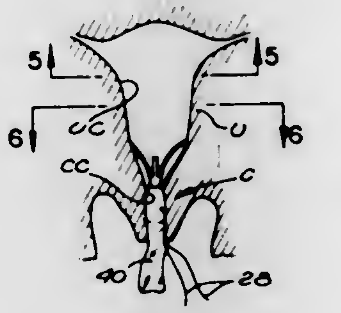
Günther Helmke, Mannheim; Peter Griss, Plankstadt; Hanns Von Andrian Werburg, Ilvesheim, and Paul Wachter, Mannheim, all of Germany, assignors to Friedrichsfeld GmbH, Mannheim, Germany
Filed Sept. 9, 1975, Ser. No. 611,782
Claims priority, application Germany, Sept. 11, 1974, 2443450
Int. Cl.² A61B *17/16, 17/32*
U.S. Cl. 128—92 E **10 Claims**



1. In a tool for preparing a socket bed in a hip bone for the implantation of the socket of a complete hip joint endoprosthesis, wherein an elongated straight guide bore hole has previously been prepared in said hip bone at the proper inclination for the socket to be inserted which said socket is provided with a threaded exterior surface having a diameter greater than the diameter of said guide bore hole, the improvement which comprises an elongated guide rod to be rotatably received in said guide bore hole, said guide rod being axially, shiftably mounted in a rotary cutter for progressively removing material around said guide bore hole, means for rotating said cutter, and indicia means for measuring the depth of penetration of said cutter with respect to the lower end of the guide rod.

4,004,582
INTRACERVICAL CONTRACEPTIVE DEVICE

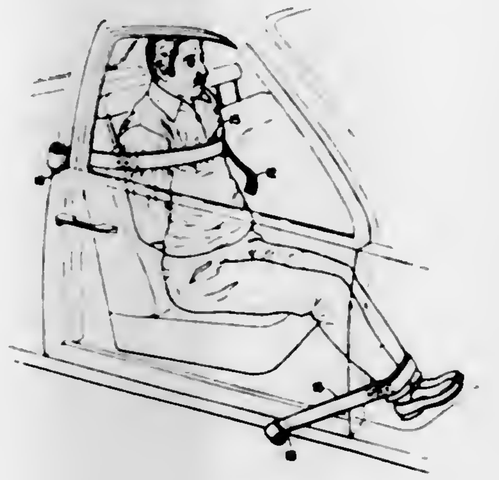
Robert M. Nakamura, 4633 Brown Deer Lane, Rolling Hills Estates, and Val Davajan, 1512 Addison Road, Palos Verdes Estates, both of Calif. 90274
Filed Oct. 28, 1975, Ser. No. 626,426
Int. Cl.² A61F *5/46*
U.S. Cl. 128—130 **12 Claims**



1. An intracervical contraceptive device, comprising:
a substantially hollow stem adapted to be operatively positioned in a cervical canal and to allow the flow of fluids from the uterus;
at least one arm connected to a first end of said stem, said arm extending outwardly into the uterine cavity to prevent inadvertent expulsion of said device;
means connected to said stem adapted to prevent spermatozoa from performing their fertilization function when the device is operatively positioned; and,
means for preventing portions of the device, other than said arm, from entering the uterine cavity when the device is operatively positioned.

4,004,583
RESTRAINING DEVICE

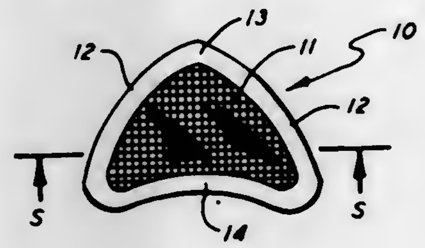
Daniel E. Johnson, 2293-6th Ave., Yuma, Ariz. 85364
Filed Jan. 2, 1975, Ser. No. 538,104
Int. Cl.² A61F *13/00;* **A62B** *35/00;* **E05B** *75/00*
U.S. Cl. 128—134 **2 Claims**



1. A restraining device of the character described comprising a first flexible strap, a second flexible strap secured at one end to said first strap intermediate the ends of said first strap, said first strap having secured to one face of that end portion which is contiguous with the second strap, a tape of one complementary part of a hook-loop fastener, said second strap having secured to that face which is in facing relationship with the said tape-covered portion of said first strap a similar complementary part of a hook-loop fastener, the opposite face of said second strap having secured thereto a tape of the complementary part of a hook-loop fastener, and an enlarged segment of said first strap, substantially thicker than the thickness of said strap and located away from the juncture of the said first and second straps and from the hook-loop fastener thereof, said first strap extending beyond said enlarged segment and away from said hook-loop covered strap portion.

4,004,584
FACIALLY-WORN BREATHING FILTER

Sheila A. Geaney, Dundalk, Ireland, assignor to Alleraid Company, Inc., Ithaca, N.Y.
Filed July 28, 1975, Ser. No. 599,665
Int. Cl.² A62B *23/06*
U.S. Cl. 128—140 N **4 Claims**



1. A breathing filter adapted to be secured over at least one facial breathing orifice of a wearer, the filter having at least

one filter area comprising a comparatively fine filtering area of a metallic monolayer mesh the mesh being formed of wires extending in lines in two directions at substantially 90° to one another, the wires being spaced apart about substantially rectangular openings between portions where the lines cross, the wires being substantially rectangular in cross section adjacent the openings and of the same single thickness where the lines cross, the metal wires being less than 0.0009 of an inch in thickness and in width around the openings and the wires in at least one direction being spaced apart less than 0.0009 of an inch at each opening, the sum of the open areas of the openings in the filter area being at least 40% of the total filter area, the filter area having at least one supporting layer of a comparatively coarse metallic mesh secured to the filtering mesh, the filtering area having therearound flexible sheet material impervious to the passage of air therethrough, the flexible sheet material being bonded to the edges of the filtering and support layers, and the outer edges of the sheet material having one surface bearing adhesive for bonding the sheet material outer edges to the skin of the wearer around the breathing orifice.

4,004,585

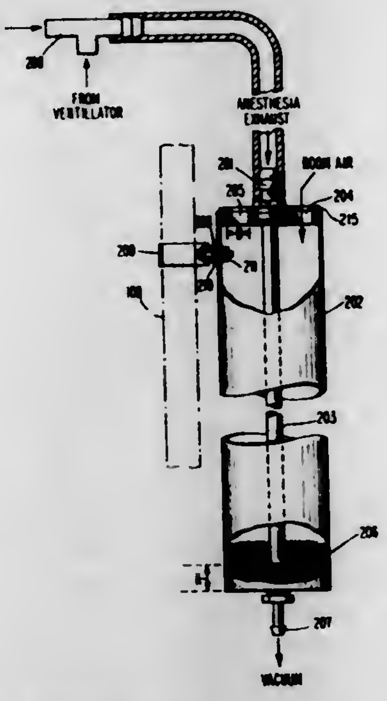
SAFETY INTERFACE FOR ANESTHESIA VACUUM SCAVENGING

John R. Boehringer, 427 Parkview Drive, Wynnewood, Pa. 19096

Filed Nov. 18, 1975, Ser. No. 632,894

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.8 **8 Claims**



1. In an anesthesia administration system having pressure relief valving in the patient circle and a vacuum exhaust from the valving, safety interface apparatus comprising:

an elongated cylindrical means having an interconnection with said vacuum exhaust at one end and an interconnection with said valving at its other end, said cylindrical means being closed to atmosphere at said one end and defining openings at said other end to allow free passage of ambient air into said means;

an elongated tubular means within said cylindrical means, said tubular means being connected to receive gases from said valving via said interconnection at said one end, said tubular means terminating with an opening a predetermined distance from said one end; and

baffle means within said cylindrical means at said one end and occupying at least a portion of said predetermined distance between said one end and the termination of said tubular means for preventing a splashing effect which may occur due to sudden surges of exhaust gases from said valve means.

4,004,586

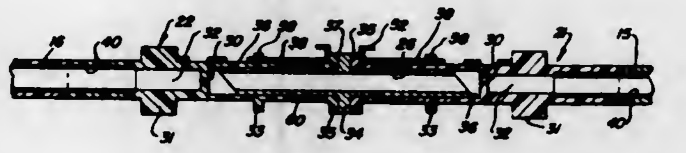
METHOD AND APPARATUS FOR SEALED, STERILE CONNECTION

John G. Christensen, Prairie View; Thomas R. Hektner, Wilmette, and Steven L. Olson, Lake Zurich, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 12, 1975, Ser. No. 557,853

Int. Cl.² A61M *5/14*

U.S. Cl. 128—214 D **20 Claims**



1. The method of transferring sterile contents from a first, sealed, sterile container, having a first, flexible, sealed, fluid transfer tube, to a second, sealed, sterile container having a second, flexible, sealed, fluid transfer tube, said first and second tubes communicating at one end with their respective sealed, sterile containers, said first and second tubes having a free end, and being each sealed with a diaphragm across their bores, said diaphragms being spaced from the free ends of said first and second tubes, said method comprising:

inserting one end of a double-ended, hollow spike into each of the bores of said first and second tubes at the free end thereof, said spike being proportioned to tightly and sealingly fit into each bore of the first and second tubes;

sterilizing said spike and that portion of said first and second tubes extending from each said diaphragm to the free ends of said tubes; and thereafter

axially collapsing said first and second tubes adjacent the free ends thereof to pass the ends of said spike through said diaphragms to open a flow channel between said first and second containers;

transferring said sterile contents through said fluid transfer tubes from said first to said second container; and resealing said second fluid transfer tube while sterility is retained in said second tube.

13. A sealed, sterile container having a sealed, flexible, sterile fluid transfer tube communicating at one end thereof with said container and having a free end; the improvement comprising:

a diaphragm positioned across the bore of said tube, said diaphragm being spaced from the free end thereof, said tube being sufficiently flexible to permit manual axial collapse thereof adjacent said free end, and a removable clip member surrounding said fluid transfer tube adjacent the free end thereof, to prevent said axial collapse prior to removal of said clip member.

4,004,587

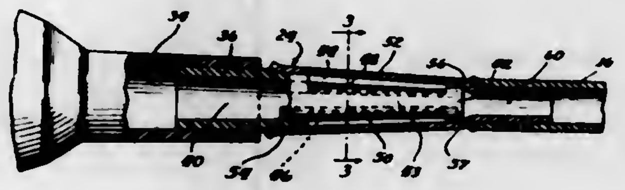
PARENTERAL LIQUID ADMINISTRATION SET WITH NON-AIR BLOCKING FILTER

Thurman Sheldon Jess, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed June 13, 1975, Ser. No. 586,665

Int. Cl.² A61M *5/16*

U.S. Cl. 128—214 R **10 Claims**



1. In a fluid flow apparatus which comprises a flow conduit means adapted for connection to a liquid source, and a filter positioned in communication with said flow conduit, the improvement comprising, in combination:

said filter comprising a housing, said housing carrying a first filter member and a separate, second filter member, in parallel flow position, whereby each increment of fluid flow through said flow conduit passes through one of said filter members, said first filter member being hydrophilic in nature to permit passage of aqueous liquid under normal liquid administration conditions, said second filter member being hydrophobic in nature to permit the passage of gas after said filter members have been in contact with aqueous liquid, whereby air-blocking of said filter is prevented, said filter members being closed from the exterior, and physically spaced from each other.

4,004,588

APPARATUS FOR FLUSHING OVA FROM COWS OR MARES

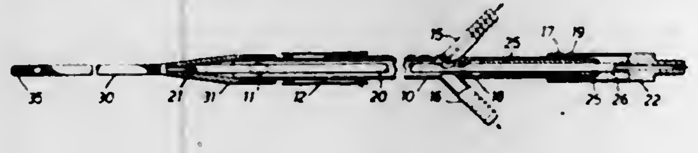
Alan Moana Alexander, Etchingham, England, assignor to Wrightson NMA Limited, Wellington, New Zealand

Filed Aug. 25, 1975, Ser. No. 607,673

Claims priority, application United Kingdom, May 21, 1975, 21920/75

Int. Cl.² A61M *1/00*

U.S. Cl. 128—241 **11 Claims**



1. Apparatus for use in flushing ova from mares or cows, such apparatus comprising an elongate member, inlet and outlet tubes defined in said elongate member, an expansible cuff adjacent one end of said member, a flexible conduit, one end of said conduit being removably attached to said one end of said member in communication with one of the tubes, an opening to said other tube between said cuff and said end of said member and a stylet passed through the said one tube and the flexible conduit whereby to stiffen said conduit.

4,004,589

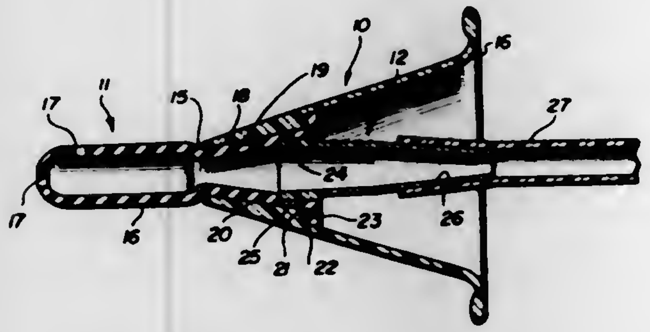
OSTOMY IRRIGATION APPARATUS

Erich Neumeier, Mosinee, Wis., assignor to Marsan Manufacturing Company, Inc., Wausau, Wis.

Filed Nov. 10, 1975, Ser. No. 630,351

Int. Cl.² A61M *3/00*

U.S. Cl. 128—245 **14 Claims**



1. An ostomy irrigating device comprising:

a truncated conical walled holder having a circular open top or apex and a circular bottom; and

a flexible elongated hollow round-nosed nozzle, separable from the conical walled holder, having a cylindrical front portion with at least one liquid dispensing orifice and a rear portion having an outwardly tapered part in contact with the conical walled holder about an interior tapered surface area adjacent the apex,

said nozzle front portion extending outwardly from the apex.

4,004,590

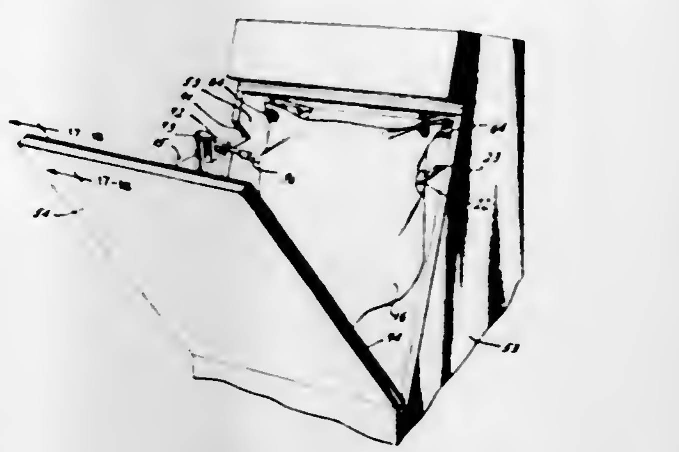
MEDICAL/SURGICAL SUCTION EQUIPMENT

Edward E. Muriot, Horsham, Pa., assignor to Health Technology Laboratories, Inc., Horsham, Pa.

Continuation-in-part of Ser. Nos. 524,052, Nov. 15, 1974, and Ser. No. 614,226, Sept. 17, 1975, which is a continuation of Ser. No. 497,838, Aug. 16, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,140

Int. Cl.² A61M *1/00*

U.S. Cl. 128—276 **9 Claims**



1. Medical/surgical suction equipment comprising a vacuum chamber with a vacuum connection, the chamber having an opening with a notched wall at an edge of the opening, a door for closing said opening having a flat surface overlapping the wall notch, the door cooperating with the chamber wall to define a closed but openable vacuum compartment, a disposable and replaceable suction bag in the vacuum compartment for receiving body liquids, a disposable suction tube connected with the bag, at least a portion of the tube being flexible and extending through said notch to a point outside of the compartment for intake of body liquids, and a disposable vacuum sealing device surrounding and mounted on the tube, the sealing device having a flat surface for engagement with the flat surface of the door, having a portion configured to engage the notch of the chamber wall and further having a flange lying in a plane transverse to the tube and adapted to overlap the surface of the notched wall outside of the vacuum compartment, the bag, tube and sealing device being handleable as a disposable unit and being unitarily removable when the door is open.

4,004,591

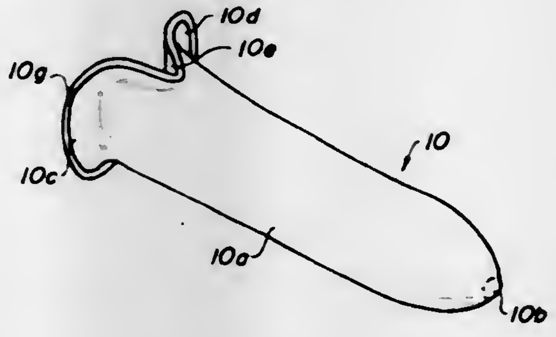
BIRTH CONTROL DEVICE

Max G. Freimark, 90870 Ferndale St., Philadelphia, Pa. 19115

Filed Nov. 17, 1975, Ser. No. 632,670

Int. Cl.² A61F *5/42*

U.S. Cl. 128—294 **7 Claims**



1. A contraceptive device to be worn internally by women comprising a generally tubular member made of an integral moisture proof membraneous compliant material and having an open end and a closed end, said tubular member having a cross-section dimensioned to fit snugly within the vaginal

canal of the wearer, said cross section being substantially constant from said open end to a region adjacent said closed end, the open end of said tubular member having two flaps normally extending outwardly and generally transversely to the axis of said device, said flaps being contoured to cover the labia majora of the wearer and the epidermal area adjacent thereto.

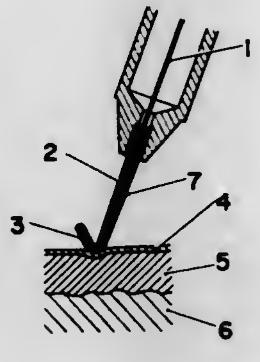
4,004,592
ARTIFICIAL HAIR IMPLANTING METHOD

Shiro Yamada, No. 31-8, Koboyama, Kobo-cho, Chiryu, Aichi, Japan

Filed May 28, 1975, Ser. No. 581,961

Int. Cl.² A61B *17/34*

U.S. Cl. 128—330 **7 Claims**



1. A method of implanting an artificial hair into human tissue, comprising:
  providing an implanting needle means having a point,
  providing an artificial hair having a trunk portion of relatively great length and at one end an integral enlarged and elongated root having a tip end, said trunk portion integrally joining said root at a flexible neck,
  grasping the neck of the root of said artificial hair with the point of said needle means and causing the root to fold back against said trunk,
  thrusting said root into the epidermis with said needle until said root reaches the hypodermal tissue, the tip end of said root trailing said neck as said root passes into the tissue, and
  withdrawing said needle whereby said root remains in the upper region of the hypodermal layer, with its tip end turned back an with said elongated root lying against the trunk portion extending from said neck, said hair being firmly fixed in position.

4,004,593
METHOD AND APPARATUS FOR CLASSIFYING CIGARETTES OR THE LIKE

Heinz Kaedling, Geesthacht, and Alexandros Nicolas, Wittenborg, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg-Bergedorf, Germany

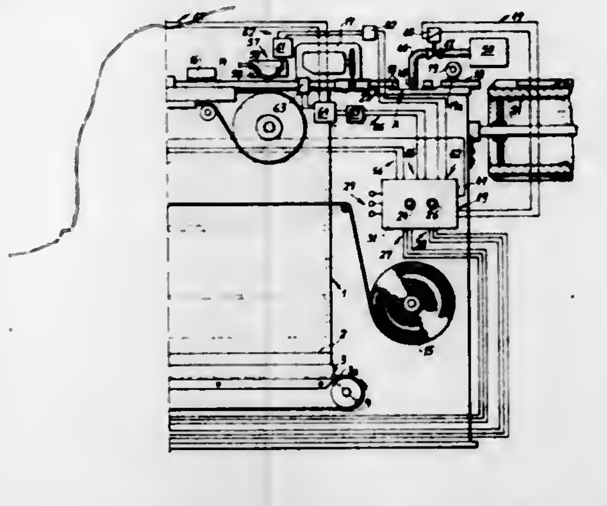
Division of Ser. No. 293,372, Sept. 29, 1972, which is a continuation of Ser. No. 787,536, Dec. 27, 1968, abandoned.

This application Apr. 9, 1975, Ser. No. 566,336

Int. Cl.² A24B *7/14;* **A24C** *5/32*

U.S. Cl. 131—21 R **11 Claims**

1. A method of classifying cigarettes or analogous rod-shaped articles, comprising the steps of producing rod-shaped articles under different operating conditions at least one of which is at least conductive to the production of defective articles, including forming a continuous wrapped filler rod in a rod making machine, moving the rod axially, and subdividing the rod into sections of equal length at a first station whereby such sections constitute a series of discrete rod-shaped articles; transporting the articles of said series lengthwise along a predetermined path toward a second station; moving successive articles which reach said second station away from said second station; and removing from said path those articles which are produced while said one condition prevails, including subjecting each article to be removed to the expelling action of a gaseous fluid only when such article reaches a predetermined portion of said path, said expelling action of said gaseous fluid including moving the articles to be removed sideways from said predetermined portion of said path.



4,004,594
METHOD AND APPARATUS FOR CONDITIONING TOBACCO

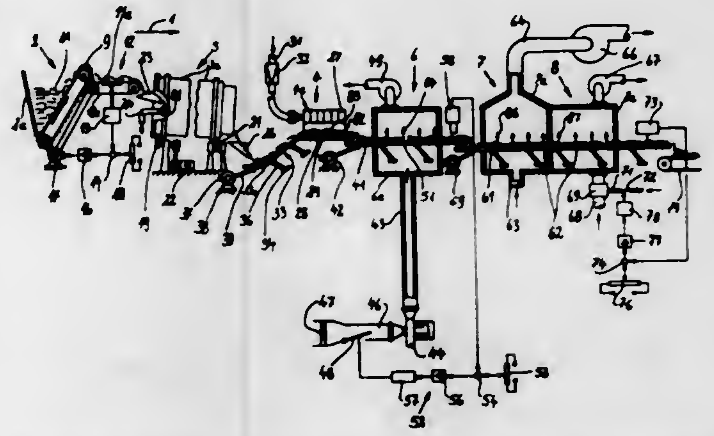
Waldemar Wochnowski, Hamburg; Willi Thiele, Geesthacht; Reinhard Hohm, Pinneberg, and Herbert Schmidt, Glinde, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Dec. 19, 1974, Ser. No. 535,050

Claims priority, application Germany, Jan. 19, 1974, 2402538

Int. Cl.² A24B *9/00*

U.S. Cl. 131—135 **29 Claims**



16. In an apparatus for conditioning tobacco, a combination comprising elongated vibratory conveyor means defining an elongated path and having a portion provided with a plurality of orifices in said conveyor means; means for supplying into said conveyor means a continuous stream of tobacco particles whereby said conveyor means transports the particles along said path and above said orifices; means for supplying to said orifices steam which issues from said orifices in the form of ascending currents; and means for regulating the pressure of steam in said steam supplying means so that said currents form a cushion which supports the particles of tobacco during transport by said portion of said conveyor means and that at least the major portion of steam issuing from said orifices condenses on and is entrained by tobacco particles beyond said portion of said conveyor means.

4,004,595
HAIR ROLLERS

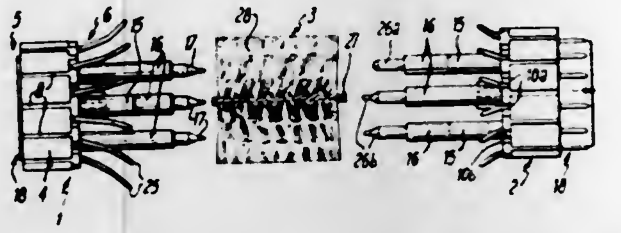
Antoni Slavinski, 5 Avondale Drive, Holcombe Brook, Bury, Lancashire, England

Filed May 23, 1975, Ser. No. 580,684

Claims priority, application United Kingdom, May 28, 1974, 23652/74

Int. Cl.² A45D *2/00*

U.S. Cl. 132—40 **14 Claims**



1. A hair roller comprising a body part having an axis, two axially spaced ends and an outer periphery around and in contact with which hair can be wound, and at least one retention member mounted at one said end of the said body part and movable axially relative thereto between a first position at which hair wound around the body part can be retained in position thereon and a second position at which said hair is free to be unwound from the body part, the retention member comprising a support structure and a plurality of prongs mounted on and projecting from said structure, the prongs being arranged to extend over said periphery of the body part in the said first position and being arranged to be retracted away from said periphery in the said second position, and the said prongs being arranged to be inclined outwardly away from said axis of the body part in the said first position, the body part comprising a cage structure and a brush member arranged within the cage structure having spines projecting out of same, the body part having end members and a plurality of elongated elements extending in side-by-side spaced disposition between the end members, each comprising two parts detachably interconnectable with each other at free ends thereof remote from the end members.

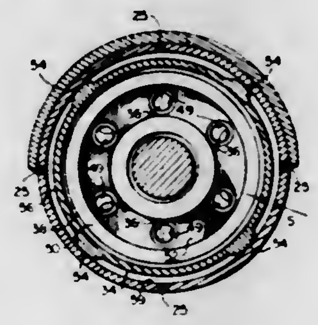
4,004,596
HAIR STYLING IMPLEMENT

Francis B. Hyland, Scituate, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Mar. 3, 1975, Ser. No. 555,077

Int. Cl.² A45D *2/24*

U.S. Cl. 132—37 R **6 Claims**



1. Hair Styling apparatus comprising:
a first tubular member having a hair styling portion with first and second ends and a plurality of apertures there between;
a second tubular member having a plurality of nodules arranged in multiple rows and columns about a peripheral surface, said second tubular member being disposed within said first tubular member with said nodules contacting predetermined discrete points (on) substantially at extremities of said hair styling portion of said first tubular member to provide a uniform predetermined spacing between said first and second members and to transfer heat by conduction from said second member to said points on said first member to operate said first tubular member hair styling portion at a predetermined uniform surface temperature;
heat reservoir means attached to one end of said second tubular member;
heat generating means disposed within said second tubular member in heat transfer contact with said heat reservoir means and said second tubular member for heating said hair styling portion to said predetermined uniform surface temperature;
variable temperature control means coupled to said heat generating means for maintaining said hair styling portion at said predetermined temperature;
a handle mounted on a first end of said first tubular member;
fluid dispensing means mounted on a second end of said first tubular member for supplying a predetermined amount of fluid to said heat reservoir means for vaporization, whereby said vaporized fluid is discharged in a radial direction through said apertures; and
clamping means pivotally mounted on said handle to clamp hair against said hair styling portion of said first tubular member.

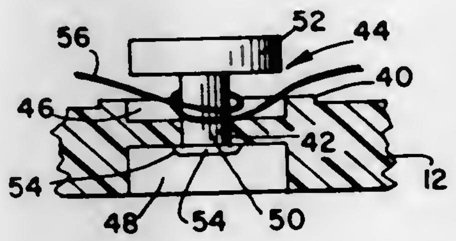
4,004,597
MEANS FOR SUPPORTING A STRIP OR LENGTH OF DENTAL FLOSS IN TENSIONED AND TAUT CONDITION FOR READY USE

Sam Kupperman, Chicago, and Dennis I. Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed July 17, 1975, Ser. No. 596,736

Int. Cl.² A45D *44/18*

U.S. Cl. 132—84 A **1 Claim**



1. In combination a handle supporting a toothbrush at one end and means for supporting a precut strip or length of dental floss in position ready for use at the opposite end, said means comprising a forked member at the end of said handle and integrally formed with said handle, said forked member having a pair of spaced arms, with each of said arms having a longitudinal groove on one of the surfaces and a transversely extending groove on the undersurface, a depressable anchoring and locking member supported in an opening in said handle adjacent said forked member, said handle having a recess around said opening, said depressable anchoring and locking member having a head and a stem with the stem extending into said opening, a precut strip of dental floss having one end adapted to be manually wound around the stem of said anchoring and locking member and extending into the longitudinal groove of one arm and the groove on the undersurface and across to the other arm and extending into the transverse groove and longitudinal groove of said other arm, with the opposite end of said strip of dental floss adapted to be manually wound around the stem of said anchoring and locking member, said depressable anchoring and locking member adapted when moved axially into said opening to move said head into said recess and said stem further into said opening to tighten said strip of dental floss across the forked arms and lock the opposite ends of the strip against sliding on said anchoring and locking member, said stem having means to prevent removal of said stem from said handle, said forked member inclined at an angle of ap-

proximately 30° with respect to the longitudinal plane of the handle.

4,004,598
MACHINE FOR SEPARATING PIECES OF MONEY OR SIMILAR ARTICLES

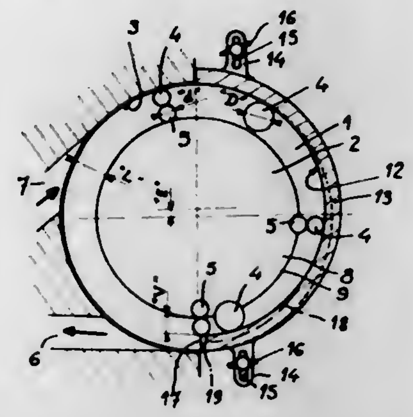
Nicolas Bezsilko, Tourcoing, France, assignor to S.A. Vandeputte Fils a Cie (department electronique Velec Sefat), Tourcoing, France

Filed Oct. 15, 1975, Ser. No. 622,603

Claims priority, application France, Oct. 15, 1974, 74.35052

Int. Cl.² G07D *3/00, 9/00*

U.S. Cl. 133—1 R **5 Claims**



1. A machine for handling pieces of money or similar items comprising a circular rotating path, a hollow vessel supporting said path for rotation, a fixed wall partially surrounding said path, an opening in said wall for supplying the pieces to be separated to the rotating path whereby the edges of the pieces roll along the wall under centrifugal force, an exit opening in the wall through which the pieces are discharged by centrifugal force to subsequent work positions, a band extending said wall adjacent said exit, means for adjusting the position of said band with respect to said path adjacent said exit, said band extending over said path and reducing the width of said path to support a single piece at said exit, the other pieces falling by their weight into said central zone.

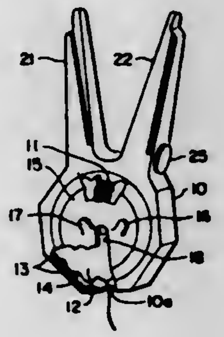
4,004,599
DENTAL FLOSS HOLDER

Marvin L. Rosenfeld, 602 Esplanade No. 205, Redondo Beach, Calif. 90277

Filed July 7, 1975, Ser. No. 593,192

Int. Cl.² A61C *15/00*

U.S. Cl. 132—92 R **3 Claims**



1. A dental floss holder including a member having a chamber for accomodating a removable holder carrying a thread of dental floss and provided with means for removing sections of the dental floss from the holder inside the chamber and supporting the removed sections in a taut manner external of the holder and spaced from external portions of the holder to permit the taut thread to be applied to the teeth of the user; the improvement wherein the member, holder, and the thread are interrelated such that upon tension being applied to the removed section of the thread, the thread itself locks the holder in position in the chamber and prevents further withdrawal or unravelling of thread from the holder, said improvement comprising an opening in the member leading from the chamber to enable removal of thread from the chamber, and an irregular surface portion provided on the holder in substantial alignment with said opening, said thread being compelled to interengage with said irregular surface portion in passing through said opening when external tension is applied to the thread, whereby said holder is thereupon locked and prevented from movement to unravel additional thread by the interengagement of the thread with the irregular surface portions of the holder and the wall of said opening.

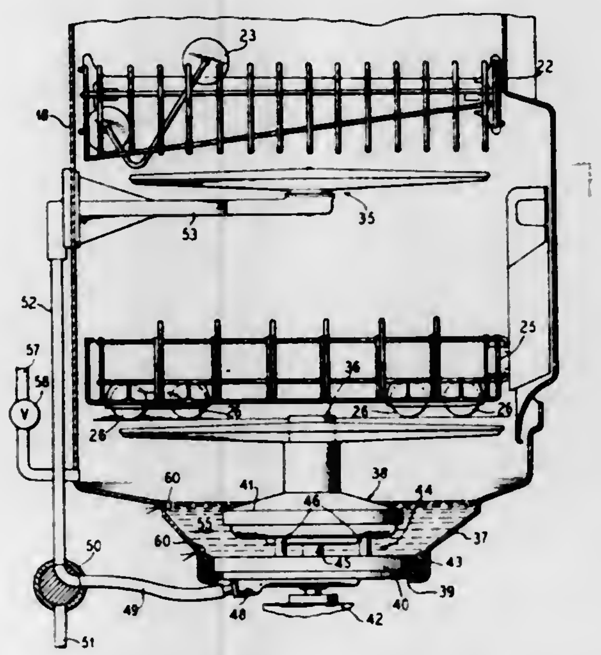
4,004,600
DISHWASHER WITH SPECIAL LOW WASHING LIQUID USAGE CYCLE

Adolph Duane Corn, Stevensville, and Jack F. Clearman, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 3, 1975, Ser. No. 546,525

Int. Cl.² B08B *3/02*

U.S. Cl. 134—57 D **1 Claim**



1. In an automatic dishwasher,

wall means forming a washing chamber and comprising a bottom wall configured to provide a depressed sump in the lower portion of said washing chamber,

first and second movable dish racks disposed in said washing chamber at successively different levels superjacent said sump,

an upper rotary spray arm positioned below the uppermost dish rack and positioned to direct a flow of washing and rinsing liquid from said spray arm upwardly against the dishware carried thereby,

a lower rotary spray arm positioned below the lowermost dish rack and positioned to direct a flow of washing and rinsing liquid upwardly against the dishware carried thereby,

a pumping assembly comprising

first and second pumps disposed in vertically stacked relation in said sump and further including a unidirectional electric motor positioned below said sump and having a power take-off shaft extending upwardly into said sump to form a common unidirectional rotary drive for said first and second pumps,

said first pump having a casing in the lowermost portion of said sump and having an outlet passage formed in said casing with an inlet port intersecting an upper wall of said casing and opening into said sump at a first lower level in said sump,

said casing having an outlet passage formed with a discharge outlet adapted to be connected to a conduit,

said second pump having a radial impeller formed with an axial inlet disposed at a second level in said sump above the level of said first inlet and an axial outlet opening directly coupled with said lower rotary spray arm,

said first and second pumps having pumping impellers of different pressure pumping capacity with the pumping impeller of said first pump constructed to discharge under a lesser increased pressure than the pumping impeller of said second pump thereby to provide a gentle reduced pressure washing action at the upper rotary spray arm for dishware in the uppermost dish rack,

water level control means for admitting water into the sump and including water sensing means disposed at said first level and at said second level to selectively vary the quantum of washing and rinsing liquid in the sump,

conduit means between said discharge outlet of said first pump and said upper rotary spray arm and a drainage outlet,

a two-way valve in said conduit means for selectively connecting said first pump to said upper rotary spray arm and said drainage outlet to drain,

and sequence control means for automatically programming said dishwasher through a preselected series of washing and rinsing steps including a special glassware cycle wherein liquid level is limited to said first lower level and liquid at reduced pressure will be gently sprayed in said washing chamber only by said upper spray arm, the second pump being rendered inoperative by virtue of its associated inlet being disposed above the level of the liquid in the sump.

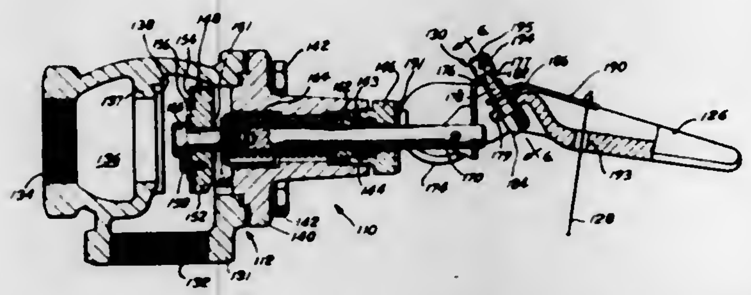
4,004,601
QUICK CLOSING EMERGENCY VALVE

Patrick Eugene Bachelder, Allen, and William David Sumner, Mc Kinney, both of Tex., assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Oct. 2, 1975, Ser. No. 619,134

Int. Cl.² F16K *17/38*

U.S. Cl. 137—77 **17 Claims**



1. A quick closing emergency valve mechanism comprising valve body means having an inlet and an outlet, a fluid flow passage in said valve body means communicating said inlet and said outlet, a valve seat in said valve body between said inlet and outlet, valve means adapted to engage said valve seat for terminating fluid flow through said flow passage, said valve means comprising a valve and an elongated stem secured thereto and extending from the valve body, spring means for biasing the valve toward the valve seat, handle means pivotally secured to the stem, said handle means having a cam portion operable against the valve body means for actuating the valve away from the valve seat, cooperating latching means on the handle means and stem to retain the valve away from the valve seat, and release means actuated to release the cooperating latch means so as to permit the spring means to bias the valve to the valve seat to terminate flow through the fluid flow passage.

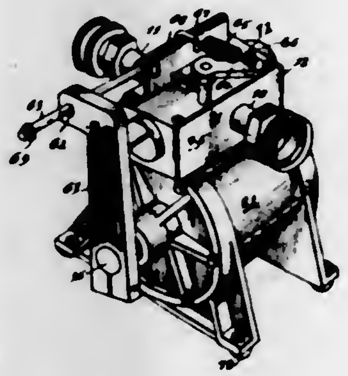
4,004,602
SELF-METERING DUAL PROPORTIONER

Nat Cordis, deceased, late of Silver Lake, Wis., and by Gladys S. Cordis, executrix, Chicago, Ill., assignors to Carl F. Jensen and Gerald T. Dobie, both of Rosemont, Ill., part interest to each

Continuation of Ser. No. 111,100, Jan. 29, 1971, abandoned, which is a continuation of Ser. No. 14,798, March 2, 1970, abandoned, which is a continuation of Ser. No. 738,764, June 7, 1968, abandoned, which is a continuation of Ser. No. 504,254, Oct. 23, 1965, abandoned, which is a continuation-in-part of Ser. No. 111,992, May 23, 1961, Pat. No. 3,213,873, which is a continuation-in-part of Ser. No. 152,204, Nov. 14, 1961, Pat. No. 3,213,796, which is a continuation-in-part of Ser. No. 380,695, July 6, 1964, Pat. No. 3,291,066. This application June 11, 1973, Ser. No. 368,619

Int. Cl.² G05D *11/03*

U.S. Cl. 137—99 **4 Claims**



1. A unitary self-metering multifluid proportioning apparatus comprising constant displacement hydraulic motor means including a housing having first and second end walls; master piston means operating within said housing; a connecting rod carried by the master piston means and passing through the first end wall of the housing; constant displacement slave pump means carried by said second end wall and including a tubular pump cylinder mounted in the said second end wall; a slave plunger axially aligned with said master piston means and operating within said tubular pump cylinder; said slave plunger means being in driven association with said connecting rod; a water supply inlet and delivery conduit means connected to said housing; a water gating assembly on said housing interposed said water supply inlet and said motor means gating water to alternate sides of said master piston means operating within said housing; spring loaded lever means mounted on said water gating assembly and linked to a reversing rod; linkage means between the connecting rod and the said reversing rod whereby the reversing rod and the slave plunger follow the reversible motion of the master piston means; a flow control within said water gating assembly shifted by said spring loaded lever means; and slave pump check valve assembly means supported by the said second end wall and containing an inlet connection, and an outlet conduit means, said outlet conduit means discharging additive fluid directly into said delivery conduit means; and wherein said slave pump check valve assembly comprises a valve means carrying a plug on its upstream side and a self-centering, flow-through, double-coned coil spring on its downstream side, said double-coned spring having tapered end portions and an intermediate enlarged portion of maximum coil girth, and a ported bridge wall across the flow path through said slave pump check valve, a tapered recess on the upstream side of said bridge wall and terminating in a port therein, said tapered recess receiving and aligning the downstream cone end of said coil spring.

4,004,603
GAS VALVE MECHANISMS

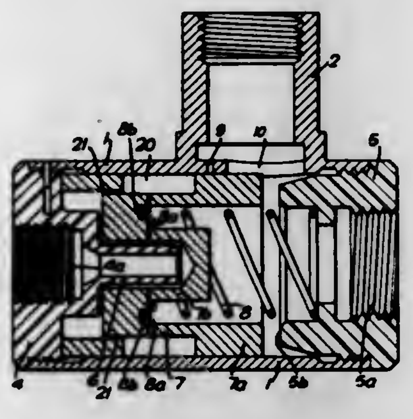
Norman Stewart Jones, Leighton Buzzard, England, assignor to Pneupac Limited, London, England

Filed May 2, 1975, Ser. No. 574,097

Claims priority, application United Kingdom, June 4, 1974, 24786/74

Int. Cl.² F16K ***15/02;*** **A61M** ***16/00***

U.S. Cl. 137—107 **8 Claims**



1. A valve mechanism comprising

a. a cylindrical body providing a gas pulse inlet, a gas pulse outlet, an exhaust outlet, the gas pulse inlet and the exhaust outlet being at opposite ends of the cylindrical body and the body having lateral branch defining the gas pulse outlet, and the body defining a first flow path between the gas pulse inlet and the gas pulse outlet, the first flow path including a port in the lateral branch, and the first flow path having a constriction, and a second, substantially unrestricted flow path between the gas pulse outlet and the exhaust outlet;

b. a valve element piston mounted for reciprocation in the body for movement in and controlling said flow paths between a first position wherein the valve element piston interrupts communication between the gas pulse inlet and outlet while opening substantially unrestricted communication between the gas pulse outlet and the exhaust outlet, and a second position wherein the valve element piston opens communication between the gas pulse inlet and outlet while interrupting communication between the gas pulse outlet and the exhaust outlet,

1. the valve element piston having a large effective area exposed to the gas pulse inlet and a gas pulse pressure at the inlet moving the valve element piston into the second position, and the piston closing the port in the first position and opening the port in the second position;

c. a spring loading the valve element to hold it in the first position and opposing the movement of the valve element into the second position; and

d. the constriction in the first flow path establishing a pressure differential acting on the valve element to oppose the spring loading in the second position.

4,004,604
METHOD OF AND APPARATUS FOR DRAINING CONDENSATE FROM A STEAM-CONTAINING SYSTEM

Hans Deinlein-Kalb, Frankenstrasse 81, Nurnberg, Germany

Continuation-in-part of Ser. No. 513,590, Oct. 10, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,586

Int. Cl.² F16T ***1/00***

U.S. Cl. 137—183 **3 Claims**

1. In a piping system supporting a pressure medium in the form of a gas or vapour, an apparatus for determining the pressure of a liquid in the pressure medium and automatically draining the same therefrom and being operative independently of the pressure and temperature of the pressure medium comprising:

a valve having a flow direction therethrough from an inflow to an outflow with a valve seat therebetween,

an axially-adjustable spindle,

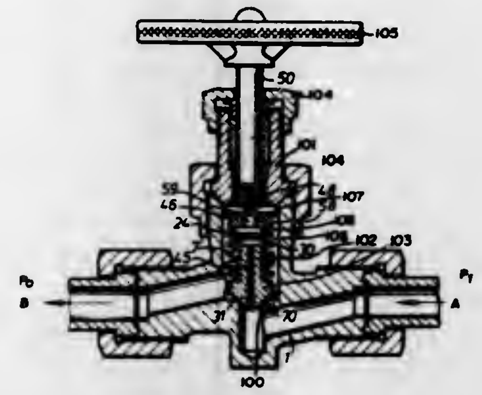
a bush interengaged with the housing and threadedly engageable with the spindle opposite the valve seat,

a valve cone disposed between the valve seat and spindle and having a head seating on the valve seat and an elongated shank extendable away therefrom,

a resilient bellows fixed to the valve cone and circumscribing the valve cone shank in a spaced relationship defining a pressure chamber therebetween,

the valve cone having an axially-extending through bore,

a pressure plate fixed to the bellows and defining a gap between the valve cone shank and pressure plate,



the valve cone having a narrow central throttle opening with the length thereof being a multiple of the diameter thereof,

the throttle opening communicating with a transverse opening leading to the pressure chamber between the bellows and shank,

the pressure plate having a central opening therethrough and a communicating relatively short throttle opening disposed obliquely to the outer end of the pressure plate leading to the gap between the valve cone shank and pressure plate,

the spindle having a conical tip extendable into the pressure plate through opening.

4,004,605
RELIEF VALVE FOR FLUIDS

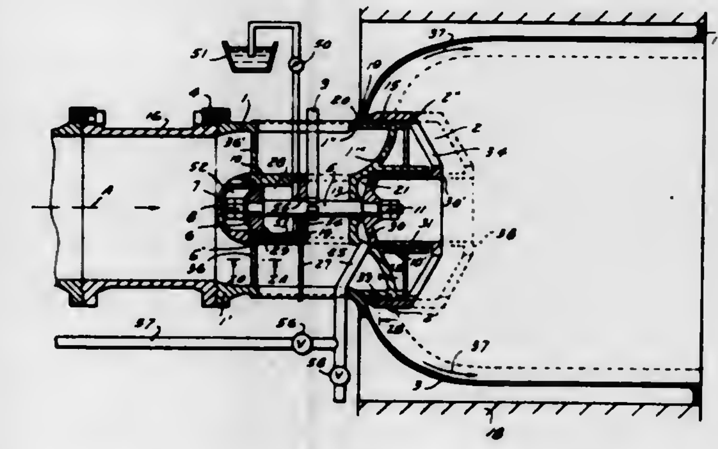
Savo Rakcevic, Ljubljana, Yugoslavia, assignor to Titovi Zavodi Litostroj Ljubljana n.sol.o., Ljubljana, Yugoslavia

Continuation-in-part of Ser. No. 492,877, July 29, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,348

Claims priority, application Yugoslavia, Aug. 2, 1973, 2100/73

Int. Cl.² F16K ***31/124***

U.S. Cl. 137—219 **10 Claims**



1. A valve for controlling water under pressure and comprising:

a generally cylindrical housing having an axial flow passage extending along an axis and having an axial input end and an axial outlet end, said passage being axially traversed by said water under pressure from said input end to said outlet end;

a front cylinder axially centered in said housing at said input end and defining in said housing a closed front chamber:

a pair of radially extending hollow ribs bridging said front cylinder and said housing to support said cylinder in said housing and having respective hollow interiors opening radially outside said housing;

a front piston in said front cylinder subdividing said front chamber into a front compartment toward said input end and a rear compartment toward said outlet end;

means for supplying oil under pressure through one of said hollow interiors to said rear compartment to displace said front piston axially toward said input end;

means for draining a fluid from said front compartment through one of said hollow interiors;

a fixed radially outwardly flared deflector mounted on said ribs at said outlet end and defining with said housing at said outlet end an outwardly opening outlet of larger diameter than said input end;

a rear cylinder mounted on said deflector and defining an axially rearwardly open rear chamber lying along said axis;

a rear piston axially displaceable in said rear chamber;

a rod lying on said axis and connected to both of said pistons for joint axial displacement thereof;

a cylindrical valve sleeve centered on said axis and carried on said rear piston, said sleeve closely surrounding said deflector and axially displaceable between a back position unblocking said outlet and a forward position blocking said outlet and preventing water flow through said passage;

an indicating member having an inner end secured to said rod and extending radially therefrom through one of said interiors outside said housing; and

means for supplying said water under pressure to said rear chamber in front of said rear piston to bias said sleeve toward said back position.

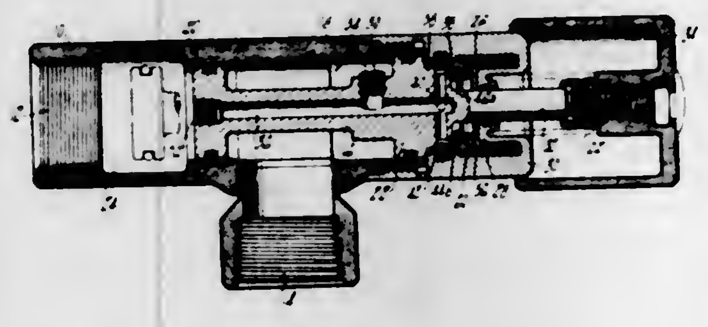
4,004,606
FLUSH VALVE

Earl W. Carson, 287 Hazard Ave., Enfield, Conn. 06082

Continuation-in-part of Ser. No. 487,711, July 11, 1974, Pat. No. 3,918,676. This application Oct. 9, 1975, Ser. No. 621,068

Int. Cl.² F16K ***21/06, 31/12***

U.S. Cl. 137—271 **9 Claims**



1. A fluid valve including:

a valve body having a fluid inlet and a fluid outlet;

valve means in said valve body, said valve means being movable between a first position in which said fluid inlet is sealed from said fluid outlet and a second position in which said fluid inlet is in fluid communication with said fluid outlet;

control chamber means in said valve body for containing fluid to control the rate of movement of said valve means from said second position to said first position, said control chamber being defined in part by said valve means;

projection means extending from said valve means to said control chamber means;

sleeve means extending from said valve means into said control chamber means;

passage means in said valve means for delivering fluid from said inlet to said control chamber, said passage means including orifice means in said projection means;

compressible ring means for controlling fluid flow from said passage means into said control chamber means, said compressible ring means being located between said projection means and said sleeve means and being exposed on one side thereof to fluid pressure in said passage means and said ring means being exposed on the other side thereof to pressure in said control chamber said compressible ring means being compressed by a pressure differential thereacross to admit fluid from said passage means to said control means when said valve means is moved from said first position to said second position;

bleed means between said control chamber means and said passage means to bleed fluid from said control chamber means to said passage means; and

actuator means for actuating said valve means from said first position to said second position.

4,004,607
CONDUIT ARRANGEMENT WITH PROTECTION AGAINST RUPTURE AND LEAKAGE

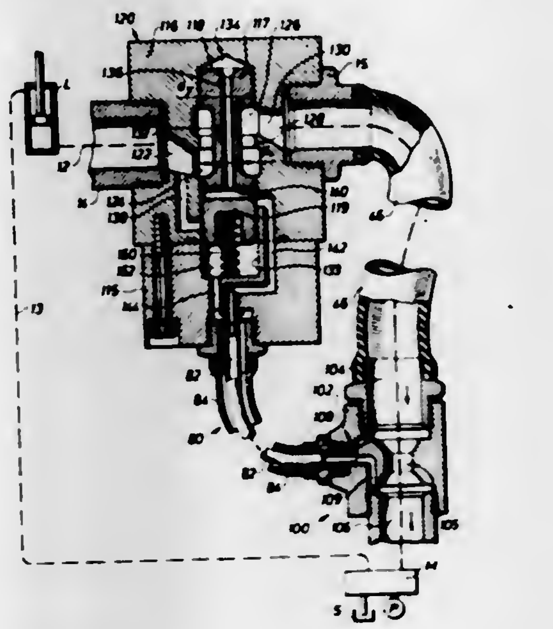
Lennart Werner Freese, Stalringen 20, 175 74 Jarfalla, Sweden

Filed Oct. 20, 1975, Ser. No. 623,712

Claims priority, application Sweden, Oct. 28, 1974, 7413556; Aug. 19, 1975, 7509247

Int. Cl.² F16K ***31/12***

U.S. Cl. 137—486 **9 Claims**



1. A valve means for protecting conduit systems against unintentional depressurization, occurring for example when ruptures or leaks arise in the system, the device being applied for monitoring especially exposed sections of the system, e.g. a flexible hose incorporated therein, and arranged automatically to stop or block the flow through such a section for an undesired change in pressure occurring therein, characterized in that a stop or blocking valve (**20; 120**) is mounted at the inlet of the monitored section (**46**), said valve normally being open and hereby offering the medium flowing through a modest resistance generating a certain pressure drop (Δp_1, FIG. 3), while a flow sensing means (**100**) of the kind wherein a medium flowing through produces a pressure drop (Δp_2) in response to the size of the flow, and for example comprising an orifice plate or venturi constriction (**105**), known per se, is placed at the outlet of the section (**46**), the blocking valve (**20; 120**) and the flow sensing means (**100**) communicating with a pressure comparator means (**50; 118**) which is arranged to compare the pressure drops (Δp_1 and Δp_2, respectively) across the blocking valve and the flow sensing means, and operative to cause the blocking valve (**20; 120**) to close

the flow into the conduit section (46) if the ratio ($\Delta p_2/\Delta p_1$) of the pressure drop over the flow sensing means (100) to that over the blocking valve (20; 120) falls below a certain value ($\Delta p_2'/\Delta p_1$).

4,004,608

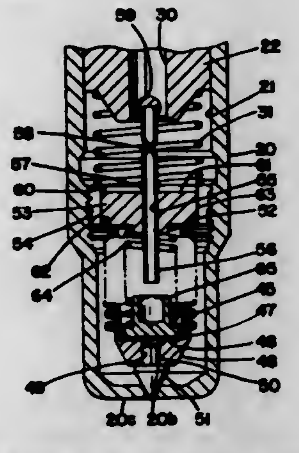
SUCTION THROTTLING VALVE

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Division of Ser. No. 523,224, Nov. 13, 1974, Pat. No. 3,942,333. This application Nov. 13, 1975, Ser. No. 631,434

Int. Cl.² F16K *31/12, 31/36*

U.S. Cl. 137—510 **4 Claims**



1. A bellows assembly or unit for a suction throttling valve of the character described, comprising a housing provided with interior threads on its inner wall, said assembly or unit comprising a bellows having an open upper end, and a closed cup-shaped lower end, a nut secured to and closing said upper end of the bellows, said nut being exteriorly threaded, for threaded engagement with said interior threads whereby said bellows assembly or unit may be rotated to vary or adjust the axial position of said assembly or unit relatively to said housing, said bellows assembly or unit further comprising a stop member within said bellows and supported by said lower end, a compression coil spring interposed between said nut and said stop member, and a bellows evacuating tube secured to and extending axially through said nut.

4,004,609

MATERIAL TRANSMITTING ELEMENT FOR CONTACTING STREAMING MEDIA OF DIFFERENT PHASES OR THE SAME PHASE

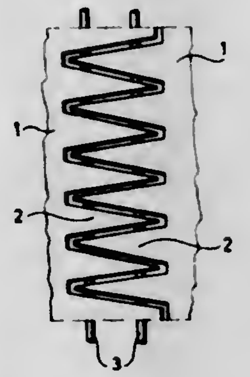
György Fábry; Istvan Takács, and György Kiszely, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 255,733, May 22, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,216

Claims priority, application Hungary, June 3, 1977, RI 433

Int. Cl.² F16K *15/14*

U.S. Cl. 137—512.15 **2 Claims**



1. A fluid transmitting element for increasing vapor-liquid contact, said element having at least one flow opening therethrough, and a flow control member disposed in said opening, said flow control member comprising a resilient flat metal plate having a plurality of interfingering strips integral therewith, said strips being coplanar with each other and with said plate and spaced apart in their undeformed condition and defining between them a zigzag slot, said strips on each side of said slot having the configuration of a straight series of sawteeth.

4,004,610

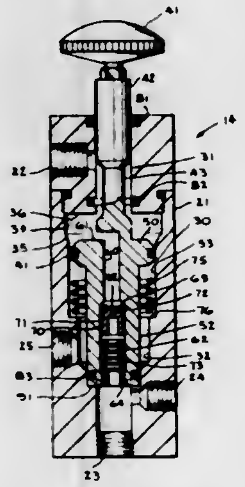
LINE CONTROL

Gerald F. Theriot, Houma, La., assignor to B.W.B. Controls, Inc., Houma, La.

Filed Apr. 14, 1975, Ser. No. 567,715

Int. Cl.² F16K *43/00*

U.S. Cl. 137—614.17 **2 Claims**



1. A control device adapted to be positioned intermediate a source of fluid under pressure and a valve actuator, said control device including:

a housing having an axial bore extending centrally thereof, said housing including fluid inlet means communicating with said axial bore, and fluid outlet means also communicating with said axial bore;

slide valve means movable within said axial bore from a first position allowing relatively unrestricted fluid communication between said inlet means and said outlet means to a second position blocking such communication between said inlet means and said outlet means;

first spring means, internal of said axial bore for biasing said slide valve means toward said second position;

said slide valve means including first force transmitting means, extending at least partially outward of said housing, for causing movement of said slide valve means from said second position to said first position;

said slide valve means further including means for preventing said fluid under pressure from causing movement of said slide valve from said second position to said first position, and means for retaining said slide valve means in said first position against the biasing force of said first spring means, said retaining means including a piston portion having a fluid pressure receiving surface, for receiving said fluid under pressure thereagainst, said piston being sealingly engageable with the wall of said axial bore when said slide valve means is in said first position; and

check valve means, carried within an axial bore through a reduced diameter portion of said slide valve means, yieldably obstructing communication between said fluid inlet means and said fluid outlet means.

4,004,611

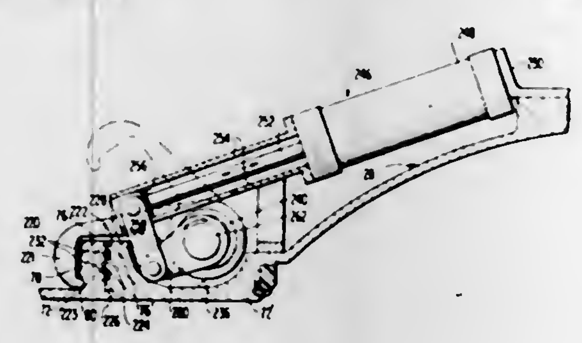
SWINGING SPHERICAL GATE VALVE AND DOUBLE SEAL QUICK DISCONNECT COUPLING

Morley V. Friedell, Wheat Ridge, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Division of Ser. No. 448,439, March 5, 1974, Pat. No. 3,902,694. This application June 2, 1975, Ser. No. 583,222

Int. Cl.² F16L *29/00*

U.S. Cl. 137—614 **4 Claims**



1. A double seal, quick disconnect fluid coupling comprising:

a pair of spherical gate valves including spherical housings terminating in axially extending cylindrical portions defining annular locating and locking interfaces for face to face confrontation,

one of said cylindrical portions forming a radially outwardly projecting seal clamp ring,

a plurality of cam lock clamps carried on the outer periphery of said other cylindrical portion at circumferentially spaced positions and extending longitudinally thereof,

each cam lock comprising a cam shaft including an eccentric portion rotatably supported on said housing cylindrical portion for rotation about an axis tangential to said housing and at right angles to the axis of said housing cylinder portion,

said clamp being hook-shaped and integral with and extending radially outward of said shaft eccentric portion and adapted to engage the side of said seal clamp ring opposite the confronting interfaces, and

actuator means for selectively rotating said cam shafts to move each clamp between open and closed positions,

said actuator means including; a pivot arm operatively coupled to said cam shaft and extending radially thereof, and

at least one reciprocating motor fixed to the outer periphery of said valve housing carrying said clamps and having a slide reciprocable along a path overlying the pivot arm pivot axis, and links pivotably coupled respectively to said slide and to said pivot arm,

and wherein, the length of said links and that of said arm, the position of said links relative to said slide and said arm, and the position of said arm relative to the eccentric portion of said cam shaft, are such that the eccentric is overcentered as determined by one line extending from the axis of the shaft to the contact point between the hook-shaped clamp and the side of said seal clamp ring and a second line extending from the shaft axis to the pivot coupling point between said links and said pivot arm and wherein said links are at right angles to the path of movement of said slide.

4,004,612

REMOTE CONTROL FOR LARGE-AREA SPRINKLER SYSTEMS

Frank Hummel, Jr., 817-14th St., Greeley, Colo. 80631, and Edmond B. King, Box 1781, Boulder, Colo. 80302

Filed Apr. 28, 1975, Ser. No. 572,104

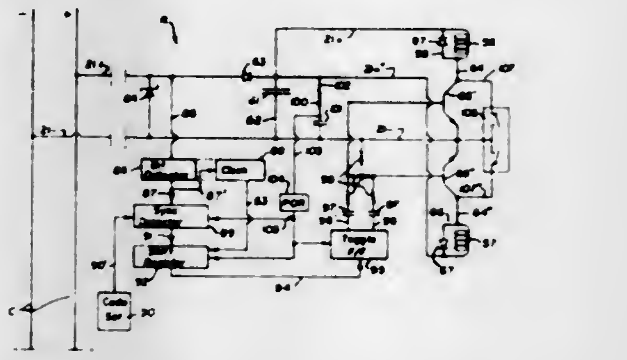
Int. Cl.² A01G *25/16*

U.S. Cl. 137—624.11 **10 Claims**

1. A low-voltage, low amperage remote control system for operating a valve, or the like, which is controlled at a control station remote from the valve, said valve being hydraulically actuated and opens and closes responsive to fluid flow directed through opposing passageways in the valve, said system comprising, in combination therewith:

a. a latch valve at a hydraulically actuated valve connected with the aforesaid opposing passageways, said latch valve being shifted to a first position to direct fluid through one passageway to open the valve and to a second position to direct fluid through the other passageway to close the valve, said latch valve remaining at the position to which it is shifted until shifted to the other position,

b. two opposing solenoid means associated with the latch valve with one solenoid means operable to shift the latch valve to said first position responsive to a charge of current through the solenoid means and the second solenoid means operable to shift the latch valve to said second position responsive to a charge of current through the solenoid;



c. direct current circuit means extended to each solenoid means including a charge-receiver means adjacent to the solenoid means to receive a charge, and a normally off electronic gate at each solenoid means to normally prevent flow of the charge from the charge-receiver means to the solenoid means; and

d. control circuit means extended from each electronic gate to a selective switching means at the control station adapted to selectively turn the gate on, whereby the charge at the charge receiver means will then produce current through the solenoid means and shift the latch valve to the position directed by the solenoid means whenever the latch valve is at the opposite position.

4,004,613

FLOW CONTROL VALVE

Robert Merrill Purton, and Robert Brent Maddock, both of Cerritos, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 9, 1975, Ser. No. 611,761

Int. Cl.² F16K *47/00*

U.S. Cl. 137—625.3 **6 Claims**

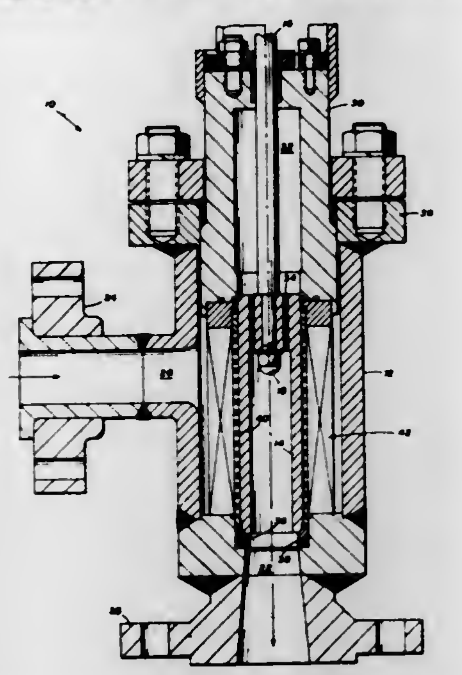
1. An improved, quiet, control valve comprising:

a hollow valve body having inlet and outlet passageways extending into said body, and having an annular valve seat encircling said outlet passageway;

a valve member movably positioned in said body and engageable with said valve seat to close said valve;

means on said body for moving said valve member; and,

flow control means in said body between said inlet and outlet passageways including annular means having a tortuous flow path therethrough and having an annular space therein forming the inlet to said flow path, said annular space being dimensionally narrower than any other portion of said flow path preventing flow therethrough of any particle sufficient in size to block said flow path, said annular means including means defining spaced, first and second radially disposed surfaces and also including an annular orifice member between said surfaces having radially spaced annular lands, successive lands engaging one only of said first and second surfaces, said orifice member having a plurality of orifices extending therethrough between said lands.



4,004,614

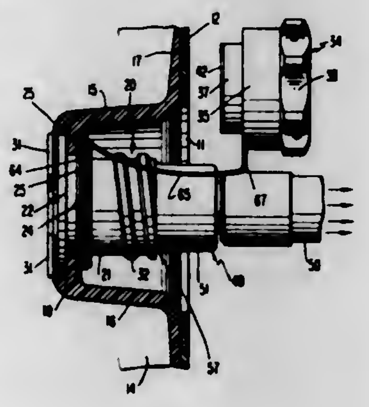
TETHER FOR CAPTIVE PLUG OF INFLATION DEVICE

Glenn H. Mackal, Ringwood; George E. Lardner, Hawthorne, and Joseph Maz, North Haledon, all of N.J., assignors to Halkey-Roberts Corporation, Paramus, N.J.

Division of Ser. No. 601,032, Aug. 1, 1975. This application Feb. 13, 1976, Ser. No. 657,726

Int. Cl.² A63H *3/06*; F16L *35/00*, *55/10*; F16K *15/20*

U.S. Cl. 138—89.2 **5 Claims**



1. In a device having a nipple and a closure member for the nipple which spans the opening therethrough, the application of the closure member to and its removal from the nipple involving rotation of the closure member relative to the nipple, the improvement which comprises a tether attaching the closure member to the nipple while permitting its removal therefrom, the tether being made of flexible plastic material in sheet form and having a circular body made substantially of two concentric rings spaced radially from each other, means rotatably securing the inner ring to the nipple inwardly of its outer free end and concentrically therewith, a radial tab connecting the two rings at one zone, a flexible strap connected at one of its ends to the outer edge of the outer ring at a second zone, such second zone being disposed diametrically opposite the first zone, the other end of the flexible strap being connected to the closure member.

4,004,615

PARTS SUBJECT TO WEAR IN SEPARATORS, CYCLONES, PIPELINES AND SIMILAR APPARATUS

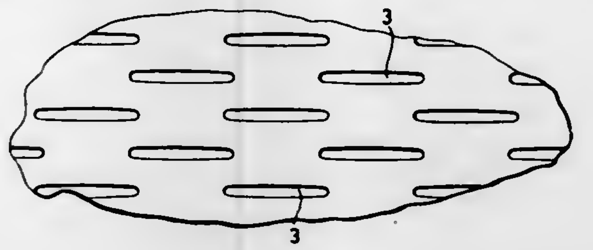
Hans Stern, deceased, late of Dortmund-Hochsten, Germany by Erika Stern, heir, and Werner Strauss, Bochum, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Feb. 4, 1975, Ser. No. 547,044

Claims priority, application Germany, Feb. 4, 1974, 2405298

Int. Cl.² F15D *1/06*; F16L *57/00*; B04C *1/00*; B07B *4/00*

U.S. Cl. 138—177 **8 Claims**



1. In apparatus in which there is a particle-conducting flow, such as separators, cyclones, pipelines and similar apparatus, and where a part of said apparatus, designated wear members, is in contact with said particle-conducting flow and is abrasively worn by said particle-conducting flow, the improvement comprising a plurality of spaced depressions in said contact surface of said wear member producing an increase in the macro surface roughness above a roughness depth of 0.1 mm, of the wear member and forming a flow-marginal layer at the surface of the wear member spacing the abrasive particles in the flow from the surface of the wear member and in which layer entrained particles sink downwardly at reduced velocity with reduced abrasive effect.

4,004,616

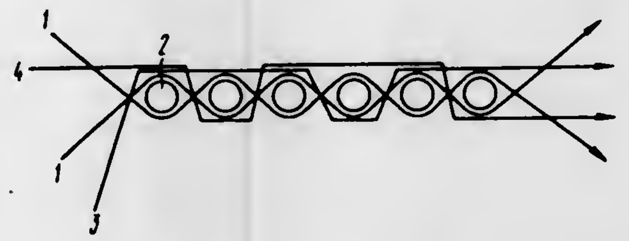
WOVEN BAND

Mikhail Alexandrovich Andronov, ulitsa Rusakovskaya, 39/43, kv. 32; Anatoly Nikolaevich Bakun, Sevastopolsky prospekt, 36, kv. 53; Felix Evgenievich Mezhevich, Rostokinsky gorodok, 6 linia, 17, kv. 84; Mikhail Ivanovich Petrov, Sevastopolsky prospekt, 17, korpus 2, kv. 39; Jury Ivanovich Belov, ulitsa 15 Parkovaya, 16, korpus 1, kv. 68, all of Moscow, U.S.S.R.; Alexandr Yakovlevich Feldman, deceased, late of Moscow, U.S.S.R., and by Raisa Alexandrovna Feldman, administratrix, ulitsa Bashilovskaya, 10, kv. 14, Moscow, U.S.S.R.

Filed June 18, 1974, Ser. No. 480,495

Int. Cl.² D03D *15/00*

U.S. Cl. 139—383 R **3 Claims**



1. A woven band comprising a plurality of warp threads having different relative elongations at rupture and different colors; and weft threads interwoven with said warp threads, in which a plurality of a first group of warp threads, with a lesser relative elongation, are interwoven in a first zone beside each other and between the rest of a second group of warp threads, which are rarefied within said first zone, the warp threads uniformally passing about the weft threads uniformally passing about the weft threads forming essentially two indicator strips running warpwise, distinguishable against the rest of the band and having definitely, apparent, visual-discriminating-ability across the bandwidth, centers of said indicator strips being spaced from band side edges distances equalling from between one-eight to one-third the band width the ratio of the relative elongation of the threads of the indicator strips to the relative elongation of the warp threads being less than the ratio of the tensile force critical for the band strength to its actual rupture strength, so that as a result of which, an overload of the band involves simultaneous formation of clearly visible discontinuities of the indicator strips spaced apart at a constant pitch along the length of the band, said discontinuities being formed within a narrow range of loads critical for the band.

4,004,617

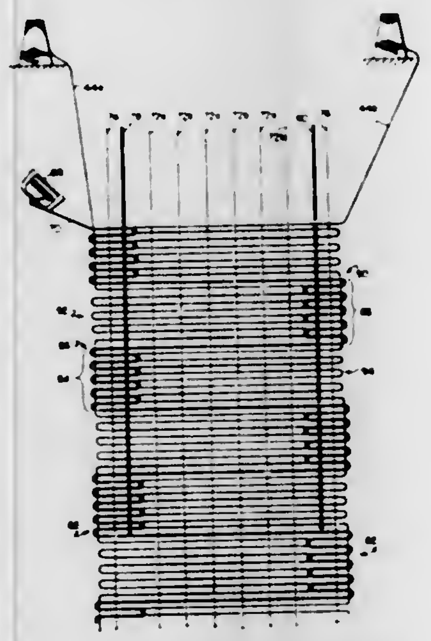
METHOD FOR FORMING A DOUBLE CATCH THREAD NARROW WEAVE

Junior C. Spence, Stuart; Robert J. Rorrer, Woolwine, and James L. Holt, Stuart, all of Va., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,438

Int. Cl.² D03D *23/00*, *35/00*, *47/02*

U.S. Cl. 139—416 **9 Claims**



1. A method of weaving a fabric comprising:

a. providing a plurality of warp threads to thereby form a first edge warp, a main warp and a second edge warp;
b. providing a first catch thread adjacent said first edge warp;
c. providing a second catch thread adjacent said second edge warp;
d. providing a first stop means at the boundry between said first edge warp and said main warp;
e. providing a second stop means at the boundry between said second edge warp and said main warp;
f. looping a shuttle thread around said first catch thread, drawing said first catch thread through said warp threads until said shuttle thread engages said second stop means, and looping said shuttle thread around said second edge warp to form an exterior shuttle thread loop about said second edge warp;
g. weaving said shuttle thread across said warps; and
h. looping said shuttle thread around said second catch thread, drawing said second catch thread through said warp threads until said shuttle thread engages said first stop means, and looping said shuttle thread around said first edge warp to form an exterior shuttle thread loop about said first edge warp.

4,004,618

CABLE TIE BRAKING MEANS IN A CABLE TIE INSTALLATION TOOL

James A. Turek, La Grange, Ill., assignor to Panduit Corporation, Tinley Park, Ill.

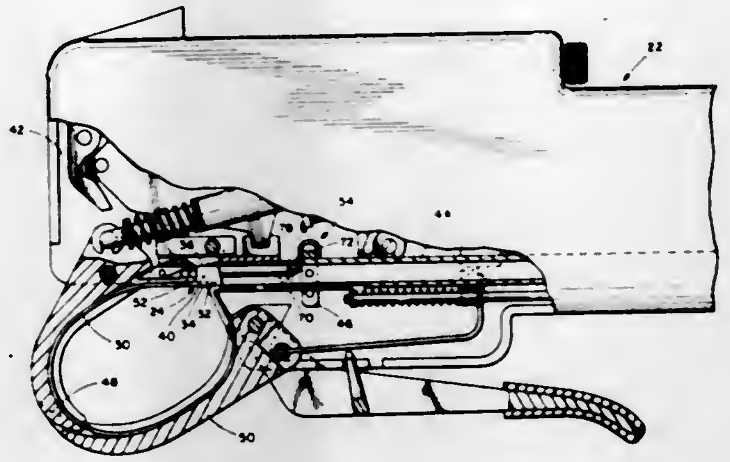
Filed Dec. 29, 1975, Ser. No. 644,398

Int. Cl.² B21F *9/02*

U.S. Cl. 140—93.2 **10 Claims**

1. An improvement in a cable tie installation tool which includes a tool member for fastening a cable tie about a bundle of wires or the like, conveyor means connected to said tool member, and propulsion means for propelling a cable tie through said conveyor means to said tool member, said tool member having positioning means for placing said cable tie about said bundle, a tube receiving said cable tie from said conveyor means and guiding the tie toward said positioning means, and stop means engagable with the head of said tie for limiting the movement of said head toward said positioning means, said improvement comprising:

braking means for decelerating said cable tie as it passes through said tube and before the head of the tie reaches said stop means whereby the likelihood of damage to said head upon engagement with said stop means is reduced and the service life of said stop means is extended



4,004,619

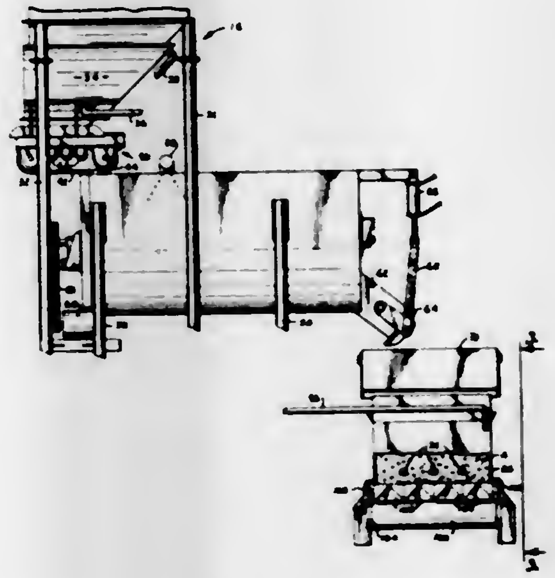
METHOD AND APPARATUS FOR PREPARING AND PACKAGING MASTIC COATING MATERIAL

Cecil A. Eddlemon, Gretna; Robert J. Harris, Marrero, and George E. Hanson, Belle Chasse, all of La., assignors to H. C. Price Co., Bartlesville, Okla.

Filed Apr. 28, 1976, Ser. No. 681,021

Int. Cl.² B65B *63/08*

U.S. Cl. 141—11 **16 Claims**



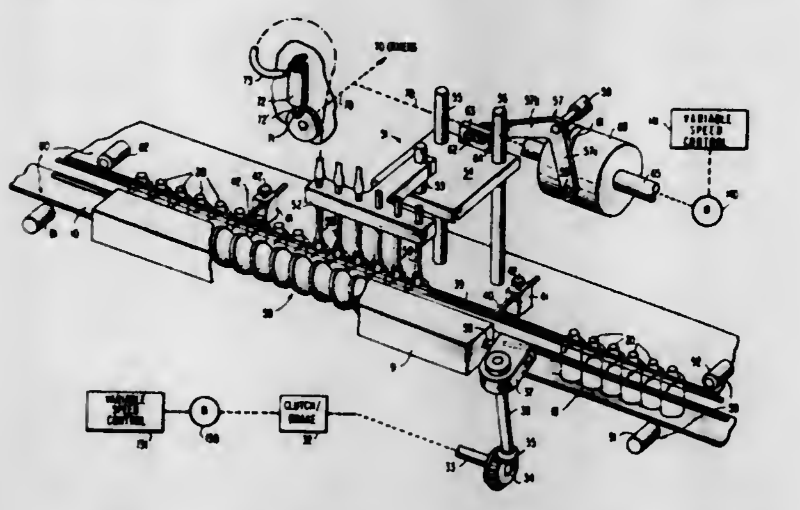
1. A method of simultaneously packaging a fluid, thermoplastic material in a plurality of containers when the material is initially present in bulk in a holding area, said method comprising the steps of:

positioning a plurality of said containers in side-by-side relationship beneath said holding area;

interposing a heating element in a vertical plane which extends upwardly between each adjacent pair of containers, each of said heating elements also lying in a horizontal plane which is intermediate said holding area and the uppermost edges of said containers; and

passing the bulk material out of the holding area so said material can follow a path toward said containers, said material passing over said heating element as it travels said path thereby dividing itself into a plurality of individual masses equal to the number of containers and then passing into said containers.

4,004,620
FLUID FILLING MACHINE
Sidney Rosen, 4119-27 Fordleigh Road, Baltimore, Md. 21215
Filed Oct. 4, 1974, Ser. No. 512,351
Int. Cl.² B65B *43/56*
U.S. Cl. 141—137 **19 Claims**



1. A fluid handling and filling machine for filling containers with a predetermined amount of fluid, comprising

pump means,

nozzle means operatively connected with the pump means,

first means for actuating the pump means,

second means for raising and lowering the nozzle means,

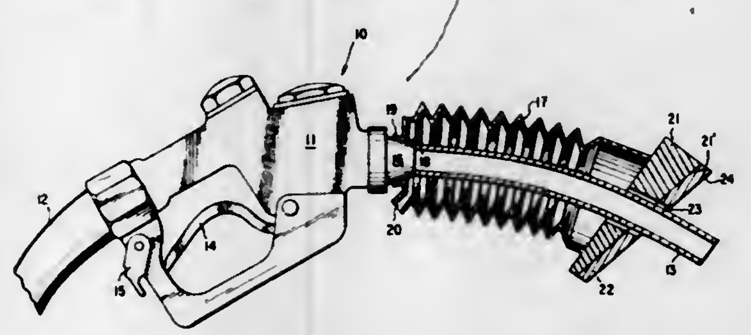
indexing means for indexing a predetermined number of containers to be properly positioned in relation to the nozzle means to enable filling of the containers by said nozzle means, said indexing means including at least one rotatable feed screw means defining indexing spaces for the containers and operable, upon rotation, to move the containers, and

control means, operatively connected with both said first and second means and with said indexing means, for correlating the movement of containers by controlled rotation of the rotatable feed screw means of said indexing means to the filling thereof by said pump means and the lowering and raising of the nozzle means, said control means including counter means for counting the number of revolutions of the feed screw means, and further means for effectively stopping the feed screw means upon completion of a predetermined number of revolutions.

4,004,621
LIQUID-DISPENSING NOZZLE ASSEMBLY
Bernard E. Weidenaar, Hacienda Heights, Calif.; Frederick L. Voelz, Orland Park; James J. Simaick, Riverdale, both of Ill., and Peter P. Moskovich, Jr., Gary, Ind., assignors to Atlantic Richfield Company, Philadelphia, Pa.
Continuation-in-part of Ser. No. 468,787, May 9, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,906
Int. Cl.² B65B *3/04*
U.S. Cl. 141—392 **13 Claims**

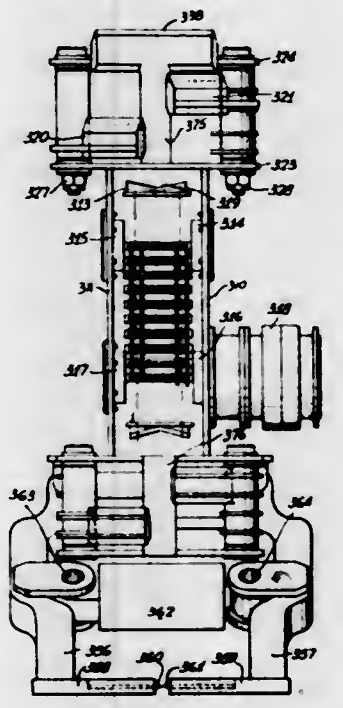
1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet, said assembly being provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

1. a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;
2. a vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said nozzle is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing, or in proximity thereto, a sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said sealant means; and
3. means for allowing removal of vapor from said chamber; the improvement comprising said sealant means comprising a compressible cellular plastic material obtained from a polyacrylate elastomer, said material having:



a. a plurality of cells present as part of its structure;
b. compressibility under normal nozzle loads of the material in contact with the outer surface of the receiver inlet in the range of from about 5 to about 85% of that part of the material's original preload volume;
c. substantial resistance to the liquid dispensed and vapor being removed, and
d. the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

4,004,622
HARVESTER PROCESSOR ASSEMBLY
Douglas D. Hamilton, Mount Royal, Canada, assignor to Logging Development Corporation, Montreal, Canada
Filed Dec. 30, 1974, Ser. No. 537,459
Claims priority, application Canada, Jan. 7, 1974, 189608
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **9 Claims**

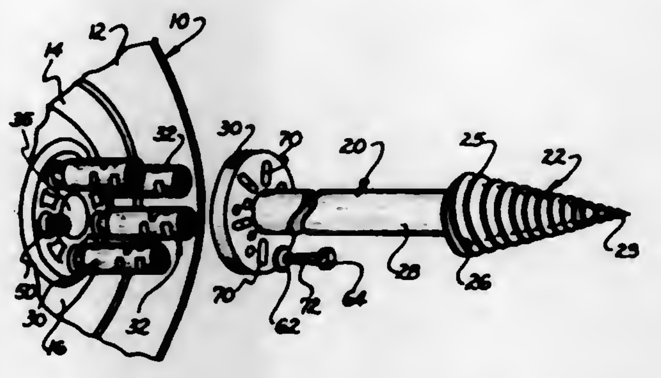


9. A combination tree felling head and processing assembly comprising:

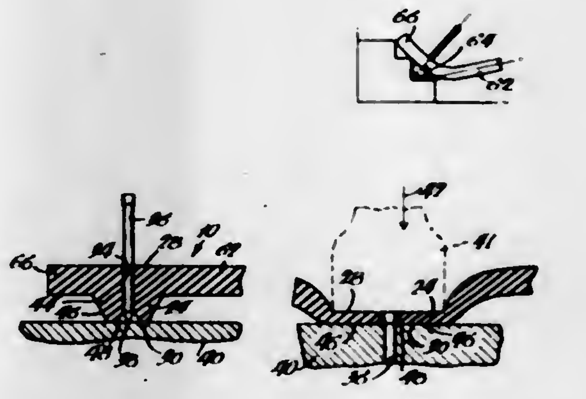
a. a rigid longitudinally extending frame with a central, substantially U-shaped in cross-section, portion providing a pair of parallel plate members spaced apart from one another for receiving an endless belt type driven tree feed means;
b. a first grapple comprising a first pair of curved arms pivotally attached to said frame at one end thereof and protruding therefrom to receive and grasp the stem of a tree extending parallel to said frame, said arms each having a cutting edge for severing limbs from the stem of a tree loosely embraced by such arms as the tree is propelled endwise;
c. a second grapple and tree severing device mounted on the end of the frame opposite to that of said first grapple, said second grapple comprising a second pair of curved arms pivotally attached to said frame and protruding therefrom to receive and grasp the stem of a tree grasped by said first grapple at a position spaced therefrom, said tree severing device comprising a third pair of arms pivotally mounted on said frame at a position adjacent the pivotal mounting of the arms of said second grapple, the pivots for said third pair of arms being spaced behind the pivots for said second grapple arms at a distance from the tree grasped by the grapple greater than that of the pivots for the arms of the second grapple, all of said pivot axes being parallel to one another and the third pair of arms extending in a direction inclined to the pivot axis in a direction away from the frame and terminating in free outer end portions, a pair of cutting members secured to respective ones of said third pair of arms adjacent the free terminal end portions thereof and disposed in a plane transverse to the length of the stem of a tree grasped by said first and second grapples, said cutting members being disposed in such a position as to sever the stem of a tree grasped by said grapples at a position spaced therefrom longitudinally along the tree, power means for the respective pairs of arms of each of said first and second grapple and tree severing device for pivotally moving the same, said power means for the severing device comprising a hydraulic cylinder interconnecting the arms and disposed at a position below the frame and second grapple;
d. tree feed means mounted in said U-shaped portion of said frame at a position between said first and second grapples and comprising an endless conveyor extending longitudinally along the frame between said pair of plate members, said endless conveyor having formations thereon for tractively engaging the surface of the stem of a tree loosely grasped by said first and second grapples; and
e. a slide plate on said frame above and below said endless conveying means for slidably engaging the trunk of the tree as it is propelled endwise by said conveying means.

4,004,623
POWER TOOL
Russell H. Thackery, 2376 Brentwood Road, Columbus, Ohio 43209
Filed Apr. 19, 1976, Ser. No. 678,247
Int. Cl.² B27L *7/00*; B60K *17/28*
U.S. Cl. 144—193 R **4 Claims**

2. A power tool driven by a vehicle wheel hub comprising, in combination, a driven wheel hub; a plurality of fixed threaded elements on said hub; a plurality of removable threaded elements for normally attaching a wheel to the hub, each of said removable threaded elements being in threaded engagement with a respective one of the fixed threaded elements; a plurality of adapter means each of which is mounted to said hub by a respective pair of the threaded elements, each of said adapter means comprising a hollow body portion including a hub engaging end provided with a bore and an internal shoulder surrounding said bore, one of said threaded elements being extended through said bore whereby tightening of the elements clamps said shoulder and tightens the adapter on the hub, each of said adapters comprising a tool mounting end including side walls provided with slots and a longitudinal bore; a transverse bar removably disposed in said slots and including a central tool mounting threaded portion; a tool including a mounting base portion positioned on said tool mounting ends and including base holes that register with said longitudinal bores; and a plurality of tool mounting threaded elements including threaded portions fastened to said threaded portions of respective transverse bars.



4,004,624
CARPENTER'S TOOL
Frederick W. Holstein, 1331 Howe St., Racine, Wis. 53403
Filed July 31, 1975, Ser. No. 601,313
Int. Cl.² B25C *3/00*
U.S. Cl. 145—46 **3 Claims**

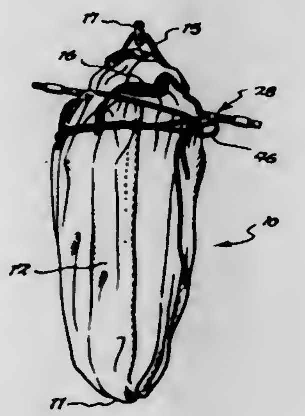


1. A tool for limiting the travel of a rigid element toward a workpiece when a hammer blow is applied to the element, said tool having a resilient, flexible body with an upper surface for receiving the impact force of a hammer blow, a lower surface for bearing engagement with the workpiece during the application of the blow, and an elongate hole extending through, and entirely surrounded by said resileint body between the upper and lower surfaces thereof for guiding the element during the application of the blow, said flexible body being compressed sufficiently in the direction parallel to that of the impact force by the application of the blow to resiliently oppose the impact force with increased resilient force during increased compression, wherein said body includes a portion tapered toward the hole from a part of the body adjacent the upper surface thereof to a part of the body adjacent the lower surface thereof, and including an elongated extension attached to the body having a thickness less than that of the tapered portion of the body measured in a direction parallel to the elongate hole, said extension extending away from the tapered portion in a substantially radial direction with respect to the hole, said extension defining an angle relative to the elongate axis of the hole and being resiliently flexible whereby the angle may be manually altered.

3. A tool for limiting the travel of a rigid element toward a workpiece when a hammer blow is applied to the element, said tool having a resilient, flexible body with an upper surface for receiving the impact force of a hammer blow, a lower surface for bearing engagement with the workpiece during the appli-

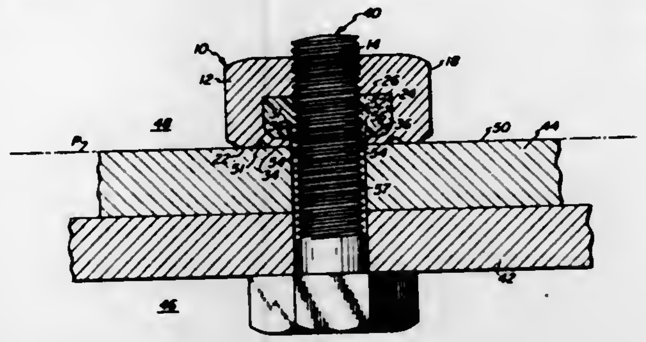
cation of the blow, and an elongate hole extending through, and entirely surrounded by, said resilient body between the upper and lower surfaces thereof for guiding the element during the application of the blow, said flexible body being compressed sufficiently in the direction parallel to that of the impact force by the application of the blow to resiliently oppose the impact force with increased resilient force during increased compression, wherein said rigid element is an elongate nail-like fastener to be driven into the workpiece, said hole being dimensioned to resiliently hold the fastener within the hole, and said upper surface is the upper most surface of the tool and engageable by the hammer when the impact force of a hammer blow is received by the fastener, said hammer being substantially limited from traveling closer to the workpiece than a selected distance by the resilient opposing force of the body, and said lower surface has a cavity therein co-axially with, and having a section opening out to said lower surface and with a transverse dimension greater than and below, the hole, said section of the cavity having a depth substantially equal to but slightly greater than said distance, whereby the hold on the element exerted by the hole is released when the element protrudes from the workpiece by an amount equal to said distance.

4,004,625
CONTAINER FOR ANCHOR AND LINE
John F. Zietlow, Jr., 37 Berkley Place, Buffalo, N.Y. 14209
Filed Nov. 3, 1975, Ser. No. 627,971
Int. Cl.^{2} B65D *33/24*
U.S. Cl. 150—7 **11 Claims**



1. A container for stowing an anchor and a length of line connected thereto, said container comprising:
- a. a hollow body portion of flexible material closed at one end and open at the other, said body portion having an interior region communicating with said open end and being of sufficient size to accommodate said anchor;
- b. means defining a plurality of pockets of flexible material in spaced relation along and around said body portion, each of said pockets having a hollow body portion closed at one end and open at the other end thereof adjacent said open end of said container body portion, each of said pockets having an interior region and the aggregate size of the interior regions of said pockets being of sufficient size to accommodate said line; and
- c. a movable closure element of flexible material on said open end of said body, said closure element comprising a pair of flaps integral with said body portion and foldable into a closed position over said open end of said container body portion, said closure element being movable from a position covering the open ends of said container body portion and said pockets when said anchor and line are stored therein to an open position allowing said anchor and line to be removed from the container for use;
- d. whereby said anchor can be stowed in the interior of said container body portion and said line can be stowed cumulatively in said pockets in a manner preventing fouling thereof and when said anchor is removed from said container for use said line can be payed out sequentially in a manner preventing fouling thereof.

4,004,626
SELF-SEALING, SELF-LOCKING THREADED FASTENER
Daniel L. Biblin, Morris Township, and Joseph R. Preziosi, Clark, both of N.J., assignors to Amerace Corporation, New York, N.Y.
Filed June 6, 1975, Ser. No. 584,475
Int. Cl.^{2} F16B *39/24*
U.S. Cl. 151—7 **6 Claims**

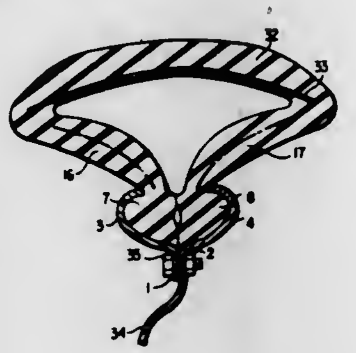


1. A self-sealing, self-locking fastener comprising:
a unitary metallic nut body including an internally threaded portion, the thread having a root of prescribed diameter and an axis, and an immovable plane annular clamping surface surrounding and perpendicular to the axis and axially spaced and facing away from said threaded portion and in and defining a clamping plane;
an annular recess in the nut body generally coaxial with the threaded portion, said recess having an inside surfaces located outside the envelope of the root of the thread and facing the thread axis and extending axially from said threaded portion toward the clamping plane, no part of said nut body being radially between said inside surface and the thread axis;
said nut body further having compression-retention means unitary with the threaded portion and having a radially inwardly extending deformable annular flange surrounding the axis and having a first surface facing said threaded portion and merging with said inside surface of said recess, a second surface facing away from said threaded portion and closer to the axis than said immovable plane annular clamping surface, said plane clamping surface and said second surface of said flange being joined by a groove, facilitating deformation of said flange, and an annular third surface confronting the axis and joining said first and second flange surfaces to provide said flange with an inner diameter, when said fastener is fully seated on a workpiece, slightly greater than said root diameter, and said second surface initially extending beyond the clamping plane in the axial direction away from the threaded portion;
and an annular member of resilient sealing and locking material, such as a fluoroplastic, retained within the recess between said threaded portion and said first surface of said flange, said annular member having an inside surface adapted for free initial reception of a complementary threaded element and having a portion of initial diameter no smaller than approximately said root diameter and extending axially from said threaded portion toward the clamping plane;
whereby, upon engaging the fastener with the complementary threaded element passing through a hole in the workpiece and tightening the flange against the workpiece, axial clamping force exerted by the workpiece on said second surface of the flange will deform said flange axially toward said threaded portion until said second surface of said flange is in the clamping plane, thereby compressing the annular member axially between said first surface of said flange and said threaded portion while contracting the inside surface thereof to establish a seal along, and locking relationship with, the complementary threaded and forcing material of the annular member against the workpiece in an annular space between the flange and the complementary threaded element to establish a seal between the annular member and the workpiece.

4,004,627
PNEUMATIC TIRE WITH SIDEWALL COMPOSITION
Paul H. Sandstrom, Tallmadge, and Joginder Lal, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 19, 1975, Ser. No. 642,273
Int. Cl.^{2} C08F *15/06*; C08G *20/20*
U.S. Cl. 152—355 **20 Claims**

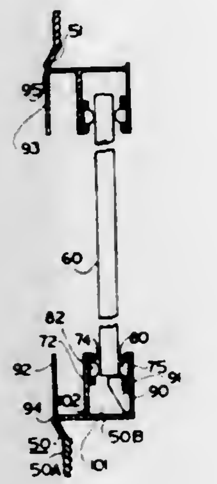
1. A pneumatic rubber tire which comprises a generally toroidal shaped carcass with a circumferential tread, shaped beads and connecting sidewall portions extending between said tread and beads and having adhered to said sidewall portion an adherent, covulcanized outer rubbery sidewall layer extending from the general area of said bead portion towards said tread, where said rubbery sidwall layer is an elastomeric composition comprised of (A) about 10 to about 40 phr rubbery EPDM, (B) about 0 to about 20 phr of a rubbery polymer prepared from at least one $C_4 - C_{10}$ α-olefin interpolymerized with at least one $C_5 - C_{30}$ nonconjugated polyene containing 2 or more carbon to carbon double bonds, (C) about 55 to about 80 phr of high unsaturation rubbers comprised of 30 to 80 weight percent natural rubber and (D) about 0.5 to about 10 phr of at least one compound additive selected from the group consisting of triallyl cyanurate, mono- and bis-maleimides selected from maleimide, N-ethylmaleimide, N-phenylmaleimide, N-trichloromethylmaleimide, N-4-carboxyphenylmaleimide, N,N'-thiobismaleimide, N,N'-dithiobismaleimide, and N,N'-phenylenebismaleimide, and anhydrides selected from isatoic anhydride, N-methyl isatoic anhydride, phthalic anhydride, succinic anhydride and maleic anhydride.

4,004,628
PNEUMATIC WHEEL FOR MOTOR VEHICLES
Giorgio Tangorra, Monza (Milan), and Giovanni Calori, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy
Filed Feb. 28, 1975, Ser. No. 554,190
Claims priority, application Italy, Mar. 4, 1974, 48941/74; Oct. 4, 1974, 28039/74
Int. Cl.^{2} B60C *5/12*
U.S. Cl. 152—383 **19 Claims**



1. A pneumatic wheel for motor vehicles comprising a rim and a pneumatic tire with a tread reinforced by an annular inextensible structure, two sidewalls having their own section midline in the meridian plane with its convexity directed towards the inside of the tire and such that in consequence of te inflation air they are subjected to combined bending and compression stresses, said sidewalls terminating in two beads connecting the pneumatic tire to the rim, said rim having at least one seat having the shape of a circumferential channel with an opening directed in a radially outer direction with respect to the axis of rotation of the pneumatic wheel, the radially outermost ends of said rim being directed towards the midline of the pneumatic wheel to constitute said opening, the width of said opening being smaller than the maximum width of said seat, said beads having a size with respect to said seat which adapts them to be subjected to an axial compression, said beads having respectively two circumferential surfaces axially facing each other, each surface having a first radially innermost zone and a second radially outermost zone, the axial distance, when the beads are not locked in the rim seat, between said first zones being smaller than that between said second zones, the axial compression corresponding to said first radially innermost zone being greater than that corresponding to said second radially outermost zone when the beads are locked in said seat, whereby the center of the axial thrust of the beads is radially inward with respect to that which would be obtained if the axial compression were uniformly distributed on said circumferential surfaces axially facing each other.

4,004,629
FRAMELESS SLIDING WINDOW ASSEMBLY
Donald V. Kelly, 10642 Helendale, Tujunga, Calif. 91042
Filed Oct. 9, 1974, Ser. No. 513,296
Int. Cl.^{2} E06B *3/32*; E05D *15/06*
U.S. Cl. 160—90 **7 Claims**



1. A window assembly comprising a window frame including as members thereof a pair of jambs, a header and a sill;
at least two of said members including portions defining a track for movement of a window lite to affect the opening and closing of the window assembly;
a window lite positioned in the track of said frame;
the sill portion including a longitudinally extending member in said track in elongated supporting contact with the edge of said lite and a recess below and lite;
handle means engaging said lite for movement within said frame;
seal means supported by said frame and extending along the surfaces of said frame portions in a sealing relationship with said lite;
said supporting member extending only partially across the thickness of said track leaving said recess unobstructed on the outer or weather side of said lites except for said seal means whereby foreign material including moisture contacting said lite and passing said seal means can drop below said lite into said recess;
said sill portion further defining drainage openings therein communicating between said recess and the exterior of the assembly;
wherein said handle means includes a portion extending into engagement with one of said track defining portions of said assembly when said window is in a closed position whereby said lite is mechanically biased against said seal means of said assembly;
wherein said handle includes a wedge-shaped foot portion extending generally parallel to the inner surface of said lite whereby said foot portion extends between said lite and frame when said lite is closed thereby mechanically wedging said lite against said seal means.

4,004,630

PROCESS FOR THE MANUFACTURE OF CAST IRON

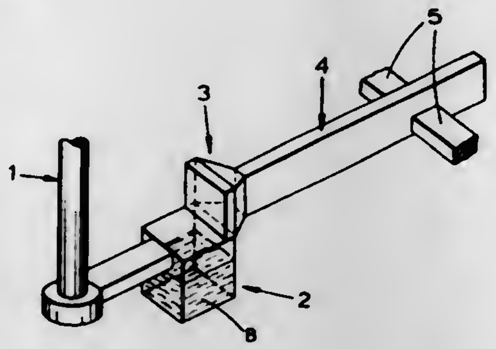
Clifford Matthew Dunks, East Grinstead, England, assignor to Materials and Methods Limited, England

Filed Apr. 28, 1975, Ser. No. 571,621

Claims priority, application United Kingdom, Apr. 29, 1974, 18657/74

Int. Cl.² B22D *27/20*

U.S. Cl. 164—57 **2 Claims**



1. A method for the production of the nodular graphite cast iron castings in a mold into which molten grey iron is introduced, said method comprising the steps of:

a. determining the required concentration of a nodularizing agent required to nodularize said molten grey iron;
b. selecting a nodularizing alloy having a predetermined percentage of nodularizing agent therein and a predetermined efficiency factor *k* which is a function of the solubility of the nodularizing alloy in the molten grey iron;
c. placing the nodularizing alloy into at least one intermediate chamber in said mold, said intermediate chamber having a base area A wherein

$$A = 1/k\ (W_T/T)\ (N_{nod}/W_T)$$

where

W_T/T = pouring rate of the molten metal into the mold

N_{nod}/W_T = required concentration of nodularizing agent

d. pouring said molten grey iron into said mold wherein said nodularizing agent is taken into solution in said molten grey iron, as said molten metal passes over the nodularizing agent in said intermediate chamber, whereby the graphite in said molten grey iron is converted to a nodular form such that a nodular cast iron casting is formed.

4,004,631

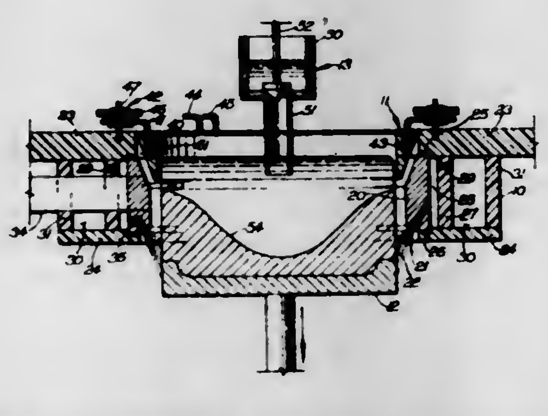
ELECTROMAGNETIC CASTING APPARATUS

David G. Goodrich, San Ramon, and Ludwig John, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 28, 1975, Ser. No. 599,744

Int. Cl.² B22D *27/02*

U.S. Cl. 164—250 **8 Claims**



1. In an electromagnetic apparatus for the continuous or semicontinuous casting of metal ingots or billets, wherein a solid ring-type metallic electromagnetic inductor is provided to generate electromagnetic forces which control the shape of a column of molten metal disposed within the inner peripheral area of the inductor and wherein a coolant source is disposed around said metal column to direct coolant onto the surface of the metal so as to cause the solidification thereof, the improvement comprising an annular coolant jacket as said coolant source with the solid ring-type metallic electromagnetic inductor disposed immediately adjacent the column of molten metal as the inner wall of the annular coolant jacket with the inner peripheral area of the inductor exposed to the column of molten metal, the inductor thereby defining in part a coolant chamber within the coolant jacket so that the inductor is cooled by the coolant in the chamber.

4,004,632

CENTRIFUGAL CASTING MACHINE CASING AND COOLING APPARATUS

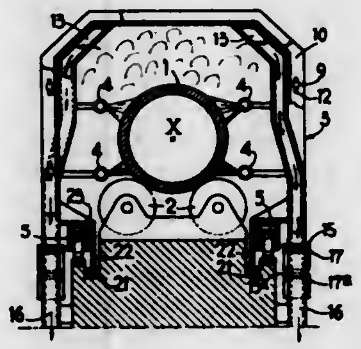
Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Apr. 11, 1975, Ser. No. 567,334

Claims priority, application France, Apr. 29, 1974, 74.14868

Int. Cl.² B22D *13/02*

U.S. Cl. 164—297 **8 Claims**



1. A machine for centrifugally casting iron pipes comprising support means, a casing, a rotary casting mould supported on the support means and rotatable about an axis, the casing being movable in translation in a direction parallel to said axis relative to the support means between a withdrawn position and an operative position in which operative position the casing surrounds the mould substantially throughout the length of the mould, the casing having a leading end and a trailing end relative to the movement of the casing to said operative position, means for spraying cooling water onto the mould, a first duct and a second duct carried by the casing respectively adjacent the leading end and the trailing end of the casing, each duct having an outlet opening onto the interior of the casing and a transverse annular end surface defining an inlet, a third duct and a fourth duct which are fixed relative to the support means, each third and fourth duct having a transverse annular end surface defining an outlet, and forced steam suction means disposed in the third and fourth ducts, the end surfaces of the first and second ducts being respectively parallel to the end surfaces of the third and fourth ducts and positioned relative to the casing to respectively coincide with and sealingly engage the end surfaces of the third and fourth ducts in the operative position of the casing, the end surfaces of the ducts being inclined relative to said axis in a direction to permit the end surfaces of the first and second ducts to disengage from the end surfaces of the third and fourth ducts when the casing moves to said withdrawn position, and the end surfaces of the first and third ducts being offset transversely of said axis from the end surfaces of the second and third ducts whereby the end surface of the first duct clears the end surface of the fourth duct when the casing moves to said withdrawn position.

4,004,633

BRICK CONSTRUCTION FOR HORIZONTAL REGENERATOR

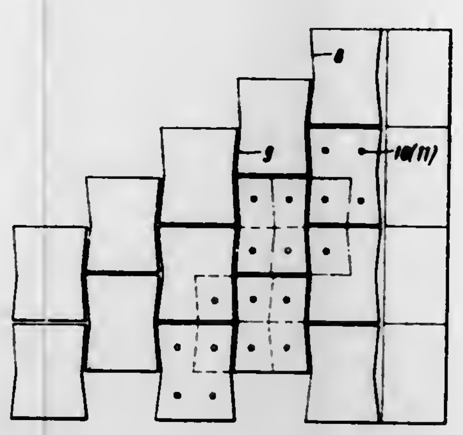
Wolfgang Cronert, Eikamp, Germany, assignor to Martin & Pagenstecher GmbH, Cologne, Germany

Filed Dec. 9, 1974, Ser. No. 531,024

Claims priority, application Germany, Dec. 13, 1973, 441153[U]

Int. Cl.² F28D *17/00*

U.S. Cl. 165—9.1 **11 Claims**



1. In a horizontally disposed regenerator having a plurality of generally parallel courses of bricks separated by vertical spacers, each course of which runs generally horizontal, the improvement wherein the bricks have a generally slab-like horizontal surface, wherein the longitudinal sides of said slab-like surface of said horizontal brick are provided with a tooth-like formation engaging in an offset manner the tooth-like formation of an adjoining horizontal brick in the same horizontal plane whereby said horizontal bricks are offset from one horizontal row to another horizontal row as the adjoining bricks are engaging one another in offset position the vertical spacers run generally longitudinal of said slab-like surfaces between courses thereof, said vertical spacers engaging the slab-like surfaces by a tongue and groove connection.

4,004,634

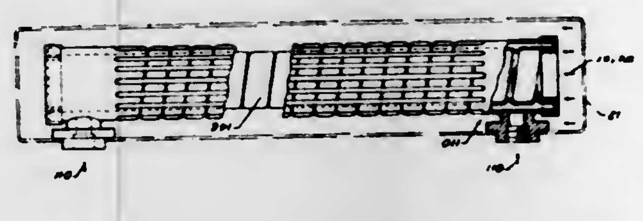
AUTOMOTIVE OIL COOLER

Edward P. Habdas, Dearborn Heights, Mich., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,989

Int. Cl.² F28D *7/10*

U.S. Cl. 165—155 **10 Claims**



1. In a submerged oil cooler for automotive vehicles comprising a hollow inner length of tubing through which engine coolant may flow and an outer length of tubing sealed at its ends to the inner tubing and having an inner surface which cooperates with the outer surface of the inner length of tubing to define a generally annular flow passage for oil which may pass through inlet and outlet fittings at opposed ends of the cooler, the improvement wherein said inner length of tubing includes a helically convoluted outer surface and said outer length of tubing includes a plurality of generally axially extending flutes which engage said helically convoluted outer surface, the crests of said flutes being periodically transversely indented along the axial length thereof to a depth less than the depth of the flutes.

4,004,635

METHOD FOR CONNECTING A SUBMERGED WELL HEAD TO A PIPE CONSISTING OF STEEL TUBES

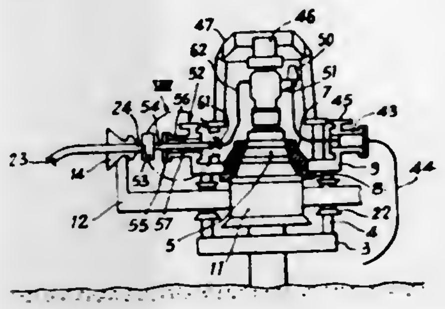
Roger Andre Marie Marquaire, La Celle St. Cloud; Michel Georges August Curtis, Lyon, both of France, and Robert Edouard Schappel, London, England, assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Apr. 7, 1975, Ser. No. 565,908

Claims priority, application France, Apr. 5, 1974, 74.12174

Int. Cl.² E21B *33/035*

U.S. Cl. 166—.6 **12 Claims**



1. A method of connecting a relatively inflexible outflow pipe to a submerged well head at a depth which may be greater than that which can be reached by a diver, the method comprising the steps of; attaching a pipe connector at the surface to an end of said outflow pipe; locking said pipe connector onto a placing structure fixed relative to said well head; lowering a diving bell onto said well head, said diving bell being provided with a bearing structure which is connected to said well head to thus render watertight the volume formed by said well head, said structure and said bell; the orientation of said bell and said bearing structure being chosen as a function of the orientation of said pipe connector relative to said well head; attaching to said well head a sub-assembly coupled to the lining of said well head; connecting said sub-assembly to a device for automatic connection to said pipe connector, which automatic connection device is fixed to said bearing structure; and automatically connecting said device to said pipe connector.

4,004,636

COMBINED MULTIPLE SOLVENT AND THERMAL HEAVY OIL RECOVERY

Alfred Brown; Ching H. Wu, and Daniel T. Konopnicki, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 27, 1975, Ser. No. 580,863

Int. Cl.² E21B *43/22, 43/24*

U.S. Cl. 166—272 **26 Claims**

1. A method for recovering viscous petroleum including bitumen from a subterranean, viscous petroleum-containing, permeable formation including a tar sand deposit, the formation having a petroleum saturation below 50%, the formation being penetrated by at least two wells in fluid communication therewith, comprising:

a. introducing a solvent which is gaseous at formation temperature and pressure, into the formation via the first well until the pressure in the formation exceeds the vapor pressure of gaseous solvent at formation temperature so said gaseous solvent exist essentially all in the liquid phase in the formation;
b. introducing a solvent which is liquid at formation temperature and pressure, into the formation via the first well;
c. thereafter reducing the pressure in at least a portion of the petroleum formation contacted by the solvents to a value greater than the vapor pressure of the solvent mixture;
d. recovering a solution of the petroleum and solvent from the formation via at least one of said wells, maintaining the formation pressure greater than the vapor pressure of the solvent mixture; and finally
e. injecting a fluid heated to a temperature substantially

greater than the boiling temperature of the gaseous solvent into the formation via the first well while recovering petroleum and solvent from said second well.

4,004,637

OIL RECOVERY BY IMPROVED SURFACTANT FLOODING

Riley B. Needham; Gilbert R. Glinsmann, and Donald R. Wier, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 27, 1975, Ser. No. 553,689
Int. Cl.^{2} E21B *43/16*
U.S. Cl. 166—273 **12 Claims**

1. A process for the recovery of oil from a predominantly oil-wet formation which comprises:
   a. introducing a first solution into the formation so as to change the wettability of the oil-wet formation from predominantly oil-wet to predominantly water-wet;
   b. introducing a second solution having a high interfacial tension of at least about 1 dyne/cm to the oil into the formation;
   c. introducing a third solution having a low interfacial tension of not more than 0.02 dyne/cm to the oil into the formation;
   d. introducing a driving fluid into the formation to drive said first, second and third solutions and oil from said formation; and thereafter
   e. recovering the oil.

4,004,638

OIL RECOVERY BY ALKALINE-SURFACTANT WATERFLOODING

Ralph F. Burdyn; Harry L. Chang, and Evin L. Cook, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,686
Int. Cl.^{2} E21B *43/22*
U.S. Cl. 166—273 **18 Claims**

1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, said reservoir containing oil having an acid number within the range of 0.1 to 1.0, the method comprising:
   a. injecting into said reservoir via said injection system an aqueous initiation slug containing an alkaline agent selected from the group consisting of alkali metal and ammonium hydroxides to neutralize organic acids in said reservoir to surface-active soaps,
   b. thereafter injecting into said reservoir via said injection system an aqueous surfactant slug containing a sulfonate surfactant and an alkaline agent selected from the group consisting of alkali metal and ammonium hydroxides,
   c. thereafter injecting into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and
   d. recovering oil from said production system.

4,004,639

SELECTIVELY PLUGGING THE MORE PERMEABLE STRATA OF A SUBTERRANEAN FORMATION

Burton B. Sandiford, Placentia, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Mar. 17, 1976, Ser. No. 667,693
Int. Cl.^{2} E21B *33/138, 43/22*
U.S. Cl. 166—292 **15 Claims**

1. A method for reducing the permeability of the higher permeability strata or channels of a heterogeneous subterranean formation penetrated by a well comprising sequentially injecting the following fluids through the said well and into the said formation:
   a. about 1 to about 100 barrels per vertical foot of strata to be treated of an aqueous solution of a relatively high concentration of a gelling agent for alkali metal silicate;
   b. about 2 to about 200 barrels per vertical foot of strata to be treated of an aqueous solution of an alkali metal silicate and a relatively low concentration of a gelling agent for said alkali metal silicate; and
   c. about 1 to about 100 barrels per vertical foot of strata to be treated of an inert aqueous spacer liquid;

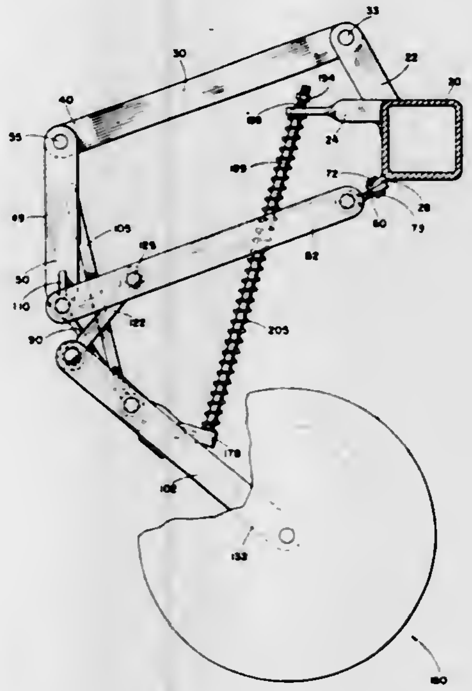
solutions (a) and (b) being injected in any order and solution (c) being injected between said solutions (a) and (b).

4,004,640

HANGER MECHANISM AND SAIL ENGAGING TOOL ATTACHED TO TOOL BAR THEREBY

Charles W. Bland, P.O. Box 405, Wakita, Okla. 73771

Filed Feb. 23, 1976, Ser. No. 660,226
Int. Cl.^{2} A01B *61/04, 65/06*
U.S. Cl. 172—710 **5 Claims**



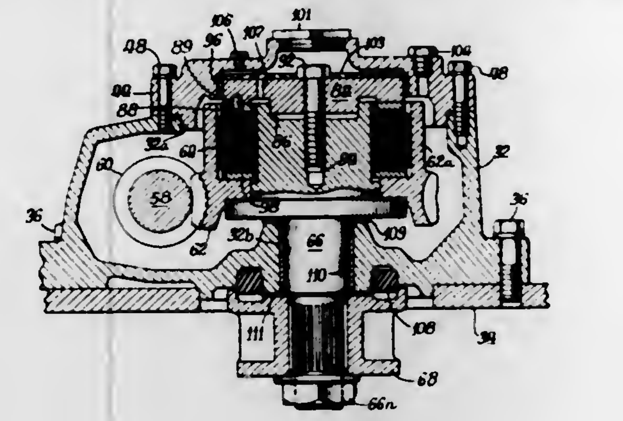
1. In the combination of a horizontal tool bar and a soil engaging tool connected thereto by a hanger mechanism, the improvement wherein the hanger mechanism comprises an upper arm structure pivotally attached at one end to said tool bar for pivotal movement about a first axis parallel to said tool bar, said upper arm structure extending forward away from said tool bar and terminating at a forward end, a lower arm structure pivotally attached at one end to said tool bar for pivotal movement about a second axis parallel to and below said first axis, said lower arm structure extending forward away from said tool bar and terminating at a forward end, a vertical bar structure pivotally attached at its upper end to the forward end of said upper arm structure for pivotal movement about a third axis parallel to said first axis, said vertical arm structure being pivotally attached at a location below the upper end thereof to the forward end of said lower arm structure for pivotal movement about a fourth axis below and parallel to said third axis, said vertical bar structure maintaining said upper and lower arm structures parallel to each other during any pivotal movement thereof, said vertical bar structure having a downward projecting extension terminating in a lower end, an implement arm located below said lower arm structure, said implement arm extending downward and rearward from an upper end thereof located below and adjacent said fourth axis to a lower end upon which said soil engaging tool is mounted, connecting link means pivotally connected at one end thereof to the upper end of said implement arm for pivotal movement about a fifth axis parallel to and below said fourth axis, said connecting link means being pivotally connected at an end opposite from said one end thereof to said lower arm structure at a location rearward of the forward end thereof for pivotal movement about a sixth axis parallel to and rearward of said fourth axis, the lower end of said extension being pivotally connected to said implement arm between the ends thereof for pivotal movement about a seventh axis parallel to and rearward of said fifth axis whereby the lower end of said implement arm moves in a substantially vertical direction.

4,004,641

MOTOR GRADER DRAWBAR ASSEMBLY WITH SAFETY CLUTCH MECHANISM

Vergil P. Hendrickson, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 24, 1975, Ser. No. 551,931
Int. Cl.^{2} E02F *3/76;* **A01B** *61/04*
U.S. Cl. 172—781 **10 Claims**



8. In a drawbar assembly for use on a motor grader or the like including: a drawbar frame; a ring gear rotatably mounted on the frame; a blade; and means interconnecting the blade and the ring gear so that the blade revolves as the ring gear rotates; characterized by:
   a rotatable shaft;
   a pinion gear engaged with the ring gear and mounted on the shaft for rotation therewith;
   drive means for selectively rotating the shaft and hence rotating the ring gear;
   a slip clutch mounted on the shaft and interposed between the drive means and the shaft to allow relative movement between the shaft and drive means when a preselected torque is exceeded, and thereby permitting the blade to revolve about an upright axis;
   a plate at one end of the shaft and operatively engaged with the slip clutch for applying a compressive force thereon; and
   a part operatively connected to the plate and adjustably engaged with the shaft for adjustably changing the compressive force and hence adjusting the preselected torque to change the force on the blade required to cause the relative movement.

4,004,642

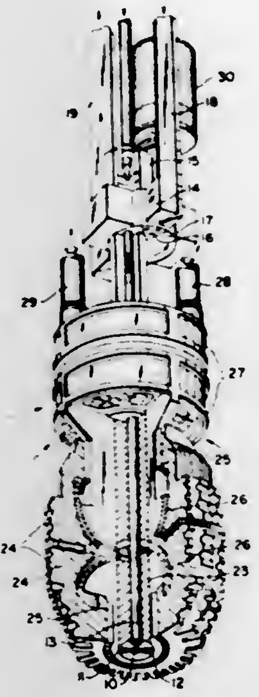
TROUND TERRA-DRILL PROCESSES AND APPARATUS

David Dardick, 500 Via Del Monte, Palos Verdes Estates, Calif. 90274

Filed Dec. 8, 1975, Ser. No. 638,310
Int. Cl.^{2} E21B *7/00*
U.S. Cl. 175—4.5 **15 Claims**

1. A terradynamic apparatus for drilling through soil and rock and capable of penetration of hard rock to great depths comprising:
   an open chamber salvo gun for firing salvos of small calibre projectiles,
   a self-contained feed system for successively feeding tiangular rounds of ammunition of open chamber salvo ammunition to said gun,
   mechanical pulverizing means disposed in proximity to said gun for pulverizing the fractured rock,
   rock removal means disposed in proximity to said gun for removal of pulverized rock from the areas about said gun,
   self-contained powering means for operating said gun, said feed system, said pulverizing means, and said removal means,
   a self-contained pod and support means for all of said gun, ammunition, feed system pulverizing means, and removal means,

said terradynamic apparatus being operated independently of the surface of the earth for repetitively firing salvos to fracture the rock, pulverize the fractured rock, and displace the pulverized rock.



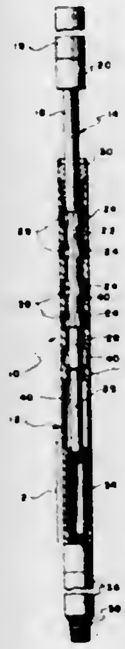
12. A terrodynamic process for drilling rock by the use of a self-contained drilling unit that is lowered into the ground and automatically fires projectiles into the rock at a velocity sufficient to fracture the rock and wherein the self-contained drilling unit contains a sufficient number of projectiles to drill to great distances, the improvement in said process wherein the projectiles being fired of small calibre and a salvo of such projectiles are fired employing triangular rounds of ammunition and an open chamber gun.

4,004,643

MECHANICAL DRILLING JAR

James L. Newman, 970 Starewood Drive, Beaumont, Tex. 77706

Filed Mar. 3, 1976, Ser. No. 663,438
Int. Cl.^{2} E21B *1/10*
U.S. Cl. 175—321 **5 Claims**



1. In a device for connection in a drill string, the combination of:
   a housing assembly having an interior cylindrical sealing surface, and

a movable assembly within the housing assembly, slideably and sealingly engaged with said surface,
the housing assembly having an interior surface above the sealing surface, surrounding the movable assembly and separated therefrom to define a lubricant space opening to the sealing surface, and
the housing assembly further having an annular trap space open to the lubricant space and concentric with the sealing surface near its tip, with an inner diameter greater than the diameter of the sealing surface,
whereby debris from the lubricant space can settle in the trap space rather than enter between the movable assembly and sealing surface.

4,004,644
ROLLER CUTTER

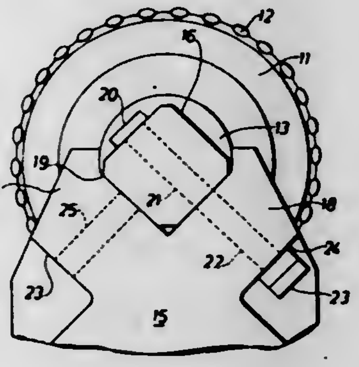
Bernt Soren Liljekvist, and Anders Persson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jan. 27, 1976, Ser. No. 652,864

Claims priority, application Sweden, Jan. 27, 1975, 7500816

Int. Cl.² E21B *9/08*

U.S. Cl. 175—364 **5 Claims**



1. A drill bit cutter assembly including:
a cutting unit rotatably mounted on a bearing shaft;
two opposed saddle structures each said saddle structure having two spaced-apart legs providing therebetween a recess for receiving an end of said shaft;
said recess and said shaft end being of complemental polygonal shape, said shaft end being secured to its recess by a bolt that extends through a transverse bore of the shaft and a saddle bore aligned therewith,
the improved construction according to which both legs of said saddle are provided with bores each of which extends entirely through one leg, said bores being angled relative to one another, and said shaft-receiving recess between said legs being of a polygonal shape complemental to that of the shaft end such that said shaft is adjustable in two positions having its transverse bore aligned with said bores of said legs of the saddle in both said positions.

4,004,645
DISC CUTTING UNITS FOR USE ON ROCK BORING MACHINES

Gwilym James Rees, 11 Granada Road, and Henry Bingham, 26 Coaton Ave., both of Selcourt, Springs, Transvaal, South Africa

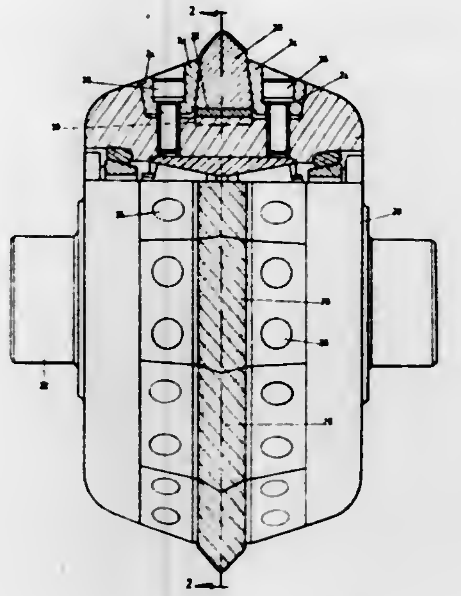
Filed July 22, 1975, Ser. No. 598,167

Claims priority, application South Africa, July 31, 1974, 74/4897

Int. Cl.² E21B *9/08*

U.S. Cl. 175—373 **4 Claims**

2. A rock boring machine of the kind including a rotatable head plate, a plurality of rotatable disc cutters mounted on the front base of said rotatable head plate, each disc cutter comprising an annular body, a plurality of cutting segments located on and substantially encircling the annular body around the periphery thereof, a plurality of separate formations spaced about the periphery of the annular body, each cutting segment being provided with a complementary formation adapted to lockingly engage one of the formations on the body to prevent peripheral movement of the cutting segments around the body, and removable clamping means for securing the cutting segments to the annular body.



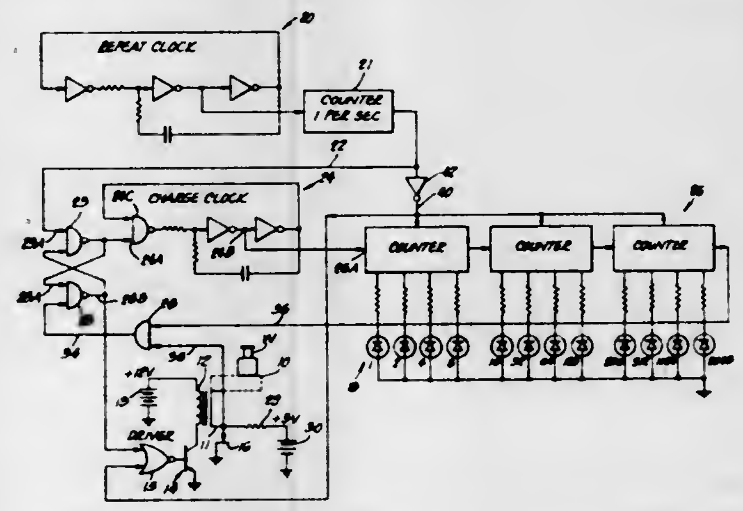
4,004,646
WEIGHING SYSTEM

Albert E. Busch, 2400 Barbara St., Bloomington, Ind. 47401

Filed Nov. 20, 1975, Ser. No. 633,634

Int. Cl.² G01G *7/02, 23/37*

U.S. Cl. 177—1 **7 Claims**



1. A method of weighing in which a weighing platform is connected to a relatively movable element of electromagnet means, the steps including, initiating a current flow through said electromagnetic means, and measuring the time required for the current to build up to a sufficiently high value to produce movement of said platform.

4,004,647
LOAD CELL ARRANGEMENT

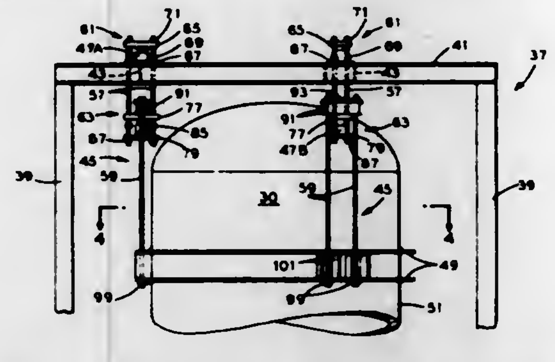
Donald Laverne Forst, Norton, and Edwin Benedict Schrengauer, Wadsworth, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 654,144

Int. Cl.² G01G *21/00*

U.S. Cl. 177—128 **15 Claims**

1. In combination with a material transport system including at least one reservoir for accumulating a predetermined quantity of material, at least one pair of load monitors capable of continuously determining the quantity of material contained within said reservoir, and support structure normally conveying the reservoir load through both of the monitors, said support structure including means allowing replacement of one of the monitors without interruption of operation of said other monitor.



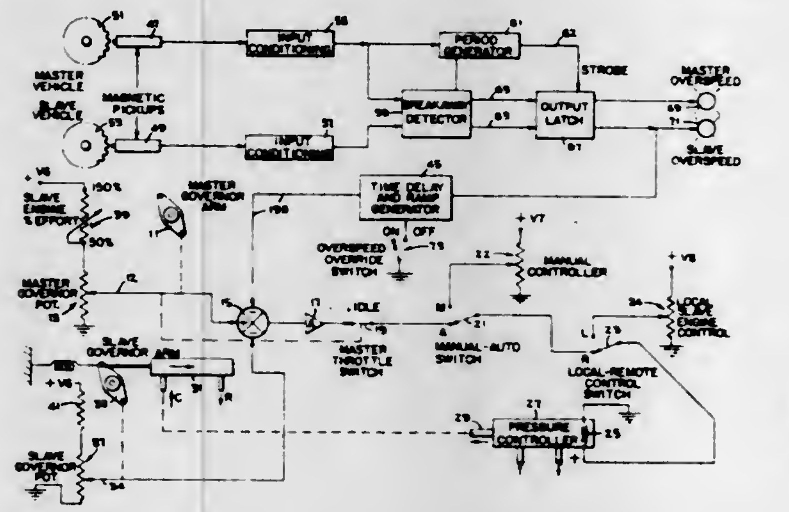
4,004,648
MULTI-ENGINE, ARTICULATED VEHICLE APPARATUS

Craig L. Joseph, San Jose; Fred J. Caterina, Cupertino, and Hans H. Cremer, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 27, 1975, Ser. No. 562,538

Int. Cl.² B60K *5/08*

U.S. Cl. 180—14 R **9 Claims**



1. In an articulated vehicular apparatus including a master vehicle, said master vehicle having an engine and associated throttle and drive shaft for drive shaft for driving a ground engaging wheel of the master vehicle, and a slave vehicle, said slave vehicle having an engine and associated throttle and drive shaft for driving a ground engaging wheel of the slave vehicle, an electronic governor controlling the entine of the slave vehicle comprising:
first signal generating means operatively associated with the ground engaging wheel of said master vehicle for producing a first signal indicative of the angular velocity of said wheel;
second signal generating means operatively associated with the ground engaging wheel of the slave vehicle for producing a second signal indicative of the angular velocity of said wheel;
wheel speed signal comparison means connected to said first and second signal generating means for producing a signed wheel speed difference of said second and said first signals;
master throttle signal generating means connected to the throttle of the master vehicle for producing a master throttle signal indicative of the throttle setting of the master vehicle;
slave throttle signal generating means connected to the throttle of the slave vehicle for producing a slave throttle signal indicative of the throttle setting of the slave vehicle;
control signal comparison means connected to said master throttle signal generating means and to said slave throttle signal generating means
means for selectively coupling said wheel speed difference signal to said control signal comparison means when the value of said second signal exceeds the value of said first signal, said signal comparison means producing a signed throttle control signal having a value determined by the values of said master throttle signal, said slave throttle signal and any wheel speed difference signal received; and
actuator means responsive to said throttle control signal, said actuator means being connected to the throttle of the slave vehicle for adjusting the throttle of the slave vehicle to restore equality between said master throttle and said slave throttle signals.

4,004,649
MUFFLER

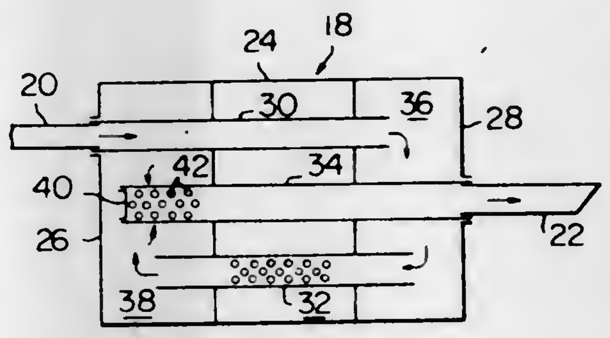
Yukio Shimada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Mar. 17, 1975, Ser. No. 559,234

Claims priority, application Japan, May 23, 1974, 49-59417[U]

Int. Cl.² F01N *3/06*

U.S. Cl. 181—36 C **7 Claims**



1. In an exhaust system for an internal combustion engine, a catalytic converter having an inlet connected in operation with an exhaust pipe of an internal combustion engine and an outlet; and
a muffler comprising a tubular body having a bore and a first and second end closures on both ends, respectively, to close the bore; means dividing the bore of said tubular body into a first expansion chamber in the proximity of the first and closure, means dividing said bore into a second expansion chamber in the proximity of the second end closure and into a third expansion chamber between the first and second expansion chambers; a first exhaust gas conduit having an exhaust gas inlet end connected with the outlet of said catalytic converter, the first exhasut gas conduit extending through the first end closure, the first expansion chamber and the third expansion chamber and having an exhaust gas outlet end projecting into the second expansion chamber; a second exhaust gas conduit having an exhaust gas inlet end opening to the second expansion chamber, the second exhaust gas conduit extending through the third expansion chamber and having an exhaust gas outlet end projecting into the first chamber; and a third exhaust gas conduit having an inlet end projecting into the first expansion chamber, the third exhaust gas conduit extending through the third expansion chamber, the second expansion chamber and the second end closure and having an exhaust gas outlet end opening to the ambient atmosphere, closing means closing the inlet end of the third conduit, the third exhaust gas conduit having a group of apertures in that portion of the third exhaust gas conduit which projects into the first expansion chamber and which is exposed to the third expansion chamber, and the group of apertures being so shaped and arranged such that broken peices issued from

said catalytic converter and contained in the exhaust gases within the third expansion chamber are prevented from entering the third exhaust gas conduit.

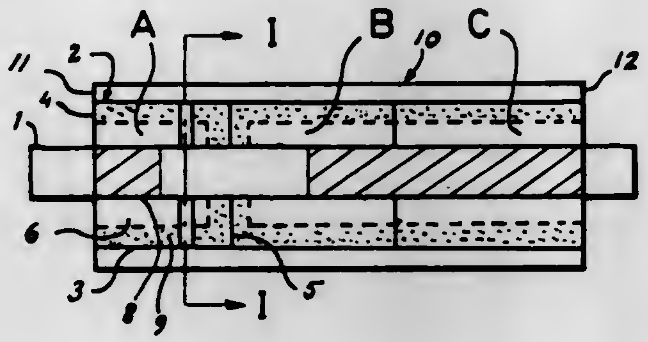
4,004,650
SILENCERS

Lars Johan Gardell, Enhorna, and Bertil Lennart Wilhelmsson, Alvsjo, both of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Dec. 29, 1975, Ser. No. 644,548

Int. Cl.² F01N *1/04*

U.S. Cl. 181—42 **6 Claims**



1. A silencer for damping sound waves created in gases, said silencer comprising a group of at least two straight damping units arranged in series, each of which damping units comprises a tubular body of thin-wall construction and two end walls, and an inner tube for conducting gases through said walls, said inner tube being attached in a gas-tight fashion and between the walls enclosing a ring-shaped chamber between the inner tube and the cylindrical surface of the tubular body, the inner tube being provided with a number of openings arranged to communicate with said chamber which is at least partially provided with sound-absorbing material, characterised in that at least one damping unit is surrounded by an outer tube which is connected in a gas-tight fashion through two end walls with the cylindrical surface of the damping unit, and in that the space between the cylindrical surface and the outer tube is divided into at least two chambers each of which is arranged to communicate with the inner tube through at least one transversely-extending branch pipe.

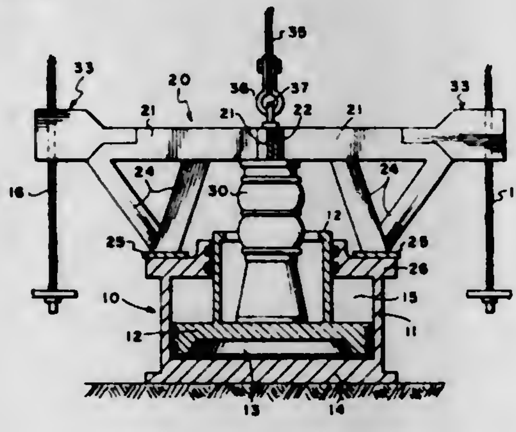
4,004,651
MEANS FOR FLEXIBLY GUIDING THE TRAVEL OF AN UPWARDLY PROPELLED WEIGHT

Clifford D. Dransfield, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 8, 1975, Ser. No. 611,351

Int. Cl.² G01V *1/04*

U.S. Cl. 181—117 **16 Claims**



1. In an apparatus for flexibly guiding the path of a moving weight above the earth including an upstanding frame within which the weight is upwardly propelled, a plurality of parallel elongate members connected between the top and the bottom of the frame and spaced laterally adjacent the weight, and a like plurality of means rigidly interconnected with the weight for guiding the weight along the respective elongate members, the improvement wherein each of said guide means comprises a plurality of vertically spaced apart contact elements adapted to at least partially surround a respective one of said elongate members at correspondingly spaced vertical intervals, so that when the upper and lower most of said contact elements engage said respective elongate member simultaneously, frictional contact between said elongate member and the intermediate contact elements is substantially eliminated.

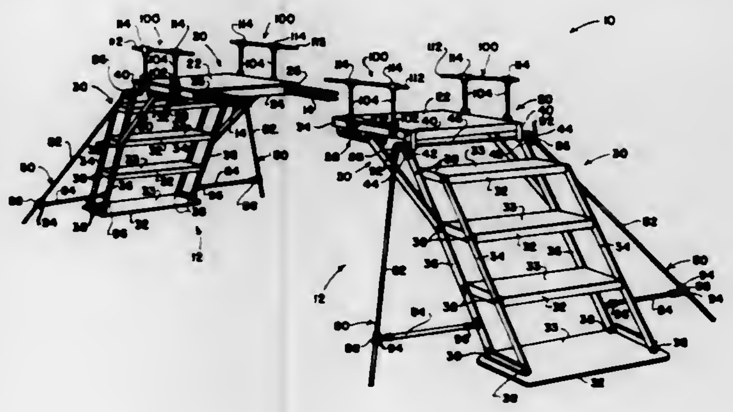
4,004,652
PORTABLE BRIDGE STRUCTURE

Samuel Laboy-Alvarado, P.O. Box 8637 Fernandez Juncos Sta., Santurce, P.R. 00910

Filed Apr. 12, 1976, Ser. No. 675,746

Int. Cl.² E04G *1/30*

U.S. Cl. 182—118 **10 Claims**



1. A portable bridge structure, comprising:

a. a pair of stair and platform assemblies each including a stair section and a platform section, and assembly interconnection means for releasably connecting the platform sections to form a bridge with the stair sections at opposite ends of the bridge;

b. each of the assemblies including section interconnection means pivotally connecting its stair and platform sections for movement between assembly folded and assembly erected positions;

c. each of the assemblies additionally including bracing means for releasably maintaining its stair and platform sections in one of a plurality of predetermined assembly erected positions, the bracing means being pivotally connected to one of the sections for movement between brace folded and brace erected positions and being selectively connectable when in brace erected positions with one of a plurality of formations carried on the other sections;

d. each of the stair sections including a plurality of tread members and support means pivotally connected to the tread members for maintaining load support surfaces defined on the tread members in substantially parallel relationship as the tread members pivot relative to the support means between stair folded and stair erected positions;

e. the sections, bracing means, tread members and support means of each assembly being operative when in the assembly folded, brace folded and stair folded positions, respectively, to lie closely alongside each other to form a compact, substantially flat bundle.

4,004,653
GRAVE FRAME

Ray C. Hass, Niles Road, St. Joseph, Mich. 49085

Filed July 14, 1975, Ser. No. 595,350

Int. Cl.² E04G *25/00*

U.S. Cl. 182—128 **4 Claims**

1. A rectangular framework for excavations such as graves and the like comprising

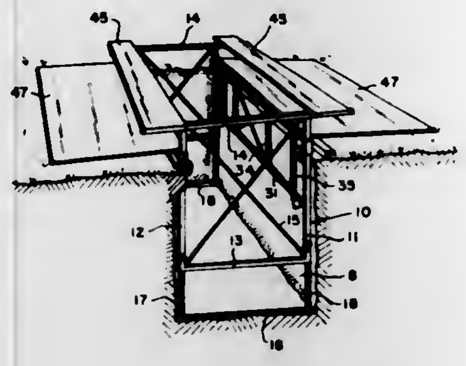
---

a. rigid end members extending from the top to the bottom of the excavation, said end members being adapted to engage the opposite ends of the excavation and to be supported on the floor of the excavation;

b. rigid side means;

c. elements included in said side means, each having ends adapted to be supported on said end members positioned at the opposite ends of the excavation;

d. means on said end members for engaging the ends of said elements (c);



e. means to elongate said elements (c) against said means (d) whereby to press said end members against the opposite ends of said excavation and hold said side means tightly between said means (d) thus providing a rigid framework;

f. adjustable brackets supported on said framework, said brackets being adapted to carry floor support means that extends longitudinally parallel to and slightly above a side edge of the excavation whereby a rigid floor means may be laid nearly flat adjacent the excavation to support heavy weights near the edge thereof without the risk of injury to persons standing thereon from a cave-in.

4,004,654
ELEVATOR STRUCTURE SUPPORTING APPARATUS

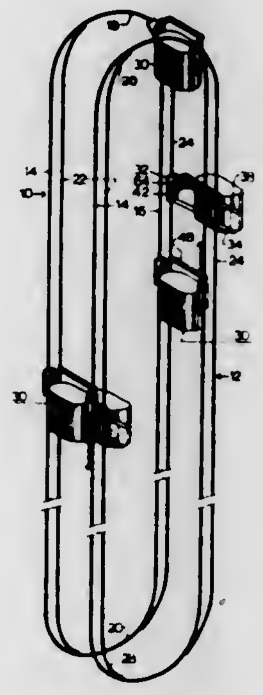
Norbert Hamy, Beaconsfield, Canada, assignor to Trebron Holdings Limited, Beaconsfield, Canada

Continuation-in-part of Ser. No. 269,453, July 6, 1972, Pat. No. 3,896,736. This application Feb. 25, 1975, Ser. No. 552,807

Claims priority, application United Kingdom, July 7, 1971, 31821/71

Int. Cl.² B66B *9/16*

U.S. Cl. 187—16 **11 Claims**



1. A supporting apparatus for supporting a container member for movement on a pair of vertical rails and for permitting relative shifting movement therealong and rotational movement with respect thereto, said apparatus comprising a pair of first frame means, wheel means carried by each of said first frame means and rotatably disposed on said rails permitting movement of each of said first frame means therealong, a pair of second frame means pivotally mounted on said pair of first frame means and being movable therewith, link means extending between and pivotally connected to said container member and said second frame means permitting movement of said container with said first frame means and swingable movement with respect thereto, a fluid actuable means for actuating said link means to shift said container member relative to said first frame means and second frame means, and clutch means operatively associated with second frame means and mounted thereon, said clutch means permitting said container to maintain a constant angular relationship with respect to the vertical rails.

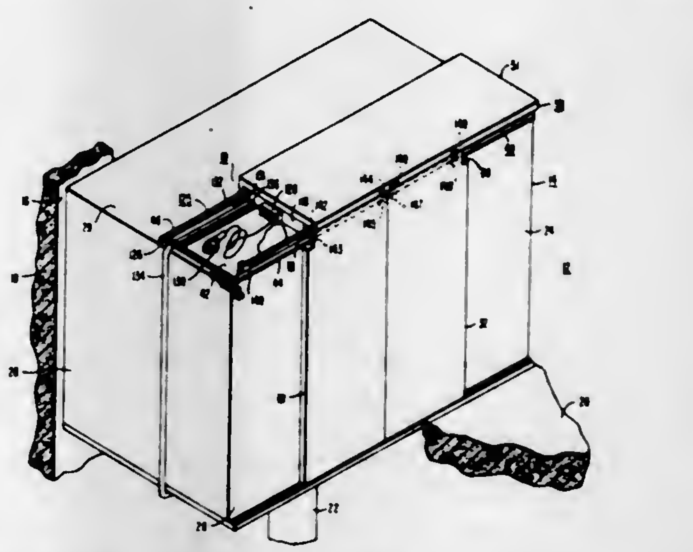
4,004,655
ELEVATOR SYSTEM INCLUDING DOOR OPERATOR HAVING AN ENCLOSURE WHICH FORMS TRACK FOR DOOR ROLLERS

Joseph K. Kraft; Robert A. Sette, both of Gettysburg, and Leigh F. Jackson, Fayetteville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1975, Ser. No. 608,481

Int. Cl.² B66B *13/08*

U.S. Cl. 187—52 R **6 Claims**



1. An elevator system, comprising:

an elevator car having side, bottom and top portions with a passenger opening in a side portion thereof,

a door operator including a drive motor, door position switches, and associated electrical control all mounted within a common enclosure permitting open wiring therebetween,

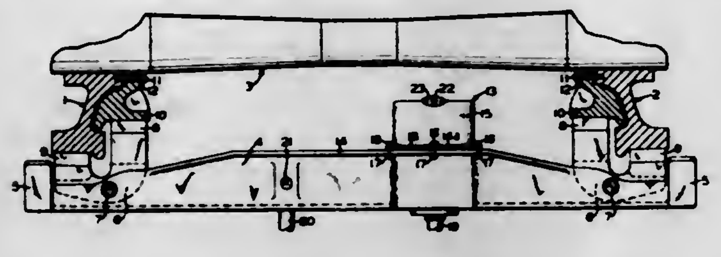
said common enclosure including a channel shaped base member having a bight and first and second leg portions, said base member being mounted on the top portion of said elevator car with the first leg portion forming an upstanding track adjacent to the side portion which includes the passenger openings,

a door including a hanger having rollers mounted thereon, said door and hanger being mounted for movement to open and close the opening in said elevator car, with the rollers of the hanger engaging said upstanding track,

and means coupling the door operator with the hanger of said door to impart linear motion thereto.

4,004,656
MULTI-BRAKE SHOE MEANS FOR A MULTI-BRAKING SURFACE BRAKED ASSEMBLY

Robert B. Morris, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed June 17, 1975, Ser. No. 587,600
Int. Cl.^{2} B61H *13/00*
U.S. Cl. 188—52 **14 Claims**



13. Multi-brake shoe means for transmitting braking force to braking surfaces formed respectively on a pair of wheels mounted in spaced-apart relation on a common axle and on a pair of brake drums mounted respectively on said pair of wheels, said multi-brake shoe means comprising:

a. a member movable toward and away from said braking surfaces on said wheels and drums,

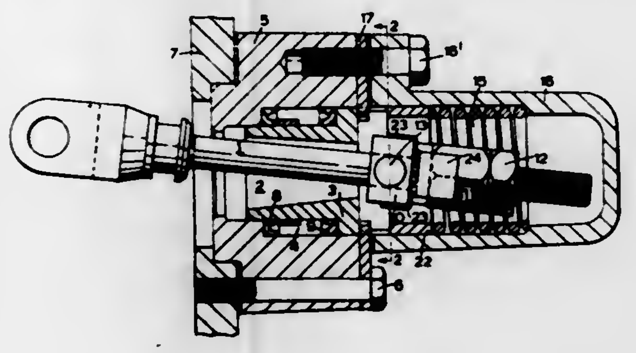
b. a plurality of brake shoes for transmitting braking force to said braking surfaces, and, wherein the improvement comprises:

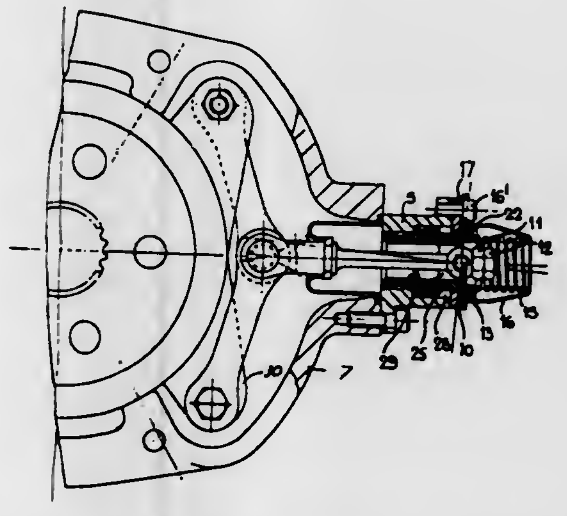
c. at least one means mounted intermediate its ends on said movable member, each end of said at least one means being effective to move at least one of said brake shoes therewith upon movement of said member toward said multi-braking surfaces, further characterized in that said at least one means comprises at least one lever that at each of its respective opposite ends abuts at least one of said plurality of brake shoes, said at least one lever being so pivotally mounted intermediate its ends on a fulcrum fixed to said movable member as to provide, upon movement of said member toward said multi-braking surfaces, for the transmission to the brake shoe abutting one end of said at least one lever a braking force that is a preselected multiple of the braking force transmitted to the brake shoe abutting the other end irrespective of the rate of wear of one brake shoe exceeding the rate of wear of the other brake shoe.

4,004,657
SELF-ENERGIZING DISC BRAKES

Piotr Ostrowski, Sutton Coldfield, England, assignor to Girling Limited, Birmingham, England
Filed Jan. 21, 1974, Ser. No. 435,311
Claims priority, application United Kingdom, Jan. 20, 1973, 3075/73
Int. Cl.^{2} F16D *55/04;* S16D *55/18;* F16J *1/10*
U.S. Cl. 188—71.3 **1 Claim**

1. In a spreading disc brake of the type having pressure plates which are angularly movable within a brake housing to initiate application of the brakes and wherein the angular movement of the plates is effected by an annular fluid pressure actuator which acts on an abutment carried by a pull-rod passing through the actuator with substantial clearance to operate in tension on toggle links connected to said pressure plates; said actuator being a cylinder housing rigidly fixed to the brake housing with the cylinder axis substantially at right angles to the axis of the plates and a piston operating in said cylinder: the invention comprising improved means for transmitting the thrust of said piston to the abutment carried by the pull-rod comprising a thrust member co-axially aligned with the piston and slidable therewith in said cylinder housing to transmit the force exerted by the piston, spring means urging said thrust member against said piston and urging said piston into the retracted position, a trunnion member forming part of said thrust member, part cylindrical bearings in said thrust member for rockably receiving said trunnion member, a substantially annular member slidably received in said cylinder housing between said thrust member and said spring means, said annular member having part cylindrical bearings complementary to the bearings in said thrust member and also rockingly receiving said trunnion member, and key means cooperating with said cylinder housing and said thrust member for maintaining the pivotal axis of the coupling parallel to the axis of the brake while confining angular movement of said pull-rod to a plane normal to the axis of the brake, said key means comprising an apertured plate fixed to said cylinder housing and extending across the outer end of the cylinder, an axially extending slot in said thrust member, and a projection on said apertured plate extending into said slot.



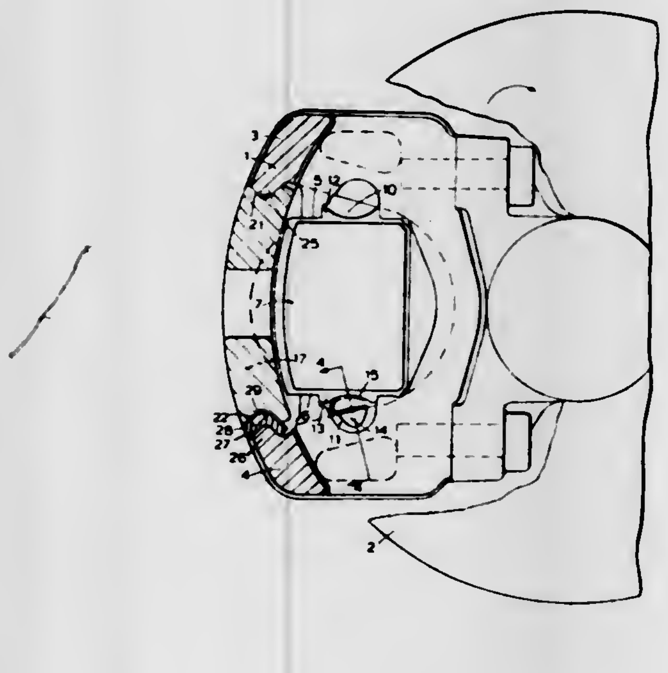


4,004,658
SLIDING CALIPER RETAINING MECHANISM FOR A DISC BRAKE

Hugh Genville Margetts, Shipston on Stour, and Gordon Alfred Habgood, Leamington Spa, both of England, assignors to Girling Limited, Birmingham, England
Continuation of Ser. No. 452,133, March 18, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,472
Claims priority, application United Kingdom, Mar. 17, 1973, 12969/73
Int. Cl.^{2} F16D *55/224*
U.S. Cl. 188—73.5 **12 Claims**

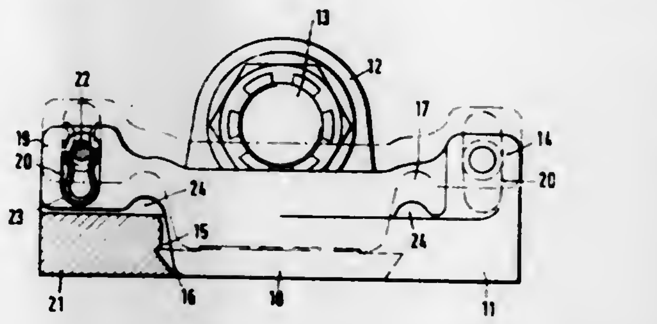
1. A disc brake for a vehicle comprising a rotatable disc having a peripheral edge, a drag-taking member adjacent to said disc, a caliper having spaced limbs straddling said peripheral edge of said disc and which are symmetrical with respect to a radius of said disc, friction pad assemblies for engagement with opposite faces of said disc located in said caliper, actuating means housed in one of said limbs for applying one of said friction pad assemblies directly to an adjacent face of said disc, the other of said friction pad assemblies being applied indirectly to the opposite face of said disc by the reaction of said actuating means which causes said caliper to slide axially with respect to said drag-taking member, circumferentially spaced arms in said drag-taking member having axially spaced opposite ends, inner faces of said arms defining therebetween

a gap in which said caliper is located, said caliper having circumferentially spaced opposite end faces adjacent said inner faces of said arms, a key of a length substantially equal to that of said arms interposed between one of said opposite end faces and said inner face of one of said arms, and an elongate resilient member interposed between the said one end face and said key over the total length thereof to urge the other of said opposite end faces into direct sliding engagement with the other of said inner faces, said elongate resilient member being substantially flat at least in a transverse direction and being provided at opposite ends with spaced tags which straddle opposite ends of said key and project in a direction away from said caliper by a distance greater than the distance between said resilient member and the said one of the said arms to engage with said axially spaced opposite ends of the said one of said arms to prevent said key from moving with respect to said drag-taking member as said caliper is moved axially in the application of the brake, said elongate member comprising sole means for locating said key in said brake and with respect to said drag-taking member and said tags being urged out of engagement with said arm to permit said key and said resilient member to be withdrawn from said brake in an axial direction, wherein said one of said opposite end faces of said caliper is formed with an axially extending outwardly directed groove of generally V outline comprising inner and outer relatively inclined surfaces, said inner face of said one at said arms is formed with a complementary projection of generally V outline comprising inner and outer relatively inclined surfaces spaced respectively from said inner and outer surfaces of said groove, said key has on one side first and second relatively inclined abutment surfaces which engage slidably with said inner and outer surfaces of said projection and on an opposite side a third abutment surface spaced from and parallel with said outer surface of said groove, and said resilient member acts between said third abutment surface and said outer surface of said groove, and wherein said key includes a projection equal in length to that of said key, said key projection extending from the said opposite side of said key towards the said outer surface of said groove and having an inner edge between which and said inner surface of said groove is defined a clearance gap in which said resilient member is located.



4,004,659
CLOSURE FOR BRAKE JAW HOLDER FOR DISC BRAKES

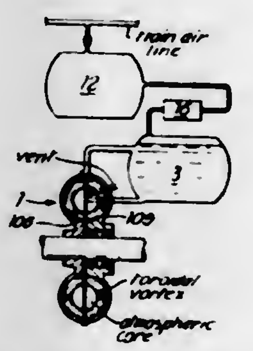
Hans Rocholl, and Willi Klein, both of Remscheid, Germany, assignors to Bergische Stahl-Industrie, Remscheid, Germany
Filed July 10, 1975, Ser. No. 594,709
Claims priority, application Germany, July 15, 1974, 2434004
Int. Cl.^{2} F16D *65/04*
U.S. Cl. 188—244 **7 Claims**



1. A closure for a brake jaw holder for disc brakes, which includes in combination: a first member forming a brake lining carrier having a rear side and provided with a lining carrying surface and having an opening, guiding means associated with said carrier for guiding a brake lining, a second member forming a closure latch movable from the rear side of said brake lining carrier into said opening for closing the same, said closure latch extending in a direction transverse to the direction of said guiding means, said second member at both sides of said opening being provided with oblong opening means having the longitudinal axis thereof extending substantially perpendicularly with regard to said lining carrying surface, elastic arresting means arranged in said second member, pin means fixedly arranged in said first member, said closure latch being movable from a first end position representing its maximum open position to a second end position representing its maximum closed position and vice versa, and said elastic arresting means being operable to arrest said closure latch in either one of said end positions.

4,004,660
CONTROL SYSTEM FOR HYDROKINETIC BRAKES

Anthony G. L. Shore; Kevin S. Preston, both of Derby, and David A. Churchill, Warwickshire, all of England, assignors to British Railways Board, London, England
Continuation of Ser. No. 425,761, Dec. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 106,163, Jan. 13, 1971, abandoned. This application June 27, 1975, Ser. No. 590,909
Int. Cl.^{2} F16D *63/00*
U.S. Cl. 188—271 **10 Claims**



1. A method for controlling a brake system embodying a hydrokinetic brake of the type having a rotor and a stator together defining a toroid and also having inlet and outlet ports for liquid flowing continually through the brake during brake application from said inlet port to said outlet port, comprising the steps of:

maintaining for each desired braking torque an essentially constant flow of said liquid into said inlet port from a liquid reservoir, said essentially constant flow being independent of the speed of rotation of said rotor;

conveying said liquid from said outlet port to said liquid reservoir;

controlling the braking torque of said brake essentially independently of the speed of rotation of said rotor by setting the pressure acting on said liquid reservoir in accordance with the desired braking torque;

maintaining the pressure at said inlet port at a fixed pressure which is lower than the pressure in said reservoir, said fixed pressure being independent of the desired braking torque and the speed of rotation of said rotor.

4,004,661

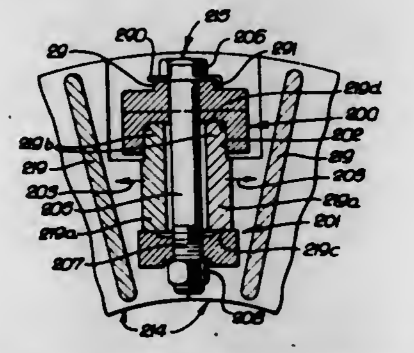
SPLIT BRAKE DISC

Franklin B. Airheart, Sylmar, and Samuel J. Martins, Reseda, both of Calif., assignors to Airheart Products, Inc., Chatsworth, Calif.

Filed May 12, 1975, Ser. No. 576,616

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **5 Claims**



1. A braking disc assembly connectible to rotating structure, comprising

a. multiple arc shaped disc body sections having opposite faces for engagement with brake pads,

b. and retention means between said opposite faces for releasably retaining said sections in assembled relation to form an integrated disc with said faces maintained in two parallel planes,

c. said sections including connecting means for attaching the sections to said rotating structure, said sections being semi-circular, the sections including parallel plates defining said opposite faces and defining a space therebetween, and a plurality of generally radially extending ribs integral with said plates and located in the space therebetween, said retention means being entirely located in said space and between radially inner and outer limits of said opposite faces of said body sections, the sections having adjacent abutting terminal ends forming a joint between said sections and to which said faces extend, and said retention means including separate radially spaced inner and outer retainers each bridging said joint and being releasably connected to one of said ribs on each side of said joint, the retention means further including a threaded fastener shaft extending between said connected ribs to hold said retainers in position, and at least one of the retainers telescopically interfitting portions of said connected ribs.

4,004,662

SHOCK ABSORBER WITH DIFFERENT DAMPING EFFECTS AT DIFFERENT PARTS OF STROKE

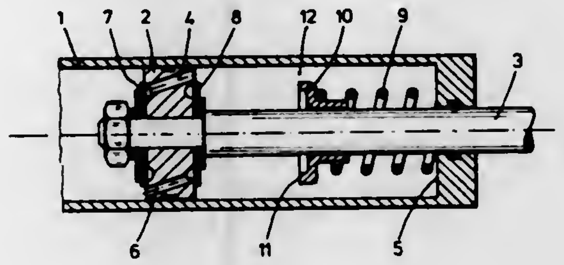
Ulrich Sorgatz, and Fritz Ammesdorfer, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 510,885, Oct. 1, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,147

Claims priority, application Germany, Oct. 16, 1973, 2351813

Int. Cl.² F16F *9/49*

U.S. Cl. 188—284 **2 Claims**



1. In a hydraulic shock absorber for use in the suspension system associated with a motor vehicle wheel so as to reduce the dynamic tilting tendency of the motor vehicle, said shock absorber having a cylinder, a piston arranged to move within the cylinder in directions of compression and extension between two end stops, and a pressure medium arranged within the cylinder to hydraulically damp the movement of the piston, said hydraulic damping having an effective level of normal damping during piston motions which occur during normal operation of the vehicle, the improvement wherein the piston includes first passages for the flow of pressure medium during piston motions toward that one of the end stops in the proximity of which the piston will be located when moved in the direction of extension, and second passages for the flow of pressure medium during piston motions away from said one stop; wherein the piston includes at least one flat spring on the side thereof facing said one stop, said flat spring being arranged to be lifted by the flow of pressure medium from a position at least partially obstructing only the second passages during piston motions directed away from said one stop; and wherein said shock absorber further comprises rest element means, disposed in the region of said one stop and spring supported in the direction towards said one stop so as to rest against said flat spring only when the piston is in said region, for providing at least a partial obstruction of said second passages and thus abruptly increasing the hydraulic damping, to a level substantially above said normal damping, of only the piston motion directed away from said one stop only after the piston has approached closer to said one stop than is usual during normal operation of the vehicle.

4,004,663

ELECTRICALLY CONTROLLED BRAKE ASSEMBLY WITH NON-COCKING OPERATING ARM

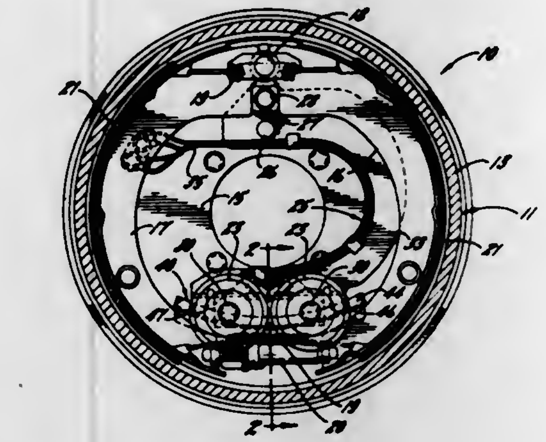
Robert L. Stibbe, Janesville, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 17, 1976, Ser. No. 658,371

Int. Cl.² B60T *7/12*; F16D *51/48*

U.S. Cl. 188—332 **4 Claims**

1. An electrically controlled brake assembly for use with a rotatable drum, said brake assembly comprising a stationary backing plate, a pair of brake shoes pivotally mounted on said backing plate and having ends disposed adjacent one another, an operating arm pivoted intermediate its ends on said backing plate to turn about an axis extending substantailly perpendicular to said plate and in a plane extending substantially parallel to said plate, means carried on said operating arm on one side of said axis and located between the adjacent ends of said shoes to bear against one of said shoes when said arm is turned in one direction about said axis and to bear against the other of said shoes when said arm is turned in the opposite direction about said axis, and electromagnet means carried on said operating arm on the opposite side of said axis and operable when energized to engage said drum and cause said operating arm to turn about said axis in one direction or the other depending upon the direction of rotation of said drum, the improvement in said brake assembly comprising, guide means fixed on said backing plate and located between said backing plate and said electromagnet means, said guide means and said backing plate coacting to define a channel means having an open side which faces said axis, and projecting means on said operating arm and located on circumferentially opposite sides of said electromagnet means, said projecting means extending into said channel means from the open side thereof and being engageable with said guide means and said backing plate to confine said operating arm substantially within said plane when said operating arm is turned about said axis.



4,004,664

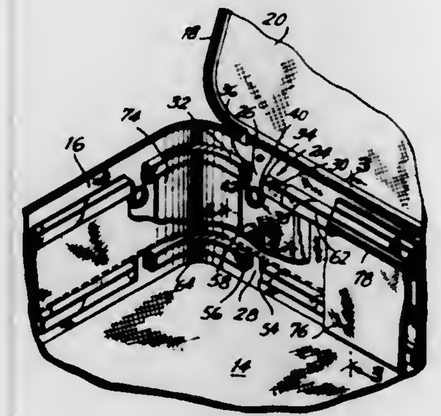
FRAME CONSTRUCTION FOR LUGGAGE

Joseph Y. Pelavin, North Bergen, N.J.; Seymour Spiegelman, Whitestone, N.Y., and John S. Rastocny, Cliffside Park, N.J., assignors to Lark Luggage Corporation, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 679,123

Int. Cl.² A45C *13/36*

U.S. Cl. 190—49 **12 Claims**



1. In an article of luggage, a luggage case having a peripheral side wall made of a flexible sheet material and having an inner surface directed toward the interior of the luggage case, and frame means engaging said side wall at said inner surface thereof and extending along said side wall for imparting a degree of rigidity thereto, said frame means including at each of a plurality of regions thereof a pair of substantially rigid frame portions respectively terminating in free ends which are spaced from and directed toward each other, and spring means operatively connected with said frame portions for urging them apart from each other to tend to increase the distance between said free ends thereof so that the article of luggage is capable of resiliently yielding at said side wall thereof in response to impacts, crushing forces, and the like.

4,004,665

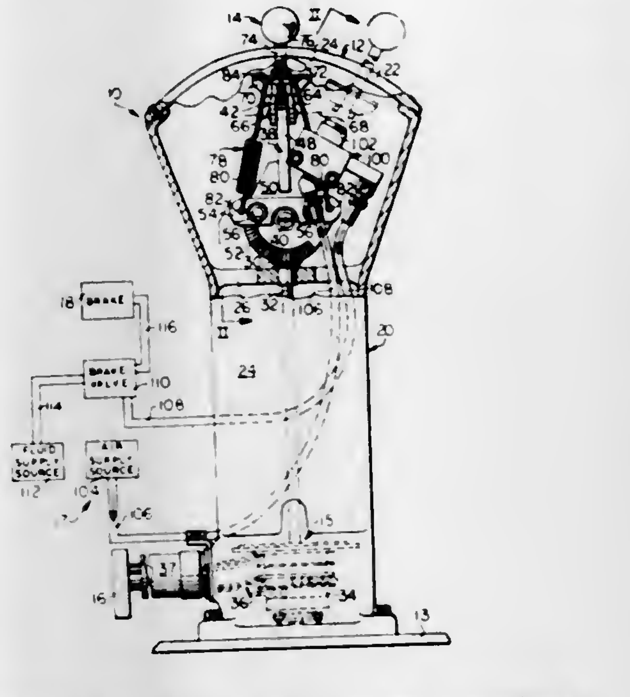
TRANSMISSION AND PARKING BRAKE CONTROL SYSTEM

Richard E. Guhl, and Charles W. Oswald, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 4, 1975, Ser. No. 637,607

Int. Cl.² B60K *29/02*; F16H *57/10*

U.S. Cl. 192—4 A **2 Claims**



1. A transmission and brake control system comprising;

a rotary drive train including a transmission shiftable between neutral and a plurality of drive conditions for operation of said drive train;

a brake for inhibiting movement of said drive train;

a transmission control arrangement operatively connected to said transmission for selectively establishing said neutral and said drive conditions including a single control lever assembly shiftable in a plane for selecting said drive conditions and shiftable normal to said plane at said neutral condition into a braking condition;

a brake control arrangement including means for communicating a source of pressure with said brake for disengagement thereof and an actuator valve communicating with said means for relieving fluid pressure to said brake and allowing engagement of said brake solely when said control lever assembly is positioned in said braking condition; and

an overcenter spring mechanism for biasably holding said control lever assembly normal to said plane in either said braking condition or said drive conditions.

4,004,666

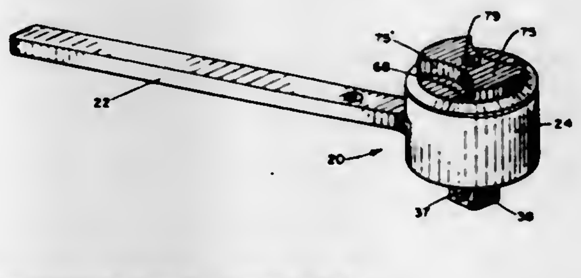
REVERSIBLE SOCKET WRENCH

Carlos R. Hinojosa, Camuy, P.R., assignor to Besenbruch-Hofmann, Inc., Lindenhurst, N.Y.

Filed Oct. 23, 1975, Ser. No. 624,787

Int. Cl.² F16D *41/08*

U.S. Cl. 192—44 **10 Claims**



1. A reversible wrench, comprising:

a ring shaped head;

a cup shaped member having a cylindrical wall rotatable axially in said head, said wall having a plurality of spaced slots therein;

- a cam block rotatably disposed inside said cup shaped member, said block having a plurality of circumferentially spaced cam faces adjacent to said slots;
- a plurality of cam wedge rollers rotatably engaged in said slots between said cam faces respectively and said head;
- a reverse control plate rotatably mounted at one axial end of said head, said plate having a depending pin, said cup shaped member having an end wall overlaying said cam block, said end wall having another slot for receiving said pin, so that rotation of said control plate rotates said member and rollers to either of two set positions on said cam block, whereby when said member is turned to one position on said cam block said rollers are cammed to engage said cam faces and said head so that said head is operatively locked to said cam block when said head is turned in one directon, and said rollers are free from said cam faces to permit said head to turn freely in the other direction operatively disengaged from said cam block, and whereby when said cup shaped member is turned to another position on said cam block said rollers are cammed to that said head is operatively locked to said cam block when said head is turned in said other direction, and said rollers are free from said cam faces to permit said head to turn freely in said one direction operatively disengaged from said cam block.

4,004,667

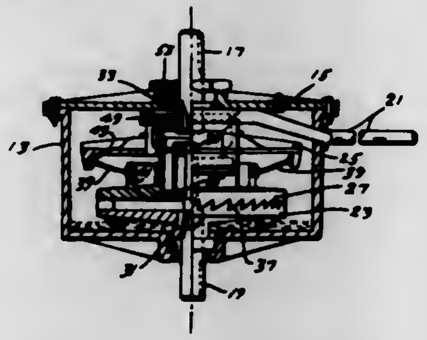
OVERLOAD CLUTCH WITH ZERO PARASITIC TORQUE

Ramojus P. Valtys, Evanston, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 314,623, Dec. 13, 1972, abandoned. This application Sept. 24, 1974, Ser. No. 508,946

Int. Cl.² F16D *7/02*

U.S. Cl. 192—56 R **3 Claims**



1. An overload clutch for use in an aircraft arrestment system, said clutch comprising a cylindrical housing having a cover, an input shaft axially disposed within said housing and extending upwardly through the cover thereof, a driving rotor mounted in said housing on said input shaft, a splined hub integral with said driving rotor and extending downwardly therefrom, a shuttle rotor slidably mounted on said splined hub for axial movement thereon, an output shaft axially disposed within said housing and extending downwardly through the bottom thereof, a driven disk mounted on said output shaft, a plurality of shelves on the inner wall of said driving rotor, a corresponding plurality of shelves on the outer wall of said shuttle rotor, a rocker bar positioned on each of said plurality of shelves, a plurality of leaf springs disposed between said rocker bars such that each end portion of each of said leaf springs is juxtaposed against one of said rocker bars, said leaf springs being normally in the buckled state to exert a compressive force for maintaining said shuttle rotor in engagement with said driven disk during rotation of said driving rotor, said leaf springs transforming to the unbuckled state in response to upward axial movement of said shuttle rotor caused by a sudden application of torque above a predetermined level to said output shaft, said shuttle rotor being held in disengagement from said driven shaft by said unbuckled leaf springs, and means for resetting said shuttle rotor into operative engagement with said driven disk for rotation by said driving rotor.

4,004,668

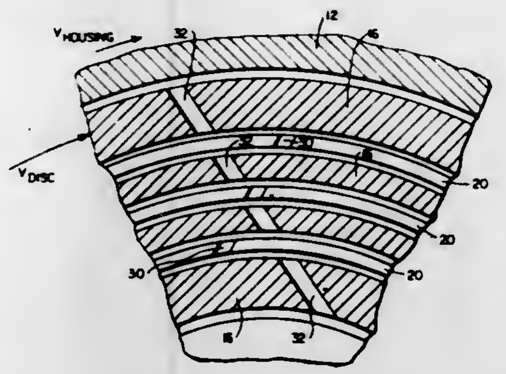
FAN DRIVE SECANT PUMPING GROOVES

Everett George Blair, Plainfield, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,508

Int. Cl.² F16D *35/00*

U.S. Cl. 192—58 B **7 Claims**



1. A fluid coupling of the type adapted for use to drive a fan for the radiator of an internal combustion engine, said coupling including relatively rotatable disc and housing members, said disc and housing having a common axis of rotation, said disc positioned within said housing, said disc on at least one face having a plurality of concentric lands which are positioned within mating concentric channels defined by concentric lands in said housing to thereby define interdigitated lands, said coupling adapted to contain a shear fluid to fill at least a portion of the clearance space between said lands and their corresponding channels for the purpose of transmitting torque, the improvement comprising, a pumping groove in the disc lands and a pumping groove in the housing lands, at least one of said pumping grooves being canted to thereby define a secant pumping groove.

4,004,669

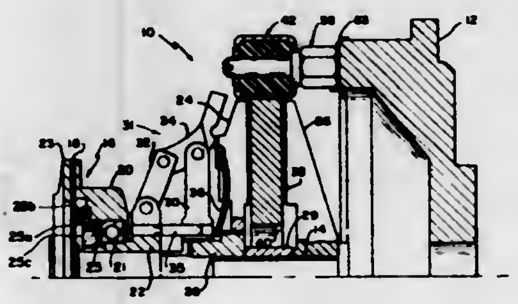
CLUTCH ASSEMBLY WITH FLOATER PLATE AND SHOCK CANISTERS

Zachary A. Roderick, Bethel Island, Calif., assignor to Galgon Industries, Inc., Fremont, Calif.

Filed Sept. 2, 1975, Ser. No. 609,234

Int. Cl.² F16D *13/46, 13/68, 3/70*

U.S. Cl. 192—70.17 **4 Claims**



1. In a drive train having a flywheel driven by an engine and a drive shaft coupled with a clutch assembly which includes at least a pair of pressure plates, the combination of an annular torque-transmitting floater plate adapted to be positioned co-axially between the pressure plates and about the drive shaft, means forming an opening in the floater plate co-axially with the drive shaft and radially spaced therefrom a distance which affords non-interfering clearance between the floater plate, pressure plates and drive shaft, with no portion of said pressure plates extending into a plane which includes the floater plate, means forming a plurality of circumferentially spaced arcuate sockets in the outer periphery of the floater plate with the longitudinal axis of each socket being generally parallel with the axis of rotation of the floater plate, a shock absorber unit mounted co-axially in each socket, each shock absorber unit including an elongate member having an axial bore and formed of an elastomeric material which is capable of resiliently absorbing shock forces transmitted from the flywheel to the clutch assembly upon interengagement therebetween, housing means enclosing each elongate member, said housing means comprising an annular shell having an outer diameter commensurate generally with the diameter of the sockets, each shell being mounted for axial sliding movement within a respective socket and with each elongate member being mounted co-axially within a respective shell, and mounting means extending axially through the bore of each elongate member for mounting the same for rotation with the flywheel.

4,004,670

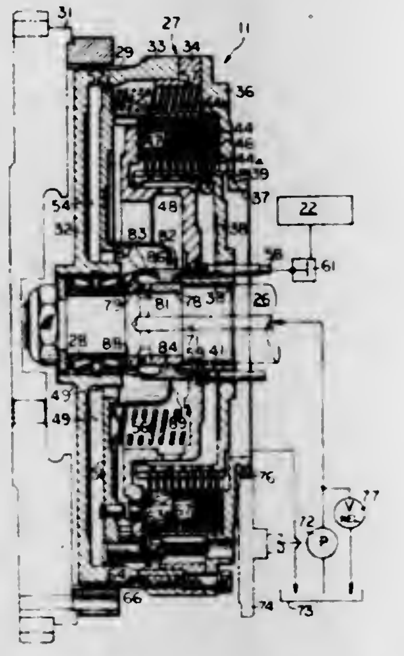
SELF-MODULATED CLUTCH WITH DRAG-REDUCTION VALVE

Karl A. Nerstad, Peoria; Franklin O. Koch, Jr., and Curtis E. Chadwick, III, both of Edelstein, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 9, 1975, Ser. No. 594,475

Int. Cl.² F16D *37/00, 13/72*

U.S. Cl. 192—105 A **6 Claims**



1. A self-modulating clutch for transmitting drive from an engine to a driven load comprising:
- a rotary input member and a rotary output member,
- a plurality of clutch discs including at least one disc coupled to said input member for rotation therewith and including at least one other disc coupled to said output member for rotation therewith,
- a pressure plate disposed adjacent said discs and being movable to apply clutch-engagement pressure to said discs and being retractable from said discs to disengage said clutch,
- self-modulating means forming a lubricant fluid-entrapping chamber within said clutch wherein a fluid pressure is developed from centrifugal effects, the magnitude of said fluid pressure being dependent on the rotational speed of said input member, and including a clutch capacity-modifying member exposed to said fluid pressure and movable thereby,
- at least one disengagement spring acting on said capacity-modifying member in opposition to said fluid pressure thereon,
- at least one engagement spring disposed between said capacity-modifying member and said pressure plate to apply increasing engagement pressure to said discs through said pressure plate when said capacity-modifying member moves in response to increasing fluid pressure in said chamber,
- passage means for supplying a flow of lubricant fluid to said clutch,
- valve means for reducing said lubricant flow when said clutch is disengaged, wherein said valve means continues to admit a reduced flow of said lubricant into said clutch while said clutch is disengaged, and
- a fluid-retainer communicated with said chamber of said self-modulating means and positioned to receive said restricted flow of lubricant fluid whereby a reserve of said lubricating fluid is available to said self-modulating means upon expansion of said chamber thereof in the course of re-engagement of said clutch.

4,004,671

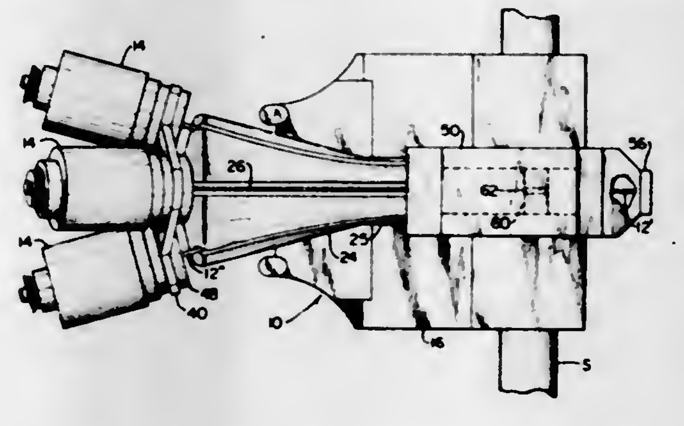
WIRE MATRIX PRINT HEAD

Nicholas Kondur, Jr., Riverton, Wyo., assignor to LRC, Inc., Riverton, Wyo.

Filed Dec. 16, 1974, Ser. No. 532,870

Int. Cl.² B41J *3/05*

U.S. Cl. 197—1 R **18 Claims**



1. A wire matrix print head adapted for use with matrix printer apparatus comprising:
- a plurality of elongated print wires having leading ends arranged in closely spaced relation to one another normal to and in confronting relation to a print medium, said print wires diverging away from said leading ends and from one another each along a predetermined corresponding path of curvature,
- a plurality of actuators, each actuator affixed to one of said print wires to drive its associated print wire forwardly toward the print medium, and to effect return of said print wire in a rearward direction away from the print medium, and
- guide wire means defining an elongated open polygonal support interposed between said actuators and the print medium to guide each of said print wires for rearward divergent extension in which at any given location along the substantial length of said print wires rearwardly of their leading ends said print wires are disposed at equally displaced included angles with respect to adjacent wires but at unequal distances apart to define the corners of a polygon having sides of unequal length in an imaginary plane passing through the print wires transversely of their leading ends, each of said print wires being unconfined along their substantial length and being guided by said guide wire means for advancement along a corresponding path of curvature as they are driven forwardly into the print medium.

4,004,672
PRINTING CONTROL DEVICE

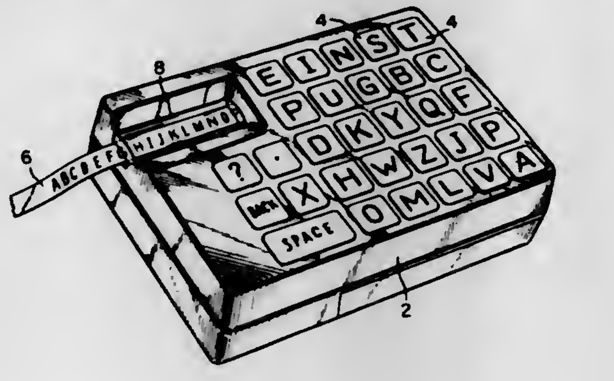
Reiji Hirano; Takayoshi Hanakata, both of Yokohama, and Matsutoshi Ito, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,397

Claims priority, application Japan, Feb. 22, 1974, 49-21686; Feb. 22, 1974, 49-21684; Feb. 12, 1975, 50-17671

Int. Cl.² B41J *3/20, 19/00;* **G05B** *19/40*

U.S. Cl. 197—1 R **7 Claims**



1. A printing control device for use in a portable electronic apparatus comprising:

a printing head fixedly disposed at a printing position and arranged to print a character on a tape-form recording medium, portions of said character being selectively printed along predetermined lines on said recording medium;

means including a step motor having a rotor and a plurality of coils arranged to provide intermittent rotation of said rotor by a predetermined angle in response to step pulses applied to said coils;

means for advancing said recording medium by predetermined incremental distances in response to the intermittent rotation of said rotor; and

recording medium feed control means coupled to said step motor and including a ring counter for supplying step pulses to advance said recording medium one said predetermined distance before and after the generation of printing control signals corresponding, respectively, to the initial and last lines of a character to be printed on said recording medium by said printing head, said step pulses including a first step pulse being operative to align the position of said rotor of said step motor means at a start position prior to the commencement of printing of said character on said recording medium by said printing head.

4,004,673
WIRE MATRIX PRINTHEAD HAVING FACILITY FOR ENABLING WIREWEAR CORRECTION

Karl H. Burzlaff, Danville, and Carmelo Sanchez, Castro Valley, both of Calif., assignors to The Singer Company, New York, N.Y.

Continuation of Ser. No. 482,917, June 25, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 604,964

Int. Cl.² B41J *3/04*

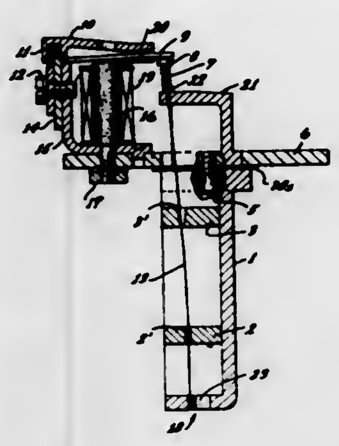
U.S. Cl. 197—1 R **4 Claims**

1. In a wire matrix printing head comprising a guide assembly for retaining a plurality of wire styli each of which styli has an input end for receiving an impact and an output end for delivery of an impact to a recording medium, said assembly having guide means adjacent one end thereof for holding and aligning the input ends of said wire styli and with electromagnetic activation means for delivering motion and velocity to selected ones of said plurality of styli, and output bearing means located adjacent the other end of said assembly to hold the output ends of said wire styli, the combination wherein:

said output bearing means includes a plurality of apertures with each aperture having its axis in alignment with an axis of one of said wire styli,

said output bearing means providing a planar face on one side thereof with the tips of the wire styli flush with said planar face, and

means movably mounting said bearing means to said guide assembly to enable altering of the position of said output bearing means and said planar face along the longitudinal length of said styli and in relationship to the output end tips of said wire styli,



said movable mounting means including means for releasing said bearing means from said guide assembly and for securing said bearing means in a desired position on said assembly.

4,004,674
PRINTING DEVICES

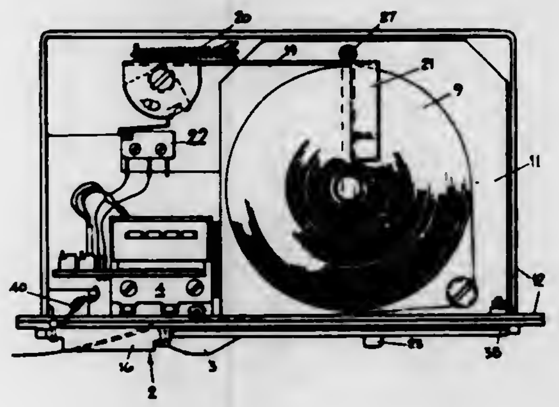
Godfrey Stephen Hall, Darlington, and John Harwood Leworthy, Newton Aycliffe, both of England, assignors to The General Electric Company Limited, London, England

Filed Jan. 21, 1976, Ser. No. 651,191

Claims priority, application United Kingdom, Jan. 22, 1975, 2763/75

Int. Cl.² B41J *1/18*

U.S. Cl. 197—1 R **4 Claims**



1. A printer for a tape which constitutes an elongated web, said printer comprising:

a. a support structure,
b. tape carrier means to carry a spool of tape to be printed,
c. means to mount said tape carrier means on said support structure for movement between a working position and a position which permits a replacement spool of tape to be fitted,
d. releasable latch means which is carried by said support structure to retain said tape carrier means in its working position and about which there is some freedom for pivotal movement of the tape carrier means,
e. means to advance tape drawn from a spool of tape carried by said tape carrier means in its working position through a printing station at which the tape is movable in a plane,
f. an anvil which has a rectilinear edge,
g. structural means which carries said anvil and which is pivotted to said support structure for movement between a working position in which said rectilinear edge lies adjacent to and to one side of said plane at the printing station and is retained in that position by engagement with said tape carrier means when in its working position at a point remote from said latch means and a position which facilitates threading of replacement tape through the printing station,
h. an electromagnetic printer unit having a plurality of metal strips each having and end portion that constitutes a printing element,
i. means to mount said printer unit on said support structure to lie on the opposite side of said plane to said anvil with the printing elements facing the rectilinear edge of the anvil when in its working position, and
j. spring means which co-operates with said support structure and said tape carrier means when in its working position to apply a force to the tape carrier means at a point spaced from said latch means and on the opposite side of the latch means to that at which the tape carrier means engages said structural means carrying said anvil so that the anvil is urged towards said printing elements thereby providing a resilient mounting for the anvil which permits some movement thereof upon operation of the printing elements.

4,004,675
TABULATOR DEVICE FOR TYPEWRITERS AND THE LIKE

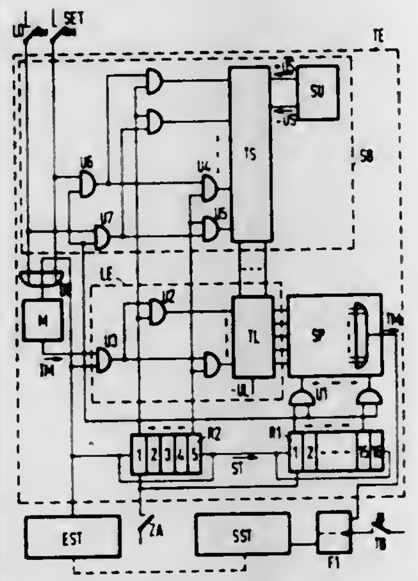
Martin Ludwig, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 23, 1975, Ser. No. 543,526

Claims priority, application Germany, Jan. 25, 1974, 2403653

Int. Cl.² B41J *25/18*

U.S. Cl. 197—176 **2 Claims**



1. In a tabulator device for typewriters, particularly for teleprinters or data-printers, in which tabulation marks are set, cancelled and recalled, the combination of a semiconductor store having electronically operable storage elements, arranged in the form of a matrix having a plurality of rows and columns, in which the tabulation marks are stored, said storage elements being operative to retain their respective contents independently of the operating voltage thereto, register means which operatively contains the addresses of the particular actuated storage elements, means, including a write-in control unit, operatively connected with said store and register means for selectively writing the tabulation marks into the store or cancelling the same therefrom, said register means comprising a pair of registers, one for row designation and the other for column designation, cooperable to supply the addresses to said store for designating the respective storage elements thereof, and means, including a read-out control unit, operatively connected with said store and register means for reading tabulation marks out of said store.

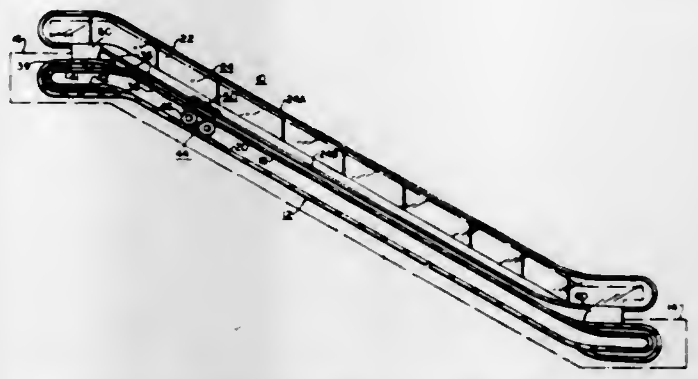
4,004,676
ESCALATOR WITH NON-JAMING STEP

Joseph K. Kraft, Gettysburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1975, Ser. No. 596,794

Int. Cl.² B66B *9/12*

U.S. Cl. 198—326 **16 Claims**



1. A moving stairway extending between upper and lower landings, comprising:

a plurality of similar steps disposed to travel between the landings in a load bearing run,

motive means,

said motive means being operable to cause said steps to descend and change from step mode to platform mode near the end of the load bearing run,

and first and second stairway skirt boards disposed at opposite sides of the steps,

each of said steps having a tread part having forward and rear edges and first and second sides, and a riser part which is disposed adjacent the forward edge of said tread part,

each of said steps having first and second projecting portions disposed at the forward edge thereof adjacent to the first and second sides, respectively, which extend outwardly past the forward edge portion of the step which extends between said first and second projecting portions, forming obtuse angles between the first and second projecting portions and said forward edge portion of the step, said first and second projecting portions being cooperatively formed by both the tread and riser parts to provide a fillet between the riser part and the first and second stairway skirt boards.

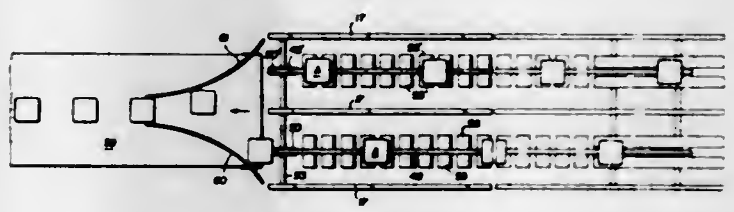
4,004,677
LINE COMBINING APPARATUS

Robert J. Heier, Whitehouse, Ohio, and Wayne E. Pettibone, Woodridge, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed July 30, 1975, Ser. No. 600,248

Int. Cl.² B65G *47/26*

U.S. Cl. 198—452 **7 Claims**



1. A package handling apparatus for combining a plurality of lines of packages into a single line comprising plural infeed conveyors each supporting a line array of randomly spaced package articles, means connected to drive the infeed conveyors at the same speed in a common direction, individual endless finger chains for each infeed conveyor, each said chain carrying plural fingers spaced along the chain an amount at least two times said package article length, means supporting

each of said individual chains adjacent the end of the infeed conveyors such that along its upper reach of said path the fingers thereof protrude above the infeed conveyor surface level for engaging packages thereon, a second conveyor span adjacent the downstream end of each infeed conveyor and at a level relative to said infeed conveyor for transferring package articles from the former to the latter and supporting them on the latter throughout its travel below the level of the protruding fingers, means connected to drive each of the second conveyors in the same direction as the infeed conveyors, means connected to drive each of the individual chains at a speed greater than the speed of the infeed and second conveyors, respectively, whereby the protruding fingers engage and control the spacing of said articles while on the second conveyor, and third conveyor means aligned to receive said spaced articles from the second conveyors, and including means engaging articles received from said second conveyors and guiding them into a single line thereon; said means comprising a pair of opposed converging arcuate guides, means mounting the guides in stationary position over the surface of the third conveyor receiving the packages, each guide extending from its one end near the downstream end of a second conveyor to overlie the third conveyor and its other end in a spaced apart relationship from the other opposite guide defining a single package outlet passage for guiding packages delivered from the individual second conveyors along the third conveyor toward each other and funnel the packages through the outlet in a single line on the third conveyor.

4,004,678

CONVEYOR SYSTEMS

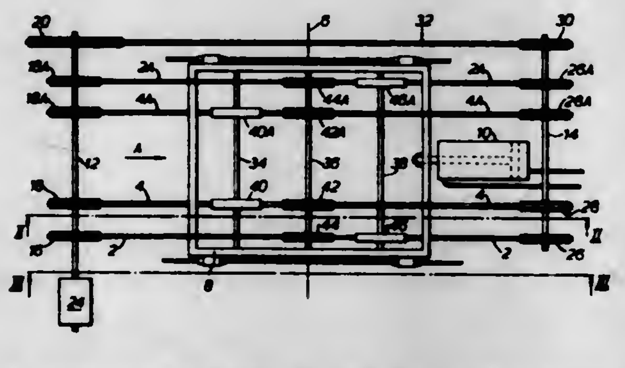
Peter D. Hardy, Welwyn Garden City, England, assignor to Metal Box Limited, Reading, England

Filed July 17, 1975, Ser. No. 596,752

Claims priority, application United Kingdom, July 19, 1974, 32033/74

Int. Cl.^{2} B65G *47/26*

U.S. Cl. 198—460 **8 Claims**



1. A conveyor handling system for transporting articles from a first position to a second position, comprising

first and second endless conveyors each defining an upper run

roller means supporting the two conveyors so that their upper runs extend in series between the two positions, the roller means having first and second coaxially supported rollers guiding adjacent ends of the upper runs to define a line junction between them,

drive means coupled to drive the two conveyors at two respectively different speeds, means responsive to the approach of an article to the junction between the two conveyors at which the article is transferred from one conveyor to the other to provide an actuation signal,

and actuation means responsive to the actuation signal and connected to the first and second rollers to displace said junction without altering the speeds of the two conveyors and in a sense to accelerate the transfer of the articles between the two conveyors.

4,004,679

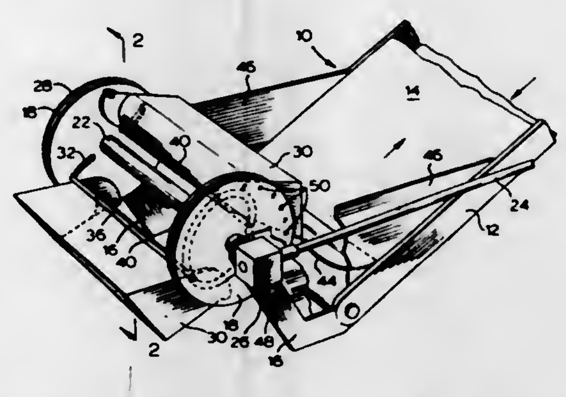
MECHANICAL SHOVELS

Steven Charles Lenkey, P.O. Box 922, Hamilton, Ontario, Canada (L8N 3P9)

Filed Apr. 18, 1975, Ser. No. 569,505

Int. Cl.^{2} B65G *65/04*

U.S. Cl. 198—509 **5 Claims**



1. A mechanical shovel comprising a frame, a first cam member rotatably mounted by the frame about an axis and providing an endless bucket-attitude controlling cam track having the said axis within its perimeter, means for adjustably fixing the position of the first cam member about the said axis, a second guide member mounted for rotation about the said axis and providing a guide slot extending radially with respect to the said axis, at least one bucket having an open front end and having a rearward extension by which it is pivoted to the second guide member so as to be rotatable therewith about the said axis, and a cam follower on the bucket between its pivot and said open front end, engaging the said cam track and the guide slot and cooperating therewith to hold the bucket with its open front end in shovelling attitude and to move it in a shovelling action parallel to a surface over which the shovel extends upon rotation of the second guide member, the first cam member being rotatable about the said axis of rotation to change the inclination of the shovelling action of the said bucket, and means for rotating the second guide member.

4,004,680

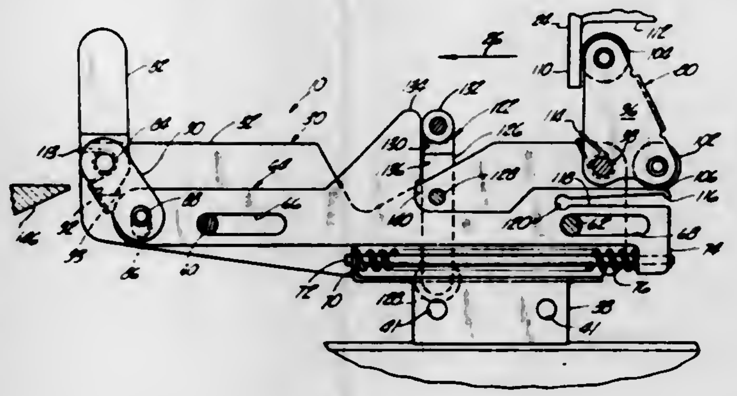
CONVEYOR PUSHER MECHANISM

Bruno D. Warmann, 15362 Fairlane Drive, Livonia, Mich. 48154

Filed Sept. 22, 1975, Ser. No. 615,398

Int. Cl.^{2} B65G *19/00*

U.S. Cl. 198—732 **13 Claims**



1. A conveyor including a support for providing a path along which trays are movable in a forwarding direction, each tray being drivingly engageable by one of a plurality of pusher members carried by a chain supported on a track located adjacent to the tray support, each pusher member being rotatably mounted on a housing attached to the chain and movable therewith, each pusher member being movable between driving and non-driving positions relative to the tray, wherein the improvement comprises:

a connecting member mounted on the housing for reciprocal movement with respect to the pusher member to control the movement of the pusher member between the driving and non-driving positions relative to the tray;

means urging the connecting member into a contacting engagement with said pusher member to urge said pusher member to an operative relation with a tray in which the pusher member is drivingly engageable;

a control member pivotably mounted on the housing in advance of the pusher member with relation to the forwarding direction of tray movement, said connecting member connecting the control member to said pusher member such that, when the control member is engageable with an object such as a preceding tray overtaken by the control member, the control member is movable in response to such engagement to cause the connecting means to move to a non-contacting relationship with the pusher member whereby the pusher member moves to a non-driving position;

a second control member operable independently of said first-mentioned control member for moving said connecting member out of a contacting engagement with said pusher member; and

barrier means mounted adjacent to a portion of the chain-supporting track and momentarily engageable with said second control member such that said second control member lockingly engages said connecting member to move the same in a non-contacting position with respect to said pusher member whereby said pusher member is moved to said non-driving position, said second control member remaining in contact with said connecting member after said momentary engagement with said barrier.

4,004,681

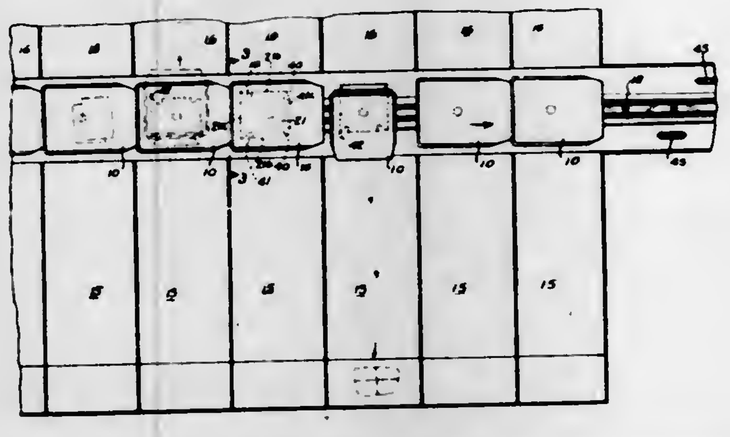
TILTING TRAY SORTING SYSTEM

Merle E. Clewett, Frederick, and Seymour Henig, Kensington, both of Md., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Apr. 5, 1976, Ser. No. 673,793

Int. Cl.^{2} B65G *47/38*

U.S. Cl. 198—796 **37 Claims**



1. In a tilting tray sorting system, the combination comprising

a plurality of carriages,

a track,

a driving means for moving said carriages along said track,

each said carriage comprising a tray,

means for supporting said tray on its carriage for swiveling movement about a vertical axis and tilting movement about a horizontal axis,

means for holding said tray in normal generally horizontal position on said carriage,

means along the path of said carriages for engaging and moving said trays such that they swivel about the vertical axis and tilt about the horizontal axis to deliver an article to one or more positions along the path of the carriages,

and means along the path of the carriages for returning said trays to their normal position.

4,004,682

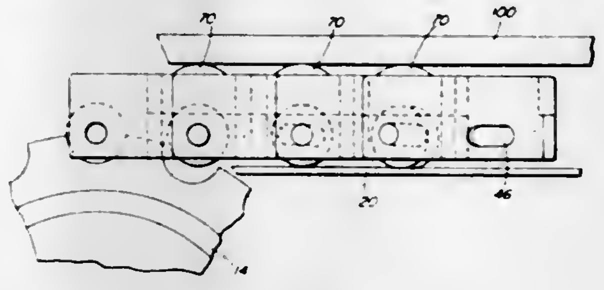
TYPE S CHAIN

Stephen H. Schuler, Brighton, Mass., assignor to Adamation, Inc., Newton, Mass.

Filed Aug. 14, 1975, Ser. No. 604,728

Int. Cl.^{2} B65G *17/00*

U.S. Cl. 198—852 **9 Claims**



1. A dishwasher conveyor which comprises:

a. a plurality of links, each link having an upper and lower surface and a yoke and a collar connected integrally therewith; the collar adapted to be rotatably received within the yoke of a next successive link; the collar of the link including opposed slots which define the limits of relative oscillatory movement about a first axis between the collar and the next successive link; and wherein the collar of one link includes an opening adjacent to an opening of the collar of the next successive link to allow maximum pivotal movement therebetween about a second axis and wherein the openings define a recess which recess receives the tooth of a sprocket;

b. a sleeve rotatably received within the collar of the yoke, the sleeve having an upper domed surface which extends beyond the upper surface of the link;

c. a wheel-like roller having a hole in the center thereof received in the sleeve and extending below the lower surface of the link; and

d. means to secure the collar of one link to the yoke of the next link and the sleeve and the roller to the collar portion, the secured links adapted for relative oscillatory motion one to the other about the first axis, which motion is limited by the slots in the collar and for pivotal motion about the second axis.

4,004,683

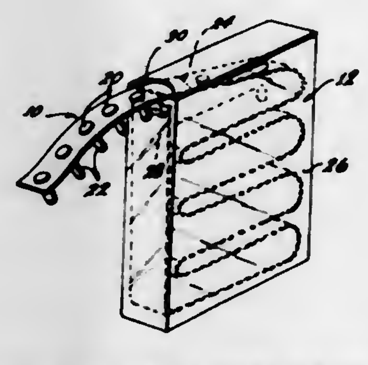
PACKAGING FOR POWER LOADS

Raymond V. Pomeroy, Portland, and Lewis A. Scott, Lake Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Filed May 7, 1975, Ser. No. 575,446

Int. Cl.^{2} B65G *15/00;* **B65H** *5/28;* **F42B** *39/08*

U.S. Cl. 206—3 **2 Claims**



1. Packaging for power load cartridges for powder actuated tools comprising; a flat elongate strip, power load cartridges having a head and a shank, attaching means attaching the heads of the cartridges to the strip with the shanks extending from one side of the strip, said attaching means permitting the shanks to be inserted into the cartridge receiving chamber of a powder actuated tool and in the inserted position permitting the strip to be peeled away from the head of the cartridge, a container for said cartridge bearing strip having an opening

through which the strip and cartridges can be incrementally removed by the tool operator, and holding means on said container continuously resisting removal of the cartridge bearing strip to prevent inadvertent spillage.

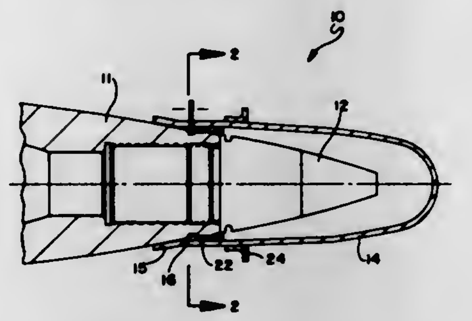
4,004,684
FUZE PROTECTOR CAP

John A. Scollins, Oak Grove, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1976, Ser. No. 690,449

Int. Cl.² F42B *37/00*

U.S. Cl. 206—3 **4 Claims**



1. A cap for protecting fuzes on projectiles during storage and handling, said projectiles being provided with a circumferential fuze setting groove, comprising:
- a deep drawn cup having the open end thereof flared to mate with the ogive of the projectile;
- at least three slots circumferentially spaced on the wall of said cup; and
- a snap ring having at least three lips adapted to project into said slots and engage the fuze setting groove on the fuze for retaining said cup on the projectile.

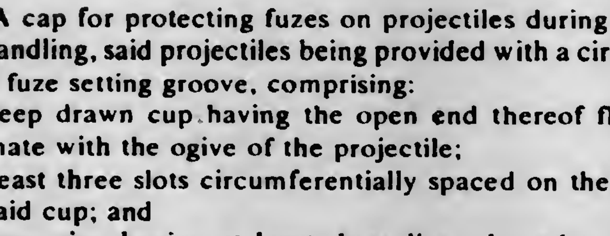
4,004,685
TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, and Iris N. Henderson, both of St. Paul, Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Mar. 7, 1972, Ser. No. 232,432

Int. Cl.² B44D *1/46;* **B05C** *11/12;* **E01B** *29/04;* **F26B** *3/00*

U.S. Cl. 206—.5 **8 Claims**



1. An article for conditioning fabrics in a machine clothes dryer by contact of the fabrics with a fabric-conditioning agent supplied by said article, said article characterized by having:
- a. fabric conditioning agent in a form such as a bar that is solid at normal room temperature and softens at the elevated temperatures reached during normal operation of a machine clothes dryer;
- b. a dispenser body surrounding or enclosing the fabric conditioning agent;
- c. means for selectively attaching the dispenser body to a wall of a machine clothes dryer drum;
- d. a permeable surface of said dispenser body through which only a small amount of said enclosed fabric conditioning agent can pass when it is softened by heating of said article in a dryer, thereby allowing the enclosed fabric-conditioning agent to act as a long lasting reservoir for fabric conditioning agent which, after it passes through the permeable surface, is transferred to the fabric being treated by contact between the fabric and the permeable surface of the article; and
- e. said article being capable of substantial re-use in conditioning different batches of fabric without replenishing the fabric conditioner of paragraph "a" hereof.

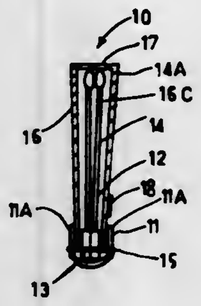
4,004,686
MATCH BOOK

Francis M. Hutchinson, 460 Elm St., Stratford, Conn. 06497

Filed Nov. 28, 1975, Ser. No. 636,085

Int. Cl.² A24F *27/00*

U.S. Cl. 206—104 **4 Claims**



1. A match book comprising,
- a substantially U-shaped base member having opposed leg portions,
- a row of matches secured to said base member between said opposed leg portions,
- said matches extending beyond the opposed leg portions of the said base member,
- a cover member detachably connected to said base member,
- said cover member defining an enclosure for encasing the matches,
- said cover member including opposed side walls, interconnected end walls, and a top wall for encasing said matches,
- said cover member being frictionally secured to said base member by insertion of the lower portion of said side walls between the leg portions of said base member and said row of matches disposed therebetween,
- and means defining a striking element for effecting ignition of said matches connected to one of said member.

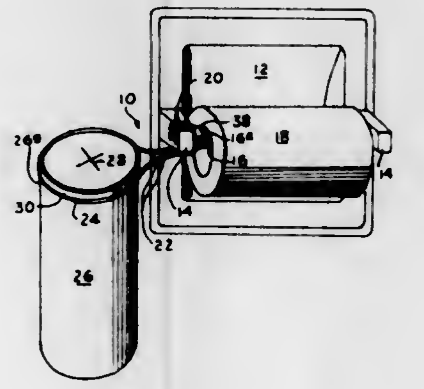
4,004,687
DEVICE FOR POSITIONING A CONTAINER OF SUPPLEMENTAL MATERIAL ADJACENT TO A TOILET-TISSUE HOLDER

Philip Boone, 15 Fenwick Road, Winchester, Mass. 01890

Continuation-in-part of Ser. No. 526,963, Nov. 25, 1974, Pat. No. 3,943,859. This application Apr. 14, 1975, Ser. No. 568,034

Int. Cl.² B65Q *83/04, 85/00*

U.S. Cl. 206—233 **10 Claims**



1. An improved device for positioning a container of health care material adajcent to a standard toilet-tissue roll holder, said holder including a principal body component and a pair of forwardly projecting posts, each of said posts having upper, lower and side surfaces and a bore formed to receive a spindle of a toilet-tissue roll, said improved device comprising:
- a container with health care material therein;
- an aperture in said container enabling said material to be released;
- a rigid unitary arm member positioning said container with respect to said holder;
- angular slide-on fastening means integral with one extremity of said arm member which substantially encircles and firmly grips one of said posts and which determines the position in which said arm member extends;
- means to fixedly position said fastening means along said post;
- support means integral with the other extremity of said arm member to bear said container; and
- means on said container to releasably engage said support means and prevent inadvertent displacement, said container being removable without adjusting any of said holder, fastening means, arm member, or support means.

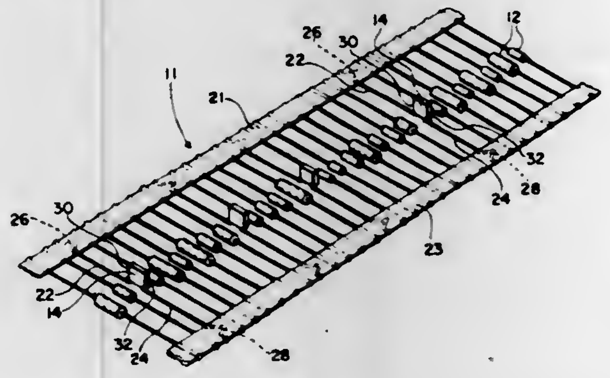
4,004,688
RADIAL LEADED ELECTRICAL COMPONENTS DESIGNED FOR AUTOMATIC INSERTION INTO PRINTED CIRCUIT BOARDS

Denver Braden, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 10, 1975, Ser. No. 594,929

Int. Cl.² B65D *73/02*

U.S. Cl. 206—330 **12 Claims**



1. A radial leaded electrical component comprising at least first and second radial leads which project outwardly in opposite directions along substantially a straight line and which lie in substantially the same plane, a first deformation in said first lead, said first deformation being positioned and configurated to insure the application of a first adhesive band over said first deformation and the application of a second adhesive band over said second lead retains said component in a predetermined orientation relative to said plane and a second deformation positioned on said first lead outwardly of said first deformation.

4,004,689
ARTICLE CARRIER

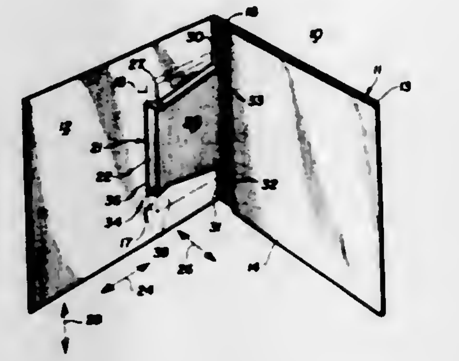
Don Leon Glasell, 331 Kedzie St., Evanston, Ill. 60202

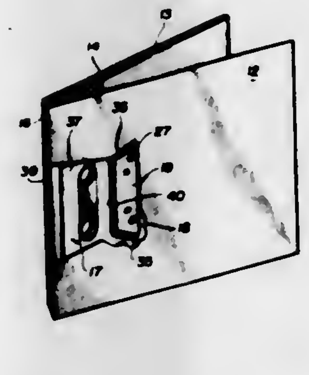
Filed Oct. 10, 1972, Ser. No. 296,485

Int. Cl.² B65D *85/67;* **B42D** *3/00*

U.S. Cl. 206—387 **3 Claims**

1. A display holder for a tape cassette or the like comprising a book-like folder body including front and rear cover portions and a bright portion interconnecting said cover portions, said front cover and bight portion having a pair of cuts formed therethrough generally normal to the bight portion and folding axes of said front and rear cover portions relative to the bight portion, corresponding ends of said cuts terminating within the front cover a substantial distance from the bight portion and the other corresponding ends of the cuts terminating adjacent said rear cover of the folder body, and a cassette embracing sleeve element integral with the folder body formed by said cuts and having top and bottom edges and a forward end hingedly joined with said front cover at the ends of the cuts which terminate in the front cover, the sleeve element having an opposite end hingedly joined with the folder body at the other corresponding ends of said cuts, and the sleeve element having a folding line spaced somewhat rearwardly of the forward end of the sleeve element by an amount approximately equal to the thickness of a cassette or the like to be held, and said folding line parallel to the hinge axes of the forward and rear cover portions, the arrangement being such that a cassette or the like is insertable beneath the





sleeve element with one face of the cassette lying against the interior of the front cover and its opposite face lying under the sleeve element with the sleeve element folded on said folding line and offset rearwardly of the front cover, said one face of the cassette viewable through the front cover in the area between said cuts, and said cuts defining abutments on the front cover adapted to engage opposed edges of the trapezoidal protrusion on a cassette and thus to arrest movement of the cassette toward the top or bottom of the folder body, the sleeve element and said bight portion of the folder body preventing movement of the cassette away from the bight portion and away from the interior of the front cover.

4,004,690
COUPON HOLDER

Ninfa R. Giarritta, San Francisco, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

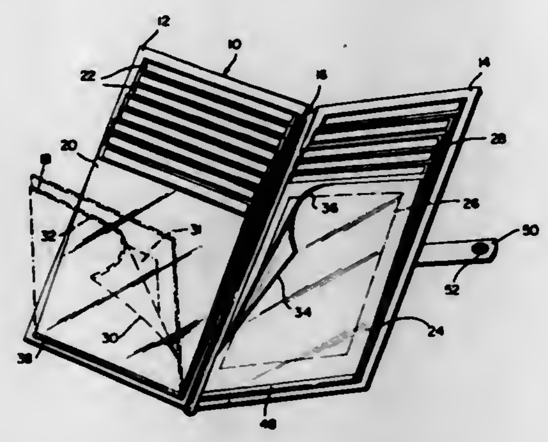
Filed Aug. 20, 1975, Ser. No. 606,320

Int. Cl.² B65D *85/00*

U.S. Cl. 206—425 **10 Claims**

1. A coupon holder for classifying coupons and for presenting coupons readily for manual dispensing comprising opposable panel support means, said panel means hingedly secured to one another, transparent pocket means hingedly secured to

each panel, opening means in said pocket means for inserting and withdrawing coupons from said pocket means, said openings facing in a direction substantially toward the edges of said panels that are hingedly secured to one another.



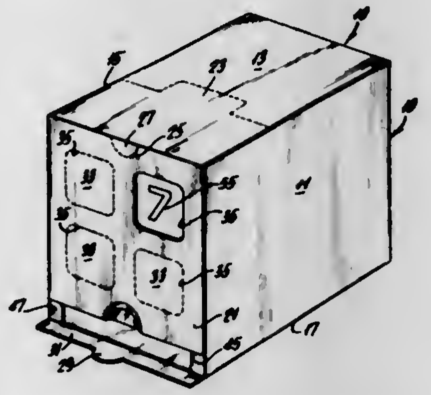
4,004,691
GLOVE PACKAGE BOX WITH INTERCHANGEABLE IDENTIFICATION

Allen Wihksne, Fort Worth, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Dec. 22, 1975, Ser. No. 643,442

Int. Cl.² B65D *5/72, 83/00*

U.S. Cl. 206—459 **7 Claims**



1. A box with interchangeable identification including a rectangular enclosure having four walls, a bottom closure at one end of said rectangular enclosure and an identification closure at the other end thereof, said identification closure comprising:

first means for making available for display, exclusively, a first plurality of symbols, this plurality being a portion of the total symbols available, said means being attached to two said opposing walls of said rectangular enclosure;

second means for making available for display, exclusively, a second plurality of symbols, this plurality being the remaining portion of the total symbols available, said means being attached to a wall of said rectangular enclosure adjacent to said first means attachment; and

means connected to said remaining of said rectangular closure walls for selectively displaying one of said symbols made available.

4,004,692
COT DISPENSER

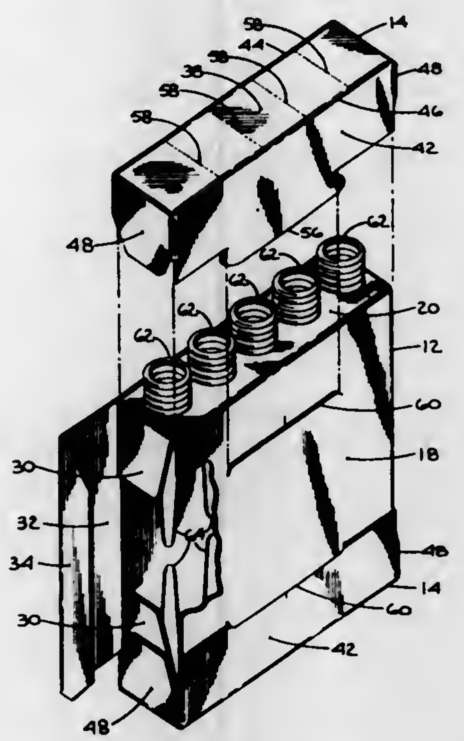
James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 23, 1973, Ser. No. 335,360

The portion of the term of this patent subsequent to Jan. 25, 1992, has been disclaimed.

Int. Cl.² B65D *83/00, 85/62*

U.S. Cl. 206—486 **13 Claims**



1. A package for storing and dispensing cots of the type used to cover medical probes, said cots having an elongated tubular body portion, a closed bottom end, an open top end and a beaded rim disposed about the open end, said probe having means, spaced from an end of said probe, for engaging the beaded rim of the cot when the cot is stretched over said probe, said package comprising:

a container having spaced perforations formed in at least a portion thereof each perforation having a diameter less than the outer diameter of the beaded cot rim and sufficiently large to receive the cot body portion and the probe so that the cots may be suspended in said perforations, said container being of sufficient size so that the probe may be inserted a sufficient distance into the cots to allow engagement of the beaded rim by the engagement means;

cover means for enclosing the perforations, said cover means being mounted to said container; and

means associated with said cover means for exposing the perforations so that cots suspended in said perforations may be removed by inserting said probe and engaging the beaded rim with said engaging means.

4,004,693
APPARATUS FOR INSPECTING THE DISPOSITION OF STEEL PLY CORDS IN PNEUMATIC TIRES

Naotaka Tsuji, and Koji Yamada, both of Kodaira, Japan, assignors to Bridgestone Tire Company Limited, Kyoba, Japan

Filed Apr. 23, 1975, Ser. No. 570,796

Claims priority, application Japan, May 9, 1974, 49-51666

Int. Cl.² B07C *5/04, 5/08*

U.S. Cl. 209—81 R **9 Claims**

1. An apparatus for automatically insecting the disposition of reinforcing steel ply cords in pneumatic tires, comprising in combination:

a tire feeding mechanism for feeding tires one by one toward a predetermined position on said apparatus;

a tire retaining mechanism having a rim member split into upper and lower halves for rotatably retaining a tire in an inspecting position;

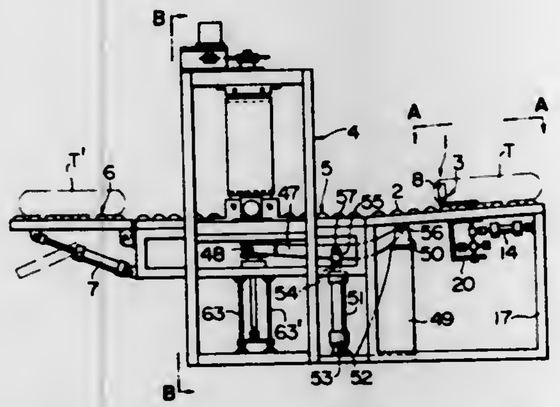
a rotational driving mechanism mechanically connected to said rim member for rotatingly driving the same;

cord disposition detecting means including a carriage mounted on a machine frame so as to be movable toward and away from said inspecting position, and electric detectors mounted on said carriage to be movable toward and away from respective inspecting positions facing opposite side wall portions of said tire;

tire size detecting means comprising a cam shaft, an arm member securely mounted on said cam shaft and rotatingly movable toward a tread surface of a tire in said predetermined position, a number of cam plates securely mounted on said cam shaft and having angularly displaced cam surfaces relative to the axis of said cam shaft, and a number of limit switches securely mounted on a machine frame opposingly to said cam plates, said cam plates actuating said limit switches in a number corresponding to an angle of rotational movement of said arm member to produce a signal indicative of the size of said tire, and a limit mechanism for limiting the movement of said cord disposition detecting carriage, said limit mechanism comprising a plate member securely mounted on said carriage and having a number of consecutively stepped surfaces and a number of limit switches securely mounted on a machine frame opposingly to said consecutively stepped surfaces of said plate member so as to produce a step signal for stopping said cord disposition detecting carriage upon a specified distance movement thereof as determined by the tire size detecting means signal;

electric control circuit means connected to said electric detectors for producing a disqualifying signal upon detection of an irregularity in the disposition of the steel ply cords in said tire; and

classifying means for distinguishing a disqualified tire from qualified ones.



4,004,694
EXTRACTOR ASSEMBLY FOR EXTRACTING AND/OR DIVERTING A SELECTED NUMBER OF SIGNATURES FROM A STREAM

Christer A. Sjogren, Miami, Fla., assignor to Eds Inc., Hialeah Gardens, Fla.

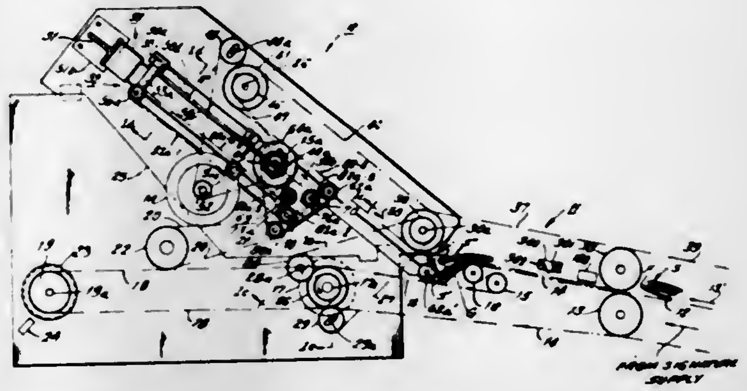
Filed Oct. 2, 1975, Ser. No. 618,815

Int. Cl.² B07C *5/342*

U.S. Cl. 209—111.7 R **20 Claims**

1. A method for separating at least one signature from a stream of signatures moving in a forward feed direction from an upstream location along a conveying path having a main path and a branch path selectively movable towards the main path for conveying a stream of signatures, weekly journals, brochures or the like, which are arranged in overlapping fashion and have spines facing forward and in the downstream direction of the main path, said signatures each having a bottom and a top surface whereby each bottom surface engages the top surface of the preceding adjacent downstream signature and each top surface engages the bottom surface of the succeeding adjacent upstream signature, the spines of each signature being a spaced distance from the spines of adjacent upstream and downstream signatures, the branch path being provided with a stationary and a reciprocating shunting devices as well as a withdrawing device having engaging belts, the method of comprising the steps of:

leading the signatures around a bend so that the spine of each signature is caused to lift away from the engaging top surface of the preceding adjacent downstream signature to form a gap between the lifted spine and the top surface of the preceding adjacent downstream signature;



moving the reciprocating shunting device into said gap whereby the lifted spine is deflected towards and along the withdrawing device and between the engaging belts; and

rapidly withdrawing the reciprocating shunting device away from said gap as the deflected signature moves between the engaging belts by means of a quick backward snatching of the withdrawing device while the extracted signature continues to move between the belts of the withdrawing device.

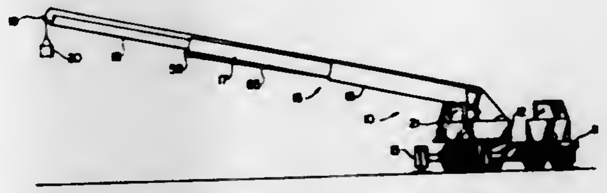
4,004,695
CHANNEL AND PLATE TELESCOPIC CRANE BOOM

John L. Hockensmith, Chambersburg, and John L. Grove, Greencastle, both of Pa., assignors to Fulton Industries, Inc., McConnellsburg, Pa.

Filed Apr. 16, 1975, Ser. No. 568,665

Int. Cl.² B66C *23/04*

U.S. Cl. 212—144 **8 Claims**



1. An extensible telescopic boom for a crane or the like comprising:

a first inner tubular boom section adapted for support on a vehicle, and a second outer tubular boom section telescopically in said inner boom section, said sections supporting a load support,

each said section including an upper U-shaped one piece bent plate channel shaped member providing sides and a top of uniform thickness, and a plate joined to said channel member providing the bottom of the tubular boom section, said plate having a greater thickness than said channel member, the width of the plate being larger than the distance between the outside surfaces of the sides of said channel shaped member substantially only enough to provide support for welding material, welding material deposited and joining the bottom portion of said side channel shaped member to said plate and positioned at the outer surface of each said side, there being sufficient welding material to achieve required structural strength, and

laterally spaced wear-pads carried by said inner tubular boom section bottom plate each being adjacent a wall of said inner boom section and underlying a wall of said outer boom section, the outer edge of each said wear-pad being substantially in the plane of the outside surface of the said wall of the said outer boom section,

whereby said boom has adequate strength with reduced width and weight and without excessive bending of the boom section bottom plate.

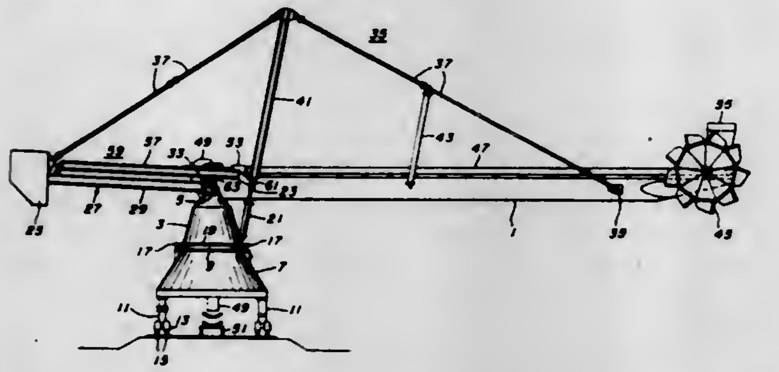
4,004,696
MATERIAL HANDLING APPARATUS WITH LOAD COMPENSATED COUNTERWEIGHT SYSTEM

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1975, Ser. No. 623,362

Int. Cl.² B66C *23/72*

U.S. Cl. 212—49 **9 Claims**



1. In material handling apparatus having: a boom pivotally supported at one end for movement in a vertical plane while maintaining an acute angle with the horizontal;

a strut pivotally supported at one end for movement in the same vertical plane as said boom although extending in the opposite direction, said strut also maintaining an acute angle with the horizontal;

a counterweight mounted near the free end of said strut;

a tension member connected between the counterweight and a point well out toward the free end of the boom to counterbalance at least a portion of the forward overturning moment generated by the boom with the moment generated by the counterweight; and

a frame extending generally upward to pivotally support an intermediate portion of the tension member at a height above the pivoted ends of the boom and the strut, said pivoted boom and strut forming an upward facing angle which tends to decrease in size as the boom begins to bend upon the application of live load thereto,

the improvement comprising:

a beam member cantilevered outward from the pivoted end of the boom in the direction of said strut, and

means coupling the strut to the outer portion of the cantilevered beam member to transfer a portion of the moment produced by the counterweight to the cantilevered beam as the live load on the boom is decreased and the angle between the pivoted boom and strut tends to increase.

4,004,697
VISUAL COUPLING INDICATOR FOR AUTOMATIC RAILWAY CAR COUPLERS

William B. Jeffrey, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 9, 1976, Ser. No. 656,316

Int. Cl.² B61G *3/10*

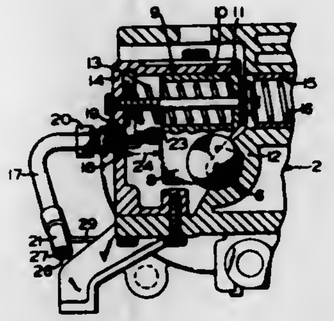
U.S. Cl. 213—75 R **8 Claims**

1. A visual coupling indicator for use with a railway car coupler comprising a casing for a mating head disposed axially parallel to the longitudinal axis of the car for mating with a counterpart mating head, said casing being of predetermined vertical dimension defined by upper and lower limits and having operably disposed therein a movable locking member biased to a locking position in which a coupling pin of the counterpart mating head is engaged for locking the mating heads in a coupled relation, and being operable to an unlocking position in which the coupling pin of the counterpart mating head is disengaged for releasing the coupled relation, said visual coupling indicator comprising:

a. a tubular member disposed externally of the casing with one end fixed to the side thereof adjacent to and in alignment with the line of movement of the locking member, said tubular member being curved such that the other end thereof extends beyond one of the upper and lower limits of the casing;

b. a flexible spring member having one end making separable abutting contact with the locking member and extending therefrom through said tubular member, said flexible member being of such length as to occupy a fully retracted position within the tubular member when the locking member is in its said locking position and to have the other end thereof extending exteriorly and beyond the other end of said tubular member into a visible position when the locking member is in its said unlocking position; and

c. indicator biasing means effective, upon movement of the locking member to the locking position, for biasingly returning said flexible member to its said fully retracted position, and being yieldable to movement of the locking member to the unlocking position for effecting operation of the flexible member to its said visible position.



4,004,698
DEVICE FOR POSITIONING A MEMBER ON A TUBULAR PLATE

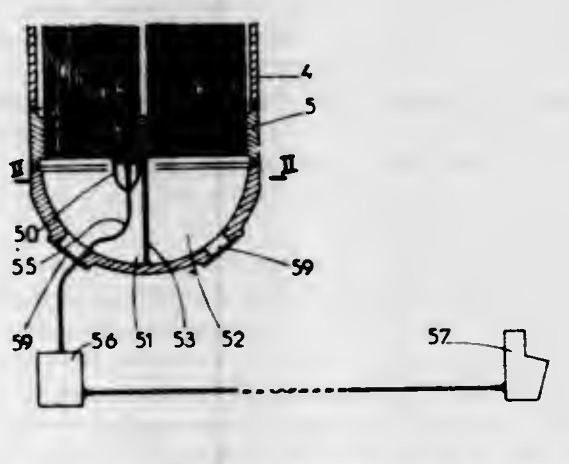
Bernard Gebelin, Courbevoie, France, assignor to Societe Franco-Americaine de Constructions Atomiques-Framatome, Courbevoie, France

Filed Dec. 2, 1975, Ser. No. 636,951

Claims priority, application France, Dec. 5, 1974, 74.39771

Int. Cl.² B25J *9/00*

U.S. Cl. 214—1 BB **7 Claims**



1. A carriage for selectively moving along a tubular plate guide tubes having members adapted to be introduced into tubes of the tubular plate, said carriage comprising: two crossed arms each carrying guide tubes; a guiding and connecting stirrup between said arms, guide means for permitting movement of each arm relative to the stirrup in a direction parallel to the tubular plate, in a longitudinal direction of the arm and in a direction perpendicular to the plate; means for controlling the movements of said arms relative to said stirrup; and said members comprising grappler fingers unitary with each of said arms and directed toward said tubular plate, said fingers comprising expansible mandrels with means for selectively causing their diameter to become greater or smaller than the diameters of the tubes of the plate.

4,004,699
METHOD AND APPARATUS FOR DISCHARGE HANDLING OF METAL SHEETS

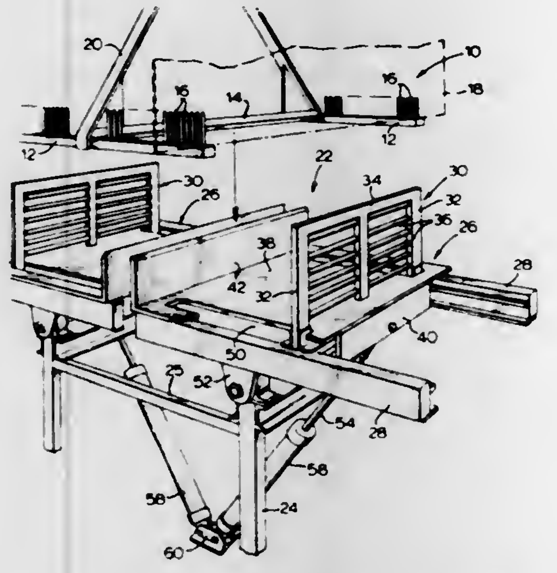
Frederick Louis Connon, Erieau, and John Neil Stone, Kingsville, both of Canada, assignors to David Krofchak Limited, Cambridge, Canada

Filed July 9, 1975, Ser. No. 594,390

Claims priority, application Canada, May 29, 1975, 228413

Int. Cl.² B65G *57/28*

U.S. Cl. 214—6 C **9 Claims**



1. Apparatus for discharge handling of a plurality of sheets from a rack having means for supporting said sheets in a vertically disposed spaced apart position, consisting of a tiltable table, said sheet supporting means being large enough in plan dimensions to telescope over said table, means for telescopic lowering of said support means below said table to release said sheets onto said table, a vertically disposed stop on said table, an upstanding member on said table movable towards said stop on said release of the sheets to form a pack thereof against said stop, means for tilting said table, while said support means is below said table, until said stop with said pack is horizontal, and means for moving said pack from said horizontally disposed stop when said slidable member is moved away from said stop.

4,004,700
HOPPER GATE FOR SELF-UNLOADING SHIPS

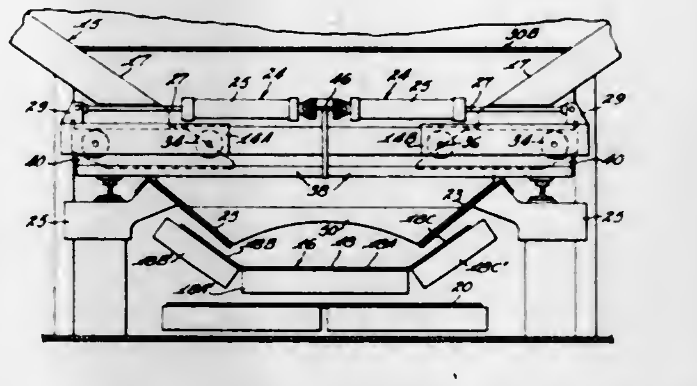
Robert M. Empey, Ontario, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,312

Int. Cl.² B65G *67/58*

U.S. Cl. 214—15 D **8 Claims**

1. A belt feeder gate for discharging a bulk material from a given hopper of a hoppered ship hold or the like onto an unloading conveyor belt positioned in underlying relation to said feeder gate, and in which the given hopper has a downwardly tapered shape defined by a first pair of oppositely disposed hopper walls inclined longitudinally relative to the longitudinal path of travel of said conveyor belt and by a second pair of oppositely disposed hopper walls inclined laterally relative to the longitudinal path of travel of said conveyor belt, said given hopper being one of a plurality of similar hoppers positioned in overlying relation to said conveyor belt along the length of said conveyor belt, the oppositely disposed longitudinally inclined hopper walls of the given hopper defining with longitudinally inclined walls of hoppers lying contiguous the given hopper upstream and downstream of the given hopper relative to the travel of said conveyor belt a pair of longitudinally spaced hog ridges lying on either side of the given hopper, wherein the improvement comprises forming said belt feeder gate as two cooperating gate sections adapted when in closed position to close the discharge opening of said given hopper, said two gate sections being mounted for movement in a horizontal plane in a direction laterally of the path of travel of said conveyor belt, said two cooperating gate sections being movable in opposite directions toward and into abutting relation to each other to close said discharge opening of said given hopper, said two cooperating gate sections being movable in opposite directions away from each other to permit discharge of material from the discharge opening of said



given hopper, the respective opposite longitudinal end portions of each gate section being respectively in underlying relation to a corresponding one of said pair of longitudinally spaced hog ridges lying on either side of said given hopper, wheel means carried by each of said gate sections, stationarily mounted track means extending laterally of the longitudinal path of movement of said conveyor belt and adapted to be engaged by said wheel means to rollingly support each of said gate sections in its opening or closing movement, said cooperating gate sections when in open position having at least a substantial portion thereof stored externally of said given hopper and in underlying relation to the external surface of said walls of said given hopper which are inclined laterally relative to the longitudinal path of travel of said conveyor belt, power means operatively associated with each of said gate sections for imparting opening or closing movement to the respective gate sections, said power means being positioned in at least one of said hog ridges associated with said given hopper corresponding to said belt feeder gate.

4,004,701
HANDLING AND DISPENSING SYSTEM AND APPARATUS FOR CYLINDRICAL OBJECTS

Daniel H. Moses, Fairfield, Ohio, assignor to Champion International Corporation, Stamford, Conn.

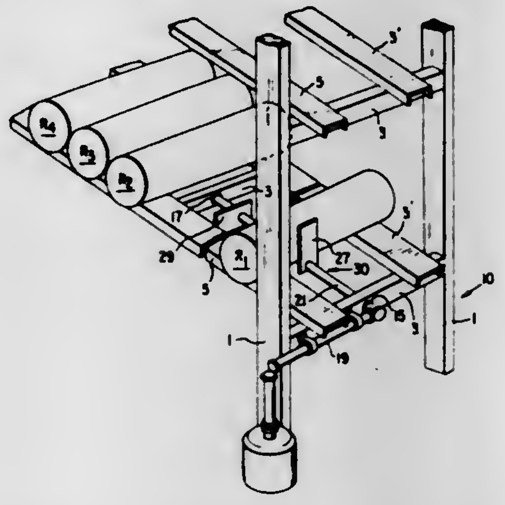
Division of Ser. No. 367,799, June 7, 1973, Pat. No. 3,951,276. This application Dec. 24, 1975, Ser. No. 644,042

Int. Cl.² B65G *1/06, 59/00*

U.S. Cl. 214—16.4 A **4 Claims**

1. A space saving system for storing and handling cylindrical stock such as floor coverings and the like comprising a plurality of identical racks in rows so arranged as to define corridors between every two adjacent rows to admit an object carrying movable pallet to move between said rows along said corridor, said racks having a support structure sloping toward the working face of said rack facing said corridors for receiving and storing a plurality of pieces of cylindrical stock in serial order with the axes of the pieces parallel to each other and also to a plane passing through the working face of the rack, a first and second rotary retention means in the form of single thin blades radially extending from and fixed to a common rockable shaft

and having their wide faces traversed to said cylindrical stock on said rack engaging and holding said lowermost cylinder in said rack, said second retention means being displaced angularly at 90° to said first means and positioned inwardly in the face of the rack a distance at least equal to the diameter of one cylindrical article engageable with the next succeeding piece of cylindrical stock of said cylindrically pieces thereof, a common drive means interconnecting said retention means to position said first retention means in an inoperative position to free said lowermost cylinder for discharge from said rack and simultaneously to position said retention means in operative position to hold the next succeeding piece of cylindrical stock in position in said rack and vice versa, said drive means mounted on said racks and positioned out of the path of movement of said pieces of cylindrical stock from the rack and also the path of movement of a pallet along said corridors; and a portable pallet means including a skeletal frame having means to receive the prongs of a fork lift truck moveable along said corridors between facing racks and of a width to receive a single piece of said cylindrical stock positioned adjacent the working face of the storage rack for receiving the lowermost piece of cylindrical stock by gravity discharge from said rack upon operation of said retention means to free same, said pallet means including stop means positioned in a plane parallel to the longer axis of said pallet means for holding said first piece of cylindrical stock on said pallet means for subsequent transport in a direction parallel to its axis when it is discharged onto said pallet means.

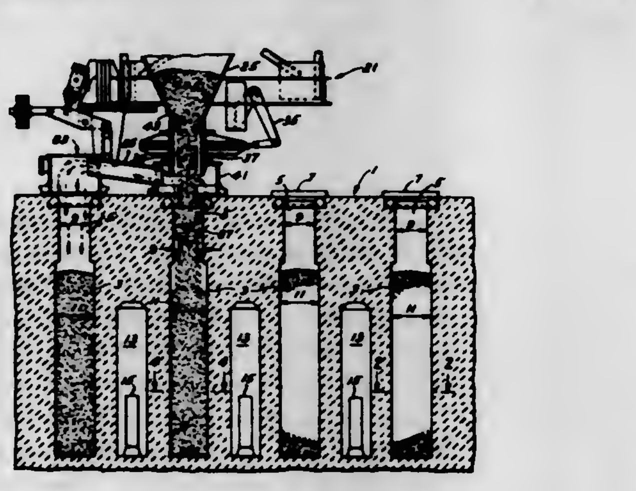


4,004,702
COKE OVEN LARRY CAR COAL RESTRICTING INSERT
Imre Szendroi, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 21, 1975, Ser. No. 570,135

Int. Cl.² C10B *31/02*

U.S. Cl. 214—35 R **6 Claims**



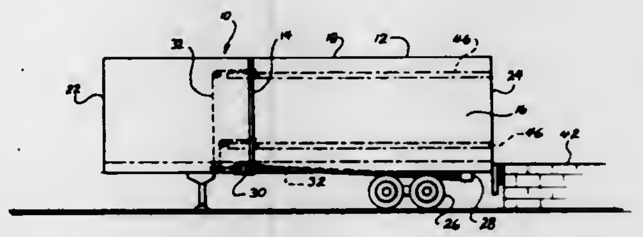
1. In a gravity operated hopper for charging coal into a coking chamber through a charging hole, said hopper having a collar defining a bottom discharge opening equal in minimum dimension to the minimum dimension of said charging hole, gate means for opening and closing said hopper and a drop sleeve around said collar the improvement comprising:
   - a. replaceable restriction means in said collar for restricting the coal flowing through said collar to a columnar mass having a width less than the interior width of said coking chamber and less than the minimum dimension of said charging hole to provide space for exhausting gases during charging of said coking chamber;
   - b. said restriction means is an insert comprising:
     - i. an outer portion in contact with the interior surface of said collar;
     - ii. an inner surface defining an orifice with a minimum dimension aligned in the same vertical plane as the width of the interior of said coking chamber; and
     - iii. means for retaining said insert in said collar.

4,004,703
TRAILER VAN ADAPTED TO TRANSPORT COMPRESSIBLE MATERIALS
James Nelson Johnson, Jr., c/o Strick Corporation, 4525 S. Interstate No. 85, Charlotte, N.C. 28206

Filed May 12, 1975, Ser. No. 576,899

Int. Cl.² B60P *1/00*

U.S. Cl. 214—82 **7 Claims**



1. A van for transporting compressible materials comprising:
   - a. an enclosure having two sides, a top and a bottom and two ends, to receive said materials,
   - b. a bulkhead disposed within said enclosure,
   - c. pulling bars removably positioned against said bulkhead,
   - d. a cable assembly removably attached at one end to said pulling bars, to move said bulkhead, and to a forward floating block of a pulley arrangement at the other end, said pulley arrangement having a pulley ratio of from 2:1 to about 5:1,
   - e. a power winch located beneath said enclosure, said power winch comprising a motor and a drum having flanges at each end for collecting cable,
   - f. a pulley arrangement fixedly attached to said power winch having an anchor point situated between said flanges of the winch drum, the pulley arrangement being located beneath said enclosure,
   - g. track members fixedly attached to the side walls of said enclosure,
   - h. locking bars of the width of said enclosure removably engaged with said track members.

4,004,704
TAMPER-PROOF CLOSURE WITH SAFETY MEANS
Fernand Hilaire, Monte Carlo, Monaco, assignor to Captocap Limited, Vaduz, Liechtenstein

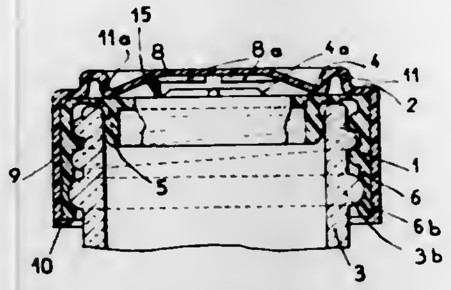
Filed May 14, 1976, Ser. No. 686,597

Claims priority, application France, June 20, 1975, 75.19377

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—220 **6 Claims**

1. Tamper-proof plastic closure device with safety means for containers having a screw-threaded and beaded neck, which comprises on the one hand a plug having a tapped skirt adapted to be screwed on said neck and provided on the inner surface of its lower edge a groove adapted to receive the bead of said neck when said plug is screwed and driven home on said neck, and on the other hand a covering cap adapted to be fitted in smooth frictional engagement on the skirt of said plug and provided with a flexible top wall having a bulged central area, a circular abutment member formed on the outer surface of said top wall around said bulged central area, the height of said circular abutment member being at least equal to the height of said bulged central area, and means for drivingly coupling said bulged central area of said top wall of said cap to the central area of said plug bottom when a pressure is exerted from the outside in the axial direction against said bulged central area of said cap.



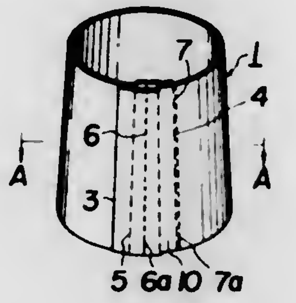
4,004,705
CAPSULE OR SEAL CARRYING A CERTIFICATE STAMP OR THE LIKE THEREIN
Masaaki Fujio, 3-15-8, Aoyamadai, Suita, Osaka, Japan

Filed June 12, 1975, Ser. No. 586,182

Claims priority, application Japan, July 18, 1974, 49-81699

Int. Cl.² B65D *41/54*

U.S. Cl. 215—246 **18 Claims**



1. A capsule having a certificate stamp fixed therein characterized in that ends of a heat-shrinkable film are overlapped and bonded to form a cylindrical body such that a non-bonded overlapping portion is provided between the bonded ends, and said certificate stamp is placed into said non-bonded overlapping portion, and guide lines for cutting are provided in crossed relation with the certificate stamp.

4,004,706
CYLINDRICAL RECEPTACLE OF FIBER-REINFORCED PLASTIC AND METHOD OF MANUFACTURING A RECEPTACLE
Willi Guldenfels, Neuallschwil, Switzerland, and Börge Ingmar Carlström, Hoganas, Sweden, assignors to Basler Stuckfarberei AG, Switzerland

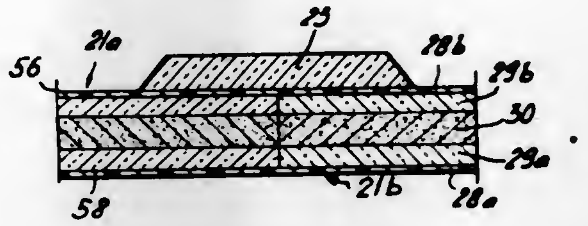
Filed Oct. 11, 1973, Ser. No. 405,286

Claims priority, application Switzerland, May 28, 1973, 7688/73

Int. Cl.² B65D *25/14*

U.S. Cl. 220—3 **11 Claims**

1. A cylindrical receptacle made of fiberglass reinforced plastic, comprising at least two plastic layers spaced from each other and containing glass fiber pieces as reinforcement, a filling layer between said two plastic layers containing a mineral granular material bonded with said plastic material, all of said layers being joined to one another by their own said plastic material, the glass fiber pieces of at least one of said plastic layers being oriented randomly and the glass fiber pieces of at least one other plastic layer being oriented in the circumferential direction.

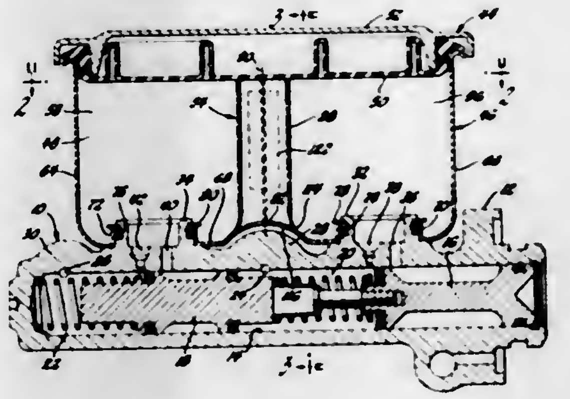


4,004,707
FLUID BAFFLE IN MASTER CYLINDER RESERVOIR
George E. Snyder, Phillipsburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,709

Int. Cl.² B65D *1/24, 25/00;* **B60T** *11/00*

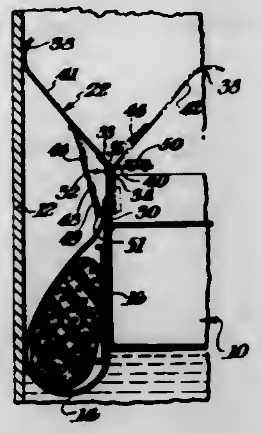
U.S. Cl. 220—22 **2 Claims**



1. In a brake fluid reservoir housing having a bottom and oppositely disposed side walls defining a fluid reservoir chamber having separate reservoir sections, the improvement comprising:
   - a removable baffle within said housing extending between two of said oppositely disposed side walls to divide said chamber into said separate reservoir sections; said baffle being a unitary member composed of a radially resilient generally cylindrical section positioned intermediate said two side walls and in edge engagement with and extending upwardly from said reservoir bottom within said chamber, a pair of plate sections extending in radially opposite directions outwardly from said cylindrical section and in a plane substantially perpendicular to said two side walls and passing through the axis of said cylindrical section, and a pad section on each of said plate sections in spaced relation to said cylindrical section, said pad sections being parallel to and engaging said two side walls, the planar width of said baffle between said two side walls being such, in relation to the width of said chamber between said two side walls, that an interference fit exists between said baffle and said two side walls causing a resilient compressive deformation of said center section exerting forces on said two side walls and retaining said baffle in position in said chamber, at least a portion of said baffle in edge engagement with said reservoir bottom being flexibly tapered to provide a feather edge accommodating flexible conforming engagement with said reservoir bottom.

4,004,708
FIRE-RESPONSIVE TANK TOP

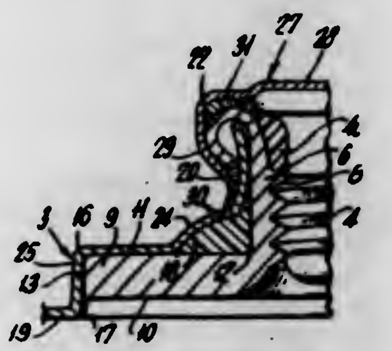
Martin C. Boyd, West Chester, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.
Filed Dec. 19, 1975, Ser. No. 642,608
Int. Cl.² B65D *87/227*
U.S. Cl. 220—224 **4 Claims**



1. In a floating tank top having a deck pivotally carrying a set of weather shield plates around its periphery and extending upwardly, with bias means urging the plates outwardly so they press against the inner surface of a tank wall in which the top is mounted, the improvement accordingly to which the plates are shaped to tilt inwardly and the bias means includes a thermally responsive mechanism that tilts the plates back inwardly when they are subjected to fire.

4,004,709
DRUM CLOSURE

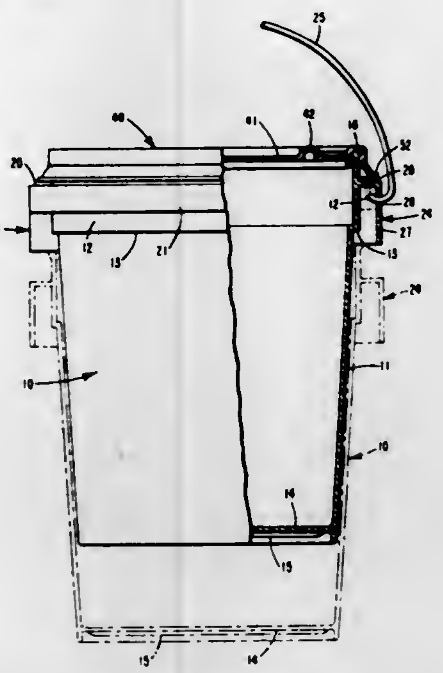
Vyto Simkus, Chicago, Ill., assignor to American Flange & Manufacturing Co., Inc., Linden, N.J.
Division of Ser. No. 522,637, Nov. 11, 1974, Pat. No. 3,946,894. This application Dec. 19, 1975, Ser. No. 642,340
Int. Cl.² B65D *51/20, 41/04, 7/02;* **F16L** *41/00*
U.S. Cl. 220—257 **1 Claim**



1. A container closure combination comprising a closure flange having an internally threaded upstanding cylindrical neck adapted for reception of a closure plug, a laterally extending noncircular base surrounding the lowermost end of said neck, a resilient sealing gasket tightly surrounding said flange neck and seated on said flange base, said flange being nested within a container wall section having an upstanding collar closely surrounding said flange neck, a container wall embossment at the base of said collar having a laterally extending portion overlying said flange base, a convexly contoured exterior surface formed within said laterally extending portion and a tamper-resisting seal securely affixed to said flange having a circular top wall surrounded by a depending skirt terminating in a lowermost free edge, the lower portion of said skirt being formed radially inwardly into engagement with said container wall collar with said free edge lying in close proximity to said convexly contoured embossment surface.

4,004,710
CONTAINER AND CLOSURE THEREFOR

Victor Eugene Crisci, Wellsburg, W. Va., assignor to Mammoth Plastics, Inc., Wellsburg, W. Va.
Filed Dec. 31, 1975, Ser. No. 645,891
Int. Cl.² B65D *41/16, 43/06, 43/08*
U.S. Cl. 220—306 **2 Claims**

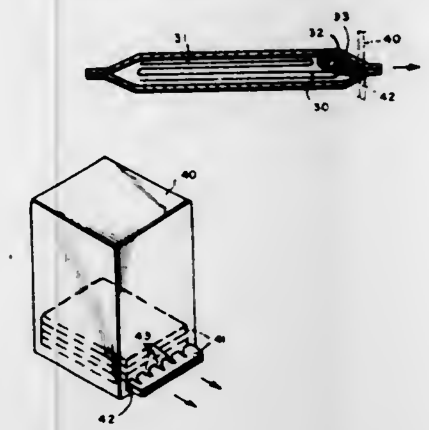


1. A container comprising a container body and a closure both being of plastics material, the body having an annular wall defining an opening and a lip around the opening, the lip having a sealing region surrounding the opening and a radially outwardly directed shoulder spaced axially along the wall from the sealing region, the shoulder having an abutment surface facing radially outwardly and axially away from the lip, and the closure having a cover portion surrounded by a U-shaped rim, the rim comprising a radially inner axial wall, a spaced radially outer axial wall and a base interconnecting said walls which define between them an axially facing recess of the rim for insertion of the lip between the walls, the rim also including a sealing region at the junction of the inner wall and base, one sealing region being in compressively loaded and tangential engagement with the other region to provide substantially a point contact between the regions in a cross-section along the axis and along a single annular line when the lip is received within the rim, and the outer wall incorporating a radially inwardly projecting bead to coact with the shoulder to urge the lip towards the base of the rim and to urge the sealing regions into said engagement, the outer wall being resiliently flexible outwardly for snap engagement around and release from the shoulder.

4,004,711
DISPOSABLE TOWEL

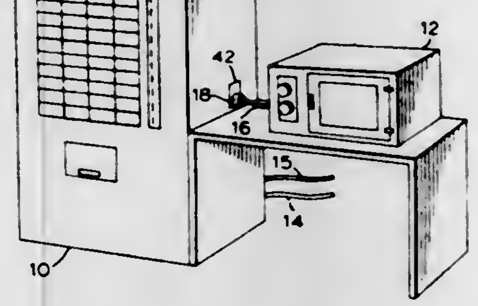
Leonard E. Ravich, Boston, Mass., assignor to Gorham International Inc., Gorham, Maine
Division of Ser. No. 341,277, March 14, 1973, Pat. No. 3,889,804. This application June 16, 1975, Ser. No. 587,021
Int. Cl.² B65D *83/08;* **B65H** *1/06*
U.S. Cl. 221—63 **4 Claims**

1. In combination, a stack of pouches, one on top of another, in a container of size and shape to accommodate said stack of pouches, each of said pouches containing a towel, a solution of an oxidizing agent and a solution of a reducing agent, said solution of reducing agent being isolated from said solution of oxidizing agent, at least one of said solution of reducing agent and oxidizing agent being contained within a rupturable pod within said pouch, said container having a slit of a size and shape permitting removal of one of said pouches from said container by sliding the same through said slit, said slit having means to rupture said rupturable pod whereupon, with removal of said pouch from said container, said pod is ruptured and said solution of oxidizing agent mixes with said solution of reducing agent in contact with said towel and an exothermic reaction is initiated.



4,004,712
VENDING MACHINE AND MICROWAVE OVEN COMBINATION

John Francis Pond, Vineland Station, Canada, assignor to Moyer Diebel Limited, Jordan Station, Canada
Filed Oct. 21, 1975, Ser. No. 624,430
Int. Cl.² A47J *39/00*
U.S. Cl. 221—150 A **3 Claims**

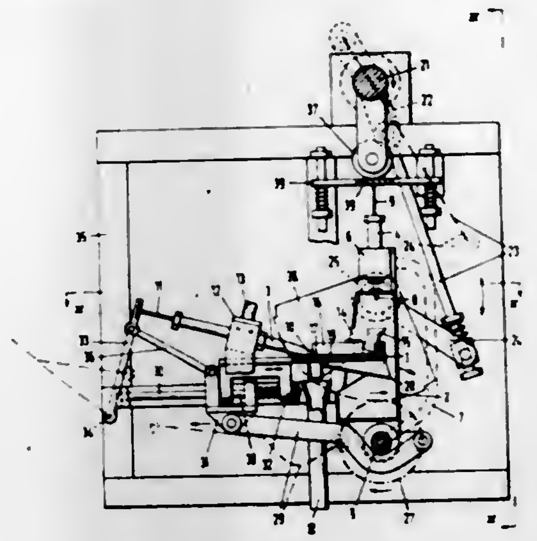


1. An electrically-operated food vending machine and microwave oven combination comprising:

- an inlet to the vending machine for electrical power;
- an outlet from the vending machine for electrical power to operate an associated microwave oven electrically connected to the outlet and having its own cooking and timing control;
- a first relay in the vending machine operable upon vending of an item by the vending machine to permit energisation of the said outlet for energisation of the oven;
- a timer in the vending machine which is actuated to commence a timing period upon vending of an item by the machine and which controls the first relay to time the period during which it can permit energisation of the outlet; and
- a second relay in the vending machine permitting the energisation of the said outlet and maintaining the said energisation of the microwave oven independently of the oven cooking timing control provided operation of the microwave oven is commenced under the control of its oven cooking timing control within a predetermined period set by the timer after the vending of a purchase from the machine.

4,004,713
METHOD AND APPARATUS FOR DOSING SEED

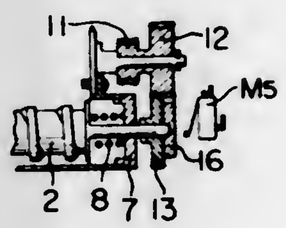
Anthony Visser, 's-Gravendeel, Netherlands, assignor to Visser Tuinbouwtechniek en Hout B.V., 's-Gravendeel, Netherlands
Filed Dec. 1, 1975, Ser. No. 636,646
Claims priority, application Netherlands, May 28, 1975, 7506282
Int. Cl.² B23Q *7/04*
U.S. Cl. 221—211 **10 Claims**



1. A method of dosed sowing of seed, characterized by periodically immersing a first hollow suction tube in a supply of seeds, retaining a limited number of seeds at the tube end by creating under-pressure inside said tube, bringing the suction tube above a substantially horizontal strip, on which the seeds retained at the tube end are dropped by removal of the vacuum, after which the strip with the seeds lying thereon is moved relative to a narrowing channel in such a manner that in the narrowest part of the channel there comes to lie each time only one seed, which seed is taken up by a second suction tube and transferred to a nutrient substrate, while the rest of the seeds lyig on the strip are returned to the supply.

4,004,714
DRY DEVELOPING MECHANISM

Yoshio Ito; Tadayuki Kitajima, both of Yokohama, and Yoshikuni Touyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 13, 1975, Ser. No. 549,768
Claims priority, application Japan, Feb. 22, 1974, 49-21687
Int. Cl.² B67D *5/22*
U.S. Cl. 222—41 **7 Claims**



1. A dry developing apparatus equipped with means for detecting the amount of developer provided therein, comprising:

- a container in which the developer is contained;
- a rotational member for agitating or carrying the developer, said member being provided in said container;
- means for supporting said rotational member such that said member, when rotated, is displaceable axially under the force of a load resistance produced by the presence of the developer.

discharge means including an opening provided in said container to release developer as it is carried by said rotational member, thereby limiting said load resistance, and to discharge said developer to a developing station;

means for urging said rotational member to make a returning movement in the direction opposite to the direction of said displacement when said load resistance is lessened with decrease of the developer; and

means for detecting a difference in the amount of the axial displacement of said rotational member for providing an indication of a decrease in the amount of developer provided in the container.

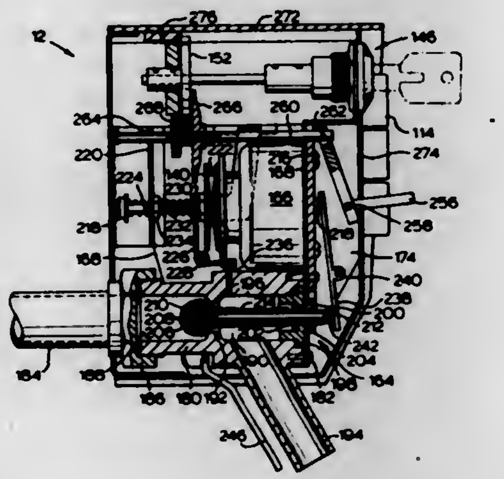
4,004,715
FLUID DISPENSING APPARATUS

Roger A. Williams, Agincourt, and Robert E. Dietz, Wellesley, both of Canada, assignors to Auto Control Tap of Canada Limited, Agincourt, Canada

Filed May 5, 1975, Ser. No. 574,661

Int. Cl.² B67D *5/24*

U.S. Cl. 222—30 **16 Claims**



1. Fluid dispensing apparatus for measuring and dispensing fluid from a pressurized fluid supply comprising:

a. a valve assembly including a valve and a solenoid actuator coupled thereto for opening the valve, the valve being adapted to be coupled to the pressurized fluid supply;

b. a timing circuit adapted to be connected between a source of electrical power and the solenoid actuator, the timing circuit including means for energizing the solenoid actuator to open the valve for a plurality of different predetermined intervals;

c. selector means operatively connected to the timing circuit, the selector means including a plurality of selector switches, each selector switch being adapted to select a different predetermined interval;

d. a trigger coupled to the timing circuit to activate the timing circuit and energize the solenoid actuator;

e. a removable cover enclosing the valve assembly and the timing circuit, the cover including locking means for locking the cover in position and preventing removal of the cover and thus access to the valve assembly and timing circuit; and

f. manual linkage means operatively coupled to the valve assembly for manually opening the valve; said manual linkage means including blocking means located inside the cover for preventing manual operation of the valve while the cover is in said locked position.

4,004,716
APPARATUS FOR DISPENSING CONFECTIONERY

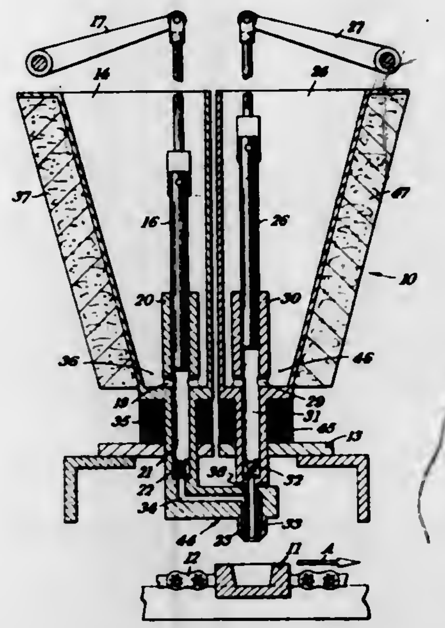
Gordon Steels, Peterborough, England, assignor to Baker Perkins Holdings Limited, England

Filed Aug. 20, 1975, Ser. No. 606,093

Claims priority, application United Kingdom, Aug. 28, 1974, 37648/74

Int. Cl.² B67D *5/46*

U.S. Cl. 222—145 **3 Claims**



1. A dispenser for effecting simultaneous deposition of first and second confectionary materials into a mould arranged beneath said dispenser so as to form in the mould a deposit having a shell of the first material surrounding a filling of the second material, said dispenser comprising:

a first hopper for containing the first material;

a second hopper for containing the second material, said second hopper being physically separated from said first hopper;

a first heater for heating the first material in said first hopper;

a second heater for heating the second material in said second hopper, said second heater being independent from said first heater;

a nozzle assembly arranged beneath said hoppers, said nozzle assembly including an inner nozzle and an annular outer nozzle surrounding said inner nozzle;

a first conduit connecting said outer nozzle to said first hopper;

a second conduit connecting said inner nozzle to said second hopper, said second conduit being separate from said first conduit;

a first plunger mounted for reciprocating movement in said first hopper for causing discharge of the first material from said first hopper through said first conduit to said outer nozzle;

a second plunger mounted for reciprocating movement in said second hopper for causing discharge of the second material from said second hopper through said second conduit to said inner nozzle;

said first plunger commencing discharge of the first material before said second plunger has commenced discharge of the second material and terminating discharge of the first material after said second plunger has terminated discharge of the second material; and

thermal insulation arranged between said first and second conduits at a location adjacent said nozzle assembly.

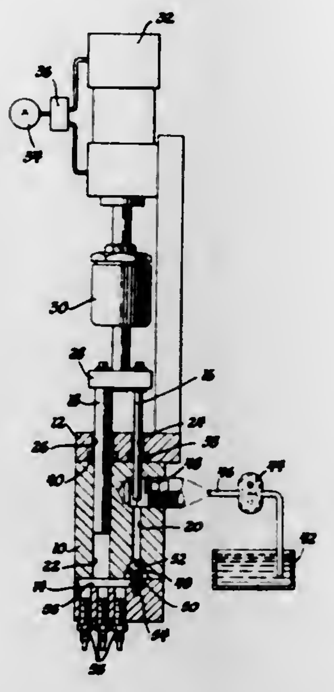
4,004,717
PRESSURE FED LIQUID DISPENSER

William L. Wanke, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 635,916

Int. Cl.² B05B *1/28*

U.S. Cl. 222—255 **2 Claims**



1. A liquid dispensing device comprising large and small variable displacement means, an inlet port for delivering a liquid under a charge pressure to said small variable displacement means, a dispensing nozzle, a check valve for permitting liquid flows from said small variable displacement means to said nozzle at pressures above said charge pressure and preventing reverse flow, said large variable displacement means continuously connected to said nozzle, and means for operating said small variable displacement means to open said inlet port so that liquid under pressure is then delivered to fill said small variable displacement means and then close off said inlet port and jointly decrease the displacement of both said variable displacement means to force liquid in said small variable displacement means through said check valve and out said nozzle and then jointly increase the displacement of both said variable displacement means, means urging the check valve into closed position when the displacement of both displacement means is increasing whereby the check valve then closes while the liquid still in said nozzle is suctioned by the expanding large variable displacement means to thereby prevent dripping from the nozzle and also break any string of the liquid dispensed from the nozzle.

4,004,718
SYRINGES

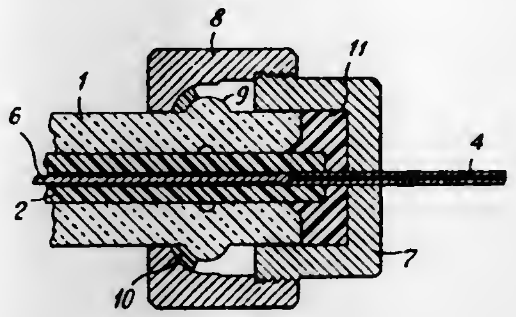
Frank Wesley, Sidcup, England, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 182,075, Sept. 20, 1971. This application May 23, 1974, Ser. No. 472,838

Int. Cl.² B67D *1/08*

U.S. Cl. 222—386 **7 Claims**

1. A syringe which comprises an elongated transparent barrel, an elongated plunger disposed in said barrel and slidable along a first length thereof, an inner liner in said barrel disposed along the remaining length of said barrel, said liner being comprised of a resilient plastics material and extending in an encircling course enclosing a space defining a bore of normally substantially constant cross-sectional dimension, said bore providing a reservoir for holding a fluid, and a piston connected to said plunger extending coaxially therewith and within the liner bore for sliding travel in said bore when said plunger is slid in said barrel first section, said first length of said barrel being graduated to indicate the volume of fluid in the syringe, the cross-sectional area of at least a tip end portion of said piston being greater than the cross-sectional area of said liner bore, said liner bore enlargingly deforming when said piston tip end slides in said liner to maintain a substantially gas tight seal between said piston tip end portion and said liner.



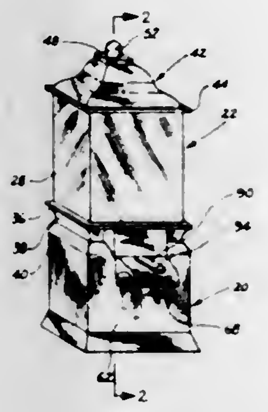
4,004,719
SLIDE DISPENSER APPARATUS

Lane T. Weitzman, 4647 Park Mirasol, Calabasas, Calif. 91302

Filed Aug. 14, 1975, Ser. No. 604,892

Int. Cl.² G01F *11/10*

U.S. Cl. 222—366 **8 Claims**



5. A dispensing device comprising: (a) a chamber having a bottom surface, said bottom surface having at least one hole therein; (b) a slide member, said slide member slidable in relationship to said bottom surface in a plane substantially parallel to the plane of said bottom surface between a first position and a second position; (c) said slide member having at least one opening therein, said opening aligning with at least a part of said hole in said bottom surface when in said first position whereby material contained in said chamber may fall into said opening and said opening not located below said bottom surface of said chamber when in said second position; (d) a spoon shaped member having an upwardly directed cavity therein and a handle means attached thereto, the cavity of said spoon shaped member removably fitting within said opening in said sliding member, said handle positioned whereby said handle is not below said bottom surface when said sliding member is in said second position.

4,004,720
IRONING MACHINE FOR IRONING COLLARS AND LAPELS OF CLOTHING GOODS

Giovanni Cartabbia, Via Predore 10, 24067 Sarnico, Italy

Filed Dec. 19, 1975, Ser. No. 642,530

Claims priority, application Italy, Dec. 23, 1974, 30965/74

Int. Cl.² D06C *15/00*

U.S. Cl. 223—57 **7 Claims**

1. A machine, for the ironing of the collar and lapels of articles of clothing, comprising:

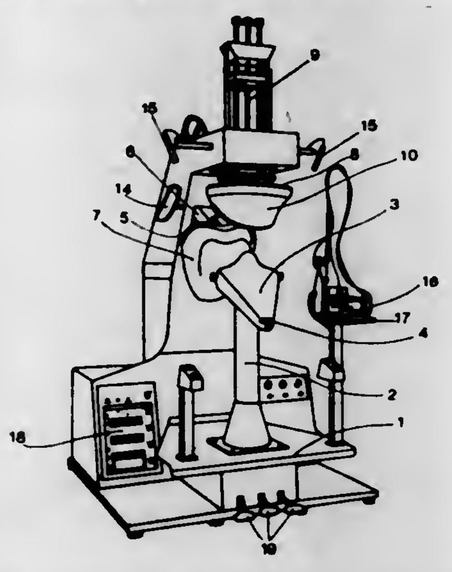
i. A machine frame

ii. a dummy mounted rotatably on said machine frame for rotation about a vertical axis

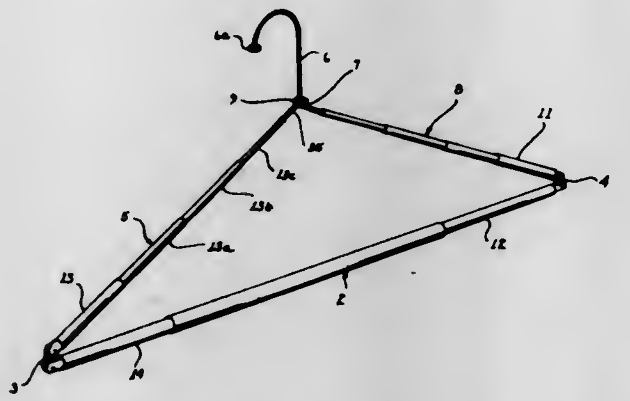
iii. means on said frame and connected to said dummy for rotating said dummy through 180°

iv. a first presser mould mounted on said machine frame above said dummy and movable vertically between a raised position above the dummy and a lowered position in which it bears against the rear and sides of the collar of an article of clothing on the dummy, when said dummy is in a first position of rotation,

v. a second presser mould mounted on said machine frame laterally of said dummy and mounted between a first position remote from the dummy and a second position in which it bears against the front of the collar and the lapels of the article of clothing, when said dummy is in a second position rotated 180° from said position of rotation.



4,004,721
COLLAPSIBLE COAT HANGER
Jackson E. Ross, 4127 W. Cheery Lynn Road, Phoenix, Ariz. 85019
Filed May 17, 1976, Ser. No. 687,032
Int. Cl.² A47J *51/10*
U.S. Cl. 223—89 **10 Claims**



1. A collapsible coat hanger, said coat hanger comprising in combination:

a. a base member having a plurality of telescoping sections;

b. a first arm having a plurality of telescoping sections;

c. a first swivel for pivotally interconnecting one end of said base member with one end of said first arm;

d. means for suspending said coat hanger from a support, said suspending means being attached to another end of said first arm;

e. a second arm having a plurality of telescoping sections;

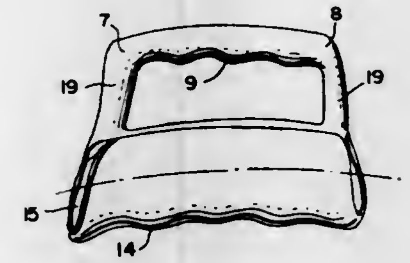
f. a second swivel for pivotally interconnecting another end of said base member with one end of said second arm;

g. hook means for interlocking another end of said second arm with said other end of said first arm to form a triangle of said base member and said first and second arms; and

h. a housing forming a part of said base member for receiving the collapsed telescoping sections of said base member, the collapsed telescoping sections of said first and second arms and said first and second swivels;

whereby, said coat hanger is telescopingly collapsible into said housing of said base member.

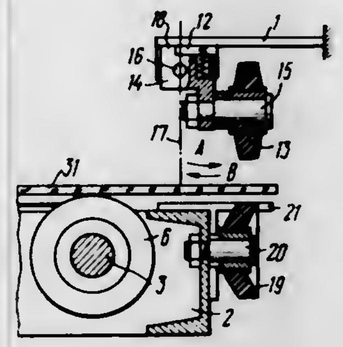
4,004,722
HANDLE DEVICE
Lynn Olivier, Brooklyn Heights, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 20, 1975, Ser. No. 606,204
Int. Cl.² A45C *13/26*
U.S. Cl. 224—45 P **1 Claim**



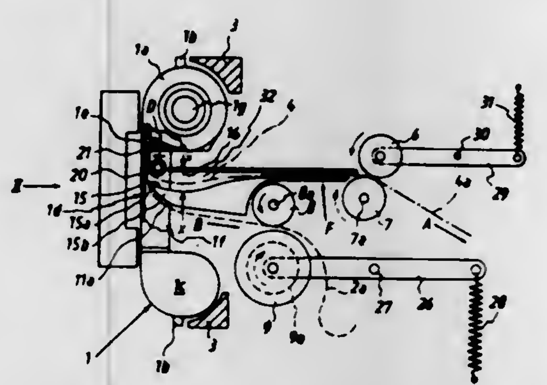
1. A handle device comprising a longitudinal hollow tubular section having a rigid hand grasping portion, said hand grasping portion having finger gripping undulations formed in the surface thereof, said hand grasping portion parallel to said longitudinal hollow tubular section and spaced radially outwardly therefrom, said hand grasping portion joined to said longitudinal hollow tubular section by two rigid joining members formed at the free ends of said longitudinal hollow tubular section, said joining members substantially perpendicular to the longitudinal axis of said hollow tubular section and said hand grasping portion forming a void whose length is less than the length of said longitudinal hollow tubular section, a continuous slit passing through the wall of said longitudinal hollow tubular section, said slit parallel to the longitudinal axis of said hollow tubular section, said slit extending the entire length of said longitudinal hollow tubular section, said joining members immediately adjacent first edge of said slit, second edge of said slit substantially thinner than said first edge, finger accommodating undulations on the outer surface of said longitudinal hollow tubular section.

4,004,723
APPARATUS FOR REMOVAL OF GLASS SHEET FLASH
Nikolai Pavlovich Kabanov, Naberezhnaya Shevchenko, 3, korpus 3, kv. 50; Vitaly Sergeevich Schukin, Leninsky prospekt, 72, kv. 500, both of Moscow; Jury Alexeevich Knyazev, ulitsa Shkolnaya, 1, kv. 16, Bor Gorkovskoi oblasti; Sergei Fedorovich Makhalov, ulitsa Shkolnaya, 5, kv. 10, Bor Gorkovskoi oblasti; Mikhail Ivanovich Popov, ulitsa Shkolnaya, 5, kv. 15, Bor Gorkovskoi oblasti; Dmitry Nikolaevich Savonichev, ulitsa Shkolnaya, 4, kv. 8, Bor Gorkovskoi oblasti; Dmitry Nikolaevich Shepelev, ulitsa Mayakovskogo, 1, kv. 3, Bor Gorkovskoi oblasti; Vladimir Nikolaevich Suvorov, ulitsa Shkolnaya, 2, kv. 6, Bor Gorkovskoi oblasti, and Vladimir Pavlovich Chalov, ulitsa Mira, 3, kv. 2, Bor Gorkovskoi oblasti, all of U.S.S.R.
Filed Feb. 5, 1975, Ser. No. 547,402
Int. Cl.² C03B *33/02*
U.S. Cl. 225—103 **6 Claims**

1. In an apparatus for removing flash from a marginal edge of a glass sheet scored to define a shaped portion to be cut from the glass sheet and of the type having means for supporting a major portion of the glass sheet; and means for applying a force to the flash along the marginal edge of the glass sheet to separate the flash portion from the shaped portion to be cut from the sheet; the improvement which comprises: said means for supporting a major portion of the glass sheet including a portion partially underlying the flash portion of the glass sheet; and said means for applying a force comprising the portion of said means for supporting which underlies the flash portion of the glass sheet, at least one resilient roller engagable with the portion of the flash portion which overlies said means for supporting to bear against the flash portion, and means mounting said at least one resilient roller to freely rotate about an axis of rotation and to pivot about an axis generally perpendicular to its axis of rotation and outwardly of the glass sheet while bearing against the flash portion thereby to apply a force effective to separate the flash portion outwardly from the glass sheet; and further comprising means operable for relatively displacing said means for supporting and said at least one resilient roller to bring said at least one resilient roller into engagement with the flash portion to effect separation of the same from the shaped portion to be cut from the glass sheet and for displacing said at least one resilient roller to disengage from the flash portion after separation of the flash has been effected.

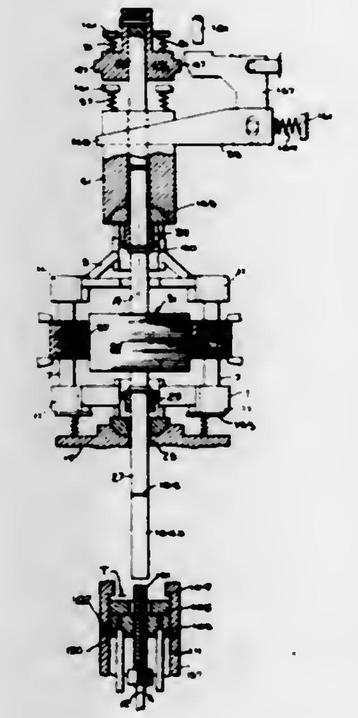


4,004,724
APPARATUS FOR REMOVING EXPOSED FILMS AND BACKING STRIPS FROM CONTAINERS
Helmut Zangenfeind, Puchheim, and Gerhard Küstner, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Jan. 26, 1976, Ser. No. 652,107
Claims priority, application Germany, Jan. 29, 1975, 2503577
Int. Cl.² G03B *1/56*
U.S. Cl. 226—91 **16 Claims**



1. Apparatus for removing convoluted films and backing strips from containers of the type wherein a casing of the container is provided with registering first and second openings, at least the leader of the backing strip is located between the openings, the casing has a wall which is formed with one of said openings and the leader of the backing strip is disposed between said wall and the other of said openings, comprising a pusher movable forwardly and backwards along a predetermined path; locating means arranged to support the casing of a container in such position that the openings of the casing are located in said path whereby said pusher passes, during the forward movement thereof, first through said one opening and thereupon through said other opening of the casing which is supported by said locating means and expels the leader of the backing strip through said other opening; first advancing means located behind said other opening of the casing which is supported by said locating means and arranged to engage the expelled leader of the backing strip and to advance the thus engaged backing strip lengthwise to thereby draw the film from the casing through the intermediary of the backing strip; film advancing means located behind and spaced apart from said other opening of the casing which is supported by said locating means; a film channel having an inlet adjacent to said other opening and an outlet adjacent to said film advancing means; means for separating the film from the backing strip including a portion disposed at one side of said inlet and being closely adjacent but spaced from said wall of the casing which is supported by said locating means so as to deflect the oncoming leader of the film when said last mentioned leader reaches said portion of said separating means so that the leader of the film enters said inlet and moves into the range of said film advancing means in response to transport of the backing strip by said first advancing means, the maximum width of said channel being such that the leader of the film therein is held against curling or folding during movement toward said film advancing means; and an auxiliary deflector located at the other side of said inlet opposite said separating means to prevent curling of the leader of the film before such leader reaches said separating means during withdrawal of the backing strip from the casing which is supported by said locating means.

4,004,725
APPARATUS FOR ASSEMBLING COMPONENTS OF A DYNAMOELECTRIC MACHINE
Jesse A. Stoner, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.
Continuation of Ser. No. 401,177, Sept. 27, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 539,038
Int. Cl.² B23K *37/06*
U.S. Cl. 228—49 **26 Claims**



1. Apparatus for assembling a pair of opposite end frames of a dynamoelectric machine to a structural component thereof positioned for assembly within receiving means therefor in the end frames, respectively, said apparatus comprising means for moving at least one of the structural component and the end frames to the assembly position and for supporting the structural component and the end frames in the assembly position, means for introducing molten metal into the receiving means to form rigid ties between the end frames and the structural component when supported in the assembly position thereof by said moving and supporting means, and means for inverting

said moving and supporting means with the structural component and end frames in the assembly position therein so as to dispose the receiving means of one of the end frames in a position to receive the molten metal from said introducing means subsequent to the solidification of the molten metal introduced into the receiving means of the other of the end frames.

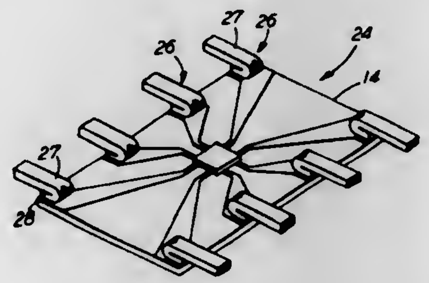
4,004,726
BONDING OF LEADS

Thomas S. Ellington, IV, Bethlehem, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,600

Int. Cl.^{2} H05K *1/10, 3/32*

U.S. Cl. 228—173 **3 Claims**



1. In a method of bonding one end of a lead to a metallized bond site on a substrate, an improvement to minimize the occurrence of a failure resulting in separation of such lead from the bond site of the substrate at an interface between the lead and the metallization of the bond site in response to a force exerted on the lead in a direction perpendicular to the plane of the bond, the improvement comprising:

providing the lead with a folded end portion shorter than a main member of the lead;

positioning the end of the lead having the folded portion in contact with the respective bond site on the substrate, such that the folded portion at the end of the lead faces the bond site; and

bonding the folded portion to the substrate, the folded portion being interposed between the main body of the lead and the bond site on the substrate being positioned to distribute and minimize concentrations of any bending stresses transmitted through the main body of the lead to the bonding site, wherein the step of bonding further comprises bonding the folded portion of the lead to the main body of the lead.

4,004,727
LAMINATE FOR THE MANUFACTURE OF LIQUID-TIGHT PACKING CONTAINERS AND A BLANK FOR PACKING CONTAINERS MANUFACTURED FROM THE LAMINATE

Ruben Anders Rausing, Rome, Italy, and Ingemar Wilhelm Ohlsson, Malmo, Sweden, assignors to Anders Ruben Rausing, Rome, Italy

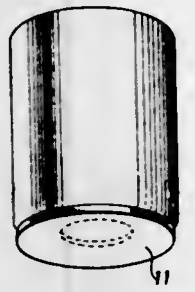
Filed Dec. 15, 1975, Ser. No. 640,943

Claims priority, application Switzerland, Jan. 6, 1975, 35/75

Int. Cl.^{2} B65D *3/00*

U.S. Cl. 229—4.5 **8 Claims**

1. A blank of carton-forming material for manufacturing containers said blank comprising a laminate having two layers of polystyrene foam in which the cellular structure has lenticular shaped cells created by stretching the polystyrene foam when being initially extruded to form the layers and an intermediate layer disposed between and adhered to said polystyrene foam layers, said intermediate layer being dimensionally stable and provided with at least one cut-out portion adjacent at least one edge of the blank, whereby when the blank is erected to form a container the polystyrene foam layers may be heated in the area of the at least one cut-out portion in the intermediate layer so as to shrink the foam layers to provide inwardly folded portions forming at least one part of the container made from the blank.



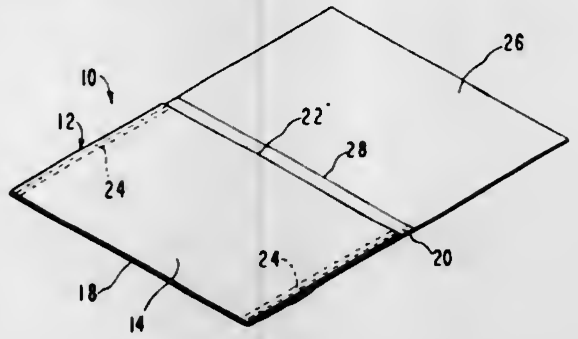
4,004,728
MACHINE FILLABLE ENVELOPE

James Ryan, and Robert W. Vandenberg, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Apr. 18, 1974, Ser. No. 461,811

Int. Cl.^{2} B65D *27/20*

U.S. Cl. 229—76 **8 Claims**



1. An envelope for use in the machine insertion of material therein comprising: a flat, sheet-like body having a front, a back, and an opening adjacent to one end margin of said front to permit materials to be inserted into the body and disposed between said front and said back, the back having a lip projecting outwardly from the opening, there being an adhesive-free closure flap hingedly connected to the outer margin of the lip underlying said back and contiguous therewith in a first position wherein said lip can be held in place as materials are directed into the body through said opening, said flap being movable to a second position overlying said front and contiguous therewith wherein said closure flap closes said opening.

4,004,729
AUTOMATED FIRE CONTROL APPARATUS

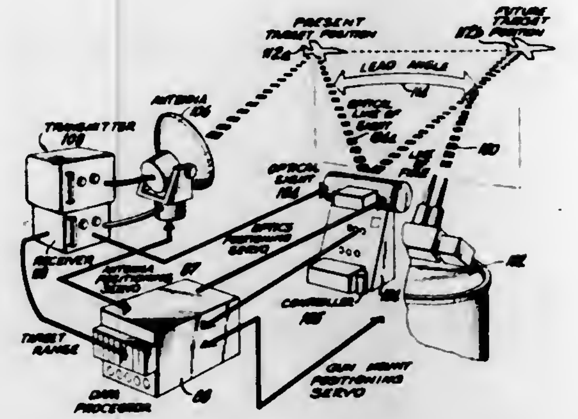
Harris C. Rawicz, Bridgewater; William J. Bigley, Scotch Plains, both of N.J.; Gene L. Cangiani, Bronx, N.Y., and Rene C. Yohannan, Sterling, N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 7, 1975, Ser. No. 629,976

Int. Cl.^{2} G06F *15/58;* **F41G** *3/08*

U.S. Cl. 235—61.5 S **22 Claims**

1. In combination in a fire control system for controlling the firing trajectory of a weapon, an optical sight including optical line of sight axis determining means and means for variably adjusting said optical axis determining means, gunner actuated controller means, said optical axis adjusting means being connected and responsive to the output signal generated by said gunner actuated control means, weapon position varying means, means for signalling the positional status of said weapon positioning means, and means connected to and responsive to the output of said weapon positional status signalling means for controlling said optical axis adjusting means.



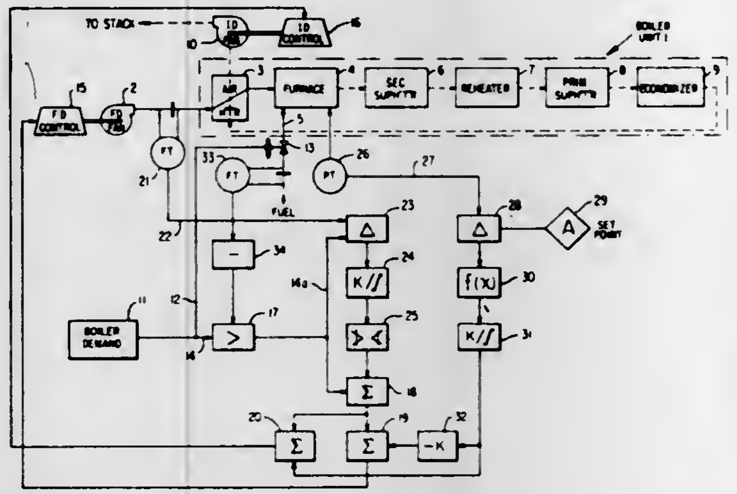
4,004,730
FURNACE DRAFT CONTROL FOR A STEAM GENERATOR

Robert R. Walker, Euclid, Ohio, assignor to Bailey Meter Company, Wickliffe, Ohio

Filed Sept. 22, 1975, Ser. No. 615,329

Int. Cl.^{2} F23N *3/08*

U.S. Cl. 236—14 **8 Claims**



1. A furnace draft control for a steam generator having a furnace, fuel supply means, forced draft supply means, and induced draft supply means, in combination, means generating a first control signal proportional to furnace pressure and means under the control of said signal increasing the forced draft and simultaneously decreasing the induced draft in functional relationship to a decrease in furnace pressure and vice versa.

4,004,731
DEVICE FOR TRANSFERRING HEAT ENERGY FROM A FIREPLACE TO A FLUID HEATING SYSTEM

Joseph T. Zung, P.O. Box 491, Rolla, Mo. 65401

Filed Sept. 5, 1975, Ser. No. 610,541

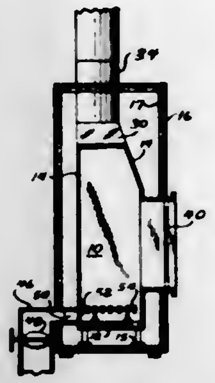
Int. Cl.^{2} F24B *7/00*

U.S. Cl. 237—51 **5 Claims**

1. In a circulating-air building temperature control system including means defining a pumped air circulation conduit for distributing controlled temperature air throughout the building and collecting return air, plus air heating means and cooling means for temperture control of the building positioned within said air circulation conduit, the improvement comprising:

an auxiliary heating unit positioned within said air circulation conduit, comprising a fireplace for burning solid fuel, defined by fireplace chamber walls and grate means for holding the fuel, said air circulation conduit being positioned about the exterior of said fireplace chamber walls, said fluid circulation conduit being sealed from said fireplace chamber;

chimney means communicating with said fireplace chamber, said chimney means being positioned in off-center relationship to said fireplace chamber; and a heat-conductive wall sealing the upper end of said fireplace chamber about the chimney, said conductive wall being positioned to slope upwardly from the end of the fireplace chamber remote from said chimney means to said chimney means, said sloped wall overlying a major portion of said fireplace chamber; solid, transparent, openable and closable door means to separate, in closed position, said fireplace chamber from the building interior, whereby a fire in said fireplace chamber may be viewed without the removal of large amounts of air from the building interior through the chimney means; and independent air supply means to provide air from the building exterior to the fireplace chamber, to facilitate combustion therein.



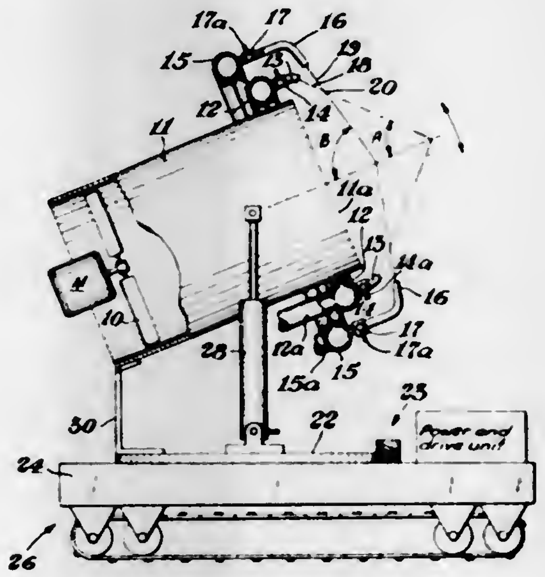
4,004,732
SNOW MAKING METHOD

Alden W. Hanson, 1605 St. Andrews Drive West, Midland, Mich. 48640

Continuation-in-part of Ser. No. 497,839, Aug. 16, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,890

Int. Cl.^{2} F25C *3/04*

U.S. Cl. 239—2 S **5 Claims**



1. In a method for producing artificial snow in a snow making machine which operates by introducing a water spray into a fan-generated large volume unidirectional mechanical movement of air at substantially atmospheric pressure and at a temperature of below 32° F., thereby to effect at least partial crystallization of the droplets of water in the spray, the improvement which comprises regularly redirecting the position and direction of the resultant snow particle laden air stream in a predetermined moving pattern such that the snow particles in the air stream are directed towards a portion of the atmo-

sphere different from that contacted by immediately previously generated snow particles and are deposited onto a different area than such immediately previously generated particles and the cross-sectional area covered by the regularly directed moving pattern of said snow particles is at least three times greater than that covered by the pattern of particles generated by the discharge end of said snow making machine.

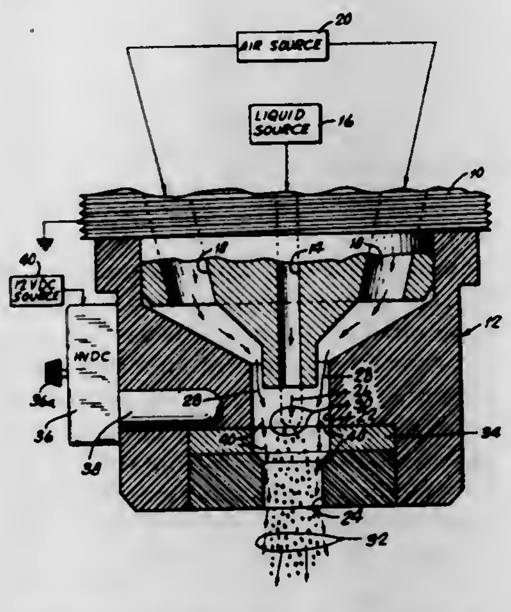
4,004,733
ELECTROSTATIC SPRAY NOZZLE SYSTEM

S. Edward Law, Athens, Ga., assignor to Research Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,266

Int. Cl.² B05B *5/02, 7/06*

U.S. Cl. 239—3 **14 Claims**



1. An electrostatic spray nozzle comprising:
a housing made of an electrically insulating material and having a front end and a back end axially spaced from each other and means defining a hollow passage extending axially from the back end forwardly toward the front end of the housing;
an annular electrode made of an electrically conductive material and disposed within the housing, coaxially with and surrounding the hollow passage, said electrode having a front end spaced rearwardly of the front end of the housing by a selected distance along said passage; and
means for forming a droplet stream moving axially forwardly through said passage from a droplet forming region disposed rearwardly of the front end of the electrode, said droplet stream forming means including a liquid conduit having a front end disposed axially rearwardly of the electrode and means for forming a liquid stream moving axially forwardly from said front end of the liquid conduit.

4,004,734
DISPENSER FOR AIR TREATING MATERIAL

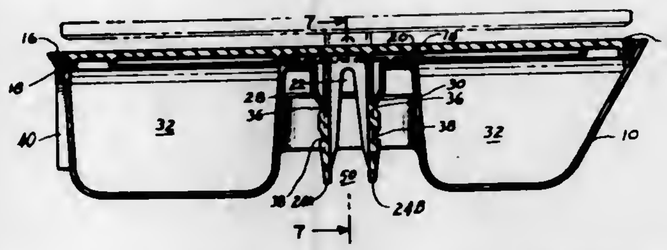
Frederick B. Hadtke, New Providence, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed Oct. 3, 1975, Ser. No. 619,274

Int. Cl.² A61L *9/00;* **B65D** *21/02*

U.S. Cl. 239—58 **11 Claims**

1. A dispenser for solid volatile materials comprising a container for said volatile material having a socket therein, said socket having two opposing walls terminating in inwardly extending sections; and a cover for said container having at least two resilient prongs extending therefrom insertable and engagingly receivable in the socket of said container, the outer surface of each of said prongs having a first detent means and at least one second detent means positioned at a greater distance from said cover than said first detent means, the positive engagement of said first detent means and said inwardly extending sections effecting the closure of the cover on said container and the positive engagement of said at least one second detent means and said inwardly extending sections resulting in the elevated positioning of said cover with respect to said container.



4,004,735
APPARATUS FOR DETONATING APPLICATION OF COATINGS

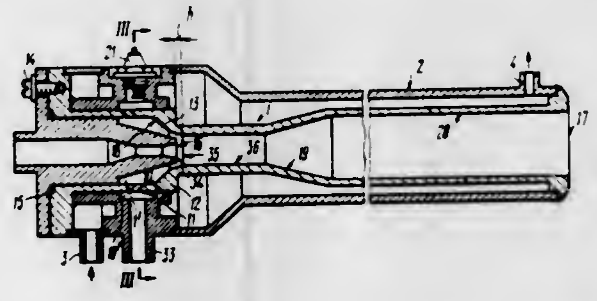
Anatoly Ivanovich Zverev, ulitsa Bratislavskaya, 26, kv. 22, Kiev; Alexandr Sergeevich Bondarenko, ulitsa Nizhegorodskaya, 26, kv. 40, Moscow; Mikhail Antonovich Pudzinsky, ulitsa Sverdlova, 13, kv. 21, Kiev; Vadim Mikhailovich Sopryazhinsky, ulitsa Bogdanovskaya, 5a, kv. 32, Kiev, and Nikolai Alexeevich Yakshin, ulitsa Kartvilishvili, 3v, kv. 51, Kiev, all of U.S.S.R.

Filed June 3, 1975, Ser. No. 583,246

Claims priority, application U.S.S.R., June 12, 1974, 2028702; June 12, 1974, 2028703

Int. Cl.² B05B *1/24*

U.S. Cl. 239—79 **3 Claims**



1. Apparatus for the application of coatings by detonation comprising; an explosion chamber in the form of a tube closed at one end; a batcher for powdered coating with a discharge pipe; a jet nozzle secured to the end of said discharge pipe and communicating the latter with the space of said explosion chamber; a circular precombustion chamber surrounding said explosion chamber near its closed end and communicating with its space through holes in the walls of said explosion chamber; a mixing chamber which prepares the explosive mixture; a safety pipe provided for communicating said mixing chamber with said precombustion chamber for delivering the explosive mixture from said mixing chamber through said precombustion chamber and said holes in the walls of said explosion chamber into its space; said jet nozzle installed in the face of the closed end of said explosion chamber so that its outlet section is located ahead of said holes in the walls of said explosion chamber relative to its open end, and the discharge of the powdered material from said nozzle into the space of said explosion chamber is accompanied by drawing the powdered material from said nozzle into the space of said explosion chamber by the vacuum created by the explosion and its intensive mixing with the explosive mixture; at least one spark plug for igniting the explosive mixture installed on the external wall of the precombustion chamber at a point located opposite the spaces between the holes in the walls of the explosion chamber so that a detonating wave originated in said explosion chamber throws the powdered coating through the open end of said explosion chamber onto the surface of the article located in front of it.

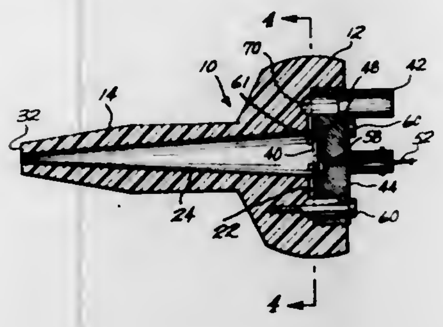
4,004,736
ULTRASONIC WATER JET

Loyd William George, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 1, 1976, Ser. No. 691,960

Int. Cl.² B05B *17/06*

U.S. Cl. 239—102 **6 Claims**



1. An ultrasonic water jet comprising in combination.
a first non electrically conductive housing section having an interior exponentially shaped duct;
a second electrically conductive housing section having a circular slot;
a non electrically conductive O-ring disposed in said circular slot;
a plurality of equiangularly displaced slots in said first non electrically conductive housing section circumferentially disposed about the central axis of said exponentially shaped duct; and,
a disk shaped piezo electric transducer disposed along said central axis between said slots and said non electrically conductive O-ring.

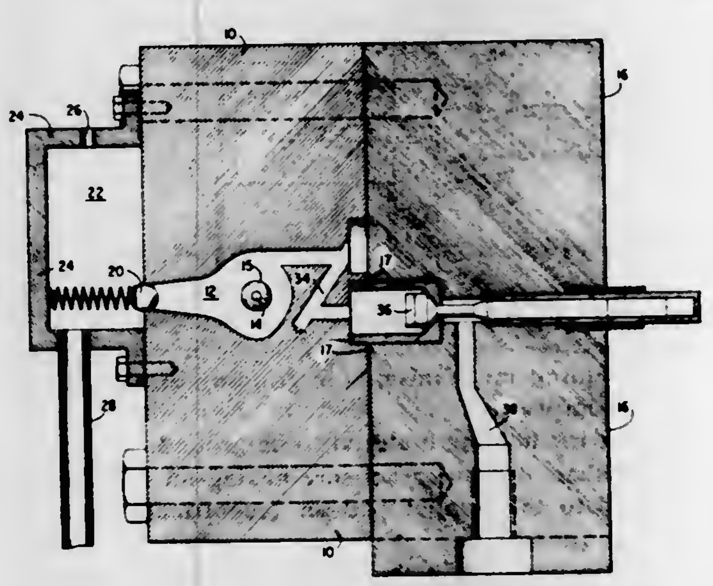
4,004,737
CONTINUOUS HIGH VELOCITY FLUID JET SYSTEM

Walter W. Aker, and Theodore T. Naydan, both of Schenectady, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Aug. 5, 1975, Ser. No. 602,095

Int. Cl.² B05B *17/04*

U.S. Cl. 239—102 **13 Claims**



1. An apparatus for producing a continuous high velocity fluid jet stream comprising a high pressure accumulator to receive pulses of fluid under pressure, fluid pressure intensifying means for delivering fluid under pressure into said accumulator, said fluid pressure intensifying means comprising a high pressure chamber for receiving fluid, electrical arc discharge means disposed in said chamber, fluid inlet means to supply fluid from a fluid source into said chamber, said fluid inlet means comprising a zig zag passageway having a multiplicity of turns for increasing frictional resistance to the flow of high pressure fluid, fluid inlet check valve means interconnected between the fluid source and the zig zag passageway for preventing the back flow of pressurized fluid into the fluid source, a high pressure fluid outlet passageway leading from said chamber into said accumulator, fluid outlet check valve means in said outlet passageway to permit fluid under pressure to flow from said chamber into said accumulator and to prevent backflow of fluid under pressure from said accumulator back into said chamber, electric supply means for supplying high voltage electric energy to said electric arc discharge means to produce a high energy electric discharge arc through the fluid in said chamber to raise its pressure and deliver a pulse of fluid under pressure from the chamber into said accumulator, and outlet means from said accumulator for delivery of a continuous high velocity fluid jet stream.

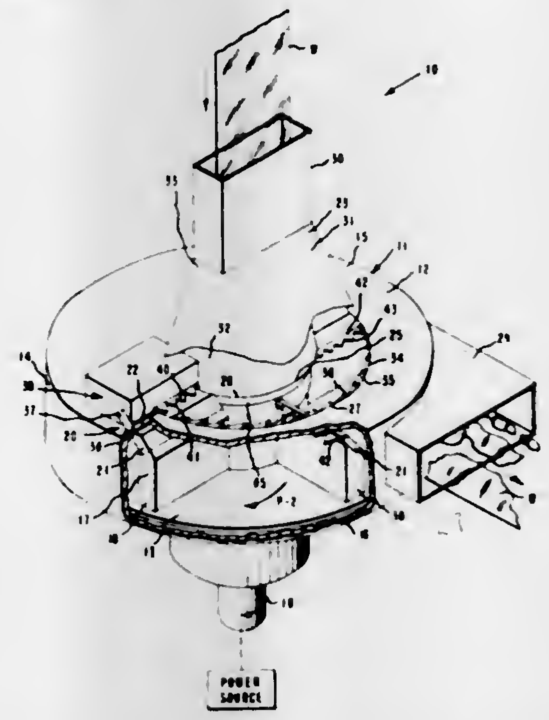
4,004,738
METHOD OF AND APPARATUS FOR SHREDDING A WEB OF PLASTIC FILM

William E. Hawkins, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 19, 1975, Ser. No. 615,186

Int. Cl.² B02C *18/12*

U.S. Cl. 241—29 **7 Claims**



1. A method of shredding a web of material including the steps of:
providing a stream of air in a shredder by rotating a fan having impeller blades;
moving the web by means of the stream of air in a first path;
shredding at least part of the web to form shredded and unshredded portions thereof as the web moves in the first path by means of a web first shredder means, such web as moved in the first path being transverse to the direction of rotation of the blades and to the first shredding means;
immediately moving the shredded portion of the web out of the shredder by means of the stream of air;
pulling the unshredded portion of the web from the first path and into a second path;
shredding the unshredded portion of the web as it moves in the second path, such unshredded web as moved in the second path being transverse to the direction of rotation of the blades and to the second shredding means; and
thereafter moving the thus shredded web out of the shredder by means of the stream of air.

4,004,739

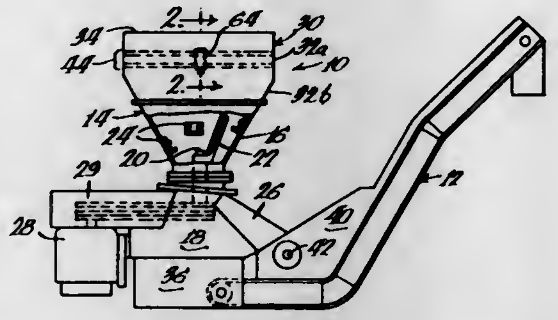
CRUSHER AND MATERIAL SENSOR

Gerhardt H. Cramer, Portage, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed Oct. 24, 1975, Ser. No. 625,495

Int. Cl.² B02C *25/00*

U.S. Cl. 241—34 **8 Claims**



1. Apparatus for crushing swarf and like materials comprising:

a crushing chamber for the material to be crushed, said crushing chamber having a loading opening to receive the material to be crushed and having means for discharging crushed material;

crushing means disposed within said crushing chamber;

motor means operable for driving said crushing means to effect crushing of material within said crushing chamber;

a supply hopper for receiving and storing material to be crushed, disposed above said crushing chamber and formed by sidewall means defining an open top and an open bottom communicating with the loading opening of the crushing chamber;

electrical control circuit connected to said motor means for controlling the operation thereof; said electrical control circuit including a normally open switch means having a pair of contacts and responsive to material in said hopper reaching a selected level for enabling said electrical control circuit;

at least a portion of said switch means being disposed internally of and supported within said hopper and extending about the periphery thereof, and one of said switch contacts being disposed along the inner surface of said sidewall means and normally electrically insulated from the other of said switch contacts;

said one switch contact being positioned for engagement by material filling said hopper as aforesaid, and the surface area of said switch portion being sufficient to insure said switch means responding to material filling said hopper as aforesaid;

whereby said switch is closed in response to said engagement of said one switch contact by material in said hopper for enabling said control circuit.

4,004,740

ROLLER CRUSHING MILL

Otto Heinemann, Ennigerloh; Heinz-Herbert Schmits, Rheda-Wiedenbruck, and Heinz Dieter Baldus, Ahlen, all of Germany, assignors to Polysius AG, Neubeckum, Germany

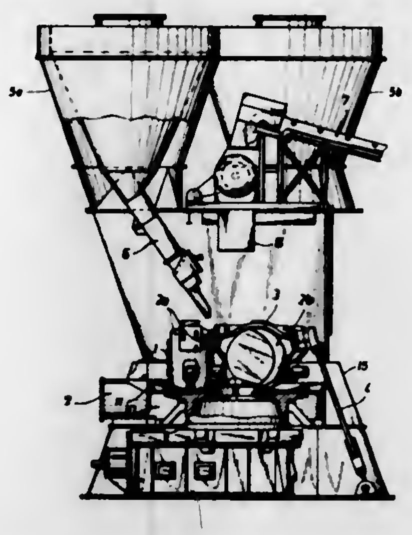
Filed Dec. 31, 1975, Ser. No. 645,800

Claims priority, application Germany, Jan. 28, 1975, 7502452[U]

Int. Cl.² B02C *15/00*

U.S. Cl. 241—52 **7 Claims**

1. In a crushing mill having a housing, a grinding plate within said housing rotatable about a substantially vertical axis, a plurality of roller means at peripherally spaced intervals bearing on said grinding plate and rotatable about a substantially horizontal axis, sifting means supported above said grinding plate in communication with said housing for receiving and sifting crushed material, and air conduit means below said grinding plate for supplying sifting air, the improvement comprising first nozzle means between said conduit means and said housing adjacent the periphery of said plate and positioned in the vicinity of each of said roller means for establishing a substantially upwardly directed first airstream, and second nozzle means between said conduit means and said housing adjacent the periphery of said plate and positioned between adjacent ones of said roller means for establishing second airstreams directed inwardly of said plate.



4,004,741

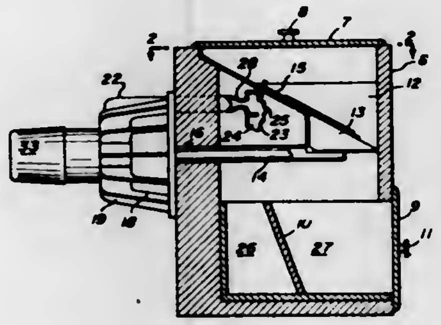
GRINDING MECHANISM

Eldon E. Perry, 141 North, 600 East, Kaysville, Utah 84037

Filed Oct. 28, 1975, Ser. No. 626,064

Int. Cl.² B02C *23/28*

U.S. Cl. 241—55 **15 Claims**



1. A grinding mechanism, for grinding grain and similar material, comprising:

a hopper for holding material to be ground;

a drum-shaped grinder housing having an inlet port connected to the hopper and an eccentrically located discharge port;

a grinding impeller in the grinder housing, having radial, paddle-type blades fixed to a shaft that extends through at least one end of the housing;

a dam on the inside surface of the grinder housing adjacent and partially surrounding the discharge port on the downstream side thereof relative to the motion of the impeller blades, so that the dam will intercept air from the vortex created by the impeller to aid in forcing finely ground material through the discharge port and maintain the discharge port in an unclogged condition; and

a motor attached to the grinder housing and to the impeller shaft for rotating the impeller.

4,004,742

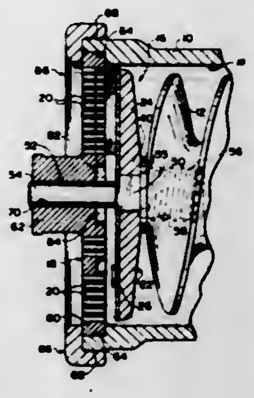
ROTARY MEAT GRINDER WITH BONE-COLLECTING FACILITIES

Charles W. Hess, Schiller Park, Ill., assignor to Speco, Inc., Schiller Park, Ill.

Filed Feb. 17, 1976, Ser. No. 658,365

Int. Cl.² A47J *43/07*

U.S. Cl. 241—82.5 **3 Claims**



1. A perforated grinder plate adapted for use in a meat grinder of the type that comprises a horizontally elongated tubular casing having one end thereof forming a meat inlet and its other end forming a ground meat outlet and defining a meat channel between the inlet and the outlet, a meat-impelling worm extending lengthwise of and mounted for rotation in the channel, provided at its rear end with a cylindrical pilot shaft, and effective upon rotation thereof to impell meat rearwardly through the channel from the inlet to the outlet, and a knife assembly mounted on the rear end region of the worm for rotation in unison with the worm and having a series of generally radially extending blades, said perforated meat grinder plate being adapted to extend vertically across said other end of the casing with its forward face in shearing relation with the blades of the knife assembly, embodying in its central portion an axial journal-forming bore for supporting rotatably said pilot shaft, and having formed in its forward face a large-sized counterbore which is disposed in coaxial relation with the bore and defines with the adjacent portion of the pilot shaft a substantially large annular bone-collecting pocket which except for its front end is closed in order that any bone particles which collect therein do not pass through the plate, said perforated grinder plate also having formed in its forward face a narrow bone-receiving groove having a width greater than the diameter of the perforations, extending inwards from the peripheral region of the plate and having its inner end in tangential communication with the pocket.

4,004,743

METHODS AND APPARATUS FOR WRAPPING A WIRE ON A TERMINAL

Robert Schechter, Peabody, Mass., and Douglas W. Winslade, Kingston, N.H., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,537

Int. Cl.² H01B *13/00;* **B21F** *15/00*

U.S. Cl. 242—7.03 **17 Claims**

1. A method for wrapping a wire on a terminal, comprising the steps of:

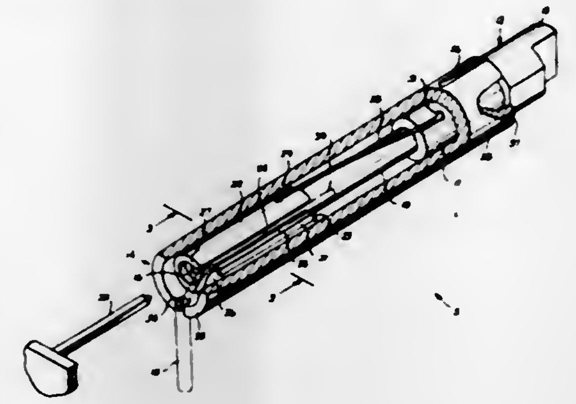
inserting a first portion of the wire into a channel formed by a longitudinal ridge on the periphery of a cylindrical drive member and one edge of a longitudinal opening in a hollow cylinder mounted circumferential to the drive member and into which opening the ridge projects;

releasably clamping the first wire portion between the longitudinal ridge and the edge of the longitudinal opening in the hollow cylinder upon rotation of the cylindrical drive member;

retaining a second portion of the wire adjacent the first wire portion against movement;

further rotating the drive member relative to the second wire portion to transmit rotational motion through the releasably clamped first wire portion to the hollow cylinder causing the releasably clamped first wire portion to be withdrawn from the channel, under tension, and wrapped about the terminal; and

biasing the hollow cylinder to a postion wherein the longitudinal ridge contacts another edge of the longitudinal opening in the hollow cylinder upon withdrawal of the releasably clamped first wire portion from the channel.



4,004,744

WINDING APPARATUS

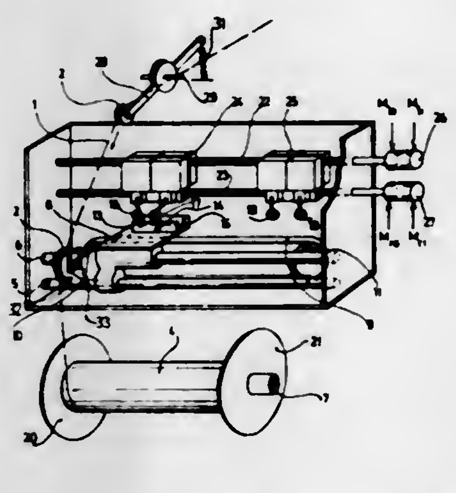
Luc Hoorelbeke, Kortrijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Mar. 21, 1975, Ser. No. 560,619

Claims priority, application United Kingdom, Apr. 2, 1974, 14582/74

Int. Cl.² B65H *54/28*

U.S. Cl. 242—25 R **15 Claims**



1. A method of detecting, during the winding of a thread onto a flanged spool by a winding apparatus having a thread guide which traverses the thread back and forth lengthwise of the spool, irregularities of the surface of the wound thread in two zones each adjacent to a respective one of the flanges of the spool, the method comprising sensing changes of the linear speed of the thread being supplied to the spool when the thread guide guides the thread into one of said zones, said changes being sensed between the spool and an upstream located buffer-accumulator.

4,004,745

YARN DISPENSING APPARATUS

Jacqueline L. Booth, Box 21, Bayview, Idaho 83803

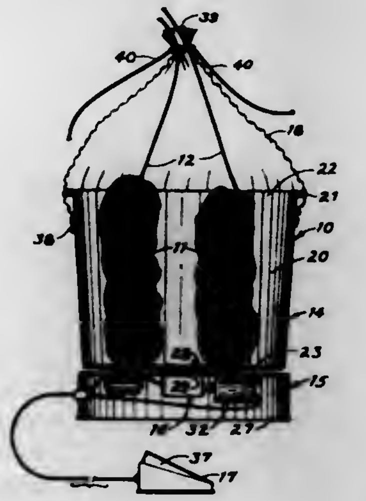
Filed June 18, 1975, Ser. No. 587,913

Int. Cl.² B65H *75/00, 49/30*

U.S. Cl. 242—54 R **3 Claims**

1. A hand knitting or crocheting aid for holding two or more skeins of yarn or thread to enable a person to knit or crochet an object without counter-clockwise twisting the yarns or threads about each other between the skeins and the object as the object is being produced, comprising:

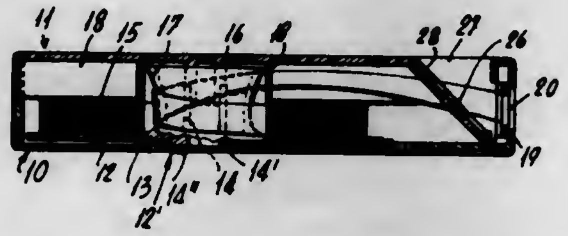
an upright open skein receiving container of sufficient size to receive two or more skeins having free ends in an upright orientation;
a flexible fabric covering attached to the container about an open end of the container with the fabric extending upward to an open end;
drawstring means at the upper end of the flexible fabric covering for drawing the covering open end partially closed to form a small opening for the free ends of the skeins to extend therethrough while covering the container to prevent the skein from being pulled from the container when the covering open end is partially closed;
a base member for supporting the skein receiving container in an upright orientation;



mounting means on the base member for supporting the container for rotational movement relative to the base member about a fixed axis;
drive means operatively connected to the mounting means for selectively rotating the container in a clockwise rotation about the fixed axis; and
control means operatively connected to the drive means for selectively activating the drive means for rotating the container clockwise to prevent counter-clockwise twisting of the two or more threads or yarns between the skeins and the object as the object is being knitted or crocheted.

4,004,746
CASSETTE MAGAZINE FOR MOTION-PICTURE FILMS

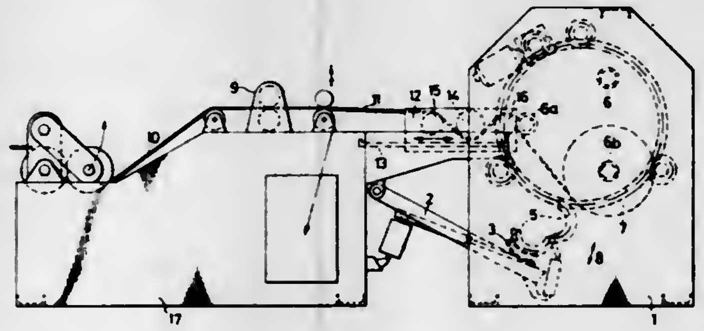
Angela Aruanno, Milan, Italy, assignor to Lamy S.r.l., Milan, Italy
Filed Jan. 23, 1974, Ser. No. 435,958
Claims priority, application Italy, Jan. 25, 1973, 19585/73; Nov. 21, 1973, 31525/73
Int. Cl.² G11B *23/10*
U.S. Cl. 242—55.19 A **6 Claims**



1. A cassette magazine for an endless motion picture film in the form of a wound roll comprising, in combination, a substantially flat container having a bottom wall provided with an access opening, a side wall and a top wall defining an interior, said side wall having a film exposure opening, said film being arranged to be advanced adjacent said film exposure opening to continuously unwind the innermost turn of the film roll and to wind the outermost turn of the roll on the outer periphery of the roll, a film roll supporting disc having a central hub rotatably mounted on said container bottom wall in said container interior in coaxial alignment with said bottom wall access opening for connection of said disc to associated projector driving means, a levelling member supported on said disc for retaining engagement with the side edges of the turns of film in the roll, said levelling member including a pair of radially extending arms arranged in angularly disposed relationship, one of said arms extending at least to the outer periphery of the film roll on said disc and the other of said arms having a free end terminating radially inward of the film roll outer periphery, means on said container engageable with said levelling member for preventing rotation of said levelling member and for permitting limited axial movement of said levelling member on said disc including a recess on said container for slidably accommodating the free end of said one arm, a spool supported on said disc in coaxial relationship therewith, said spool extending upwardly through the film roll on said disc and having an upper end disposed above the film roll adjacent said container top wall, said spool having a circular cross-sectional shape for guiding engagement with the innermost turn of the film roll on the disc during the advance of the film and to promote separation of the innermost turn of the film, a presser pad member in said container interior for maintaining the advancing film adjacent said film exposure opening, and means for guiding the advancing film from said spool to said presser pad member and means for guiding the advancing film from said presser pad member to the roll.

4,004,747
WINDING APPARATUS

Wilhelm Schulze, Delligsen, Germany, assignor to Maschinenbau Greene GmbH & Co., KG, Kreiensen, Germany
Continuation of Ser. No. 442,878, Feb. 15, 1974, abandoned. This application June 23, 1975, Ser. No. 589,029
Claims priority, application Germany, Nov. 9, 1973, 2232338
Int. Cl.² B65H *35/02, 35/04*
U.S. Cl. 242—56.5 **2 Claims**

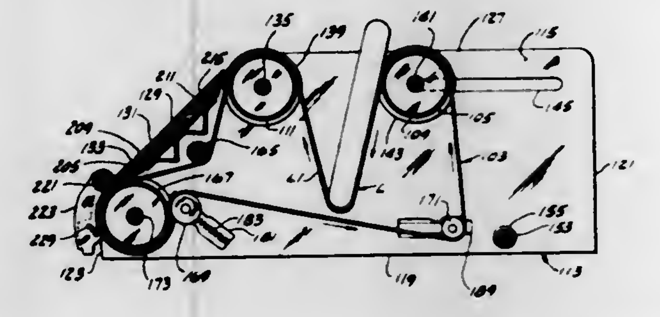


1. Apparatus for slitting a continuous web of material into a plurality of spaced webs and for transferring said webs onto winding cores, comprising
a machine frame to which said continuous web of material is supplied,
a plurality of said winding cores adapted to be rotatably driven to wind said web of material thereon,
means for selectively moving said cores into and out of a winding position,
a pressure roller biased toward the respective one of said cores in said winding position,
means carried by said machine frame for feeding a continuous web of material between said pressure roller and the one of said cores in said winding position,
a separating element having a web cutting edge extending transversely across said web for swinging movement into a web separating position to transversely cut said web to provide a free edge for attachment to another one of said winding cores,
a pair of mutually parallel spaced rails mounted to said machine frame and extending in the direction of movement of said web to said winding position,

a support device mounted on said rails for reciprocal rectilinear movement thereon,
said pressure roller being mounted on said support device,
(a web spacing roller carried by said support device in fixed spaced relationship with said pressure roller, and)
web slitting means mounted on said frame upstream of said spacing roller for slitting said continuous web into a plurality of adjacent longitudinal web sections, and
a web spacing roller carried by said support device in fixed spaced relationship with said pressure roller to expand the width of said web coming from said slitting means,
whereby said continuous web of material is slit into a plurality of separate continuous webs, which webs are subsequently spaced apart and then wound on said winding cores.

4,004,748
APPARATUS FOR DISPENSING FABRIC FROM A BOLT

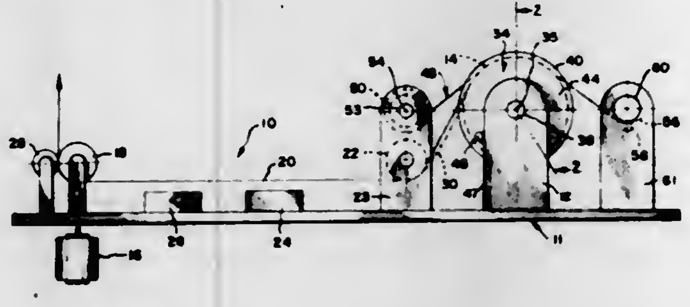
Gail B. Schwarz, Belleville, Ill., assignor to The Measuregraph Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 477,166, June 6, 1974, abandoned. This application Mar. 20, 1975, Ser. No. 560,358
Int. Cl.² B65H *75/02, 17/02*
U.S. Cl. 242—62 **22 Claims**



1. Apparatus for dispensing fabric from a bolt comprising an endless belt conveyor, means guiding the conveyor for travel in an endless path including an upwardly opening loop in which a bolt may be cradled with the bolt extending transversely of the conveyor, means for driving the conveyor to rotate a bolt cradled in the loop to unwind fabric from the bolt, said guiding means including a first and a second guide for establishing said loop, the conveyor travelling over the first guide, thence downwardly, upwardly and over the second guide, and said apparatus having means mounting said guides for relative movement toward and away from one another as the bolt rotates, said guides being relatively movable from one another as the bolt rotates to a horizontal position and toward one another as the bolt rotates away from horizontal position.

4,004,749
ELECTROGRAPHIC PRINTER PAPER TENSIONING DEVICE

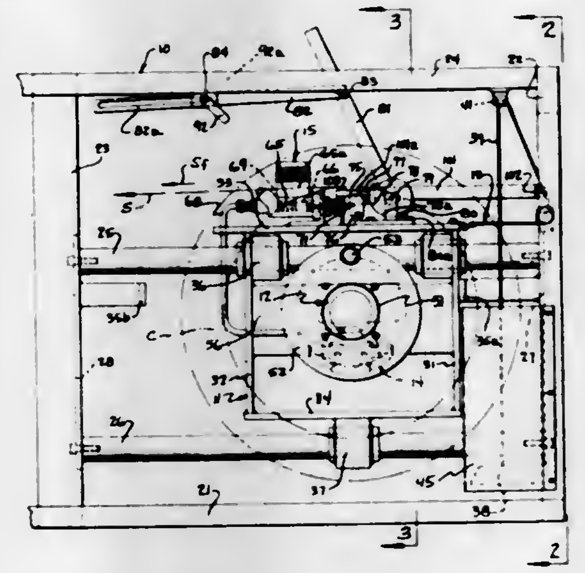
Robert F. Strange, Round Rock, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Oct. 28, 1975, Ser. No. 625,995
Int. Cl.² B65H *23/06, 59/16*
U.S. Cl. 242—75.4 **27 Claims**



1. An electrographic printer recording medium tensioning device, comprising:
a base;
an electrographic recording medium support device carried by the base and having a curved surface for contacting one surface of the recording medium substantially across its width;
at least one constant-force spring having first and second ends and a connecting portion therebetween, the first and second ends being mounted to said base to dispose the connecting portion tp bear constantly and evenly against the other surface of the recording medium forcing it into contact with the curved surface of the recording medium support device for tensioning the recording medium.

4,004,750
METHOD AND APPARATUS FOR CONTROLLING THE STOCK TENSION AS IT IS WITHDRAWN FROM A COIL

Earl M. Seagrave, Jr., Rockford, Ill., assignor to Antek, Inc., Rockford, Ill.
Filed Aug. 29, 1975, Ser. No. 609,107
Int. Cl.² B65H *75/22;* **B21C** *47/16*
U.S. Cl. 242—75.43 **16 Claims**



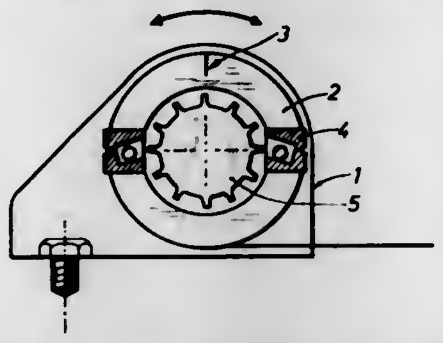
1. A flexible stock pay-off apparatus for controlling tension on continuous flexible stock as it is withdrawn from a coil, the pay-off apparatus including a frame, a carriage mounted on the frame for movement relative thereto along a path between a retracted position and an extended position, a coil support mounted on the carriage for rotation about an axis transverse to said path in response to withdrawal of stock from a coil on the support, means yieldably urging the carriage along said path toward said retracted position, variable brake means for controlling rotation of a coil on said coil support, and means operative in response to movement of the carriage along the path for variably operating the brake to increase and decrease the braking action as the carriage moves respectively toward and away from said retracted position.

4,004,751
SAFETY BELT INERTIA RETRACTOR AND BACKING DEVICE

Per Olaf Weman, Haslah, and Harald Martin Schmelow, Ellerau, Krs. Segeberg, both of Germany, assignors to Sigmatex, A.G., Basel, Switzerland
Filed Nov. 25, 1974, Ser. No. 527,008
Claims priority, application Germany, June 21, 1974, 2429801
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.4 A **15 Claims**

1. A belt winder for a safety belt for vehicles with quick-action locking means, comprising a housing, a winding shaft for the safety belt, a locking mechanism arranged between the housing and the winding shaft, a mounting support on the winder, said mounting support having a pocket therein, an

inert mass mounted in the pocket, said pocket being open at one side, said mass moving to lock the winder shaft when the vehicle accelerates in at least one of the three directions in space, the mounting support comprising a ring mount having



an adjusting cylinder arranged therein so that the adjusting cylinder can selectively be rotated about its longitudinal axis, the ring mount being selectively rotatable about an axis perpendicular to the longitudinal axis of the adjusting cyclinder.

4,004,752
TAPE CASSETTE

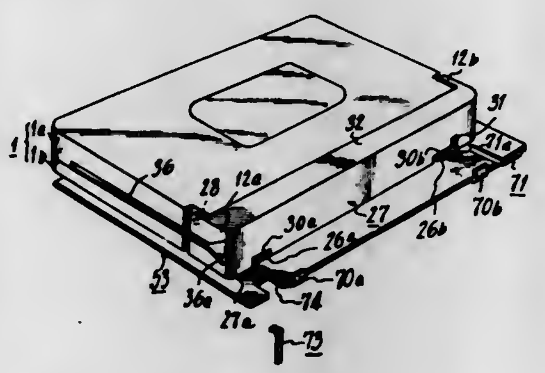
Naoki Kamaya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 438,447, Jan. 31, 1974, Pat. No. 3,900,172. This application Mar. 26, 1975, Ser. No. 562,120

Claims priority, application Japan, Feb. 1, 1973, 48-14227[U]; Sept. 25, 1973, 48-11572[U]

Int. Cl.² G03B *1/04*; **G11B** *15/32, 23/04*

U.S. Cl. 242—198 **4 Claims**



1. A tape cassette comprising:

a. a housing of generally rectangular configuration containing at least one reel for a supply of tape and having top and bottom walls and a peripheral wall extending between said top and bottom walls along sides of the housing so as to leave an opening along at least one side of the housing through which the tape can be withdrawn;

b. braking means contained in said housing and being normally applied for preventing rotation of said reel; and

c. means for releasing said braking means in response to the insertion of said housing into a holder therefor in a selected one of at least two orthogonally related directions one of which directions extends parallel to said one side of the housing.

4,004,753
PNEUMATIC CUSTOMER TERMINAL FOR DRIVE-UP BANKING INSTALLATIONS

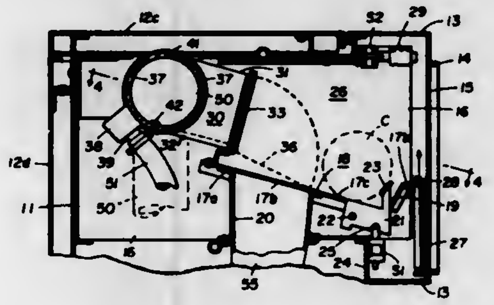
William D. Thomas, Marion, Iowa, and Chadwick C. Boltz, Kansas City, Mo., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Nov. 6, 1975, Ser. No. 629,327

Int. Cl.² B65G *51/32*

U.S. Cl. 243—19 **6 Claims**

1. In a customer terminal for a pneumatic banking system having carrier send and receive tubes opening up through the terminal, the terminal including a compartment therein opening through a terminal front wall for access by customers, the compartment having a pair of forwardly disposed opposite side walls spaced apart a width greater than the axial length of a generally cylindrical carrier for use with the system, the improvement comprising: a carrier receive chamber disposed at the rear of and having a transverse front opening into the compartment; an air return tube opening into the chamber; a transverse door closing the front opening of the chamber and hinged to open forwardly and downwardly into the compartment between its side walls, the receive tube opening into the chamber so that a carrier entering the chamber is disposed therein in a horizontal attitude with its axis transversely of the compartment side walls and is directed against the door, the door forming when open a forwardly and downwardly inclined carrier ramp from the chamber down which a carrier disposed in the chamber as aforesaid will roll therefrom; means normally biasing the door to its closed position and effective so that a carrier when disposed as aforesaid against the door will overcome the biasing means and open the door to its ramp forming position; a funneled send tube mouth opening up into the compartment and disposed below and covered by the chamber door when in its ramp forming position and above and connected to the send tube, the send tube mouth being effective to receive a carrier tossed therein and to orient the carrier into an upright position so that the weight of same dispatches the carrier end first down the send tube, the compartment side walls and the door when closed closely surrounding the adjacent margins of the send tube mouth; and carrier receiving means in the compartment disposed forwardly of the send tube mouth and the forwardmost edge of the chamber door when in its ramp forming position, the carrier receiving means being effective to halt and retain a carrier in position for access by a customer through the front of the compartment after the carrier has rolled forwardly off the rear face of the door and disposed to thereafter allow the biasing means to close the door.



4,004,754
HIGH-SPEED, HIGH-G AIR BEARING OPTICAL MOUNT FOR ROSETTE SCAN GENERATOR

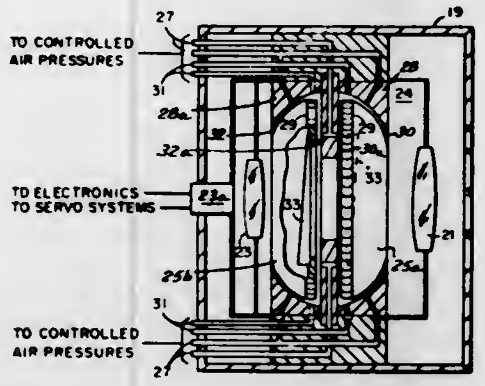
Mary V. Cox, Huntsville, and Rayburn K. Widner, Arab, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,843

Int. Cl.² F41G *7/12*

U.S. Cl. 244—3.16 **4 Claims**

1. A scan generator comprising: a tube with filter and collection optics spaced therein for transmission therethrough of electromagnetic waves from a target, a pair of intermediate bearing mounts mounted in said tube between said filter and collection optics, a pair of rotor carriers journaled in said pair of intermediate bearing mounts to define an air bearing space between each bearing mount and its respective rotor carrier, means for supplying a source of compressed air to the air bearing space between each bearing mount and its respective rotor carrier to mount said rotor carriers on an air bearing, said rotor carriers having peripheral buckets in registery with compressed air supplied through said bearing mounts for application of discrete pressures to the buckets to produce relative rotations of the rotor carriers, said rotor carriers being centrally pierced and having optical prisms oppositely disposed on the respective rotor carriers to direct said electromagnetic waves from a predetermined target scan pattern to said collection optics for transmission to a detector.


27
19
TO CONTROLLED AIR PRESSURES
31
28a
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24
32
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32a
30a
33
TO ELECTRONICS TO SERVO SYSTEMS
23a
33
21
23
25b
25a
31
TO CONTROLLED AIR PRESSURES
27

4,004,755
VTOL AIRCRAFT WITH COMBINED AIR BRAKE AND DEFLECTOR DOOR

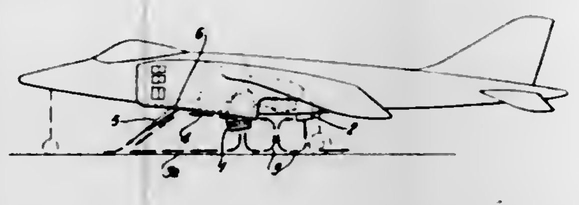
Ralph Spenser Hooper, Richmond-upon-Thames, England, assignor to Hawker Siddeley Aviation Limited, England

Filed July 30, 1975, Ser. No. 600,305

Claims priority, application United Kingdom, Aug. 6, 1974, 34680/74

Int. Cl.² B64C *15/08, 9/32*

U.S. Cl. 244—12.5 **6 Claims**



1. An aircraft of the fixed wing vertical take-off and landing type employing jet-engine-efflux-discharging vectored thrust lift nozzles for take-off and landing which nozzles are angularly movable to positions in which said nozzles provide thrust for forward flight, comprising a hot gas deflector door incorporating edgewise air blowing means and movably mounted on the underside of the aircraft fuselage such that said door is movable from a retracted position, in which said door may conform to the fuselage profile, to a fully open position in which said door is directed forwardly and downwardly.

4,004,756
AUTOMATIC FLIGHT CONTROL MEANS FOR ROTARY WING AIRCRAFT

Milton I. Gerstine, Wilmington, Del.; Joshua I. Goldberg, Ridgefield, Conn.; Setsuo Futatsugi, Kagamigahara, Japan; Kazuo Ueda, Kagamigahara, Japan; Ryozo Seo, Kagamigahara, Japan; Koji Iwasaki, Kagamigahara, Japan, and Makoto Uemura, Kagamigahara, Japan, assignors to The Boeing Company, Seattle, Wash.

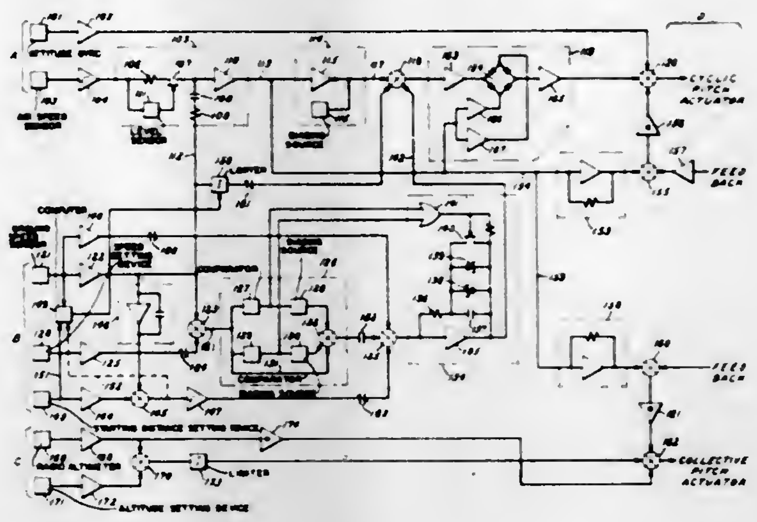
Filed Nov. 24, 1975, Ser. No. 634,380

Claims priority, application Japan, Nov. 22, 1974, 49-134512

Int. Cl.² B64C *19/00*; **G05D** *1/08*

U.S. Cl. 244—17.13 **3 Claims**

1. Automatic flight control means for rotary wing aircraft comprising speed detecting means for detecting speed of a rotary wing aircraft and generating a speed signal, starting distance signal generating means for providing a starting distance signal corresponding to the starting distance between a control starting spot to a desired hovering spot, reference signal generating means connected with the speed detecting means and the starting distance signal generating means for providing from the speed signal and the starting distance signal, a reference signal corresponding to the remaining distance to the desired hovering spot, and means connected with the speed detecting means and the reference signal generating means for receiving the speed signal and the reference signal therefrom to provide a difference signal whereby cyclic pitch control mechanism of the aircraft is controlled so as to attain a speed corresponding to the remaining distance.



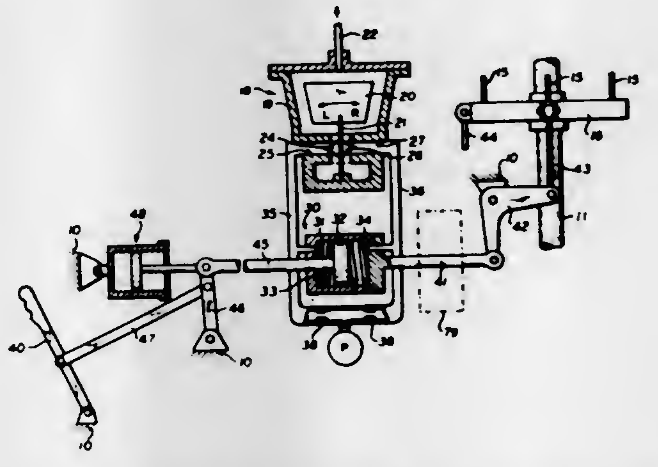
4,004,757
OSCILLATION DAMPER FOR THE HUB OF A ROTORCRAFT ROTOR AND ITS COMBINATION WITH A ROTORCRAFT

Glidden S. Doman, West Chester, Pa., assignor to William Gallagher, West Chester, Pa.

Filed Oct. 16, 1975, Ser. No. 623,008

Int. Cl.² B64C *11/44*

U.S. Cl. 244—17.13 **18 Claims**



1. An oscillation damper for the hub of a rotor of a rotorcraft having blades extending outwardly from the hub with the pitch of the blades being controlled by a swash plate which rotor is adapted to be rotated at a cruising r.p.m. comprising a seismic device having a housing, a weight mounted for movement in the housing, weight spring means engaging the weight and maintaining the weight in central position in the housing, the weight and its spring means being tuned to the frequency of the lateral aeromechanical instability or approximately at one half of the r.p.m. of the rotor at cruising speed, weight damping means one half critically damping the response of the weight to secure a vector force lag of approximately 15°, control means connected with the weight and controlled by the movement thereof including a first controller and a second controller, an extendable and contractable motor means connected with the control means and controlled by the movement of the first controller to expand the motor means and controlled by the movement of the second controller to contract the motor means, and connecting means carried by the motor means and adapted to be connected with a swash plate.

4,004,758

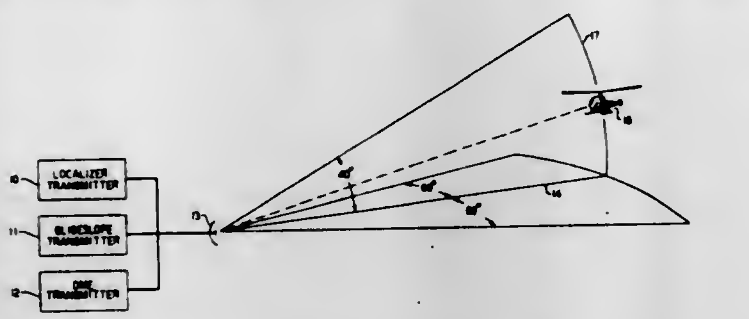
METHOD AND APPARATUS FOR PROVIDING DECELERATED AIRCRAFT APPROACH

Robert P. Boriss, Holmdel, and Thomas F. McNamara, New Shrewsbury, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1975, Ser. No. 639,552

Int. Cl.² G05D *1/12*

U.S. Cl. 244—17.13 **6 Claims**



1. A method of providing a decelerated approach for a rotary winged aircraft towards a landing site, wherein it is assured the heading of the aircraft at breakout corresponds to the inbound course, which comprises:

transmitting a plurality of radio beams outwardly from said landing site towards said aircraft, said beams having encoded thereon information relative to said aircraft's azimuth, elevation, range and range rate and defining a desired approach path towards said landing site;

decoding said plurality of encoded radio beams, on said aircraft, thereby to derive signals representative of the aircraft's instantaneous azimuth, elevation, range and range rate;

correcting the heading of said aircraft, responsive to said signals, to fly said aircraft along said approach path towards the landing site, while simultaneously;

decelerating said aircraft according to a predetermined deceleration curve thereby to bleed off all forward and vertical velocity as said aircraft approaches said landing site;

freezing the heading of said aircraft to the inbound course at a predetermined range rate prior to breakout and then

correcting for further lateral displacement of said aircraft from said approach path by exclusive use of lateral roll commands.

4,004,759

VERTICALLY-FLYING AIRCRAFT

Roland Hund, Immenstaad, Germany, assignor to Dornier System GmbH, Germany

Filed June 10, 1975, Ser. No. 585,528

Claims priority, application Germany, July 16, 1974, 2434042

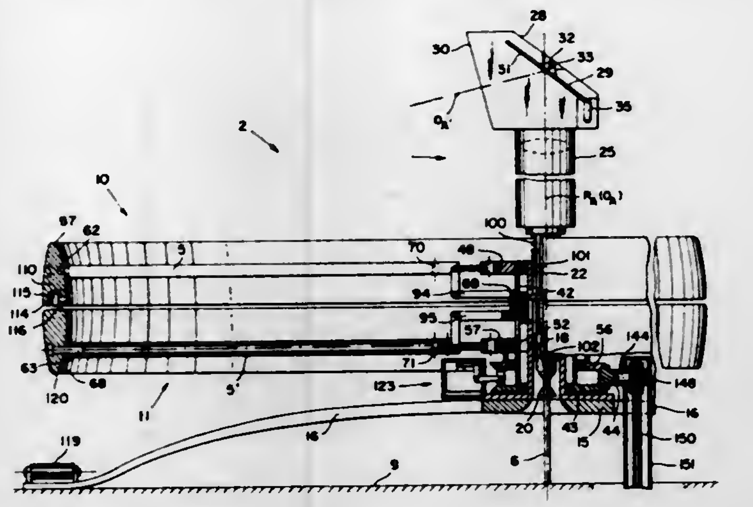
Int. Cl.² B64C *27/20*

U.S. Cl. 244—17.17 **10 Claims**

1. A vertically-flying aircraft having no on-board engine and being adapted to fly while moored to a ground station, comprising at least one rotatable rotor means for producing vertical thrust,

mechanically-acting storage means for storing at least a substantial portion of the required drive energy for the drive of said rotor means,

and coupling means adapted to connect said rotor means to a drive means of a ground station, whereby drive energy is stored in said rotor means.



4,004,760

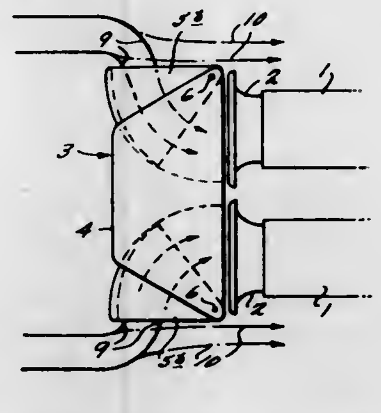
DEVICE FOR PREVENTING FOREIGN MATTERS FROM BEING SUCKED INTO A GAS TURBINE ENGINE FOR AN AIRCRAFT

Kiyoatsu Ando; Hiroshi Nakajima, and Hiroshi Ueno, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,869

Int. Cl.² B64D *33/02*

U.S. Cl. 244—53 B **2 Claims**



1. A device for being mounted in front of an aircraft engine air intake to prevent foreign matter from being sucked into the engine, said device comprising;

a first, fixed portion for extending as a deflector before the air intake and having a cutaway, open area for exposing at least part of the air intake to air flow directly ahead of the air intake;

a second, movable portion having an inlet region communicating therethrough to an outlet region thereof, and a deflector region extending between the inlet region and outlet region; and

pivot means mounting the second, movable portion upon the first, fixed portion for movement between these two positions:

a. a first inactive position, wherein the outlet region of the movable portion is positioned directly ahead of the air intake, the deflector region thereof is substantially telescoped with said first, fixed portion so to substantially inactivate the deflecting ability of said deflector region, and wherein the inlet region of the movable portion is positioned directly ahead of the air intake, so that at least some of the air passing through said device to the air intake need not be substantially deflected to do so; and

b. a second, active position, wherein the outlet region of the movable portion remains positioned directly ahead of the air intake, but the deflector region is extended across that part of the region directly ahead of the air intake that is exposed in said first, inactive position, and the inlet region of the movable portion is positioned directly ahead of one edge of the air intake, so that air to enter the air intake must first proceed substantially laterally.

4,004,761

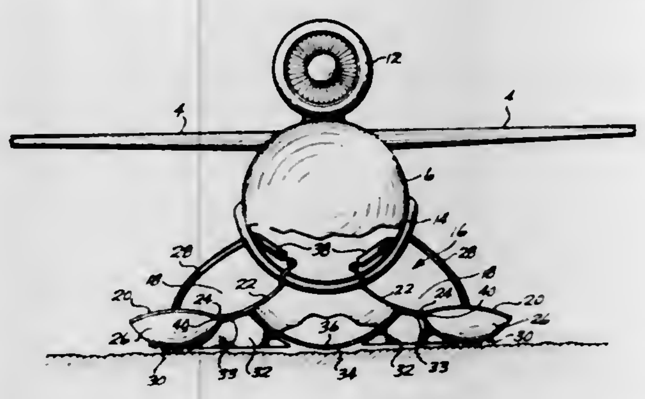
OUTRIGGER AIR CUSHION LANDING SYSTEM

John Jerome McAvoy, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 10, 1976, Ser. No. 684,801

Int. Cl.² B60V *3/08*

U.S. Cl. 244—100 A **4 Claims**



1. An air cushion landing system for an aircraft having a fuselage comprising:

a. rigid member means having a first and second portion, the first portion mounted to the fuselage of the aircraft, and the second portion mounted to the first portion of said rigid member means;

b. first inflatable bag means sealably mounted to the underside of the second portion of said rigid member means;

c. second inflatable bag means sealably mounted to the underside of the first portion of said rigid member means;

d. flap means mounted to the underside of the first portion of said rigid member means for containing a volume of air between said flap means and said first and second inflatable bag means;

e. inflating means for inflating said first and second inflatable bag means whereby said first and second inflatable bag means cushion the aircraft at landing;

f. actuating means connected to the aircraft and to said rigid member means for extending said rigid member means and said first and second inflatable bag means during landing and retracting said rigid member means and said first and second inflatable bag means during cruise operation.

4,004,762

AIRCRAFT UNDERCARRIAGE WITH RIDE CONTROL MEANS

Stanley Frederick Noel Jenkins, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

Filed June 3, 1975, Ser. No. 583,424

Claims priority, application United Kingdom, June 6, 1974, 25248/74; Sept. 9, 1974, 39322/74

Int. Cl.² B64C *25/60*

U.S. Cl. 244—104 FP **14 Claims**

1. An aircraft undercarriage for supporting an aircraft structure comprising:

a ground contacting element;

a variable length liquid filled strut operatively connected to the aircraft structure and to the ground contacting element for supporting a proportion of the weight of the aircraft structure;

resilient means for controlling the length of said strut in dependence on the load supported thereby;

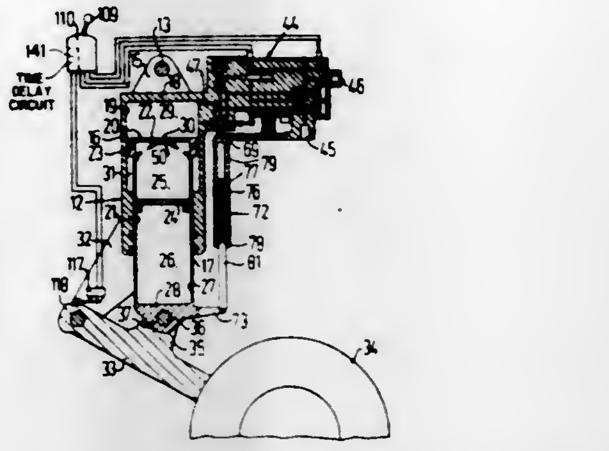
a movable wall acting on said resilient means in a direction to increase the load thereon under the pressure of liquid in the liquid filled strut,

a liquid pressure source and a liquid drain;

ride control valve means to selectively connect said strut to said source and said drain,

a ride control mechanism operatively connected to the ground contacting element and the aircraft structure for sensing relative movement therebetween, and to the ride control valve means for maintaining the length of said strut constant with varying aircraft static load;

and further valve means operative to isolate said strut from said source and said drain except when the aircraft is supported on the ground by the ground contacting means.



4,004,763

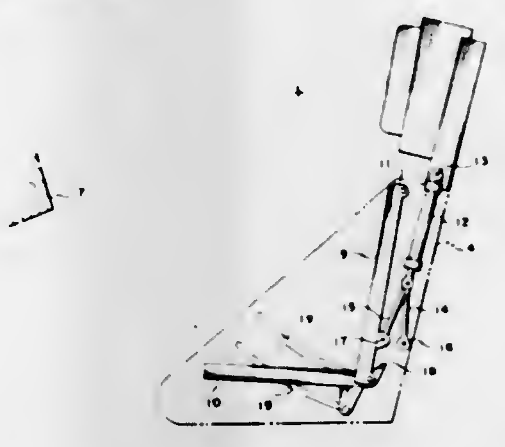
ARTICULATED HIGH "G" PILOT'S SEAT

Frederick E. Bunnell, III, Burbank, and Henry G. Combs, Canyon Country, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 488,426, July 15, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,214

Int. Cl.² B64D *25/02*

U.S. Cl. 244—122 R **7 Claims**



1. An articulated high "G" force aircraft seat comprising:

a rail assembly attached to and constituting an integral aircraft structure;

a seat assembly supported on said rail assembly and movable relative thereto for ejection;

a headrest having a rear portion and a forward or helmet receiving portion, said rear portion being secured to said seat assembly, guide means connecting said forward portion to said rear portion for movement of said forward portion about a pivot axis generally coaxially aligned with the intended center of azimuth rotation for the helmeted head of a seat occupant, said forward portion having helmet engaging means requiring said forward portion to move with the helmet in azimuth but not in elevation whereby near normal head motion of the seat occupant may be maintained under high "G" force conditions;

a seat back pivotally attached at one end approximate normal shoulder height to the seat assembly adjacent said headrest;

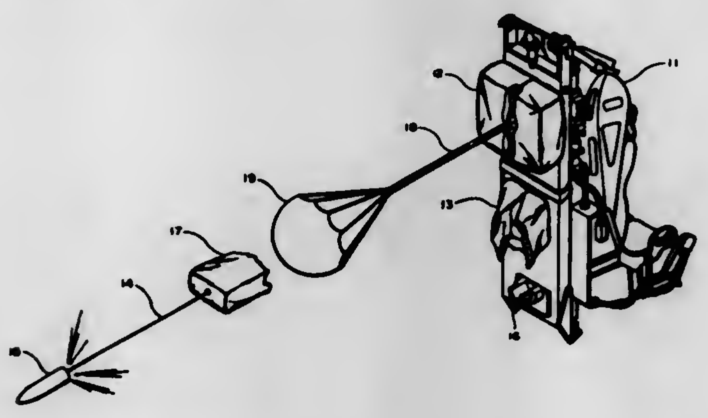
a seat pan pivotally attached to the other end of the seat back; and

actuator means for moving the seat pan and said other end of the seat back between a normal sitting position and a reclined position.

4,004,764
DROGUE CHUTE EXTRACTION

Vernon D. Burklund; W. James Stone, both of China Lake, and Joseph A. Schmidt, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1974, Ser. No. 469,739
Int. Cl.^{2} B64D *17/72*
U.S. Cl. 244—149 **4 Claims**



1. A method for deploying a drogue parachute, said method comprising the steps of:

igniting a rocket motor which is attached by means of a tow line to a closed bag containing a drogue parachute packed into the closed bag;

pulling, by means of said rocket motor and said tow line, the bag and drogue parachute therein through the air; and

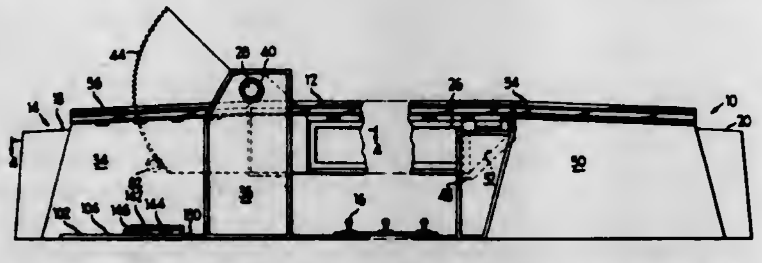
ripping said bag off said drogue parachute through the action of said motor for releasing said drogue parachute into an air stream from said bag and said rocket motor.

2. Apparatus for deploying a drogue parachute comprising:
- a. a bag in which said drogue parachute is packed;
- b. a tow line attached by one end to said bag; and
- c. a rocket motor attached to the other end of said tow line; said bag being so constructed that when said rocket motor is fired and a predetermined amount of force is exerted on it through said tow line it will rip away from said drogue parachute and allow the drogue parachute to deploy.

4,004,765
BRIDGE ACCESSORY FOR TRACK VEHICLES

Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1976, Ser. No. 656,113
Int. Cl.^{2} B61L *23/04*
U.S. Cl. 246—118 **6 Claims**



1. A bridge accessory for use with a model vehicle set having an electrically conductive track layout for defining a path of travel and supplying power to the model vehicle, and including at least one cross-over point in the track layout, comprising:

a frame structure at the cross-over point;

a bridge portion including a movable track segment pivotally mounted on the frame, said bridge portion being movable between a down position where the model vehicle may pass over the bridge portion and an up position where the model vehicle may pass under the bridge portion;

a selectively operable drive means connected to the movable bridge portion and a power supply for selective movement of the bridge portion between its respective up and down positions, said bridge portion having an arcuate gear rack adjacent the pivoted end thereof and said drive means includes a pinion gear in engagement with said gear rack for moving the bridge portion between its up and down positions by rotation of said pinion gear in a predetermined direction;

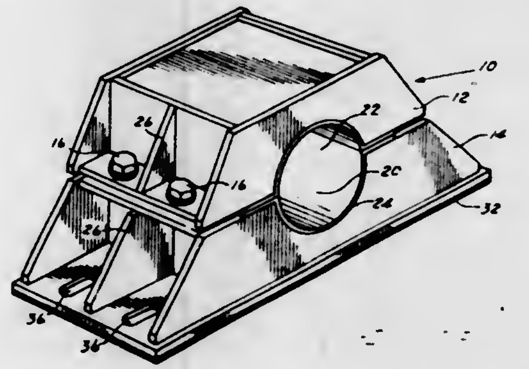
circuit means operatively connected to said bridge portion including at least one power supply rail and at least one ground rail on the track and insulation means for a first power supply rail segment of predetermined length on the track segment on the movable bridge portion and a second power supply rail segment of predetermined length on the track layout under the cross-over point for insulating said first and second power supply rail segments from the remainder of the track layout power supply rail, said circuit means being connected to said power supply for alternately connecting the first insulated power rail segment on top of the movable bridge portion with the power supply when the bridge is in its down position and the second insulated power supply rail segment under the cross-over point with the power supply when the bridge is in its up position; and

sounding means connected to said drive means for producing an audible signal when the bridge portion is in motion, said sounding means including a bell and a movable hammer adjacent said bell and cam means associated with said hammer and the drive means for causing the hammer to strike the bell as the drive means is energized.

4,004,766
ISOLATION CLAMP FOR TRANSMISSION TUBE

William W. Long, 7501 W. 61st No. 134, Overland Park, Kans. 66202

Filed Oct. 28, 1975, Ser. No. 626,118
Int. Cl.^{2} F16L *3/16*
U.S. Cl. 248—55 **5 Claims**

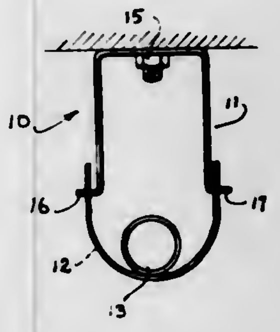


1. A vibration absorbing transmission tube isolation clamp which effectuates reduction of transmittance upon structures in communication with a tube being held by the clamp of side to side forces generated by thermal expansion of the tube as the tube transmits liquid under pressure, the clamp comprising:
- a. a bottom piece which has tube housing to surround one-half of a transmission tube and which housing has a vibration absorbing low coefficient of friction material therein, and with the base of the bottom piece being provided on each side of the tube housing with one or more elongated openings whose long axes are at right angles to and lateral to the longitudinal axis of the tube housing and further with the base having its underside provided with a low coefficient of friction material situated to interface with the support structure when the clamp is in use; and
- b. a top piece having a tube housing to surround one-half of the transmission tube and which housing has a vibration absorbing low coefficient of friction material therein, with the top piece securable to the bottom piece so that when so secured to the bottom piece the tube housing contributed by the bottom piece and the top piece together totally surround the transmission tube when the transmission tube is situated between the top piece and the bottom piece.

4,004,767
PIPE HANGER

Dennis J. Chilton, Mississauga, Canada, assignor to Joseph Zentil, Toronto, Canada

Filed Oct. 28, 1975, Ser. No. 626,232
Int. Cl.^{2} F16L *3/00*
U.S. Cl. 248—58 **4 Claims**

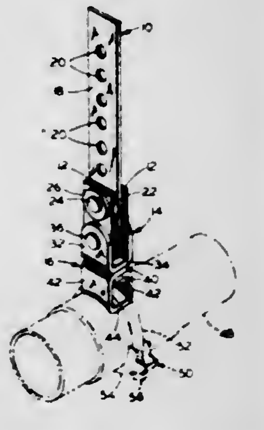


1. A pipe-supporting assembly comprising in combination a hanger and a saddle, said assembly being characterized in that said hanger includes a pair of spaced and parallel oppositely and outwardly projecting tongues each having a pair of spaced co-planar slots therein opening upon the opposite side-edges of said tongues, said saddle being suspended from said tongues and having a pair of spaced substantially circular apertures therein and an open-ended substantially radial slot extending between each aperture and the ends of said saddle, said slots permitting said saddle to engage said tongues and be supported rotatably thereby between said co-axial slots.

4,004,768
UNIVERSAL JOINT HANGER FOR TAILPIPES AND THE LIKE

Ralph K. Evans, Plantsville, and Roy S. Florian, Southington, both of Conn., assignors to Nickson Industries, Inc., Plantsville, Conn.

Filed Aug. 13, 1975, Ser. No. 604,227
Int. Cl.^{2} E21F *17/02*; **F16L** *3/00*
U.S. Cl. 248—59 **6 Claims**

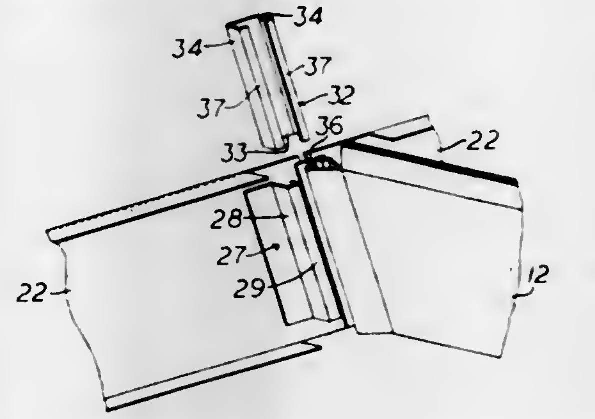


1. A pipe hanger comprising:
- a. a pair of closely spaced strap members each having first and second end portions at opposite ends thereof and extending in parallel planes;
- b. an elongated sheet-like support member having a thickness less than the thickness of either of said strap members, said support members having a planar engagement portion and a support portion at opposite ends thereof, said engagement portion extending in a parallel plane between the planes of said strap members and being disposed between said first end portions of said closely spaced strap members and said support portion being adapted for mounting said hanger upon a support surface;
- c. means pivotably mounting said first end portions of said strap members to said engagement portion of said support member;
- d. a bracket of generally U-shaped configuration having spaced legs extending along and closely adjacent the outer surfaces of said second end portions of said strap members and a web spaced from said second end portions;
- e. means pivotably mounting said legs of said bracket to said second end portions of said strap members, the axis of said second mentioned pivotal mounting means being aligned with and parallel to the axis of said first mentioned pivotal mounting means;
- f. hanger means depending from said bracket web and adapted to provide pipe support means;
- g. means pivotably mounting said hanger means to said bracket web adjacent the midpoint thereof whereby said bracket will pivot said hanger means about an axis lying in substantially the same plane as that of said engagement portion of said support member and said pivotal axes of said bracket mounting means and of said support member with said strap members are substantially parallel during pivoting.

4,004,769
DETACHABLE END PLATFORM FOR MERCHANDISE DISPLAY UNIT

Muammer A. Oztekin, P.O. Box 6247A, Birmingham, Ala. 35217

Filed Feb. 19, 1976, Ser. No. 659,535
Int. Cl.^{2} F16M *11/20*
U.S. Cl. 248—188.1 **4 Claims**



1. In a detachable end platform for merchandise display unit embodying at least one upstanding shoe member formed of adjacent parallel plates and extending generally perpendicular to at least one upstanding side plate with the outer end of said shoe member terminating adjacent one end of said side plate, means detachably connecting said one end of said side plate to said outer end of said shoe member comprising:
- a. an outwardly opening recess in said outer end of said shoe member between said adjacent parallel plates,
- b. an upstanding bracket carried by the inner side of said side plate in spaced relation to said one end thereof, said bracket having one end fixed to said side plate and further comprising a first portion extending away from said side plate, a second, laterally extending portion extending from said first portion and substantially parallel to said plate, and terminating in a third portion extending toward said plate, and,

c. a channel-like clip having a web slidably engaging the inner surface of said plate with one flange of said clip extending into an engaging said outwardly opening recess and the other flange of said clip engaging the inner surface of said upstanding bracket so that said clip connects said side plate to said shoe member.

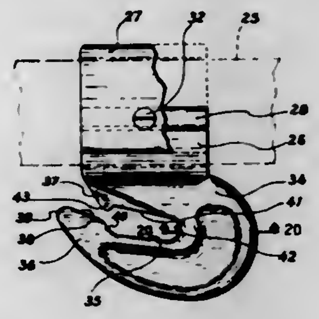
4,004,770
HOOK AND HOOK ASSEMBLY USING A SLING OF BAND MATERIAL

Thomas J. Karass, 411 Kindersley Ave., Mount Royal, Quebec, Canada

Continuation-in-part of Ser. No. 353,567, April 23, 1973. This application Nov. 26, 1974, Ser. No. 527,297

Int. Cl.^{2} F16M *13/00*

U.S. Cl. 248—323 **6 Claims**



1. A hook for suspending a sling of band material therefrom comprising a suspending portion, an intermediate generally flat portion and a hooking portion joined together into a generally J-shaped configuration, said flat portion being as long as the width of said band material and interconnecting said suspending portion and said hooking portion, a protuberant lip portion attached to said suspending portion, positioned between said suspending portion and said hooking portion and forming a reduced spacing between the same which is smaller than the width of said band material, said protuberant lip portion having a lower edge which overlies said flat portion and which forms a downwardly extending boss at its outer end, said boss having a portion which is lower than the uppermost point of said hooking portion and a sleeve portion integrally formed with said suspending portion and arranged to slidably engage around a tubular rail.

4,004,771
BALL-AND-SOCKET TYPE CONNECTIONS FOR USE WITH MINING APPARATUS

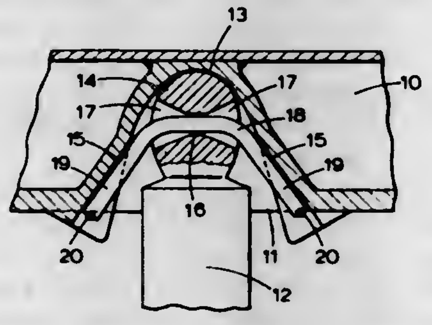
Lubomir Plevak, Lunen, Horstmar, and Norbert Hölken, Altlunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Continuation-in-part of Ser. No. 391,366, Aug. 24, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,747

Claims priority, application Germany, Sept. 9, 1972, 2244312

Int. Cl.^{2} E21D *15/55*

U.S. Cl. 248—357 **24 Claims**



1. A ball-and-socket type connection for connecting an elongate component and a support prop of a mine support assembly, said connection comprising; a ball part provided on the support prop; a socket part provided on the elongate component; said socket part being shaped to receive said ball part and having a mouth at a side thereof through which the ball part can be introduced, and separate securing means comprising at least one unitary member extending into the socket part through the mouth to engage within the ball part, the unitary member being introducable into the ball part through the mouth and being detachably connected to the elongate component at one or more positions directly accessible from the side of the component in which the mouth is formed to maintain the ball part in the socket part.

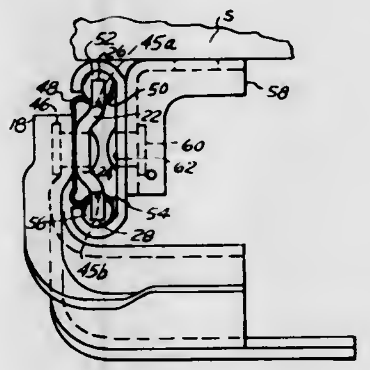
4,004,772
MANUAL SEAT ADJUSTER

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Jan. 30, 1975, Ser. No. 545,412

Int. Cl.^{2} F16M *13/00*

U.S. Cl. 248—430 **11 Claims**



1. Support structure for a vehicle seat comprising generally horizontally extending front and rear rail portions, each formed of horizontally elongated strip material having its width disposed generally vertically and having a generally horizontal upper edge forming a trackway, a single ball on each portion, an elongated carriage movable longitudinally of said rail portions, said carriage being formed of horizontally elongated strip material with its width disposed generally vertically and having a laterally and downwardly exending top edge portion, defining a downwardly open channel in which said balls are movable as said carriage is moved, pairs of abutments on the top edges of said rail portions and on said carriage engageable with said balls to limit the horizontal movement of said carriage, the top edge portion of said carriage being laterally and reversely arcuately curved to provide for support of said carriage on said balls by contact between said balls and the bottom of said channel, the lower edge of said carriage being laterally and reversely arcuately curved at the said one side of said carriage to provide a ball receiving channel below said rail portions, said rail portions having generally horizontal bottom edges forming trackways, balls interposed between the lower edges of said rail portions and the channel therebelow, and resilient ball retainers formed of spring steel fixed to said rail portions to extend for the full length of the edge portions thereof forming the trackways, and including laterally extending free flanges interposed between the tops and bottoms of said rail portions and said balls to maintain said balls in contact with the bottoms of said channels at all times.

4,004,773
CANDLE MOLD

William R. Binder, 2101 Black Horse Drive, Warrington, Pa. 18976

Filed July 29, 1974, Ser. No. 492,433

Int. Cl.^{2} C11C *5/02*

U.S. Cl. 249—93 **5 Claims**

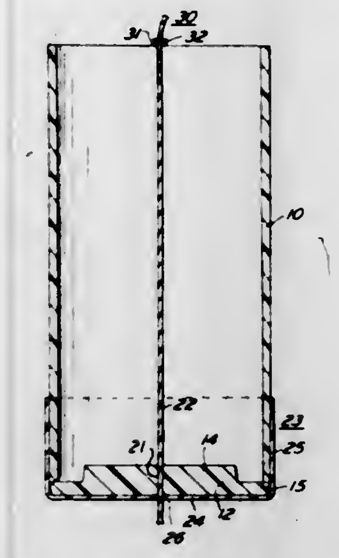
1. A candle mold which comprises

a hollow tube open at each end having internal and external surfaces,

a candle end former plate below said tube closing the lower end of said tube to provide the top end of the finished candle,

said former plate having a hole for a wick to be passed therethrough,

a flexible one piece end closure cap in gripping engagement with the external surface of said tube and said plate retaining said former plate in position on the lower end of said tube, and sealing the same from leakage,



said closure cap having an opening aligned with said opening in said former plate through which said wick is adapted to extend,

said closure cap opening sized to be in frictional gripping and sealing engagement with said wick but permitting manual upward movement of said wick, and

wick retaining means at the upper end of the tube.

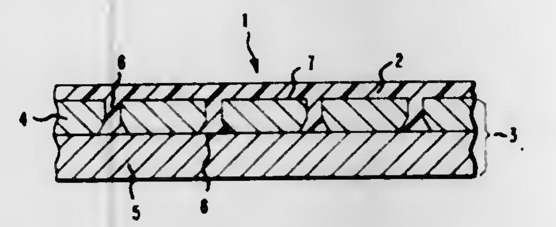
4,004,774
COATED PANEL

Alvin John Houston, Dollard des Ormeaux, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Jan. 8, 1975, Ser. No. 539,596

Int. Cl.^{2} B28B *7/36*; **E04G** *9/05*

U.S. Cl. 249—114 **8 Claims**



1. In an improved, reusable concrete form board comprising a composite structure having a coating of a normally solid polyolefin resin at least 10 mils thick on a plywood substrate, the improvement which comprises:

a. providing the substrate with a plurality of circular orifices at its coated surface each having a cross-sectional area in the range of 0.01 to 0.05 square inch disposed over at least the coated surface thereof and spaced with centers from 0.5 to 2 inches apart, said orifices leading into first, cylindrical portions of the holes extending from the coated surface of the solid substrate to a junction line, inside the solid substrate, with a frustoconical portion of the holes whose sides are at an angle in the range of 20°–60° with the vertical axis of the holes and whose cross-sectional area, for at least a part of their depth, increases at least 10% as the distance from said junction line increases, and

b. providing that the normally solid polyolefin resin coating the surface of said substrate penetrates through said orifices and into said holes beyond said junction lines where the cylindrical and frustoconical sections of the holes meet for at least a distance such that the cross-sectional area is at least 10% greater than the area of the orifice at the coated surface of the solid substrate.

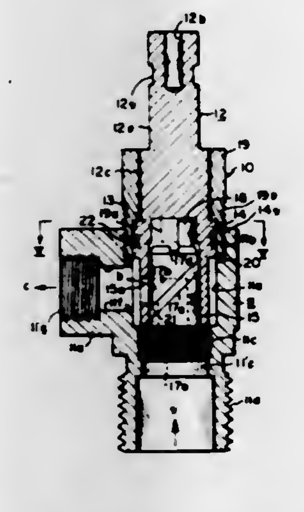
4,004,775
PLUG VALVE

Lloyd K. Jones, and David A. Yanov, both of Morgantown, W. Va., assignors to Elk Manufacturing Company, Inc., Morgantown, W. Va.

Continuation-in-part of Ser. No. 411,246, Oct. 31, 1973, Pat. No. 3,874,637. This application Feb. 6, 1975, Ser. No. 547,697

Int. Cl.^{2} F16K *5/04, 27/06*

U.S. Cl. 251—310 **6 Claims**



1. In an improved fluid-flow controlling valve whose operating parts may be fully assembled and disassembled without disconnecting either its fluid inlet or outlet fittings, a hollow longitudinally extending integral housing having an open first end portion providing a pipe connection inlet fitting and having an opposite open second end portion for the insertion and removal of all operating parts thereof, said housing having a central chamber portion between said open end portions, and having a side outlet portion open to said central chamber portion in substantially a right angular relation with respect to said open first end portion; said side outlet portion providing a pipe connection outlet fitting, a longitudinally extending stationary plug-like seating part adapted to be inserted and removably mounted within said central chamber portion through said opposite open second end portion to extend in a spaced relation concentrically within and along said central chamber portion, said seating part having an end port open to said first open end portion, and an open side port connected by an angular-shaped bore therein to said end port to define a fluid passageway therethrough; a rotatable operating stem part having a sleeve portion integral therewith at one end thereof that is adapted to be introduced through said open second that is adapted to be introduced through said open second end portion into a concentric rotatable operating position about said seating part within said central chamber portion, said sleeve portion having an open end facing towards and closed-off with respect to said open first end portion by said seating part, having a closed-off opposite end, and having an open side port for movement into and alignment with the open side port of said seating part, said stem part having a closed-off operating end portion providing a closed opposite end for said sleeve portion and extending therefrom outwardly through said second open end portion of said housing; said housing having threading about said open second end portion thereof, a bonnet part having threading that is complementary with the threading about said open second end portion for removably securing said bonnet part on said housing, said bonnet and stem parts having interfitting portions for removably retaining said stem part in an operating position within said housing and about said seating part, the interfitting portion of said bonnet being an outwardly offset recess portion,

and the interfitting portion of said stem part being an outwardly projecting annular bearing portion in rotative engagement within said recess portion of said bonnet part; said sleeve portion being positioned in an inwardly spaced relation within said central chamber portion by said annular bearing portion, annular sealing gasket means operatively positioned diagonally between the outer periphery of said seating part and the inside of said sleeve portion for sealing-off spacing therebetween within said central chamber portion in a diagonally cross-extending relation with respect to the side port of said seating part, and said stem and seating parts being endwise-removable from said housing part through the opposite second end portion of said housing after said bonnet part has been unscrewed from said housing.

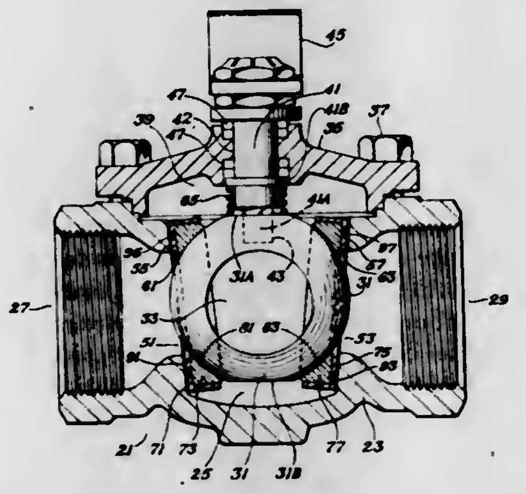
4,004,776
BALL VALVE

Carl H. Stender, Corpus Christi, Tex., assignor to Champlin Petroleum Company, Fort Worth, Tex.

Filed Jan. 17, 1975, Ser. No. 541,713

Int. Cl.^{2} F16K ***5/06***

U.S. Cl. 251—315 **2 Claims**



1. A ball valve comprising:

a valve body having a ball receiving cavity with aligned inlet and outlet passages leading to said cavity,

a ball rotatably supported in said cavity between said inlet and outlet passages,

said ball having a hard outer surface formed by a thin layer of ceramic material formed of chrome oxide coated thereon and having an opening extending through said ball,

first and second ring-shaped seats located in said valve body on opposite sides of said cavity,

the inner surfaces of said first and second ring shaped seats defining a portion of said inlet and outlet passages respectively,

each ring-shaped seat comprising an annular cast iron member having a concave seating surface adapted to engage said ball,

a resilient O-ring located between the back side of each ring-shaped seat and wall structure of said valve body to form a seal between the back side of said seats and said wall structure of said valve body,

means for rotating said ball to an open position wherein its opening is aligned with said inlet and outlet passages and to a closed position wherein its opening is out of alignment with said inlet and outlet passages,

said ball and said concave seating surfaces of said annular cast iron members being lapped to a close tolerance fit.

4,004,777
HYDRAULIC TENSIONING DEVICE

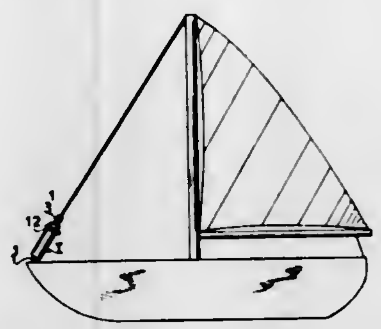
Bernard Despas, Montherme, France, assignor to Societe d'Estampage et de Forge Ardennes Champagne-Sefac, Montherme, France

Filed Dec. 16, 1975, Ser. No. 641,228

Claims priority, application France, Dec. 20, 1974, 74.43545

Int. Cl.^{2} B66F ***3/24***

U.S. Cl. 254—51 **11 Claims**



1. An hydraulic tensioning device comprising a casing, an hydraulic pump and an operatively associated jack, a shaft mounted in the casing for slidable guidance in a fixed angular position and being coupled to said jack, said shaft having longitudinally extending notches in its peripheral surface defining raised intermediate portions which are provided with transverse grooves, locking means for locking the shaft in a controlled axial position said locking means comprising a locking ring having a bore which is provided with grooves and notches corresponding with the grooves and notches on said shaft said locking ring being operatively mounted to surround said shaft, actuating means cooperating with said locking ring for moving the ring angularly and externally of said casing so as to mesh the grooves in the bore of the locking ring with the corresponding grooves on said shaft to thereby lock the shaft in an adjusted axial position and to disengage the grooves on the shaft and the ring and permit axial movement of the shaft, said locking ring being keyed to said casing.

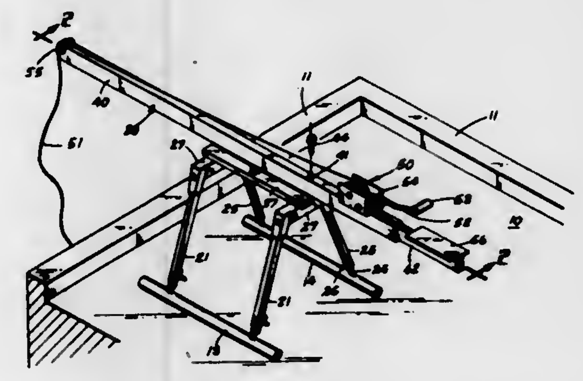
4,004,778
PORTABLE ROOF WINCH

George J. Steinhagen, 7119 W. Roma, Phoenix, Ariz. 85033

Filed Mar. 29, 1976, Ser. No. 671,088

Int. Cl.^{2} B66C ***23/72***

U.S. Cl. 254—142 **7 Claims**



1. In a portable roof winch,

a. a collapsible frame for erection on a roof and including a bar which assumes a horizontal position when the frame is erected;

b. an extensible beam secured to said bar by a pivotal mounting and comprising two telescopic parts one of which is secured to said pivotal mounting and presenting a free end and the other of which is moveable relative to said pivotal mounting and having a free end;

c. a pulley on the free end of said part which is secured to the pivotal mounting;

d. a manually operable winch carried by the telescopic part that is moveable relative to said pivotal mounting and located adjacent to but spaced from the free end of that telescopic part;

e. an operator's seat on the telescopic part on which said winch is mounted between the free end of that part and the winch;

f. mechanism for holding said telescopic parts of the extensible beam in an adjusted position; and

g. a cable that is taken up on said winch passes over said pulley, and has a free end with load engaging means thereon whereby counterbalance is supplied by the weight of an operator sitting on the seat.

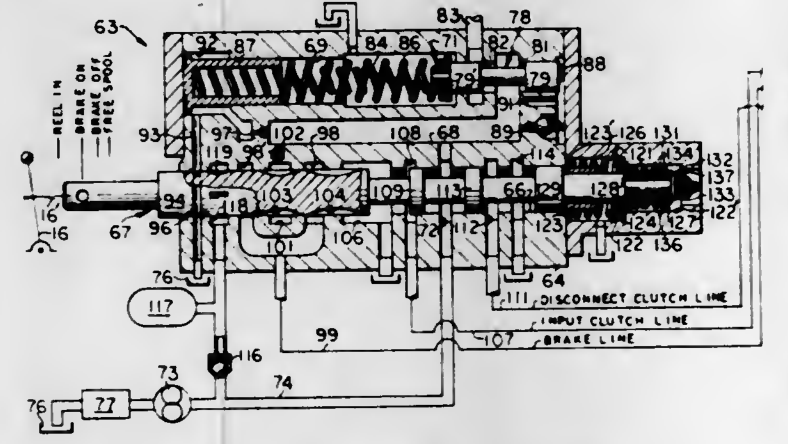
4,004,779
WINCH AND FLUID CONTROL SYSTEM THEREFOR

Edward E. Flesburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 5, 1975, Ser. No. 574,807

Int. Cl.^{2} B66D ***1/00***

U.S. Cl. 254—187.4 **6 Claims**



1. A winch and fluid control system comprising:

a rotatable drum for receiving and releasing a cable,

drive means for supporting said drum and for selectively transmitting rotary drive thereto, said drive means having a normally disengaged input clutch which engages in response to application of fluid pressure thereto and further having a normally engaged brake for stopping rotation of said drive means and which is releasable by application of fluid pressure thereto and still further having a normally engaged disconnect clutch which disengages said drum from said drive means in response to fluid pressure,

a source of pressurized fluid,

a control valve having an inlet chamber communicated with said source of pressurized fluid and having a brake fluid outlet and an input clutch outlet and a disconnect clutch outlet connected to said brake and said input clutch and said disconnect clutch respectively, said control valve having a valving element shiftable between at least four positions including a Brake-On position at which said inlet chamber is isolated from each of said outlets and a Reel-In position at which said inlet chamber is communicated with said input clutch outlet and said brake outlet while said disconnect clutch outlet is vented and a Brake-Off position at which said inlet chamber is communicated with said brake outlet while said input clutch outlet and said disconnect clutch outlet are vented, and a Free-Spool position at which said inlet chamber is communicated with said disconnect clutch outlet,

resilient centering means for urging said valving element towards said Brake-On position and for resisting movement of said valving element away therefrom, and

means for creating additional resistance to further movement of said valving element as said valving element approaches said Free-Spool position thereof, said means for creating additional resistance to movement of said valving element being additional resilient means positioned to be distorted by movement of said valving element only upon movement of said valving element into said Free-Spool position thereof from the next adjacent one of said positions thereof.

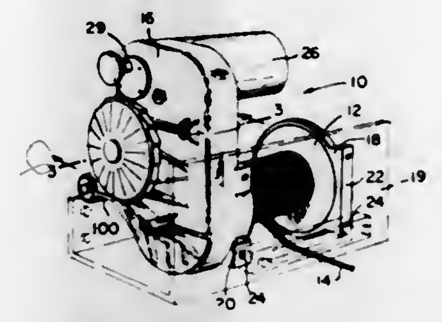
4,004,780
WINCH

Encho Janaki Kuzarov, Milwaukie, Oreg., assignor to Warn Industries, Inc., Kent, Wash.

Filed Sept. 23, 1975, Ser. No. 615,848

Int. Cl.^{2} B66D ***1/00***

U.S. Cl. 254—187.4 **7 Claims**



1. In a winch comprising:

a. a drum adapted to have a cable wound thereon,

b. a first power transmitting means operatively connected to said drum,

c. a driven cam member having an axially facing cam surface and having an operative connection to said first power transmitting means, said cam being rotatable in a first direction to cause said drum to turn so as to reel in cable, and rotatable in a second direction to cause said drum to pay out cable,

d. a rotatably mounted second driving cam member having an axially facing second cam surface to engage said first cam surface, said second cam member being rotatable in a first direction to engage said first cam member in wedging engagement to urge said first and second cam members axially away from each other and to tend to drive said cam member in its first direction to reel in cable, and rotatable in a second direction to move away from wedging engagement to permit said first cam member to rotate in its second direction to pay out cable,

e. second power transmitting means to transmit power from a power source to said second drive cam,

f. a brake-clutch assembly comprising:
   1. a rotatably mounted ratchet plate,
   2. a first shoe mounted on one side of the ratchet plate and connected to the first driven cam so as to rotate therewith,
   3. a second shoe mounted on the other side of the ratchet plate and connected to the second cam member so as to rotate therewith,

g. said first and second shoes being connected to said first and second cam members to be movable toward each other and into frictional engagement with said ratchet plate by movement of the first and second cam members axially away from each other, and movable away from each other and out of frictional engagement with the ratchet plate by movement of the first and second cam members axially toward each other, whereby wedging engagement of the two cam members tends to move the shoes into engagement, and movement of the cam members out of wedging engagement permits the shoes to move up out of engagement,

h. said winch being characterized in that:
   1. when the winch is rotating in a direction to pay out cable at a constant speed by virtue of an exterior force acting on said drum, there are internal drag forces on the second drive cam including the drag of the second power transmitting means, the second shoe and the second cam member, which drag results in a first axially directed force component being created between the two cam members to urge said cam members away from each other and urge the shoes into engagement,

2. said winch has a practical minimum and maximum operating range with regard to the magnitude of torque loads against which the drum acts, and with the winch reeling in or paying out cable at the practical minimum operating limit, the torque load on the drum, acting back through the driven cam, produces a second axially directed force component tending to move the cams away from each other to cause the shoes to engage,
3. with the shoes disengaged, and with a tension load being applied to the cable so that cable is paying out at an accelerating rate of speed, there is practical upper limit to the level of acceleration of rotational speed of the winch drum, and at such level of acceleration, the frictional drag forces that act on the second drive cam and inertial forces of those components which act on the second drive cam, including the second shoe, the second power transmitting means and the second drive cam itself, are additive, this resulting in a third axially directed force component tending to move the two cams away from each other and cause the shoes to be engaged,
4. said winch being so constructed that the first force component is less than the second force component or the third force component, the improvement comprising:

a. constantly engaged pawl means which engage said ratchet plate in a manner that under all operating conditions of the winch, said ratchet plate is permitted to rotate only in a direction to reel in cable, and
b. biasing means to exert a fourth axially directed force component to urge said shoes out of engagement and urge said cam members axially toward each other, said biasing means being such that said fourth force component is greater than said first force component but less than said second or third force component, whereby:
   1. with the winch operating under power to reel in cable, as in lifting a load, the shoes are engaged with the ratchet plate, so that when power is turned off, the clutch-brake assembly functions as a brake to stop cable from paying out under the force of the external load,
   2. with the winch operating under power to pay out cable as in lowering a load, the shoes are in engagement with the ratchet plate, so that sliding engagement occurs with the clutch-brake assembly acting as a speed governor to prevent the drum from overrunning the power source,
   3. with cable being pulled off the drum at a moderate rate of acceleration, the shoes remain disengaged to permit the paying out of cable with the ratchet plate remaining stationary, and
   4. in a situation where cable is paying out at an excessive rate of acceleration, the shoes engage the stationary ratchet plate to act as a brake and stop further paying out of cable.

4,004,781
ARRANGEMENT FOR THE MANAGEMENT OF PASTURES ALONG LAND STRIPS LIMITED BY WIRE FENCES

Fernando Ramon Pereda, Dr Luis Agote 2455, Buenos Aires, Argentina

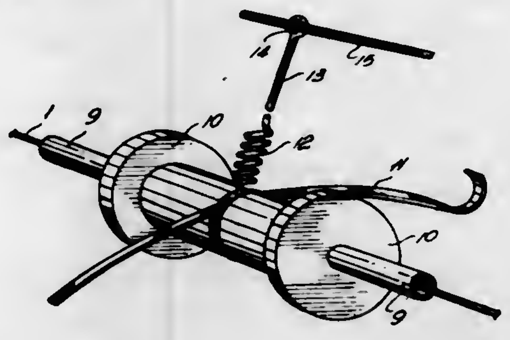
Filed Sept. 26, 1975, Ser. No. 617,259

Int. Cl.² A01K *3/00*

U.S. Cl. 256—10 **3 Claims**

1. An arrangement for rotational grazing of pastures along land strips defined by wire fences, comprising

a. a body having a passage for a wire;
b. a wire extending through said passage;
c. at least one disc-shaped member on said body, the axis of said disc-shaped member being coaxial with said passage;
d. a plurality of guiding wires defining boundaries of said land strips;
e. means for linking the ends of said first-mentioned wire with said guiding wires;
f. a supporting member on said body;
g. a resilient member having one of its ends attached to said supporting member;



h. a conductive wire parallel to said first-mentioned wire and slidably coupled to said resilient member;
i. said conductive wire being provided at its ends with slidable attachment means having respective conductors extended on said guiding wires and connected to a voltage source.

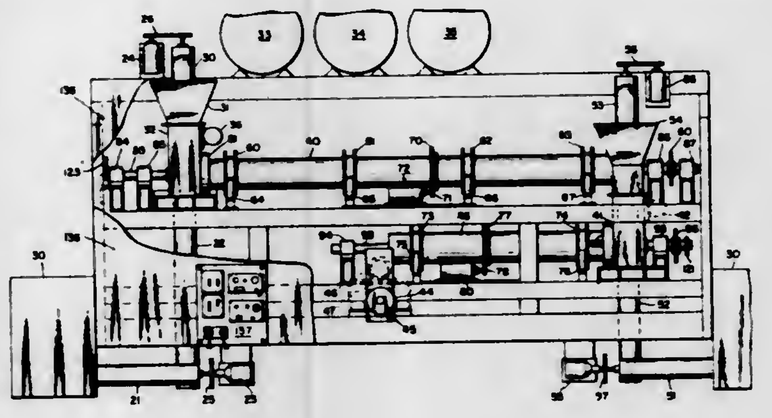
4,004,782
MACHINE FOR MIXING AGGREGATE AND RESIN

Harvey I. Jeppsen, Mesa, Ariz., assignor to J.I.P. Industries, Inc., Los Angeles, Calif.

Filed July 7, 1975, Ser. No. 593,551

Int. Cl.² B01F *7/24*

U.S. Cl. 259—3 **9 Claims**



1. A mixing machine for mixing a particulate material with a liquid resin compound comprising:

a mixing chamber for receiving and combining said particulate material and said liquid resin compound;
a rotatably mounted mixing tube mechanically coupled to said mixing chamber for mixing and conveying said material and said compound therefrom;
a shaft having a spiral mixing screw conveyor disposed within said mixing tube;
a plurality of triangular teeth disposed along said shaft between the spirals of said spiral mixing screw conveyor; and
drive means coupled to said tube and said shaft for counter-rotation thereof to provide a turbulent mixing action which coats each particle of said material with said compound.

4,004,783
PROCESS CONTAINER

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360
Division of Ser. No. 321,436, Jan. 5, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,366

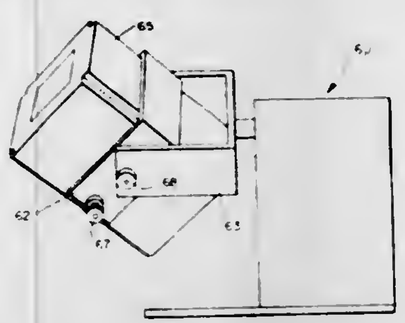
Int. Cl.² B01F *11/00, 9/00*

U.S. Cl. 259—72 **4 Claims**

1. A process for processing material which comprises the steps of

providing a container which has a central portion for containing the material to be processed,

providing a device for supporting said container, said device comprising arms for engaging and supporting said container and means for moving said arms.
providing complementary elongated slidably interlocking fitting means on said arms and on said container, said fitting means on said container extending transversely thereof;
providing a plurality of retractable members on said arms and complementary apertures on said container for engaging said retractable members,



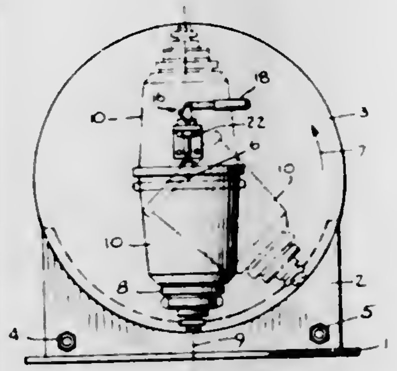
displacing said retractable members to their retracted position,
bringing said container into engagement with said arms so that said complementary fitting means slide into interlocking engagement and provide transverse support for said container,
returning said retractable members to their unretracted position so that they engage said complementary means to interlock said container to said arms, and
mixing the material in said container by moving said arms.

4,004,784
MACHINE FOR PREPARING ORTHOPEDIC CAST-MAKING MATERIALS

Edward C. Distler, Warminster, Pa., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.
Continuation of Ser. No. 536,243, Dec. 24, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,499

Int. Cl.² B01F *9/00*

U.S. Cl. 259—72 **13 Claims**



1. A machine for tilting and rotating a container comprising a first support mounted for rotation around a predetermined. horizontal axis, a second support normally facing in an upward direction for receiving said container in the upright position thereof and rotatably mounted on said first support with its axis of rotation extending transversely to said first-mentioned axis, clamping means mounted on one of said supports for securing said container to said second support for rotation therewith, and rotating means including timing means, said rotating means being connected to said first and second supports for selected sequential and intermittent rotation of said first and second supports about their respective axes, said first support being rotatable by said rotating means for repositioning said second support from facing in the upward direction to a position in which it faces in a downward direction.

4,004,785
SELF-CLEANING TYPE STIRRING APPARATUS

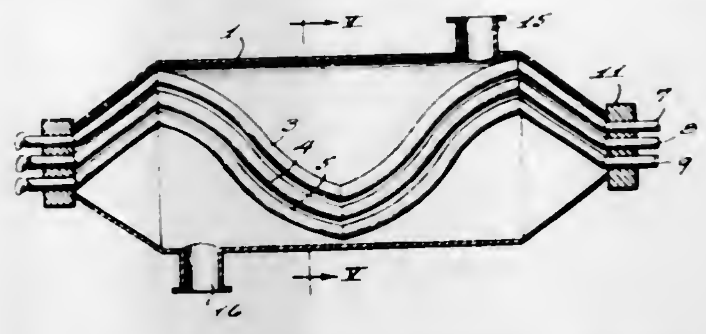
Hikokusu Kajimoto, and Takafumi Shimada, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1973, Ser. No. 322,685

Claims priority, application Japan, Jan. 19, 1972, 47-7385

Int. Cl.² B01F *7/18, 15/06*

U.S. Cl. 259—104 **2 Claims**



1. A self-cleaning type stirring apparatus, comprising:

a container having a tubular outer peripheral wall and two opposite ends;
a corresponding plurality of rotary shafts rotatably extending into the container from the two opposite ends to provide pairs of rotary shafts, the rotary shafts at each end all having axes of rotation mutually laterally displaced from another;
a plurality of stirring members disposed within the container, the number of stirring members corresponding to the number of said pairs of rotary shafts;
each stirring member being of looping U-shape so as to include a central portion and two opposite end portions which are inclined with respect to the axes of rotation of said rotary shafts;
the opposite end portions of each stirring member being connected between the two individuals of a respective pair of said rotary shafts so that each stirring member includes a central portion which is substantially radially displaced from the axes of rotation of the rotary shafts of the respective pair to which that stirring member is connected, so that as each pair of rotary shafts is rotated once, said central portion of the respective stirring member is correspondingly revolved about the rotary axes of that pair of rotary shafts;
said stirring members including the central and two opposite end portions thereof and said rotary shafts, collectively, upon rotation of said rotary shafts, sweeping close to said peripheral wall and said two opposite ends, and sweeping close to one another along substantially the full axial extent of the interior of the container, without mutual interference, the stirring members all nesting when all extend in the same radial direction from the respective rotary shafts.

4,004,786
STIRRING DEVICE

Will R. Stephens, Cedar Rapids, Iowa, assignor to Barnard & Leas Manufacturing Co. Inc., Cedar Rapids, Iowa

Filed May 16, 1975, Ser. No. 578,104

Int. Cl.² B01F *7/00*

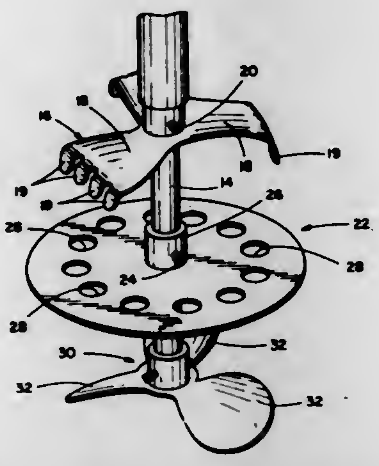
U.S. Cl. 259—107 **3 Claims**

1. A stirring device for mixing ingredients in a tank comprising:

(a_1) a tank,
a. a motor,
b. a shaft extending into said tank and mounted for rotational movement about a vertical axis,
c. a horizontally disposed circular shear plate mounted for rotation with said shaft, said plate having a plurality of openings for shearing ingredients forced therethrough,
d. a first prop mounted for rotation with said shaft above

and spaced from said shear plate having at least two blades pitched from the horizontal to mix and propel said ingredients downwardly toward said shear plate and having a plurality of fingers extending outwardly from the ends of the blades in a direction toward the shear plate,

e. a second prop mounted for rotation with said shaft below



and spaced from said shear plate having at least two pump blades pitched from the horizontal in the direction opposite to the pitch of the blades of the first prop to mix and propel said ingredients upwardly toward said shear plate, whereby the combined actions of the first and second props produce a vortex condition in the vicinity of the rotating shear plate for thorough mixing.

4,004,787
MIXING AND VENTING EXTRUDER

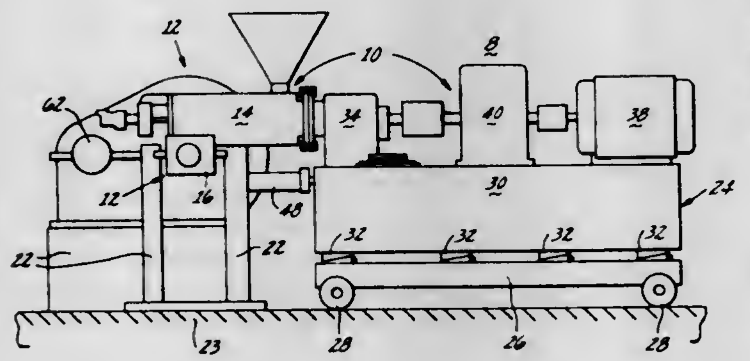
Henry Ellwood, and Maurice Rothwell, both of Greater Manchester, England, assignors to USM Corporation, Boston, Mass.

Filed Jan. 8, 1976, Ser. No. 647,511

Claims priority, application United Kingdom, Jan. 10, 1975, 1037/75; May 9, 1975, 19527/75

Int. Cl.² B29B *1/10;* B01F *7/08, 15/02*

U.S. Cl. 259—192 **4 Claims**



1. A screw-extruding machine for homogeneously mixing and extruding a thermoplastic material, said machine comprising:

- a feed hopper for feeding thermoplastic material to said machine;
- at least one rotor disposed in a mixing bore of said machine for mixing said thermoplastic material fed to said machine;
- an extruding screw disposed in an extruding bore of said machine, said extruding bore being in communication with said mixing bore;
- a sealable vacuum chamber disposed about the rearward end of said extruding screw;
- a vacuum pipe attached to said vacuum chamber permitting gaseous evacuation of said material during machine operation;
- a scrap outlet disposed included with said sealable vacuum chamber; and

means for reversing said extruding screw to cause undesirable material from being extruded through said screw bore, said undesirable material being disposable through said outlet disposed within said vacuum chamber.

4,004,788
MIXING AND KNEADING MACHINE

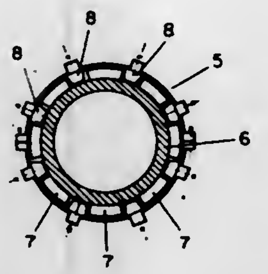
Fritz Ronner, Prattein, Switzerland, assignor to BUSS Aktiengesellschaft, Basel, Switzerland

Filed Oct. 3, 1972, Ser. No. 294,581

Claims priority, application Switzerland, Oct. 28, 1971, 15736/71

Int. Cl.² B29B *1/04, 1/06*

U.S. Cl. 259—191 **1 Claim**



1. A method of increasing the output of a mixing and kneading machine consisting essentially of a casing of fixed length; a screw shaft arranged in said casing; said screw shaft being provided with at least four mixing and kneading vanes; said casing being provided with kneading elements equal in number to said vanes and projecting radially inwardly on the inner wall of said casing; means for simultaneously rotating and reciprocating at least once per rotation said screw shaft within said casing; the method steps comprising the steps of increasing the diameter of the casing by a factor of 2 to 3 while simultaneously increasing the core diameter of said screw by an amount to maintain unchanged the difference between the casing diameter and the diameter of the screw and simultaneously reducing the screw speed by a factor of ½ to ⅓; providing a number of worm vanes and of kneading elements which is increased by a factor of 2 to 3, the increased number of vanes and kneading elements and the increases in the diameter being inversely proportional to the reduction in screw speed and further increasing the number of axial reciprocating movements of the screw by at least the same factor as the increase in the screw diameter.

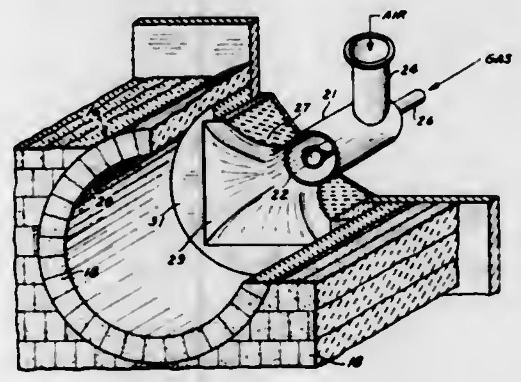
4,004,789
TUNNELIZED BURNER FOR PANEL TYPE FURNACE

John J. Beias, Baltimore, and Leonard P. Pellatiro, Glen Arm, both of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 5, 1975, Ser. No. 547,306

Int. Cl.² C21D 9/56

U.S. Cl. 266—87 **8 Claims**



1. Apparatus for heating a flat continuous metallic strand of a predetermined width moving in a vertical path, comprising:

a. a plurality of heating zones, each zone consisting of a set of two panels disposed in parallel relationship and spaced from one another such as to permit the vertical movement of the strand through said heating zones between each set of panels,

b. at least one of said panels having a flat face portion adjacent the moving strand and a central passage that extends inwardly from said flat face portion through such panel, and

c. a burner having a nozzle and a burner block surrounding said nozzle, which burner is mounted at the rear of such panel in line with said central passage, said central passage having a substantially uniform transverse cross-section from said flat face portion to said burner block and said burner block having a cone shaped throat diverging from said nozzle toward said central passage, whereby the flame produced by such burner does not impinge against the moving strand.

4,004,790
PLATE-TYPE RADIATOR SUITABLE FOR SHAFT FURNACES, PARTICULARLY FOR BLAST FURNACES, AND A METHOD FOR FABRICATION OF THIS RADIATOR

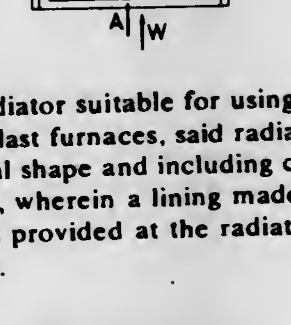
Leszek Krol; Adam Gierek, both of Katowice; Kazimierz Skoczkowski, Raciborz; Stanislaw Bednarczyk, Chorzow; Pawel Mandelka, Swietochlowice; Teodor Nowak, Bytom, and Eugeniusz Krzemien, Katowice, all of Poland, assignors to Huta Kosciuszko, Frzedsiebiorstwo Panstwowe, Chorzow, Poland

Filed Nov. 19, 1975, Ser. No. 633,382

Claims priority, application Poland, Nov. 26, 1974, 175946

Int. Cl.² C21B *7/10*

U.S. Cl. 266—193 **3 Claims**



1. A plate-type radiator suitable for using in shaft furnaces and particularly in blast furnaces, said radiator having a conventional geometrical shape and including cooling pipes cast-in in a cast iron box, wherein a lining made of semi-graphite straight sections 3 is provided at the radiator side facing the interior of a furnace.

4,004,791
PRESHAPED BLAST FURNACE HEARTH CONSTRUCTION

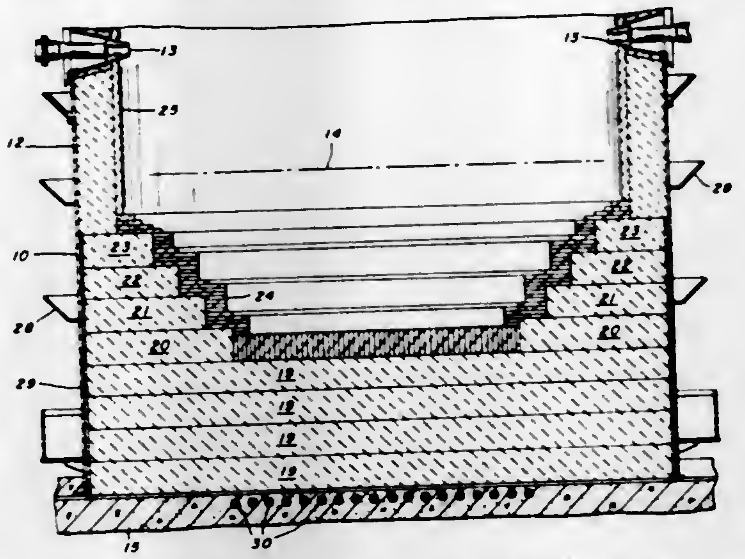
Leonard M. Saunders, Pine Township, Allegheny County, Pa., and Earl W. Sieger, Bayvillage, Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1976, Ser. No. 667,789

Int. Cl.² C21B *7/06*

U.S. Cl. 266—197 **4 Claims**

1. In a blast furnace hearth constructed of carbon blocks and having a dished upper face, the improvement in which said hearth comprises a plurality of courses of full carbon beams, and a plurality of courses of stub carbon beams overlying the uppermost course of full carbon beams, the courses of stub beams being progressively shorter from the lowermost upwardly and extending inwardly from the hearth wall toward the center of the furnace.



4,004,792
METALLURGICAL FURNACE HAVING FLUID INJECTION MEANS FOR A MELT IN THE FURNACE

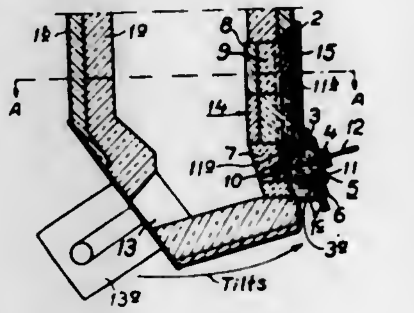
Kåre Folgerö, Vasteras, and Lars-Gunnar Norberg, Hagfors, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 23, 1975, Ser. No. 625,200

Claims priority, application Sweden, Oct. 29, 1974, 7413574

Int. Cl.² C21C *5/48*

U.S. Cl. 266—218 **3 Claims**



1. A metallurgical furnace comprising a vessel which tilts between substantially vertical and horizontal positions and having a refractory lining for containing a melt, said vessel having a lower portion with substantially opposite sides through which first and second openings are formed respectively, the first opening giving the melt access to an electric inductor means for receiving and heating a portion of the melt and a fluid-injection nozzle being positioned in the second opening, said vessel having a removable refractory wall portion extending upwardly from said second opening and nozzle, said wall portion, second opening and nozzle being free from the melt when said vessel is tilted to a substantially horizontal position, said second opening being formed by inwardly tapered boundary surfaces of said lining, and said removable refractory wall portion having correspondingly tapered boundary side surfaces and being formed as separable inner and outer parts with respect to the inside of said vessel, said inner part being formed by separable segments.

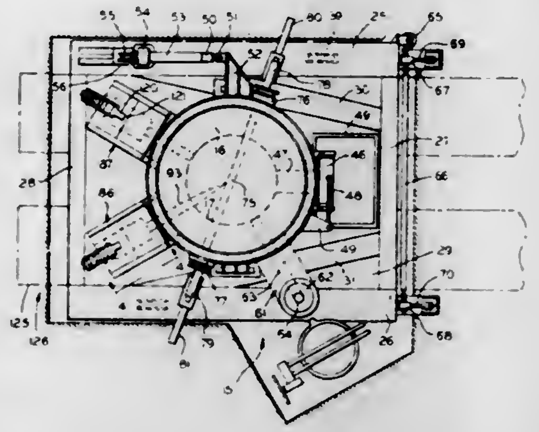
4,004,793
DUAL HOLDING FURNACE

Ronald D. Gray, Bethel Park, Pa., assignor to Leotromelt Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,843

Int. Cl.^{2} C21C *5/42*

U.S. Cl. 266—236 **12 Claims**



1. A holding furnace comprising a vessel including a refractory shell defining a first space for containing molten material,

cover means enclosing said space,

support means for supporting said vessel in an elevated position above a conveyor space,

a plurality of refractory lined pouring chambers extending from one side of said vessel in spaced apart relation, each of said chambers communicating with said first space adjacent the lower end thereof, each of said chambers having a bottom with an opening formed therein, said openings being disposed for draining molten material from said chambers into molds located beneath said vessel,

a plurality of stopper means respectively mounted for movement into and out of an opened and closed position relative to said openings,

operating means for individually operating said stopper means to selectivity open said openings for draining said molten material from said chambers and to close said openings for interrupting said draining of material,

a plurality of conveyor means disposed below said vessel and in said conveyor space and one passing beneath each chamber for positioning molds consecutively under each of said openings.

4,004,794
SPRING FORMED OF AN ELASTOMER MASS INCLUDING WATER

Jean Jarret, Fourqueux, and Jacques Jarret, Vhatou, both of France, assignors to Societe d'Exploitation des Ressorts Auto-Amortisseurs Jarret, Paris, France

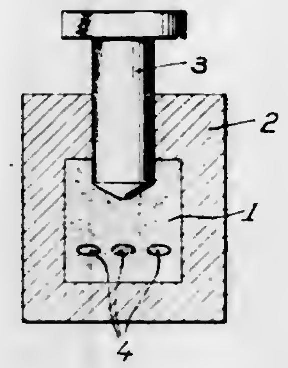
Filed Apr. 5, 1973, Ser. No. 348,162

Claims priority, application France, Apr. 19, 1972, 72.13817

Int. Cl.^{2} F16F *9/52, 1/36*

U.S. Cl. 267—153 **2 Claims**

1. An improved spring of the type in which an elastomer is subjected to hydrostatic compression wherein an elastomer mass is contained in an enclosure defined by a metallic casing and by a piston mounted to a slide in a wall of the casing, the improvement characterized in that the elastomer mass comprises inclusions of water contained in at least one sealed and deformable bag.



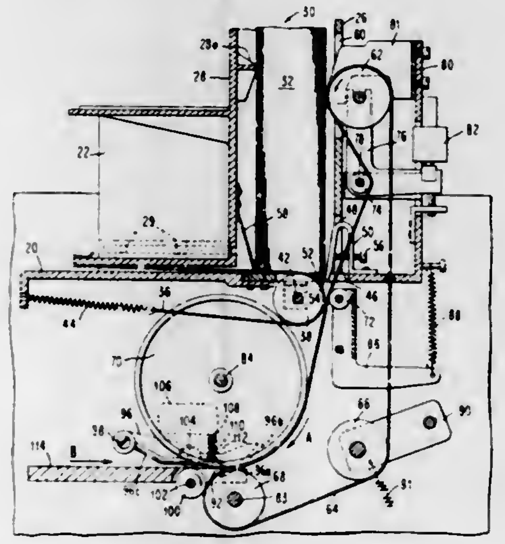
4,004,795
HOPPER MECHANISM

Mark Charles Agnew, Rochester, Minn.; James Jacob Best, Austin, Tex., and Willard Leon Gudgel, Byron, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 461,469, April 16, 1974, abandoned. This application June 12, 1975, Ser. No. 586,313

Int. Cl.^{2} B65H *3/06, 1/12, 9/06*

U.S. Cl. 271—10 **11 Claims**



5. Hopper mechanism for document cards comprising:

means forming a hopper for vertically disposed document cards in the form of a stack including a hopper base extending transversely of said document cards and supporting the document cards, means for bracing a front card of the stack, and a back shoe effective on the back card of the stack and moveable toward said bracing means,

said hopper base being provided with a throat gap through it adjacent the front card of the stack through which the front card may pass,

a pick roll positioned to move into contact with the front card of the stack as braced by said bracing means to move the card through said throat gap,

a thin flexible material strip extending across the upper surface of said hopper base for holding the bottom edges of said document cards spaced with respect to the upper surface of said hopper base, one end of said strip being attached to said back shoe, and

means for exerting a pull on the other end of said strip for thereby causing said strip to move across said hopper base along with movement of said back shoe toward said card bracing means as the cards are fed through said throat gap out of said hopper.

7. Document card transport mechanism including

moveable means for engaging with a document card and propelling it forwardly in a certain path,

a swinging registration arm positioned in said path and having a document card registration edge in said path and arranged so that a card passing forwardly in said path swings the registration arm to move the registration edge out of the path to allow the card to pass beyond said registration edge,

a roll positioned to have a peripheral surface in said path beyond said registration edge, and

means for driving said roll so that its said peripheral surface moves reversely with respect to the forward direction of movement of a document card so that the roll drives the document card backwardly after said card passes beyond said registration edge and drives the card into contact with said registration edge so as to register the card in a particular position in said path.

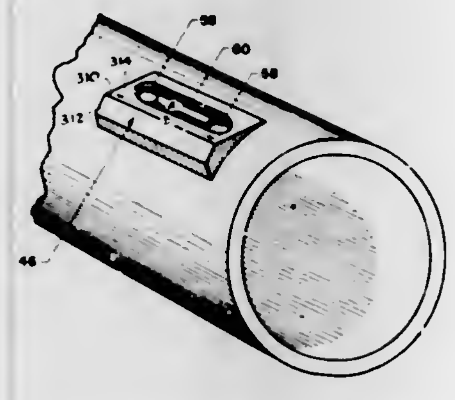
4,004,796
CALIPER-STITCH AND TRIM MACHINE

Thomas F. Macke, Fort Lauderdale, Fla., assignor to Hydrabind, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 299,819, Oct. 24, 1972, Pat. No. 3,938,799. This application Sept. 4, 1973, Ser. No. 393,914

Int. Cl.^{2} B65H *3/10*

U.S. Cl. 271—94 **8 Claims**



1. A sheet material separator device for moving a first sheet of material from generally flat overlying sheets of material comprising:

a base member,

a first sheet contact member including a generally flat contact surface with a leading edge, a breaking means positioned above and rearward of said leading edge of said contact surface, and a following surface, said contact member movably connected to said base member for arcuate movement into engagement with and away from the generally flat overlying sheets, said contact surface positioned forward in reference to the direction of movement of said contact member of said breaking means, said breaking means positioned forward of said following surface, said breaking means being a line forming the common boundary between said contact surface and said following surface, said following surface positioned to prevent direct contact of said following surface with the first sheet during initial movement of the first sheet after said contact surface engages the first sheet and begins separating the first sheet from the overlying sheets,

a connecting means connected in said contact surface for holding a contact portion of the first sheet of material in generally fixed engagement with said contact surface and generally over said breaking means, said connecting means being generally surrounded by said contact surface and being smaller in surface area than said contact surface,

moving means connected to and between said base member and said contact member for moving said contact member in a path to and from the generally flat overlying sheets

said following surface falling away from said breaking means in the direction opposite to the direction of movement of said contact member and toward said moving means, said breaking means aiding in separating said contact surface of said first sheet from said generally flat overlying sheets during the initial movement of said contact member.

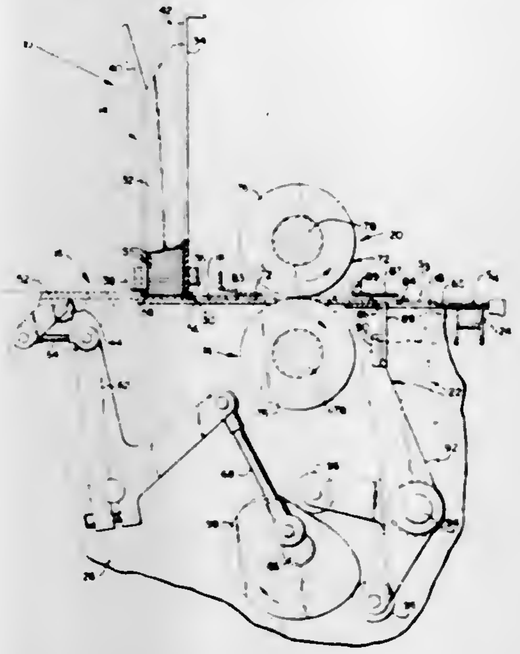
4,004,797
GUM SLAB FEED APPARATUS

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Division of Ser. No. 463,909, April 25, 1974, Pat. No. 3,933,064. This application June 19, 1975, Ser. No. 588,152

Int. Cl.^{2} B65H *1/06, 3/24*

U.S. Cl. 271—136 **10 Claims**



1. A gum slab feeding apparatus comprising a frame including means defining a substantially horizontal gum slab feed path having an upwardly facing slab support surface, a magazine feed mechanism including a magazine for containing a supply of gum slabs, means supporting said magazine on said frame for pivotal movement about a horizontal axis extending transversely of said path and longitudinally spaced from said magazine between an active position wherein said magazine extends upwardly from said path to maintain a supply of gum slabs in vertically stacked relation to said path and an inactive position wherein said magazine is vertically displaced a substantial distance above said path and longitudinally spaced a substantial distance from its active position, and a pusher mechanism for successively feeding gum slabs from the bottom of said magazine and along said path, a plurality of transversely spaced and longitudinally extending guide plates mounted on said frame and defining another horizontal surface above said support surface and a forwardly facing front surface extending transversely of said path, said pusher mechanism having at least one pusher finger supported for reciprocal forward and rearward movement in a space between a pair of adjacent guide plates between an advanced position and a retracted position, said one pusher finger having a forward end portion including a horizontally disposed first upper surface below the elevation of said another surface and a forwardly facing first abutment surface at its forward end, said one finger having a rear portion including a horizontally disposed second upper surface above the elevation of said other surface and a second forwardly facing abutment surface defining a junction between said forward end portion and said rear portion, and drive means for imparting reciprocal forward and rearward movement to said pusher mechanism, said magazine having a pair of transversely spaced end brackets and means providing transverse connection between said end brackets and defining front and rear walls of said magazine, said front

and rear walls being generally vertically disposed and having lower edges spaced above said other surface a distance slightly greater than the vertical dimension of a slab contained within said magazine when said magazine is in its active position, said other surface defining the bottom of said magazine when said magazine is in its active position.

4,004,798
PHOTOCOPYING MACHINE SHEET SEPARATION DEVICE

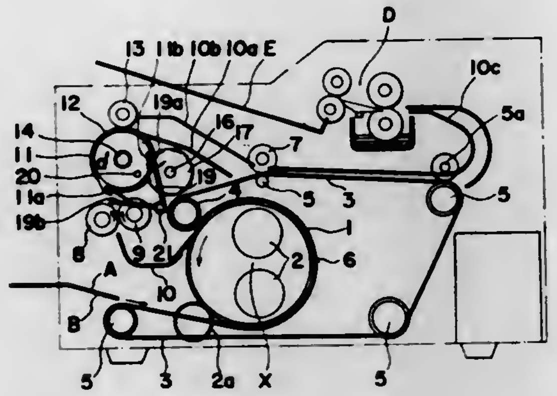
Naohiro Akisato, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1976, Ser. No. 672,537

Claims priority, application Japan, Apr. 8, 1975, 50-47737[U]

Int. Cl.² B65H *29/64*

U.S. Cl. 271—172 **12 Claims**



1. In a photocopying machine comprising a pair of slippage rolls through which an original document and a sheet of copy paper are passed subsequent to exposure of the copy paper, the rotary speed of constituent rolls of said pair of slippage rolls being such that said copy paper is caused to precede said original document at least during initial passage of said original document and said copy paper through said slippage rolls so as to separate, automatically said copy paper from said original document, a sheet separation device comprising;

separator guide means including at least one plate element and a support shaft on which said plate element is freely rotatable, said plate element having a peripheral notched portion in which the leading edge portion of said copy paper is engaged so as to be guided along an orbit out of the path of the original document,

stop means which engage said separator guide means to hold said notched portion at a position to face the leading edge portion of said copy paper exiting from said slippage rolls, and, in turn, is disengaged from said separator guide means by being contacted by the leading edge portion of said copy paper,

initial drive means coupled to said separator guide means for forcibly rotating said separator guide means in a direction of disengaging said notched portion from the leading edge portion of said copy paper when said stop means is disengaged from said separator guide means, and

subsequent drive means coupled to said separator guide means for continuously rotating said separator guide means at a speed lower than the peripheral speed of said slippage rolls to the waiting position where said separator guide means is again engaged with said stop means.

4,004,799
RECONSTRUCTIBLE KARATE BOARD

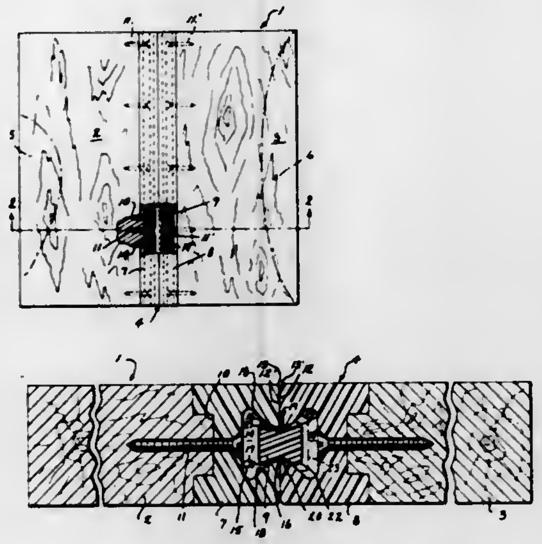
Robert L. Kundert, Madison, Wis., assignor to Focus/Board Inc., Madison, Wis.

Filed Apr. 7, 1975, Ser. No. 565,910

Int. Cl.² A63J *5/00*

U.S. Cl. 272—8 N **13 Claims**

6. A karate board comprising a pair of similar elongated similar shaped flat board members each having a thickness substantially less than its width or length and having a joinder edge, a separable replaceable connecting means for securing said board members in an edge to edge relationship, said connecting means including a pair of corresponding channel members fixedly secured one each to each edge said joinder edges, each of said channel members having flat edge faces located in abutting relation in the connected position of said board members and including a centrally located coupling channel, each of said coupling channels having an entrance neck portion defining a pair of locking projections having a limited flexibility and an inner enlarged base portion spaced inwardly of the projections, an elongated key member; said key member having at least one pair of opposed enlarged portions and a reduced portion intermediate said enlarged portions, each of said coupling channels of said connecting means receiving an enlarged portion of said key member and said reduced intermediate portion of said key member receiving a projection of each of said chambers when said board members are connected in said edge to edge relationship said edge channels and key member forming a non-breaking deformable releasable connection firmly connecting said board members in coplanar relationship and preventing separation of the flat board members in the plane of the board members and transverse of said joinder edges and with the edge key snapping outwardly of said channel without noticable disruption of the channels and key in response to a karate force applied to the keyed board member.



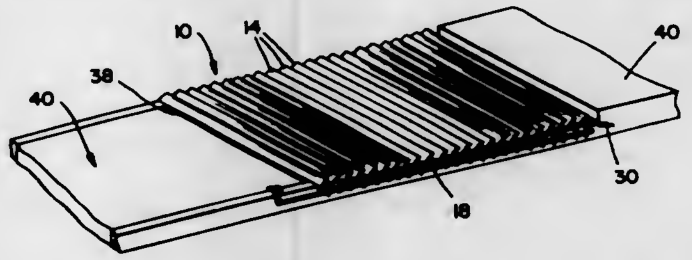
4,004,800
LONG JUMP MARKING BOARD

Richard E. Hanner, 8455 Laurel Lane, Loomis, Calif. 95650

Filed June 26, 1975, Ser. No. 590,657

Int. Cl.² A63K *3/04*

U.S. Cl. 272—101 **6 Claims**



1. A running long jump take-off board for indicating the initiation of a running jump comprising:

a generally elongated base member having a planar, continuous horizontally disposed upper surface;

a plurality of generally elongate longitudinally parallel, spaced flat strip elements disposed in parallel, overlying relation to and supported by said upper surface extending transverse a direction of said board and of said running jump, each of said elements having a lower elongated edge pivotally mounted to said base member and being adapted to be individually pivoted to occupy a first upright angularly disposed position and a second substantially horizontal position, each of said elements being pivoted on said lower edge to move from said first position to said second position independently of each other, each of said elements including an upper edge disposed with respect to said lower edge, towards a point of commencement of said running jump when said elements are in said first and second positions, said second position disclosing the contact point of an athlete's foot when said elements, occupying said first position, are contacted by an athlete's foot as the jump is initiated; and

means connected to said base for returning said elements from said second position to said first position including stop means for preventing said elements to occupy a position beyond said first position.

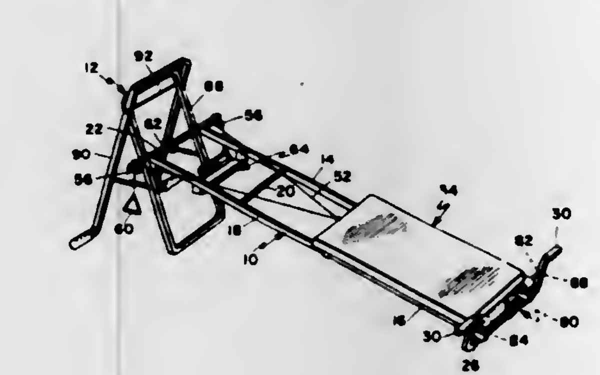
4,004,801
ISOTONIC EXERCISE UNIT

Thomas J. Campanaro, 6840 Convoy Court, San Diego, Calif. 92111, and Douglas E. Marino, 2023 Red Coach Lane, Encinitas, Calif. 92024

Filed June 13, 1975, Ser. No. 586,734

Int. Cl.² A63B *21/00*

U.S. Cl. 272—120 **5 Claims**



1. An exercise unit comprising:

a. a pair of parallel rails;

b. cross members mounted to and between said rails to maintain same in spaced relation;

c. a carriage having rollers engaged on said rails whereby said carriage is easily movable along the substantial length thereof;

d. means for maintaining one end of said rail pair at an elevation relative to the other end thereof;

e. a foot grip freely pivotable on the rails during an exercise operation, and said grip being positioned between said pair of rails near the elevated end thereof and having releasible strap means for retaining the feet therein;

f. said foot grip comprising a pair of generally orthogonally related cradle-forming padded plates, the first of which plates normally being disposed beneath the sole portions of the feet of the user and the second of said plates extending behind the heels of the user and substantially covering same whereby a person lying on said carriage can engage his feet in said foot grip and draw himself upward along said rails by pulling with the back of his heels against the second of said plates.

4,004,802
SHEET STRIPPING DEVICE

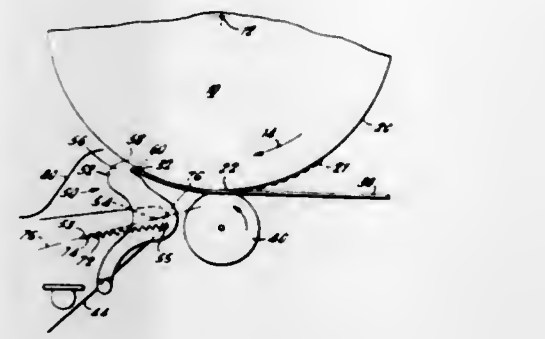
Edric R. Brooke, Welwyn Garden City, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1975, Ser. No. 619,419

Claims priority, application United Kingdom, Nov. 20, 1974, 50317/74

Int. Cl.² B65H *29/54*

U.S. Cl. 271—174 **5 Claims**



1. A device for stripping sheet material from a sheet carrying surface moving relative thereto including

a finger having a sheet contacting portion at a first end adjacent said sheet carrying surface to contact the lead edge of a sheet of material on said surface, said finger being pivoted about a point spaced from and upstream of said sheet contacting portion whereby the pivot point is behind the lead edge of said sheet material when it is engaged by said sheet contacting portion;

means for biasing said sheet contacting portion toward said sheet carrying surface, said means for biasing said sheet contacting portion toward said sheet carrying surface is an over center spring which moves over center after said finger has been moved by said lead edge to a position where said lead edge is stripped from said sheet carrying surface.

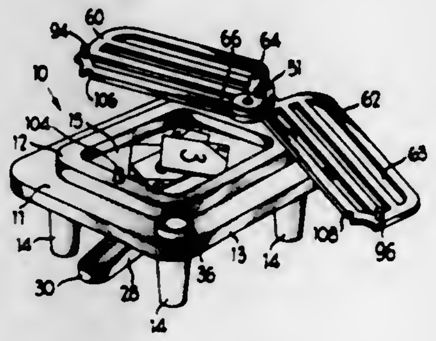
4,004,803
GAME APPARATUS WITH TIMER-CONTROLLED RECEPTACLE CLOSURE

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 623,810

Int. Cl.² A63F *9/00*

U.S. Cl. 273—1 R **12 Claims**



1. A game apparatus, comprising:

a frame;

a receptacle mounted on said frame;

pivotally mounted, generally planar closure means for said receptacle and adapted to cover said receptacle;

at least one playing piece adapted to be deposited in said receptacle by a player of the game; and

timing means operatively associated with said closure means and adapted on actuation after an interval of time to cause said closure means to cover said receptacle thereby preventing a player from depositing said playing piece in said receptacle.

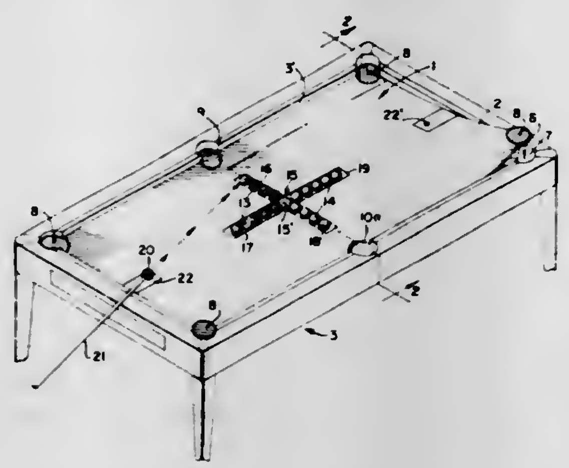
4,004,804
GAME APPARATUS

William T. Gholson, 9853 Ventura St., St. Louis, Mo. 63136

Filed Jan. 2, 1976, Ser. No. 646,021

Int. Cl.² A63D *15/00, 15/04*

U.S. Cl. 273—5 R **9 Claims**



1. A game apparatus including, a rectangular game top having a substantially planar upper playing surface, means supporting said game top at a fixed elevation, out-of-bounds markers at the four corners of said playing surface, a tee marker of a first color adjacent one end of said playing surface, a cue ball of said first color adapted to be spotted on said tee marker upon the initiation of play, a tee marker of a second color adjacent the opposite end of said playing surface, a cue ball of said second color adapted to be spotted on said second color tee marker, a plurality of sequentially numbered playing balls of said first color and a plurality of sequentially numbered balls of said second color disposed upon said playing surface, rack marking means in the center of said playing surface for initially spotting all of said playing balls, a side marker of said first color intermediately disposed along one side of said playing surface, a side marker of said second color intermediately disposed along the opposite side of said playing surface, and cues adapted to be used by two players each to drive one of said colored cue balls to sequentially strike said numbered playing balls of a similar color into one said side marker of a similar color.

4,004,805
ELECTRONIC LINE MONITORING SYSTEM FOR A TENNIS COURT

Kun-Mu Chen, 4608 Tacoma Blvd., Okemos, Mich. 48864, and Bertha L. Chen, 7200 Marine Drive, Alexandria, Va. 22307

Filed Aug. 30, 1974, Ser. No. 499,341

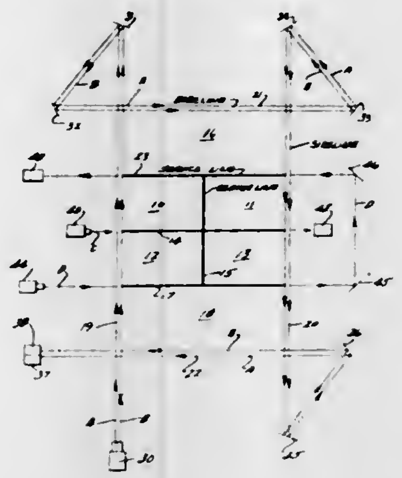
Int. Cl.² A63B *61/00*

U.S. Cl. 273—29 R **18 Claims**

1. A system for use in conjunction with a tennis court to detect shots in which a tennis ball is slightly out of bounds and provide an indication thereof comprising:

means for establishing a pair of inner and outer substantially parallel reference light beams tracing the entire outer boundary of a tennis court with said outer beam being the out-of-bounds representation point of said boundary when in use, said beams being positioned slightly above the playing surface and spaced from one another a distance such that a tennis ball will not interrupt both beams simultaneously when it strikes the boundary during play; said establishing means being a dual beam light projector and a plurality of light reflectors, at least a pair of said reflectors being positionable near at least three corners of a tennis court to direct said inner and outer beams along the boundary of a tennis court;

means for intercepting said beams after they have traced said boundary and providing signals representative of the interruption of either of said beams;



logic circuit means coupled to said intercepting means for generating a signal only when said outer beam is momentarily interrupted by a tennis ball during play; and

signalling means coupled to said logic circuit and responsive to said means generating said signal to provide an alarm indicating an out-of-bounds shot.

4,004,806
APPARATUS FOR COLLECTING BALLS

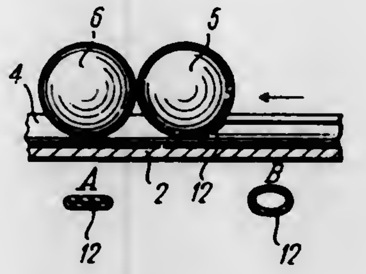
Stanislaus Malik, Taelesbahnstrasse 24, 7340 Geislingen, Germany

Filed June 26, 1975, Ser. No. 590,510

Claims priority, application Germany, June 27, 1974, 2430916

Int. Cl.² A63B *61/00*

U.S. Cl. 273—29 R **22 Claims**



1. Apparatus for collecting balls from a playing area, comprising

a. a channel surrounding at least a portion of said playing area for receiving balls rolling out of said playing area;

b. a device of relatively high weight in comparison to a ball normally used in conventional ball games, said device being capable of rolling transport in said channel;

c. means for driving said rolling device along in said channel, whereby balls received in said channel will also be driven therealong; and

d. means for collecting said driven balls.

4,004,807
TABLE BALL GAME

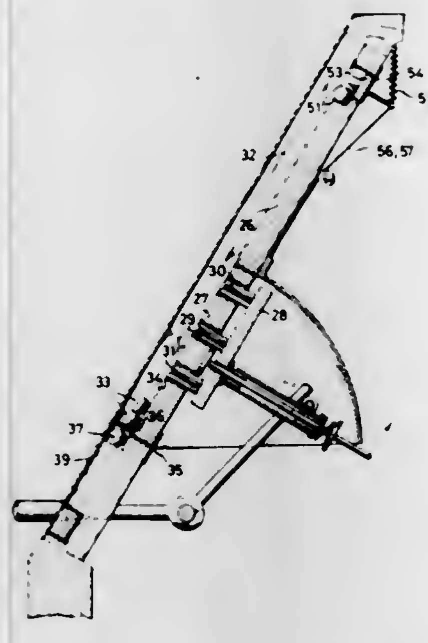
Xaver Leonhart, No. 60 1/3, Harburg b. Landau/Isar, Germany 8381

Filed Jan. 14, 1976, Ser. No. 648,950

Claims priority, application Germany, Oct. 9, 1975, 2545263

Int. Cl.² A63D *5/08*; **A63F** *7/02*; **G07F** *17/38*

U.S. Cl. 273—41 **8 Claims**



1. A table ball game comprising a housing, a long rectangular playing surface connected in said housing and having a surface opening adjacent one end thereof, an upper plate positioned in said surface opening having one side pivotally connected to said playing surface and having a surface in alignment with said playing surface and which slopes downwardly towards said one end in its normal position, said upper plate having cylindrical openings therethrough disposed at right angles to said surface thereof and of a size adapted to accommodate game balls therein, a lower plate disposed beneath and parallel to said upper plate and connected to move relative to said upper plate, upstanding cylindrical pins connected to said lower plate in registration with said cylindrical openings and having free ends which in their normal position terminate approximately in alignment with the surface of said upper plate and having small centrally disposed recesses on the said free ends, stationary guide means connected with the underside of each of said plates and extending at right angles to the respective plates, and operating means connected with said stationary guide means and operative to first move said lower plate away from said upper plate and axially move said upstanding cylindrical pins downwardly in the cylindrical openings in the upper plate by a distance to accommodate a game ball therein, subsequently pivot both of said plates in the position in which they are separated from one another in a downward direction away from the playing surface about the pivot connection of the upper plate with the playing surface, and finally return both of said plates in the reverse order to the normal positions thereof.

4,004,808
SPIRAL MANIPULATIVE GAME

Jon A. Gerber, 15 Bellewood Circle, North Syracuse, N.Y. 13212

Filed Mar. 29, 1976, Ser. No. 671,274

Int. Cl.² A63F *9/00*

U.S. Cl. 273—108 **10 Claims**

1. Spiral manipulative game apparatus comprising:

a. means defining a spiral path having terminal ends;

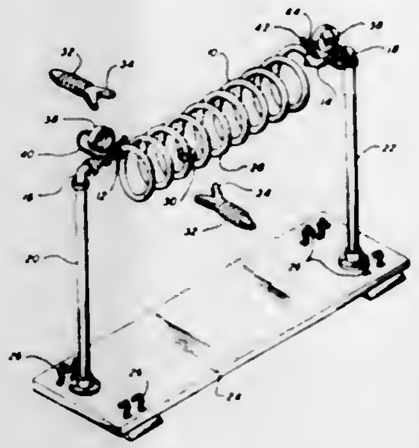
b. support means fixedly positioning said path-defining means with its central axis substantially horizontal;

c. a projectile movably attached to said path-defining means for free movement along said spiral path; and

d. a pair of separate elements having end portions adapted to engage and propel said projectile along said path by manual manipulation of said elements by two players.

10. A method of playing a game employing a movable projectile constrained in a spiral path along a horizontal axis, said method comprising:

a. positioning a player on each side of the horizontal axis,



b. positioning the projectile at the center of the spiral path;

c. the players attempting to move the projectile in opposite directions along the path by propelling the projectile upwardly along the path on their respective sides of the axis; and

d. continuing until the projectile reaches one end of the path.

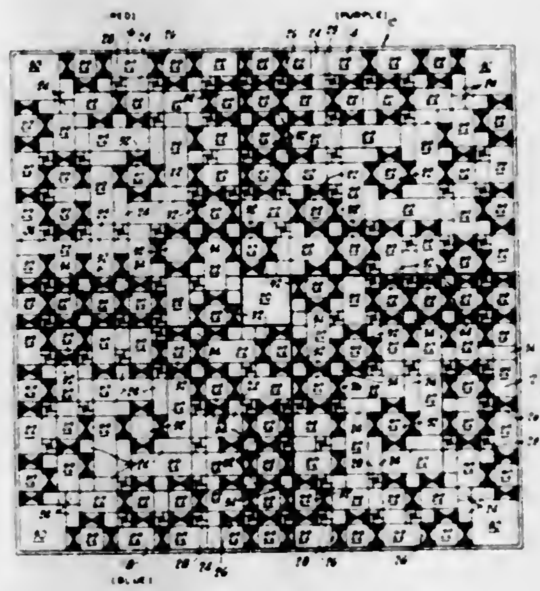
4,004,809
BOARD GAME APPARATUS

Gerald A. Schreiber, Bethany, Okla., assignor to Bartholomew, Limited, Bethany, Okla.

Filed May 12, 1975, Ser. No. 576,334

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 C **14 Claims**



1. A board game apparatus comprising:

a game board having a playing surface divided into a plurality of playing areas surrounding a center section, each playing area comprising:

a plurality of playing spaces formed on the playing surface thereof;

a plurality of blank spaces formed on the playing surface thereof and separating said playing spaces one from the other;

a plurality of passage indicia means formed on the playing surface within certain of said blank spaces for indicating passages from one playing space to another through said blank spaces; and

means thereon for visually distinguishing each said playing area from each of the other playing areas;

a plurality of playing piece sets corresponding in number to the number of playing areas, each playing piece set comprising a plurality of playing pieces each bearing means thereon for visually identifying said pieces with one of said playing areas, the plurality of pieces in each said set being so constructed and arranged to be selectively combinable to construct at least two forms of a playing entity positionable on and movable over said game board playing surface and sized to fit within any playing space, and each of the plurality of playing pieces in each set bearing indicia means thereon for visually indicating the identity of a playing entity constructed by the selective combination of said playing pieces;

playing entity form identification means having indicia thereon for indicating the identity of each playing entity form visually identified with a playing area of said game board to be constructed by the combination of said set of playing pieces visually identified with the playing area;

enemy playing entity form identification means having indicia thereon for indicating, for each of said playing entities, the identity of at least one opposing playing entity form to be attacked by each of said playing entities;

protected playing entity form identification means having indicia thereon for indicating, for each of said playing entities, the identity of at least one of the forms of each of said playing entities which is protected from attack by opposing playing entities;

playing entity movement indication means having indicia thereon for indicating, for each of said playing entities, the movement of each of said playing entities over the playing surface of said game board; and

a plurality of indicia means, corresponding in number to the number of playing areas and having means thereon for visually identifying each of said indicia means with a respective associated playing area, for moving over the playing surface of said game board between the center section of said game board and the starting and finishing spaces of the playing areas.

4,004,810

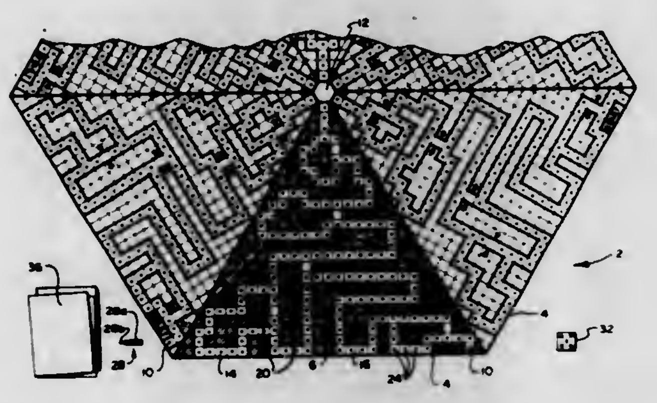
GAME APPARATUS

Darwin E. Henrie, 1194 N. 3000 West, Clinton, Utah 84015

Filed Nov. 17, 1975, Ser. No. 632,189

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—134 GM **15 Claims**



1. A game for at least two players comprising

a game board having a generally planar surface playing area divided into at least two segments, each for use by a different player, each segment including a pathway inscribed thereon having a starting position and a finishing position, each pathway being divided into a plurality of playing spaces over which a playing piece is moved and each having a plurality of loops which branch from the pathway at various locations therealong and rejoin the pathway or another loop at locations closer to the finishing position, each of said loops providing an alternate path around a corresponding primary portion of the pathway over which a playing piece may be moved.

a plurality of gate elements disposed on the game board playing area in each segment at a plurality of positions along each pathway, each gate element being adapted for movement between a close position, for blocking movement of a playing piece along the corresponding pathway past the element, and an open position, for allowing movement of a playing piece along the pathway past the element, and

a device usable by the players for randomly presenting any one of a plurality of numerical values which are preassigned to indicate actions which the players may take.

4,004,811

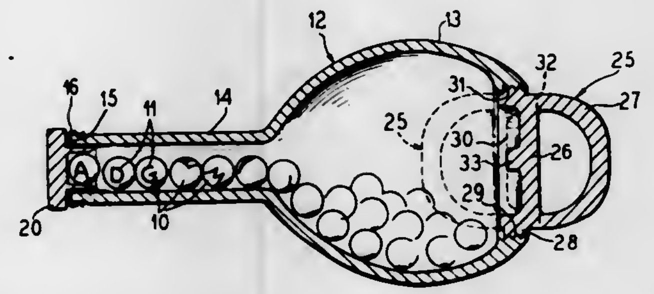
WORD GAME APPARATUS

Henry Brandin, 232 N. Milwaukee Ave., Wheeling, Ill. 60090

Filed Jan. 24, 1975, Ser. No. 543,831

Int. Cl.^{2} A63F *3/06*

U.S. Cl. 273—135 D **4 Claims**



1. An apparatus for use in a game of luck and skill among a plurality of participants, in which word combinations are to be made from letters randomly drawn, the apparatus comprising:

a plurality of solid objects identical to one another except for each object having a letter imprinted on a surface thereof, which is different from other letters imprinted on others of said objects;

an opaque flask having a narrow neck, and containing a set of said objects and obscuring the letters thereon, from which individual objects may be selectively and randomly dispensed in a sequence;

a board on which each participant may place his lettered objects with their letters displayed; and

said flask having a handle on its outer surface opposite said neck, whereby the flask and contents may be held and agitated.

4,004,812

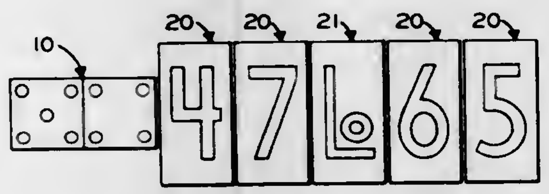
DOMINO TYPE GAME

Paul H. Lutz, 8738 21st N. W., Seattle, Wash. 99817

Filed Apr. 17, 1975, Ser. No. 568,827

Int. Cl.^{2} A63F *9/20*

U.S. Cl. 273—137 C **13 Claims**



1. In a game, a multiplicity of substantially rectangular playing pieces, a plurality having numerical symbols visually represented thereon selected from a defined numerical range having a mid point, another piece symbolizing Hi and still another piece symbolizing Lo, said pieces being adapted to be successively positioned in side by side relation in transverse alignment in a run of alternate numerically higher and lower sequence with the piece symbolizing Lo being equivalent to pieces lower than said mid point and the piece symbolizing Hi being equivalent to pieces higher than said mid point, said pieces being of different colors and having a pre-assigned playing value individual to their respective colors.

4,004,813

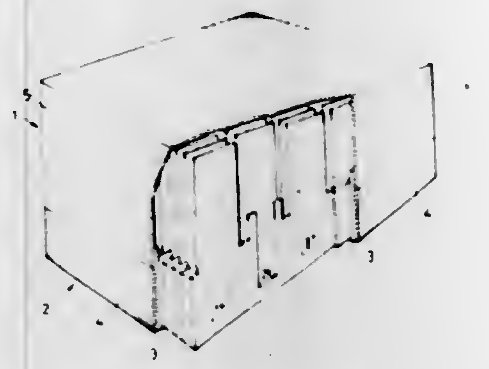
LOTTERY-TICKET ASSEMBLY

Stig Ingemar Sanden, Apelvagen 7, S-241 00, and Gertrud Marianne Sanden, Sturegatan 50, S-241 00, both of Eslov, Sweden

Filed Mar. 12, 1975, Ser. No. 557,586

Int. Cl.^{2} G07C *15/00*

U.S. Cl. 273—139 **4 Claims**



1. A lottery ticket assembly, comprising:

a container;

a plurality of lottery ticket strips mounted in an upstanding position in said container, each lottery ticket strip including a common base portion and a plurality of upwardly projecting, spaced lottery tickets,

each of said lottery tickets comprising: a pulling portion formed from said base portion, said pulling portion being defined by spaced, generally parallel side tear-off lines and a bottom tear-off line and projecting upwardly from said base portion, and being adapted to carry a lottery ticket designation thereon; an upwardly extending tongue portion integral with said pulling portion between said side tear-off lines, and defined by a top edge, and generally parallel side edges that lie outside said parallel side tear-off lines; and frangible bridge portions on either side of said pulling portion lying between said side tear-off lines and said side edges, and connecting said tongue portion with said base portion, said bridge portions being weakened by tear-off lines extending laterally outwardly from the side tear-off lines of said pulling portion toward said side edges of said tongue portion, said laterally extending tear-off lines terminating short of said tongue portion side edges whereby said tongue portion remains integrally joined with said bridge portions and said base portion; and

spacer strips disposed in alternating relationship between the base portions of said lottery ticket strips, and adapted to hide lottery designations carried on said pulling portions.

4,004,814

HORIZONTALLY SWINGABLE GOLF TEE

C. Lee Blair, Seymour, Ind., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Nov. 25, 1975, Ser. No. 635,119

Int. Cl.^{2} A63B *57/00*

U.S. Cl. 273—204 **1 Claim**

1. A golf tee comprising:

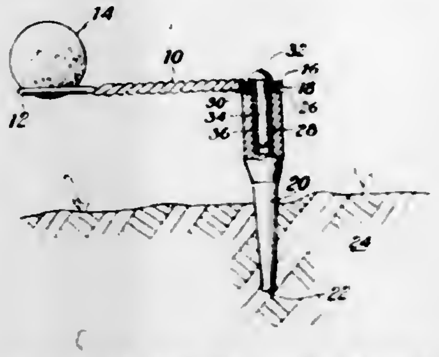
an elongated vertical wooden element having a lower pointed end and a vertical axially disposed bore extending downwardly from the upper end to a point intermediate the ends;

a metal pin having an enlarged horizontal head and a shaft extending vertically downwardly from said head, said shaft being disposed in fixed position in said bore with the head disposed above the upper end of the element;

a hollow metal tube disposed in the bore and receiving said shaft;

a first horizontal metal ring encircling the shaft below said head and above the top end of the tube in bearing relationship therewith; and

a single continuous length of metal wire, said length being bent into a second horizontal ring portion larger in diameter than the first ring with a central opening adapted to support a golf ball, the remaining portion said length being of inter-twisted strands to form a horizontally elongated arm attached to and extending radially outwardly from the second horizontal ring, said arm being attached at its radially outward end to the periphery of the first horizontal ring.



4,004,815

MINIATURE TOY SOUND-REPRODUCING DEVICE

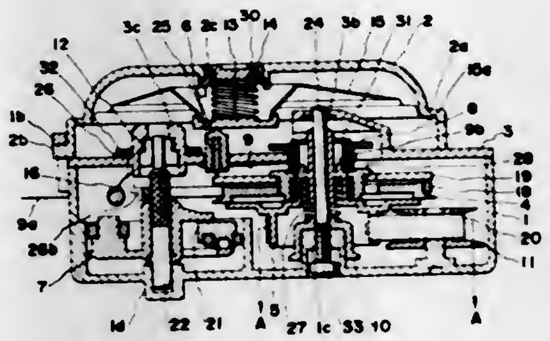
Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Japan

Filed June 26, 1975, Ser. No. 590,684

Claims priority, application Japan, Mar. 6, 1975, 50-29645[U]

Int. Cl.^{2} A63H *3/33*

U.S. Cl. 274—1 A **8 Claims**



1. A simplified device for sound reproduction comprising, in combination:

- a. a casing;
- b. a shaft mounted uprightly within said casing;
- c. a rotor slidably mounted on said shaft, said rotor being both rotatable and movable up and down relative to said shaft;
- d. biasing spring means for yieldably urging said rotor upwardly to normally hold the same in an elevated position on said shaft;
- e. constant torque spring means for exerting constant torque on said rotor to cause the same to rotate in a predetermined direction;
- f. means actuated manually for rotating said rotor in a direction opposite to said predetermined direction against the force of said constant torque spring means while simultaneously causing said rotor to descend from said elevated position against the force of said biasing spring means, including
  1. A reel arranged coaxially with said rotor so as to be movable up and down and rotatable simultaneously therewith; and
  2. a string having one end affixed to said reel and another

end led out of said casing through an eyelet positioned in the side wall of said casing, said string being adapted to be pulled manually to cause said rotor to rotate in said opposite direction and to descend from said elevated position against the force of the said biasing spring means; and

3. a spring over-hung above said record on which said string is held out of contact with said record;

g. a turntable arranged coaxially with said rotor and movable up and down simultaneously therewith, said turntable having a phonograph record thereon;

h. clutch means for connecting said rotor to said turntable only during rotation of said rotor in said predetermined direction, whereby said turntable with said record is rotatable simultaneously with said rotor in said predetermined direction;

i. a pickup arm pivotally supported at one end and having a reproducing stylus at the other end, said stylus being adapted to ride in a groove on said record on said turntable when said rotor is in said elevated position;

j. means for causing said pickup arm to return to a predetermined starting position over said record during descent of said rotor from said elevated position; and

k. a diaphragm including a contact portion which is arranged in direct contact with said pickup arm, whereby the vibrations set up in said stylus during rotation of said record in said predetermined direction are transmitted to said diaphragm to cause the same to produce audible sound.

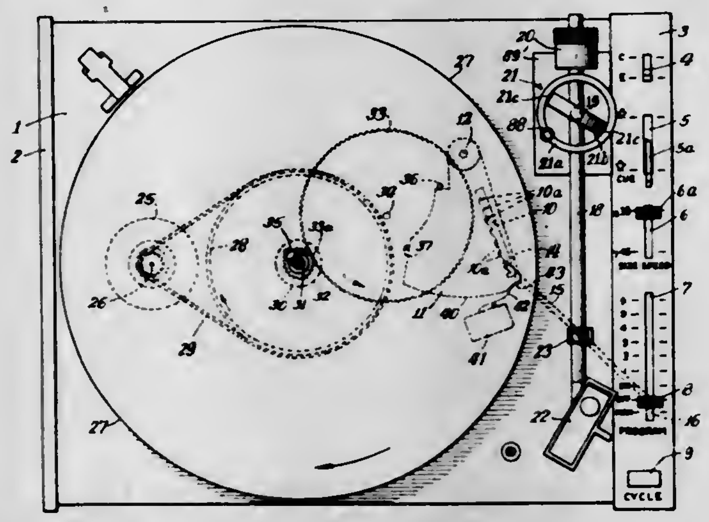
4,004,816
PROGRAMMER FOR RECORD PLAYER

Dwipendra Nath Guha, Huntington, N.Y., assignor to Avnet, Inc., New York, N.Y.

Filed June 6, 1974, Ser. No. 477,171

Int. Cl.^{2} G11B *17/16*

U.S. Cl. 274—10 R **9 Claims**



3. In a programmer for a record player having:

a rectangular base plate and turntable rotatably mounted on said base plate,

the combination of a record holder and feeder spindle and a cycling cam (33) for controlling the co-operation of the turntable with an eccentric pin (36) on the cam,

tone arm and record feeder spindle,

said base plate having a slot (10) inclined to a side edge of the base plate (1), one side edge of said slot having a series of notches (109) equal in number to the maximum number of records to be included in a program,

a second slot (7) in the base plate adjacent and parallel to the side edge of said base plate,

a program indicator knob (8) guided in said second slot, said first slot (10) being slightly inclined to said second indexing slot (7) and having, in cooperation with said knob, indications of the number of records which can be included in a projected program,

a program rod (15) bearing at one end a pin (14) projecting laterally into said first-named slot (10) and connected at its other end to said indicating knob,

a spring (39) connected between the base plate (1) and said pin (14) tending to retain releasably said pin (14) in any one of the notches (10a) in said slot (10), said pin (14), upon being disengaged from one notch, being drawn by the spring into engagement with the next adjacent notch, and the knob at the other end of the program rod to be shifted in its indicating slot to indicate the number of playings then remaining to be performed in sequence in a program,

a generally triangular program plate (11) pivotally mounted on pin (12) at one corner of said base plate and said plate (11) being engageable on one side edge by the pin (36) of the cycling cam (33) upon completion of the playing of a record, and

said plate (11) having cam teeth (13) matching the notches (10a) of the edges of the slot (10) in the base plate and being movable in one direction to push the program rod pin (14) out of one notch whereupon said spring biased pin is shifted into the next adjacent notch whereby the program knob is moved to the next lower indication.

4,004,817
TONE ARM ASSEMBLY IN RECORD PLAYER

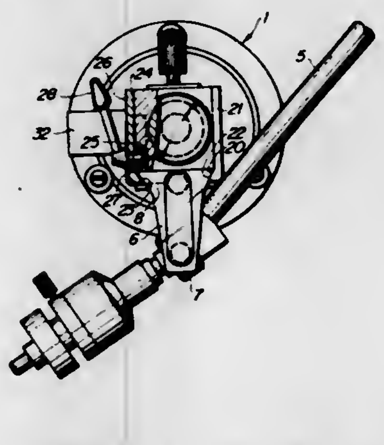
Seisuke Shimoda; Yoshiaki Shimoda, both of 20-11, Nakajujo-3-chome, Kita, Tokyo, and Harutada Shimoda, 333, Oaza Segasaki, Urawa, all of Japan

Filed July 7, 1975, Ser. No. 593,518

Claims priority, application Japan, July 4, 1974, 49-75808

Int. Cl.^{2} G11B *3/10*

U.S. Cl. 274—23 R **5 Claims**



1. A tone arm assembly for a record player, said assembly comprising:

a. a tone arm structure means including a tone arm with a pickup at one end thereof and bearing means for supporting said tone arm said bearing means having an engaging portion and a socket, said tone arm having lead wires passing therethrough connecting said socket to said pickup; and

b. supporting structure means mounted on the housing of said record player said supporting structure means including an engaging means including a dovetail groove for engaging said engaging portion of said bearing means, plug means mounted on said supporting structure means and having lead wires for connection to an amplifier when said engaging means engages said engaging portion of said bearing means, operating means including a screw means wherein the rotation of said screw means moves one side of said dovetail groove into and out of contact with said engaging portion of said bearing means whereby when said operating means moves said engaging means into engagement with said engaging portion said tone arm structure means is held in said supporting structure means and said plug means is concurrently connected to said socket means thereby enabling said pickup to be connected to said amplifier and wherein when said operating means moves said engaging means out of engagement with said engaging portion said tone arm structure means is removable from said supporting structure.

4,004,818
HANDLE FOR SKI POLE

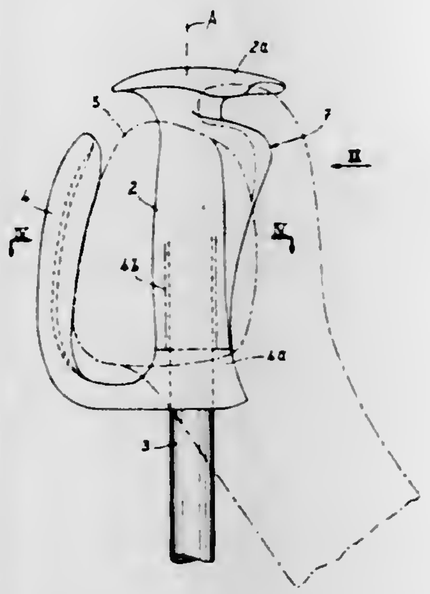
René Ramillon, 3 rue Emile-Zola, Grenoble, France

Filed July 1, 1974, Ser. No. 484,960

Claims priority, application France, July 3, 1973, 73.25311

Int. Cl.^{2} A63C *11/22*

U.S. Cl. 280—11.37 H **3 Claims**



1. A handle for a ski pole, said handle comprising:

an elongate tubular grip body adapted to fit over the upper end of a ski pole and to fit into the hand of a user; and

an elongated resilient guard member secured to said pole only immediately below said body and extending upwardly alongside said body but spaced from the major portion of the length of said body to overlie the back of the hand gripping the body, said guard member having a free extremity turned toward but spaced from the top of said body, said member and said body being formed of an elastomer, said member including a support ring surrounding said pole immediately below said body, said body being rotatable on said pole independently of said ring to permit adjustment of the handle parts relative to each other and the ski pole during fabrication thereof, said body being thereafter fixed on said pole.

4,004,819
MOBILE TRUCK PROVIDED WITH IMPROVED REMOVABLE RACKS FOR PANS, TRAYS AND THE LIKE

Louis Joseph Brongo, Kingston, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed July 29, 1975, Ser. No. 599,997

Int. Cl.^{2} B62B *5/00*

U.S. Cl. 280—79.3 **16 Claims**

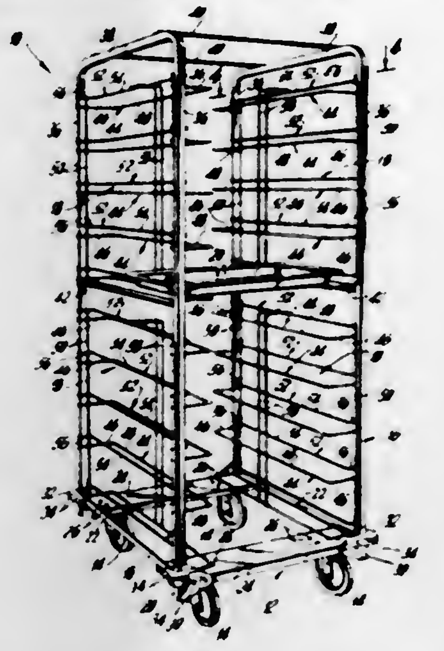
1. A device for supporting a plurality of removable pans, trays and the like thereon, said device comprising:

a base portion;

a pair of laterally spaced apart side frame sections provided with spaced apart legs secured to and extending upwardly from said base portion; and

removable racks mounted on said frame sections for supporting said pans, trays and the like on said device, said racks including support means for spacedly stacking a plurality of pans, trays and the like, one above the other between said laterally spaced apart frame sections, said racks further including retaining means cooperating with said side frame sections to provide a releaseable engagement therewith;

said retaining means of each said rack including two pairs of vertically oriented, spaced apart, associated retaining rods secured to opposite free ends of said support means, the spacing between each of said pair of said associated retaining rods being at least equal to maximum cross-sectional dimension of each associated leg of said side frame sections such that a releaseable snap engagement is created therebetween.



4,004,820
TRANSPORT CART

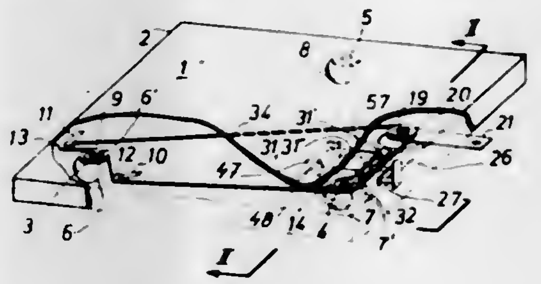
Kurt Weber, Elgg, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,481

Claims priority, application Switzerland, Apr. 8, 1974, 4835/74

Int. Cl.^{2} B62D *7/00*

U.S. Cl. 280—103 **12 Claims**



1. A transport cart comprising a plurality of support wheels including at least one freely rotatably mounted swivel wheel, a front wheel rotatably mounted on a vertical axis, and a rear wheel rotatably mounted on a vertical axis; and a steering arrangement including a pivotally mounted connecting rod, an endless belt engaging said steering gear, said rear wheel and said front wheel, a steering gear connected with said front and rear wheels for pivoting said front and rear wheels in opposite directions and means for selectively connecting said connecting rod to said steering gear and said front wheel for pivoting of said front and rear wheels in opposite directions in response to pivoting of said connecting rod whereby said rear wheel follows in the wake of said front wheel during movement of the cart.

4,004,821
DEVICE FOR THE RAPID DISENGAGEMENT OF A RETAINING SYSTEM IN VEHICLES

Werner Breitschwerdt, and Heinz W. Knoll, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

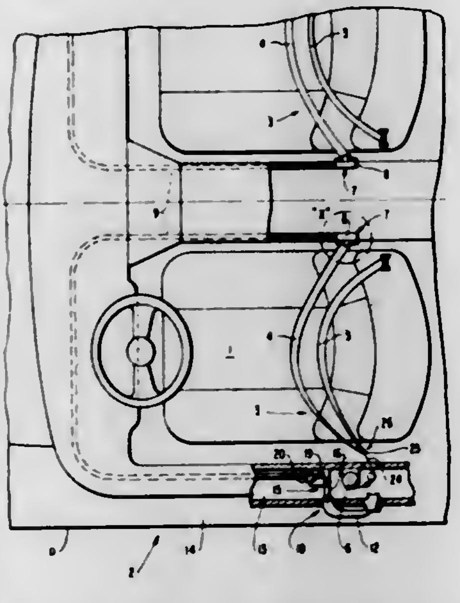
Filed May 24, 1973, Ser. No. 363,565

Claims priority, application Germany, May 31, 1972, 2226389

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B60R *21/10*

U.S. Cl. 280—744 **12 Claims**



1. An installation for the rapid release of a retaining system in vehicles with a vehicle body characterized in that at least one actuating means is provided at a readily accessible place of the vehicle body which includes means enabling the initiation of a release of the retaining system from the outside of the vehicle body, and in that the actuating means cooperates with an outside door handle means which is operatively connected with a belt release means and which, upon exceeding a predetermined actuating force acting on the same, initiates an unlatching of the belt release means.

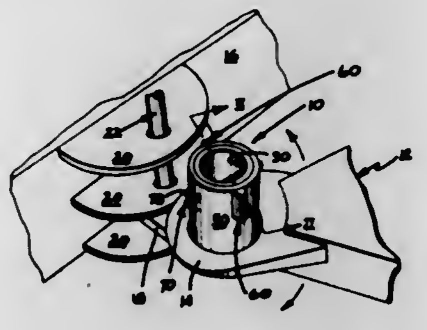
4,004,822
TRAILER HITCH ADAPTER

Harold E. Fisk, 3211 Hayes St., Marne, Mich. 49435

Filed Jan. 2, 1976, Ser. No. 645,998

Int. Cl.² B60D *1/14*

U.S. Cl. 280—415 A **22 Claims**



1. Vehicular trailer hitch apparatus comprising cylinder means formed in at least two parts for engaging the ball member of a ball-type trailer hitch of the type having a support member from which the ball member projects outwardly, said cylinder means including internal shoulder means for engaging a surface of the ball member to prevent removal of said cylinder means from the ball member, and receiving means for receiving a hitch ring of a Lunette-eye trailer tongue therearound; securing means engaging and holding said parts of said cylinder means on the ball member; and retaining means for retaining the hitch ring on said receiving means while allowing pivotal movement about said receiving means.

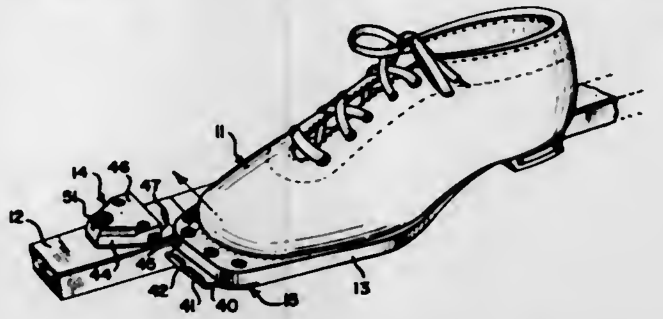
4,004,823
TOURING SKI BOOT BINDING

Ewald D. Pyzel, and Harold E. Codding, both of Reno, Nev., assignors to Ski Safe Inc., Carson City, Nev.

Filed Aug. 8, 1975, Ser. No. 602,976

Int. Cl.² A63C *9/10*

U.S. Cl. 280—615 **6 Claims**



1. A touring ski binding for releasably securing the toe of a touring ski boot to a touring ski comprising: a ski binding member secured to the upper surface of a touring ski and a boot binding member secured to the toe of a touring ski boot, each of said binding members having transversely disposed L-shaped binding elements adapted to releasably engage each other; and spring loaded latch means mounted on the ski binding member for releasably engaging the boot binding member and releasably retaining the binding members in engagement with each other;

the ski binding member having a main housing portion secured to the upper surface of the ski, a horizontally disposed transverse portion spaced a predetermined distance above the upper surface of the ski and extending rearwardly a predetermined distance from the rearward edge of the main housing portion of the ski binding member, and a vertically disposed transverse portion extending downwardly a predetermined distance at the transverse rearward edge of the horizontally disposed portion of the ski binding member, said horizontal and vertical portions of the ski binding member comprising the L-shaped binding element of said binding member;

the boot binding member having a horizontally disposed portion secured to the under surface of the ski boot at the toe end thereof and a vertically disposed portion extending upwardly along the transverse forward edge of the horizontally disposed portion of said boot binding member, said horizontal and vertical portions of the boot binding member comprising the L-shaped binding element of said binding member;

the L-shaped binding element of the ski binding member defining an L-shaped slot that is adapted to receive the L-shaped binding element of the boot binding member, and the vertically disposed portion of the boot binding member being formed with a notch that is adapted to be engaged by the spring loaded latch means mounted on the ski binding member to prevent lateral movement of said binding members relative to each other, when said binding members are in mutual engagement with each other.

4,004,824
GUIDE PLATE FOR SKI BINDINGS

Josef Svoboda, Schwechat, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Mar. 28, 1975, Ser. No. 562,895

Claims priority, application Austria, Mar. 29, 1974, 2650/74

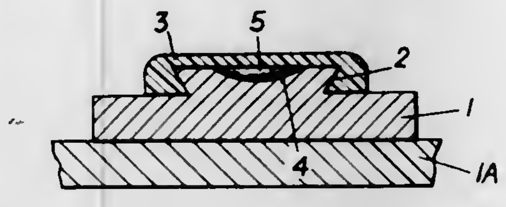
Int. Cl.² A63C *11/00*

U.S. Cl. 280—636 **7 Claims**

1. A guide plate assembly for use between a ski boot sole and a ski surface, comprising:

an elongated mounting plate secured to said ski surface and having first securement means integrally formed thereon and extending parallel to the longitudinal axis of said mounting plate and being exposed at the opposite ends of said mounting plate;

a monolithic guide strip made of low friction material and having second securement means integrally formed thereon and extending parallel to the longitudinal axis of said guide strip, said second securement means being initially coupled with said first securement means on said mounting plate, said guide strip thereafter being movable with respect to said mounting plate without distortion to said second securement means for assembly, said first and second securement means thereafter being cooperatively directly engaged with each other to effect a holding of said guide strip on said mounting plate;



said first securement means including an elongated first rib projecting upwardly on said mounting plate and having a dovetail shape;

said second securement means including means defining a pair of spaced and parallel second ribs which define a first recess therebetween, said recess having a dovetail cross section and receiving said first rib snugly therein, said dovetail-shaped rib and recess cooperatively holding said guide strip on said mounting plate;

wherein said first securement means includes a pair of elongated second recesses extending parallel to and on opposite sides of said first rib and having a dovetail cross section; and

wherein said pair of parallel second ribs have a dovetail cross section and are each received in one of said elongated recesses.

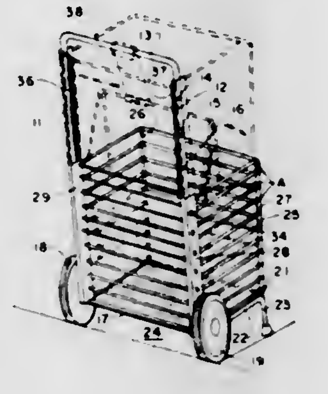
4,004,825
SHOPPING CART

Alice Green, Downey, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 12, 1975, Ser. No. 612,795

Int. Cl.² B62B *11/00*

U.S. Cl. 280—654 **3 Claims**



1. A shopping cart, comprising

a substantially U-shaped frame having a pair of spaced substantially parallel sides and a head joining the sides and substantially perpendicular thereto and functioning as the handle of the cart, each of the sides having a plurality of spaced holes formed therethrough substantially parallel in direction to the head;

an axle mounted at the ends of the sides of the frame opposite the head substantially parallel to the head;

a pair of wheels rotatably mounted on the axle, each on the opposite side of a corresponding side of the frame from that facing the other side of said frame;

a pair of support members each of substantially inverted L-shape and each affixed to a corresponding one of the sides of the frame in the area of the axle, each of said support members having a first arm extending substantially perpendicularly from a side of the frame and a second arm extending at right angles to the first arm in a manner whereby the support members support the frame in upright position on a supporting surface;

a basket-type member having four corner members, each of two of which at least partially surrounds a corresponding side of the frame and has a hole passing therethrough in alignment with the holes through the side, said basket-type member being slidably mounted on the frame by virtue of the two corner members thereof being slidably mounted on the frame for movement in directions along the sides of the frame; and

a pair of pins each positioned through the hole of a corresponding corner member of the basket-type member and through a selected hole through the corresponding side of the frame thereby releasably maintaining the basket-type member in a selected position above a surface supporting the cart.

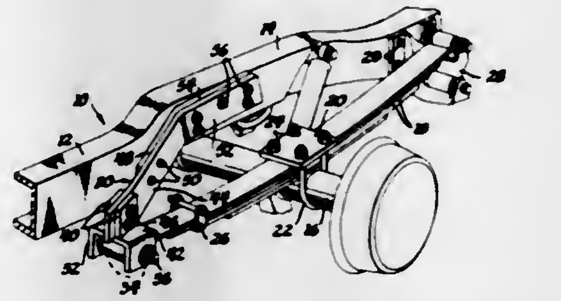
4,004,826
LEAF SPRING SUSPENSION SYSTEM

Jayant W. Subhedar, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1976, Ser. No. 647,447

Int. Cl.² B60G *11/04*

U.S. Cl. 280—718 **5 Claims**



5. For use with a motor vehicle having a frame, a pair of oppositely disposed rear wheels, and a rigid axle interconnecting said oppositely disposed rear wheels, a rear leaf spring suspension system comprising a leaf spring stack extending alongside a side rail of said frame between said side rail and the adjacent wheel of said pair of wheels, bracket means for securing said leaf spring stack at an intermediate point therealong to said axle, shackle means secured to said side rail and adapted to pivotally support one end of the main leaf of said leaf spring stack about the axis of one cylindrical spring eye opening of said main leaf, and compliant bracket means operatively connected between said side rail and the other end of said main leaf, said compliant bracket means including a tunnel-shaped spring support member, pivot means connecting said other leaf spring end to said spring support member at the other cylindrical spring eye opening of said main leaf, and a laterally movable member secured at a bottom edge surface thereof to the top surface of said spring support member and at a side surface thereof to said side rail such that said laterally movable member forms a free-state predetermined laterally diverging angle with said side rail and is movable toward or away from said side rail during turning operations of said motor vehicle, as a result of the action of centrifugal force on the body of said motor vehicle and the resultant forces and/or moments applied to said rear wheels at the point of contact with the road surface, to provide an improved lateral force compliance steer of said rear wheels during said turning operations.

4,004,827
GAS BAG SAFETY APPARATUS

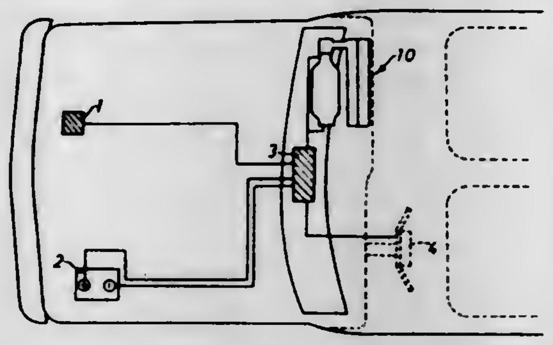
Yutaka Kondo, and Takashi Usugi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sept. 23, 1975, Ser. No. 615,919

Claims priority, application Japan, Apr. 8, 1975, 50-42621

Int. Cl.² B60R *21/08*

U.S. Cl. 280—742 **2 Claims**



1. A seaming method for a check valve for an inflatable knee bag to be assembled within an inflatable torso bag of a gas bag safety apparatus comprising the steps of

providing a transverse cut on the central portion of a rectangular sheet of the gas bag material;

further providing two cuts in parallel to each other respectively at each end of the transverse cut to form a pair of flaps;

folding the respective flaps outwardly to form a pair of valve portions;

further folding the sheet at the transverse center along the folded lines of the flaps to have the folded flaps to be adjacent to each other; and

seaming all the folded sheet portions to form a valve seat portion for the valve portions.

4,004,828
VEHICLE SAFETY DEVICE USING AN INFLATABLE CONFINEMENT AND METHOD OF FOLDING THE INFLATABLE CONFINEMENT

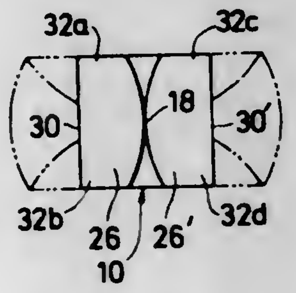
Yoji Sogabe; Tetsuo Edamatsu, both of Ashikaga, and Takashi Oka, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Kohkoku Chemical Industry Co., Ltd., Tokyo, both of, Japan

Filed Aug. 19, 1975, Ser. No. 605,807

Claims priority, application Japan, Aug. 19, 1974, 49-94866

Int. Cl.² B60R *21/08*

U.S. Cl. 280—743 **11 Claims**



1. A safety device including an inflatable confinement which comprises substantially congruent two layers joined together along their entire edges and having a gas inlet opening formed in one layer and located in registry with a central portion of the other layer and which has a folded inoperative condition stored in a receptacle and an expanded protective condition moved out of the receptacle, the inflatable confinement in said folded inoperative condition having a generally rectangular configuration having first two diametrically opposed double-layer portions which are folded over to form respective creases substantially parallel with each other across said center portion and which have respective free ends at least in part meeting each other on said center portion, and second two diametrically opposed double-layer portions which are folded over to form respective creases substantially perpendicular to said creases formed by said first two opposed double-layer portions and which are at least in part superimposed on the first two opposed double-layer portions with the respective free ends thereof located at least in part on the outer face of said center portion.

4,004,829
PASSIVE SEAT BELT SYSTEM

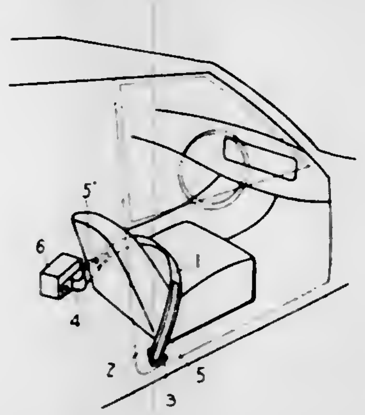
Masumi Kato, Toyoake; Shigenori Kanazawa, Toyota, and Kiyomitsu Oshikawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed July 11, 1975, Ser. No. 595,319

Claims priority, application Japan, July 17, 1974, 49-82608; July 29, 1974, 49-86777; July 30, 1974, 49-87852

Int. Cl.² B60R *21/02*

U.S. Cl. 280—745 **10 Claims**



1. A passive seat belt system for vehicles having at least one seat and door comprising:

seat belt means for vehicles for restraining a wearer occupying a seat,

retractor means including a reel attached to one end of said belt means for permitting said belt means to be unwound from said reel and thereby extended and for retracting said belt means by winding it around said reel for a predetermined extent,

seat belt reinforcing means, including first and second stiffeners of predetermined lengths combined with said seat belt means at opposite ends thereof, for straightening said seat belt means at said opposite ends for said predetermined lengths when the seat belt means is extended,

said first stiffener being on said one end of said belt means and being wound onto said reel by said retractor means,

said first stiffener being made of convex metal which has longitudinal rigidity when unwound from said reel but being transversely flexible for flat winding onto said reel, and

driving means for driving said seat belt reinforcing means via said convex metal strip when said vehicle door is opened so that said seat belt means is automatically unreeled to enable said wearer to get in and out of said vehicle with ease.

4,004,830
LANDING GEAR CONSTRUCTION

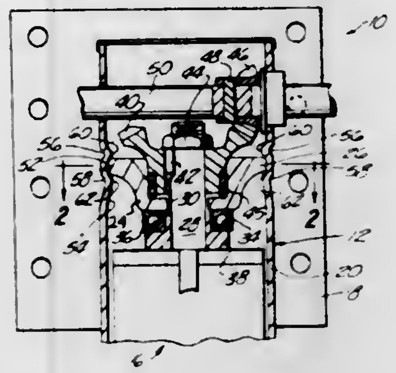
Jack T. Belke, Grand Rapids, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed July 25, 1975, Ser. No. 599,051

Int. Cl.² B60S *9/02*

U.S. Cl. 280—763 **4 Claims**

1. In a trailer landing gear assembly having a generally cylindrical housing and means for securing said housing to said trailer, a landing gear foot adapted to engage the ground and an extension assembly having a gear base plate received in said housing and a downwardly depending axle adapted to be received in two registering apertures in said foot, said gear base plate having an annular flange adjacent to the inner surface of said housing, the improvement comprising vertical load supporting means formed in said housing for connecting said extension assembly to said housing and for connecting said foot to said housing, said means comprising at least two upper and two lower inwardly projecting projections integral with said housing,, wherein said upper projections are positioned on said housing to abut against the upper surface of said gear base plate flange and said lower projections abut against the lower surface of said gear base plate flange whereby said cylindrical portions and said projections support the vertical load of said landing gear assembly between the extension assembly and the landing gear housing.



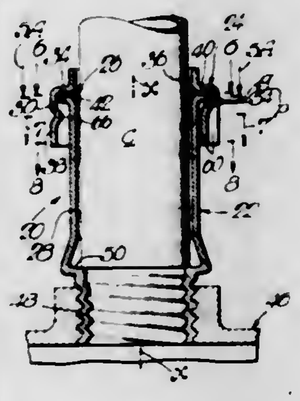
4,004,831
CONDUIT CONNECTORS

Gilbert R. Boutin, 14 E. Hill Road, Woodbury, Conn. 06798

Filed Mar. 1, 1976, Ser. No. 662,925

Int. Cl.² F16L *35/00*

U.S. Cl. 285—81 **11 Claims**



1. A conduit connector, providing a tubular body with an axis and an outwardly extending endflange with angularly spaced notches; a locking gland having a flat ring base with inward prongs thereon and being with its base normally resting on said body flange; and a cup-like cap having a bottom with a central aperture and peripheral rim with angularly spaced inner cam formations thereon, said cap being projected with its rim over said gland and body flange with its bottom aligned with said gland base, and being turnable into and from a release position in which said cam formations are aligned with said notches and said cap has freedom of axial movement into raised and lowered positions in which said cam formations are in and out of register with said notches, respectively, and said cam formations being so spaced from said cap bottom that on turning said cap in said lowered position thereof from said release position said cam formations engage said body flange and clamp the same and said gland base thereon to said cap bottom.

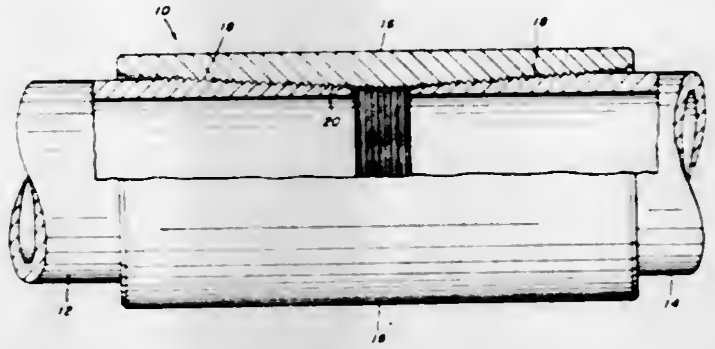
4,004,832
THREAD FORM FOR PIPE JOINTS

Eugene B. Connelly, Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 19, 1975, Ser. No. 614,801

Int. Cl.² F16L *15/00*

U.S. Cl. 285—333 **4 Claims**



1. A threaded joint including mating male and female members having complementary cooperating threaded surfaces formed on a taper of about one and one-half inch on diameter per foot of length, said threads having crests and roots which, in profile, are arcs of circles and an intermediate flank portion of finite length connecting said crests and roots, each flank portion being tangent along opposite sides to the adjacent crests and roots and being angularly disposed with respect to perpendiculars to the axis of the joint, the angles of said flanks being symmetrical with respect to said perpendiculars and being of a magnitude less than the angle of repose of the joint materials.

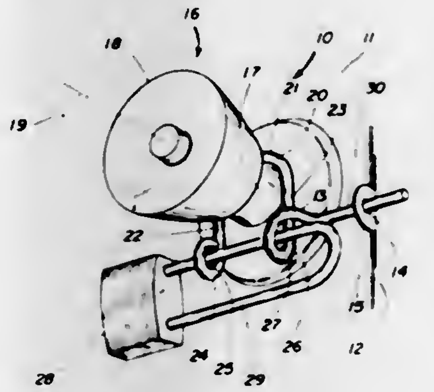
4,004,833
DOOR LOCK DEVICE

Howard L. Hull, 5752 Evanston St., Indianapolis, Ind. 46220

Filed Oct. 17, 1975, Ser. No. 623,444

Int. Cl.² E05C *19/18*

U.S. Cl. 292—288 **10 Claims**



1. The combination comprising:

a door having two sides;

a door knob assembly mounted upon said door and comprising a shaft extending outwardly from one side of said door and having a horizontal axis, and a knob larger than said shaft and attached to said shaft;

a lock bolt having a first section extending downwardly on both sides of the shaft of said door knob assembly below the horizontal plane passing through the center of said shaft, and a second section extending from said first section; and

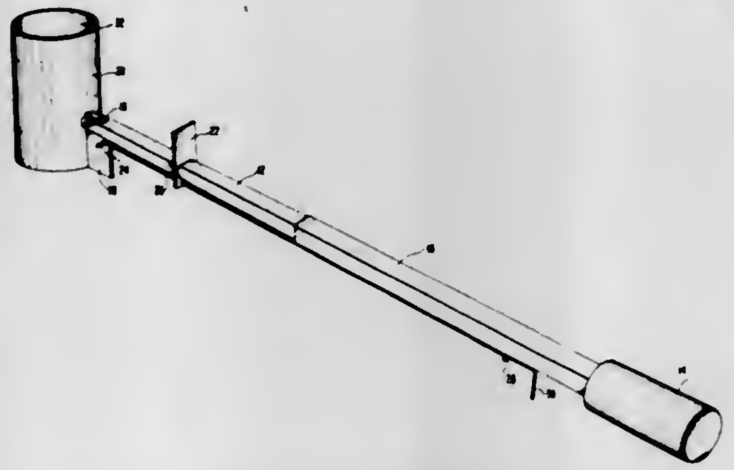
a door jamb defining a doorway, said door being hingedly mounted in said door jamb and having an open and a closed position, said door having a latching edge and the door jamb having a latching surface adjacent the latching edge of said door when said door is in the closed position; and

retaining means for engaging said lock bolt when said door is in the closed position, said retaining means including a strike plate attached to the latching surface of said door jamb, said strike plate having a first aperture in which the second section of said lock bolt is received;

said door knob assembly including a sliding bar operable to extend from the latching edge of said door, said strike plate additionally including a second aperture for receiving said sliding bar, said sliding bar having a first position in which it is received within the second aperture and a second position in which it is contained within said door.

4,004,834
TAPPET FOLLOWER RETRIEVAL TOOL

Alex Podpaly, 4011 Lawrence Ave., Kensington, Md. 20795
Filed Jan. 2, 1976, Ser. No. 646,261
Int. Cl.^{2} B25B *9/00;* **B25J** *1/00*
U.S. Cl. 294—19 R **2 Claims**



1. A retrieval tool having a long handle for remotely removing worn tappet followers from their bushings inward of the engine crankcase in which they are mounted through a camshaft bearing mount opening in the end of said crankcase,

a substantially cylindrical cup hinged at one side substantially above its bottom to the outer end of said handle, and

a control rod slidably mounted along one side of said handle and having its outer end operatively connected to said cup, and its inner end formed to provide a control grip for turning said cup on its hinge between an open position at right angles to said handle and a substantially closed position parallel to said handle, which has a closure plate extending from it over the top of said cup in its closed position so that said cup may be withdrawn safely from said crankcase through restricting clearance spaces therein, without spilling the cup's contents.

4,004,835
OVERSHOT

William T. Taylor, 222 Camp Lilly Road, Humble, Tex. 77338
Filed Sept. 15, 1975, Ser. No. 613,365
Int. Cl.^{2} E21B *31/12*
U.S. Cl. 294—86.29 **8 Claims**

1. An overshot comprising:

a scissor-like mechanism having a pair of facing hook means which open and close toward one another to pick up a fishing neck;

a transverse pin supporting said scissor-like mechanism;

an encircling ring about the lower end of said scissor-like mechanism which, on relative movement upwardly and downwardly, limits the span of opening of said hook means;

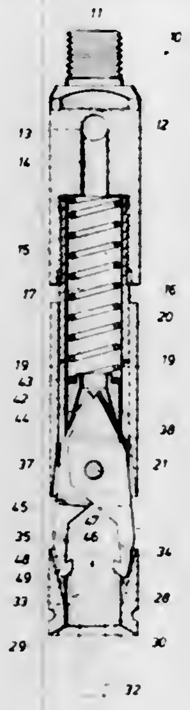
a support member connected to said pin for supporting said pin;

first means for relatively moving said ring controllably toward said scissor-like mechanism by moving either said ring or said support member, said first means causing said ring and said hook means to co-act to open and close, said first means further lowering said hook means to close by co-action with said ring when a fishing neck is engaged and the weight thereof acts downwardly thereon;

an upper body supporting said ring and said support member; and

said first means comprising

a pair of protruding and relatively movable arms pivotally mounted on said pin and comprising a portion of said scissor-like mechanism which, on movement, open or close said scissor-like mechanism;

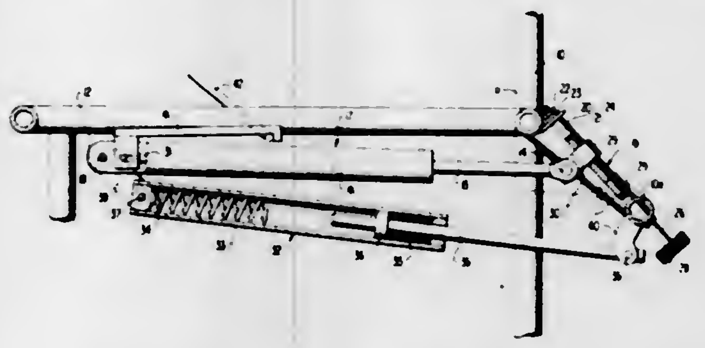


a resilient means in said upper body bearing against said scissor-like mechanism to open the span of said scissor-like mechanism when it is not in constraining contact with said ring; and

said arms being formed with surfaces which contact and co-act with said resilient means to increase the span of opening of said scissor-like mechanism.

4,004,836
CHAIR WITH TILTABLE SPRING BIASED BACK-REST

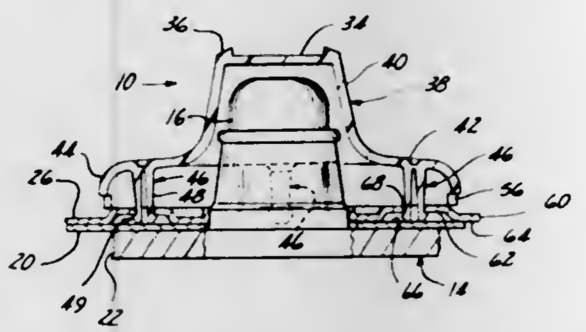
Nils Lars Ove Kristensson, Stockholm, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden
Filed Oct. 15, 1975, Ser. No. 622,651
Claims priority, application Sweden, Oct. 15, 1974, 7412981
Int. Cl.^{2} A47C *3/00*
U.S. Cl. 297—354 **1 Claim**



1. A chair having a tiltable back-rest frame rotatably mounted on the chair frame about a horizontal axis and being tiltable backwards against the action of a pressure spring member mounted between the frame of the chair and a lever arm rigidly connected with the back-rest and extending downwardly relative to said horizontal axis, the lever arm comprising an adjustment screw rotatably mounted in an extended frame member secured to the back-rest and located below said horizontal axis, a threaded sleeve mounted on the adjustment screw and connected with the spring member, the adjustment screw having a knob to enable rotation of the adjustment screw thereby to effect continuous axial displacement of the threaded sleeve along the screw, the spring member being a gas spring comprising a cylinder and a piston rod adapted to be locked in any desired position of the piston rod relative to the cylinder, a further cylinder and piston therein with a piston rod including two helical compression coil springs located in the cylinder on opposite sides of the piston, the further cylinder and piston rod extending between the chair frame and the extended frame member so that one of the helical springs will be substantially fully compressed when the backrest is in its upright position to form a stop member and to counteract the gas spring, whereas the other helical spring is substantially fully compressed when the back-rest is in its substantially horizontal position to form a stop member and to assist the gas spring when raising the back-rest.

4,004,837
WHEEL COVER WITH SNAP ON FASTENER

John A. Main, Plymouth, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Dec. 8, 1975, Ser. No. 638,814
Int. Cl.^{2} B60B *7/02*
U.S. Cl. 301—37 P **16 Claims**



1. A removable hub cap for a vehicle wheel having a rim and a disk fixed thereto which has a plurality of prong receiving holes disposed in the mounting hole circle area thereof and each arranged to provide a space having a predetermined axial dimension between the inner margin of each prong receiving hole and the surface on which the disk bears when mounted on a vehicle, said removable hub cap comprising; a cap body constructed and arranged to overlie both the prong receiving holes and mounting holes in the disk and to be removable from the disk, a plurality of prongs carried by said body and extending generally axially from one face thereof with the free end of each of said prongs being adapted to pass through one of the prong receiving holes, and cam means on each of said prongs adjacent the free end thereof constructed and arranged to engage said inner margin of one of said prong receiving holes and urge the free end of its associated prong into firm engagement with the surface on which the disk bears when mounted on a vehicle, whereby said removable hub cap is releasably secured and tightly retained on the vehicle wheel when said prongs are inserted in said prong receiving holes with their associated cam means firmly engaging the inner margins of said prong receiving holes and urging the free ends of said prongs into engagement with the surface on which the disk bears when mounted on a vehicle.

4,004,838
VEHICLE HUB ASSEMBLY

Donald D. Savage, Huntsville, Ala., assignor to B. J. Powell, Atlanta, Ga., a part interest
Division of Ser. No. 439,736, Feb. 5, 1974, Pat. No. 3,907,053. This application Sept. 23, 1975, Ser. No. 616,068
Int. Cl.^{2} B60B *27/06*
U.S. Cl. 301—105 R **1 Claim**

1. A hub construction for attaching a wheel to a drive shaft having a support portion and a threaded engagement portion comprising:

a hub carrying the wheel defining a central passage therethrough adapted to be received on the support portion of the drive shaft to support the wheel on the drive shaft, a semicircular recess oriented generally normal to said passage at one end of said passage of a first diameter larger than the diameter of said passage, an access opening through said hub to said recess of a width substantially equal to said first diameter; said hub further including an annular flange adjacent said recess opposite said passage and defining an inside opening smaller in diameter than said first diameter, larger in diameter than the diameter of said passage, and concentrically arranged with respect to said passage, said annular flange further defining a cutout therethrough communicating with said access opening with a width less than the width of said access opening, said cutout centered with respect to said access opening: and,

a hub nut internally threaded to engage the threaded engagement portion of the drive shaft, said nut including a circular flange at one end thereof adapted to be received in said semicircular recess through said access opening and restrained against movement axially away from said passage by said annular flange, and a smaller diameter wrenching portion receivable through said cutout into said inside opening.

4,004,839
DUAL CIRCUIT BRAKE FORCE REGULATING DEVICE

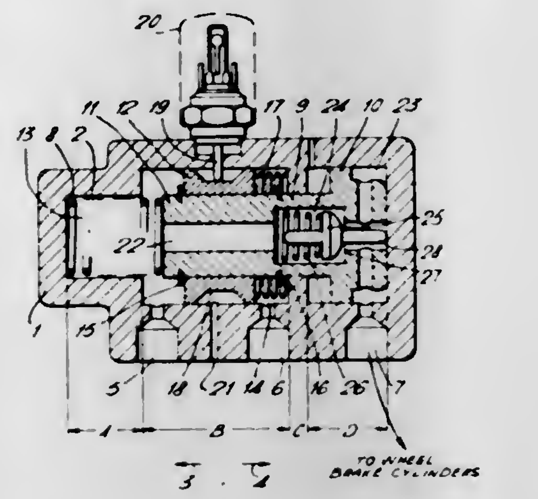
Jochen Burgdorf, Offenbach, Germany, assignor to ITT Industries, Inc., New York, N.Y.
Filed Feb. 6, 1976, Ser. No. 655,915
Claims priority, application Germany, Feb. 25, 1975, 2507997
Int. Cl.^{2} B60T *8/26*
U.S. Cl. 303—6 C **10 Claims**

1. A brake force regulator for a dual circuit brake system having a housing including:

an axially displaceable stepped piston for closing a fluid connection through said housing between a first brake circuit and at least one wheel brake cylinder which is acted on by the pressure in said first brake circuit and by a control force, both of which act on said stepped piston in the opening direction and wherein said stepped piston is acted on in the closing direction by the pressure supplied to the wheel brake cylinder;

an axially displaceable locking piston carried in a sealed, sliding relationship by said stepped piston within and in a sealed sliding association with said housing, said housing including a control chamber containing pressure fluid which acts on the locking piston in the opening direction being supplied by the uncontrolled pressure in said first brake circuit and an annular chamber for pressure fluid which acts on said locking piston in the closing direction being supplied by the pressure in said second brake circuit;

means on said stepped piston for limiting the axial displaceability of said locking piston from a middle position in the opening direction;



said locking piston's exterior surface having an annular recess formed from an intermediate mid-section and two ramp portions on either side thereof; and

a pressure differential warning switch associated with said housing having a tripping pin positioned through said housing to engage the mid-section of said locking piston in a radial direction when said locking piston is in its normal position on said stepped piston and to cause actuation of said tripping pin when said locking piston is displaced in either the opening direction or in the closing direction because of the failure of pressure in one of said brake circuits.

4,004,840
BEARING CAGE

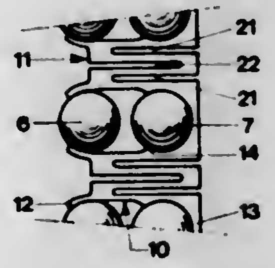
Gordon Boyd Johnston, Beesd, Netherlands, and Hasse Eivind Strandberg, Floda, Sweden, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Jan. 31, 1975, Ser. No. 545,893

Claims priority, application Netherlands, Feb. 6, 1974, 7401604

Int. Cl.² F16C *33/46*

U.S. Cl. 308—201 **4 Claims**



1. In a bearing having an inner race ring and an outer race ring, two rows of rolling elements positioned to roll between said rings in raceways in said rings and thereby to define two axially-spaced planes, with the rolling elements in the two rows being positioned to form pairs of axially aligned rolling elements, and a generally cylindrical bearing cage insertible axially from one side of the bearing and having holding means for holding separate said pairs of rolling elements and circumferentially separating each pair of axially aligned rolling elements from the adjacent pairs of rolling elements, the improvement wherein said bearing cage comprises a plurality of partitions, means connecting said partitions with an axially-extending recess defined between each two adjacent partitions, said cage being elastically compressible in the radial direction of said bearing, whereby during loading of said rolling elements in said raceway are moveable relative to each other, said cage further comprising two axially-extending, diverging snap-fingers on each of said partitions for defining said holding means, said partitions having radially extending apertures between the planes of the two rows of rolling elements, wherein said apertures comprise a first slot extending axially in each partition from one axial end thereof, and a second slot extending axially in each of said partitions from the other axial end of said bearing cage and circumferentially overlapping said first slot in a region of said partitions between said planes.

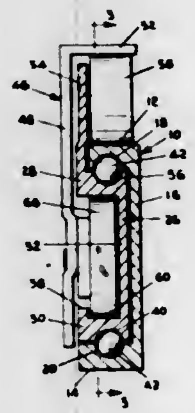
4,004,841
FULL EXTENSION DRAWER GUIDE

Robert J. Vander Ley, Jenison, Mich., assignor to Leslie Metal Arts Company, Inc., Grand Rapids, Mich.

Filed June 12, 1975, Ser. No. 586,209

Int. Cl.² A47B *88/00;* **F16C** *21/00*

U.S. Cl. 312—342 **7 Claims**



1. A drawer guide for cabinet drawers and the like comprising:

a first elongated rail having an upright side and laterally projecting track flanges at the upper and lower portions thereof.

a second rail having an elongated indented portion formed of upper and lower laterally projecting track flanges joined by an upright side portion with the indented portion of the second rail nesting closely within the first rail so that the sides of the first rail and the second rail are closely adjacent to one another;

roller bearing means between the upper track flanges of the first and second rails and between the lower track flanges of the first and second rails so that the second rail slides freely with respect to the first rail;

a roller flange projecting vertically from the outer edge of a second rail track flange past one of said first rail track flanges;

a friction roller rotatably mounted on said roller flange so that said roller rolls in contact with a surface of a first rail track flange;

a third elongated rail having an upright side portion and a laterally extending track flange, said side portion being juxtaposed to said second rail and said second track flange extending laterally over and in contact with said friction roller;

guide roller means mounted on said upright side portion of said third rail, sized to fit and positioned within said second rail between the upper and lower track flanges thereof so that the third rail glides with respect to said second rail;

whereby as said first rail is moved with respect to said third rail, said friction roller moves said second rail one-half the distance of the first rail with respect to the third rail.

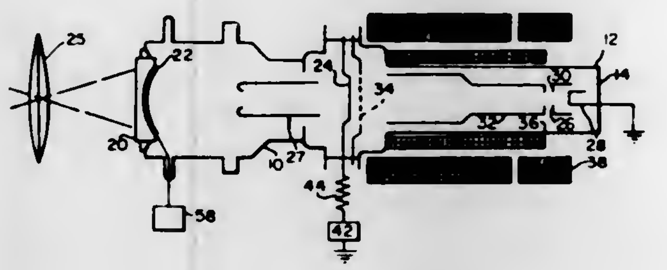
4,004,842
METHOD OF PROVIDING A SILICON DIODE ARRAY TARGET WITH IMPROVED BEAM ACCEPTANCE AND LAG CHARACTERISTIC

Walter J. Whitson; Alfred B. Laponsky, both of Horseheads, and Raymond J. Malanoski, Waverly, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 5, 1975, Ser. No. 610,710

Int. Cl.² H01J *9/233*

U.S. Cl. 316—1 **1 Claim**



1. A method of producing an electron tube of the pick-up type having a photoemissive input portion, a generally planar diode array target portion, with photoelectrons from the photoemissive input portion being collected on the input side of the diode array target, and electronic scanning means spaced from the output side of the target for maintaining a reverse bias potential across the individual diodes of the array, and where the diode array target portion includes enlarged high surface area metal contact caps extending from individual diode portions on the output side of target, and wherein a thin layer of high resistivity material is disposed over the output side surface of the target covering the diode portions and the surface between diode portions, the method for providing a high electron beam acceptance and improved lag characteristic by operationally aging the target with input radiation sufficient to produce an output signal current density of at least about 300 nanoamps per square centimeter, with the reverse bias potential maintained at about 7.5 volts, for at least 50 hours.

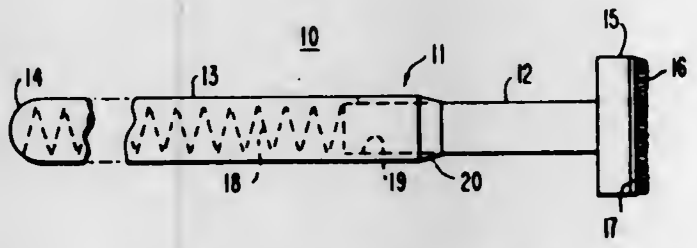
4,004,843
PROBE PIN

Robert A. Boenning, Timonium, and George R. Welden, Cockeysville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1975, Ser. No. 616,710

Int. Cl.² H01R *13/00*

U.S. Cl. 339—108 TP **8 Claims**



1. A probe pin for contacting electrically at one end a metallic mass having an irregular surface, comprising an elongated metallic shank, a single piece of electrically conductive resilient deformable synthetic resin affixed conductively to one end of the shank, whereby the piece provides a low resistance area contact with the irregular surface when the shank is urged axially in slight pressure engagement with the irregular surface.

7. A probe pin for contacting electrically an irregular metallic conductive surface, comprising a spring loaded telescopic shank, and a single piece of electrically conductive resilient deformable synthetic resin affixedly positioned conductively to one end of the shank, said piece being deformable in response to pressure engagement of the piece against an irregularly contoured surface sufficient to compress the spring loaded shank, whereby an electrically conductive low resistance area contact is made between the probe pin and the irregular metallic surface.

4,004,844
ELECTRICAL CONNECTOR

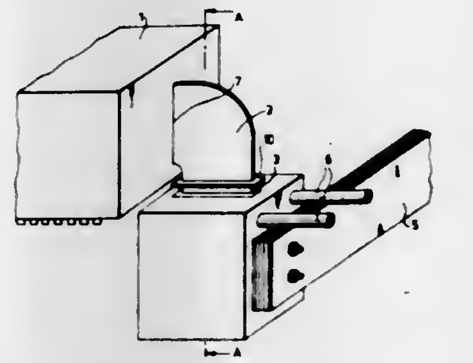
Arthur George Knapton; Gordon Leslie Selman, and Stephen Lionel Pearce, all of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Filed Sept. 19, 1975, Ser. No. 615,089

Claims priority, application United Kingdom, Sept. 25, 1974, 41687/74

Int. Cl.² H01R *3/04*

U.S. Cl. 339—118 R **14 Claims**



1. Apparatus comprising a container suitable for holding molten glass at high temperature and an electrical connection for connecting the container to a source of electric current, the connection comprising a metal reservoir in mechanically rigid contact with a current supplying busbar, said reservoir containing electrically conducting material which is liquid at temperatures of operation and a current carrying conductor electrically connected to said container and dipping into the electrically conducting liquid to establish electrical contact therewith and mounted for continuous electrical contact with the electrically conducting liquid during movement of the said container relative to said reservoir caused in use by thermal expansion and contraction of the container and the contents thereof.

4,004,845
HIGH DENSITY ELECTRICAL CONNECTOR EMPLOYING MALE BLADE WITH OFFSET PORTIONS

Jerzy R. Sochor, Manhattan Beach, Calif., assignor to Elco Corporation

Filed Apr. 17, 1975, Ser. No. 569,100

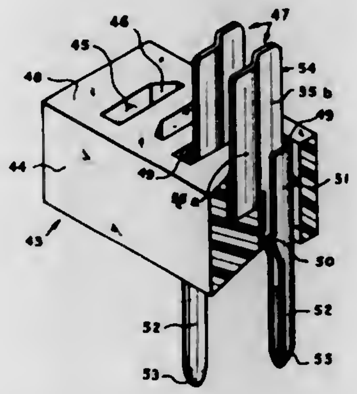
Int. Cl.² H01R *13/12*

U.S. Cl. 339—258 P **10 Claims**

1. A connector comprising mating male and female halves, said male half comprising an insulator housing, a plurality of contacts mounted in a row having a given direction in said housing, said contacts having an elongated configuration, one end of each contact constituting a mating end, the rest of each contact comprising means for securely mounting said contact in said housing and effecting a tail connection with said contact, said mating end comprising a blade portion protruding from a portion of said insulating housing in a direction of mating, said blade portion being generally straight in said direction of mating and comprising a first generally flat part oriented generally parallel to said direction of mating and generally normal to said given direction of said row, a second generally flat

part oriented generally parallel to but spaced from the plane of said first generally flat part, and an interconnecting part being substantially narrower in width than said first and second generally flat parts, and integrally joining said first and second generally flat parts such that said blade has a general step-like configuration when viewed in the direction of mating,

said female half comprising an insulating housing, a plurality of female contacts mounted in said housing, said contacts having an elongated configuration, one end of each contact consitituting a mating end, the rest of each contact comprising means for securely mounting said contact in said housing and effecting a tail connection with said contact, said mating end comprising a pair of elongated fork tine members oriented in a direction of mating, each of said fork members having a convex mating surface facing generally normal to said direction of mating, the convex surfaces of said respective tine members facing outwardly in opposite but generally parallel directions, said female contact being positioned in said insulating housing to mate with respective ones of said male contacts when said male and female halves are brought together, said fork tine members of each of said female contacts being shaped and spaced such that the convex surfaces thereof will press against respectively opposite sides of the blade portion of its corresponding male contact when mated therewith.



4,004,846

ELECTRICAL TERMINAL

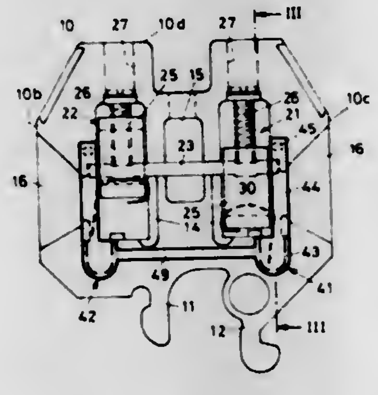
Hans Woertz, Basel, Switzerland, assignor to Oskar Woertz, Inhaber Hans Woertz, Basel, Switzerland

Filed Mar. 12, 1976, Ser. No. 666,477

Claims priority, application Switzerland, Mar. 25, 1975, 3759/75

Int. Cl.² H01R *9/10*

U.S. Cl. 339—263 R **10 Claims**



10. An electrical terminal comprising a housing, at least one clamping device supported in the housing for fixedly clamping at least one electrical conductor, said clamping device comprising a stationary contact element and a clamping body provided with an opening for the reception of said at least one conductor, the contact element extending into the opening of the clamping body, a blocking flap provided at the opening of the clamping body for preventing the mistaken introduction of a conductor externally of the clamping body into the housing, at least one insert element arranged at the insulating housing, said insert element forming a pocket for the reception of the blocking flap.

4,004,847

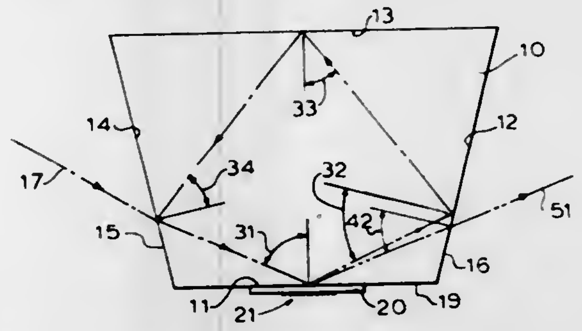
LIGHT OPTIC DATA HANDLING SYSTEM

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed Feb. 4, 1976, Ser. No. 655,152

Int. Cl.² G02F *1/16*

U.S. Cl. 350—161 W **5 Claims**



1. Light beam distributor means, comprising:

a. a light admitting surface;

b. a source of light and means for directing light therefrom along an input path toward said admitting surface and thereupon along a primary optical path while undergoing a series of light reflections within said distributor means so as to establish an availability of light from said source at a plurality of predetermined light output positions of said distributor means for an optically controlled redirecting of light along a selected one of a plurality of secondary optical paths stemming from said output positions;

c. said means for directing light along said primary path including an array of light reflecting interfaces of first and second light conducting media presenting, respectively, first and second indices of refraction, each of said interfaces presenting a length dimension and each angularly oriented so as to establish an optical relationship one with respect of the other, with respect to said input path, and with respect to said secondary optical path, said array of interfaces providing a series of 360° primary optical paths for said light, each said 360° path displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension:

d. said output positions extended along said length dimension coincident with a predetermined one of said interfaces of first and second light conducting media of said array of interfaces, light reflection control means extended along said length dimension adjacent an interface of first and second light conducting media preceding said one interface for effecting, selectively, a redirecting of light along a path away from said primary optical path toward an output position of said one interface so as to establish an angle of incidence of said light thereon for frustrating a reflection of said light therefrom and thereby allowing a passing of light along a secondary path stemming from said output position.

4,004,848

LIQUID CRYSTAL DISPLAY DEVICE

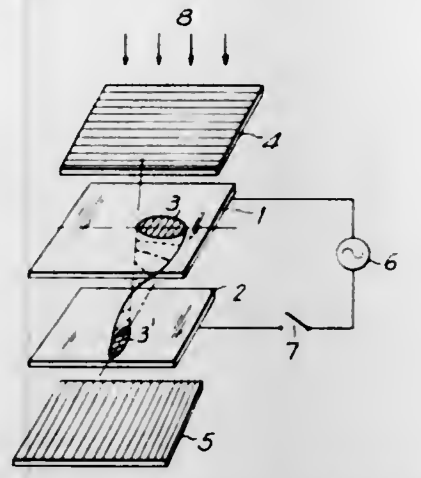
Yoshio Yamazaki, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Mar. 13, 1974, Ser. No. 450,954

Claims priority, application Japan, Mar. 13, 1973, 48-28507

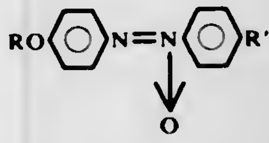
Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 350—160 LC **8 Claims**



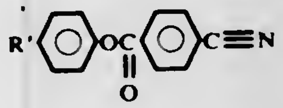
1. A liquid crystal display device, comprising opposing electrode plates unidirectionally rubbed on the facing surfaces thereof, the rubbing directions being at right angles to each other, polarizer and analyzer plates at the exterior surfaces of said opposing electrode plates and a nematic liquid crystal composition having a positive dielectric anisotropy between said electrode plates, said composition consisting essentially of at least one compound having the formula

I



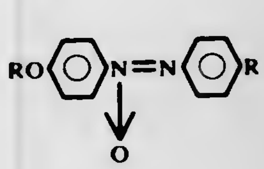
and at least one compound having the formula

II



where R' is a normal alkyl group having 1 – 8 carbon atoms, R is selected from the group consisting of normal alkyl groups having 1 – 8 carbon atoms and normal saturated acyl groups having 1 – 9 carbon atoms, the formula I is considered equivalent to

III



4,004,849

DISPLAY APPARATUS AND PROCESS

Meredith David Shattuck, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,398

Int. Cl.² G02B *5/23*

U.S. Cl. 350—160 R **10 Claims**

1. An apparatus for displaying a visible image, said apparatus comprising two substantially parallel planar electrodes at least one of which is transparent, and, contained between said electrodes, a solution in liquid of at least two polymers, at least one of which is selected from the group consisting of cellulose nitrate, polyester, polyvinylcarbazole and formaldehyde condensation polymers with the other polymer being selected from the group consisting of polymethylene-N-ethyl carbazole polymer, 3-vinyl-10-methyl phenothiazine polymer, styrene copolymerized with 2-vinyl pyridine, dibenzothiophene condensation polymer with formaldehyde, 1-vinyl naphthalene polymer, formaldehyde condensation polymer with dibenzothiophene and dibenzofuran, polyvinylcarbazole, polyester and polystyrene, and with the liquid being selected from the group consisting of tetrahydrofuran, methyl ethyl ketone, acetone, dimethyl formamide and mixtures thereof.

4,004,850

MIRROR APPARATUS

Arlan L. Nelson, N79 W16188 Community Drive, Menomonee Falls, Wis. 53051

Filed Sept. 22, 1975, Ser. No. 615,381

Int. Cl.² G02B *5/08;* **A47F** *7/14*

U.S. Cl. 350—299 **4 Claims**

1. Apparatus comprising:

a support rod;

bracket means slidably mounted on said support rod;

at least two mirrors articulatingly supported in said bracket means and pivotally movable about an axis parallel to said support rod;

means comprising a plurality of legs for supporting said apparatus, said legs being coupled to said support rod and being individually adjustable to permit said support rod to remain relatively vertical on uneven terrain;

said bracket means including at least one pair of opposed spherical chambers, each chamber having an elongated slot formed therein;

said mirrors each having a generally spherical protruberance received by one of said chambers for being articulatingly supported in said bracket means;

said bracket means having a generally vertical aperture for receiving said support rod;

means for deforming said bracket aperture to increase the friction between said aperture and said support rod;

said means for supporting said apparatus comprising block means having a plurality of apertures and a generally tubular leg slidably received in each aperture, each leg frictionally contacting said aperture;

said block means having a central aperture for receiving said support rod; and

each of said plurality of apertures extending at an acute angle relative to a horizontal plane and having a generally circular opening on one side of said block tapering to a generally elliptical opening on the opposite side of said block, said legs being pivotable within said aperture between a first position and a second position, said legs being freely slidable relative to said block in said first position, and frictionally fixed in said block in said second position.

4,004,851

OPTICAL DEVICE WITH MEANS FOR REDUCING INTERNAL REFLECTIONS

Hirokazu Negishi, No. 1-23, Honmoku-cho, Naka-Ku Yokohama Kanagawa, and Kazuya Matsumoto, No. 1-88, Tamagawa Okusawa Setagaya, Tokyo, both of Japan

Continuation of Ser. No. 78,179, Oct. 5, 1970, abandoned, which is a continuation of Ser. No. 837,964, March 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 573,097, Aug. 17, 1966, abandoned. This application Oct. 10, 1972, Ser. No. 296,304

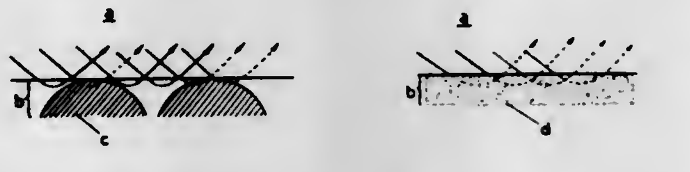
Claims priority, application Japan, Aug. 24, 1965, 41-4051582; Aug. 24, 1965, 41-4051583

Int. Cl. G02b *5/22;* **B32b** *17/06*

U.S. Cl. 350—311 **3 Claims**

1. An optical device comprising a transparent optical mass having an outer surface, internal reflection suppressing coating having an index of refraction smaller than that of said

optical mass and coated directly on said surface for suppressing internal reflections of light passing through said mass at angles of incidence to said surface greater than the critical angle, said internal reflection suppressing coating including a dispersing medium and a material in the form of light absorbing particles having dimensions smaller than one-fifth of the wavelength of visible light dispersed in said medium and having a sufficient density near the surface to absorb a major portion of visible light at all wavelengths incident upon the surface through the mass at angles of incidence greater than the critical angle.



4,004,852

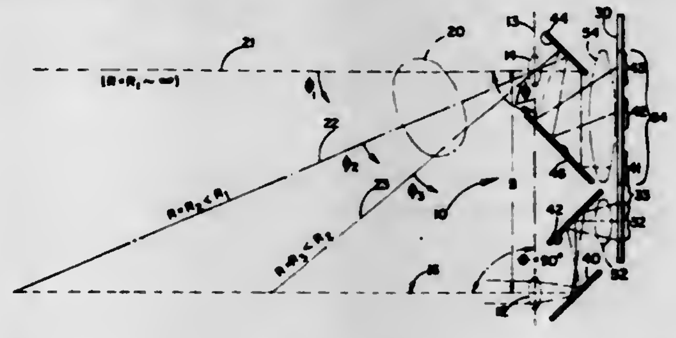
INTEGRATED AUTOMATIC RANGING DEVICE FOR OPTICAL INSTRUMENTS

Eugene E. Pentecost, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 30, 1975, Ser. No. 591,578

Int. Cl.² G01C *3/00;* **G03B** *7/08*

U.S. Cl. 356—1 **11 Claims**



1. An automatic range determination system comprising:

image sensing means for sensing an image focused thereon;

optical means for focusing first and second images of an object the range of which is to be determined onto said image sensing means, said first and second images derived along different sightlines;

quantization means for quantizing the data generated for each image element by said image sensing means;

storage means for receiving and storing the quantized image data corresponding to said first and second images;

comparison means for comparing on an element by element basis the stored quantized image data corresponding to said first image to the stored quantized image data corresponding to said second image and providing an output which is representative of the degree of similarity between the stored quantized image data for corresponding elements of the first and second images;

control means for controlling operations performed during range determination sequences and for causing the comparator means to compare during a range determination sequence the stored data with respect to M successive elements of the first image in separate comparison sequences with the stored data for a plurality of different sets of M successive elements of said second image;

alignment storage means for storing the relative alignment between the elements of the first image and the elements of the second image which yields an optimum comparison between the stored data;

comparison optimization means for recognizing the alignment between the elements of said first image and said second image which, for the optimization criterion utilized, yields an optimum comparison between the elements of the first image and the elements of the second image.

4,004,853

EXPOSURE METER CIRCUIT

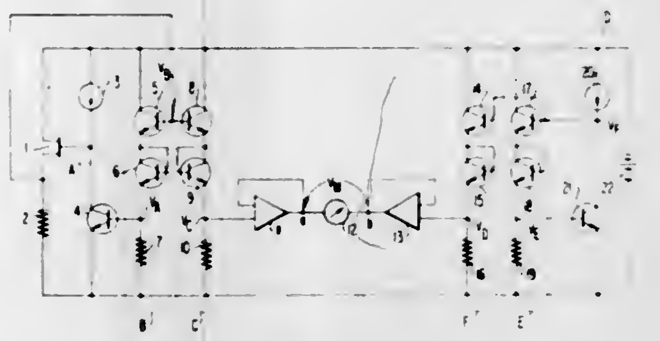
Chiharu Mori, and Masahiro Kawasaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1975, Ser. No. 610,506

Claims priority, application Japan, Sept. 3, 1974, 49-101164

Int. Cl.² G01J *1/44*

U.S. Cl. 356—226 **20 Claims**



1. An exposure meter circuit comprising:

a. a first transistor having base, collector and emitter electrodes, the emitter of said first transistor being connected to a source of reference potential;

b. a first current source connected to the collector of said first transistor; and first current source comprising a photovoltaic device such as a photodiode corresponding to a first exposure determining factor;

c. a first emitter-follower circuit connected between the collector and base of said first transistor to form a feed back circuit, the emitter current of said first emitter-follower circuit corresponding to a second exposure determining factor and providing logarithmic compression;

d. a second emitter-follower circuit connected to receive the output at the collector of said first transistor, the emitter current of said second emitter-follower corresponding to a third exposure determining factor and providing logarithmic compression;

e. a second transistor having base, collector and emitter electrodes, the emitter of said second transistor being connected to a source of reference potential;

f. a second current source connected to the collector of said second transistor, said second current source corresponding to a fourth exposure determining factor;

g. a third emitter-follower circuit connected between the collector and base of said second transistor to form a feed back circuit, the emitter of said third emitter-follower circuit corresponding to a fifth exposure determining factor and providing logarithmic compression; and

h. indicating means connected between the output of said second-emitter-follower circuit and the output from the collector of said second transistor for providing an indication of a desired exposure determining factor.

4,004,854

DISPENSER AND APPLICATOR DEVICE

Carl Breer, II, 45 Preston Place, Grosse Pointe Farms, Mich. 48236

Filed June 10, 1975, Ser. No. 585,525

Int. Cl.² B43K *5/00;* **B67D** *5/06, 37/00;* **A47G** *19/14*

U.S. Cl. 401—205 **4 Claims**

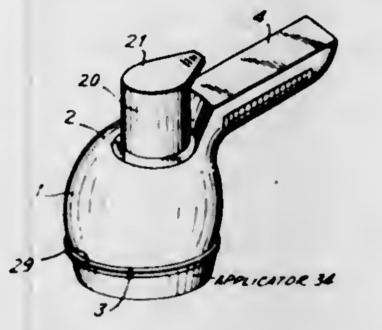
1. A dispenser and applicator device for selectively dispensing and applying material to a selected area, said dispenser and applicator device comprising

a manually supported housing of substantially hemispherical bowl-type configuration having a substantially round spherical top and a substantially planar bottom, and a substantially elongated handle extending from the housing in the area of the top thereof, essentially tangentially with the top of the housing;

a storage area in the housing for storing material, the storage area having an opening at the bottom of the housing;

manually controlled dispenser control means in the housing and extending therefrom for manually selectively controlling the dispensing of material from the storage area; and

a bellows having a top, a bottom, and a liquid to be dispensed therein and bellows valve means in the bottom of the bellows for dispensing the liquid therefrom under pressure, said dispenser control means comprising a piston-type member axially movably mounted in the top of the housing and having an upper end extending beyond the housing in operative proximity with the handle and a lower end abutting the top of the bellows for transmitting manual pressure thereto.



4,004,855

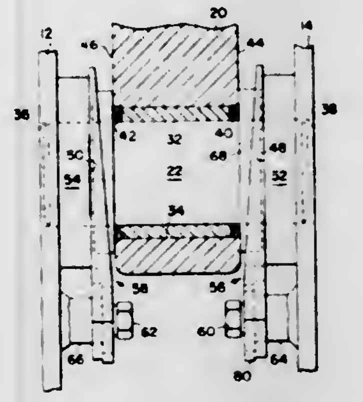
ARTICULATED JOINT INCLUDING SEALS MAINTAINED BY WEDGE

Gary Lee Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 21, 1976, Ser. No. 688,674

Int. Cl.² F16C *11/00*

U.S. Cl. 403—158 **10 Claims**



1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to the second member by a pivot pin assembly including aligned holes located in the pair of parallel portions and the second member and a bushing located in the hole of the second member and receiving a pin extending into the holes in the pair of parallel portions, and seal means for preventing abrasive material from entering between the pin and bushing, the improvement comprising: said bushing being a predetermined length less than the length of the hole in said second member, first and second pairs of opposed Belleville springs located in the last named hole at opposite ends of the bushing and having a combined uncompressed length greater than said predetermined length less than the length of the hole; and first and second wedge means respectively interposed between the pair of parallel portions and the second member and respectively engaging one of each of said first and second pairs of Belleville springs and maintaining said first and second pairs of Belleville springs in a compressed state within the length of the hole in the second member.

4,004,856

SCAFFOLD SUBASSEMBLY

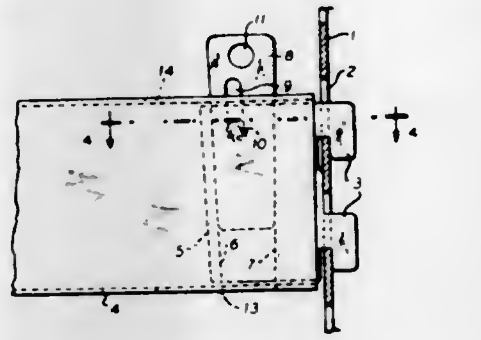
Gerhard Wesseler, Vreden, Germany, assignor to Dula-Werke Dustmann & Co., Dortmund-Hombruch, Germany

Filed Mar. 19, 1975, Ser. No. 559,935

Claims priority, application Germany, Mar. 29, 1974, 2415208

Int. Cl.² F16B *7/00*

U.S. Cl. 403—186 **7 Claims**



1. Cross member having end hooks for a scaffold assembly formed by a plurality of said cross members and uprights having slots in which the hooks engage to join the cross members and uprights together, and having wedges securing the cross members and uprights in place, the improvement which comprises the cross member having a hook which is secured to the cross member in an unremovable manner and so that it is longitudinally shiftable on the cross member between a retracted position permitting placement of the cross member in place between uprights to be joined thereby and an extended position for engagement of the hook in a slot of the upright, the hook having an extension projecting inwardly along the cross member and shaped to form an abutment disposed inwardly of the hook, and a vertically movable wedge secured in an unremovable manner to the hook extension for wedging against the abutment to secure the hook in place in the slot of the upright and a second abutment which is mounted on the cross member in stationary condition outwardly of the abutment of the hook for providing a pocket for the wedge between the hook abutment and the stationary abutment the unremovable mounting of the hook on the cross member being provided by interference between the wedge and the second abutment when the hook is fully extended, and interference between the wedge and a portion of the cross member when the hook is fully retracted.

4,004,857

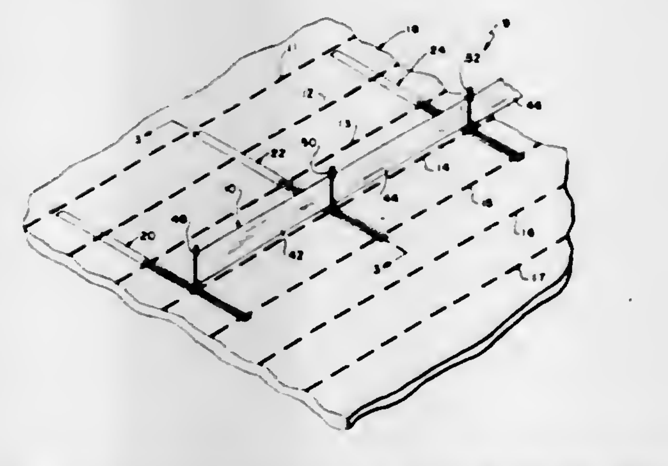
MOVEABLE BARRIER APPARATUS FOR ROADWAY

Robert M. Eschen, Jr., 440 Grand Ave., Oakland, Calif. 94610

Filed Sept. 19, 1975, Ser. No. 614,916

Int. Cl.² E01F *13/00*

U.S. Cl. 404—6 **6 Claims**



1. Moveable barrier apparatus for dividing parallel lanes of a roadway, comprising the combination of a plurality of spaced-apart elongate channels embedded in the roadway and

extending transversely of the lanes, a car mounted for longitudinal movement within each channel, an elongate upstanding barrier mounted above the roadway for movement with the cars, the barrier extending in a direction lengthwise of the lanes, actuator means within each channel, the actuator means being interconnectted between one end of the respective channel and the car which is associated therewith, said actuator means associated with each channel comprising a pair of extensible hydraulic rams, each ram having a head end and a rod end, with the rams being positioned on opposite sides of the associated car and horizontally oriented at substantially right angles with the barrier, means for connecting one end of each of the rams to opposite ends of the respective channels and for connecting an opposite of each of the rams to the associated cars, and control means for operating the actuator means to conjointly move the cars to selected positions within the channels whereby the barrier is carried to a selected transverse position which divides the roadway into parallel traffic lanes, said control means including means for hydraulically locking the rams when the barrier is fixedly positioned whereby shock forces impacting upon either side of the barrier are carried through and resisted by the hydraulic fluid locked within the rams and thereafter by the channels and roadway.

4,004,858

ADJUSTABLE BORING BAR PROVIDED WITH HARD METAL SHIFTING TIP FOR METAL WORKING

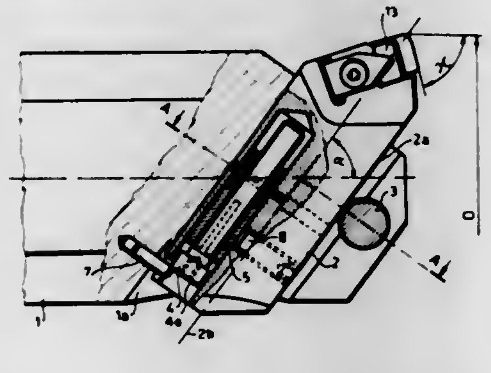
Andras Szilva, Jaszbereny, Hungary, assignor to Apritogepgyar, Jaszbereny, Hungary

Filed May 2, 1975, Ser. No. 573,990

Claims priority, application Hungary, May 3, 1974, AI 234

Int. Cl.² B23B *29/10*

U.S. Cl. 408—153 **2 Claims**



1. An adjustable boring bar for coarse and for fine machining comprising:

a boring bar shaft (1) connectable to a machine tool, the shaft having a cylindrical bore (1a) disposed at an angle with the geometrical axis of the boring bar shaft (1);

a boring head (2) disposed in said bore (1*a*) and including a shifting tip (13) disposed in an end of the boring head (2) and a cylindrical mantle receivable in the cylindrical bore (1*a*), said cylindrical mantle having a flattened portion (2*a*) which is parallel to the centerline of the boring head (2);

means mounting the boring head in the cylindrical bore (1*a*) of the boring bar shaft (1) for positioning and orienting edges of the shifting tip (13), including a first adjusting screw (3) for providing the force necessary for the fastening of the cylindrical mantle of the boring head (2) and further including a radial slot (1*b*) in the boring bar shaft (1), said slot (1*b*) extending from an end portion of the boring bar shaft (1) which points toward the workpiece and intersects the entire length of the cylindrical bore (1*a*) and wherein a portion of said screw (3) penetrates said bore (1*a*) in a chord-like fashion perpendicular to said slot (1*b*) and wherein said portion of said screw (3) is parallel to the flattened portion (2*a*) on the cylindrical mantle of the boring head (2);

a second adjusting screw (4) for coarse adjustment of the boring head (2) disposed in the mantle of the boring head (2) parallel to and displaced from the axis of said mantle, an end portion (4*a*) of said second adjusting screw (4) pointing outwardly from the mantle of the boring head; and

a dowel pin limiting member (7, 17) having one fixed end portion and the other end portion extending into the cylindrical bore (1*a*) and abutting against the end portion (4*a*) of the second adjusting screw (4).

4,004,859

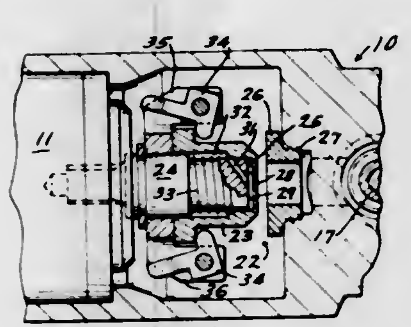
AIR TOOL WITH SPEED RESPONSIVE SHUTOFF

John A. Borries, Chesterland, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 18, 1975, Ser. No. 605,224

Int. Cl.² F01D *25/00*

U.S. Cl. 415—25 **6 Claims**



1. A speed responsive shutoff for a rotary air tool driven by an air motor operable by a throttle valve with an air passage therebetween, comprising:

an air shutoff valve in the air passage between the air motor and the throttle valve including means biasing the valve toward its closed position to close off the air passage;

said shutoff valve including a valve seat positioned in the air passage, a valve head movable toward and away from the valve seat, means defining an expansible chamber behind the valve head for urging the valve head toward the closed position when the chamber is pressurized, an orifice through the valve head establishing communication between the expansible chamber and the upstream side of the valve head, said orifice being sufficiently small to enable upstream air pressure on initial opening of the throttle valve to open the valve against the biasing means sufficiently to run the air motor up to said predetermined speed level;

means for opening the shutoff valve response to the attainment of a predetermined motor speed level; and

means for dissipating air pressure from the expansible chamber when the throttle valve is closed;

whereby, when the air motor slows to a second speed level under load, the biasing means overcomes the opening means and moves the valve head toward the closed position, and as air pressure builds upstream of the valve head, the expansible chamber becomes pressurized to at least partially offset the effect of upstream air pressure, allowing the valve to be closed under the influence of the biasing means.

4,004,860

TURBINE BLADE WITH CONFIGURED STALK

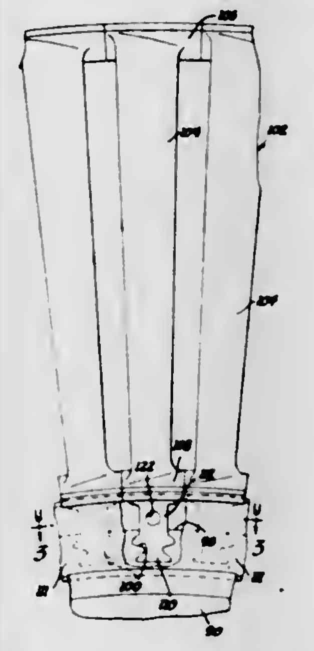
Ted F. Gee, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 489,606, July 22, 1974, Pat. No. 3,952,391. This application Dec. 22, 1975, Ser. No. 643,155

Int. Cl.² F01D *5/30*

U.S. Cl. 416—2 **1 Claim**

1. In a turbine of the type having a free shaft coupled to a load and an exhaust passage defined in part by an outer shroud surrounding the shaft for directing combustion products produced by combustion of air and fuel supplied from an overspeed protected control system through the exhaust passage with the free shaft being susceptible to speed increases in excess of a rated maximum speed upon loss of load and failure of the overspeed protection fuel system, the combination of a rotor wheel having an outer peripheral rim, said rotor wheel having a high tensile strength and a material strength reduction under operating conditions not in excess of 3.3 standard deviations from its statistical mean strength, means coupling said rotor wheel to said shaft, a plurality of dovetail slots in said peripheral rim, a ring of turbine blades located at spaced circumferential points on said wheel peripheral rim extending into said exhaust passage, each of said blades having a high tensile strength and a material strength development under operating conditions not to exceed 1.5 standard deviations from its statistical mean strength, each of said blades including a root having a multiple dovetail form fit within one of said slots, each of said blades having a stalk portion with end walls and parallel side walls located radially outwardly of said peripheral rim and having each of said end walls and side walls thereon machined to maintain a controlled rectangular area therethrough, a circular hole directed through each of said stalks at a point radially outwardly of said rim, said hole having an area with relation to the machined cross section of said stalk to assure separation of said blades from said rim at said hole prior to the average tangential stress in said wheel exceeding 0.9 of the ultimate tensile strength of said wheel.



4,004,861

WIND DRIVEN PRIME MOVER

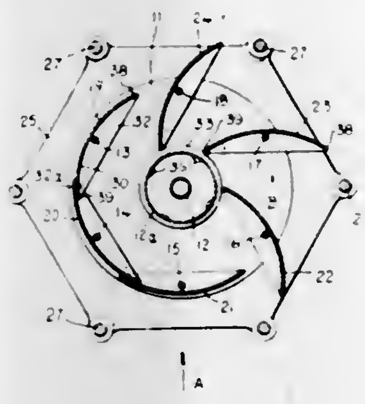
Charl Soules, 37 Kingsdale Ave., Willowdale, Ontario, Canada M2N 3W3

Filed June 13, 1975, Ser. No. 586,541

Int. Cl.² F03D *7/06*

U.S. Cl. 416—41 **6 Claims**

1. In a wind driven power producing apparatus, a wind driven prime mover comprising a rotatable circular turntable having an axial (shaft) rotatably mounted on a fixed base, a plurality of arcuate shaped wind vanes automatically opened and closed solely by wind action, said vanes being pivotally mounted on the turntable (at right angles) parallel to the axis of rotation of the turntable, said pivots being located substantially centrally between the outside edge and inside edge of the vane, the vanes being of a length that in a closed position the (leading) inside edge of one vane will (overlap) underlie the (trailing) outside edge of the preceding vane and (stop means limiting the pivot movement of the vanes to an) in the open position in response to the wind velocity the inside edge will engage against the axial shaft.



4,004,862

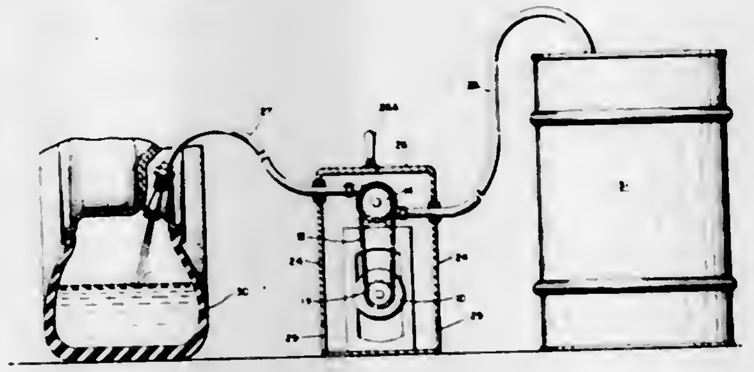
BATTERY POWERED FLUID TRANSFER APPARATUS

Billy R. Hill, Canyon; David L. Whatley, Amarillo, Tex., assignor to Cerco Tires Inc., Amarillo, Tex.

Filed Aug. 18, 1975, Ser. No. 605,591

Int. Cl.² F04B *21/00*

U.S. Cl. 417—234 **1 Claim**



1. An apparatus for transferring liquids from a reservoir container to a vehicle tire and vise versa comprising:

a. a base,

b. motor support means upstanding from said base and secured thereto,

c. a 12 V DC motor mounted in said motor support means,

d. a positive displacement gear pump secured to the top of said motor support means,

e. a sprocket and chain drive between said motor and gear pump,

f. motor power leads adapted to be connected to the terminals of a 12 V DC battery,

g. cover means over and secured to said base and motor support means having side, end walls and a top having a handle within which said motor and pump are housed,

h. a reversing switch in circuit between said battery connection and said motor mounted exteriorly on said cover means,

i. and a supply and discharge hose connected respectively to the intake and discharge of said pump and passing through the side walls of said cover means, said supply hose being receivable in said reservoir container and said discharge hose being connectable to said vehicle tire.

4,004,863

HYDRAULIC PUMP WITH REMOTE CONTROL EQUIPMENT

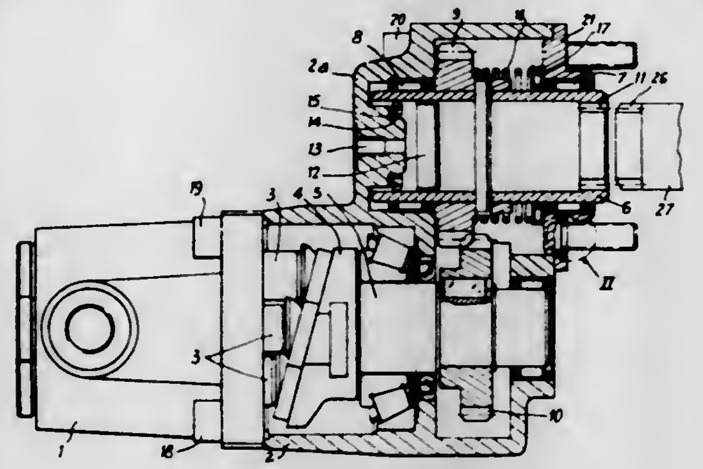
Louis-Claude Porel, Ramberville, France, assignor to Etablissements Rene Leduc & Fils, Ramberville, France

Filed Jan. 27, 1975, Ser. No. 544,382

Claims priority, application France, Jan. 30, 1974, 74.03009

Int. Cl.^{2} F04B *9/00*

U.S. Cl. 417—271 **10 Claims**



1. A hydraulic pump adapted to be driven by a rotating member of another device, said pump comprising a casing, a pump driving shaft mounted in said casing, pump means supported in said casing driven by said driving shaft, an auxiliary housing attached to said casing, a shaft slidably mounted in said auxiliary housing, driving gear means mounted on said slidable shaft, mating, interengaging mechanical means on said slidable shaft and said rotating member of said other device for directly driving the slidable shaft when said means are interengaged, gear means mounted on said pump shaft adapted to be engaged and driven by said driving gear means on said slidable shaft, means for biasing said slidable shaft to a first position wherein said driving gear means of the slidable shaft is out of driving engagement with the driven gear means of the pump driving shaft and the interengaging means of the slidable shaft is out of engagement with the mating, interengaging means of said rotating member, means for supplying fluid under pressure to said slidable shaft to move it against the force of the biasing means to a second position wherein the interengaging means of the slidable shaft is engaged by the mating, interengaging means of said rotating member of the other device so that the driving gear means is rotated and the driving and driven gears are engaged to rotate the pump shaft.

4,004,864

METHOD FOR MODIFYING A COMPRESSING APPARATUS UNIT

Lauritz Benedictus Schibbye, Saltsjo-Duvnas, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

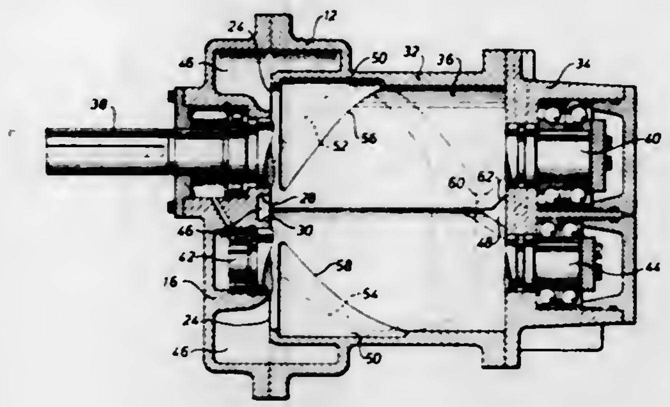
Filed June 23, 1975, Ser. No. 589,210

Claims priority, application United Kingdom, July 1, 1974, 29038/74

Int. Cl.^{2} F04C *15/02*

U.S. Cl. 418—1 **13 Claims**

1. Method for modifying a compressing apparatus unit to a higher compression ratio than the normal design compression ratio with substantially the same power consumption, said unit comprising a prime mover and a screw compressor directly connected thereto, said screw compressor including a barrel member and at least two intermeshing screw rotors sealingly mounted therein, said compressor being designed and dimensioned, and having predetermined design inlet port size, to accurately match the maximum available power of the prime mover at said normal design compression ratio, the normal design compression phase of said compressor beginning at a predetermined point therein, comprising extending the inlet port of said compressor to a greater size than said predetermined design size and into said normal design compression phase of said compressor to decrease the volumetric capacity of said compressor, the increase in power consumption owing to the higher compression ratio being balanced by a decrease thereof owing to the resulting decrease in volumetric capacity.



4,004,865

PUMP WITH YIELDABLE RADIAL PARTITIONS AND ROTATABLE SIDE PLATES

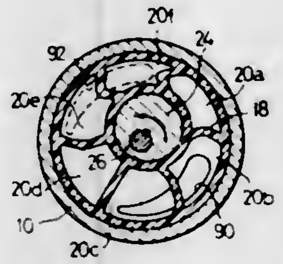
Yoshi Ikeda, Musashino; Kenji Osada, Tokyo, and Kazumi Doi, Mitaka, all of Japan, assignors to Nikkiso Eiko Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 464,926

Claims priority, application Japan, May 1, 1973, 48-49511; Nov. 16, 1973, 48-129061; Dec. 3, 1973, 48-135960; Feb. 13, 1974, 49-17924

Int. Cl.^{2} F01C *5/00*; **F04C** *5/00*

U.S. Cl. 418—45 **4 Claims**



1. A volume pump having a pump chamber formed between an inner sleeve and a concentrically arranged outer sleeve, a plurality of normally closed compartments within said chamber and formed by circumferentially spaced apart generally radially directed yieldable partitions extending between and engaging said inner and outer sleeves, said compartments in radial direction extending the full extent of the partitions between said sleeves, side plates for closing opposite ends of said compartments defined by said generally radially directed partitions, one of said plates having suction means for the compartments formed therein and the other of said side plates having delivery means for the compartments formed therein, and rotatable deflection means within said inner sleeve to successively change the volume of said compartments, each of the side plates being rotatable and being formed with symmetrical ports, the port size of each side plate being variable as a function of volume change of a compartment governed by said deflection means during rotation thereof.

4,004,866

GEROTOR DEVICE WITH VALVE COMPENSATING MEANS

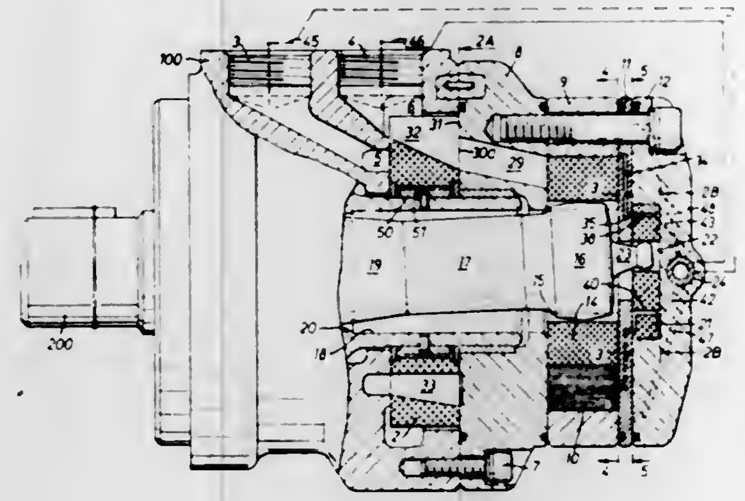
Carl Verner Ohrberg, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 10, 1975, Ser. No. 630,294

Claims priority, application Germany, Nov. 12, 1974, 2453560

Int. Cl.^{2} F01C *1/02, 21/12*; **F03C** *3/00*; **F15B** *11/10*

U.S. Cl. 418—61 B **3 Claims**



1. A rotary piston machine comprising a casing having interchageable fluid inlet and outlet ports, an internally toothed stator member and an eccentrically disposed externally toothed rotor member in meshing engagement, said rotor member having rotational movement about its own axis and orbital movement about the axis of said stator member with the teeth of said members intermeshing in sealing engagement to form expanding cells on one side of the line of eccentricity and contracting cells on the other side of said line during relative movement between said members, said casing having passages extending to said cells, drive shaft means in said casing connected to said rotor, distributing valve means between said ports and said passages, two way pressure responsive motor means connectin said distributing valve means to said shaft means allowing limited relative motion therebetween, two way pressure responsive control valve means connected to said inlet and outlet ports and said motor means for selectively actuating said motor means in either direction to change the positional setting of said distributing valve means relative to said shaft means, a stationary plate adjacent said rotor and stator members having circumferentially arranged sensing orifices in respective proximity to said cells, a sensing valve engaging said plate and being connected in driving relation to said shaft means for rotation at the orbiting speed of said rotor member, a first sensing port in said sensing valve on the line of eccentricity thereof and dual sensing ports straddling said line of eccentricity, said first sensing port being connected to one side of said control valve means and said dual sensing ports being connected to the other side of said control valve means, said sensing ports being cooperable with said sensing orifices to determine if said distributing valve means is in phase with said rotor member and to compensate if necessary by actuating said control valve means which in turn actuates said motor means for adjusting said distributing valve means relative to said shaft means.

4,004,867

HIGH VOLTAGE CABLE SPLICE APPARATUS

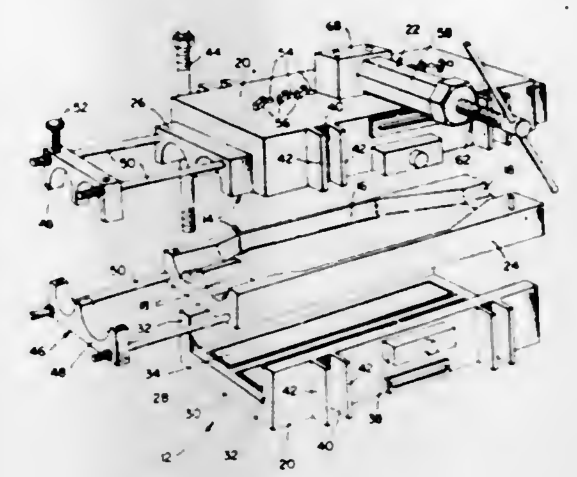
Arthur L. Nelson, La Jolla, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Filed Feb. 25, 1975, Ser. No. 552,903

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.^{2} B29H *5/16*; **B29C** *27/00*

U.S. Cl. 425—11 **11 Claims**



1. In apparatus for forming insulation about an uninsulated section of a conductor of a high voltage cable and having a mold defined by opposing mold halves which form a mold cavity therebetween into which the uninsulated conductor section is placed; a pressure platen in contact with each mold half; means for biasing the pressure platens against each other to thereby firmly close the mold; means for heating the mold; and means for introducing into the cavity a heat softenable and curable insulating material; the improvement comprising: a plurality of vent holes extending from the cavity through the mold to the exterior for venting to the atmosphere entrapped gas and insulating material, the vent holes being tapered over at least a portion of their length and having a major diameter proximate the cavity to prevent hardened insulating material disposed in such vent holes from breaking from the newly formed insulation when the cable is removed from the mold.

4,004,868

INJECTION MOLD FOR LAMINATED ARTICLE

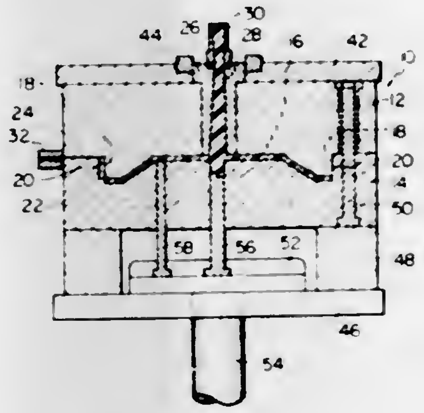
Keiki Ohdate, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Sept. 30, 1975, Ser. No. 618,229

Claims priority, application Japan, Oct. 1, 1974, 49-112298; Oct. 1, 1974, 49-112299

Int. Cl.^{2} B29F *1/05*

U.S. Cl. 425—130 **5 Claims**



1. A mold for the injection molding of a laminated article plastic having a first layer of a first resin and a second layer of a different second resin, the mold comprising:

a stationary die plate;

a movable die plate juxtaposed against said stationary die plate in such an arrangement that the contacted end faces of said stationary and movable die plates are locally spaced from each other to form a cavity corresponding in shape and dimensions to said first layer and that the dimensions of said cavity are enlarged when said movable die plate is parted from said stationary die plate;

a first sprue formed in said stationary die plate for providing fluid communication between said cavity and the atmosphere; and

a second sprue formed in said movable die plate, said second sprue being defined by opposite end faces of said stationary and movable die plates, said opposite end faces being shaped such that said cavity is prevented from communicating with the atmosphere through said second sprue when said stationary and movable die plates are in full contact but allowed to communicate with the atmosphere through said second sprue when said movable die plate is parted from said stationary die plate by a predetermined distance corresponding to the thickness of said second layer.

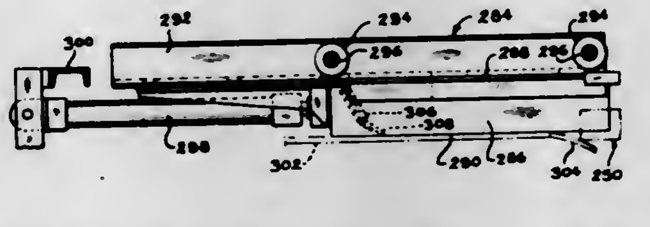
4,004,869
BLOCK MOLDING MACHINE WITH FEED DRAWER CONTROL MEANS

Milo G. Balhorn, Waterloo, Iowa, assignor to Old Fort International Inc., Adrian, Mich.

Division of Ser. No. 544,137, Jan. 27, 1975, Pat. No. 3,961,874. This application Feb. 13, 1976, Ser. No. 657,944

Int. Cl.^{2} B28B *13/02*

U.S. Cl. 425—159 **3 Claims**



1. In a block molding machine, a fsame, a moldbox supported by the frame and open at the top, a table plate generally in the plane of the open to of the moldbox and supported by the frame adjacent to the moldbox, a chute for receiving material to be introduced into said moldbox, the outlet end of said chute being located over said plate, and a feed drawer assembly for charging material from said chute into the open top of said moldbox, said frame supporting a pair of horizontally spaced feed drawer rollers on each side of said feed drawer assembly, said feed drawer assembly including a feed drawer having an open top and bottom and rails on opposite sides for travel on said feed drawer rollers between a first position on said table plate with the open top of the feed drawer in communication with said chute and a second position with the open bottom in communication with the open top of the moldbox, a feed drawer cylinder operatively connected to said frame and to said feed drawer for moving the feed drawer between its first and second positions, said feed drawer cylinder being double acting, and control means operatively connected to said feed drawer cylinder for actuating said feed drawer cylinder so that said feed drawer cylinder reciprocates said feed drawer in relatively short strokes for a selected time period after the feed drawer is initially moved over said moldbox to charge the latter.

4,004,870
DUAL-BELT COOLING SYSTEM

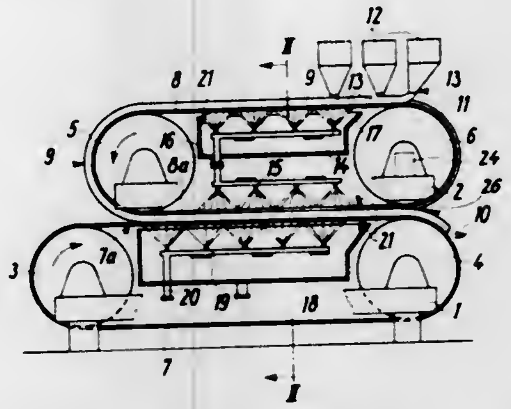
Manfred Guttinger, Stuttgart, and Konrad Schermutzki, Schmiden, both of Germany, assignors to Sandco Ltd., Ottawa, Canada

Filed June 4, 1975, Ser. No. 583,515

Claims priority, application Germany, June 5, 1974, 2427058

Int. Cl.^{2} B29C *23/00*

U.S. Cl. 425—224 **4 Claims**



1. In a dual-belt cooling system having upper and lower endless belts each of which is mounted upon a pair of horizontally spaced rolls and has an upper run and a lower run, wherein the lower run of the upper belt and the upper run of the lower belt are spaced from each other and define a treatment zone which is substantially rectangular in cross-section and through which a product layer passes in direct heat exchange relationship with coextensive surfaces of both of said belts, and means for providing a coolant in contact with the surfaces of said belts which are on the opposite sides of said coextensive surfaces whereby heat is extracted from the opposite sides of said product layer through the respective belts and to the coolant, the upper surface of said upper run of said upper belt extending horizontally, that improvement which comprises feed means to deposit said product layer upon said top surface of said upper run of said upper belt whereby the product layer passes along said upper run and thence downwardly through an arc of the order of 180° around one of said drums and enters said treatment zone, and cooling means to supply coolant to the bottom surface of said upper run of said upper belt and thereby precool the product layer and solidify it sufficiently to ensure that the product layer will maintain continuous contact with both belts when passing through said treatment zone.

4,004,871
MOLD GATE APPARATUS

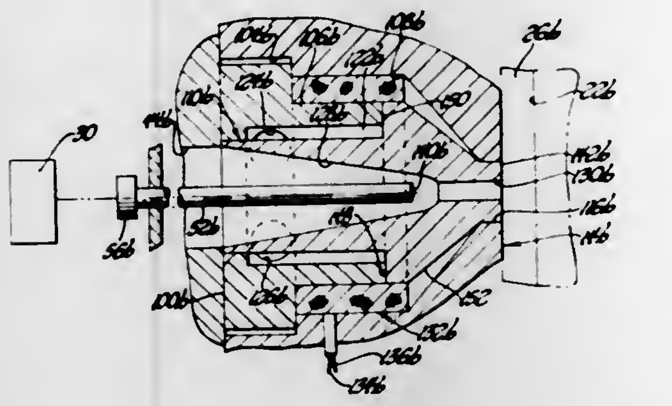
Claude Hardy, 35268 Bennett, Livonia, Mich. 48152

Continuation of Ser. No. 339,642, March 12, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,728

Int. Cl.^{2} B29F *1/03*

U.S. Cl. 425—243 **14 Claims**

1. A mold gate insert assembly, comprising insert body means having an inlet end and an outlet end, axially extending passage means formed through said insert body means and having an inlet opening formed in said inlet end and an outlet opening formed in said outlet end, said passage means being effective for enabling the flow therethrough of moldable material from an associated source of said material to an associated mold cavity, said insert body means comprising first and second insert body sections, one of said insert body sections being received by the other of said insert body sections and being sealingly secured to each other, chamber means defined by at least one of said first and second insert body sections as to be situated generally radially outwardly of said passage means and effective to carry therethrough fluid coolant means so as to thereby create a cooling effect along a first axially extending zone of said passage means, and generally annular electrical heating means carried by said insert body means and situated generally radially outwardly of said passage means so as to thereby create a heating effect along a second axially extending zone of said passage means, said chamber means and said heating means being spaced from each other as to have a portion of said insert body means generally therebetween, said first insert body section being of a sleeve-like configuration, said second insert body section having at least a portion thereof closely received within said first insert body section, said first insert body section having an axial end surface, said second insert body section comprising an annular radially extending flange surface, said flange surface being adapted to be in sealingly fixed engagement with said axial end surface, and said heating means being situated generally radially outwardly of said chamber.



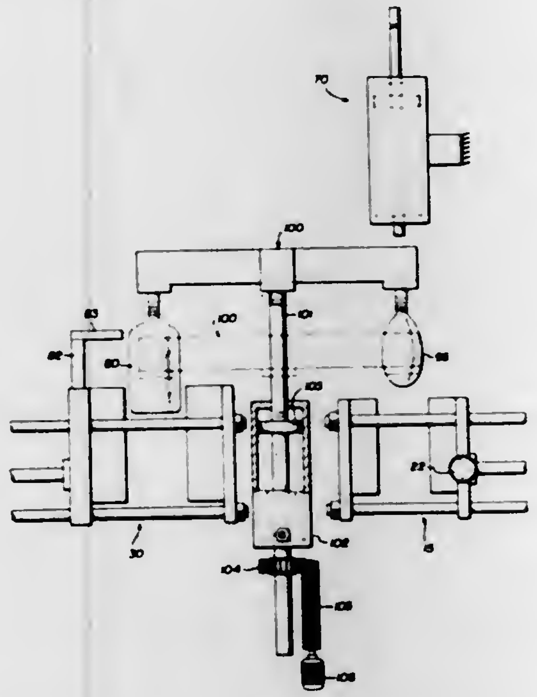
4,004,872
APPARATUS FOR BLOW MOLDING PLASTIC ARTICLES

Thomas J. Krall, and Albert R. Uhlig, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 461,286, April 16, 1974, abandoned. This application June 11, 1975, Ser. No. 585,933

Int. Cl.^{2} B29C *17/67*

U.S. Cl. 425—326 B **9 Claims**



1. In an apparatus for blow molding a plastic article by successive pre-form blowing and final article blowing steps, said apparatus including a pre-form blowing station interposed between a parison extrusion station and a final blow mold station, the improvements of a pre-form blow mold linearly movable between said parison extrusion station and said pre-form blowing station, means for opening and closing said pre-form blow mold, a fixed final blow mold located at said final blowing station spaced from said pre-form blowing station, means for opening and closing the final blow mold independently of said means for opening and closing said pre-form blow mold, a rotary turret arcuately movable about an axis intermediate said pre-form blowing station and said final blowing station to transfer the blown pre-form from said pre-form blowing station to said final blowing station, means for vertically raising and lowering said turret, a blow tube carried by said rotary turret and aligned with each blowing station in sequence as the turret is indexed, and means for supplying blow air to said tube for providing a source of blow air at each mold location.

4,004,873
CONTINUOUSLY OPERATING PRESS

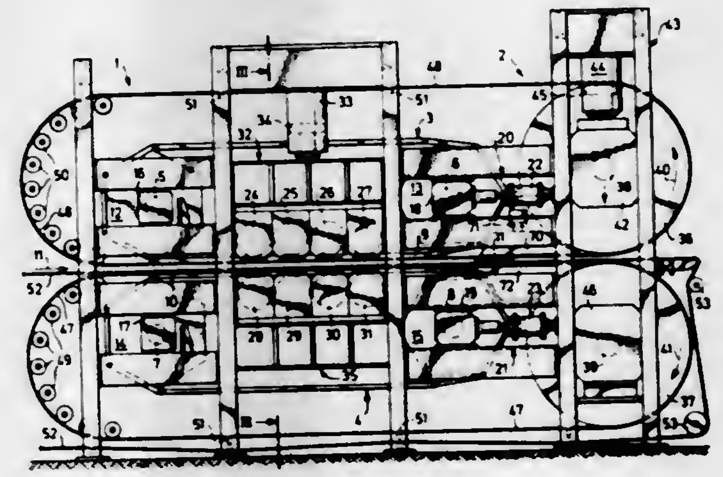
Albert De Mets, Roeselare, Belgium, assignor to Konstruktiewerkhuizen DeMets N.V., Belgium

Filed Aug. 27, 1975, Ser. No. 608,344

Claims priority, application Belgium, Aug. 27, 1974, 147937

Int. Cl.^{2} B29C *15/00*

U.S. Cl. 425—335 **26 Claims**



1. In a continuously operating press for the production of particle boards such as chip boards, fiber boards and the like from particle fleeces, comprising two endless plate belts arranged one above the other and consisting of belt plates pivoted to one another, said plate belts rotating about horizontal and parallel axes, the runs of the plate belts facing each other being driveable in the same direction by pressure rolls, and an endless steel band surrounding each endless plate belt, the improvement comprising at least one large-diameter drum arranged in each space surrounded by the respective endless steel bands, the large-diameter drums being positioned behind the respective endless plate belts with respect to the motion direction of the facing runs of said plate belts, the diameters of the largediameter drums being larger than the diameters of each of said pressure rolls, at least two large-diameter drums being supported in the same vertical plane, at least one of the large-diameter drums supported in the same vertical plane being moveable towards the other large-diameter drum supported in the same vertical plane so that the large-diameter drums in the same vertical plane can exert an adjustable compressive force on the particle fleece passing therebetween.

4,004,874
APPARATUS FOR PRODUCTION OF CAST CONCRETE MEMBERS

Larry W. Foster, Franklin, Tenn., assignor to Span-Deck, Inc., Franklin, Tenn.

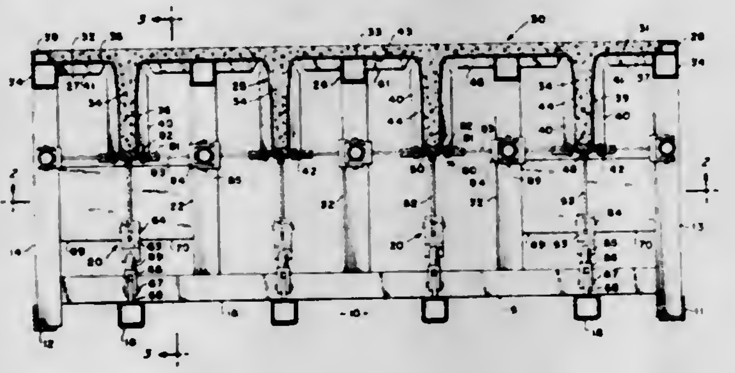
Filed June 19, 1974, Ser. No. 480,944

Int. Cl.^{2} B28B *7/10*

U.S. Cl. 425—438 **4 Claims**

1. Apparatus for the production of cast concrete structural members comprising a stress frame, a mold form open from the top to receive a fluid concrete mix and carried by said frame, said mold form including at least one pair of substan-

tially vertically disposed spaced side members closed off at opposite end and a horizontally disposed pallet closing off the lower end of the mold form, a side member springing mechanism for flexing said side members laterally away from each other at the lower ends after the concrete mix has been set in said form, said springing mechanism including a first yoke pivotally connected to the lower end of one of said side members of a pair, a second yoke pivotally connected to the lower end of the other of said side members of said pair, a first and a second connecting rod each affixed at one end to said first and said second yokes, respectively, a third yoke connected to the other end of said first connecting rod, a fourth yoke connected to the other end of said second connecting rod, a drive bar, means pivotally connecting said third and said fourth yokes to said drive bar, means connected to said drive bar for actuation thereof from a first to a second position to affect flexing of said side members, a swing arm assembly for supporting said pallet, said swing arm assembly adapted to be activated to elevate the pallet and the cast member after the concrete mix has been set in said form and the side members flexed to enable the cast member to be removed from the form, said swing arm assembly including a longitudinally extending support plate depending from said pallet, a plurality of spaced frist yokes disposed beneath said support plate and being pivotally connected to said support plate, a plurality of spaced second yokes pivotally connected to said stress frame and a plurality of connecting rods each connected at opposite ends to one of said plurality of first yokes and one of said plurality of second yokes, hydraulic actuating means connected to said support plate for displacing said support plate lengthwise of the form and thereby activating said swing arm assembly to elevate said pallet and the cast member set in the form.



4,004,875
LOW NOX BURNER

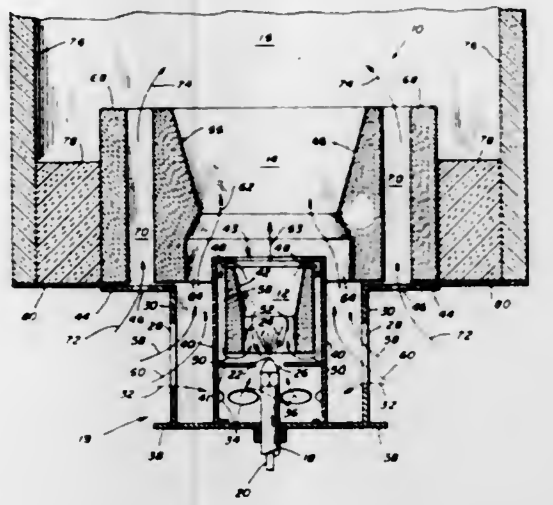
John Smith Zink, and Hershel E. Goodnight, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 23, 1975, Ser. No. 543,231

Int. Cl.^{2} F23J *15/00*

U.S. Cl. 431—9 **5 Claims**

1. A fluid fuel burner designed to produce minimum quantities of NOx, comprising:
   - a. a nozzle for injection of fuel into a first combustion zone surrounded by a first ceramic tile, and means to supply said fuel under pressure to said nozzle;
   - b. means adjacent said nozzle to supply a limited volume of primary air in the region of said nozzle, the volume being insufficient for complete combustion of said fuel;
   - c. an enclosure means surrounding and spaced from said first ceramic tile to define a first annular space communicating the outlet of said first combustion zone with the region of said nozzle;
   - d. means to recirculate a portion of the products of combustion from said first combustion zone around the outside of said first tile through said annular space to the vicinity of said nozzle;
   - e. a cylindrical wall annularly spaced from and surrounding said enclosure, said wall having openings therein to supply therethrough air, a portion of which becomes said volume of primary air, a remaining and larger portion being secondary air;
   - f. means to supply said secondary air in heat exchange relation with the outside of said enclosure means to cool said recirculated products thence to a second combustion zone downstream from said first combustion zone, the quantity of secondary air being sufficient to theoretically completely combust said fuel, said second zone surrounded by second ceramic tile;
   - g. a second annular space surrounding said second tile in communication with the outlet of said second combustion zone; and
   - h. means to supply tertiary air to said outlet of said second combustion zone via said second annular space.



4,004,876
METHOD OF BURNING PULVEROUS RAW MATERIAL AND ROTARY KILN PLANT THEREFOR

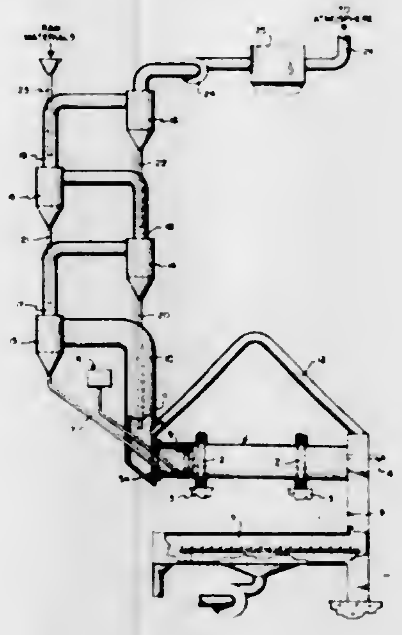
Karl Jens Sylvest, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Mar. 19, 1975, Ser. No. 559,705

Claims priority, application United Kingdom, Mar. 22, 1974, 12858/74

Int. Cl.^{2} F27B *15/00, 7/02*

U.S. Cl. 432—14 **28 Claims**



1. A method of heat treating pulverous raw material consisting entirely of, or at least containing a substantial portion of, lime to produce at least a partial calcination thereof prior to passing the material down through an inclined rotary kiln for further heat treatment, the kiln having hot gases generated therein and communicating at its material inlet end portion with a multistage raw material preheating means and a calcination chamber through which the hot kiln gases are directed for at least partially calcining the preheated material, and at the material outlet end portion with means for cooling the kiln product comprising:

   - a. feeding pulverous raw material to said preheating means for preheating with the hot kiln exit gases passing from the upper end of the kiln to said preheating means prior to feeding the material to the material inlet end portion of the kiln;
   - b. introducing into the upper material inlet end portion of the rotary kiln proper, a fuel capable of producing a combustible gas upon contacting the hot material;
   - c. causing the fuel to mix intimately with the preheated material in the upper material inlet end portion within the kiln proper so as to produce a combustible gas;
   - d. causing the combustible gas to be directed with the kiln exit gases from the upper inlet end portion of the kiln proper to the calcination chamber communicating therewith;
   - e. suspending substantially uncalcined raw material in the calcination chamber in said gas mix;
   - f. directing into the calcination chamber a sufficient amount of preheated oxygen-containing gas from the cooling means so as to contact the suspension of gas and raw material in the chamber and causing the oxygen-containing gas to be ignited and to thereby preheat and at least partially calcine substantially isothermally, the raw material suspended in the combined gases in the calcination chamber;
   - g. directing the combined stream of hot gases and preheated, at least partially calcined material into the last stage of the preheating means;
   - h. separating the treated material from the combined stream of exit gases from the calcination chamber; and
   - i. feeding the treated material to the upper material inlet end portion of the kiln for further heat treatment in the kiln and for mixing with fuel therein to continuously produce combustible gas with said fuel.

4,004,877
HAIR DYE AND ITS USE

Johannes R. Saphir, Hamburg, Germany, assignor to Carl Brehmer & Sohn, Bremen, Germany

Continuation of Ser. No. 355,971, April 30, 1973, abandoned. This application July 28, 1975, Ser. No. 599,399

Claims priority, application Germany, May 5, 1972, 2222001; Feb. 22, 1973, 2308678

Int. Cl.^{2} D06P *3/00, 5/00*

U.S. Cl. 8—10 **12 Claims**

1. An air oxidation hair dye for reconstituting natural and synthetic hair, comprising the following components in percent by weight:

	15.5	water free of oxygen
	1.0	monoethanolamine
about 4.0 to about	12.0	5% solution of p-aminodiphenylamine in isopropanol
	17.5	formamide
about 0.56 to about	1.7	copper solution comprising 4 parts copper sulphate in crystal form 4 parts tartaric acid 4 parts monoethanolamine 88 parts water free oxygen
	14.0	4% solution of polyvinylpyrollidone in isopropanol and
	38.3	isopropyl alcohol.

3. An air oxidation hair dye for reconstituting natural and synthetic hair, comprising the following components in percent by weight:

55.25	isopropyl alcohol
0.86	N-phenyl-p-phenylenediamine
21.00	formamide
21.27	distilled water
1.32	monoethanolamine
0.10	copper sulphate in crystal form with 5 mole of H_2O
0.10	tartaric acid as said complex forming agent and
0.10	sorbitan-mono-oleate derivative.

5. An air oxidation hair dye for reconstituting natural and synthetic hair, comprising the following components in percent by weight:

55.00	isopropyl alcohol
1.37	N-phenyl-p-phenylenediamine
21.00	formamide
20.93	distilled water
1.36	monoethanolamine
0.12	copper sulphate in crystal form with 5 moles of H_2O
0.12	tartaric acid and
0.10	sorbitan-mono-oleate derivative.

7. An air oxidation hair dye for reconstituting natural and synthetic hair, comprising the following components in percent by weight:

55.00	isopropyl alcohol
0.87	ortho-phenylenediamine
0.52	p.p.-diaminediphenylamine sulphate
0.35	N-phenyl-p-phenylenediamine
21.00	formamide
1.36	monoethanolamine
20.60	distilled water
0.10	copper sulphate (crystals with 5 moles of H_2O)
0.10	tartaric acid and
0.10	sorbitan-mono-oleate derivative.

9. A hair dye for reconstituting natural and synthetic hair, consisting of an air oxidation hair dye, a metal complex compound and a solvent which keeps the air oxidation hair dye and the metal complex compound in solution, said metal complex compound consisting of a metal present in a quantity ranging from 0.1% to less than 1% by weight and selected from the group consisting of copper, iron, manganese, cobalt, nickel, chromium, titanium, tin, hafnium, zinc, vanadium, zirconium and molybdenum; a complex forming agent present in the weight percent range corresponding to that of said metal quantity given above, and monoethanolamine ranging from 1.0% to 1.36% by weight, said solvent ranging from 38.3% to 55.25% by weight, said solvent comprising formamide said percent by weight referring to the weight of the total composition.

4,004,878
PROCESS FOR THE PREPARATION OF PILLING-RESISTANT FIBER PRODUCTS FROM POLYESTERS

Karl-Heinz Magosch, and Jörn Rüter, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 7, 1975, Ser. No. 620,286

Claims priority, application Germany, Oct. 15, 1974, 2448954

Int. Cl.^{2} D06M *11/02*

U.S. Cl. 8—115.5 **7 Claims**

1. In the method for producing pilling-resistant fiber products from polyesters containing 0.5 to 5.0 molar percent, based on the acid component of a compound containing ace-

tal groups which is bifunctional with respect to the polyesterification, the improvement comprising treating threads and fibers produced from said polyesters with aqueous acids.

4,004,879
PROCESS FOR WET TREATMENT OF TRAVELLING WEBS

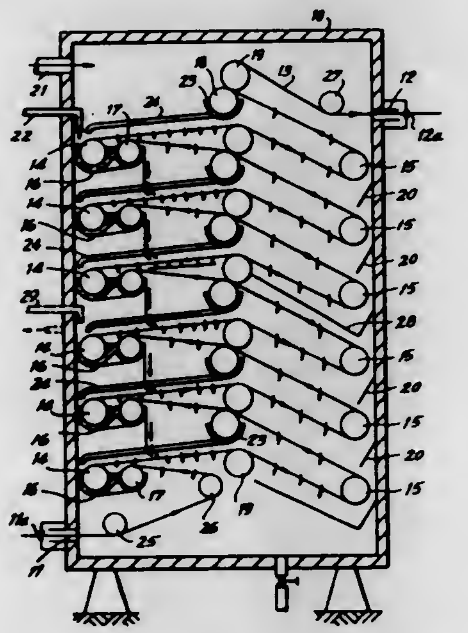
Christian August Meier-Windhorst, late of Hamburg, Germany, and by Elke Meier-Windhorst, heir, Heidenkampsweg 66, 2000 Hamburg 1, Germany

Filed May 23, 1975, Ser. No. 580,453

Claims priority, application Germany, May 25, 1974, 2425374

Int. Cl.² D06B *3/02, 21/02*

U.S. Cl. 8—149.1 **7 Claims**



1. A continuous process for the wet treatment of elongated webs of textile materials and the like with treating liquids, comprising the steps of:

a. introducing said web into, and moving it generally upward through a closed treatment chamber containing a hot gaseous treatment medium, while guiding the web upwardly through a plurality of vertically spaced-apart and horizontally disposed treatment stages within said chamber;

b. each of said treatment stages comprising guiding the web in a generally horizontal direction into and through a bath of hot treating liquid located on one side of the interior of said chamber, then guiding the web through said hot gaseous medium in a generally horizontal direction to the opposite side of said chamber, then reversing the direction of movement of the web, passing the web through squeezing means to remove excess treating liquid, and then moving the web upwardly to the next treatment stage;

c. subjecting the generally upwardly moving web to the application of downwardly moving squeezed-out treatment liquid (1) between said squeezing step and immersion in the next bath and (2) after its emergence from said next bath, each squeezing step serving to separate the preceding and following treatment stages; and

d. removing the treated web from said chamber.

4,004,880
METHOD AND APPARATUS FOR CUSHIONING CONTINUOUS EXOTHERMAL REACTIONS

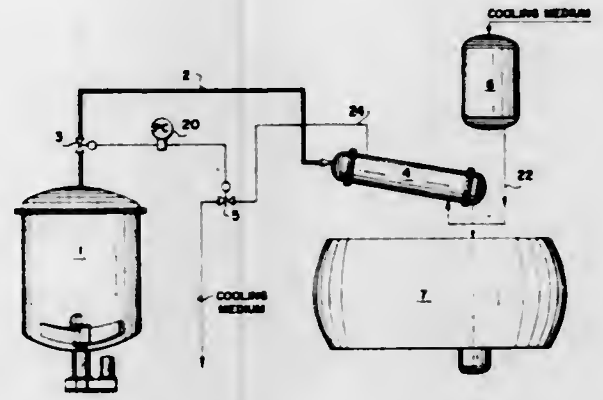
Franz Langheim, and Michael Braasch, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed May 29, 1975, Ser. No. 581,935

Claims priority, application Germany, June 14, 1974, 2428705

Int. Cl.² B01J *3/02, 4/00*

U.S. Cl. 23—230 A **6 Claims**



1. A method for cushioning continuous exothermal reactions by the expansion of gases during an over-pressure condition during a power failure, comprising:

a. conducting a continuous exothermal reaction in a reactor under elevated gas pressure in the presence of liquefied gases;

b. at pressures beyond a given safe pressure, expanding said liquefied gases into a condenser to lower said elevated gas pressure below said given safe pressure;

c. condensing said gases in said condenser;

d. collecting the condensed gases in an accumulator;

e. supplying cooling medium to said condenser at a pressure head sufficient to discharge the cooling medium through the condenser; and

f. initiating said expanding and said supplying for cushioning said exothermal reaction during an over-pressure condition during a power failure.

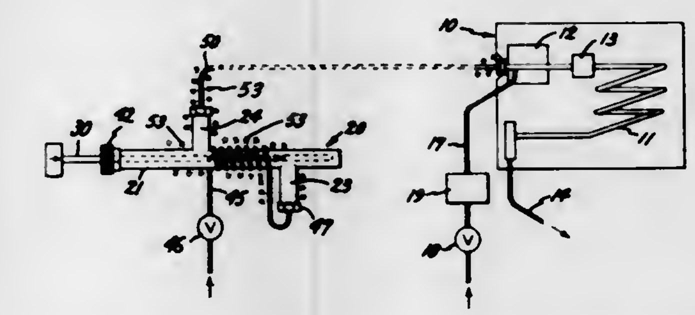
4,004,881
APPARATUS FOR GENERATING CARRIER GAS-TEST SPECIMEN VAPOR MIXTURES FOR DELIVERY INTO A GAS CHROMATOGRAPH

Woodfin V. Ligon, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 18, 1975, Ser. No. 641,837

Int. Cl.² G01N *31/08, 31/12*

U.S. Cl. 23—232 C **4 Claims**



1. In a gas chromatograph instrument including a hollow coil gas chromatographic column having an inlet end to receive a mixture of carrier gas and test specimen vapor and an outlet end adapted for connection to a mass spectrometer, the combination of specimen vapor generation and delivery apparatus comprising as an assembly:

a. a barrel open at one end to receive a specimen to be vaporized and delivered quantitatively into the gas chromatographic column and having carrier gas inlet and outlet opening axially spaced for carrier gas flow through the barrel in contact with a specimen contained therein,

b. a carrier gas conduit connected to the inlet end of the said column and to the barrel and communicating with the barrel gas outlet opening to receive carrier gas and specimen vapor mixtures for delivery into the said column,

c. a carrier gas supply line connected to the barrel and communicating with the carrier gas inlet opening of the barrel,

d. an elongated cylindrical probe slidable axially in the barrel having a specimen-receiving chamber and axially spaced carrier gas inlet and outlet openings for registry respectively with the barrel inlet and outlet openings,

e. barrel closure means secured to the open end of the barrel including a releasable seal cooperating with the probe to close the barrel open end against gas flow while carrier gas is flowing in contact with a test specimen in the barrel, and

f. heating means comprising an electrical resistance heating coil disposed around the barrel between the carrier gas inlet and outlet openings and around the conduit for vaporizing a test specimen in the barrel and preventing condensation of the resulting vapor prior to delivery of the carrier gas and vapor mixture into the inlet end of the gas chromatographic column.

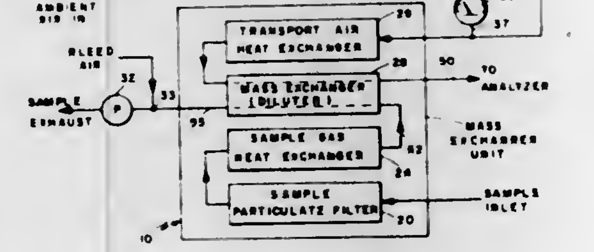
4,004,882
GAS ANALYSIS DILUTER

James Donald Byrne, San Diego, and Paul Arthur Griffith, Fallbrook, both of Calif., assignors to Monitor Labs, Incorporated, San Diego, Calif.

Filed Aug. 14, 1975, Ser. No. 604,879

Int. Cl.² G01N *1/22*

U.S. Cl. 23—254 R **9 Claims**



1. A gas analysis diluter comprising:

diffuser barrier means comprising a tubular gas pervious membrane having an inlet end connected to receive a transport gas stream, a conduit surrounding said tubular membrane and having an inlet end connected to receive a sample gas stream,

said gas pervious membrane having a large relative mass conductance to a selected molecular species of said sample gas,

a transport gas heat exchanger for heating the sample gas to a selected temperature,

a sample gas heat exchanger for heating the sample gas to said selected temperature.

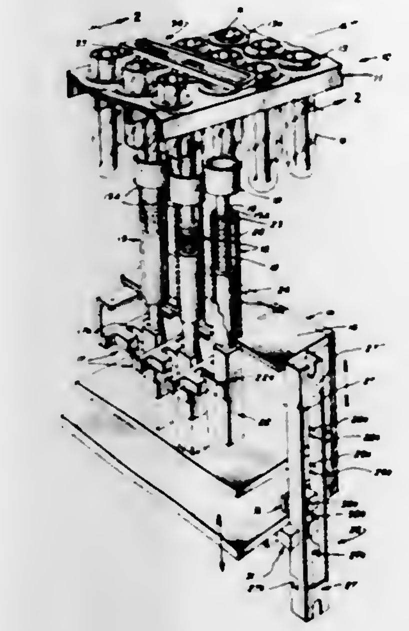
4,004,883
SENSING, LEVELING AND MIXING APPARATUS

Rolf Meyer, Des Plaines; Manuel I. Martin, Hoffman Estates, and Ronald A. Bolton, Chicago, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed July 11, 1975, Ser. No. 594,936

Int. Cl.² C12K *1/00;* **G01N** *1/18*

U.S. Cl. 23—259 **9 Claims**



1. An apparatus for sequentially sensing, leveling and moving a plurality of tubular receptacles having open upper ends, said apparatus comprising a support unit for accommodating the receptacles whereby the upper end of each receptacle is frictionally engaged by means carried on the support unit and the lower end of each receptacle depends freely from the support unit, said support unit being intermittently moved to successive stations; sensing and leveling means disposed at a first station and having a first member positioned over said unit when the latter is at the first station and being vertically adjustable relative to said unit, said first member, when moving in one direction, being adapted to engage the upper ends of a predetermined number of receptacles and cause the latter to assume a first vertical position with respect to said support unit, and a second member disposed beneath said unit when the latter is at the first station and being vertically adjustable in timed sequence with said first member, said second member being movable upwardly and adapted to resiliently engage the lower ends of the predetermined number of receptacles while the latter are held in the first vertical position by said first member, said second member moving the resiliently engaged receptacles to a second vertical position when said first member moves out of engagement with the upper ends of said predetermined number of receptacles whereby the latter, when in said second vertical position, have the lower ends thereof disposed in a common horizontal plane; and means disposed at a second station for engaging and imparting orbital motion to the receptacle lower ends disposed in said common plane when said support unit is disposed at said second station.

4,004,884
TIME DIVISION METERING SYSTEM

Joseph John Zdrodowski, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed July 2, 1976, Ser. No. 702,242

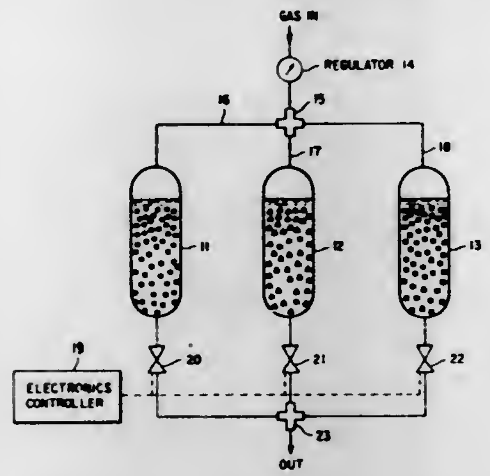
Int. Cl.² G01N *1/18, 31/08*

U.S. Cl. 23—259 **7 Claims**

1. A time division metering system comprising in combination:

A. a plurality of fluid reservoir vessel means each said vessel means being in operative fluid flow relationship with a valve means said valve means controlling the flow of fluid from said vessel means;

B. electronic controller means in electronic control relationship with said plurality of valves wherein said electronic controller means provides a signal to each said valve means in preselected order, said signal causing each said valve means to open for a predetermined interval and at a predetermined frequency thereby allowing fluid to flow from the corresponding reservoir vessel means so as to achieve rapid cycling;



C. tee means in operative fluid flow relation with each said valve means wherein the fluid flowing from said valve means are combined to form a single final fluid stream containing quantities of the respective fluids from said reservoir vessel means in exact ratio to the time intervals each corresponding valve means was held open.

4,004,885

REMOVAL OF SULFUR OXIDES AND PARTICULATE MATTER FROM WASTE GAS STREAMS

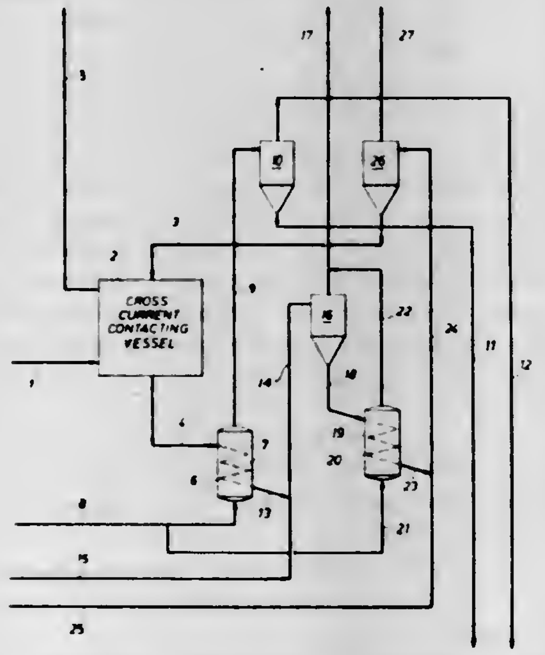
Willem Groenendaal; Friedrich C. Taubert, both of The Hague; Jaap E. Naber, and Gijsbertus A. Bekker, both of Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 467,530, May 6, 1974, Pat. No. 3,966,879. This application Mar. 15, 1976, Ser. No. 666,827

Claims priority, application United Kingdom, May 8, 1973, 21848/73

Int. Cl.² B01D *41/02, 46/32;* **B01J** *8/12*

U.S. Cl. 23—260 **1 Claim**



1. An apparatus suitable for use in the removal of sulfur oxides and particulate matter from waste gases which comprises:

a. a contacting vessel having an inlet for waste gases containing sulfur oxides and particulate matter and an outlet for waste gas substantially free of sulfur oxides and particulate matter, an internal compartment contaihing a moving bed of supported, copper-containing acceptor for sulfur oxides, said internal compartment being defined by perforated walls disposed inside the contacting vessel, an inlet for fresh supported copper-containing acceptor in fluid communication with said internal compartment and an outlet for said acceptor loaded with sulfur oxides and particulate matter also in fluid communication with said internal compartment, and a means for directing the flow of said waste gases and said moving bed of acceptor cross-currently to one another, said waste gas flowing through the perforated walls of said internal compartment containing said moving bed of acceptor;

b. a first purge vessel for removing particulate matter from the acceptor having a bottom inlet for purge gas and a top outlet for purge gas and particulate matter, a top inlet for acceptor material loaded with sulfur oxides and particulate matter connected to the loaded acceptor outlet of said contacting vessel and a bottom outlet for purged acceptor material, at least one perforated plate disposed in the vessel at an angle with the vertical for transporting the loaded acceptor material from its inlet to the outlet and a means for passing said purge gas through said perforated plate thereby stripping said particulate matter from said loaded acceptor during its transport on said perforated plate;

c. a first vertical riser tube debouching into a first cyclone for removing sulfur oxides from the acceptor, having a bottom inlet for purged acceptor material connected to the bottom outlet of the first purge vessel and a bottom inlet for reducing gas, a first cyclone top outlet for sulfur oxide-containing gas and a first cyclone bottom outlet for reduced acceptor material;

d. a second purge vessel with a bottom inlet and a top outlet for a purge gas, a top inlet for reduced acceptor material connected to the first cyclone bottom outlet and a bottom outlet for purged acceptor material and at least one perforated plate disposed in the vessel at an angle with the vertical for transporting acceptor material from its inlet to the outlet, and

e. a second vertical riser tube debouching into a second cyclone for reactivating the acceptor having a bottom inlet for purged acceptor material connected to the bottom outlet of the second purge vessel and a bottom inlet for an oxygen-containing gas, a second cyclone top outlet for the oxygen-containing gas and a second cyclone bottom outlet for reactivated acceptor material connected to the acceptor inlet of the contacting vessel.

4,004,886

TWO STAGE CONTINUOUS PROCESS AND APPARATUS FOR CRYSTALLIZATION

Henricus A. C. Thijssen, Son, Netherlands, and Nicolaas J. J. Huige, Milwaukee, Wis., assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 340,933, March 13, 1973, abandoned, and a continuation-in-part of Ser. No. 96,467, Dec. 9, 1970, abandoned. This application Mar. 7, 1975, Ser. No. 556,340

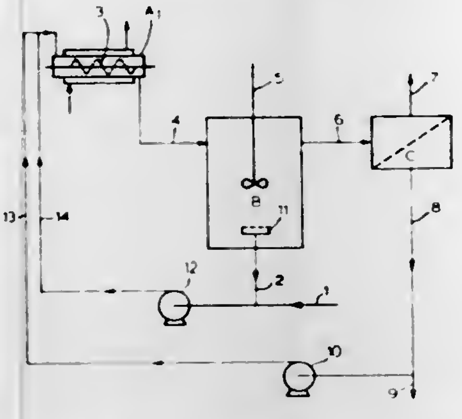
Claims priority, application Netherlands, Dec. 12, 1969, 6918686; Mar. 2, 1970, 7002961

Int. Cl.² B01D *9/04*

U.S. Cl. 23—273 F **7 Claims**

1. In an apparatus for producing crystals from a stream of solution comprising a heat exchange vessel for producing crystal nuclei whereby said solution is caused to become supersaturated with respect to said crystallizable component and to form said nuclei; a crystallizer vessel for recrystallizing whereby crystal growth is promoted and a separator vessel wherein a first conduit means connects said crystallizer vessel

to said heat exchange vessel and a second conduit means connects said crystallizer vesel to said separator vessel so that said solution passes continuously from said heat exchange vessel to said crystallizer vessel wherein small crystals are formed in said heat exchange vessel and larger crystals are formed in said stream of solution in said crystallizer vessel and wherein crystals are separated from said solution in said separator vessel, the improvement comprising wherein the crystallizer is equipped with a means for rapidly mixing the stream of solution to produce a substantially homogenuous mixture therein and promote growth of said larger crystals whereby substantially all of said small crystal nuclei are dissolved thereby promoting growth of said larger crystals, and the apparatus includes a means for removing crystal-free liquor from said crystallizer vessel and means to recirculate crystal-free solution from said crystallizer vessel to said heat exchange vessel while retaining the crystals dispersed in said crystallizer vessel and a third conduit connected between said heat exchange vessel and said crystallizer vessel for carrying the crystal-free solution.



4,004,887

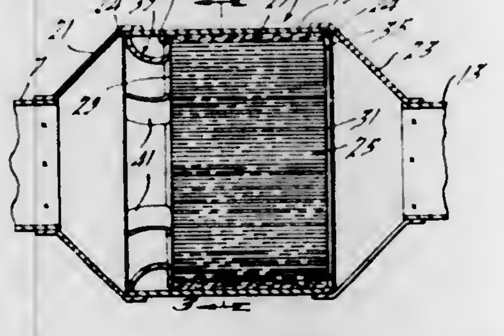
CATALYTIC CONVERTER HAVING A RESILIENT THERMAL-VARIATION COMPENSATING MONOLITH-MOUNTING ARRANGEMENT

James D. Stormont, Grass Lake, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Mar. 16, 1973, Ser. No. 342,264

Int. Cl.² F01N *3/15, 7/00, 7/16*

U.S. Cl. 23—288 FC **12 Claims**



1. A catalytic converter unit adapted for use in the exhaust system of a combustion engine comprising, a housing having a cylindrical shell and end members attached to opposite ends of the shell and providing respectively and inlet and outlet for said converter unit, a unitary block-like refractory monolithic honeycomb catalyst element supported in said shell, differential growth compensating clamp means for holding the catalyst element in a desired longitudinal position in the shell comprising a first member that is integral with said shell and substantially rigid with respect to the shell and having a first shoulder for operative engagement with the element to oppose movement thereof in one longitudinal direction and a second member having a second shoulder for operative engagement with an outer circumferential annular portion of the element to oppose movement thereof in the opposite longitudinal direction, said second member being longitudinally resilient and acting to apply continuous pressure to hold the element against the first shoulder, said members having thermally expansive lengths and said length of the first member being greater than said length of the second member, both said members being composed of metal and having coefficients of thermal expansion greater than that of the catalyst element and said coefficient of the second member being greater than that of the first member and providing a differential thermal compensating means for the lesser rate of thermal expansion of the element as compared to the shell over the entire temperature range to be experienced by the converter, said second member being annular and including a multiplicity of circumferentially separated reversely bent and bowed spring fingers extending axially away from said second shoulder to make said second member longitudinally resilient, and means anchoring the ends of said spring fingers remote from said element to said shell and maintaining said fingers in a continuous state of tension at all temperatures of the converter.

4,004,888

EXHAUST GAS CLEANING ARRANGEMENT WITH A RESILIENTLY SUPPORTED MONOLITHIC CERAMIC CATALYZER

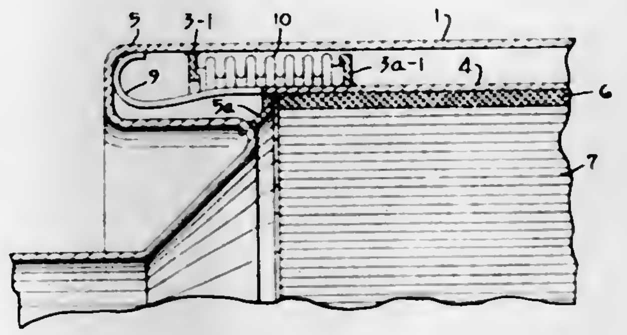
Reimar Musall, and Wilhelm Wolsing, both of Hannover, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

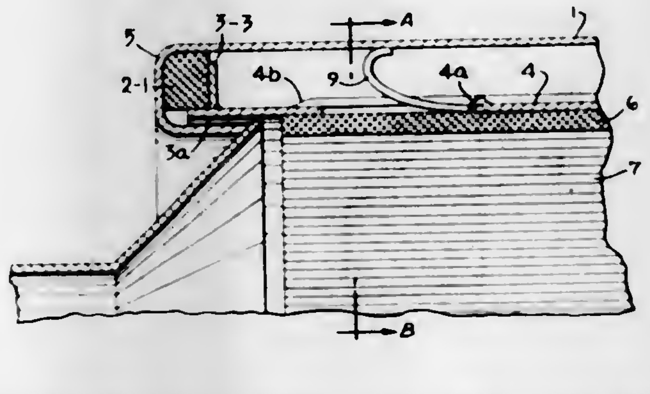
Continuation of Ser. No. 349,414, April 9, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,911

Claims priority, application Germany, Apr. 7, 1972, 2216644

Int. Cl.² B01J *8/00;* **F01N** *3/15*

U.S. Cl. 23—288 FC **9 Claims**





1. An apparatus for cleaning exhaust gases comprising a monolithic catalyst body suitable for removing toxic gases from a gas flow through an exhaust gas passage and a holder resiliently supporting said monolithic catalyst body, said holder comprising:

a rigid housing having an inlet opening and an outlet opening and forming an outer wall of said exhaust gas passage;

a sleeve circumferentially engaging for restraint the monolithic body to restrain substantially all axial movement of the body relative to the sleeve, said sleeve and said body being disposed in said housing;

resilient tongues, each tongue having two ends, circumferentially disposed about said sleeve, said tongues engaging said sleeve near one tongue end and resiliently abutting against said housing near the other tongue end thereby resiliently supporting and centering said sleeve in, and spaced apart from, said housing; and

sealing means disposed between said sleeve and said housing and being operable to restrain the passage of exhaust gases through the space therebetween.

9. An apparatus for cleaning exhaust gases comprising a monolithic catalyst body suitable for removing toxic gases from a gas flow through an exhaust gas passage and a holder resiliently supporting said monolithic catalyst body, said holder comprising;

a rigid housing having an inlet opening and an outlet opening and forming an outer wall of said exhaust gas passage;

a damping layer composed of mineral wool circumferentially disposed about the monolithic body;

a sleeve operable to circumferentially grip the monolithic body through said layer, said sleeve and said body being disposed in said housing;

resilient tongues, each tongue having two ends, circumferentially disposed about said sleeve, said tongues engaging said sleeve near one tongue end and resiliently abutting against said housing near the other tongue end thereby resiliently supporting and centering said sleeve in, and spaced apart from, said housing; and

sealing means disposed between said sleeve and said housing and being operable to restrain the passage of exhaust gases through the space therebetween.

4,004,889

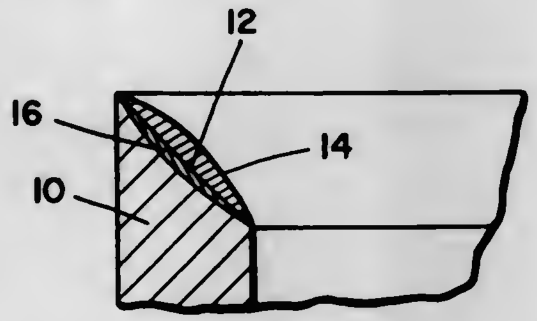
POWDERED METAL ARTICLE HAVING WEAR RESISTANT SURFACE

Preston Lee Gale, East Peoria, and James L. Roberts, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1975, Ser. No. 619,880

Int. Cl.² B22F *7/04*

U.S. Cl. 29—182.2 **8 Claims**



1. A metal article consisting of a body of a pressed, sintered and heat treated metallic powder of a first metal or metal alloy having a given melting temperature and a wear-surface of fused metal bonded to a surface of said body, said wear-surface having a fine dendritic structure and consisting of a second metal or metal alloy having a melting temperature approaching said given melting temperature of said first metal or metal alloy, said body having minute voids between the particles of said metallic powder and a portion of said fused metal of said wear-surface being received within said voids to a limited depth of not more than about 0.003 in (0.0076 cm) at said surface of said body without substantial alloying between said fused metal and said particles of said metallic powder.

4,004,890

METHOD AND MEANS OF REDUCING EROSION OF COMPONENTS OF PLASMA DEVICES EXPOSED TO HELIUM AND HYDROGEN ISOTOPE RADIATION

Manfred S. Kaminsky, Hinsdale; Santosh K. Das, Naperville, and Thomas D. Rossing, De Kalb, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 9, 1976, Ser. No. 656,214

Int. Cl.² B22F *3/00*

U.S. Cl. 29—182.3 **7 Claims**

1. A coating for surfaces of plasma devices exposed to radiation of atoms and ions of helium and isotopes of hydrogen comprising a sintered powder of a metal and an oxide of the metal, the metal selected from the group consisting of aluminum and beryllium.

3. A method of reducing erosion from a surface exposed to particle radiations of helium or isotopes of hydrogen comprising the steps of:

coating the surface with a powder of a metal selected from the group consisting of aluminum and beryllium; and

sintering the coated surface in a gas mixture containing oxygen to form a sintered mixture of the metal and its oxide.

7. In a plasma containment device the improvement wherein the surfaces of said device that are exposed to radiation by atoms or ions of helium or isotopes of hydrogen are formed of a sintered powder of a metal and its oxide, the metal selected from the group consisting of aluminum and beryllium.

4,004,891

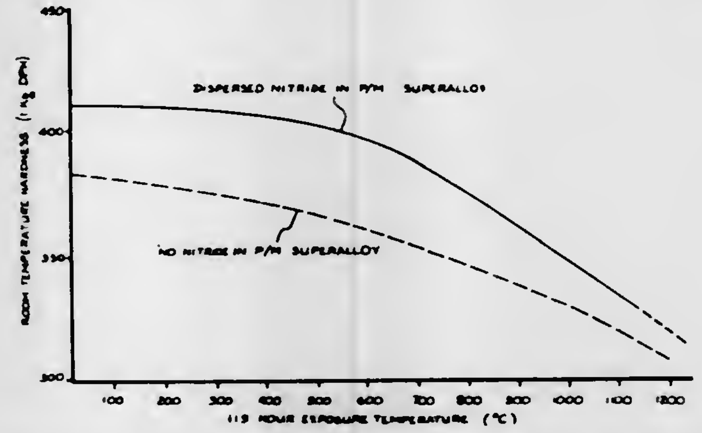
SUPERALLOYS CONTAINING NITRIDES AND PROCESS FOR PRODUCING SAME

Ching San Lin, Sayre, and James Thomas Smith, Towanda, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 343,873, March 22, 1973, abandoned, which is a continuation of Ser. No. 146,198, May 24, 1971, abandoned. This application Feb. 5, 1975, Ser. No. 547,110

Int. Cl.² B22F *5/00*

U.S. Cl. 29—182.5 **1 Claim**



1. A superalloy composition resulting from a process wherein a first superalloy composition having a predetermined atomic ratio of metallic elements, containing from about 50 to about 75 weight percent of nickel, and having a second metal selected from the group consisting of titanium, aluminum, zirconium, and additional metallic materials alloyed with said nickel, is converted to a second superalloy composition by nitriding said second metal to form a dispersion of a metal nitride selected from the group consisting of titanium nitride, aluminum nitride, zirconium nitride, and mixtures thereof; and said second superalloy having the same atomic ratio of metals as said on first superalloy composition when said metal nitride is calculated on the basis of the metallic content thereof.

4,004,892

COOKWARE FABRICATED FROM COMPOSITES OF COPPER, ALUMINUM AND STAINLESS STEEL

John B. Ulam, McMurray, Pa., assignor to Clad Metals, Inc., Canonsburg, Pa.

Division of Ser. No. 423,253, Dec. 10, 1973, Pat. No. 3,952,938. This application Apr. 29, 1975, Ser. No. 572,732

Int. Cl. B32B *15/18; 15/20*

U.S. Cl. 29—196.2 **3 Claims**

1. A hot pressure bonded metallic composite consisting essentially of a core which consists of a member from the group consisting of copper and copper alloys completely coated by a member from the group consisting of aluminum and aluminum alloys, said core forming a major thickness portion of said composite, and at least one outer cladding layer of stainless steel.

4,004,893

METHODS FOR MOLDING COAL AND LIKE MATERIAL

Francis J. Cumings, Windham, N.H., and Victor Kevorkian, Belle Mead, N.J., assignors to Ingersoll-Rand Research, Inc., Princeton, N.J.

Continuation of Ser. No. 529,023, Dec. 3, 1974, abandoned. This application Jan. 30, 1976, Ser. No. 653,699

Int. Cl.² C10L *5/00, 5/22*

U.S. Cl. 44—10 H **2 Claims**

1. A method for molding coal and like firm brittle material which can be converted to a plastic-like substance through the application of heat, comprising the steps of providing the material in a solid form, supplying said material in such solid form into an injection bore which includes a discharge opening for discharging material to a mold, heating said supplied material in said injection bore to a temperature sufficiently great to convert the material from solid form to plastic-like condition while rotatably driving a screw conveyor in said injection bore to convey the material in plastic-like condition through said injection bore to a space adjacent to said discharge opening, accumulating said material in plastic-like condition in said space into an axially-growing mass, and axially displacing said screw conveyor by said growing mass to cause said screw conveyor to be moved away from said discharge opening for a controlled distance, then axially driving said screw conveyor towards said discharge opening to drive such accumulated material in plastic-like condition through said discharge opening into the mold cavity of a closed multipart mold, molding the material in plastic-like condition into an article in said mold cavity and thereafter opening said multi-part mold and discharging the molded article from said mold cavity, and cyclically repeating the beforegoing steps to thereby successively form molded articles.

4,004,894

OTTO CYCLE ENGINE FUELS CONTAINING DERIVATIVES OF CYCLIC POLYCARBOXYLIC ACIDS

Heinz Nohe, Meckenheim, and Ernst Guenther Nottes, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 417,127, Nov. 19, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 563,051

Claims priority, application Germany, Nov. 18, 1972, 2256690

Int. Cl.² C10L *1/22*

U.S. Cl. 44—58 **7 Claims**

1. A liquid hydrocarbon fuel for an Otto cycle engine which contains a deposit and residue inhibiting amount of an oil-soluble and gasoline-soluble derivative of a cyclic polycarboxylic acid of the formula (I):

$$[A](COX)_m \qquad (I)$$

in which A is the radical of a monocyclic, bicyclic or tricyclic non-aromatic polycarboxylic acid of a total of eight to sixteen carbon atoms including *m* carboxyl groups, *m* being from 3 to 6, X denotes identical or different groups OR, OR is the radical of an alcohol of 1 to 20 carbon atoms with the proviso that at least two of the identical or different radicals R have each at least 8 carbon atoms.

4,004,895

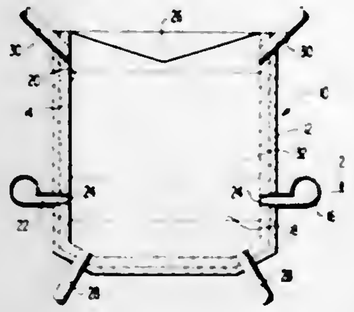
COAL REACTOR

Louis Gold, 2725 39th St., NW., Washington, D.C. 20007

Continuation-in-part of Ser. No. 355,400, May 30, 1973, abandoned. This application Apr. 29, 1975, Ser. No. 572,769

Int. Cl.² C10J *3/00, 3/08*

U.S. Cl. 48—101 **6 Claims**



5. A coal reactor for the clean combustion of sulfur bearing coal in the presence of limestone comprising a truncated vertical shaft furnace having an internal combustion chamber with a diameter substantially equal to the height, means for introducing coal and limestone at the top of said furnace, a ring of circumferentially spaced tuyeres extending through the vertical wall of the furnace and spaced above the bottom, means for introducing an ambient temperature air blast, means for removing the sulfur bearing slag from the bottom of sid furnace and means for removing the gaseous effluent resulting from said combustion.

4,004,896

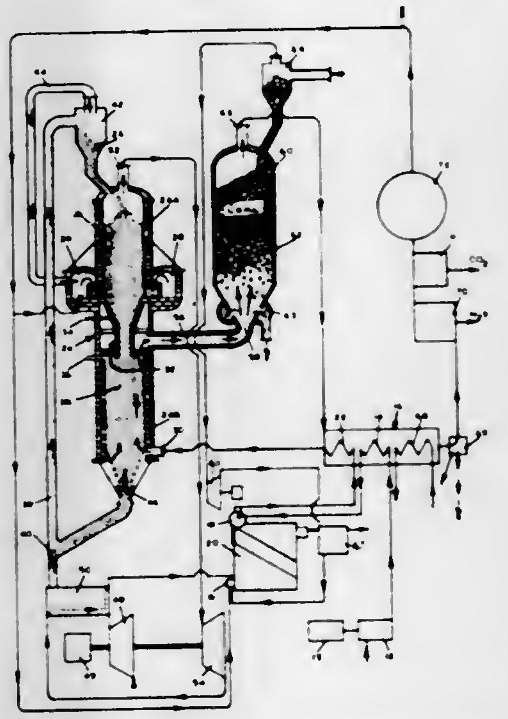
PRODUCTION OF WATER GAS

Shao L. Soo, Urbana, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 21, 1974, Ser. No. 525,955

Int. Cl.² C10J *3/00*

U.S. Cl. 48—202 **18 Claims**

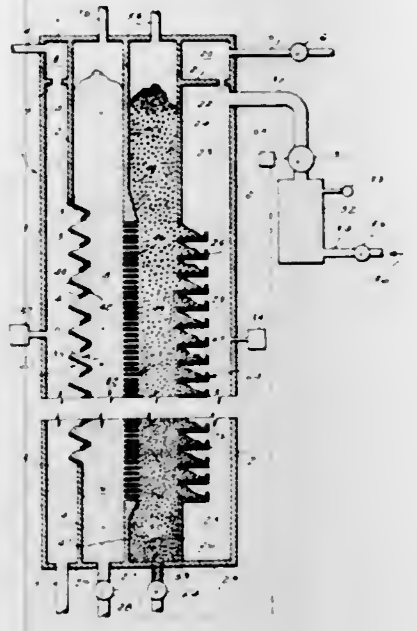


1. In a method of producing synthesis gas by reacting carbon and steam in a reaction vessel, including introducing solid carbon and steam to said reaction vessel and supplying heat to said vessel sufficient for the reaction of said solid carbon with steam, the improvement comprising supplying superheated steam to said vessel at a temperature and in a quantity sufficient to provide the entire heat of reaction for the reaction of said carbon with a portion of said superheated steam, said superheated steam being substantially the only source of heat supplied to said carbon in said reaction vessel, and wherein said reaction vessel is substantially free from an oxygen containing gas.

4,004,897

FILTERING DUSTY GAS IN IMPROVED PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025
Filed Aug. 28, 1974, Ser. No. 501,278
Int. Cl.² B01D *46/04*
U.S. Cl. 55—96 **3 Claims**



1. The method of treating a gas involving the separation and removal of particulate material by means of a filter of granular material which comprises

a. arranging the granular material in a bed having apertured outer walls having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members, each member having an upper and a lower surface, each of said upper and lower surfaces having outer and inner edges with respect to the filter bed, said surfaces being articulated at an edge joint at their respective inner edges, said gas entry portions having gas entry faces substantially contigous with said outer edges of said upper surfaces, a line being drawn through a said outer edge of a said lower surface and also through said inner edge joint of the next subjacent member forms an angle less than about 60° from the horizontal and said filter bed having gas exit portions spaced from said inner edge joints;

b. forwardly flowing the gas for treatment in a substantially continuing flow through the gas entry portions of the granular material bed and outwardly from the gas exit portions to separate and accumulate particulate material at said gas entry faces;

c. stopping the flow of said gas;

d. causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b);

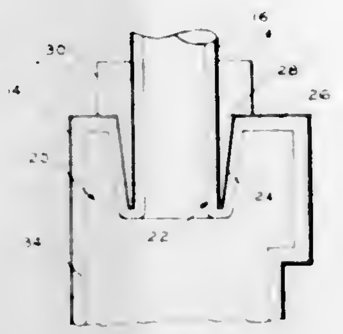
e. causing said transient reverse flow to produce first, a rise in the pressure difference at a given rate of rise between the gas exit portions and the gas entry portions and subsequently a fall in the pressure difference between the gas exit portions and the gas entry portions, said pressure difference remaining greater than a first critical minimum difference for a time interval of less than about 150 milliseconds, said first critical pressure difference being that at which a steady flow of gas in the reverse direction just produces a localized spill of granular material from the gas entry faces, and the pressure difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in the reverse direction producing said pressure difference at said given rate of rise just initiates a body movement of the granular material supported by said members toward the gas entry faces to spill a portion of the granular material and accumulated particulate material from the bed; and

f. supplying fresh granular material to said bed to replace material spilled from said gas entry portions.

4,004,898

CYCLONE SEPARATOR GAS TUBE HEAT DISSIPATOR

Bodo Kalen, Dix Hills, N.Y., assignor to Emtrol Corporation, Great Neck, N.Y.
Filed Jan. 30, 1976, Ser. No. 653,617
Int. Cl.² B04C *3/02*
U.S. Cl. 55—267 **9 Claims**

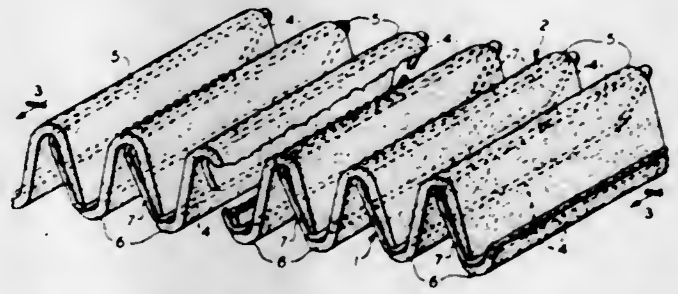


1. A cyclone separator having a housing comprised of a metallic exterior separator shell and interior wall insulating means, said separator shell having a generally cylindrical top portion provided with a horizontally tangentially extending gas inlet, a gas outlet at the top of the separator shell comprising a vertically extending metallic tubular member, said tubular member having a lower portion extending into the top portion of the separator shell, said lower portion of the tubular member being connected at its bottom to an inverted frustoconical upwardly diverging wall, said diverging wall forming part of the top portion of the separator shell to provide a heat dissipating air space between the lower portion of said tubular member and said diverging wall, the insulating means comprising an insulating layer on the interior of the separator shell covering at least the top portion of the shell and the interior wall of the tubular member and said diverging wall.

4,004,899

AIR FILTER CONSTRUCTION

Alfred Giacovas, 669 Wolfs Lane, Pelham, N.Y. 10083
Filed Feb. 28, 1975, Ser. No. 553,881
Int. Cl.² B01D *27/06*
U.S. Cl. 55—499 **1 Claim**



1. A filter assembly for filtering contaminant particles from a gas stream, comprising

a filter medium disposed in the form of a plurality of spaced-apart pleats and defining a plurality of corrugations,

a self-supporting fiber strand supporting said filter medium and including a plurality of longitudinal portions and forming a plurality of corrugations in order to maintain said filter medium in its spaced-apart pleated form,

each of said longitudinal portions being disposed in a bend of said pleats of said filter medium, so as to locate the longitudinal portions of said strand on alternate opposite sides of the filter medium for engagement with said filter medium at said bends of said filter medium,

said fiber strand including connecting portions connecting the ends of each of said longitudinal portions; yield the spacing between said pleats, and

said connecting portions of each of said longitudinal portions being directed towards the adjacent bend of the next opposite of said pleats, and said connecting portions are disposed outside of said filter medium.

4,004,900

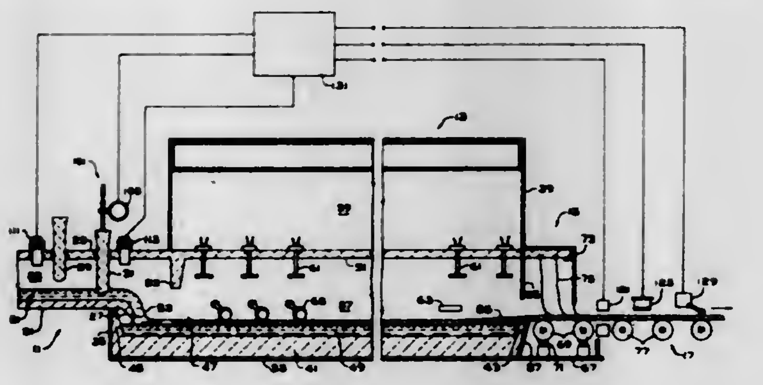
MANUFACTURE OF FLAT GLASS AT CONTROLLED THROUGHPUT RATE

Joseph R. Staahl, Jr., Conneaut Lake; Joseph M. Matesa, Pittsburgh, and David E. Worth, Atlantic, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 19, 1975, Ser. No. 614,829

Int. Cl.² C03B *18/02*

U.S. Cl. 65—29 **9 Claims**



1. In the method of stabilizing the volumetric flow of molten glass in making flat glass comprising the steps of discharging molten glass of varying temperature through an opening defined by a channel and a movable tweel having its position adjusted and maintained to control the size of the opening; flowing the discharged molten glass onto a pool of molten metal in an enclosed forming chamber; advancing the glass along the surface of the pool of molten metal while cooling it and while applying forces to it to form a dimensionally stable, continuous sheet of glass; withdrawing the formed continuous sheet of glass from the pool of molten metal and from the enclosed forming chamber; and conveying the continuous sheet of glass therefrom; the improvement which comprises periodically controlling the volumetric throughput of glass wherein all signals are in common physical units and during each control period the control comprises:

a. detecting the width, thickness and speed of the continuously formed sheet of glass and generating representative width, thickness and speed signals responsive to said detection;

b. detecting the temperature of the molten glass in the vicinity of the tweel and generating a glass temperature signal responsive thereto which glass temperature signal is representative of the viscosity of the molten glass in the vicinity of the tweel;

c. generating a throughput signal representative of the volumetric throughput of molten glass through the opening defined by the tweel and channel by combining said width, thickness and speed signals as a product of said width, thickness and speed signals;

d. detecting the difference between said throughput signal with a predetermined throughput signal representative of a desired throughput and generating a first control signal responsive to said detected signal difference;

e. detecting the difference between said glass temperature signal with said first control signal and generating a second control signal equal to a second control signal generated during the previous control period less a fixed factor of said detected signal difference which is related to a ratio of incremental tweel height change to an incremental glass temperature change; and

f. adjusting and maintaining the position of the tweel responsive to said second control signal whereby during each control period a greater tweel opening is provided for glass of increased viscosity and a lesser tweel opening is provided for glass of decreased viscosity.

4,004,901

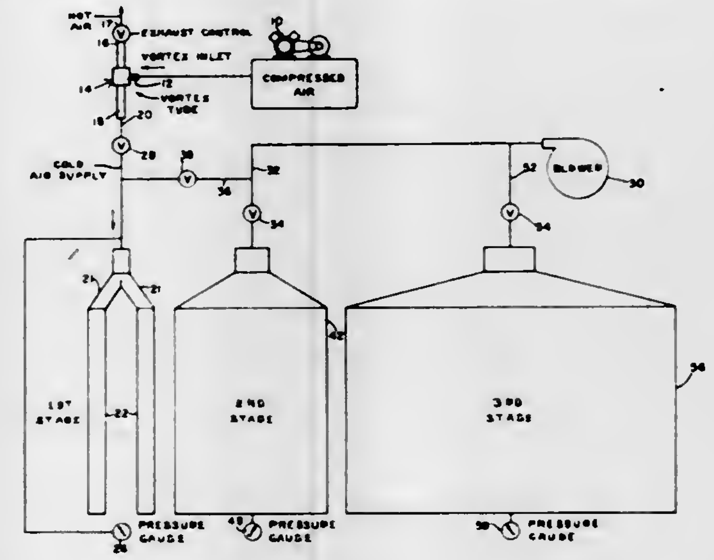
TEMPERING GLASS SHEETS

Eugene W. Starr, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 28, 1975, Ser. No. 626,590

Int. Cl.² C03B *27/00*

U.S. Cl. 65—114 **6 Claims**



1. A method of tempering a glass sheet comprising the steps of:

a. heating the glass sheet to an elevated temperature sufficient for tempering;

b. cooling the surfaces of the glass sheet by impinging chilled tempering medium having a first temperature upon the glass at a first pressure so as to establish a thermal gradient through the glass thickness and harden the surfaces of the sheet;

c. further cooling the surfaces of the glass sheet by impinging tempering medium having a second temperature higher than said first temperature upon the glass at a second pressure higher than said first pressure so as to continue maintenance of a thermal gradient through the glass thickness and impart a tempered condition thereto; and

d. cooling the glass sheet through its thickness to ambient temperature.

4,004,902

METHOD OF DYEING AND TREATING GLASS STREAMS

Helmut Pieper, Lohr (Main), Germany, assignor to Nikolaus Sorg G.m.b.H. & Co., Pflochsbach, Germany

Filed July 23, 1974, Ser. No. 491,125

Claims priority, application Germany, Jan. 25, 1974, 2403476

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.² C03B *5/02*

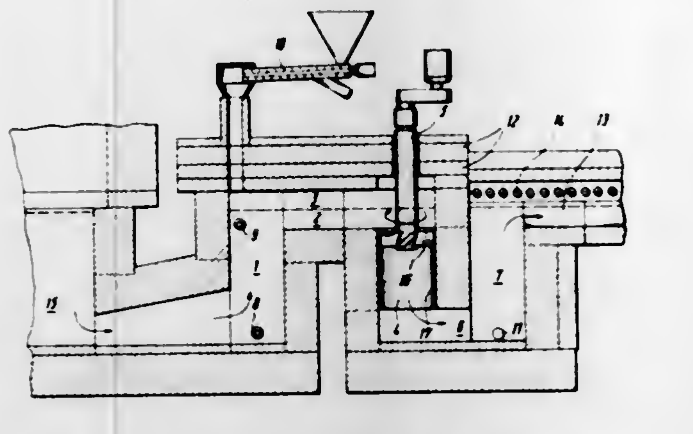
U.S. Cl. 65—134 **2 Claims**

1. A method of treating a glass stream for dyeing and refining the glass in said stream which comprises the steps:

a. heating the glass stream while flowing in a vertical upward flow by applying electrical energy to at least two electrodes disposed one above the other in said vertical upward flow causing a rising glass stream above said electrodes,

b. thereafter passing the stream with a free surface horizontally while supplying dyes, color frits or a pre-dyed glass stream to said free surface of said glass stream at a point directly above said electrodes within said vertical upward flow to prevent freezing of the glass when said dyes, frits or stream are added,

c. subsequently flowing the stream vertically downwards with mechanical agitation through a passage having a circular cross-section, the force of agitation being opposite the flow of the glass stream, and



d. thereafter flowing the stream upwards for further processing or treatment.

4,004,903

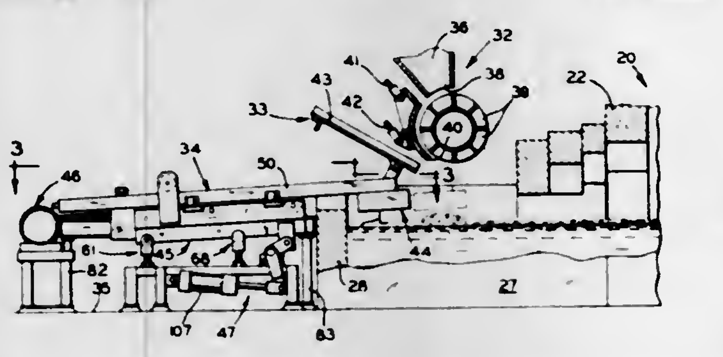
METHOD OF AND APPARATUS FOR INCREASING THE MELTING RATE OF GLASS MAKING MATERIALS

Lloyd W. Daman, Pemberville; Earl A. Hille, Elmore, and Donald E. Shamp, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 5, 1975, Ser. No. 584,104

Int. Cl.² C03B *3/00*

U.S. Cl. 65—135 **10 Claims**



1. In a glass melting furnace of the type having a melting chamber containing a bath of molten glass and a batch feeding apparatus for loosely depositing glass making materials in a transversely extending row on the surface of the molten glass, the improvement comprising: means for periodically pressing said row of loosely deposited glass making materials against the surface of said molten glass for compacting said row of glass making material, and means for advancing said pressing means toward said melting chamber wherein said row of glass making materials is bodily moved along the surface of said molten glass by said pressing means said pressing means includes a pressing member and said advancing means includes means for moving said pressing member from a raised attitude to a lowered attitude to compress said loosely deposited glass making materials between said pressing members and the surface of said molten glass bath.

4,004,904

ELECTRONIC SYSTEM FOR ARTICLE IDENTIFICATION

Robert Thomas Fergusson, Denver, Colo., assignor to Index, Incorporated, Denver, Colo.

Filed Aug. 4, 1975, Ser. No. 601,905

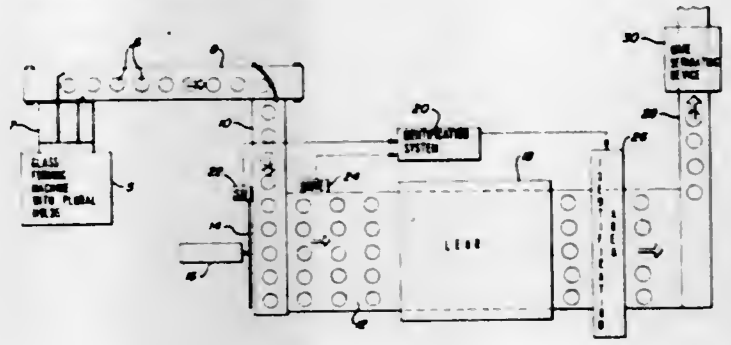
Int. Cl.² C03B *9/40*

U.S. Cl. 65—158 **23 Claims**

1. A system for identifying specific articles amongst a group of articles, the specific articles emanating from at least one predetermined source amongst a plurality of such sources, the articles being produced in a predetermined sequence relative to the sources and formed into rows in which the predetermined sequence is maintained prior to conveyance to an identification area spaced from the row formation area, said system comprising:

signal generating means for generating an output signal indicative of presence of a specific row of articles at said identification area;

first means connected with the signal generating means for receiving said output signal and, in turn, providing output signals each of which is indicative of an article within the specific conveyed row;



second means connected with said first means and providing sequential output signals each corresponding to a signal from the first means and indicative of said predetermined source from which a specific conveyed article emanated; and

identification means at said identification area receiving said output signals from said first and second means and responsive thereto to provide an identification of selected articles with respect to a selected source of articles in said conveyed row, whereby the identity of each article of the selected articles relative to the source of the article is preserved when the articles are formed into rows.

4,004,905

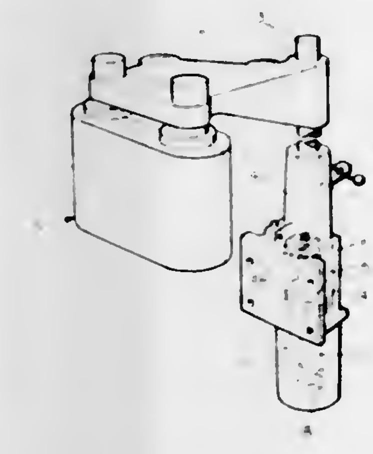
SAFETY LOCK FOR FORMING MACHINE BLOWHEAD

Eustace Harold Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 21, 1975, Ser. No. 634,091

Int. Cl.² C03B *9/14*

U.S. Cl. 65—159 **1 Claim**



1. In apparatus for forming glass containers wherein the glass is formed into shape in a mold by a blowing head mechanism, the improvement in said blowing head comprising:

a vertically positioned, stationary, pneumatic piston-cylinder motor;

a rod connected to said piston and extending vertically upward from said stationary pneumatic motor;

a stationary support member above said motor, said support member having a generally vertical bore there- through;

said piston rod having a portion thereof extending within the bore of said stationary support member;

a blowing head arm fixed to said piston rod;

said blowing head arm extending radially from said rod and adapted to carry a relative heavy blowhead on the extending end thereof remote from the piston rod.
a radially extending casting formed on the side of said support member and having a central horizontal bore therein;
a bolt slideable in the bore of said casting;
a single radial opening formed in the side of that portion of the piston rod which registers with the bore in said casting when said rod is in its uppermost position whereby when said bolt is moved forward in said casting, it will enter the opening in said piston rod;
an operating handle extending from the side of said bolt;
said operating handle extending through a slot in said casting;
said slot being generally "Z" shaped so that axial movement of the bolt is controlled by the position of the handle thereof to two extreme portions of said slot, wherein in one position the bolt is fully retracted relative to said piston rod and in the other position the bolt will be extending into the radial opening in the piston rod to thereby physically lock the blowing head at its highest elevation.

4,004,906

GLASSWARE FORMING MACHINE OF THE I. S. TYPE FOR UPRIGHT PRESS AND BLOW PROCESS

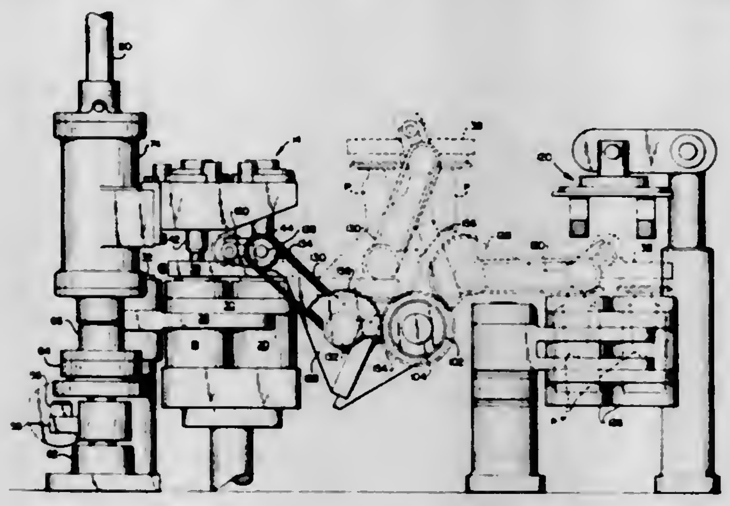
George E. Rowe, deceased, late of Wethersfield, Conn. (by Selma S. Rowe, executrix), assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 31, 1975, Ser. No. 545,777

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C03B *9/00, 9/14*

U.S. Cl. 65—239 12 Claims



1. A glassware forming machine comprising:
a. a blank mold station having an upwardly open blank mold cavity defining structure for receiving the gobs of glass to be formed,
b. partible neck ring mold structures for mating with said blank mold cavity defining structure at said blank station,
c. parison neck forming means for insertion downwardly into the closed neck ring molds at said blank station,
d. a final blow station horizontally spaced from said blank station and having upwardly open blow mold cavity defining structure for receiving the partially formed parisons from said blank station,
e. means for transferring said parisons from said blank station to said blow station, said means including neck ring arms associated with said partible neck ring mold structures and means pivotally supporting said arms for movement about a horizontal axis located between said blank mold and blow mold stations, and
f. said transferring means further including means pivotally supporting each neck ring structure adjacent the free end of its associated neck ring arm, said neck ring mold structures supporting the parison during transfer from said blank to said blow station and also keeping the parison in an upright orientation during such transfer.

4,004,907

ARYLISOTHIOCYANATE FOR THE REGULATION OF PLANT GROWTH

Wolfgang Schmid, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

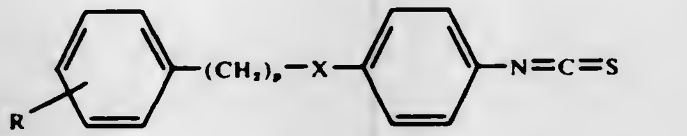
Filed Oct. 15, 1975, Ser. No. 622,596

Claims priority, application Switzerland, Oct. 22, 1974, 14102/74

Int. Cl.² A01N *9/12;* **C07C** *161/04*

U.S. Cl. 71—72 9 Claims

1. An arylisothiocyanate compound of the formula I



(I)

wherein
R represents hydrogen, lower alkyl, lower alkoxy or halogen,
X represents oxygen or sulphur, and
p represents an integer from 2 to 5.

8. A process for the defoliation and desiccation of unlignified parts of plants above the soil, which process comprises applying thereto a defoliating and desiccating effective amount of an arylisothiocyanate according to claim 1.

4,004,908

β-HALOGENOETHYL-SILANES AS STIMULATORS FOR LATEX FLOW

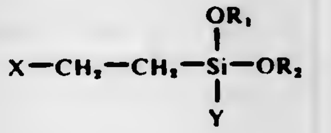
Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 443,179, Feb. 15, 1974, Pat. No. 3,912,493, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application July 14, 1975, Ser. No. 595,811

Int. Cl.² A01N *9/00*

U.S. Cl. 71—79 7 Claims

1. A method for the stimulation of latex flow from latex discharging plants which comprises applying to said plants a latex flow stimulating amount of a compound of the formula



$$\mathrm{X-CH_2-CH_2-\overset{\displaystyle OR_1}{\underset{\displaystyle Y}{Si}}-OR_2}$$

wherein X is chlorine; Y is chlorine and R_1 and R_2 are both methyl, or Y is a group $-OR_3$ and each of R_1, R_2 and R_3 is an alkyl radical having 1 to 5 carbon atoms.

4,004,909

BETA-HALOGENOETHYL-SILANES AS FRUIT ABSCISSION, RIPENING AND THINNING AGENTS

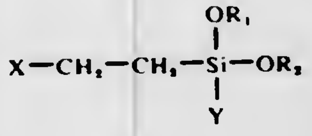
Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 443,179, Feb. 15, 1974, Pat. No. 3,912,493, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application July 14, 1975, Ser. No. 595,812

Int. Cl.² A01N *9/00*

U.S. Cl. 71—79 6 Claims

1. A method for regulating the growth of plants as to facilitate fruit abscission, fruit thinning, and fruit ripening which comprises applying to said plants a growth-regulating amount of a compound of the formula



$$\mathrm{X-CH_2-CH_2-\overset{\displaystyle OR_1}{\underset{\displaystyle Y}{Si}}-OR_2}$$

wherein X is chlorine; Y is a group $-OR_3$ and each of R_1, R_2 and R_3 is a group $-CO-R_4$ wherein R_4 is an alkyl radical having 1 to 5 carbon atoms.

4,004,910

BETA-HALOGENOETHYL-SILANES AS FRUIT RIPENING AGENTS

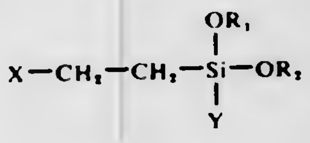
Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 443,179, Feb. 15, 1974, Pat. No. 3,912,493, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application July 14, 1975, Ser. No. 595,813

Int. Cl.² A01N *9/00*

U.S. Cl. 71—79 5 Claims

1. A method for regulating the growth of plants as to facilitate fruit ripening which comprises applying to said plants an effective fruit ripening amount of a compound of the formula



$$\mathrm{X-CH_2-CH_2-\overset{\displaystyle OR_1}{\underset{\displaystyle Y}{Si}}-OR_2}$$

wherein X is chlorine; Y is a group — OR_3 and each of R_1, R_2 and R_2 is an alkyl radical having 1 to 5 carbon atoms.

4,004,911

TRIHYDRIC ALCOHOL DERIVATIVES

Eirlys R. Isaac, Sittingbourne, and Michael D. Barker, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

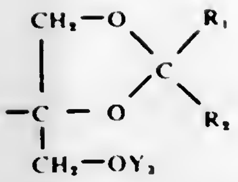
Division of Ser. No. 392,394, Aug. 8, 1973, Pat. No. 3,919,251, which is a continuation of Ser. No. 74,505, Sept. 22, 1970, abandoned. This application Apr. 18, 1975, Ser. No. 569,514

Claims priority, application United Kingdom, Sept. 23, 1969, 46745/69

Int. Cl.² A01N *9/24*

U.S. Cl. 71—88 7 Claims

1. A method for controlling weeds which comprises applying to the weed habitat a herbicidally effective amount of a compound of the formula



wherein R is an alkyl group of 1 to 6 carbon atoms; R_1 and R_2 each is hydrogen, a lower alkyl group, a lower alkyl group substituted by phenyl or a phenyl group optionally substituted by chlorine or by an alkyl group, or R_1 and R_2 together may be a polymethylene group of 3 to 6 carbon atoms; and Y_3 is a phenyl group, a chlorophenyl group, or benzyl optionally substituted on the ring by from 1 to 3 atoms of chlorine or fluorine or by a lower alkyl group or by a phenyl group.

4,004,912

1-THIADIAZOLYL-6-ACYLOXYTETRAHYDROPYRIMIDINONE HERBICIDES

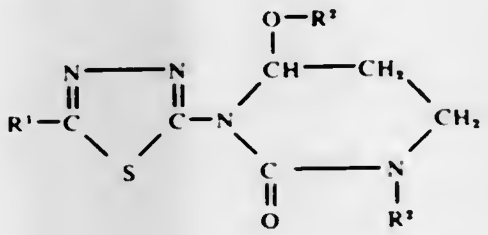
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 10, 1975, Ser. No. 594,932

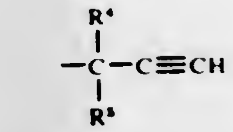
Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 10 Claims

1. A compound of the formula

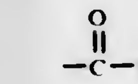


wherein R^1 is cycloalky of from 3 to 7 carbon atoms; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl and



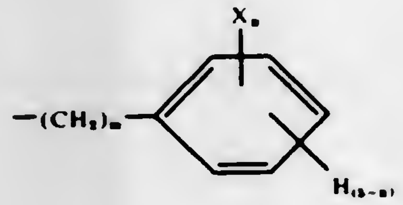
$$\mathrm{-\overset{\displaystyle R^4}{\underset{\displaystyle R^5}{C}}-C{\equiv}CH}$$

wherein R^4 and R^5 are each selected from the group consisting of hydrogen and lower alkyl; and R^3 is selected from the group consisting of hydrogen and



$$\mathrm{-\overset{\displaystyle O}{\overset{\|}{C}}-R^6}$$

wherein R^6 is selected from the group consisting of lower alkyl, lower chloroalkyl, lower bromoalkyl, lower alkenyl, lower alkynyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, halogen, lower haloalkyl, nitro, cyano, and lower alkoxy, and *m* and *n* are each integers from 0 to 3.

10. A method of controlling weeds which comprises con-

tacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim 1.

4,004,913

SELECTIVE HERBICIDAL COMPOSITIONS

Helmuth Hack, Odenthal-Hahnenberg; Ferdinand Munz, Schildgen; Ludwig Eue, Cologne, and Werner Schafer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 26, 1972, Ser. No. 257,366

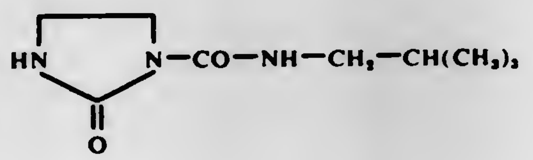
Claims priority, application Germany, June 12, 1971, 2129199

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—90 **2 Claims**

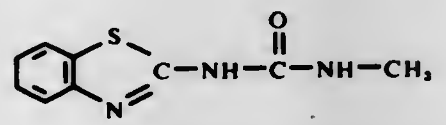
1. Selective herbicidal composition comprising, as active ingredients, in effective amounts

a. imidazolidin-2-one-1-carboxylic acid isobutylamide of the formula



and

b. 1-methyl-3-(2-benzothiazolyl)-urea of the formula



wherein the weight ratio of (a) to (b) is 0.5:1 to 5:1.

4,004,914

THIOLCARBAMATES FOR COMBATING UNDESIRED PLANT GROWTH

Werner Toepfl, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 84,465, Oct. 27, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,962

Claims priority, application Switzerland, Nov. 3, 1969, 16351/69

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—100 **3 Claims**

1. A method for combatting undesired grasses in rice cultures which comprises applying thereto a herbicidally effective amount of N-methyl-N-allyl-S-p-chlorobenzyl-thiolcarbamate.

4,004,915

HERBICIDAL CARBAMATES AND THIOLCARBAMATES

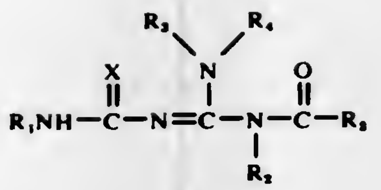
Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 356,422, May 2, 1973, Pat. No. 3,882,160, which is a continuation-in-part of Ser. No. 312,904, Dec. 7, 1972, Pat. No. 3,823,179. This application Nov. 1, 1974, Ser. No. 520,114

Int. Cl.^{2} C07C *129/08*; A01N *9/20*

U.S. Cl. 71—106 **12 Claims**

1. A compound having the formula



wherein

R$_1$ is selected from a C$_2$ –C$_8$ alkyl substituted with O-1 methoxy, ethoxy, methylthio, or ethylthio group; a C$_3$–C$_8$ alkenyl; a C$_3$–C$_8$ alkynyl; [a C$_4$–C$_8$ cycloalkyl substituted with O-1 C$_1$–C$_4$ alkyl, o-2 methyl groups,

R$_2$ is a C$_1$–C$_3$ alkyl;

R$_3$ is hydrogen, methyl, or ethyl;

R$_4$ is a C$_1$–C$_4$ alkyl, a C$_3$–C$_4$ alkenyl, or a C$_3$–C$_4$ alkynyl;

R$_5$ is —OR$_6$.

wherein

R$_6$ is a C$_1$–C$_6$ alkyl substituted with 0–3 chlorine atoms or 0–1 methoxyl; and

X is oxygen.

5. A method of controlling undesirable vegetation comprising applying to the locus of the undesirable vegetation a herbicidally effective amount of at least one compound of claim 1.

4,004,916

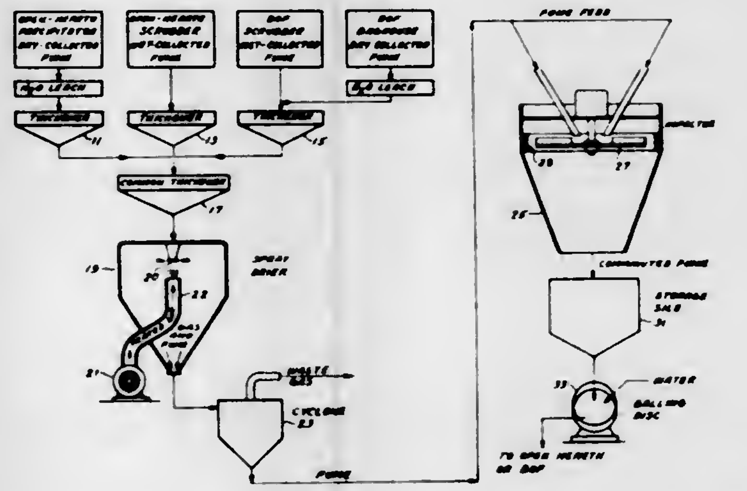
METHOD FOR AGGLOMERATING WET-COLLECTED FUME FOR USE IN METALLURGICAL FURNACES AND AGGLOMERATES PRODUCED THEREBY

John W. Kreiger, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed July 1, 1975, Ser. No. 592,287

Int. Cl.^{2} C22B *1/08*

U.S. Cl. 75—3 **21 Claims**



1. A method for utilizing moisture-bearing iron-containing fume from steelmaking furnaces to produce green balls suitable for charging into steelmaking furnaces to recover said iron, comprising:

a. substantially instantaneously drying said fume,

b. impact-fracturing a portion of said fume whereby the Blaine surface area of said fume is not less than about 8,000 square centimeters per gram, and

c. balling said fume on a balling device while adding sufficient moisture to produce effective agglomeration.

4,004,917

ACICULAR METALLIC POWDERS PRODUCED FROM THE ORGANOMETALLIC SALTS

Robert J. Deffeyes, and Wesley R. Tyler, both of Arlington, Tex., assignors to Graham Magnetics Incorporated, Graham, Tex.

Division of Ser. No. 401,636, Sept. 28, 1973, Pat. No. 3,909,240. This application July 11, 1975, Ser. No. 595,066

The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.

Int. Cl.^{2} C22B *23/04*

U.S. Cl. 75—.5 AA **9 Claims**

1. A process for making cobalt based metallic particles containing at least 50% cobalt, said process comprising the steps of

1. selecting fasces-shaped metal-oxalate particles comprising said cobalt and consisting of rod like structures of substantially greater acicularity than said fasces-shaped particles, and
2. reducing said salt to cobalt-based particles

said cobalt-based particles being characterized by a magnetic squareness of at least 0.72 and a coercivity of at least 500 oersteds.

4,004,918

METHOD OF TREATING WASTE PRODUCED DURING STAINLESS STEEL MAKING

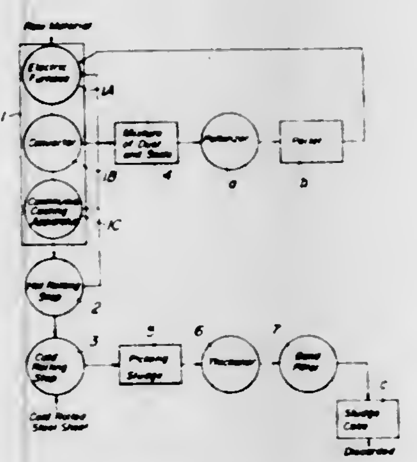
Hiroshi Fukuoka, Tokuyama; Teruhiko Kameyama, Shinnanyo; Yuji Takahashi; Kenji Nicho, both of Tokuyama; Tatsuo Misawa, Funabashi; Tsuneyuki Inoue, Ohmama, and Kimiaki Imai, Ichikawa, all of Japan, assignors to Nissin Steel Co. Ltd. and Japan Metals & Chemicals Co. Ltd., both of Tokyo, Japan

Filed June 12, 1975, Ser. No. 586,375

Claims priority, application Japan, Sept. 4, 1974, 49-100828

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—11 **8 Claims**



1. A method of treating waste produced during stainless steel making and processing, comprising:

forming a sludge cake containing 2–5 weight percent water by dehydrating slurry-like pickling sludge containing 30–70 weight percent water produced during pickling treatment in connection with a cold rolling step of stainless steel processing;

kneading the sludge cake containing 2–15 weight percent water with a mixture of dust produced during stainless steel making and scale produced during a hot rolling step of stainless steel processing, thereby obtaining a kneaded mass;

adding to said kneaded mass 1 to 5 weight percent of an organic binder and less than 5 weight percent of an inorganic binder, said weight percents being based upon the solid components of said kneaded mass;

adjusting the water content while kneading to obtain a water content in the range of 8 to 20 weight percent of the total kneaded mass;

shaping the kneaded mass under pressure into the form of a briquette;

heating the briquette to reduce its water content;

charging one or more briquettes, together with a carbonaceous reducing agent into an electric furnace for pyrometallurgically reduction refining to exact metal from such briquettes.

4,004,919

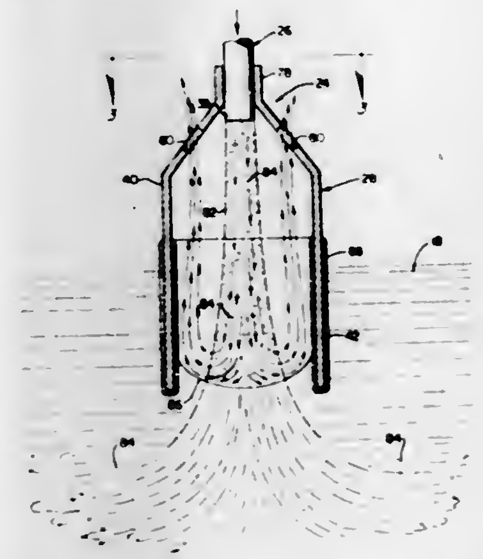
METHOD AND APPARATUS FOR TREATING METAL

William G. Wilson, Pittsburgh, Pa., assignor to Molycorp, Inc., White Plains, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,397

Int. Cl.^{2} C22C *33/08*

U.S. Cl. 75—53 **7 Claims**



1. A method of introducing additives of solid material into a molten metal bath, comprising:

providing solid additive material in particulate form;

providing a continuous stream of carrier gas;

entraining the particles of material in the carrier gas stream to produce a fluidized mixture;

directing a free stream of the mixture downward toward the surface of the bath from a selected level above the surface at a selected velocity, at which velocity the energy of the particles is sufficient to enable them to penetrate into the bath and the energy of the gas is insufficient to enable the gas to penetrate into the bath;

utilizing the energy of the particles to separate them from the gas at the surface of the bath and drive them down into the molten metal;

providing an impervious tubular shield around the lower portion of the stream extending below the static surface level of the bath to confine the gas to a contact area substantially less than the total surface area of the bath and to prevent contact of the stream with the remaining portion of the surface of the bath; and

utilizing the resistance of the surface of the contact area of the bath to deflect the gas and cause it to flow upward in a column adjacent to the downward flowing stream and within the shield.

4,004,920

METHOD OF PRODUCING LOW NITROGEN STEEL

Richard J. Fruehan, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,804

Int. Cl.^{2} C21C *5/34*

U.S. Cl. 75—60 **6 Claims**

1. In a bottom blown process for the refining of molten pig iron wherein a stream of oxygen-containing gas is introduced so as to decrease the carbon content in the resulting refined molten steel to a level below 0.2 percent, said gas being introduced at a total rate R$_T$ within the requisite throughput range,

wherein R_T is the sum of R_O, the rate at which oxygen is introduced and R_I, the rate at which other gases are introduced, and wherein R_O is at least $0.8R_T$, said bath containing an initial level of nitrogen in excess of 0.002%, said initial level being substantially in excess of that desired in the final steel product,

the improvement which comprises,

a. introducing an inert gas prior to the time the carbon content of the molten bath is decreased to a level of 0.3 percent, so as to achieve a purging rate of inert gas introduction which is at least 0.8 R_T, said inert gas being introduced at said purging rate for a time sufficient to decrease the nitrogen content to a desired level which is less than 80 percent of said initial level;

b. thereafter, increasing the rate of oxygen introduction so that R_O is again at least 0.8 R_T, said increased rate of oxygen introduction being employed for a time sufficient to decrease the bath carbon content to a final level below 0.2%.

4,004,921

TREATMENT OF LEAD SULPHIDE

Stephen Peter Beaton, Amherstview, and David Alan Harbourne, Kingston, both of Canada, assignors to Du Pont of Canada Limited, Montreal, Canada

Filed May 20, 1975, Ser. No. 579,361

Claims priority, application Canada, May 23, 1974, 200712

Int. Cl.² C22B *13/00*

U.S. Cl. 75—77 **18 Claims**

1. A process for the treatment of lead sulphide to produce at least one of lead sulphite and lead sulphate comprising the step of contacting lead sulphide with an aqueous solution of sulphur dioxide at a temperature of at least 20° C substantially in the absence of oxygen.

4,004,922

FREE MACHINING STEEL

Daniel Thivellier, Faverges; Leon Seraphin, Ugine, and Roland Tricot, Albertville, all of France, assignors to Ugine Aciers, Paris, France

Filed Sept. 3, 1975, Ser. No. 610,052

Claims priority, application France, Nov. 10, 1974, 74.35231

Int. Cl.² C22C *38/60*

U.S. Cl. 75—123 AA **12 Claims**

1. A previously deoxidized, resulfurated free machining steel, having a homogeneous distribution of globular sulfides and sulfurous inclusions and having a sulfur content of about 0.04 and about 0.5% and having a greatly improved crosswise ductility and resilience, characterized in that it contains sulfur globularizing free magnesium in a quantity at the most equal to 0.005% and at the least equal to 5 thousandths of the sulfur content, said magnesium having been added to said steel subsequent to deoxidation.

4,004,923

METHOD OF USING A TEST FILM TO MEASURE DEVELOPER ACTIVITY

Roy E. Hensel, Cranbury, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 412,405, Nov. 2, 1973, abandoned, which is a division of Ser. No. 306,325, Nov. 13, 1972, abandoned. This application Jan. 14, 1975, Ser. No. 540,831

Int. Cl.² G03C *5/04;* **G03F** *7/02*

U.S. Cl. 96—27 R **6 Claims**

1. A method of controlling developer activity in the processing of photosensitized printing plates comprising exposing a presensitized printing plate to a test pattern together with a film of material to be reproduced by said plate, said test pattern being composed of two configurations of regularly spaced elements of between about 55 and 90 percent area coverage, placed adjacent to one another for critical visual judgement with the unaided eye, one of said configurations being a background and the other configuration being a foreground,

said configurations being selected on the basis of larger and smaller practical total element perimeter per unit area with the configurations of larger total element perimeter being polygonal,

the background configuration having uniform element sizes of regular spacing and the other configuration having a progressive series of varying element sizes of regular spacing,

the configuration of the foreground being capable of showing a large integrated optical density change for a specific image change and the background being capable of showing relatively little integrated optical density change for the same image change,

developing said plate with fresh developer fluid,

selecting visually a region of the foreground which matches the integrated optical density of the background area on the reproduced test pattern on said plate,

repeating said steps of exposing and developing for subsequent plates,

and adding replenisher or a diluent for said developer fluid when a foreground area other than said selected foreground region blends into said background area on the reproduced test pattern configuration on one of said subsequently exposed and developed plates.

4,004,924

THERMORECORDING

Marcel Nicolas Vrancken, Hove, Belgium, and Wolfgang Lässig, Cologne-Stammheim, Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 405,780, Oct. 12, 1973, abandoned, which is a division of Ser. No. 550,834, May 17, 1966, Pat. No. 3,793,025. This application June 17, 1975, Ser. No. 587,642

Claims priority, application United Kingdom, May 17, 1965, 20818/65; May 24, 1965, 21985/65

Int. Cl.² G03C *5/00, 11/12*

U.S. Cl. 96—35 **14 Claims**

1. Process for producing an original having visible light absorptive image markings on a light transparent background by exposing to visible light a heat-sensitive recording layer, which method comprises the steps of imagewise exposing said recording layer to light passing through said original while said original is disposed between said recording layer to light passing through said original while said original is disposed between said recording layer and the source of said light in heat-conductive relation to said recording layer, said recording layer consisting essentially of a hydrophilic water-removable binder having homogeneously distributed therethrough finely divided particles of a hydrophobic thermoplastic polymer normally solid at room temperature and finely divided material capable of absorbing visible light and converting such absorbed light into heat, said layer being generally transparent in the absence of said material, said exposure being for a time lasting no longer than 10^{-1} second to visible light of an intensity of at least 0.3 Watt, second per sq. cm. and sufficient to heat the areas of said layer corresponding to the transparent areas of the original to reduce the water removability thereof not sufficient to heat the areas of said layer corresponding to the image areas of said original to reduce the water removability thereof; and washing said exposed layer with an aqueous liquid to remove therefrom the areas corresponding to said image areas said finely divided light absorbing material being selected from the group consisting of carbon black, graphite, a heavy metal, or an oxide or sulfide of such heavy metal.

4,004,925

PRODUCTION OF PHOTOMASKS BY FORMING COMPLEX OF SILVER AND DIAZONIUM OR PYRYLIUM SALTS

Jan Frans Van Besauw, Mortsel, and Albert Lucien Poot, Kontich, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Feb. 18, 1975, Ser. No. 550,442

Claims priority, application United Kingdom, Feb. 19, 1974, 7447/74

Int. Cl.² G03C *7/00, 5/00*

U.S. Cl. 96—58 **14 Claims**

1. A photomask comprising a support that is transparent to ultra-violet radiation and visible light and a layer incorporating a photomask image, the image parts of which contain a complex compound of a silver halide and a diazonium, pyrylium, or thiapyrylium salt, wherein said complex compound is substantially opaque to ultra-violet radiation an blue light but substantially transmitting visible light in the wavelength range above 500 nm.

4. A process for the preparation of a photomask image that is substantially opaque to ultraviolet radiation and blue light but substantially transmitting of visible light in the wave length range above about 500 nm by treating a photographic material, which contains in image-wise distribution a water-insoluble silver salt with an aqueous solution containing at least one salt of the group consisting of a diazonium salt, a pyrylium salt, and a thiapyrylium salt, whereby a complex is formed which is substantially opaque to ultraviolet and blue light and is substantially transparent to visible light of a wave length above about 500 nm.

4,004,926

FORMATION OF AZINE DYES

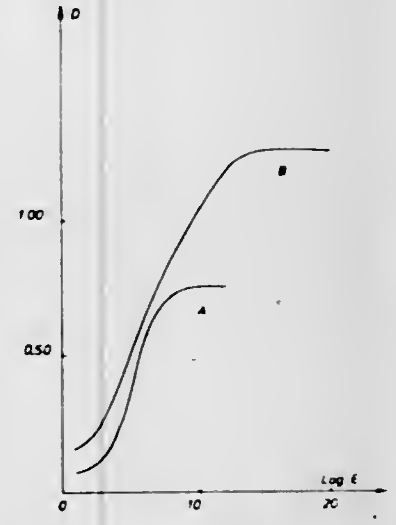
Jozef Frans Willems, Wilrijk, and Wilhelmus Janssens, Aarschot, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 26, 1975, Ser. No. 562,114

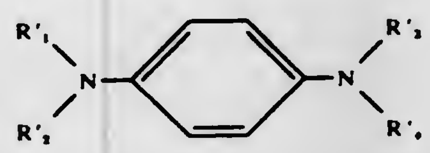
Claims priority, application United Kingdom, Apr. 2, 1974, 14542/74

Int. Cl.² G03C *5/30, 7/04, 7/16, 7/00*

U.S. Cl. 96—66 R **10 Claims**



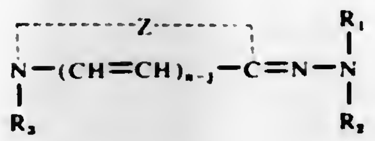
1. A method of producing a coloured image by developing a latent silver image obtained by the image-wise photo-exposure of a photosensitive silver halide material, wherein the development is carried out with p-phenylenediamine corresponding to the following general formula:



wherein:

each of R'_1, R'_2, R'_3, and R'_4 (same or different) represents an alkyl group, in the presence of

1. a hydrazone compound having the following general formula:



$$\overbrace{\underset{R_3}{\underset{|}{N}}-(CH{=}CH)_{n-1}-C}^{Z}{=}N-\underset{R_2}{\underset{|}{\overset{\overset{R_1}{|}}{N}}}$$

wherein:

n is 1, 2, or 3,

R_1 is hydrogen or an acyl group, and

R_2 is a $-CONH_2$ group or a $-SO_2H$ group, wherein X represents a hydroxyl group, an amino group, an aliphatic group, an aryl group or an heterocyclic group,

R_3 is an alkyl group or an aryl group, and Z represents the necessary atoms to close a nitrogen-containing heterocyclic nucleus, and

2. a colour of the phenol, naphthol, or active methylene compound series.

4,004,927

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING LIQUID ORGANOPOLYSILOXANE

Nobuo Yamamoto; Kiyotaka Hori; Masakazu Yoneyama; Yasuhiro Nakayama, all of Minami-ashigara, and Akira Abe, Annaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 3, 1975, Ser. No. 546,487

Claims priority, application Japan, Feb. 1, 1974, 49-13466

Int. Cl.² G03C *1/76, 1/72*

U.S. Cl. 96—67 **14 Claims**

1. A photograhic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and with at least one photographic layer of the photographic light-sensitive material containing a liquid organopolysiloxane having therein at least one siloxane unit in which (1) a methyl group and (2) a member of the group consisting of an alkyl group, a cycloalkyl group, an alkoxyalkyl group, an aralkyl group, an aryloxyalkyl group or a 2,3-epoxypropyloxyalkyl group, each member of said group (2) having at least 5 carbon atoms, are attached to the silicon atom of the siloxane unit.

4,004,928

COLOR PHOTOGRAPHIC MATERIAL

Sadayuki Miyazawa, and Yoshikazu Takaya, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

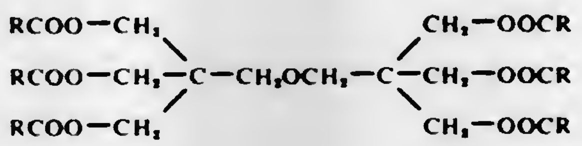
Filed Aug. 25, 1975, Ser. No. 607,546

Claims priority, application Japan, Aug. 28, 1974, 49-98567; Aug. 29, 1974, 49-98398

Int. Cl.² G03C *1/84, 1/40*

U.S. Cl. 96—84 UV **9 Claims**

1. A color photographic material having a silver halide emulsion layer and a filter layer, there being present either one or both of (1) a non-diffusing oil-soluble color coupler in said silver halide emulsion layer; or (2) an ultraviolet ray absorber in said layer on a support, there being present in at least one of said silver halide emulsion layer and said layer at least one compound of the formula:



(1)

wherein R is an alkyl group of 1 – 8 carbon atoms as a permanent solvent for said color coupler or said ultraviolet ray absorber.

4,004,929

COLOR CORRECTED PHOTOGRAPHIC ELEMENTS

Roy L. Orvis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

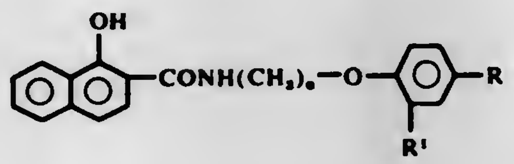
Continuation-in-part of Ser. No. 447,809, March 4, 1974, abandoned. This application Mar. 21, 1975, Ser. No. 561,019

Int. Cl.² G03C *1/40, 7/04*

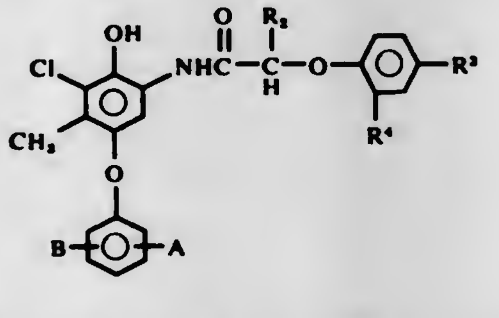
U.S. Cl. 96—100 **8 Claims**

1. In a photographic element comprising a support and at least one silver halide emulsion layer coated on said support and containing, incorporated in said layer (a) at least one naphtholic coupler capable of forming a cyan dye upon reaction with oxidized aromatic amino color developing agent, and (b) at least one colored coupler compound capable of forming a cyan dye upon reaction with said color developing agent;

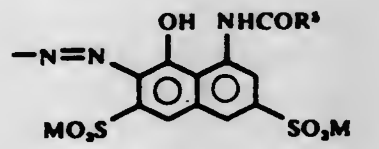
the improvement wherein said naphtholic coupler has the structure:



wherein R and R¹ are independently selected and are alkyl groups containing 1 to 8 carbon atoms and *n* is an integer from 1 to 6; and said colored coupler compound has the structure

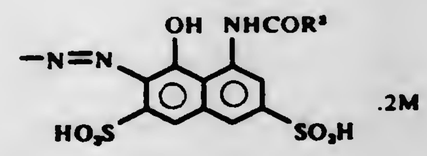


wherein R² is an alkyl group containing 1 to 6 carbon atoms, R³ and R⁴ are independently selected and are alkyl groups containing 2 to 6 carbon atoms, B is hydrogen or COOR⁶ wherein R⁶ is alkyl containing 1 to 8 carbon atoms and A is a sulfonated naphthylazo group selected from those having the structure:



(T)

or



(V)

wherein R⁵ is an alkyl group containing 1 to 4 carbon atoms, M is a photographically inactive monovalent cation.

4,004,930

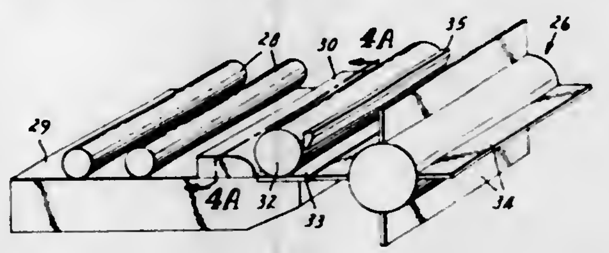
FLUID COMPOSITION FOR FORMING RETROREFLECTIVE STRUCTURES

Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 2, 1975, Ser. No. 592,744

Int. Cl.² C09D *5/00;* **G02B** *5/12*

U.S. Cl. 106—19 **10 Claims**



1. A fluid composition useful to prepare retro- reflective structures comprising:

1. a liquid vehicle that includes a transparent film-forming binder material; and
2. retroreflective platelet particles compatibly dispersed in said liquid vehicle comprising flat segments cut from a larger retroreflective sheeting; the shortest dimension of a face of the segments averaging at least about one-and-one-half times the thickness of the segments, and the segments including a monolayer of retroreflective elements optically exposed over at least one face of the segments; the index of refraction of said film-forming binder material being such that when said segments are embedded in said transparent film the retroreflective elements will retroreflect light incident on the film.

4,004,931

CONSTANT VISCOSITY INKS

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1975, Ser. No. 581,986

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² C09D *11/08*

U.S. Cl. 106—30 **10 Claims**

1. A constant viscosity liquid developer composition comprising by weight about 3–35 percent coloring agent, about 25–90 percent organic liquid solvent, about 5–35 percent of a rosin ester binder, about 1–3 percent alkylated polyvinylpyrrolidone dispersing agent soluble in the organic liquid, the ratio of the dispersing agent to the coloring agent being about 5–15 percent whereby the viscosity varies less than about 20 percent when the temperature is increased from about 15° C to about 35° C.

4,004,932

ISOCYANATED POLYVALENT METAL SALTS OF OXIDIZED WAXES

Joseph O. Bienvenu, Longview, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 20, 1974, Ser. No. 534,682

Int. Cl.² C09D *11/12, 11/06*

U.S. Cl. 106—31 **18 Claims**

1. An isocyanated polyvalent metal salt of an oxidized nonbenzenoid hydrocarbon wax characterized as follows:

1. Said wax having a melting point of 120°–230° F prior to oxidation;
2. Said wax having an acid number of about 5–20 and/or a saponification number of about 10–60 after oxidation.

4,004,933

PRODUCTION OF POROUS CERAMIC MATERIALS

Frank Ernest George Ravault, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Dec. 20, 1972, Ser. No. 317,088

Claims priority, application United Kingdom, Jan. 14, 1972, 1929/72

Int. Cl.² C03C *3/22;* **B29H** *7/22*

U.S. Cl. 106—40 R **14 Claims**

1. In the method of making a porous ceramic material which comprises impregnating a preformed organic foam structure with a slurry of finely divided ceramic material, and drying and firing the so impregnated foam, the improvement which comprises,

prior to impregnation of the foam with the slurry applying to at least a portion of the foam at least one liquid composition which penetrates the foam,

said liquid composition comprising a material selected from the group of agents which, when contacted by a component of the slurry, cause formation of a gel, whereby the material on contact with the slurry causes said finely divided ceramic material to adhere to the surface of the foam so as to form a thick coating on the foam, and

drying the foam prior to impregnation.

4,004,934

SINTERED DENSE SILICON CARBIDE

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 409,073, Oct. 24, 1973, abandoned. This application Apr. 22, 1976, Ser. No. 679,207

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.² C04B *35/56*

U.S. Cl. 106—44 **23 Claims**

1. A method of making a pre-shaped dense sintered silicon carbide ceramic article comprising the steps of:

a. forming a homogeneous dispersion of a submicron powder of
   1. β-silicon carbide,
   2. a boron containing compound in an amount equivalent to about 0.3–3.0% by weight of boron based on said silicon carbide, and
   3. an elemental carbon source selected from the group consisting of elemental carbon and a carbonaceous additive in an amount equivalent to 0.1–1.0% by weight of elemental carbon based on said silicon carbide,

b. shaping the homogeneous dispersion into a green body substantially of the form of said desired final pre-shaped sintered article and of dimensions larger than those of said desired sintered article by the amount of sintering shrinkage, and

c. sintering the green body in an inert atmosphere chemically-inert with respect to silicon carbide at atmospheric pressure or below atmospheric pressure at a temperature of about 1900° -2100° C until the ceramic article has a density of at least 85% of theoretical, said carbonaceous additive being pyrolyzable to produce said elemental carbon at a temperature below sintering temperature.

4,004,935

GLAZING COMPOSITIONS FOR CERAMIC ARTICLES

Derek Grosvenor, Middlesbrough, and John Robert Frederick Nicholson, Stockton, both of England, assignors to Tioxide Group Limited, Billingham, England

Filed Nov. 14, 1974, Ser. No. 523,682

Claims priority, application United Kingdom, Dec. 1, 1973, 55803/73

Int. Cl.² C03C *5/02*

U.S. Cl. 106—48 **21 Claims**

1. A substantially lead-free glazing composition capable of forming a glaze with a gloss of from 9–55 units measured at 45°, on ceramic articles when fired at a temperature of 950°–1200° C., comprising a finely—divided frit, an unfritted crystalline silica, water and optionally a clay, in which said frit comprises as essential ingredients silica (SiO_2) in an amount of from 25 to 55 mole percent, titanium dioxide (TiO_2) in an amount of from 7 to 20 mole percent, alkali metal oxides (M_2O) in an amount of from 10 to 25 mole percent, and strontium, calcium or magnesium (as oxide) in an amount of from 5 to 15 mole percent, alumina (Al_2O_3) in an amount of from 5 to 15 mole percent, and boron (B_2O_3) in an amount of from 0 to 10 mole percent, the amount of said unfritted crystalline silica being such that the silica content of the final glazing composition is increased from 5 to 28 weight percent (SiO_2) relative to the silica content of the frit.

4,004,936

LOW TEMPERATURE SEALED GLASS COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Jimmie Lee Powell, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1976, Ser. No. 687,808

Int. Cl.² C03C *3/10, 3/12, 3/14*

U.S. Cl. 106—53 **4 Claims**

1. A low temperature vitreous/crystalline seal glass composition consisting essentially of the following constituents in percent by weight:

	Percent by Weight
PbO	63.5–64.6
B_2O_3	13.0–13.9
Bi_2O_3	1.2–1.5
ZnO	11.4–11.9
SiO_2	2.4–2.8
Al_2O_3	0.8–1.0
Cu_2O	4.3–5.8

said composition having a softening temperature of from about 400° to 408° C, a glass transition temperature of from about 370° to 375° C, a strain temperature of from about 309° to 326° C, and annealing temperature of from about 332° to 342° C; and a thermal coefficient of expansion of from about $83 \times 10^{-7}/°C$ to $86.5 \times 10^{-7}/°C$.

4,004,937

METHOD FOR PRODUCING A SINTERED SILICON NITRIDE BASE CERAMIC AND SAID CERAMIC

Hideyuki Masaki, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Division of Ser. No. 408,358, Oct. 23, 1973, Pat. No. 3,950,464. This application Nov. 18, 1975, Ser. No. 632,943

Claims priority, application Japan, Oct. 24, 1972, 47-106817

Int. Cl.² C04B *35/58, 35/02, 35/00;* **F27B** *9/04*

U.S. Cl. 106—59 **2 Claims**

1. A process of preparation of a silicon-nitride based ceramic, comprising the steps of combining at least one member of a first group consisting of MgO, ZnO and NiO, and at least one member of a second group consisting of Al_2O_3, Cr_2O_3, Y_2O_3, TiO_2 and SnO_2, all members being in powdered form, the mol ratio of said first group member or members to said second group member or members ranging from 1:9 to 9:1, heating said combined members to a temperature sufficient to form a spinel or spinel-like compound therefrom, cooling and grinding said compound to a fine powder, mixing said powdered compound with powdered Si_3N_4 in a mol ratio between 8:92 and 40:60, forming said mixed powders into a green compact and sintering said green compact at a temperature between 1600° C and 1800° C in an inert gas in the absence of applied pressure, the resultant composition consisting essentially of Si_3N_4 and members of said first and second groups, and all powders being finer than 300 mesh prior to heating.

4,004,938

METHOD AND APPARATUS FOR MANUFACTURING CEMENT CLINKER

Rudolf Rohrbach, Dotternhausen, and Horst Ritzmann, Enaiger, both of Germany, assignors to Polysius AG, Neubeckum and Rudolf Rohrbach, Dotternhausen, both of, Germany

Filed Apr. 21, 1975, Ser. No. 569,832

Claims priority, application Germany, Apr. 25, 1974, 2420121

Int. Cl.² C04B *7/44*

U.S. Cl. 106—100 **11 Claims**

1. A method of manufacturing cement clinker from limestone and clay components in a plant having a sintering kiln joined by a conduit to a multiple stage preheater having final and other interconnected stages, said method comprising introducing limestone components to a stage of said preheater other than said final stage; establishing via said conduit a stream of hot gases from said kiln to the final and other stages of said preheater to preheat said limestone components; introducing preheated limestone components from a stage of said preheater other than said final stage into said conduit; introducing fuel-bearing clay components into said conduit; combusting fuel in said fuel-bearing components in the presence of the preheated limestone components in said conduit to calcine the limestone and clay components; delivering the calcined limestone and clay components to the final stage of said preheater; discharging said calcined limestone and clay components from said final stage of said preheater to said kiln; and firing said calcined limestone and clay components in said kiln to form cement clinker.

4,004,939

BISULFITE TERMINATED OLIGOMERS AS DISPERSING AGENTS

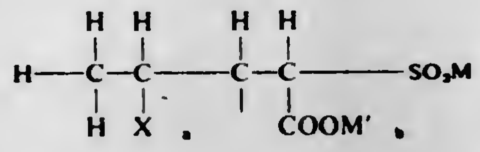
John T. O'Brien, Cheshire, and Woodrow W. White, Oxford, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,397, March 29, 1974, abandoned. This application July 31, 1974, Ser. No. 493,382

Int. Cl.² C08H *1/00;* **C08L** *3/00*

U.S. Cl. 106—135 **40 Claims**

1. A method of dispersing insoluble solid particulate matter selected from the group consisting of inorganic pigments, extenders, and fillers in aqueous systems containing 25 to 85% by weight solid particulate matter comprising adding, in an amount effective to disperse the solid particulate matter, an oligomer having the formula:



$$H-\left[\begin{array}{cc} H & H \\ | & | \\ C- & C- \\ | & | \\ H & X \end{array}\right]_a-\left[\begin{array}{cc} H & H \\ | & | \\ C- & C- \\ | & | \\ & COOM' \end{array}\right]_b-SO_3M$$

wherein M is a water soluble cation; X is selected from —CN and —$COOCH_3$; M' is based on a cation selected from the group consisting of ammonia, an amine, and an alkali metal; *a* + *b* is from 4 to 250; and *a*/*a* + *b* is from 0.0 to 0.6.

4,004,940

PIGMENTATION OF POLYMERS

Claude Cormier, Sherbrooke, Canada, assignor to Celanese Canada Limited, Montreal, Canada

Continuation-in-part of Ser. No. 403,150, Oct. 3, 1973, which is a continuation-in-part of Ser. No. 165,377, July 22, 1971, abandoned. This application Jan. 13, 1975, Ser. No. 540,629

Int. Cl.² C08J *3/00*

U.S. Cl. 106—308 M **5 Claims**

1. An improved polypropylene/pigment essentially dry-blended concentrate being a blend of isotactic polypropylene particles and at least one pigment coated on the particles, and wherein said pigment's concentration is 10–75% by weight, wherein the improvement comprises:

at least 95 weight percent of said polypropylene particles have a maximum chord of less than 50 microns,

whereby fibers made therefrom have improved color, fewer pigment agglomerates and fewer broken filaments.

4,004,941

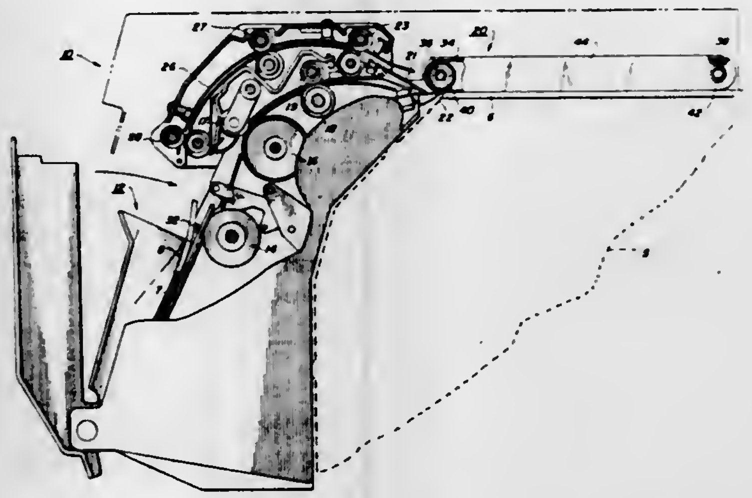
CLEANING METHOD FOR AUTOMATIC DOCUMENT HANDLER

Ronald M. Nekula, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 19, 1975, Ser. No. 615,010

Int. Cl.² B08B *3/08*

U.S. Cl. 134—15 **3 Claims**



1. In a document handling process in which a platen belt transports a document to be copied onto a stationary exposure platen against a registration edge associated with the platen to register the document thereon, the improvement for treating the platen belt to minimize the variation in frictional characteristics between a dirty belt and a clean belt comprising the steps of:

cleaning the surface of the belt which contacts the document to be copied with a solvent; and,

applying silicone oil to the cleaned surface of the belt in an amount sufficient to reduce the coefficient of friction of the cleaned surface to substantially the same coefficient of friction existing on the surface prior to said cleaning step.

4,004,942

PROCESS AND APPARATUS FOR CLEANING PARTICULATE MATERIALS

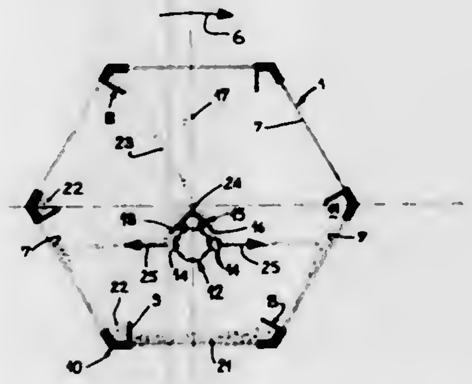
Gerard Yves Richard, Precy sur Oise, France, assignor to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C., France

Filed June 5, 1975, Ser. No. 584,138

Claims priority, application France, June 10, 1974, 74.19976

Int. Cl.² B08B *7/00*

U.S. Cl. 134—25 R **5 Claims**



1. A process for mechanically and pneumatically cleaning and stripping a particulate substance comprising introducing particles of said substance into a current of gas under pressure, projecting said particles by means of said current of gas against the interior sides of a rotating drum from a fixed point adjacent the central axis of said drum, carrying the resultant particles upwardly in the direction of rotation of said drum, and allowing them to fall by gravity into said current of gas whereby they are intermittently and repeatedly subjected to shock treatment against the interior sides of said drum.

4,004,943

RECHARGEABLE ELECTROCHEMICAL CELL

Pieter Abraham Boter, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,165

Claims priority, application Netherlands, Aug. 19, 1974, 7411045

Int. Cl.² H01M *35/02*

U.S. Cl. 429—59 **4 Claims**

1. A rechargeable electrochemical cell having an electrode which consists of $La_{1-y}R_yNi_{5-z}M_zH_x$, where $y = 0$ to 1, $z = 0$ to 1, $x = 0$ to 7, *R* is a metal selected from the group consisting of the rare earth metals, calcium and thorium, and M is a metal selected from the group consisting of cobalt, copper and iron, in the presence of iron $z < 0.2$, a counterelectrode consisting of a material which is capable of reversibly taking up and giving off a proton and an electron and an electrolyte.

4,004,944

ELECTRODE MATERIAL FOR ACCUMULATORS AND OTHER ELECTROCHEMICAL SOURCES OF CURRENT

Josef Šandera; Milan Calábek; Miroslav Cenek, all of Brno; Vojtech Koudelka, Mlada Boleslav; Oldrich Kouřil, Brno; Jiri Malik, Mlada Boleslav, and Josef Vaňáček, Brno, all of Czechoslovakia, assignors to Prazska akumulatorka, narodni podnik, Mlada Boleslav, Czechoslovakia

Filed July 28, 1975, Ser. No. 599,421

Claims priority, application Czechoslovakia, July 30, 1975, 5419/75

Int. Cl.² H01M *35/02*

U.S. Cl. 429—215 **4 Claims**

1. An improved active composition of a completed plastic-bonded electrode in an electrochemical current source, the composition consisting essentially of (1) a powdered base active material selected from the group consisting of cadmium, nickel, zinc and zinc oxide, (2) a binding agent, and (3) a substance selected from the group consisting of oxalic acid and a salt thereof, the last-mentioned substance being present in the composition in the range of 1.5–60% by weight.

4,004,945

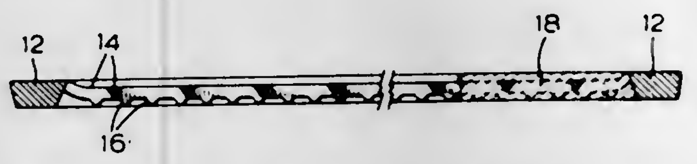
BATTERY PLATE GRID

Carleton H. Smith, 34 North Drive, Islington, and Kenneth G. Dunning, 413 Vancouver Crescent, Oshawa, both of Canada

Continuation of Ser. No. 497,742, Aug. 15, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 656,874

Int. Cl.² H01M *4/80*

U.S. Cl. 429—244 **2 Claims**



1. A lead battery plate grid for a lead acid battery comprising a lead perimeter frame, a lead lattice network of intersecting bars formed integrally with and within said perimeter frame, protuberances spaced apart on one side only of said lattice network and formed integrally therewith, said perimeter frame having a greater thickness than said lattice network, the principal plane of said lattice network being between the spaced apart planes of opposed face surface of said perimeter frame, said protuberances on said one side of the said lattice network of said grid having a height of about ½ of the difference in thickness between said lattice network and said perimeter frame whereby the outer extremities of said protuberances are in the plane of one face surface of said frame.

4,004,946

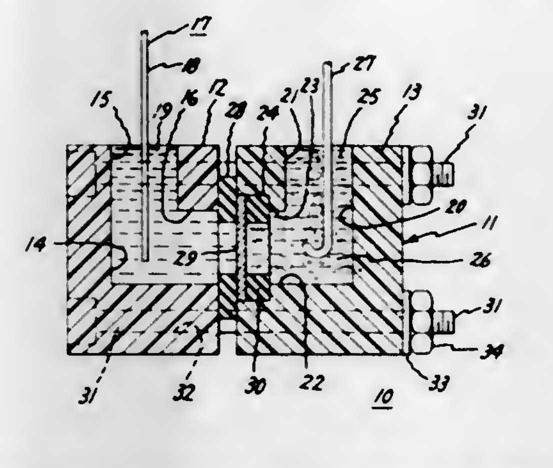
SEALED LITHIUM-CHLORINE CELL

Gregory C. Farrington, Elnora, and Walter L. Roth, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 517,513, Oct. 24, 1974, abandoned. This application June 23, 1975, Ser. No. 589,136

Int. Cl.² H01M *6/18, 8/10*

U.S. Cl. 429—72 **5 Claims**



1. A sealed lithium-chlorine cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a non-aqueous electrolyte, a cathode positioned within the casing, the cathode comprising chlorine with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9Al_2O_3$ of which 1.3 to 85.0 percent of the total alkali content is lithium.

4,004,947

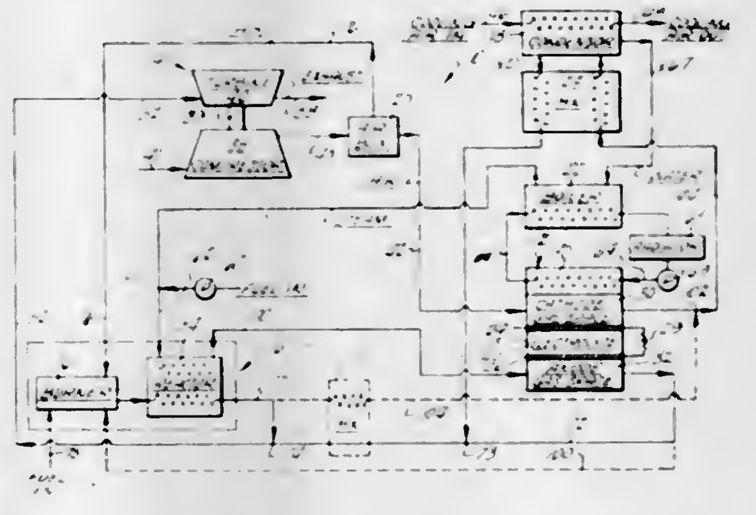
PRESSURIZED FUEL CELL POWER PLANT

David P. Bloomfield, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,601

Int. Cl.² H01M *8/06*

U.S. Cl. 429—17 **30 Claims**



1. A power plant for generating electricity comprising:

a fuel cell stack including a plurality of fuel cells connected electrically in series through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte

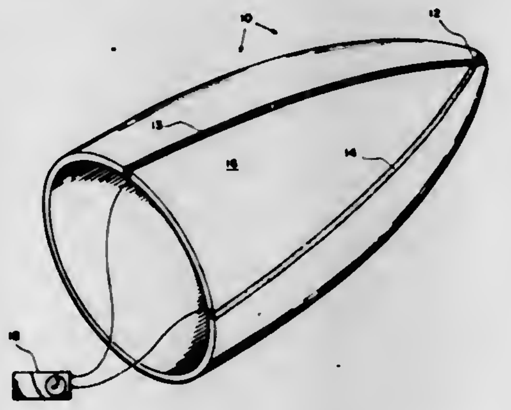
disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode;
compressor means including a compressor operably connected to turbine means;
means for delivering air at a pressure of at least two atmospheres from said compressor into said cathode gas space;
fuel conditioning apparatus including reactor means for producing hydrogen from a hydrogen containing fuel;
burner means for providing heat to said reactor means;
means for delivering pressurized hydrogen containing fuel into said reactor means;
means for delivering pressurized hydrogen from said fuel conditioning apparatus into said anode gas space;
means for delivering at least a first portion of said anode effluent gases into said burner means for providing fuel to said burner means; and
means for delivering pressurized effluent gases from said cathode gas space and effluent gases from said burner means into said turbine means for powering said turbine means and driving said compressor.

4,004,948

PAINT-ON THERMOCOUPLE

Warren K. Smith, Poway, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,044
Int. Cl.^{2} H01L *35/12*
U.S. Cl. 136—201 7 Claims



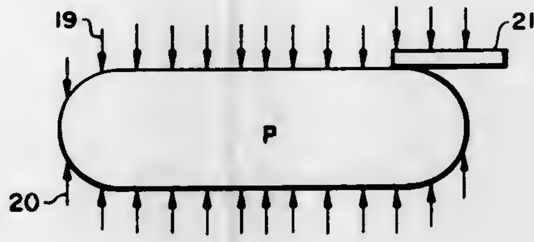
1. The method of making a thermocouple on a surface to be tested comprising:
mixing two electrically dissimilar metals in finely divided form each with a liquid vehicle and a liquid dryer to obtain two fluid mixtures each having a desired fluid consistency;
applying a narrow film of each mixture so obtained on said surface along diverging lines intersecting in a relatively small area and terminating at two accessible points remote from said area; and
drying said lines of narrow film at ambient temperature.
7. A thermocouple comprising:
a non-conductive substrate;
a first thin narrow strip of metallic film on said substrate; and
a thin narrow strip of a second, dissimilar, metallic film intersecting and electrically contacting said first strip;
said first metallic film being a paint containing a finely divided metal selected from the group consisting of: silver, platinum, gold and lead; and
said second strip being a paint having a pigment consisting essentially of constantan.

4,004,949

METHOD OF MAKING SILICON SOLAR CELLS

Israel Arnold Lesk, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,848
Int. Cl.^{2} H01L *21/265*
U.S. Cl. 148—1.5 9 Claims



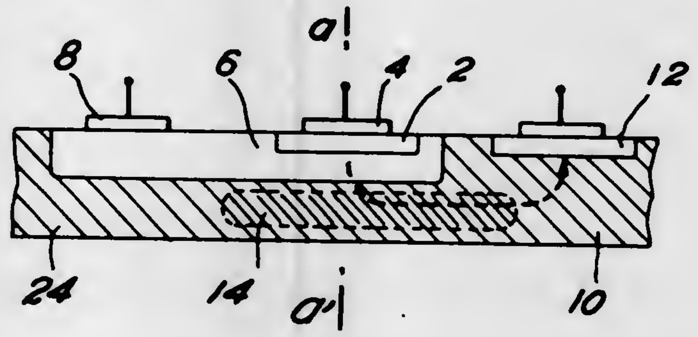
1. A method for making a silicon solar cell, which comprises:
providing a silicon substrate of a first conductivity type having first and second opposing surfaces and at least two opposing rounded edges joining said first and second surfaces,
ion implanting an impurity of a second conductivity type into one of said first and second surfaces of said silicon body to form a second conductivity type region extending from said one surface into said substrate and forming a P-N junction with said substrate which terminates at at least one of said rounded edges,
ion implanting an impurity of the first conductivity type into the other of said first and second surfaces to form a first conductivity type region having a greater doping level than said substrate extending from said other surface into said substrate and forming a boundary with said substrate extending into said substrate a sufficient extent to terminate against said at least one of said rounded edges and contact said P-N junction, and
forming electrical contacts to said first and second conductivity type regions.

4,004,950

METHOD FOR IMPROVING THE DOPING OF A SEMICONDUCTOR MATERIAL

Pierre Baruch, Paris; Joseph Borel, Echirolles, and Joel Monnier, Antibes, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly and Commissariat a l'Energie Atomique, Paris, both of, France

Filed Jan. 10, 1975, Ser. No. 539,983
Claims priority, application France, Jan. 10, 1974, 74.00774
Int. Cl.^{2} H01L *21/263*
U.S. Cl. 148—1.5 21 Claims



1. A method for improving the doping of a semiconductor material with impurities of a given conductivity type, wherein said method consists in a first step in doping said material with said impurities which have a given concentration profile and, in a second step, in maintaining said material at a high temperature, in bombarding said material with a beam of a constant intensity of particles accelerated with a constant energy which is sufficient to penetrate into the material during a given time interval so as to obtain migration of the impurities resulting in an increase in the impurity concentration irrespective of the sign of the initial concentration gradient within a zone adjacent to the zone of stopping of the particles, said zone being in a portion of said material which is doped with said impurity.

4,004,951

PROTECTIVE COATING FOR ALUMINUM PRODUCTS

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 593,092, July 3, 1975, abandoned. This application Sept. 8, 1975, Ser. No. 610,966
Int. Cl.^{2} C23F *7/00*
U.S. Cl. 148—6.27 18 Claims

1. A method of forming a tenacious, hydrophobic coating on an aluminum surface which is resistant to polar organic solvents comprising treating the aluminum surface with an alkaline solution at a pH less than 10 containing a compound which generates therein a long chain aliphatic carboxylate anion having from 10–20 carbon atoms and maintaining the temperature at the surface-solution interface greater than 60° C, the solution initially etching the aluminum surface and then the solution forming aa tenacious hydrophobic coating on the aluminum surface which is resistant to polar organic solvents.

4,004,952

CARBURIZED BEARING MEMBERS

Chester F. Jatczak; Jesse A. Burnett, both of North Canton, and Terry W. Mohr, Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

Division of Ser. No. 598,067, July 22, 1975, Pat. No. 3,954,517. This application Jan. 23, 1976, Ser. No. 651,815
Int. Cl.^{2} C22C *38/44, 38/46*
U.S. Cl. 148—39 3 Claims

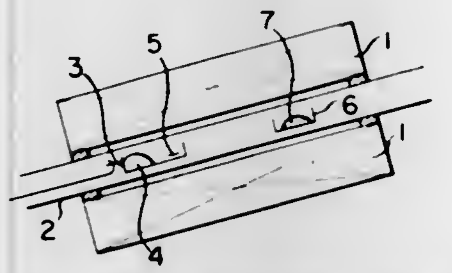
1. A machine element formed from a carburized steel alloy having a surface hardness of at least Rockwell C58 and consisting essentially of about 0.1 to 0.3% carbon, 0.2 to 1% manganese, 0.2 to .6% silicon, from an effective amount up to 1.2% chromium, 2.5 to 3.5% nickel, 4 to 6% molybdenum, 0.25 to 0.85% vanadium and the remainder substantially all iron, the hot twist characteristics of said alloy being such that it can experience at least 40 twists to fracture at temperatures of 1800° F and above.

4,004,953

METHOD FOR GROWING CRYSTALS OF III-V COMPOUND SEMICONDUCTORS

Mutsuyuki Otsubo; Hidejiro Miki, and Kiyoshi Shirahata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sept. 23, 1975, Ser. No. 615,882
Claims priority, application Japan, Oct. 7, 1974, 49-115367
Int. Cl.^{2} H01L *21/208*
U.S. Cl. 148—172 6 Claims



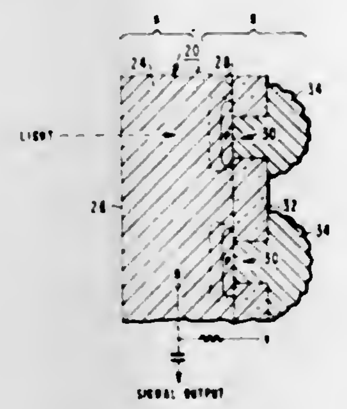
1. A method for growing semi-insulating Group III–V compound semiconductor crystals having a residual free electron concentration of 10^{12} cm^{-3} or less, on a substrate by means of an epitaxially crystallizing process in a liquid state, which comprises the steps of:
a. placing a boat containing a saturated solution of a III–V compound having chromium added therein in an inclined reaction tube;
b. heating the solution at a temperature of 800° – 950° C in an atmosphere of hydrogen;
c. cooling the reaction tube to room temperature and placing a substrate in said boat without permitting the substrate to come into contact with the solution, while another boat having a V Group element vapor-generating solution thereon is inserted in said reaction tube;
d. heating the reaction tube at a temperature of 700° to 900° C, and bringing the saturated solution of III–V compound into contact with the substrate by reversing the inclination of the reaction tube; and
e. slowly cooling the system to grow a crystal of the III–V compound on the substrate at a temperature of 700° – 830° C.

4,004,954

METHOD OF SELECTIVE GROWTH OF MICROCRYSTALLINE SILICON

Donald Richard Tshudy, Lancaster, and Thomas William Edwards, Mount Joy, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,400
Int. Cl.^{2} H01L *21/205, 31/14*
U.S. Cl. 148—174 12 Claims



6. A method of selective growth of microcrystalline silicon on an array of discrete surface regions of a silicon wafer exposed through an array of openings in a layer overlying said wafer, the method including the steps of:
a. preheating the wafer and overlying layer to a temperature above 1000° C. in an enclosed chamber in a continually renewed atmosphere comprising hydrogen for at least one minute; and thereafter,
b. selectively growing mircrocrystalline silicon on the discrete surface regions of the silicon wafer by the hydrogen reduction of silicon tetrachloride at a temperature below said preheat temperature.

4,004,955

POSITIVE SELECTIVE NICKEL ALIGNMENT SYSTEM

Richard W. Dost; James L. Hudson, and Larry L. Jordan, all of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 363,488, May 24, 1973, Pat. No. 3,914,050. This application June 9, 1975, Ser. No. 585,343
Int. Cl.^{2} H01L *21/306*
U.S. Cl. 156—3 2 Claims

2. A method of selectively depositing a metallic coating on the back side of a semiconductor wafer in precise alignment with mesa emitter regions on the front side of the wafer using a pattern of ridges between said emitter mesas to acquire said alignment, said method comprising the steps of:
forming a pattern of ridges on a front side of a semiconductor wafer between said emitter mesas;
forming a silicon dioxide layer on the back side of said semiconductor wafer;

applying a layer of photoresist coextensive with and contiguous said silicon dioxide layer;

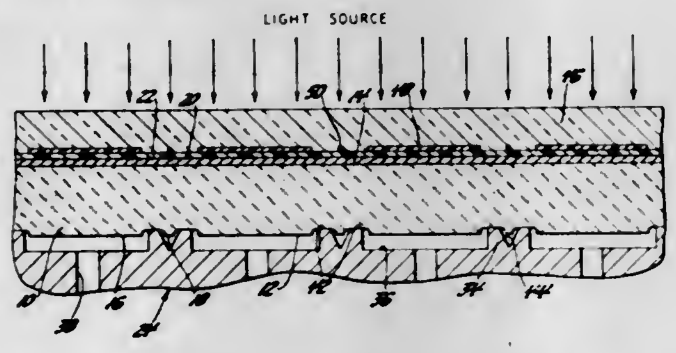
aligning a photomask with a distinctive alignment chuck, said chuck having at least one major face having a plurality of recesses complementary to said emitter mesas, grooves in said face between said recesses which precisely correspond with said pattern of ridges on said wafer, said grooves having a width and depth slightly greater than the width and height of said ridges;

nesting said pattern of ridges of said semiconductor wafer in said alignment chuck grooves thereby aligning said wafer with said chuck and automatically registering said photomask with selected regions on the back side of the wafer;

abutting said photomask with said photoresist layer on said back side of said semiconductor wafer whereby said photomask is in positive alignment with said emitter mesas on the front side of said wafer;

exposing said photoresist layer with said photomask thereon to an ultraviolet light;

removing said wafer;



developing said photoresist to form windows in said photoresist layer in which a plurality of selected areas of said silicon dioxide layer are exposed, said windows being in alignment with said emitter mesas on said front side of said wafer;

applying a maskant to the front side of said wafer;

etching said wafer to remove said selected areas of said silicon dioxide layer and expose a plurality of underlying silicon selected areas on said back side of said wafer.

removing said photoresist;

electrolessly plating a nickel coating on said selected areas on said back side of said wafer to form a plurality of discrete low resistance electrical contacts for each device included in said wafer, said nickel contacts being in precise alignment with said emitter mesas on the front side of said wafer; and

separating a plurality of individual mesa devices from said wafer by etching completely through portions of said wafer not coated with said nickel whereby said nickel does contaminate exposed PN junctions of the devices.

4,004,956
SELECTIVELY STRIPPING TIN OR TIN-LEAD ALLOYS FROM COPPER SUBSTRATES

Frank A. Brindisi, Jr., Madison, Conn., assignor to Enthone, Incorporated, West Haven, Conn.

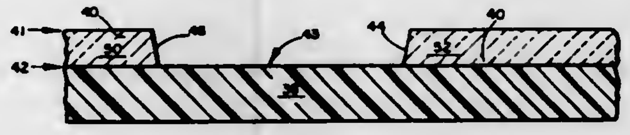
Filed Aug. 14, 1974, Ser. No. 497,435
Int. Cl.² C09K *13/08*
U.S. Cl. 156—666 **20 Claims**

1. In an acidic aqueous solution for selectively stripping tin or tin-lead alloy solder from a copper substrate comprising a nitro-substituted aromatic compound having at least one $-NO_2$ group attached to the aromatic ring and a water-solubilizing substituent also attached to the aromatic ring, an inorganic acid capable of reacting with tin and lead to form water-soluble salts thereof and incapable of reacting with tin and lead to form a water-insoluble compound film, a thiourea for preventing redeposition of stripped tin onto the copper substrate, and an organic acid of the formula RCOOH wherein R is 1–2C alkyl or a hydrogen atom, the improvement whereby a more rapid stripping of the tin or tin-lead alloy solder from the copper is provided, which comprises having present in the aqueous solution an effective amount of a haloacetic acid wherein the halo is chloro or bromo, the amount of said haloacetic acid being sufficient, in combination with said acid of the formula RCOOH wherein R has the meaning aforesaid, to synergistically accelerate the rate of stripping of the tin or tin-lead alloy solder from the copper substrate.

4,004,957
METHOD FOR ETCHING SILICON

Leo J. Quintana, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 599,910, July 28, 1975. This application June 14, 1976, Ser. No. 695,686
Int. Cl.² H01L *7/50*
U.S. Cl. 156—643 **6 Claims**



1. A method of selectively etching silicon comprising the steps of:

depositing a layer of positive photoresist material upon said silicon;

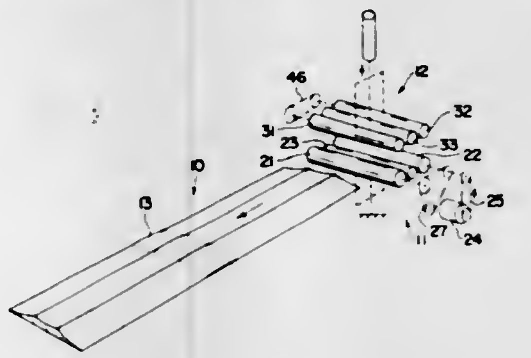
defining in said photoresist material the portions of the silicon which are to be protected from etching; and

exposing the unprotected portions of the silicon to an etchant for a period of time which is sufficient to remove a desired quantity of silicon, said etchant comprising between 20 and 95 percent by volume nitric acid, between 80 and 5 percent by volume fluoboric acid and up to about 2 grams of ammonium fluoborate per liter of the etchant.

4,004,958
METHOD AND APPARATUS FOR PRODUCING BETTER BALANCED TREAD COMPONENTS IN PNEUMATIC TIRES

Billy Joe Jones; Donald James Linnstaedter, and Freydoun Monajjem, all of Waco, Tex., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 15, 1975, Ser. No. 605,105
Int. Cl.² B29H *17/20*
U.S. Cl. 156—128 R **6 Claims**



1. In a method for fabricating a laminated band of uncured elastomeric material for vulcanizing in a mold, to form a pneumatic tire, including the steps of constructing a carcass of superposed plies and applying thereto a cut-to-length extruded vulcanizable strip that is wrapped around the carcass and lap spliced at its ends, the improvement which comprises:

before said strip is applied to said carcass, longitudinally shortening said strip to form a thickened portion midway between the ends thereof

whereby when said strip is applied to said carcass and said laminated band is vulcanized, said thickened portion is located 180° from the zone of the splice to counterbalance the extra weight of said splice zone.

4,004,959
UNSATURATED POLYESTER WITH POLYIMIDE-AMMONIA PREPOLYMERS AS THERMOSETTING LAMINATE

Pierre Ledru, Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

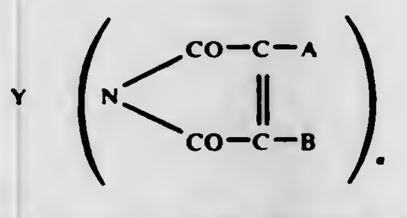
Filed Feb. 13, 1975, Ser. No. 549,788

Claims priority, application France, Feb. 15, 1974, 74.05209

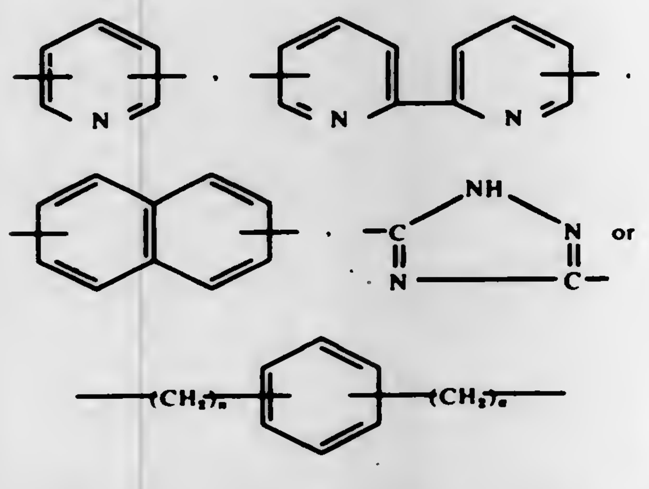
Int. Cl.² C09J *3/02*; C08L *67/06*, *77/00*
U.S. Cl. 156—331 **8 Claims**

1. A thermosetting composition which comprises:

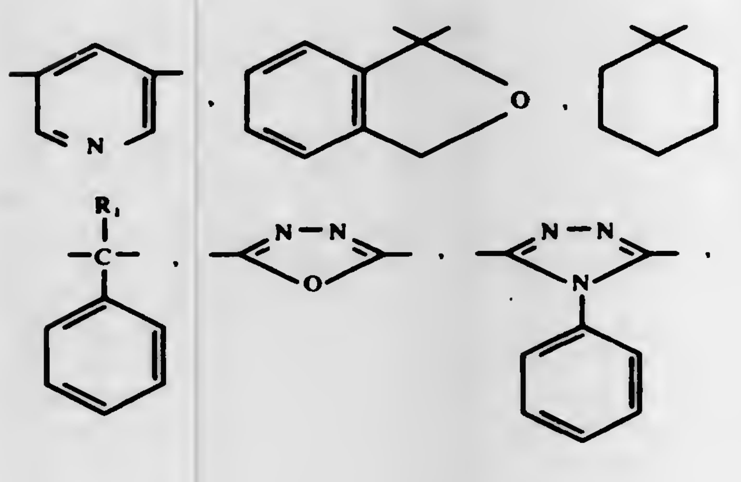
a. a prepolymer possessing imide groups, with a softening point from 50° to 200° C., prepared by reacting ammonia with a polyimide of the formula:



in which *a* is a number ranging from 2 to 4, Y represents an organic radical of valency *a* selected from a linear or branched alkylene radical with 2 to 12 carbon atoms, a phenylene radical, a cyclohexylene radical, one of the radicals of the formulae:



wherein *n* represents an integer from 1 to 3, a radical consisting of phenylene or cyclohexylene radicals bonded to one another either directly or by an atom or group selected from —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, —CONH—, —COO—, $-P(O)R^1-$, —CONH—X—NHCO—,



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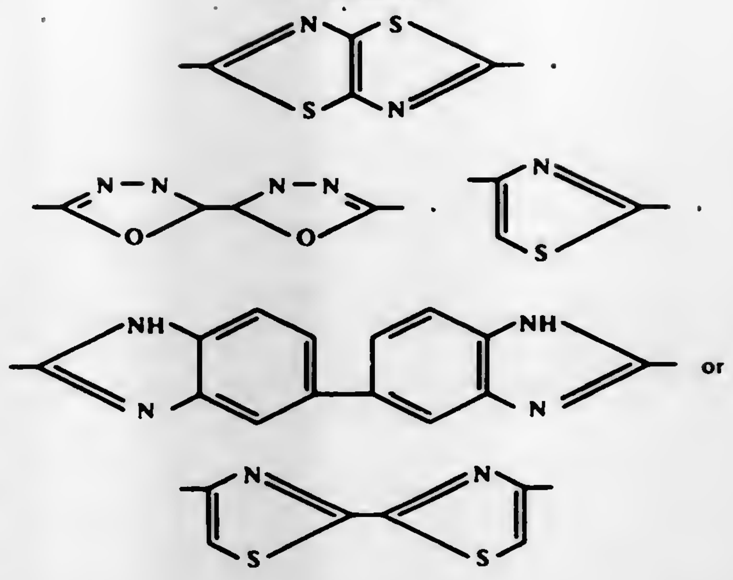
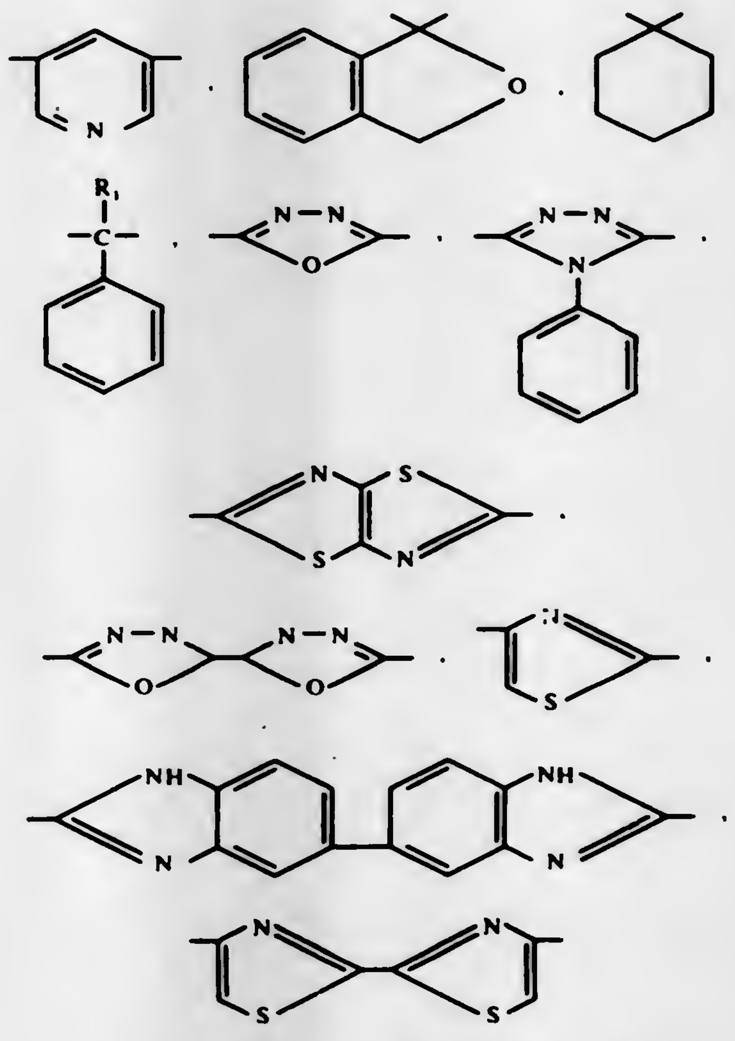
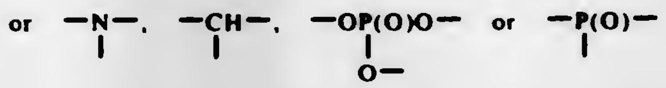


wherein R^1 represents a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical, and X represents an alkylene radical with 2 to 12 carbon atoms, said phenylene and cyclohexylene radicals optionally being substituted by methyl groups or a tri- or tetra-valent radical, the valencies of which are carried by a benzene type nucleus, optionally substituted by methyl groups, a naphthalene-type nucleus, a pyridine-type nucleus or a triazine-type nucleus or several benzene nuclei bonded to one another by a valency bond or by an inert atom or group selected from —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, —CONH—, —COO—, $-P(O)R^1-$, —CONH—X—NHCO,





or $-\underset{|}{N}-$, $-\underset{|}{C}H-$, $-O\underset{\underset{O-}{|}}{P}(O)O-$ or $-\underset{|}{P}(O)-$

and each of A and B, which may be identical or different, represents a hydrogen or chlorine atom or a methyl radical, the proportions of polyimide and ammonia being such that there are 2 to 20 imide groups per mol of ammonia; and

b. an unsaturated polyester, the prepolymer being present in an amount from 35% to 95% by weight of the total weight of the prepolymer and unsaturated polyester.

4,004,960
COPOLYESTER-AMIDE RESIN AND ADHESIVE PROCESSES

Ernest M. Crowell, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Apr. 7, 1975, Ser. No. 565,598

Int. Cl.^{2} C09J *3/02*

U.S. Cl. 156—331 **9 Claims**

1. A heat fusible heterophase copolyester-amide resin formed of copolyester soft segments chemically joined to hydrogen bonding copolyamide hard segments having limited compatibility with the copolyester soft segments in which said copolyester segments comprise from about 30 to about 60% of aliphatic ester components and from about 70 to about 40% of aromatic ester components, said copolyester segments have a molecular weight of from about 5,000 to about 15,000, and in which the total amide structure in said copolyesteramide constitutes by weight from about 5 to about 40% based on the weight of said copolyester-amide and amide structure from aminolysis of said copolyester constitutes from about 40 to about 70% by weight of said total amide structure.

7. An adhesive process in which a copolyester-amide resin as defined in claim 1 is melted and deposited in molten condition on a surface to be bonded, the deposited adhesive is cooled below the crystallization temperature of the polyamide segments, a further surface is pressed against the deposited copolyester-amide during the period within which the polyester segments remain mobile so that the deposited copolyester-amide retains tack to establish a bond to said further surface, and the copolyester-amide is hardened to tack-free strong condition bonding said surfaces firmly together.

4,004,961
STITCHING APPARATUS FOR STITCHING TIRE COMPONENTS ON A BUILDING DRUM

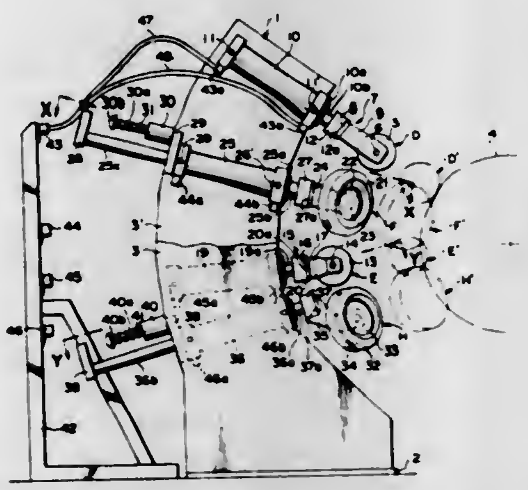
Yutaka Takasuga, Higashimurayama; Seiichiro Nishimura, Tokyo, and Masayoshi Suzuki, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Kyoba, Japan

Filed Sept. 25, 1975, Ser. No. 616,888

Claims priority, application Japan, Sept. 26, 1974, 49-111082

Int. Cl.^{2} B29H *17/08*

U.S. Cl. 156—421 **7 Claims**



1. A stitching apparatus for stitching tire components formed in a toroidal shape and laid out on a building drum, the apparatus comprising: a frame structure arranged opposingly to and spaced apart from the drum; a central roller disposed opposingly to a mid-circumferential plane of the drum and having a rotational aixs parallel with that of the drum for stitching mid-circumferrential portions of the tire components on the drum, said central roller being made of metal in a generally cyclindrical shape; at least one pair of side rollers circumferentially spaced apart from said central roller and arranged symmetrically to the mid-circumferential plane of the drum for stitching side portions of the tire components, said side roller having a rotational axis inclined to that of the drum, to urge perpendicularly against the tire components, and being constituted of a pneumatic tire roller; a roller urging mechanism including two urging means mounted on said frame structure in radical relation with the rotational axis of the drum and having respective leading ends rotatably carrying thereon said central roller and said side rollers for alternatively projecting and retracting said rollers toward and away from a circumferential surface of the drum to stitch the tire components from their mid-circumferential portions to their side portions; and a roller urging pressure control mechanism for controlling the urging pressures of said side rollers exerted onto the side portions of the tire components on the drum in cooperation with said roller urging mechanism upon movement of said side rollers toward the building drum.

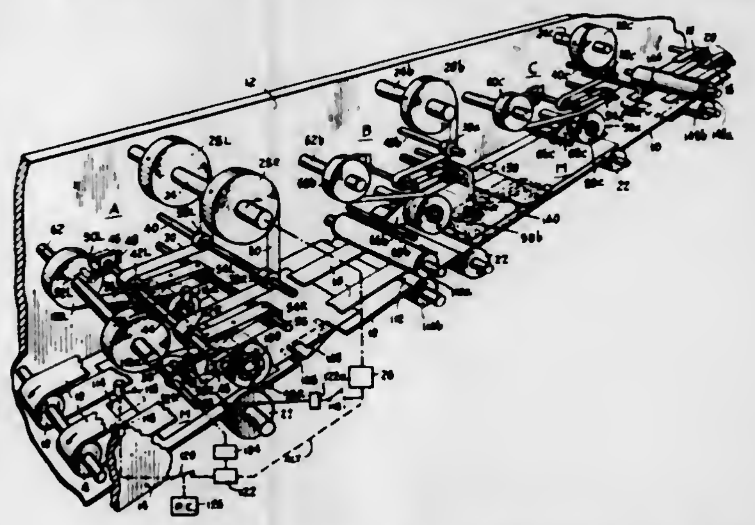
4,004,962
SEALING MACHINE

Robert Eugene Kleid, Fairfield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 9, 1975, Ser. No. 584,872

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—475 **8 Claims**



1. Apparatus for sealing an article of folded sheet material having opposite side surfaces and a pair of substantially aligned edges to be sealed, which comprises: means for moving said article along a predetermined path of travel; tape applying means including a rotatable taping head; said taping head having a substantially cylindrical surface which is normally spaced from said article; a supply of sealing tape having a non-adhesive major surface and an adhesive major surface; means for partially wrapping said sealing tape on said taping head to dispose the non-adhesive surface in contact with the taping head surface and expose the adhesive surface; means for moving the taping head and thus the tape wrapped thereon toward and away from said article to adhere a portion of a length of wrapped tape to one side of said article; means for holding non-adhered wrapped tape against said taping head, whereby the movement of the article to which said tape length is adhered commences rotating said taping head; means for detaching said length of tape from said head including means for abruptly halting rotation of the taping head, whereby said moving article breaks said adhered length of tape away from non-adhered wrapped tape; and means for folding said length of tape around said aligned edges and into adherence with the opposite side surface of said article thereby sealing said aligned edges.

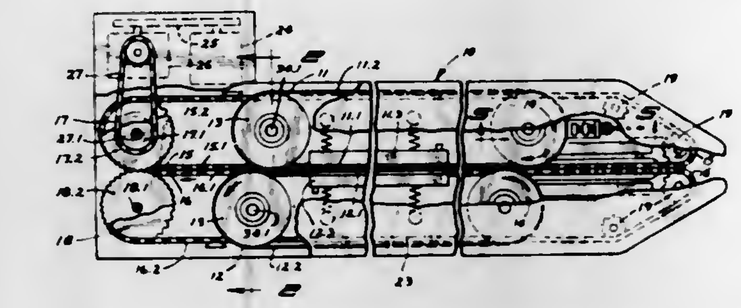
4,004,963
BAND WHEELS AND DRIVE THEREFOR IN BAND SEALER

Stanley D. Denker, New Richmond, Wis., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Dec. 3, 1975, Ser. No. 637,293

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—583 **4 Claims**



1. In a band sealer, a frame plate having a slot through which the bag top passes for sealing;

a pair of bag conveyor chains immediately above the frame plate and having conveyor runs confronting each other in closely spaced relation along the slot;

means including sprockets mounting and driving such chains;

heat transfer means producing sealing of the bag tops carried by the chains and including a pair of endless heat transfer bands located adjacent and above the chains and having heat transfer runs in confronting and closely spaced relation along the conveyor runs of the chains; and

means including wheels mounting and driving such bands, one wheel for each band overlying the adjacent chain in closely spaced relation and there being an open and unobstructed space next above the wheel through which an entire band may be moved for application to and removal from the wheels and also including a stationary mounting for the wheel and affixed to the frame plate, said mounting being disposed between the wheel and the frame plate, and coupling means directly connecting each band wheel with the adjacent conveyor chain, said coupling means including a sprocket meshed with said chain, gears driven by said sprocket and driving the band wheel and located beneath the wheel and producing the identical speed in the band and in the chain.

4,004,964
MULTISTAGE CONTINUOUS VACUUM PAN

Joseph Christophe Victor Ducasse, Papaaloa, Hawaii, assignor to Unice Machine Company, San Francisco, Calif.

Filed Apr. 18, 1974, Ser. No. 462,080

Int. Cl.^{2} B01D *1/26, 1/00;* F28F *9/22*

U.S. Cl. 159—17 C **8 Claims**

1. A pan for the continuous boiling of liquid materials having vaporizable constituents therein, said pan comprising:

a closed vessel divided into a plurality of successive stages;

each said stage comprising:

a lower liquid material receiving section separated from similar sections of adjacent stages;

an upper vapor collecting section; and

an intermediate heating section, separated from similar sections of adjacent stages, and having plural liquid material passageways vertically communicating said liquid material receiving section and a concentrated liquid material collecting zone lying between the top of the heating section and the bottom of the vapor collecting section;

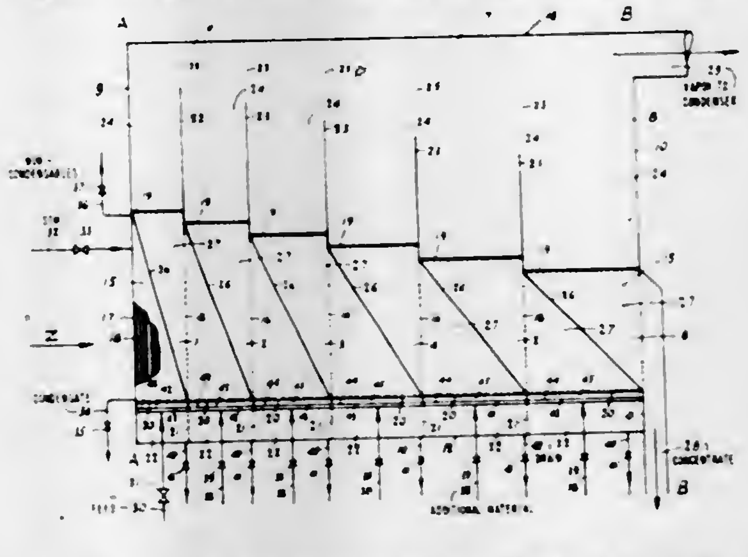
means for heating said plural liquid material passageways;

means for introducing liquid material to be processed into said liquid material receiving section of the upstream-most of said stages;

means for removing processed material from said vessel, from a discharge end of the downstream-most of said stages;

a plurality of ducts, one each extending from the concentrated liquid material collecting zone of each said stage to the material receiving section of the next downstream stage, except said downstream-most stage, and from the concentrated liquid material collecting zone of said downstream-most stage to said processed material removing means, each of said ducts being isolated from each other;

whereby liquid material passes from stage to stage by moving from each liquid material receiving section upwardly through the heating section thereabove into the concentrated liquid material collecting zone thereabove and through one of said ducts to the liquid material receiving section of the next downstream stage, said liquid material being boiled in each said heating section, and vapor resulting from such boiling being collected in each said vapor collecting section;



means connected to said vessel and in communication with all of said vapor collecting sections as a common section for creating a vacuum in said vessel and for removing vapor from said vapor collecting sections;

the height of said liquid material passageways being successively lower stage-by-stage in the downstream direction of said vessel, whereby the hydrostatic head of the liquid material is stage-by-stage reduced; and

the cross-sectional areas of said liquid material passageways being successively greater stage-by-stage in the downstream direction of said vessel.

4,004,965
VERTICAL FLAMELESS REBOILER FOR RECONCENTRATING LIQUID DESICCANT

Morden A. Jackson, Tulsa, Okla., assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 216,831, Jan. 10, 1972, Pat. No. 3,975,229. This application May 24, 1976, Ser. No. 689,638

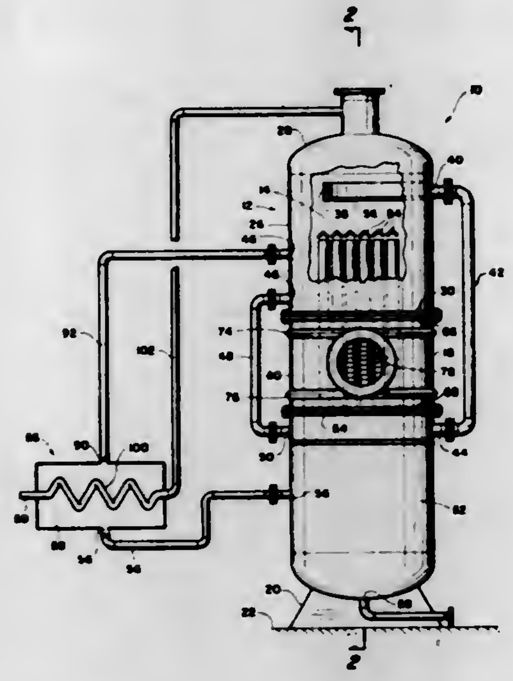
Int. Cl.^{2} B01D *1/00;* F22D *1/00;* B01D *53/02*

U.S. Cl. 159—27 R **6 Claims**

1. A vertical reboiler for reconcentrating liquid desiccant through utilization of exhaust gas from a prime mover comprising:

a. an elongated vertically disposed enclosed vessel having an upper enclosed reboiler chamber, a lower enclosed reboiler chamber and an enclosed heating chamber interposed therebetween.

b. said upper chamber having centrally disposed water-rich-desiccant inlet means at the upper end thereof, a first outlet for disengaged water vapors also centrally disposed at the upper end thereof, water-rich-desiccant receiving tray disposed below the inlet means and above the liquid desiccant contained in the upper chamber, first downcomer means disposed outside the housing, the ends thereof being in open communication with the receiving tray and the lower chamber, second outlet spaced below the receiving tray for removing heated water-lean-desiccant, second downcomer means disposed outside of the housing connecting the lower portion of the upper chambers to the lower chamber for recirculation of the dessicant.



c. a plurality of spaced apart open-ended riser conduits vertically disposed and carried by the heating section, the lower ends thereof in communication with the upper portion of the lower chamber and the upper ends extending into the upper drum above the said second outlet.

d. said heating chamber enveloping the lower portion of said riser conduits for convection heating of the desiccant within the risers, and having exhaust gas inlet means on one side thereof and oppositely disposed exhaust gas outlet means.

4,004,966
FUME CONTROL FOR SULFUR DIOXIDE AMMONIA ABSORPTION SYSTEMS

Robert E. Matty, and Stephen S. Strom, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,498

Int. Cl.² D21C *11/12, 11/14*; C01B *17/00*

U.S. Cl. 162—30 R **5 Claims**

1. A fume free method of recovering chemicals useful in forming a digesting cooking liquor from an ammonia base cooking liquor pulping process of cellulosic materials wherein a residual waste liquor is formed comprising:

combusting the waste liquor to form a flue gas containing sulfur dioxide;

cooling the flue gas;

passing the cooled flue gas through a plurality of absorbing zones, while

contacting the gas with an aqueous solution of ammonium monosulfite-bisulfite of pH not in excess of 5.9 pH units; adding ammonia to the aqueous solution in each of the said absorbing zones while maintaining the pH of the aqueous solution at no greater than 5.9 pH units; and

separating the aqueous solution from the flue gas for use in forming the cooking liquor.

4,004,967
BLEACHING CELLULOSE PULP WITH OXYGEN IN THE PRESENCE OF FORMALDEHYDE

Brita Swan, and Rune Gustavsson, both of Saffle, Sweden, assignors to Billeruds Aktiebolag, Saffle, Sweden

Continuation of Ser. No. 521,873, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 370,608, June 18, 1973, abandoned. This application July 2, 1975, Ser. No. 592,510

Claims priority, application Sweden, June 22, 1972, 8288/72

Int. Cl.² D21C *9/10*

U.S. Cl. 162—65 **10 Claims**

1. In a method for bleaching alkaline cellulose pulp with oxygen, the improvement which comprises adding formaldehyde to the pulp during the bleaching process in an amount from 3 to 30 kg per ton of pulp.

4,004,968
CONSECUTIVE MULTI-PLY FORMERS WITH AN UNENCUMBERED DOFFER FELT

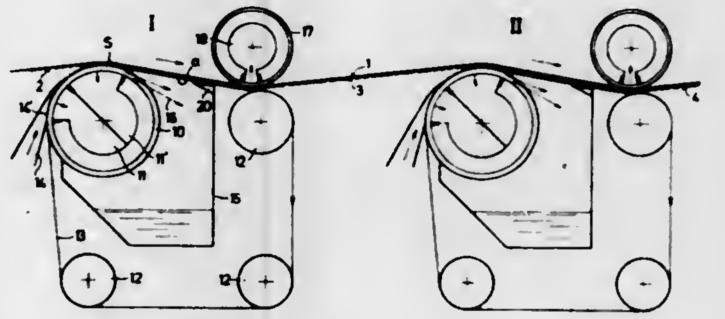
Heinz Braun; Hans Dahl, both of Ravensburg; Jost Hefter, Fenken, and Wolf-Gunter Stotz, Ravensburg, all of Germany, assignors to Escher Wyss G.m.b.H., Ravensburg, Germany

Continuation of Ser. No. 423,121, Dec. 10, 1973, abandoned. This application May 27, 1975, Ser. No. 580,774

Claims priority, application Switzerland, Dec. 11, 1972, 17971/72

Int. Cl.² D21F *1/04, 1/40, 1/50, 11/08*

U.S. Cl. 162—304 **4 Claims**



1. A paper machine comprising

a plurality of consecutively disposed formers, each former including a breast box, a suction breast roll and at least one suction box in said roll for dewatering a paper web formed by said former under negative pressure;

a doffer felt extending between said formers over each said suction breast roll of each former in unencumbered fashion;

a plurality of guide rolls about each said former; and

a long wire extending about each said breast roll and the related guide rolls, said wire having a portion extending along said doffer felt to dispose the formed paper web therebetween.

4,004,969
PAPER MACHINE DRAINAGE FOIL WITH WEAR-RESISTANT INSERT

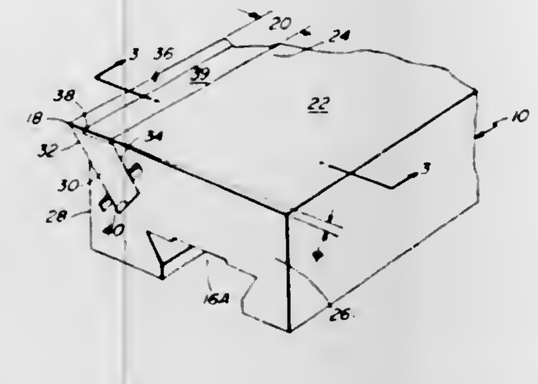
Norman J. Beauchemin, Shrewsbury, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

Filed Nov. 5, 1975, Ser. No. 629,024

Int. Cl.² D21F *7/00*

U.S. Cl. 162—352 **7 Claims**

1. For use in a paper machine having a traveling screen for supporting water-wet pulp during the drainage of water therefrom, an elongated drainage foil intended to extend lengthwise transversely under the full width of the screen and having a leading edge for initial contact with said screen, followed in the direction of travel of the screen by an upward-facing land surface in supporting relation thereto, followed in said direction of travel by a drainage surface diverging from the underside of the screen to control the drainage of water from said pulp, the improvement in said foil comprising, a first body defining said drainage surface and a second body defining all of said land surface from said leading edge to said drainage surface, said land surface being covered at least in part with a wear-resistant material that is permanently affixed to said second body and is harder than the material of said second body, an elongated channel running the length of the first body, said second body being removably disposed within said channel wherein said second body is an elongated slab of solid material having first and second wide sides substantially parallel to each other, and a third side joining the first side at an acute angle and joining the second side at an obtuse angle, said land surface being on said third side, said second body being installed in said first body with said first side oriented forward of said second side whereby said first and third surfaces meet at said acute angle to form the leading edge of said drainage foil, and said second and third surfaces meet at a line that coincides substantially with the forward edge of said drainage surface, said elongated channel in said first body has first and second side walls and a bottom wall and an elongated opening into the channel between the edges of said first and second side walls that are remote from said bottom wall, and first and second auxiliary slots extending in opposite directions, respectively, substantially perpendicularly into said first and second side walls, and having retainer means on said second body extending, respectively, from said first and second wide sides into said first and second auxiliary slots to retain said second body in said channel against force oriented to move said second body out of said channel through said elongated opening, and said retainer means comprises an array of discrete projections spaced in a line along each of said first and second wide sides.



4,004,970
RADIATION SOURCE FOR MOSSBAUER INVESTIGATIONS OF TELLURIUM COMPOUNDS AND METHOD OF PREPARING SAME

Anatoly Julianovich Alexandrov, ulitsa Butlerova, 10, kv. 112, Moscow; July Sergeevich Grushko, ulitsa Koli Podryadchikova, 16, kv. 40, Gatchina Leningradskoi oblasti; Evgeny Fredovich Makarov, Trubnikovsky pereulok, 11, kv. 3, Moscow; Konstantin Yakovlevich Mishin, ulitsa Kurgetova, 23, kv. 73, Gatchina Lenigradskoi oblasti, and Daljus Antanas Jono Baltrunas, ulitsa Zhirmunu, 17, kv. 27, Vilnjus Litovskoi, all of U.S.S.R.

Filed Mar. 3, 1975, Ser. No. 554,705

Int. Cl.² G21E *1/10*

U.S. Cl. 176—16 **2 Claims**

1. A method of preparing a radiation source for Mossbauer investigations of tellurium compounds comprising the steps of: irradiating $5MgO.Te^{124}O_3$ with thermal neutrons in a reactor to obtain $5MgO.Te^{125m}O_3$; annealing the $5MgO.Te^{125m}O_3$ at a temperature ranging from 600° to 1,100° C for a period of from 5 to 10 hours; and then gradually cooling the annealed $5MgO.Te^{125m}O_3$ to room temperature.

4,004,971
GAS COOLED NUCLEAR REACTORS

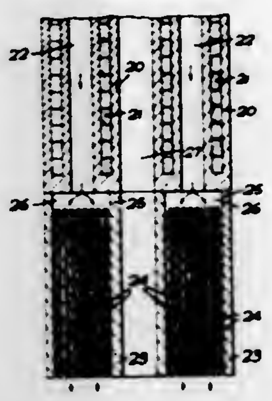
David Vernon Freck, Stroud, and John Anthony Hall, Thornbury, both of England, assignors to Central Electricity Generating Board, London, England

Filed Aug. 19, 1974, Ser. No. 498,565

Claims priority, application United Kingdom, Aug. 21, 1973, 39392/73

Int. Cl.² G21C *5/00, 9/32*

U.S. Cl. 176—37 **7 Claims**



1. In a gas cooled nuclear reactor having a core assembly through which a coolant gas is passed and energy extracting means for extracting energy from said gas; the improvement comprising a filter arranged in the gas path from the core to the energy extracting means so that the whole of the coolant gas from the core passes through the filter before passing to said energy extracting means, which filter comprises a graphite body having a plurality of holes therein with a hydraulic diameter between 1 and 6 mm and a ratio of length to hydraulic diameter between 170 and 1000, said holes providing passages for the coolant gas leaving the reactor core.

4,004,972
NUCLEAR FUEL ELEMENT

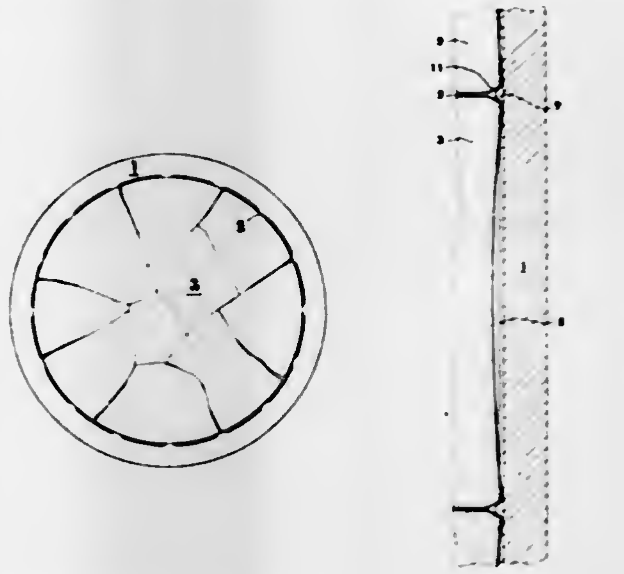
Johan Hilding Mogard, Lidingo, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Jan. 30, 1974, Ser. No. 437,871

Claims priority, application Sweden, Feb. 2, 1973, 7301524

Int. Cl.² G21C *3/18*

U.S. Cl. 176—81 **8 Claims**



1. Nuclear fuel element for use in power producing nuclear reactors, comprising an axially elongated cladding tube or metal or metal alloy, a plurality of axially aligned cylindrically shaped solid bodies of the sintered oxide type which undergo fracturing under power operation into a number of fragments separated by crack paths which characteristically extend radi-

ally and remain open in the peripheral region of said fuel bodies, wherein the improvement comprises means for improving the heat-transfer between said fuel bodies and said cladding tube and for minimizing the creation of stress concentration in the wall of the cladding tube in that said cladding tube has a cylindrically shaped inner surface, at least 8 axially extending mutually parallel circumferentially spaced ribs formed on and extending radially inwardly from the cylindrically shaped inner surface, the radial dimension of said ribs inwardly from the cylindrically shaped inner surface of said cladding tube being at most about 0.05 mm and said ribs being spaced apart a sufficient distance to avoid coincidence of cracks and intimate contact between the inner surface of said cladding tubes and fuel bodies, the outer cylindrical surface of said fuel bodies and the inner surface of said cladding tube forming an annular gap therebetween having a width in the range from about the radial dimension of said ribs to about 0.15 mm.

4,004,973

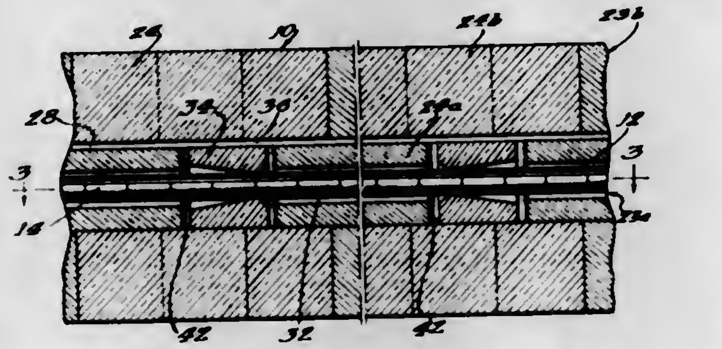
NEUTRONIC REACTOR

John T. Carleton, Elsmere, Del., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 28, 1952, Ser. No. 306,824

Int. Cl.² G21C *5/00*

U.S. Cl. 176—84 **3 Claims**



1. A neutronic reactor comprising, in combination, a solid moderator constructed of longitudinally extruded rectangular blocks of graphite stacked in abutting relationship in layers, the axes of extrusion of the blocks in successive layers being normal to each other, alternate layers having rows of blocks provided with longitudinal channels therein disposed in end to end relationship forming ducts through the moderator, said rows of channeled blocks being separated by rows of solid blocks, said channeled blocks having smaller dimensional cross sections and shorter lengths than the adjacent solid blocks in the same layer and concave ends, and spacer blocks of graphite disposed in abutting relationship between successive channeled blocks in each row of channeled blocks, said spacer blocks having channels therein tapering in from each side forming an annulus, said channels in the spacer blocks being aligned with the channels in the channeled blocks in each row to form a continuous duct through the moderator, the axes of extrusion of said spacer blocks being normal to that of the channeled blocks in said row, said spacer blocks being the same width as the solid blocks and the same height as the channeled blocks, and the combined length of one channeled block and one spacer block equaling the length of a solid block, the ends of said solid blocks in rows adjacent to channeled blocks terminating adjacent to spacer blocks, tubes disposed within the ducts, and material fissionable by neutrons of thermal energy disposed within the tubes.

4,004,974

LIVE VIRUS CULTURE VACCINE AGAINST CARNIVORE DISTEMPER AND METHOD OF PRODUCING SAME

Mikhail Petrovich Chumakov, Leninsky prospekt 68/10, kv. 354; Inna Alexandrovna Prokhorova, Balaklavsky prospekt, 40, kv. 59, both of Moscow; Viktor Pavlovich Grachev, poselok Instituta poliomielita, 3, kv. 36, Moskovskaya oblast; Valentina Vasilievna Petukhova, proezd Dezhneva, 30, korpus 2, kv. 131, Moscow; Julia Anatolievna Svezhinina, poselok Instituta poliomielita, 2, kv. 34, Moskovskaya oblast; Ljubov Leonidovna Mironova, poselok Instituta poliomielita, 1, kv. 7, Moskovskaya oblast; Ninel Mikhailovna Ralf, poselok Instituta poliomielita, 3, kv. 33, Moskovskaya oblast; Valentina Dmitrievna Popova, bulvar Generala Karbysheva, 9, korpus 1, kv. 45, Moscow; Aida Nurislamovna Mustafina, poselok Instituta poliomielita, 4, kv. 127, and Vladimir Ivanovich Chernyshev, poselok Instituta poliomielita, 3, kv. 4, both of Moskovskaya oblast, all of U.S.S.R.

Filed May 7, 1975, Ser. No. 575,220

Int. Cl.² C12K *7/00;* A61K *39/24*

U.S. Cl. 195—1.3 **6 Claims**

1. A live virus culture vaccine useful against carnivore distemper and which is safe for animals, prepared by the sequential steps of (1) pre-adapting an attenuated strain of carnivore distemper virus to a cell culture of monkey (green monkey) kidney tissue by 8 to 10 passages at a temperature of 34(±0.2)C°, the incubation period for viral growth ranging from 4 to 5 days; (2) cultivating the adapted strain in the cell culture of monkey (green monkey) kidney tissue, which cell culture is selected from among a primary cell culture or a subculture, in the presence of a nutrient medium at a temperature of 34(±0.2)C°; (3) removing the resultant virus-containing fluid of the degenerated cell detritus of said culture; and (4) lyophilizing the liquid vaccine thus formed in the presence of a suitable virus thermostabilizer.

4,004,975

METHOD OF ISOLATING AND CRYOPRESERVING HUMAN WHITE CELLS FROM WHOLE BLOOD

Fabian J. Lionetti, Milton, and Stephen M. Hunt, Allston, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1975, Ser. No. 645,161

Int. Cl.² C12K *9/00;* F25D *25/00;* A61K *35/14*

U.S. Cl. 195—1.8 **10 Claims**

1. A method of salvaging human white blood cells from the buffy coat of centrifuged human whole blood comprising:

isolating and removing by centrifuging the platelet rich plasma and a selected volume of the buffy coat of the topmost red cells from a blood collection bag containing a unit of whole blood;

preparing a 40% weight/volume solution of hydroxyethyl starch in water and further diluting this solution in an isotonic solution of salts containing 148 mequiv per liter each of cations Na^+ 140, K^+ 5 and Mg^{2+} 3, and anions including chloride 98, acetate 27 and gluconate 23 to dilutions on the order of from 10 to 16% of the 40% weight/volume solution;

obtaining a concentration of 4% hydroxyethyl starch at a hematocrit of 0.30 from said diluted solution by admixing selected volumes of concentrated hydroxyethyl starch and sedimenting out the red cells in the cell mixture;

siphoning off the red cells from said mixture of separated and concentrated cells into a sterile bag for storage;

admixing with the remaining white cells a sterile solution of 10% dimethylsulfoxide in said isotonic solution with said sedimented white cells;

freezing said white cells and storing the frozen white cells in an environment maintained at substantially −80° C;

thawing said concentration of white cells,

admixing with said thawed cells a sterile wash solution containing an isotonic solution as defined above but adjusted to a pH of 7.4 containing citrate-phosphate-dextrose in a 10 ml volume;

removing the supernatant layer of substantially 8.0 ml; and resuspending the residue of white cells in said adjusted isotonic solution by gentle agitation.

4,004,976

PROCESS FOR RECOVERING THE MAIN SAPOGENINS FROM THE ROOTS OF RHIZOMES OF HELLEBORUS

Otto Isaac, Bruchkobel, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

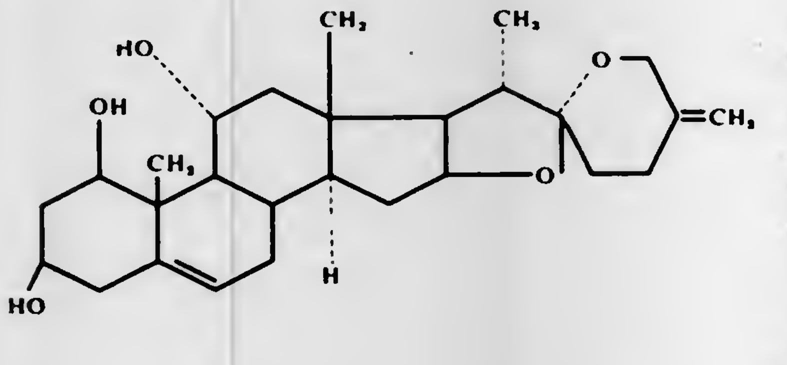
Filed Apr. 7, 1975, Ser. No. 565,698

Claims priority, application Germany, Apr. 8, 1974, 2416979

Int. Cl.² C12D *13/08*

U.S. Cl. 195—2 **8 Claims**

1. A process for the recovery of the main genin in the roots and rhizomes of a Helleborus species, said main genin having the formula



comprising treating the roots, rhizomes or an extract containing said main genin with an enzyme which is cellulase, hemicellulase or β-glucosidase and recovering said main genin after the enzyme treatment.

4,004,977

METHOD FOR PURIFYING *PULLULAN*

Koso Kato, and Tatsuo Nomura, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsukagaku Kenkyujo, Okayama, Japan

Filed Jan. 22, 1975, Ser. No. 543,071

Claims priority, application Japan, Jan. 31, 1974, 49-12263

Int. Cl.² C12D *13/04*

U.S. Cl. 195—31 P **3 Claims**

1. In a method for purifying pullulan which comprises cultivating a pullulan producing microorganism in a liquid medium, removing the cells from the culture broth, precipitating pullulan present in said broth with a solvent to recover the pullulan, and then dehydrating and/or drying the recovered pullulan, the improvement wherein said solvent is selected from the group consisting of esters, and ketones which have about 20 to 25% solubility in water.

4,004,978

MICROBIOLOGICAL REDUCTION OF ZEARALENONE AND RELATED COMPOUNDS

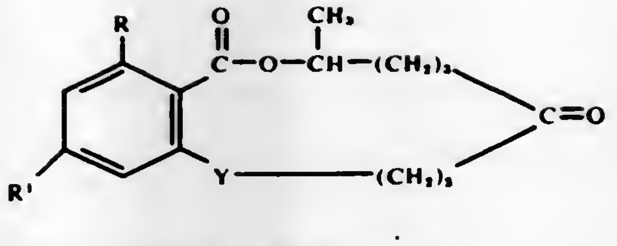
James Robert McMullen, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Sept. 19, 1975, Ser. No. 615,044

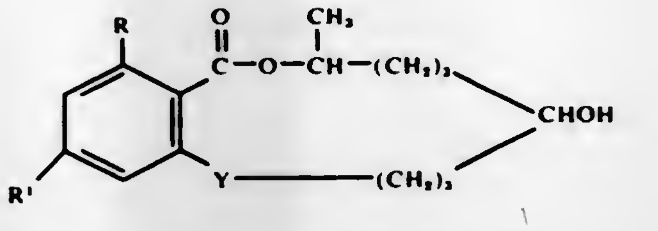
Int. Cl.² C12D *13/00*

U.S. Cl. 195—51 R **17 Claims**

1. A method for reducing a keto-compound of the formula



to a hydroxy-compound of the formula



wherein R and R¹ may be the same or different and each is selected from the group consisting of hydrogen, hydroxy, and $-OR^2$, wherein R^2 is selected from the group consisting of lower alkyl of from 1 to about 6 carbon atoms, monocyclic aryl of about 6 to 8 carbon atoms, and monocyclic aralkyl, in which the alkyl portion has 1 to about 5 carbon atoms and the aryl portion has about 6 to 8 carbon atoms; and Y is selected from the group consisting of $-CH_2-CH_2-$ and $-CH=CH-$, which comprises cultivating a ketone-reducing, enzyme-producing microorganism in a nutrient fermentation medium, said enzyme being capable of reducing the keto-group of said keto-compound, and contacting the keto-compound with the ketone-reducing enzyme produced by the microorganism to reduce the keto-compound to produce the hydroxy-compound.

4,004,979

PREPARATION OF ACTIVE PROTEINS CROSS-LINKED TO INACTIVE PROTEINS

Stratis Avrameas, La Celle Saint Cloud; Georges Broun, Rouen; Eric Sélégny, Rouen, and Daniel Thomas, Rouen, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation of Ser. No. 286,233, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 810,835, March 26, 1969, abandoned. This application Jan. 15, 1975, Ser. No. 541,257

Claims priority, application France, Mar. 29, 1968, 68.146205; Jan. 29, 1969, 69.01451; Mar. 19, 1969, 69.07897

Int. Cl.² C07G *7/02, 7/00*

U.S. Cl. 195—68 **3 Claims**

1. A process for producing an article containing a cross-linked active protein substance which comprises dispersing, mixing and reacting in a solvent medium 1. an active protein and 2. an inactive protein simultaneously with 3. a cross-linking agent for said proteins under cross-linking conditions for said cross-linking agent until an active protein substance is formed containing said active protein cross-linked with said inactive protein substance, controlling the degree of cross-linking by introducing tris (hydroxymethyl) aminomethane in an amount sufficient to stop chain growth, said formed active protein substance amounting to about 1 to 20% by weight of the total proteinic substances and said cross-linking agent amounting to about 0.5 to 8% weight based on the weight of the whole mixture being reacted and separating the solvent from said formed active protein substance.

4,004,980
ENZYME ENTRAPPMENT WITH CELLULOSE ACETATE FORMULATIONS

Alden H. Emery; Henry C. Lim, both of West Lafayette, and Michael J. Kolarik, South Charleston, all of W. Va., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 25, 1975, Ser. No. 561,685

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **8 Claims**

1. A method of forming an entrapped enzyme, said method comprising:
providing cellulose triacetate in solid form;
adding a second solid material to said cellulose triacetate, said second solid material being selected from the group consisting of cellulose diacetate and glucose pentaacetate;
dissolving the cellulose triacetate and second solid material in a solvent;
adding an enzyme to said cellulose triacetate and second solid material;
extruding said dissolved cellulose triacetate and said second solid material through an orifice to form a solid matrix soluble in a swelling liquid and
soaking said solid matrix in an aqueous solution of acetone and water containing between about 50 to 98% acetone for swelling said matrix to increase the permeability of the solid matrix.

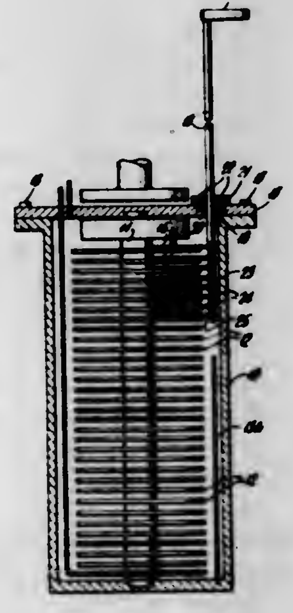
4,004,981
CELL REMOVING DEVICE

William M. Hurni, North Wales; William J. McAleer, Ambler, and Maurice R. Hilleman, Lafayette Hill, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 1, 1975, Ser. No. 573,655

Int. Cl.² C12K *9/00, 1/10*

U.S. Cl. 195—127 **9 Claims**



1. In a multiplate cell propagator comprising a substantially cylindrical vessel having a plurality of spaced apart parallel discs on which cells are grown, the discs mounted on a rotatable shaft within the vessel, the improvement comprising a second shaft pivotably mounted within the vessel, the second shaft having mounted thereon parallel to the plane of the discs a contacting means adapted to contact at least part of the surface of a disc upon pivotal movement of the second shaft whereby cells are removed from the surface of the disc, the contacting means comprising a substantially rod-like member.

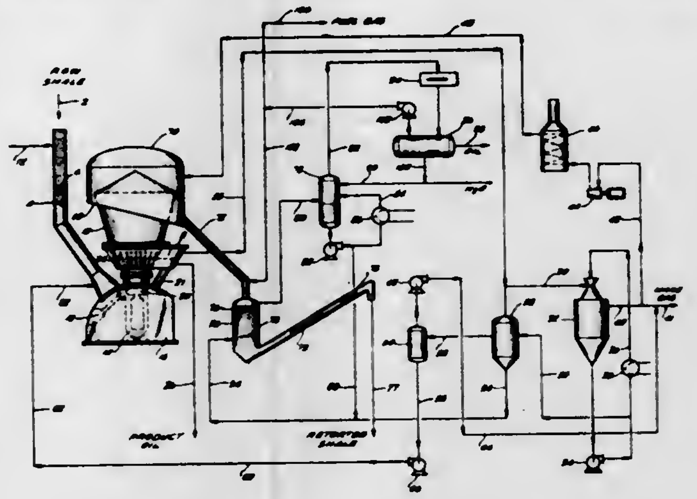
4,004,982
SUPERATMOSPHERIC PRESSURE SHALE RETORTING PROCESS

Don C. Jennings, and Roland O. Dhondt, both of Long Beach, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 5, 1976, Ser. No. 683,287

Int. Cl.² C10B *53/06*

U.S. Cl. 201—29 **9 Claims**



1. In a shale retorting process wherein crushed oil shale is gravitated downwardly through a feed conduit into a feeder cylinder which alternately receives a charge of shale and then discharges the same upwardly by means of a reciprocating piston into the bottom of a communicating retort, and wherein the upflowing shale in said retort contacts hot, non-oxidative, downflowing education gases to educe product oil and gas from said upflowing oil shale, said oil and gas being discharged from the bottom portion of said retort into an isobaric product collection vessel in which a first liquid level of oil is maintained, and wherein hot, retorted shale overflowing the top of said retort is transferred through a gas-tight transfer conduit to a water quenching zone, the improvements which comprise:

1. maintaining substantially continuous hydraulic communication between the product oil in said collection vessel and the bottom of said feed conduit, whereby a second liquid oil level is maintained in said feed conduit;
2. maintaining a first liquid water level in said quenching zone, substantially below the top of the retorted shale bed maintained therein, whereby a quench gas mixture comprising superheated steam and combustible water gas is generated in said quenching zone;
3. removing shale from the bottom of said quenching zone through an upwardly extending outlet conduit communicating therewith below said first liquid water level, whereby a second liquid water level is maintained in said outlet conduit, the rate of removal of said retorted shale being controlled so as to maintain the top of said retorted shale bed substantially above said first liquid water level; and
4. maintaining superatmospheric pressures throughout said retort while preventing the discharge of retort gases through said feed conduit and said outlet conduit solely by means of the hydrostatic seals established by the oil in said feed conduit and by the water in said outlet conduit.

7. In a shale retorting process wherein crushed oil shale is fed upwardly through a vertical retort in countercurrent contact with hot, non-oxidative, downflowing eduction gases to educe product oil and gas from said upflowing oil shale, said oil and gas being discharged from the bottom portion of said retort, and wherein retorted shale at a temperature of about 900° – 1100° F overflows the top of said retort and is transferred through a gas-tight transfer conduit to a water quenching zone, the improvements which comprise:

1. maintaining a first liquid water level in said quenching zone substantially below the top of the retorted shale bed maintained therein, whereby a quench gas mixture comprising superheated steam and combustible water gas is generated in said quenching zone solely by means of heat derived from said retorted shale;

2. removing shale from the bottom of said quenching zone through an upwardly extending outlet conduit communicating therewith below said first water level, whereby a second liquid water level is maintained in said outlet conduit, the rate of removal of said retorted shale being controlled so as to maintain the top of said retorted shale bed substantially above said first liquid water level; and

3. preventing the discharge of retort gases and quench gases through said outlet conduit solely by means of the hydrostatic seal established by the water in said outlet conduit.

4,004,983
COKE OVEN BATTERY

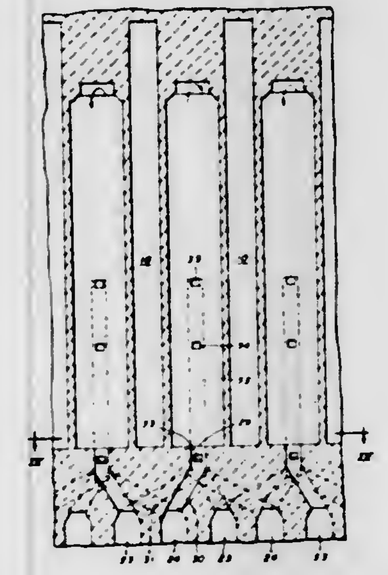
Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Mar. 28, 1975, Ser. No. 562,814

Claims priority, application Germany, Apr. 4, 1974, 2416434

Int. Cl.² C10B *5/12, 5/14, 5/16*

U.S. Cl. 202—142 **3 Claims**



1. In a coke oven battery of the type heated optionally by lean gas or rich gas and which includes a twin heating flues disposed in a row between the coke oven chambers, the twin heating flues being defined by continuous and discontinuous crosswalls in an alternating arrangement, each heating flue having inlets at its base for rich and lean gas, and cross-regenerators below the coke oven chambers, each of said cross-regenerators being operated over its entire length in the same flow line during a single heating half-cycle and in reverse during the other half-cycle, said twin heating flues being defined by crosswalls incorporating passageways therein that define header flues in each of the crosswalls for preheated air and alternatively as exit ports at intervals of graduated elevations, the improvement comprising:

means defining a first series of ducts extending in a gaseous conducting manner between a first one of said regenerators and every other header flue in each of two adjacent rows of said twin heating flues for conducting preheated air during a heating half-cycle, said means further defining a second series of ducts extending in a gaseous conducting manner between of second of said regenerators and exit ports in the bottom of the heating flues forming said two adjacent rows thereof for conducting preheated lean gas when heating a coke oven chamber thereby and for conducting preheated air when heating a coke oven chamber with rich gas, said first and second series of ducts being arranged alternatively from row-to-row of heating flues in a manner to alternate the sequence of upgoing and downgoing sections of twin flues between rows thereof.

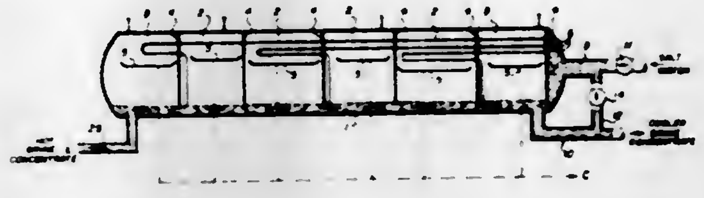
4,004,984
DISTILLATION PLANT

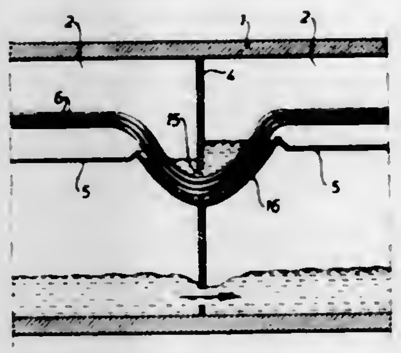
Peter Heinrich Erwin Margen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Feb. 7, 1975, Ser. No. 548,098

Int. Cl.² B01D *1/28, 3/02, 1/26*

U.S. Cl. 202—173 **6 Claims**





1. Distillation plant comprising an axially elongated tubular shaped shell, a plurality of generally vertically positioned horizontally spaced partitions extending transversely of the axis of said shell and dividing the interior of said shell into a plurality of serially arranged vaporizing chambers, a bundle of condenstion tubes extending through said vaporizing chambers and passing through said partitions between adjacent said vaporizing chambers, at least one of said partitions having an opening therethrough with said tube bundle passing through said opening, a bowl positioned in the opening in said partition and extending outwardly therefrom into each of the adjacent said chambers with the upper edge of said bowl located at least above the uppermost point of the opening through said partition, said tube bundle extending through and dipping into said bowl on both sides of said partition, and said bowl arranged to receive distillate to a level above the uppermost point of the opening in said partition so that a water lock is formed within said bowl for sealing the adjacent said chambers from one another.

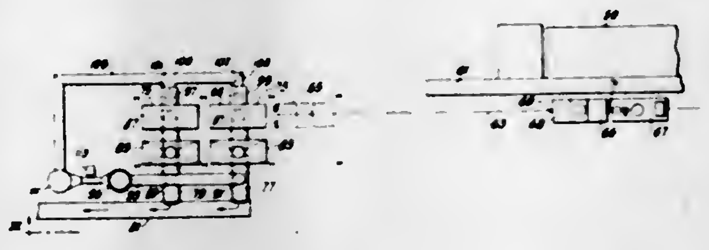
4,004,985
SYSTEM FOR QUENCHING HOT COKE

William D. Edgar, Allison Park; John D. Sustarsic, McKees Rocks, and Allan F. Adamsky, Washington, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 286,752, Sept. 5, 1972, abandoned. This application Sept. 13, 1974, Ser. No. 505,855

Int. Cl.² C10B *39/12*

U.S. Cl. 202—230 **4 Claims**



1. In a coke oven battery, the improved coke quenching system comprising:
a. a quenching car track disposed alongside said battery and extending therefrom to a remote location relative to said battery;
b. a hopper removably mounted to a frame that is movable

on said track, said hopper being adapted for receiving incandescent pushed coke from said battery;
- c. means for moving said frame and hopper along said track to said remote location;
- d. plural racks disposed at said remote location for supporting said hopper;
- e. plural conveyor means disposed relative to said plural racks respectively;
- f. means for transferring and selectively positioning said hopper on a single rack overlying a respective single conveyor;
- g. means for discharging coke from said hopper onto said respective conveyor;
- h. means for quenching said incandescent coke on said plural conveyor means;
- i. means for collecting fumes from said hopper at said location as said coke is discharged therefrom onto said respective single conveyor;
- j. means for collecting vapors from the environment surrounding said plural conveyor means;
- k. means for conducting said fumes into a fume cleaning device and for discharging the cleaned fumes to atmosphere;
- l. means for conducting said vapors into apparatus that discharges said vapors to atmosphere; and
- m. further conveyor means for removing and carrying away said coke from said plural conveyors after said coke is quenched.

4,004,986
FLUE GAS COLLECTOR FOR REGENERATIVELY-HEATED COKE OVENS

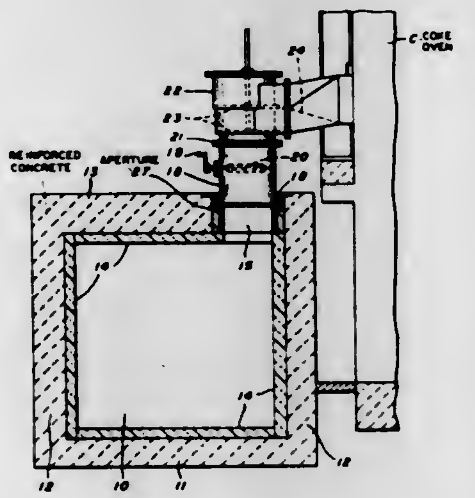
Wolfgang Franzer, Varenholzstrasse 17, 464 Wattenscheid, and Hans Adamus, Kriemhildenstrasse 5, 43 Essen, both of Germany

Filed Jan. 30, 1975, Ser. No. 545,123

Claims priority, application Germany, Mar. 16, 1974, 2412749

Int. Cl.² C10B *27/00*; C10J *3/82*

U.S. Cl. 202—254 **8 Claims**



1. In a coke oven installation, a flue gas collector which extends along a battery of coke ovens and to which regenerators are connected by changeover valves, said flue gas collector comprising a base, crown and side walls formed from reinforced concrete, apertures in said flue gas collector and socket pipes fitted therein adapted to receive the discharge ends of outlet pipes leading from said changeover valves, and insulating material lining the interior wall surfaces of said base, crown and side walls and between the inlet ends of said socket pipes and said discharge ends of the outlet pipes, the nature and thickness of said insulating material being such that said reinforced concrete at no time during oven operation exceeds a temperature of 100° C.

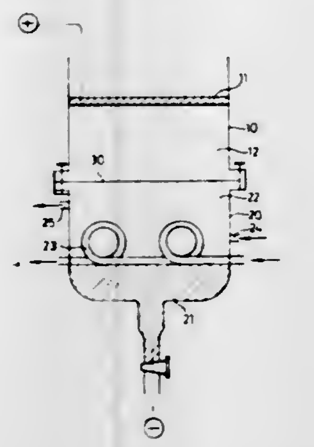
4,004,987
METHOD FOR THE PREPARATION OF RARE AND PRECIOUS METALS BY ELECTROLYTICAL AMALGAMATION USING ION EXCHANGE MEMBRANE

Chau-Ting Chang, Taiwan, China /Taiwan, assignor to Institute of Nuclear Energy Research, Taiwan, China /Taiwan

Filed Oct. 15, 1974, Ser. No. 514,479

Int. Cl.² C25C *5/02*

U.S. Cl. 204—1.5 **3 Claims**



1. Method for the preparation of rare and precious metals by electrolytical amalgamation comprising steps of amalgamation and thermal decomposition and characterized by amalgamating a metal from the group consisting of uranium, neptunium and transuranium from the relevant aqueous solution electrolytically in a cell having two compartments with an ion exchange membrane in between for the purpose of adjusting the pH during the course of electrolysis, and then thermally decomposing the amalgam obtained under reduced pressure to produce metallic powder and solid metal.

4,004,988
METHOD OF PREPARING SODIUM CHLORATE BY ELECTROLYSIS

Paul Mollard, Sainte Foy les Lyon, and Pierre Lakodey, Saint Priest, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sept. 25, 1974, Ser. No. 509,057

Claims priority, application France, Sept. 25, 1973, 73.34248

Int. Cl.² C25B *1/26*

U.S. Cl. 204—95 **1 Claim**

1. A method for preparing sodium chlorate which comprises electrolyzing an aqueous solution of sodium chloride in the presence of at least one phosphorus-containing complexing agent which is a phosphoric, polyphosphoric or metaphosphoric acid or an alkali-metal salt thereof in an amount of from about 0.5 to 10 times the concentration stoichiometrically equivalent to the alkaline earth concentration in said aqueous solution, wherein said presence of complexing agent is effected by adding to said aqueous sodium chloride solution a phosphorus substance capable of generating phosphates, polyphosphates or metaphosphates under the conditions of the electrolysis, said substance being phosphine, elemental phosphorus, hypophosphites, hypophosphates, phosphorus halides or phosphorus oxyhalides.

4,004,989
METHOD FOR AUTOMATIC ADJUSTMENT OF ANODES BASED UPON CURRENT DENSITY AND CURRENT

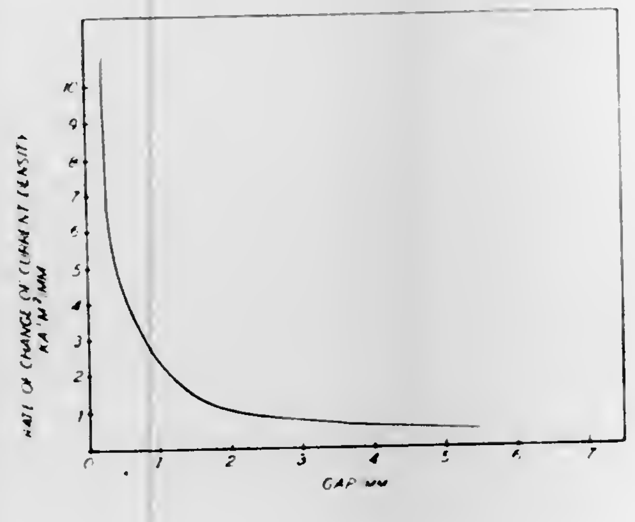
Richard W. Ralston, Jr., Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 461,822, April 18, 1974, Pat. No. 3,873,430, which is a continuation-in-part of Ser. No. 272,240, July 17, 1972, abandoned. This application Mar. 21, 1975, Ser. No. 561,014

The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.

Int. Cl.² C25B *1/36, 15/04, 15/06*

U.S. Cl. 204—99 **21 Claims**



1. In an electrolytic cell containing adjustable anodes operably connected to motor drive means adapted to raise and lower said anodes upon receipt of electric signals from a digital computer, a liquid cathode and an aqueous electrolyte wherein a voltage is applied across said anodes and said cathode to develop an electric current from said anodes through said aqueous electrolyte to said cathode, the improved method for positioning a minor fraction of said anodes at an optimum distance from said cathode which comprises
- a. positioning a minor fraction of said anodes above said cathode at a distance apart so that when said minor fraction of anodes is moved in either direction an incremental distance, there is a relatively small change in current passing through said minor fraction of anodes,
- b. moving said minor fraction of anodes in the direction of said cathode at a substantially constant rate, and conveying electric signals to said computer to indicate the distance travelled by said minor fraction,
- c. measuring said current through said minor fraction of anodes, conveying electric signals to said computer to indicate said current and calculating in said computer the change in the current density per unit of distance as said minor fraction of anodes moves toward said cathode, comparing the resulting calculated change in current density with distance with a predetermined limit,
- d. conveying signals to said motor drive means to discontinue movement of said minor fraction of anodes towards said cathode when the change in said current density per unit of distance reaches a predetermined limit, and
- e. after said discontinued movement, measuring the current to said minor fraction of anodes for a predetermined period, conveying electric signals to said computer to indicate said current for said predetermined period, comparing said signals with a predetermined limit, and sending signals to said motor drive means to raise said minor fraction of anodes when the current during the predetermined period increases beyond a predetermined limit.

4,004,990
PROCESS FOR SEPARATING AND RECOVERING NICKEL AND COBALT

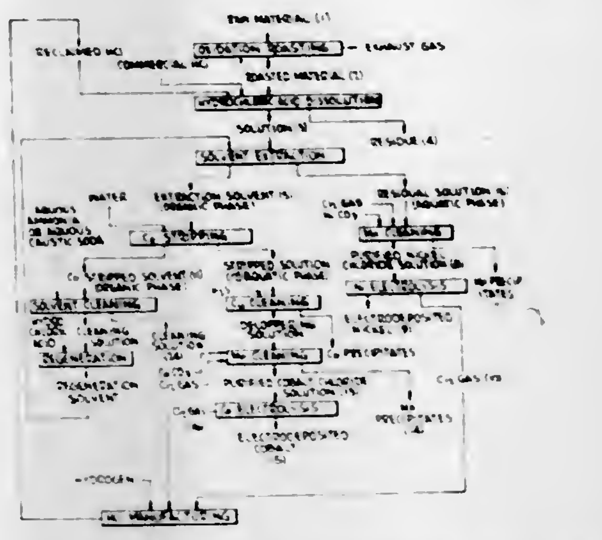
Airi Suetsuna, and Toshimasa Iio, both of Niihama, Japan, assignors to Sumitomo Metal Mining Co., Limited, Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,288

Claims priority, application Japan, Sept. 21, 1973, 48-105987

Int. Cl.² C25C *1/08*; C22B *3/00*

U.S. Cl. 204—113 **8 Claims**



1. A process for separating and recovering nickel and cobalt from a mixed aqueous chloride solution containing nickel and cobalt, as well as iron, copper, zinc and manganese as impurities, comprising:
- contacting the chloride solution, in extracting relationship, with a triamine organic solvent selected from the group consisting of trinormaloctylamine and triisooctylamine to produce (1) an organic extract phase containing the amines and said cobalt, together with the iron, copper and zinc impurities, and at least a portion of the manganese impurities, and (2) a first aqueous phase containing said nickel together with the remainder of the manganese impurities;
- treating said nickel-containing first aqueous phase to cause the manganese therein to precipitate and thereby provide a purified solution of nickelous chloride;
- contacting said organic extract phase, in extracting relationship, with water to produce (1) a second aqueous phase containing said cobalt together with the manganese impurities and a portion of the copper impurities, and (2) an organic solvent phase containing said amines and the iron and zinc impurities, together with the remainder of the copper impurities; and
- treating the cobalt-containing second aqueous phase to remove the copper and manganese impurities therefrom and thereby provide a purified solution of cobaltous chloride.

4,004,991
TWO-STAGE PRESSURE LEACHING PROCESS FOR ZINC AND IRON BEARING MINERAL SULPHIDES

Herbert Veltman, Fort Saskatchewan; Geoffrey James Julien Mould, Flin Flon, and Paul Kawulka, Fort Saskatchewan, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Dec. 12, 1975, Ser. No. 640,292

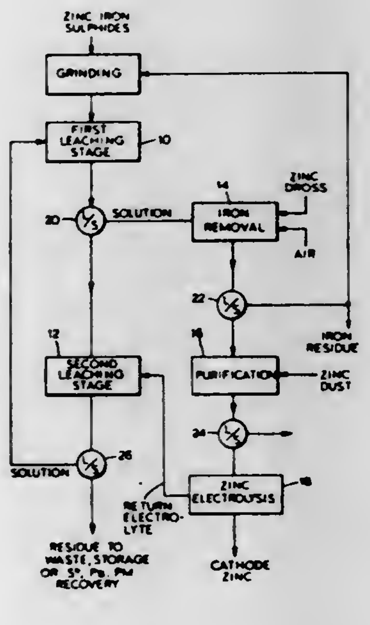
Claims priority, application Canada, Oct. 22, 1975, 238439

Int. Cl.² C25C *1/16*

U.S. Cl. 204—119 **6 Claims**

1. In a process for recovering zinc from zinc and iron-containing mineral sulphides in which the sulphides, in finely divided form, are pressure leached with aqueous sulphuric acid solution under oxidizing conditions to convert sulphide sulphur to elemental form and produce a zinc sulphate bearing leach-end solution which, after purification, is subjected to

electrolysis to recover cathode zinc and produce a return electrolyte containing residual zinc values and sulphuric acid, the improved procedure for obtaining rapid and substantially complete extraction of zinc from said sulphides and for producing a leach-end solution low in dissolved iron and free acid which comprises conducting said pressure leaching under a positive partial pressure of oxygen and at a temperature above about 135° C. but below about 175° C. in two countercurrent stages with said mineral sulphides being fed into the first of said two leaching stages and said return electrolyte being fed into the second of said two leaching stages; adjusting and co-relating the quantity of said mineral sulphides fed into said first leaching stage relative to the quantity of acid fed to said second leaching stage with said return electrolyte such that at least about one mole of zinc in sulphide form enters said first leaching stage for each mole of acid entering said second leaching stage and, at the same time, controlling the quantity of return electrolyte entering said second leaching stage such that about 1 mole of acid enters for each mole of zinc that must be dissolved in said electrolyte to increase the zinc concentration thereof to a predetermined level suitable for treatment of said solution in said electrolysis operation; continuing said first leaching stage to extract zinc values from said mineral sulphides with concurrent conversion of sulphide sulphur to elemental sulphur and to produce a first stage leach residue containing unreacted sulphides, elemental sulphur and precipitated iron and a first stage leach solution having a pH above 1 and containing dissolved zinc, less than about 3 g.p.l. free sulphuric acid and less than 2 g.p.l. of dissolved iron; passing said first stage leach solution to said purification and then to said electrolysis steps and passing said first stage leach residue to said second leaching stage; continuing said second leaching stage to extract substantially all zinc from said first stage leach residue and to produce a second stage leach residue containing any unreacted sulphides, elemental sulphur and precipitated iron and a second stage leach solution containing said extracted zinc, unreacted sulphuric acid and dissolved iron; and separating said second stage leach solution from said second stage leach residue and passing said second stage leach solution to said first leaching stage.



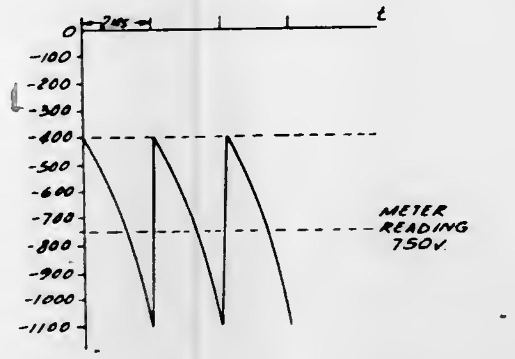
4,004,992
POWER SUPPLY FOR ELECTROCHEMICAL MACHINING

Roger K. Tyler, Detroit, and James D. Andrews, Birmingham, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 539,318, Jan. 8, 1975, abandoned, which is a continuation of Ser. No. 347,779, April 4, 1973, abandoned. This application Mar. 15, 1976, Ser. No. 666,767

Int. Cl.² C25F *3/00*

U.S. Cl. 204—129.55 **10 Claims**



1. In the method of electrochemical drilling in which an insulating hollow cathodically charged electrode is positioned in closely spaced relation to an anodically charged workpiece and a highly conductive electrolyte is passed through said electrode to become cathodically charged and to impinge on said workpiece to initiate hole drilling, the improvement which comprises applying to said electrolyte a negative voltage having a substantial negative DC component and negative pulses superimposed thereon, said pulses providing a ripple which is from 75 to 600% of said negative DC component, the pulses being the sole source of the electrochemical drilling current, and the amplitude of the pulses being insufficient to cause a spark discharge to occur between the electrode and the workpiece.

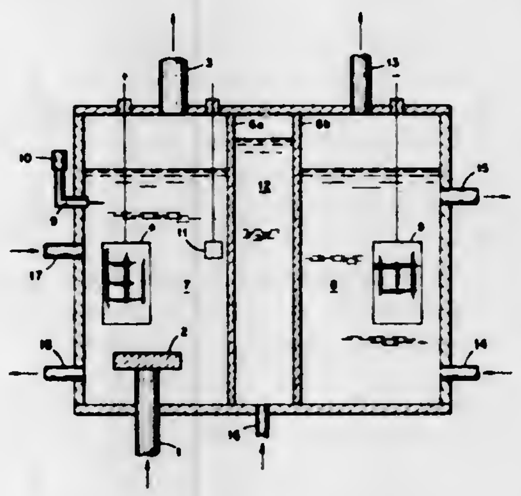
4,004,993
ELECTROLYTIC TRAPPING OF IODINE FROM PROCESS GAS STREAMS

Donald E. Horner; James C. Mailen, both of Oak Ridge, and Franz A. Posey, Concord, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,571

Int. Cl.² C25B *1/24*

U.S. Cl. 204—131 **6 Claims**



1. A method of removing molecular, inorganic, and organic forms of iodine from a gaseous atmosphere, said method comprising contacting said gaseous atmosphere with anolyte of an operating partitioned electrolytic cell, said electrolytic cell comprising an anode compartment containing anolyte and a cathode compartment containing catholyte, said anolyte comprising an aqueous nitric acid solution containing a catalytic amount of cobalt ions to effect the electrolytic oxidation of iodine in said atmosphere to iodine species soluble in said anolyte.

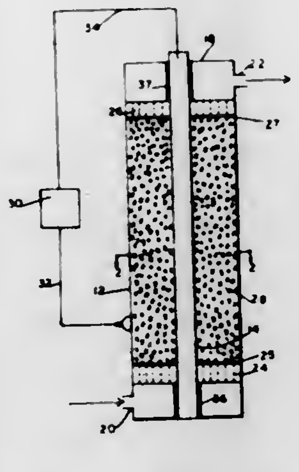
4,004,994
ELECTROCHEMICAL REMOVAL OF CONTAMINANTS

Joseph M. Andrus, Park Ridge, Ill., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 271,082, July 12, 1972, abandoned. This application May 16, 1974, Ser. No. 470,421

Int. Cl.² C02B *1/82*

U.S. Cl. 204—149 **13 Claims**



1. An apparatus for the removal of ionic contaminants for aqueous solutions which comprises:

a. a vertically disposed cylindrical electrode;
b. an internal electrode, axially disposed within said cylindrical electrode;
c. a particulate bed comprising carbonaceous particles disposed between and in contact with said cylindrical electrode and said internal electrode, said particulate bed retained in disposition between said electrodes by retaining means thereby forming a medium of lower electrical conductivity between said electrodes;
d. a source of direct current which is in electrical communication with said cylindrical electrode and said internal electrode in such manner as to induce a potential difference between said electrodes across said bed;
e. a base header and a top header fitted over the ends of said cylindrical electrode thereby forming a closed system;
f. input means in open communication with the base of said cylindrical electrode such that the solution to be treated can be continuously introduced into said cylindrical electrode; and
g. output means in open communication with the top of said cylindrical electrode such that the treated solution can be continuously removed from said cylindrical electrode.

7. A method of removing ionic contaminants from aqueous solution comprising:

a. continuously feeding said solution into the base of a vertical treatment zone formed by a vertically disposed cylindrical electrode and an internal electrode axially disposed within said cylindrical electrode, said treatment zone additionally containing a particulate bed comprising carbonaceous particles disposed between and in contact with said cylindrical electrode and said internal electrode; said particulate bed retained in disposition between said electrodes by retaining means thereby forming a medium of lower electrical conductivity between said electrodes, in such a manner that the solution rises vertically through said bed while applying an electrical potential across said bed sufficient to maintain a current density of at least 10 amps/cu. ft. of bed, and
b. continuously removing said solution from the top of said treatment zone.

4,004,995
PROCESS FOR REMOVING NITROGEN OXIDES AND SULFUR DIOXIDE FROM EFFLUENT GASES

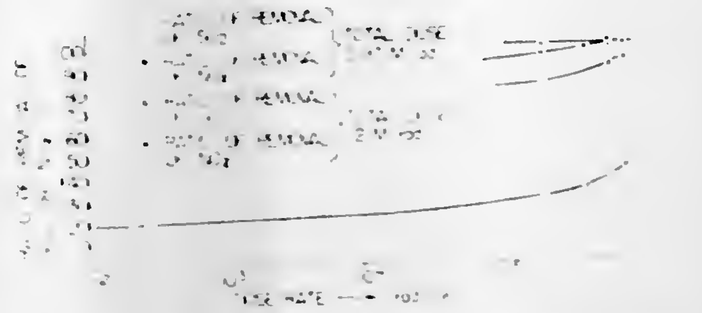
Sueo Machi, Takasaki; Keita Kawamura, Yokohama; Shingi Aoki, Fujisawa; Waichiro Kawakami, and Shoji Hashimoto, both of Takasaki, all of Japan, assignors to Ebara Manufacturing Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,788

Claims priority, application Japan, Mar. 3, 1973, 48-25290; Mar. 3, 1973, 48-25292; Aug. 15, 1973, 48-91549; Aug. 15, 1973, 48-91550; Sept. 22, 1973, 48-107123

Int. Cl.² B01J *1/00*

U.S. Cl. 204—157.1 H **12 Claims**



1. A process for removing NO_x and SO_2 from effluent gases, comprising

increasing the pressure of the effluent gases containing NO_x and SO_2 in a reaction chamber to a pressure in the range of from more than atmospheric pressure to about 2 atmospheres and at the same time irradiating the pressurized gases with an ionizing radiation from a radiation source which is placed near or in said reaction chamber, thereby converting gaseous pollutants, NO_x and SO_2, to mist and solid particles, and then

collecting the particles thus produced by a mist and dust collector.

4. A process for removing NO_x from effluent gases, comprising

delivering the effluent gases containing NO_x to a reaction chamber inlet,

moving said gases through the reaction chamber and at the same time irradiating the gases, including at least 1% by volume of oxygen, with an ionizing radiation from a radiation source placed near said reaction chamber, thereby converting gaseous NO_x to mist and/or solid particles,

delivering the irradiated gases with the particles thus produced to a washing tower, and there washing the gases with water and/or alkaline solution, and then

releasing the washed gases into the atmosphere.

7. A process for removing NO_x from effluent gases, comprising delivering the effluent gases containing NO_x and at least an equivalent amount of moisture to a reaction chamber inlet, moving said gases through the reaction chamber and at the same time irradiating the gases with an ionizing radiation thereby converting gaseous pollutant, NO_x, to mist and/or solid particles, and then

collecting the particles thus produced by a mist and dust collector.

10. A two-step process for removing NO_x and SO_2 from effluent gases, comprising

delivering said effluent gases containing NO_x and SO_2 to a reaction chamber inlet,

moving said effluent gases through said reaction chamber and irradiating them with an ionizing radiation from a radiation source which is placed near or in said reaction chamber thereby converting substantially all of the gaseous NO_x to mist and/or fine solid particles,

delivering the thus irradiated gases containing mist and/or fine solid particles as well as the remaining gaseous SO_2 to a collecting apparatus and there separating said mist and/or fine solid particles from the gases,

delivering the thus-treated gases containing substantial amounts of gaseous SO_2 to a means for desulfurization which does not depend on irradiation, and there removing the remaining SO_2, and

releasing the thus purified gases into the atmosphere.

4,004,996

FLUORINATION OF ORGANIC COMPOUNDS

Janos Kollonitsch, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 23, 1974, Ser. No. 535,878

Int. Cl.² C07C *87/22, 91/06, 101/10;* **B01J** *1/10*

U.S. Cl. 204—158 HA **6 Claims**

1. A process for substitutive C-fluorination of an organic substrate which is D-alanine, 2-deutero-D-alanine, putrescine, spermine, t-butylamino ethanol, L-ornithine, 2-aminobutyric acid, polyacrylic acid, polyvinylchloride, or polycaprolactone comprising dissolving or suspending the substrate in liquid hydrogen fluoride, liquid hydrogen fluoride containing boron trifluoride, or liquid hydrogen fluoride containing antimony pentafluoride at −80° to 15° C. and introducing fluorine thereto under irradiation with light.

4,004,997

PROCESS OF CURING A POLYMERIZABLE COMPOSITION CONTAINING A MAGNETIZED POWERED FERROMAGNETIC MATERIAL WITH RADIOACTIVE RAYS

Kenkichi Tsukamoto, Fujihara; Yusuke Matsumura, Chigasaki, and Ryuichi Sano, Kamakura, all of Japan, assignors to Seiko Shimada, Tokyo; Teizo Takahashi, Imaichi and Mitso Nishida, Chigasaki, all of, Japan

Continuation-in-part of Ser. No. 327,639, Jan. 29, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,454

Claims priority, application Japan, Jan. 30, 1972, 47-10856

Int. Cl.² C08F *8/00, 2/46*

U.S. Cl. 204—159.14 **9 Claims**

1. A process of curing a composition comprising the step of mixing at least one polymerizable ethylenically unsaturated composition selected from the group consisting of polymerizable resins having ethylenically unsaturated groups therein and ethylenically compounds and a filler comprising a magnetized powdery ferromagnetic substance in an amount of 1.5 to 998 parts by weight based on 100 parts by weight of the at least one polymerizable composition and then curing the mixture with radioactive rays selected from the group consisting of α-rays, βrays, γrays, X rays and electron beams in an amount of from 2.5 to 10 Mrads.

4,004,998

PHOTOPOLYMERIZABLE COMPOUNDS AND COMPOSITIONS COMPRISING THE PRODUCT OF THE REACTION OF A HYDROXY-CONTAINING ESTER AND A MONOCARBOXY-SUBSTITUTED BENZOPHENONE

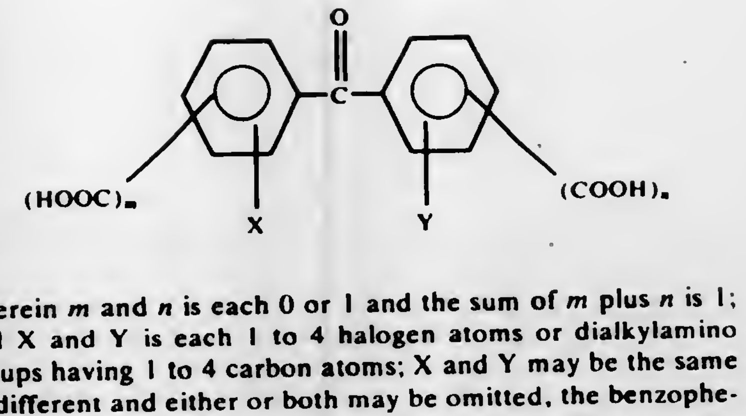
George Rosen, Wayne, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 405,517, Oct. 11, 1973, Pat. No. 3,926,640, which is a continuation-in-part of Ser. No. 200,174, Nov. 18, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,783

Int. Cl.² C08F *2/46, 4/00*

U.S. Cl. 204—159.22 **9 Claims**

1. A photopolymerizable compound comprising the product of the reaction of (1) a monomeric hydroxy-containing polyethylenically unsaturated ester or a monomeric isocyanatemodified hydroxy-containing polyethylenically unsaturated ester which is the product of the reaction of (a) an ethylenically unsaturated acid and (b) a polyhydric alcohol and (2) a monocarboxy-substituted benzophenone having the formula



wherein *m* and *n* is each 0 or 1 and the sum of *m* plus *n* is 1; and X and Y is each 1 to 4 halogen atoms or dialkylamino groups having 1 to 4 carbon atoms; X and Y may be the same or different and either or both may be omitted, the benzophenone moiety being about 5-50 weight percent of the product.

4,004,999

PROCESS FOR PREPARING A COATED PRODUCT

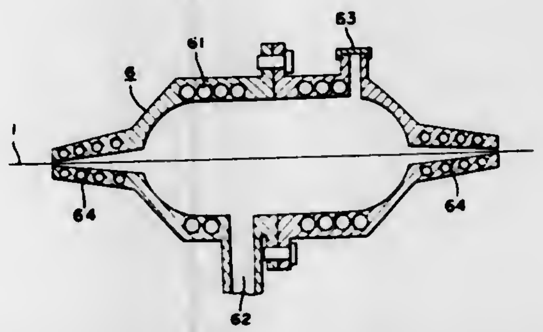
Kyoichi Shibayama; Fumihiko Sato, and Takashi Takahama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,908

Claims priority, application Japan, Apr. 30, 1974, 49-49012; Apr. 30, 1974, 49-49013

Int. Cl.² C25D *13/06, 13/16*

U.S. Cl. 204—181 **4 Claims**



1. A process for preparing a coated product which comprises electrodepositing a varnish from a water dispersion onto a conductive substrate; dipping said coated substrate into hot water so that the varnish is treated with said hot water; and thereafter treating said varnish coating with compressed steam.

4,005,000

ELECTROCOATING APPARATUS AND METHOD

John L. Kraska, Riverside, Ill., assignor to National Can Corporation, Chicago, Ill.

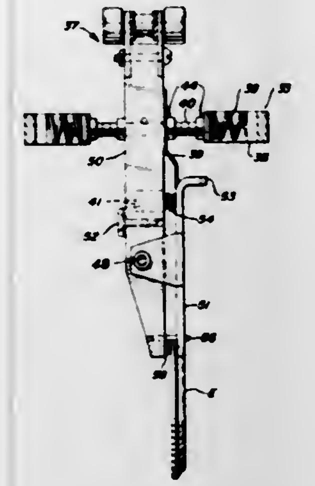
Continuation-in-part of Ser. No. 397,889, Sept. 17, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,353

Int. Cl.² B65G *49/02;* **C25D** *13/06, 17/06*

U.S. Cl. 204—181 **25 Claims**

21. A method for electrocoating articles, such as can ends, in a basin containing an electrolytic solution and a fixed anode, comprising continuously moving a plurality of hangers along a predetermined path with a lower portion of said path being located directly above said basin, said hangers each having a body portion and an electrically conductive jaw pivoted on said body portion and normally biased to a closed position, pivoting said jaw to an open position at a location upstream of said basin, inserting a peripheral portion of said article between said moving body portion and said jaw and releasing said jaw to grip a peripheral edge of said article, engaging each moving hanger with a fixed cathode track along

said lower portion of said path to produce a current flow through said jaw to said article while said article is immersed in said solution, and removing each article from said hangers at a location downstream of said basin.



4,005,001

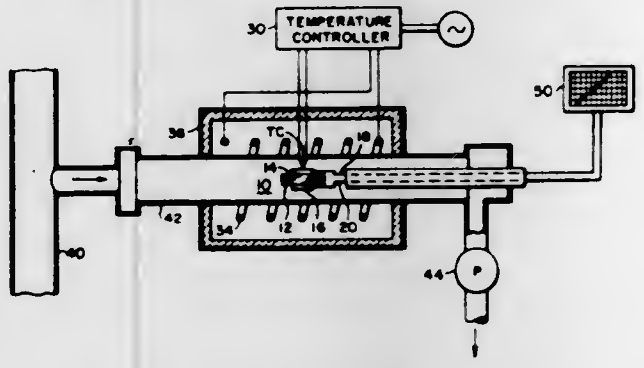
COMBUSTIBLES SENSOR

Alfred R. Pebler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1973, Ser. No. 345,393

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **3 Claims**



1. Apparatus for determining the presence of predetermined combustible constituents such as methane, hydrogen and carbon monoxide, in an excess oxygen gas mixture, comprising, an oxygen ion conductive solid electrolyte electrochemical cell including a first and second electrode means disposed on opposite surfaces thereof, means adapted for supplying an excess oxygen gas mixture containing one or more combustibleconstituents simultaneously to said first and second electrodes, said first electrode composed of a material for supporting a first rate of catalytic combustion reactivity between said oxygen and combustible constituents of said mixture and said second electrode composed of a material exhibiting a second rate of catalytic combustion reactivity between said oxygen and combustible constituents of said gas mixture, said first rate of catalytic combustion reactivitybeing different than said second rate of catalytic combustion reactivity so as to produce an oxygen potential difference between said first and second electrodes, said solid electrolyte electrochemical cell developing an output signal corresponding to said oxygen potential difference, said output signal being indicative of the cumbustible constituents present in said gas mixture,

sadi oxygen potential difference produced by said combustible constituents being a function of the temperature of said solid electrolyte electrochemical cell and each particular combustible constituent producing a maximum oxygen potential difference at a predetermined temperature, and

means for maintaining said solid electrolyte electrochemical cell at the predetermined temperature at which maximum oxygen potential difference is produced by a combustible constituent of interest.

4,005,002

APPARATUS FOR MEASURING SUBSTRATE CONCENTRATIONS

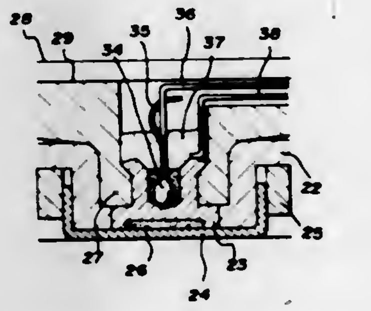
Philippe Racine, Munchenstein, Switzerland; Jean-Claude Higelin, Hegenheim; Roland Engelhardt, Mulhouse, both of France, and Wolfgang Mindt, Erlangen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 1, 1974, Ser. No. 493,583

Claims priority, application Switzerland, Aug. 6, 1973, 11351/73

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **9 Claims**



1. A device for measuring the concentration of substrates of enzyme reactions occurring during intermediate metabolism, more particularly the concentration of lactate and glucose in fluid biological samples, including a measuring cell formed as a tubular chamber for receiving the fluid sample, an enzyme electrode containing a platinum or gold electrode, an enzyme layer and a semi-permeable membrane covering the enzyme layer; a reference electrode; said tubular chamber being placed between the contact surfaces of said electrodes; and an electrical circuit for measuring the current which flows through the platinum or gold electrode,

which device is characterized in that it comprises means for locally regulating the temperature of the enzyme layer, a hydraulic device for alternately filling the measuring cell with an acceptor-containing buffer solution or a fluid sample, and said electrical current measuring circuit includes an electronic circuit which, after the measuring cell has been filled with a fluid sample, determines the peak value of the current flowing through the platinum or gold electrode, the peak value, being representative of the concentration of substrate to be measured.

4,005,003

MULTI-COMPONENT METAL ELECTRODE

James M. Popplewell, Guilford; Michael J. Pryor, Woodbridge, and Alexander F. Beck, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 15, 1975, Ser. No. 568,353

Int. Cl.² C25B *11/10*

U.S. Cl. 204—290 F **10 Claims**

1. A multi-component metal electrode comprised of

a. a film-forming metal base having
b. a coating comprised of
  1. a porous oxide of a film-forming metal containing radial cracks and being partially detached from said film-forming metal base,
  2. a ruthenium oxide-containing conductive oxide, and
  3. a chemically resistant metal oxide derived from an inorganic compound comprising at least part of said conductive oxide.

4,005,004
ELECTRODE COATING CONSISTING OF A SOLID SOLUTION OF A NOBLE METAL OXIDE, TITANIUM OXIDE, AND ZIRCONIUM OXIDE

Maomi Seko, Tokyo; Shinsaku Ogawa, Nobeoka; Mitsuo Yoshida, Nobeoka, and Akira Nakamura, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 10, 1975, Ser. No. 611,889

Claims priority, application Japan, Sept. 27, 1974, 49-11105

Int. Cl.^{2} C25B *11/10*

U.S. Cl. 204—290 F **16 Claims**

1. An electrode comprising an anti-corrosive conductor having a coating of a solid solution containing at least one noble metal oxide together with titanium oxide and zirconium oxide, the total amount of titanium oxide plus zirconium oxide being from 1 to 50 %; said total amount containing from 0.5 to 49.5 mol % titanium dioxide and 0.5 to 49.5 mol % zirconium oxide.

4,005,005
PROCESS FOR RECOVERING AND UPGRADING HYDROCARBONS FROM TAR SANDS

John D. McCollum, and Leonard M. Quick, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 474,907, May 31, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 664,015

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—11 LE **12 Claims**

1. A process for recovering upgraded hydrocarbons from tar sands solids, comprising removing, cracking, desulfurizing, and demetalating hydrocarbons from the tar sands solids by contacting the tar sands solids with a water-containing fluid under super-atmospheric pressure, at a temperature in the range of from about 600° F. to about 900° F., in the absence of externally supplied catalyst and hydrogen, wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the removed hydrocarbons; and lowering said temperature or pressure or both, to thereby make the water in the water-containing fluid a less effective solvent for the removed hydrocarbons and to thereby form separate phases.

4,005,006
COMBINATION RESIDUE HYDRODESULFURIZATION AND THERMAL CRACKING PROCESS

Angelo A. Montagna, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 18, 1975, Ser. No. 597,398

Int. Cl.^{2} C10G *23/00*

U.S. Cl. 208—89 **9 Claims**

1. A process comprising passing an asphaltene-containing residual oil containing metals and sulfur together with hydrogen downflow through initial and final catalytic hydrodesulfurization zones in series to produce a relatively low sulfur hydrodesulfurization effluent, passing a portion of the hydrodesulfurized oil flowing between said hydrodesulfurization zones through a thermal cracking zone containing a fixed bed of inert solids at a temperature from 750° to 1,000° F. which is above the hydrodesulfurization temperature to produce thermally cracked light oil and thermally cracked relatively high sulfur heavy oil containing less than 7 weight percent pentane insolubles, separating thermally cracked light oil from said relatively high sulfur cracked heavy oil, and blending at least a portion of said relatively high sulfur thermally cracked heavy oil with at least a portion of said relatively low sulfur hyrodesulfurization effluent.

4,005,007
HYDROCARBONACEOUS BLACK OIL CONVERSION PROCESS

Mark J. O'Hara, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 428,280, Dec. 26, 1973, Pat. No. 3,909,450. This application July 28, 1975, Ser. No. 599,562

Int. Cl.^{2} C10G *23/02;* **B01J** *27/24*

U.S. Cl. 208—111 **7 Claims**

1. A process for the conversion of an asphaltene-containing hydrocarbonaceous charge stock which comprises reacting said charge stock and hydrogen in contact with a catalytic composite, said composite consisting essentially of a Group VI-B metal oxide and a Group VIII metal oxide impregnated on a refractory inorganic oxide carrier material, improved by further impregnating a nitrogen-containing organic compound on said carrier material to deposit from about 0.3 to about 0.6 wt. % nitrogen thereon, and effecting thermal decomposition of said compound and adsorption of nitrogen on said carrier material, said nitrogen-containing compound being characterized by a basic dissociation constant of less than about 1×10^{-13} at 25° C.

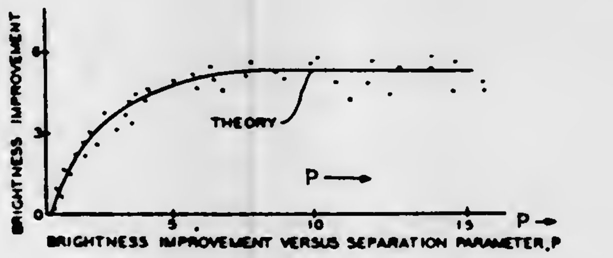
4,005,008
APPARATUS FOR MAGNETIC BENEFICIATION OF PARTICLE DISPERSION

Robin R. Oder, San Francisco, Calif., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 495,712, Aug. 8, 1974, abandoned. This application July 25, 1975, Ser. No. 599,226

Int. Cl.^{2} B03C *1/02*

U.S. Cl. 209—223 R **5 Claims**



1. In a system for effecting magnetic separation of magnetically attractable particles of magnetic susceptibility Q and mean diameter *d* from a dispersion of viscosity η of said particles in a fluid carrier, said system being of the type including a non-magnetic canister, means for generating a magnetic field of intensity H, means disposing said canister in said field, a ferro-magnetic filamentatious matrix within said canister, and means for flowing said dispersion through said canister and matrix, and providing a retention time of τ in said matrix; the improvement wherein:

said canister is packed with filamentatious material of magnetization M and filaments of generally circular cross-section with a mean filamentary diameter D, which material occupies a fraction X of said canister volume; said parameters M, D and X being selected in accordance with the relationship $C_0/C=e^{-\alpha p}$, where α is a numerical coefficient characteristic of the system, and p is the system separation parameter and interrelates said parameters by the expression:

$$p=(\eta^{Q}(d/D)^{2} M \tau H X(1-X).$$

4,005,009
METHOD OF TREATING WASTE WATER CONTAINING SURFACTANT AND HEAVY METALS

Mototaka Kinoshita, Kashiwa; Yoshimitu Sekiguchi, Ichikawa, and Susumu Ando, Chiba, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1975, Ser. No. 555,572

Claims priority, application Japan, Mar. 14, 1974, 49-28521

Int. Cl.^{2} B03D *1/02*

U.S. Cl. 210—44 **3 Claims**

1. A method of treating waste water from metal processing operations, said waste water containing from 3 to 20 ppm of heavy metals and from one to 20 ppm of anionic surfactant, which consists essentially of the steps of:

A. adding to said waste water from 30 to 1000 ppm of at least one inorganic coagulant selected from the group consisting of aluminum chloride, polyaluminum chloride, aluminum sulfate, ferrous chloride, ferric chloride, ferrous sulfate and ferric sulfate, and then adjusting the pH of said waste water to from pH 5 to pH 10, before any further treatment of said waste water, so that the surfactant reacts with said inorganic coagulant, and adding to said waste water from 200 to 5000 ppm of at least one inorganic salt selected from the group consisting of sodium sulfate, potassium sulfate, ammonium sulfate, sodium chloride, potassium chloride and ammonium chloride
B. after step A, adding to said waste water from one to 50 ppm of a cationic macromolecular coagulant selected from the group consisting of polyamine and polyethylene imine cationic coagulants, and
C. after step B, blowing air through said waste water to generate a foam so that the foams absorb said surfactant and heavy metals, separating the foam and recovering a treated waste water having a reduced content of said surfactant and heavy metals.

4,005,010
METHOD OF PACKING MEDIA IN A TOWER OR BED

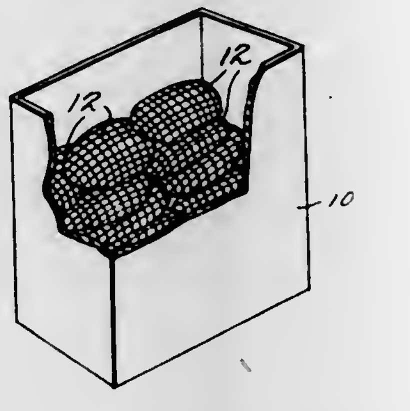
John Lunt, Alderley Edge, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 499,991, Aug. 23, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,658

Claims priority, application United Kingdom, Sept. 21, 1973, 44381/73

Int. Cl.^{2} C02C *1/04;* **B01D** *3/28*

U.S. Cl. 210—17 **3 Claims**



1. A method of biologically treating effluent and sewage comprising the steps of

a. disposing a plurality of plastic elements as packing media in each of a plurality of open-weave or open-mesh sacks, the openings in said open-weave or open-mesh sacks being smaller than the smallest dimension of an individual plastic element,
b. filling a tower or bed with a plurality of said open-weave or open-mesh sacks containing said plastic elements therein, said plastic elements when wetted providing surfaces for growing bacteria and other micro-organisms as a biological film,
c. passing effluent and sewage through said packed tower or bed while supplying through said media and said sacks air required to sustain the growth of the bacteria and other micro-organisms on wetted packing element surfaces, and allowing the biological film to pass through said media and said sacks as it from time to time is dislodged, and
d. retaining said packing media containing sacks in place in said tower or bed for the effective life of said tower or bed.

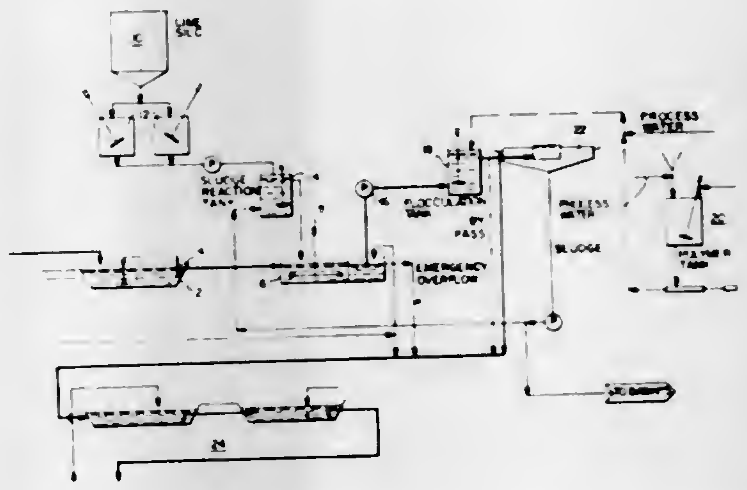
4,005,011
METHOD FOR TREATING EFFLUENT RESULTING FROM THE MANUFACTURE OF SYNTHETIC DYESTUFFS AND RELATED INTERMEDIATE CHEMICALS

Charles D. Sweeny, Loganton, Pa., assignor to American Color & Chemical Corporation, Lock Haven, Pa.

Continuation-in-part of Ser. No. 396,694, Sept. 13, 1973, abandoned. This application July 24, 1975, Ser. No. 598,687

Int. Cl.^{2} C02C *5/02*

U.S. Cl. 210—18 **3 Claims**



1. A method of treating an effluent which is an aqueous mixture containing environmentally significant amounts of organic solvents and byproducts of processes for the production of chromophoric compounds resulting from the manufacture of synthetic dyestuffs and related intermediate chemicals, said organic solvents and byproducts including toxic amounts of nitrobenzene and one or more heavy metals selected from the group consisting of mercury, iron, chromium, nickel, copper, lead, zinc, and arsenic, said process comprising:

a. subjecting said effluent to a first equalizing treatment;
b. chemically treating said equalized effluent with lime whereby toxic heavy metal impurities are reduced below a toxic level in said effluent and the effluent is neutralized;
c. adding a polymer flocculating agent and clarifying the thus equalized chemically treated effluent;
d. subjecting the thus clarified effluent to a second equalizing treatment;
e. subjecting the resultant mixture to carbon adsorption with activated carbon to remove color and whereby the level of nitrobenzene is reduced below about 12.0 mg/l;
f. biologically degrading the thus treated effluent with activated sludge containing microorganisms capable of biodegrading organic waste material; and
g. clarifying said biologically degraded effluent, whereby the color, TOC and BOD are reduced to a predetermined ecologically acceptable level.

4,005,012

SEMIPERMEABLE MEMBRANES AND THE METHOD FOR THE PREPARATION THEREOF

Wolfgang J. Wrasidlo, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 22, 1975, Ser. No. 615,252

Int. Cl.² B01D *13/04*

U.S. Cl. 210—23 H **7 Claims**

1. In a process for desalination of saline water by reverse osmosis comprising contacting the saline water under pressure with a reverse osmosis membrane, the improvement comprising using as the reverse osmosis membrane a composite semipermeable membrane prepared by a method comprising the steps of:

- a. treating a microporous substrate with an aqueous solution of an amine modified polyepihalohydrin,
- b. immersing the resultant coated microporous substrate in a solution of a polyfunctional agent capable of reacting with the amine groups of said amine modified polyepihalohydrin to form an ultra-thin film on one surface of said microporous support, and
- c. drying said composite semipermeable membrane at an elevated temperature.

4,005,013

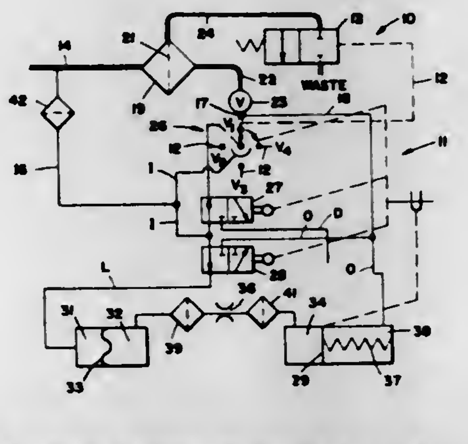
DIFFERENTIAL CONTROLLER VALVE AND SEQUENCER

Melvin F. Hinton, La Jolla, Calif., assignor to Reed Irrigation Systems, El Cajon, Calif.

Filed Apr. 8, 1976, Ser. No. 675,072

Int. Cl.² B01D *35/22*

U.S. Cl. 210—106 **16 Claims**



1. In a liquid filtration system including a plurality of parallel filter assemblies connected to a common inlet source and a common outlet line, each filter assembly including a blow-down discharge valve which when opened is effective to clean the filter, such blow-down discharged valve being capable of being held closed by a predetermined minimum level of fluid pressure in a pilot line connected thereto, and opened by the relieving of such pressure, such pressure level being between atmospheric and that of the common inlet source, the improvement of a sequential blow-down controller, comprising:

- means connecting each pilot line from the plurality of filters to the controller in a specified sequence of positions;
- means receiving pressure from the common inlet source;
- means monitoring the outlet pressure at the common outlet line;
- means normally providing inlet source pressure in the pilot lines of the blow-down discharge valves;
- means for sensing a predetermined pressure differential between the common inlet and the common outlet, indicating that at least one of the filter assemblies requires blow-down;
- means for relieving the pressure in the blow-down pilot line of one of the filter assemblies in response to the sensing of said predetermined pressure differential and maintaining the pressure relief for a predetermined time period, thereby effecting blow-down of said one filter assembly for substantially said predetermined time period;
- means for resupplying inlet source pressure in said one filter pilot line at the end of said predetermined time period; and
- means for connecting the next pilot line in the sequence to said pressure-relieving means, following blow-down of said one filter assembly, for pressure relief of said next pilot line when said sensing means again determines that blow-down is required;

whereby blow-down of the filter assemblies continues in sequence until said predetermined pressure differential is eliminated by cleaning of at least one filter, and when the predetermined pressure differential again occurs, blow-down of at least one filter assembly again occurs, commencing with the filter assembly whose pilot line is next in sequence.

4,005,014

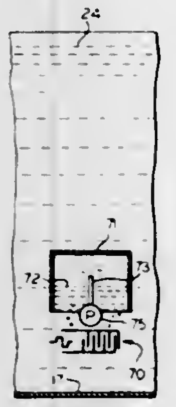
WATER TREATMENT SYSTEM WITH PROLONGED AERATION

Arnold Wikey, 5040 W. Newport, Chicago, Ill. 60641

Continuation of Ser. No. 470,794, May 17, 1974, abandoned. This application Oct. 2, 1975, Ser. No. 618,885

Int. Cl.² C02C *1/10*

U.S. Cl. 210—192 **3 Claims**



1. A water treatment system for purifying and aerating water, by exposing the water to a pressurized oxygenated atmosphere,

said water treatment means comprising the combination of:

diffusion means for diffusing bubbles of oxygen in the water being purified and aerated,

baffle means comprising at least one inverted container,

said baffle means positioned a fixed distance below the surface of the water and arranged to capture the gases being diffused through the water,

said baffle means comprising means enabling the escape of said captured gases when the pressure due to the build up of gases within the baffle means exceeds the pressure due to the distance of the baffle means below the surface of the water, whereby the atmosphere of pressurized gases builds up in said baffle means,

aeration means for mechanically aerating the water within the pressurized gases in said baffle means,

said aeration means comprising pump and spray apparatus located under said at least one inverted container for spraying ambient water into the captured pressurized gases within said at least one inverted container, and

said diffusion means comprising electrolysis means located under said at least one inverted container,

said electrolysis means comprising platinum plated titanium electrodes, simultaneously providing an oxygenated atmosphere under said baffle means by breaking down the water into extremely small bubbles of its component gases, aerating the water by diffusion, and maintaining the pressurized gases in said baffle means.

4,005,015

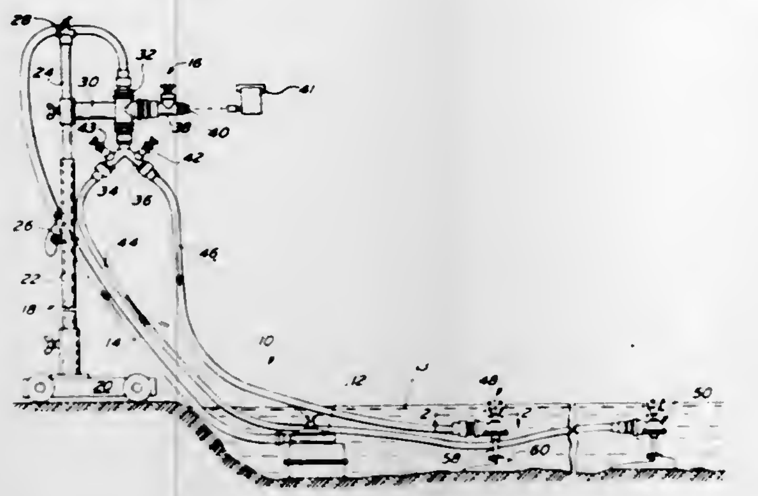
AERATING APPARATUS

James F. Boward, Jr., 4020 Locust Lane, Harrisburg, Pa. 17109

Filed June 5, 1975, Ser. No. 584,087

Int. Cl.² B01F *3/04*

U.S. Cl. 210—220 **9 Claims**



1. Apparatus for aerating bodies of water comprising a pump having an inlet and one outlet, a first conduit having one end connected to said pump outlet, valve means coupled to the other end of said first conduit to allow a fluid at atmospheric pressure to be introduced into said first conduit, structure for supporting said valve means and said other end of said first conduit at an elevation above water level with said other end of said first conduit at an elevation above water level with said other end of said first conduit being directed downwardly, distribution conduit means having a greater flow capacity than said first conduit, said distribution conduit means having one end communicating with said first conduit downstream from said valve means for receiving water and any fluids introduced thereinto through said valve means, and an upwardly directed submersible distributor head connected to the other end of said distribution conduit means, said distributor head having a chamber therein, said chamber having an inlet and an outlet, said chamber inlet being at an elevation below the elevation of said chamber outlet and being connected to said distribution conduit means for receiving water and fluid introduced through said first conduit therein, said chamber outlet being substantially smaller in size as compared with said chamber inlet for permitting discharge of water and said fluid vertically upwardly from said distributor head.

4,005,016

APPARATUS FOR CONTINUOUSLY WITHDRAWING SOLIDS WHICH FORM A SEDIMENT IN A LIQUID

Egon Haese, Bochum, and Hans Moll, Marl, both of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed July 7, 1975, Ser. No. 593,321

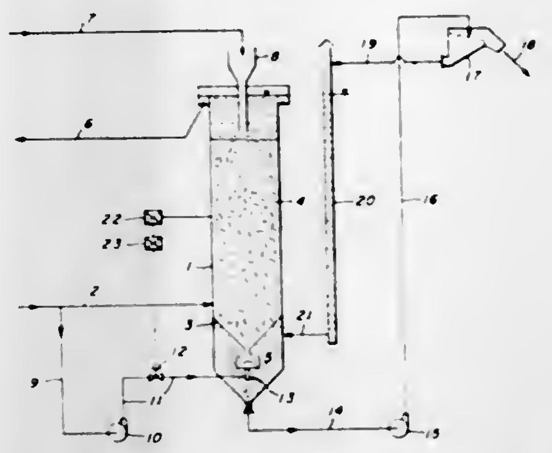
Claims priority, application Germany, July 12, 1974, 2433598

Int. Cl.² B01D *15/02*

U.S. Cl. 210—268 **10 Claims**

1. An apparatus to continuously withdraw solid particles from a liquid-filled processing chamber into a liquid-filled collecting chamber, said solids forming a sediment in the liquid, said apparatus comprising the combination of:

- a vertically-extending container including means to introduce solid particles to said container, means to withdraw solid particles from said container, means to introduce liquid to said container and means to withdraw liquid from said container
- a funnel-shaped plate extending in an oblique downward direction within the bottom portion of said container in a manner to thereby define in said container a processing chamber above said plate and a collecting chamber below said plate, said funnel-shaped plate including a downwardly-extending central outlet nozzle,
- an inverted bell-shaped chamber having a bottom wall joined with an upwardly-extending side wall forming an open top, the bell-shaped chamber being disposed within said collecting chamber centrally below the discharge end of said outlet nozzle,
- a mushroom-shaped distributor spaced above the bottom wall of said bell-shaped chamber and spaced inwardly from the side walls thereof, the distributor having a generally cone-shaped upper surface with the apex thereof lying at the discharge end of said outlet nozzle, the upper surface of said distributor being inclined at an angle with respect to the horizontal which angle is greater than the angle of repose of the solids passing through the container, and
- a conveying pipe projecting upwardly through the bottom wall of the bell-shaped chamber to said distributor, the conveying pipe having fluid discharge openings located within the space between said distributor and the bottom wall of said bell-shaped chamber.



4,005,017

CONTACTING APPARATUS

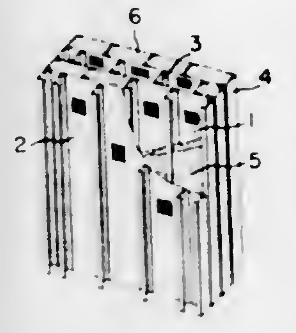
Kazuto Kusano; Hiroshi Ando, both of Tokyo; Takashi Kagami, Yokohama; Azusa Uchida, Zushi; Noboru Akiyama, Izumisano; Yoshihiro Ueda, and Yoshio Akiba, both of Kasukabe, all of Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 426,224, Dec. 19, 1973, abandoned. This application July 25, 1975, Ser. No. 599,030

Claims priority, application Japan, Dec. 25, 1972, 47-147704

Int. Cl.² B01D *23/10*

U.S. Cl. 210—284 **6 Claims**



1. An apparatus for contacting a fluid with a solid, comprising:

- an elongated upright housing which is open at its opposite longitudinal ends so that a fluid can be flowed into one end thereof and discharged from the opposite end thereof;
- a multi-layer network structure disposed in said housing and

defining a plurality of upright, parallel, spaced-apart zones filled with solid particles, said network structure also defining a plurality of upright, parallel, spaced-apart, fluid flow passages respectively disposed between each pair of adjacent zones, said network structure consisting of a plurality of like units disposed in side-by-side relation, each of said units consisting of

1. a pair of upright, spaced-apart, rectangular, flat, fluid-permeable nets of the same size disposed in parallel to each other, extending longitudinally in said housing and defining a single zone,
2. a plurality of upright, parallel, substantially uniformly laterally spaced-apart, elongated inner spacers disposed between the lateral ends of said nets and extending from one longitudinal end to the other longitudinal end thereof, said inner spacers contacting the opposing surfaces of said pair of nets and dividing the zone between said pair of nets into a plurality of compartments which are substantially rectangular in cross-section,
3. a bottom wall extending between the lower ends of said pair of nets for retaining said solid particles in said compartments,
4. side walls at the lateral ends of said pair of nets for closing the lateral ends of said zone,
5. a plurality of upright, parallel, substantially uniformly laterally spaced-apart, elongated, outer spacers attached to the outer surface of one of said pair of nets, said outer spacers being located between the lateral ends of said one net and extending between and contacting said outer surface of said one net of one unit and the outer surface of a net of the adjacent unit defining the opposite side of the adjacent zone, said outer spacers extending parallel to said inner spacers and extending from one longitudinal end to the other longitudinal end of said nets, said outer spacers dividing the space between two adjacent zones into a plurality of fluid flow passage sections which are substantially rectangular in cross-section, said outer spacers being disposed laterally offset from and located approximately midway between and spaced from adjacent inner spacers with said one net being exposed between adjacent inner and outer spacers so that each flow passage section overlaps and communicates through said one net with two of said compartments and vice versa,
6. further side walls at the lateral ends of the space between two adjacent zones for closing the lateral ends of said fluid flow passages, said fluid flow passages being open at the upper and lower ends thereof, whereby the fluid flows longitudinally through said sections and is adapted to contact the solid particles in said compartments.

4,005,018

LIQUID FILTERING APPARATUS

Floyd H. Wyman, Mauldin, and John E. Chambers, Travelers Rest, both of S.C., assignors to Thermo-Kinetics, Inc., Greenville, S.C.

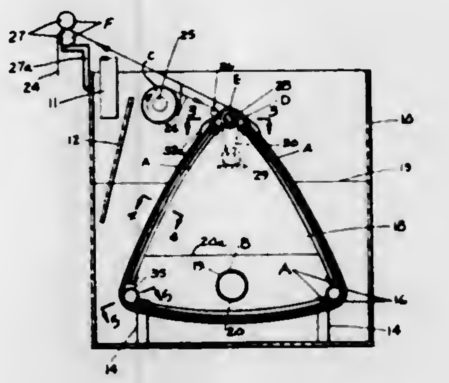
Continuation of Ser. No. 319,748, Dec. 29, 1972, abandoned. This application May 29, 1975, Ser. No. 581,865

Int. Cl.² B01D *33/02*

U.S. Cl. 210—386 **2 Claims**

1. A liquid filter for use at least partially submerged in a tank containing liquid with contaminants therein including:

A. a drum defining a space therein for receiving filtered liquid;
B. means for supporting said drum for rotation in the tank at least partially submerged within the liquid therein;
C. power operated means for supplying an elongated sheet of filter medium about the drum to exclude liquid from the space within the drum except through said filter medium;
D. filter medium support means extending about and carried by said drum permitting liquid after passing through the filter medium to collect at a bottom portion within the drum;
E. an outlet communicating with the filtered liquid within the drum adjacent the bottom portion of the drum for removing filtered liquid therefrom maintaining a liquid level outside the drum higher than a liquid level within the drum;
F. a driving means having driving connection adjacent the periphery of said drum exteriorally of said tank for rotating the drum independently of the filter medium moving fresh filter medium about the drum while removing spent filter medium;



G. sealing means including a flange carried by the tank defining an opening therein, and rotary sealing means carried by said flange within which said drum rotates, separating said driving means from said filtered liquid,
H. means below said flange receiving filtered liquid from said drum through said opening; and
I. squeeze rolls driven by said power operated means between which said spent filter medium is passed after liquid contact for compacting the filtered-out material and removing excess liquid from said filter media.

4,005,019

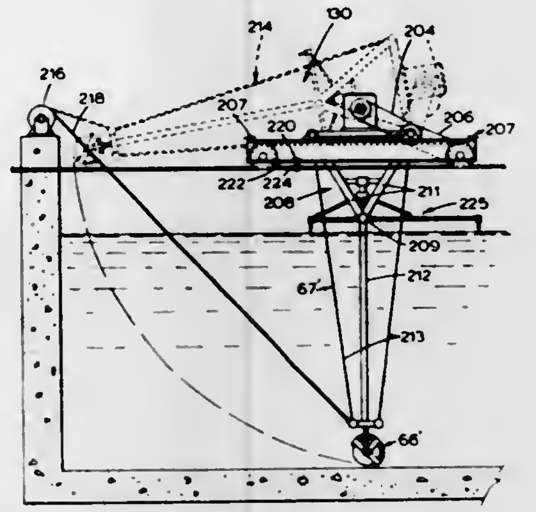
GRAVITATIONAL SEPARATOR

Joseph N. Parlette, Pickering Village, Canada, assignor to L.S. Love & Associates Limited, Brampton, Canada

Continuation-in-part of Ser. No. 509,779, Sept. 27, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,888

Int. Cl.² B01D *21/12*

U.S. Cl. 210—525 **4 Claims**



1. A clarifier for use in the gravity separation of suspended particles from a liquid, the clarifier including:

a tank for receiving liquid to be clarified, the tank being of rectangular shape in plan and including a bottom having sludge outlet means through which settled sludge can be removed;
a gantry supported for movement above the surface of liquid in the tank;
gantry drive means adapted to cause the qantry to reciprocate from end to end of the tank in the performance of repeated passes over said liquid surface;

a sludge conveyor device which is submerged in liquid in the tank in use at a clearance above the bottom of the tank;
support means coupling the conveyor device to the gantry so that the device moves with the gantry and sweeps over the bottom surface of the tank as the gantry performs said repeated passes above the surface of the liquid in the tank;
the conveyor device including: a screw which has a helical blade and which is arranged transversely with respect to the direction of movement of the gantry, so as to move sludge which has settled on the bottom of the charifier in said transverse direction towards said outlet means, the screw being positioned with its axis parallel to the bottom of the tank and spaced therefrom by an amount sufficient to provide for clearance between the bottom of the tank and the blade of the screw; means for driving the screw in rotation about said axis; a shroud which extends around part of the circumference of the screw to confine sludge in the region of said helical blade, the shroud being co-extensive with the screw and having an arcuate cross-sectional shape corresponding to the profile of the screw; means coupling the shroud with the screw for free pivotal movement about the longitudinal axis of the screw between two operative positions in each of which the shroud trails with respect to the direction of movement of the gantry so that a leading portion of the screw is exposed for action or sludge in its path; and shroud reversing means located at each end of the clarifier and adapted to engage the shroud as it approaches the reversing means and to restrain the shroud as it moves away from the reversing means each time the gantry reverses its direction of movement in reciprocating from end to end of the tnak, whereby the shroud is caused by said reversing means to automatically move into the other of its two positions.

3. A clarifier for use in the gravity separation of suspended particles from a liquid, the clarifier including:

a tank which is of rectangular shape in plan and which includes a bottom surface having sludge outlet means through which settled sludge can be removed from the tank;
a gantry supported for movement above the surface of liquid in the tank;
gantry drive means adapted to cause the gantry to reciprocate from end to end of the tank in the performance of repeated passes over said liquid surface;
a sludge conveyor device which is submerged in liquid in the tank in use at a clearance above the bottom of the tank;
conveyor drive means coupled to the sludge conveyor device;
support means coupling the conveyor device to the gantry so that the device moves with the gantry and sweeps over the bottom of the tank as the gantry performs said repeated passes above the surface of the liquid;
the conveyor device having at least one sludge-contacting surface which, when the device is in operation, moves in a direction transverse to the direction of movement of the gantry and towards said outlet means;
a scum box positioned at one end of the tank;
scum skimming means including: at least one skimmer blade which extends transversely with respect to the direction of movement of the gantry; a pair of elongate blade support elements which are spaced longitudinally of said blade and which have outer ends coupled to the blade and inner ends coupled to the gantry for pivotal movement about a horizontal axis so that the blade is movable between a normal skimming position and an elevated position clear of the surface of liquid in said tank; and means biassing the blade into said normal skimming position;
the scum box including a ramp positioned in the path of said skimming blade and arranged to lift the blade from said skimming position to said elevated position when the blade approaches said scum box as a result of movement of the gantry towards the box when the clarifier is in use; and,
in association with at least one of said elongate blade support elements, locking means for retaining the skimmer blade in said elevated position during movement of the gantry in a direction away from said scum box, said locking means being disposed above the liquid in the clarifier and including: detent means coupled to said elongate blade support element and vertically movable in response to movement of said skimmer blade from said skimming position to said elevated position; a pivotally mounted latch coupled to said gantry and movable between an operative position for engagement with said detent means, and a release position; means biassing the latch into said operative position so as to engage the detent means as the skimmer blade moves to said elevated position in use; and release means coupled to said latch and operable by contact with an abutment at the end of said tank opposite to said scum box to move said latch said release position and allow the skimmer blade to return to its skimming position for return movement of the gantry towards the scum box.

4,005,020

PARAFFIN REMOVING COMPOSITIONS

Thomas H. McCormick, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

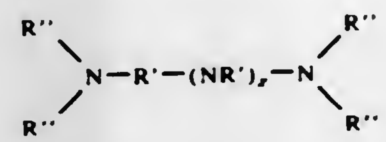
Filed July 19, 1973, Ser. No. 380,698

Int. Cl.² E21B *43/00;* **B08B** *7/00*

U.S. Cl. 252—8.55 B **12 Claims**

1. A composition for removing depositions of paraffin wax, asphaltic and bituminous organic solids and similar materials comprising a basic solution of oxyalkylated materials wherein (A) at least one of said oxyalkylated materials is an oxyalkylated amine and one other of said oxyalkylated materials is (B) a sulfated oxyalkylated fatty alcohol or salt thereof, which composition contains in addition to (A) and (B) a mixture of non-ionic oxyalkylates one of which is (C) an oxyalkylated alkyl phenol, each alkyl group having 1 to 18 carbon atoms, and the other of which is (D) ethylene glycol monobutyl ether, said oxyalkylated amine (A) being the product of oxyalkylation of an oxyalkylatable amine containing as the oxyalkylatable groups an oxyalkylatable amino or hydroxyl group, the amine being selected from the group consisting of

1. monoamines containing a monovalent hydrocarbon radical, a furyl, pyranyl, hydrogenated furyl or hydrogenated pyranyl radical attached to the amino nitrogen, any remaining valences of the amino nitrogen being satisfied by hydrogen,
2. piperidine, piperazine, or morpholine,
3. a polyamine of the formula



$$(R'')_2N-R'-(NR')_x-N(R'')_2$$

where R'' is hydrogen, alkyl, cycloalkyl, aryl or aralkyl, R' is a divalent alkylene radical of up to 6 carbon atoms and x is a number from 0 to 8, and

4. a monoacylated polyamine of the formula

$$RCONHR'(NR')_x\text{-}NH_2$$

where RCO is the acyl group of a 10 to 18 carbon fatty acid or is abietyl CO, and R' and x are as defined in (3) above, or such an amine containing a hydroxyl group and wherein the range of proportions of the components is as follows:

A. oxyalkylated amine, 15%–65%
B. sulfated oxyalkylated fatty alcohol, 15%–50%
C. oxyalkylated phenol, 15%–50%, and
D. ethylene glycol monobutyl ether, 5%–30%.

4,005,021

OIL-SOLUBLE REACTION PRODUCTS OF (A) A HIGH MOLECULAR WEIGHT OLEFIN POLYMER, ACRYLONITRILE, CHLORINE, AN AMINE AND MALEIC ANHYDRIDE, WITH (G) AN ALIPHATIC AMINES; AND LUBRICANT COMPOSITIONS CONTAINING THE SAME

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 477,667, June 10, 1974, Pat. No. 3,914,203. This application Mar. 26, 1975, Ser. No. 562,270

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **7 Claims**

1. A lubricant composition comprising a major amount of a normally liquid oleaginous lubricant, and from about 0.1% to about 10% of the oil-soluble product obtained by the process comprising reacting (a) from about 0.3 moles to about 2.5 moles of a high molecular weight olefin polymer having an average molecular weight of at least 600, with from about 0.5 moles to about 7.5 moles of acrylonitrile, and from about 0.4 to about 2.0 moles of chlorine or bromine iodine catalyzed at a temperature of from about 60° F to about 160° F; (b) reacting, at a temperature of from about 200° F to about 350° F for a period of about 1 to 6 hours, the product of (a) with sufficient amount of primary aliphatic hydrocarbyl amine to replace the halogen atoms in the product of reaction (a); (c) reacting the product of (b) with from about 0.2 moles to about 1.5 moles of maleic anhydride at a temperature of from about 200° F to about 350° F for a period of about 2—4 hours; and (d) reacting at a temperature of from about 200° F to about 350° F, the product of reaction (c) with from about 0.2 moles to about 1.5 moles of primary aliphatic hydrocarbyl amine containing at least one primary amino group per anhydride function in the reaction product of (c).

4,005,022

ELECTROSTATIC LIQUID TONERS

Bheema R. Vijayendran, Bethel, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,612

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.1 L **2 Claims**

1. In a liquid toner having as ingredients particles of carbon black pigment, aliphatic saturated hydrocarbon solvent and a resin soluble in the aliphatic saturated hydrocarbon, the improvement comprising: increasing the electrophoretic property of the carbon pigment particles by modifying the pigment surface with an organic modifying agent capable of modifying the carbon surfaces through doner/acceptor electron interactions by having a molecule structure containing at least three benzene rings and having a solubility of 0.03 to 6 grams per liter in the aliphatic saturated hydrocarbon solvent.

4,005,023

SILICONE FLUID USEFUL AS A BRAKE FLUID

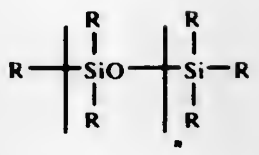
Edgar D. Brown, Jr., Schenectady, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 368,479, June 11, 1973, abandoned, which is a division of Ser. No. 290,075, Sept. 18, 1972, abandoned. This application Aug. 25, 1975, Ser. No. 607,494

Int. Cl.² C01M *3/44*

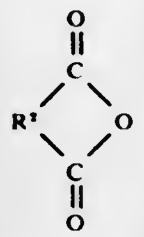
U.S. Cl. 252—78.3 **7 Claims**

1. A process for transmitting force through a hydraulic brake system having hydraulic activating means, hydraulic activated means and hydraulic line means connecting said hydraulic activating means with said hydraulic activated means comprising substantially filling said hydraulic activating means, said hydraulic activated means and said hydraulic lines with a hydraulic silicone fluid mixture having acceptable water tolerance and having therein a linear polymer silicone hydraulic fluid of the formula,

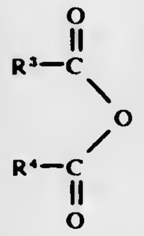


$$R-\left[\begin{array}{c}R\\ |\\ \mathrm{SiO}\\ |\\ R\end{array}\right]_{n}-\begin{array}{c}R\\ |\\ \mathrm{Si}\\ |\\ R\end{array}-R$$

where *n* varies from 1 to 2000, R is methyl and the viscosity of said fluid varies from 20 to 500 centistokes at 25° C, where there is present at a concentration of 5 to 40% by weight of the total fluid of a water tolerance additive which is selected from the class consisting of compounds of the formula,



and of the formula,



where R^2 is a divalent hydrocarbon radical selected from the class consisting of alkylene and arylene radicals of 4 to 15 carbon atoms and R^3, R^4 are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals.

4,005,024

RINSE AID COMPOSITION CONTAINING AN ORGANOSILANE

Pedro A. Rodriguez, Forest Park; David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

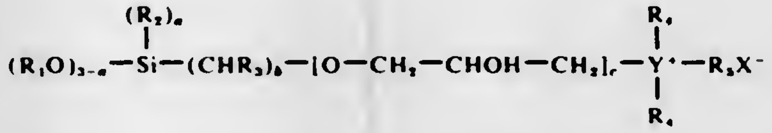
Filed Apr. 22, 1975, Ser. No. 570,939

Int. Cl.² C11D *9/36*

U.S. Cl. 252—89 R **23 Claims**

1. A rinse aid composition capable of imparting soil release properties to cooking utensils and tableware washed therewith consisting essentially of:

a. from 0.1% to 50% of an organosilane having the formula:



$$(R_1O)_{3-a}-\overset{\overset{\displaystyle (R_2)_a}{|}}{\mathrm{Si}}-(CHR_3)_b-[O-CH_2-CHOH-CH_2]_c-\underset{\underset{\displaystyle R_4}{|}}{\overset{\overset{\displaystyle R_4}{|}}{Y^+}}-R_5X^-$$

or is a siloxane oligomer thereof wherein R_1 is an alkyl group containing 1 to 4 carbon atoms,

$(CH_3)_3$ Si or $Z(OCH_xH_{2x})_m$

where *x* is 2 to 4, *m* is 1 to 20, and Z is hydrogen, an alkyl group containing 1 to 18 carbons or an acyl group containing 1 to 4 carbon atoms; R_2 is an alkyl group containing 1 to 18 carbon atoms; *a* is 0 to 2; R_3 is hydrogen or an alkyl group containing 1 to 18 carbon atoms; *b* is 1 to 3; *c* is 0 or 1; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_xH_{2x}O)_mZ$

where *x*, *m* and Z are as defined above, or oxygen provided only one R_4 is oxygen and further provided that there is no X^- when R_4 is oxygen; R_5 is an alkyl, aryl, or arylalkyl group containing 1 to 22 carbon atoms; X is halide; and Y is nitrogen, sulfur or phosphorus;

b. from 5% to 98.9% of a water-soluble organic nonionic detergent; and

c. from 1% to 40% of a monofunctional organic carboxylic acid containing 1 to 6 carbon atoms.

4,005,025

ORGANOSILANE-CONTAINING ANIONIC DETERGENT COMPOSITION

George Carl Kinstedt, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

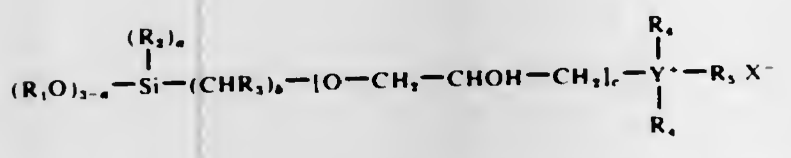
Filed May 5, 1975, Ser. No. 574,817

Int. Cl.² C11D *3/16, 3/36*

U.S. Cl. 252—89 R **31 Claims**

1. A detergent composition capable of imparting soil release benefits to metallic and vitreous surfaces contacted therewith consisting essentially of:

a. an organosilane having the formula



$$(R_1O)_{3-a}-\overset{\overset{\displaystyle (R_2)_a}{|}}{\mathrm{Si}}-(CHR_3)_b-[O-CH_2-CHOH-CH_2]_c-\underset{\underset{\displaystyle R_4}{|}}{\overset{\overset{\displaystyle R_4}{|}}{Y^+}}-R_5\,X^-$$

or a siloxane oligomer thereof wherein R_1 is an alkyl group containing 1 to 4 carbon atoms or

$Z(OC_xH_{2x})_m$

where *x* is 2 to 4, *m* is 1 to 20, and Z is hydrogen, an alkyl group containing 1 to 3 carbons, or an acyl group containing 1 to 4 carbon atoms; R_2 is an alkyl group containing 1 to 18 carbon atoms; *a* is 0 to 2; R_3 is hydrogen or an alkyl group containing 1 to 18 carbon atoms; *b* is 1 to 3; *c* is 0 or 1; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 18 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_xH_{2x}O)_mZ$

where *x*, *m* and Z are as defined above, or oxygen provided only one R_4 is oxygen and further provided that there is no X^- when R_4 is oxygen; R_5 is an alkyl, aryl or arylalkyl group containing 1 to 18 carbon atoms; X is bromide or chloride; and Y is nitrogen, sulfur, or phosphorus and the sum of the carbon atoms in R_2, R_3, R_5 and R_4 when R_4 is alkyl, aryl, arylalkyl or carboxy-substituted alkyl does not exceed 30 carbon atoms;

b. a water-soluble organic anionic detergent in a weight ratio of organosilane to detergent of from 1:1 to 1:10,000; and

c. a source of alkalinity in an amount such that the pH of a 0.2% aqueous solution of the composition lies in the range 8.5–10.5, said source being selected from the group consisting of water-soluble inorganic and organic bases.

4,005,026

DETERGENT COMPOSITIONS CONTAINING NOVEL CRYSTALLINE FORMS OF OPTICAL BRIGHTENERS

James C. Heath, Norwood; Raymond E. Werner, Blue Ash, both of Ohio; John W. Delaney, Fort Mitchell, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 834,560, June 18, 1969, Pat. No. 3,951,960, which is a continuation-in-part of Ser. No. 526,351, Feb. 10, 1966, abandoned, which is a continuation-in-part of Ser. No. 283,558, May 27, 1963, abandoned, which is a continuation-in-part of Ser. No. 177,743, March 6, 1962, abandoned. This application Sept. 5, 1975, Ser. No. 610,629

Int. Cl.² C11D *3/28, 7/32, 7/34*

U.S. Cl. 252—89 B **3 Claims**

1. A detergent composition consisting essentially of a detergent and an effecitive brightening amount of the compound disodium 4,4′-bis(4,6-dianilino-s-triazin-2-ylamino)-2,2′-stilbenedisulfonate in the form of birefringent crystalline rods in which the lowest index of refraction has a value between 1.53 and 1.54 and is parallel to the long axis, said rods being characterized by the following X-ray diffraction data:

INTERPLANAR SPACINGS, A
6.23
5.90
5.70
5.59
5.51
5.34
4.90
4.85
4.60
3.98
3.82
3.64
3.44
3.28
3.22

4,005,027

SCOURING COMPOSITIONS

William L. Hartman, Cheviot, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 377,976, July 10, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 415,033

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.² C11D *3/395*

U.S. Cl. 252—95 **17 Claims**

1. An aqueous false body fluid hard-surface scouring cleanser comprising

A. from about 0.2% to 5% by weight of a bleaching agent which yields a hypochlorite species in aqueous solution;

B. from about 1% to 6% by weight of an inorganic colloid-forming clay selected from the group consisting of smectites, attapulgites and mixtures of smectite and attapulgites;

C. from about 0.1% to 3% by weight of a bleach-stable surfactant selected from the group consisting of water-soluble alkyl sulfates containing from about 8 to about 18 carbon atoms in the alkyl group;

D. from about 5% to 60% by weight of insoluble particulate abrasive material having particle diameters ranging from one micron to about 250 microns and a specific gravity of from about 0.5 to about 5.0;

E. from about 1% to 15% by weight of an inorganic buffering agent capable of maintaining composition pH within the range of from about 10.5 to 14; and

F. from about 10% to 80% by weight of deionized water.

4,005,028

ORGANOSILANE-CONTAINING DETERGENT COMPOSITION

David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

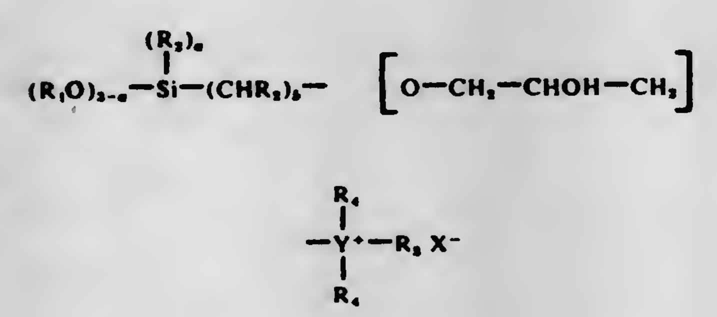
Filed Apr. 22, 1975, Ser. No. 570,534

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **45 Claims**

1. A detergent composition capable of imparting soil release benefits to metallic and vitreous surfaces contacted therewith consisting essentially of;

a. an organosilane having the formula



$$(R_1O)_{3-a}-\overset{(R_2)_a}{\overset{|}{Si}}-(CHR_3)_b-\Big[O-CH_2-CHOH-CH_2\Big]\qquad -\underset{\underset{R_4}{|}}{\overset{\overset{R_4}{|}}{Y^+}}-R_5\ X^-$$

or is a siloxane oligomer thereof wherein R_1 is an alkyl group containing 1 to 4 carbon atoms,

$(CH_3)_3Si$ or $Z(OC_xH_{2x})_m$

where x is 2 to 4, m is 1 to 20, and Z is hydrogen, an alkyl group containing 1 to 18 carbons or an acyl group containing 1 to 4 carbon atoms; R_2 is an alkyl group containing 1 to 18 carbon atoms; a is 0 to 2; R_3 is hydrogen or an alkyl group containing 1 to 18 carbon atoms; b is 1 to 3; c is 0 or 1; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_xH_{2x}O)_mZ$

where x, m and Z are as defined above, or oxygen provided only one R_4 is oxygen and further provided that there is no X^- when R_4 is oxygen; R_5 is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms; X is halide; and Y is nitrogen, sulfur or phosphorus; and

b. a water-soluble organic detergent selected from the group consisting of nonionic, zwitterionic and ampholytic detergents and mixtures thereof in a weight ratio of organosilane to detergent of from 2:1 to 1:10,000.

4,005,029

LAUNDERING ADJUNCT

J. Paul Jones, Springfield Township, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 384,529, Aug. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 230,518, Feb. 29, 1972, abandoned. This application Mar. 10, 1976, Ser. No. 665,475

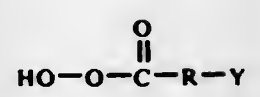
The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.² C11D *7/38, 7/56*

U.S. Cl. 252—99 **17 Claims**

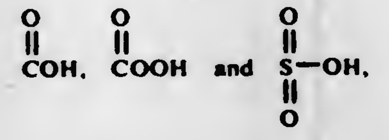
1. A dye transfer inhibiting composition consisting essentially of:

a. from about 2% to about 75% by weight of a peroxygen compound selected from the group consisting of (1) water-soluble monopersulfates, (2) water-soluble monoperphosphates, (3) organic peroxyacids having the general formula



$$HO-O-\overset{\overset{O}{\|}}{C}-R-Y$$

wherein R is selected from the group consisting of alkylene groups containing from about 1 to about 16 carbon atoms and arylene groups containing from about 6 to about 8 carbon atoms, and Y is selected from the group consisting of hydrogen, chlorine, methyl, phenyl,



$$\overset{\overset{O}{\|}}{C}OH,\ \overset{\overset{O}{\|}}{C}OOH\ \text{and}\ \underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-OH,$$

(4) water-soluble salts of said peroxyacids, and (5) mixtures of compounds selected from groups (1) through (4);

b. from about 0.2% to 40% by weight of an activator compound selected from the group consisting of aldehydes, ketones, and compounds which yield aldehydes or ketones in aqueous solution, said activator producing a Relative Oxidation Constant of 0.25 or greater when the peroxygen compound is an inorganic persalt and a Relative Oxidation Constant of 25.0 or greater when the peroxygen compound is an organic peracid;

c. from about 2% to about 75% by weight of a zwitterionic surfactant which is a member selected from the group consisting of derivatives of: secondary amines; tertiary amines; heterocyclic secondary and tertiary amines; quaternary ammonium; quaternary phosphonium; and tertiary sulfonium compounds;

d. from about 1% to about 85% of a buffering compound capable of maintaining the pH of an aqueous solution of said dye transfer inhibiting composition within the range of from about 7 to about 12.

4,005,030

ORGANOSILANE-CONTAINING ANIONIC DETERGENT COMPOSITION

David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

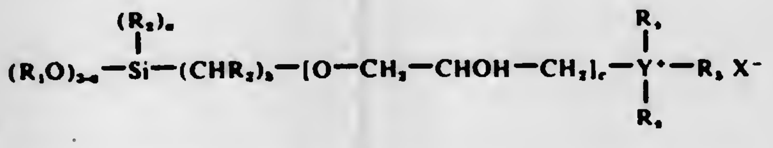
Filed Apr. 22, 1975, Ser. No. 570,533

Int. Cl.² C11D *3/12, 7/10*

U.S. Cl. 252—140 **26 Claims**

1. A detergent composition capable of imparting soil release benefits to metallic and vitreous surfaces contacted therewith consisting essentially of:

a. an organosilane having the formula



$$(R_1O)_{3-a}-\overset{(R_2)_a}{\overset{|}{Si}}-(CHR_3)_b-[O-CH_2-CHOH-CH_2]_c-\underset{\underset{R_4}{|}}{\overset{\overset{R_4}{|}}{Y^+}}-R_5\ X^-$$

or is a siloxane oligomer thereof wherein R_1 is an alkyl group containing 1 to 4 carbon atoms, or

$Z(OC_xH_{2x})_m$

where x is 2 to 4, m is 1 to 20, and Z is hydrogen, an alkyl group containing 1 to 3 carbons or an acyl group containing 1 to 4 carbon atoms; R_2 is an alkyl group containing 1 to 12 carbon atoms, a is 0 to 2; R_3 is hydrogen or an alkyl group containing 1 to 12 carbon atoms, b is 1 to 3; c is 0 or 1; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_xH_{2x}O)_mZ$

where x, m and Z are as defined above, or oxygen provided only one R_4 is oxygen and further provided that there is no X^- when R_4 is oxygen; R_5 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms; X is halide; and Y is nitrogen, sulfur or phosphorus and the sum of the carbon atoms in R_2, R_3, R_5 and R_4 when R_4 is alkyl, aryl, arylalkyl or carboxy-substituted alkyl does not exceed 20 carbon atoms; and

b. a water-soluble organic anionic detergent in a weight ratio or organosilane to detergent of from 1:1 to 1:10,000.

4,005,031

NICKEL PEROXIDE OXIDIZING AGENT

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 350,281, April 11, 1973. This application Feb. 19, 1976, Ser. No. 659,459

Int. Cl.² C07B *3/00;* **C01B** *15/04*

U.S. Cl. 252—186 **13 Claims**

1. A process for preparing nickel peroxide oxidizing agent, comprising: treating nickel oxide, deposited on fine, free-flowing graphite, with an alkali hypohalite or alkali persulfate in an aqueous alkaline medium.

9. In a process for oxidizing unsaturated alcohols in an inert organic solvent medium with a nickel peroxide oxidizing agent prepared by treating nickel oxide with an alkali hypohalite or an alkali persulfate in an aqueous alkaline medium, the improvement which comprises:

depositing said nickel oxide onto fine free-flowing graphite prior to said treatment.

4,005,032

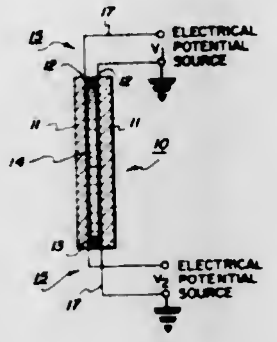
LIQUID CRYSTALLINE COMPOSITION HAVING MIXED CHOLESTERIC-NEMATIC PROPERTIES

Werner E. L. Haas, Webster; James E. Adams, Jr., Ontario, and Bela Richter, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 509,056, Sept. 25, 1974, Pat. No. 3,947,183. This application Nov. 20, 1975, Ser. No. 633,896

Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **1 Claim**



1. A liquid crystalline composition having mixed cholesteric-nematic properties, comprising: about one part by weight p-[N-p-butoxybenzylidene) amino] phenylacetate; about one part by weight p-anisalamino-phenylacetate about two parts by weight p-anisalamino valerophenone; about one part by weight of a mixture of about 65% by weight N-(p-ethoxybenzylidene)-butylaniline and about 35% by weight N-(p-methoxy-benzylidene) -p-butylaniline; and, up to about 5% by weight of an optically active material selected from the group consisting of cholesteryl chloride; cholesteryl erucate; cholesteryl-2-(2-ethoxy) ethyl carbonate; and cholesteryl geranyl carbonate.

4,005,033

RESILIENT ORGANIC MICROSPHERES IN MASTIC ADHESIVES, SEALANTS, CAULKS, COATING COMPOUNDS AND RELATED PRODUCTS, AND METHODS OF MANUFACTURE

Phillip Carl Georgeau, and Lester I. Winebrenner, both of Kalamazoo, Mich., assignors to Champion International Corporation, Stamford, Conn.

Filed May 17, 1973, Ser. No. 361,364

Int. Cl.² C08J *9/32, 9/22*

U.S. Cl. 260—2.5 B **5 Claims**

1. Process for the preparation of a mastic adhesive composition which comprises subjecting an aqueous slurry of hollow, resilient expandable thermoplastic resinous microspheres formed of an expandable copolymer or vinylidene chloride and acrylonitrile having a diameter of about 6 to 8 microns and having incorporated therein a volatile liquid blowing agent for said thermoplastic resin, to a temperature of about 80° to 140° C. for a period of about 1 to 3 seconds whereby the blowing agent is converted to a gas causing the microspheres to expand, and then quenching to 50° to 65° C. with an aqueous mastic composition to increase the volume and decrease the weight of said adhesive.

4,005,034

POLY(HALOETHYL-ETHYLENEOXY) PHOSPHORIC ACID ESTER POLYMERS AS FLAME RETARDANT AGENTS

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 409,486, Oct. 25, 1973, Pat. No. 3,896,187, Continuation-in-part of Ser. No. 164,928, July 21, 1971, abandoned, Continuation-in-part of Ser. No. 760,988, Sept. 19, 1968, abandoned. This application Dec. 20, 1974, Ser. No. 535,004

Int. Cl.² C08K *5/51, 5/52;* **C08J** *9/52*

U.S. Cl. 260—2.5 AJ **6 Claims**

1. A flame retardant composition comprising, in admixture, a polymeric material selected from the group consisting of polystyrene, polyolefines, vinyl polymers, rubber, nitrocellulose, epoxy resins, phenolic resins, acrylic resins, polyesters, cellulose acetate polymers, and polyurethane polymers in combination with liquid poly(chloroethylethyleneoxy) phosphoric acid esters which are prepared by reacting tris (2-chloroethyl) phosphate by heating said phosphate to a temperature within the range of from about 140° C. to about 220° C. in the presence of a basic catalyst with ethylene dichloride as reaction byproduct; and terminating said reaction at a reaction byproduct level of ethylene dichloride in an amount of from about 0.5 mole to about 0.9 mole ethylene dichloride per mole of tris(2-chloroethyl) phosphate in said reaction.

4,005,035

COMPOSITION FOR REINFORCED AND FILLED HIGH DENSITY RIGID POLYURETHANE FOAM PRODUCTS AND METHOD OF MAKING SAME

Dann T. Deaver, Harper Woods, Mich., assignor to Tecnik International Corporation, Mount Clemens, Mich.

Filed Dec. 24, 1974, Ser. No. 536,117

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AK **20 Claims**

1. In a process for manufacturing in a mold a rigid polyurethane foam product having a density of from 10 to 80 lb/ft³ with said foam being formed from the reaction of an isocyanate component and a polyol component having a highly branched polyol having a molecular weight per branch of approximately 300 to 800 with at least one said component including a suitable blowing agent, the steps comprising: heating the polyol component and isocyanate component to a preselected temperature above 74° F, mixing the preheated polyol component and isocyanate component, mixing in silica sand and chopped glass fibers with the viscosity of the ad-

mixed components being in the range of from around 1200 cps to around 3600 cps, said chopped glass fibers being in the range of from 3 to 25% by weight of the foamed product, said silica sand being in the range of from 10 to 75% by weight of the foamed product, with the polyurethane being no less than about 20% by weight of the foamed product, said silica sand being of a mesh size of from No. 30 U.S. sieve to No. 200 U.S. sieve, said chopped glass fibers being 1/32" to 1" in length with each fiber being comprised of a plurality of filament strands, heating the mold to a temperature approximately at or above the temperature of the preheated materials, pouring the admixed components into the mold for foaming.

4,005,036

FROTHED MOLDING COMPOSITIONS

Joseph P. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 25, 1974, Ser. No. 464,100

Int. Cl.² C08J *9/30;* **C08L** *61/04, 61/24, 61/34*

U.S. Cl. 260—2.5 F **13 Claims**

1. A frothed molding composition consisting essentially of a film of an uncured binder uniformly dispersed throughout a fibrous matrix of fibers wherein the molding composition is frothed in the presence of a frothing agent of salts of fatty acids wherein the composition comprises 35 to 95% by weight of solids of binder and 5 to 65% by weight of solids of fibers and wherein the uncured binder is a phenol-formaldehyde condensate, a phenol-aminoplast-formaldehyde condensate, an aminoplast-formaldehyde condensate, a furfuryl condensate, a furfuryl alcohol condensate, or a resorcinol-formaldehyde condensate.

4,005,037

POLYCARBONATE-POLYVINYL CHLORIDE MOULDING COMPOUNDS

Fritz Mietzsch; Dietrich Hardt, both of Cologne; Volker Serini, Krefeld; Herbert Bartl, Odenthal-Hahnenberg, and Hugo Vernaleken, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 14, 1975, Ser. No. 540,981

Claims priority, application Germany, Jan. 17, 1974, 2402177

Int. Cl.² C08L *7/00, 67/06*

U.S. Cl. 260—4 AR **14 Claims**

1. A process for the production of an aromatic polycarbonate-modified vinyl chloride polymer which comprises the radical polymerisation of a mixture of olefinically unsaturated monomers containing at least 70% by weight of vinyl chloride in the presence of at least one aromatic polycarbonate having an average molecular weight of from 10,000 to 200,000 and the addition of from 0-100% by weight, based on the aromatic polycarbonate-modified vinyl chloride polymer, of a rubber or a rubber-modified thermoplastic resin after polymerisation.

4,005,038

PAINT COMPOSITION CONTAINING DENATONIUM BENZOATE OR LIGNOCAINE BENZYL OCTANOATE WITH A LATEX RESIN BINDER FOR APPLICATION OVER OLD PAINT FILMS TO PREVENT INGESTION OF POISONS THEREFROM

Walter Minkoff, Rockville Center, N.Y., assignor to Peerless Paint and Varnish Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 460,875, April 15, 1974, Pat. No. 3,935,137, which is a continuation of Ser. No. 345,071, March 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 267,623, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,796, Feb. 16, 1971, abandoned. This application Nov. 5, 1975, Ser. No. 628,931

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/10;* **C08L** *1/26, 31/04;* **C09K** *3/00*

U.S. Cl. 260—17 R **11 Claims**

1. A coating composition for application to previously coated substrates consisting essentially of a paint containing 0.05% to 0.5% by weight of the non-volatile portion of said paint of a bitter tasting deterrent selected from the group consisting of at least one of denatonium benzoate and lignocaine benzyl octanoate; 9.0% to 99.5% by weight of a latex resin binder for controlling the amount of said deterrent released on contact with saliva; and an effective amount of a surfactant for stabilization of said paint, said coating composition having the visual appearance, durability, adhesion, toughness, washability and continuity of conventional paint and having a repulsive taste which discourages persons from licking, sucking, chewing, swallowing or otherwise mouthing said substrates.

4,005,039

CURABLE COMPOSITIONS FOR BULKING TIMBER COMPRISING (A) A MODIFIED POLYOL CONTAINING -0-3-ALKYLENEAMIDO GROUPS AND (B) AN AMINO RESIN PRECURSOR CONTAINING REACTIVE N-HYDROXYMETHYL GROUPS

Duncan Gardiner, St. Albans, England, assignor to Research Corporation, New York, N.Y.

Filed June 10, 1975, Ser. No. 585,527

Claims priority, application United Kingdom, June 28, 1974, 28902/74

Int. Cl.² C08L *5/00*

U.S. Cl. 260—17.3 **11 Claims**

1. A composition suitable for use in bulking timber comprising:

a. at least one modified polyol in which at least two of the free hydroxyl groups have been converted to -0-3-alkyleneamido ether groups;
b. an amino resin precursor containing reactive N-hydroxymethyl groups;
c. a curing catalyst for catalyzing the curing of the composition when heated; and
d. a polar solvent capable of swelling wood.

4,005,040

FOAMED AND SOLID RUBBER-STARCH GRAFT COPOLYMER COMPOSITIONS AND METHOD OF PREPARATION

George G. Maher, Dunlap, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 10, 1975, Ser. No. 630,373

Int. Cl.² C08L *3/06, 7/02*

U.S. Cl. 260—17.4 GC **32 Claims**

1. A method of preparing starch graft copolymers comprising the following steps:

a. Preparing an aqueous solution of an alkali metal salt of starch xanthate having a xanthate degree of subsitution of from 0.05 to 3, said aqueous solution having a pH of about 11;

b. Reacting in said aqueous solution hydrogen peroxide and a vinyl monomer with said starch xanthate to form a gel of starch graft copolymer, said starch xanthate, hydrogen peroxide, and vinyl monomer being present in amounts such that the pH of the resulting reaction media drops to a value of from about 2 to 7;
c. Recovering said starch graft copolymer.

4,005,041

AIR-DRYING OR HEAT-CURABLE POLYURETHANE COATING COMPOSITIONS

Kenneth Elliot Piggott, Durban, South Africa, assignor to Prolux Paint Manufacturers (PTY) Limited, Alrode, South Africa

Filed June 24, 1975, Ser. No. 590,013

Claims priority, application South Africa, June 25, 1974, 74/4071; June 25, 1974, 74/4072

Int. Cl.² C08G *18/12;* **C08L** *91/00*

U.S. Cl. 260—18 TN **15 Claims**

1. A process for the production of allyl ether group-containing isocyanate adducts useful in coating compositions, comprising reacting isophorone diisocyanate in the presence of a catalyst with a polyhydroxy compound in the proportion of substantially one mole of the diisocyanate to each hydroxyl group, and then condensing the product so obtained with an hydroxyl group-containing allyl ether of an aliphatic diol or polyol in an amount such that substantially one hydroxyl group in the allyl ether is used for each unreacted isocyanate in said product.

4,005,042

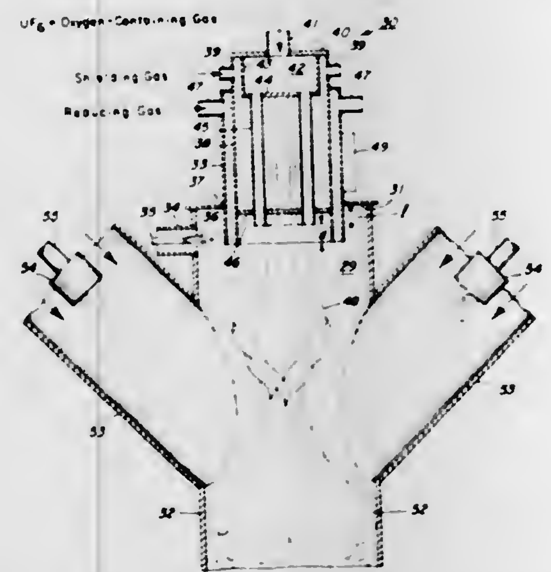
PROCESS FOR PRODUCING URANIUM RICH COMPOSITIONS FROM URANIUM HEXAFLUORIDE USING FLUID INJECTION IN THE POST OXIDATION STEP

Abdul Gaffar Dada, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed July 2, 1975, Ser. No. 592,507

Int. Cl.² C01G *43/02*

U.S. Cl. 252—301.1 R **14 Claims**



1. In the method of preparing a uranium oxide rich composition from uranium hexafluoride in a reaction zone in the presence of an active flame comprising the steps of introducing a first gaseous reactant comprising a mixture of uranium hexafluoride and an oxygen-containing carrier gas into the reaction zone, separately introducing a second gaseous reactant comprising a reducing gas into the reaction zone and separately introducing a shielding gas into the reaction zone between the first gaseous reactant and the second gaseous reactant which temporarily prevents substantial mixing and reaction between the first gaseous reactant and the second gaseous reactant until sufficient cross diffusion of the reactants and the shielding gas occurs as the reactants and the shielding gas pass through the reaction zone, resulting in a reaction producing a particulate uranium dioxide rich composition and gaseous reaction products, and introducing a third gaseous reactant comprising an oxygen-containing gas into contact with the particulate uranium dioxide rich composition and gaseous reaction products thereby converting the gaseous reaction products in the reaction zone to an oxidized form and oxidizing the uranium dioxide rich composition to a higher oxide of uranium, the improvement comprising the step of introducing an atomized fluid having a high latent heat of evaporation into the third gaseous reactant so that the third gaseous reactant envelopes the atomized fluid as it is introduced into the reaction zone and the atomized fluid is converted to a gas and cools the materials in the reaction zone.

4,005,043

PREPARATION OF COMPOSITION FOR CONVERTING HYDROCARBONS AND FATS INTO BIODEGRADABLE AQUEOUS EMULSIONS

Pierre Fusey, 8 Rue l'Abbe de l'Epee, Paris 5eme, France

Filed July 25, 1975, Ser. No. 599,164

Claims priority, application France, July 25, 1974, 74.25835

Int. Cl.² B01F *17/00*

U.S. Cl. 252—356 **7 Claims**

1. A process for the preparation of a composition for forming hydrocarbons or fats into a biodegradable emulsion, comprising admixing at ambient temperature more than one mole of a $C_8 - C_x$ carboxylic acid with a mole of a nitrogen compound selected from the group consisting of tertiary alkyl amines and tertiary alkanolamines, with the addition of 2 to 10% by weight of the composition of lecithin, adding ammonia to bring the mixture to a pH of from 7 to 9, and diluting the composition thus formed with a benzene-free petroleum solvent or water.

4,005,044

METHOD OF MAKING AQUEOUS ANTIFOAM COMPOSITIONS

William J. Raleigh, Watervliet, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 20, 1975, Ser. No. 588,700

Int. Cl.² B01D *19/04*

U.S. Cl. 252—358 **10 Claims**

1. A method of making a stable, emulsified antifoam composition, which comprises:

i. dissolving an emulsifying agent in water;
ii. dispersing a dimethylpolysiloxane fluid in the solution of the emulsifying agent;
iii. admixing a silazane-treated precipitated silica filler with the dispersion produced in step (ii), and
iv. milling the mixture of step (iii) until there is produced a composition which is homogeneous and incapable of separating into two layers.

4,005,045

METHOD FOR CARRYING OUT ENDOTHERMIC CHEMICAL REACTIONS WITH THE USE OF NUCLEAR REACTOR COOLING GASES

Egon Haese, Bochum-Linden, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 15, 1973, Ser. No. 388,347

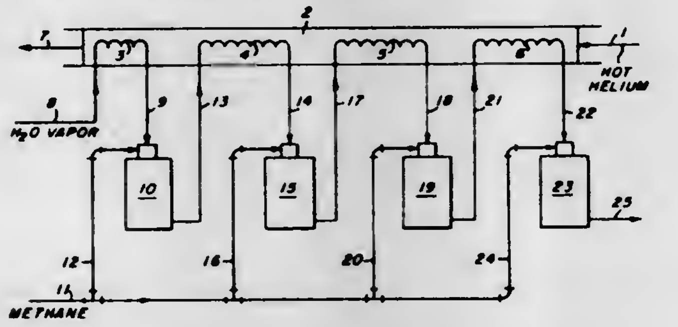
Claims priority, application Germany, Aug. 17, 1972, 2240355

Int. Cl.² C01B *2/16, 2/02*

U.S. Cl. 252—373 **9 Claims**

1. In the method for carrying out an endothermic chemical reaction of the type wherein a hydrocarbon fuel is dissociated by reaction with a gaseous medium and wherein a mixture of the gaseous medium and fuel are heated by a cooling medium from a nuclear reactor and passed through a plurality of serially-connected reaction chambers, the steps of:

1. passing said gaseous medium through a first heat exchanger to the first of said serially-connected reaction chambers while adding a portion of said fuel to the first reaction chamber,
2. passing the output of said first reaction chamber through a second heat exchanger and thence to a second of said reaction chambers while adding another portion of the fuel to the second reaction chamber,



3. repeating step (2) by passing the output of each reaction chamber through a heat exchanger and thence to a succeeding one of said serially-connected reaction chambers while adding a portion of the fuel to each reaction chamber, and
4. causing a cooling medium from said nuclear reactor to contact all of said heat exchangers whereby heat from the cooling medium is transferred via said heat exchangers to said reaction chambers to facilitate said endothermic chemical reaction.

4,005,046

CATALYSTS AND CARRIERS THEREFOR

Grish Chandra, Penarth, and Brian John Griffiths, Coytrahen, near Bridgend, Wales, assignors to Dow Corning Limited, Barry, Wales

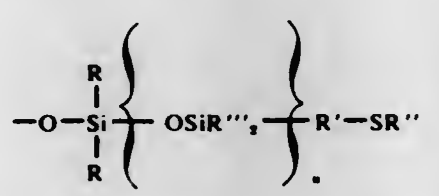
Filed Nov. 6, 1975, Ser. No. 629,268

Claims priority, application United Kingdom, Nov. 12, 1974, 49028/74

Int. Cl.² B01J *31/02*

U.S. Cl. 252—428 **6 Claims**

1. As a composition of matter an inorganic particulate solid having chemically bonded to the surface thereof at least one group of the general formula



$$-O-\underset{R}{\overset{R}{Si}}\left\{OSiR'''_2\right\}_n R'-SR''$$

wherein the R substituents are the same or different and are selected from the group consisting of a chlorine atom, a bromine atom, a monovalent radical having from 1 to 8 inclusive carbon atoms and free of aliphatic unsaturation which is a hydrocarbon radical, a halogenated hydrocarbon radical, an oxyhydrocarbon radical, an oxime radical having less than 14 carbon atoms, an oxygen atom and the radical $-NQ_2$, in which each Q represents a hydrogen atom or an alkyl or an aryl radical having less than 10 carbon atoms, R′ represents a divalent hydrocarbon radical having from 1 to 16 inclusive carbon atoms, R″ and R‴ represents a monovalent hydrocarbon radical free of aliphatic unsaturation and having from 1 to 8 inclusive carbon atoms and *n* is 0 or an integer of 1 to 20, the sulfur atom in said group being coordinatively bonded to an atom of platinum or rhodium.

4,005,047

CATALYTIC COMPOSITION AND ITS USE FOR POLYMERIZING CYCLOOLEFINS

Yves Chauvin, St. Germain en laye; Dominique Commereuc, Meudon; Daniel Cruypelinck, Nanteuil le Haudoin, and Jean-Pierre Soufflet, Chatou, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 4, 1975, Ser. No. 547,032

Claims priority, application France, Feb. 4, 1974, 74.03715; May 21, 1974, 74.18008; Nov. 20, 1974, 74.38111

Int. Cl.² C08F *4/22*

U.S. Cl. 252—429 R **7 Claims**

1. A catalytic composition, particularly useful for polymerizing cycloolefins, consisting essentially of:

a. a compound of the formula

$$M(CO)_yL_z$$

or

$$L_x(CO)_{5-x}\text{-}MC(R)(R^1)$$

wherein

M is molybdenum or tungsten;

L is a hydrocarbyl amine, a hydrocarbyl ether, a hydrocarbyl nitrile, a hydrocarbyl ketone, pyridine, a hydrocarbyl pyridine, a hydrocarbyl phosphine, a hydrocarbyl arsine, a hydrocarbyl stibine, hexamethyl phosphoramide, or a phosphorus, arsenic or antimony trihalide;

R and R^1 are selected from the group consisting of the radicals R_1, OR_3, SR, NHR and NR_1R_2 in which R_1 and R_2 are hydrogen or hydrocarbyl radicals and R_3 is hydrogen, a hydrocarbyl radical or a quaternary hydrocarbyl ammonium group;

x is 0 or 1;

y is 6 −*z*N, N being the number of polar groups of L; and

z is 0 or an integer from 1 to 5; and

b. titanium tetrachloride, the molar ratio of (b) to (a) being 5 : 1 to 300 : 1 respectively.

4,005,048

TREATING HYDROCARBONS

Dennis Albert Dowden; Ian Robertson Shannon, and Michael Staines Spencer, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 245,882, April 21, 1972, Pat. No. 3,857,901. This application May 7, 1974, Ser. No. 467,800

Claims priority, application United Kingdom, Apr. 27, 1971, 11548/71

Int. Cl.² C07C *3/58, 5/24*

U.S. Cl. 252—432 **6 Claims**

1. An acidic catalyst for treating hydrocarbons consisting essentially of a crystalline solid solution in zirconia of an irreducible oxide of a lower valency metal selected from the group consisting of magnesium, aluminum, yttrium, calcium, manganese and rare earth metal, wherein the zirconia is present in solution in excess by atoms so that the crystal lattice of the zirconia is made defective by the presence of the oxide of the selected lower valency metal, the percentage by metal atoms of the selected lower valency metal in the solution being in the range 0.05% to 30%; and wherein the crystalline solid solution also contains an acidic co-catalyst in a proportion of 0.1 to 20% by weight, said co-catalyst being silica, boria or an ion selected from the group consisting of sulphate, chloride, fluoride, and phosphate, said ion being chemically combined with the solid solution.

4,005,049

SILVER CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1975, Ser. No. 580,683

Int. Cl.² B01J *23/66, 23/68*

U.S. Cl. 252—467 **11 Claims**

1. A silver/transition metal catalyst obtained by calcining the polysilver salt of a polycarboxylic acid and at least one transition metal salt of a polycarboxylic acid at temperatures from 200°–500°C under an inert gas and oxidizing the said calcined salts with oxygen at temperatures from 20°–500°C, the said polysilver salt being selected from the group consisting of aromatic polycarboxylic acids and heterocyclic polycarboxylic acids and the transition metal of said transition metal salt being selected from the group consisting of the metals of Groups IV-B, V-B, VI-B, VII-B, VIII and I-B of the Periodic Table.

4,005,050

TANTALUM OR NIOBIUM-MODIFIED RESISTOR ELEMENT

Ronald K. Stewart, Mount Clemens, and Robert H. Insley, Royal Oak, both of Mich., assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 19, 1972, Ser. No. 245,511

Int. Cl.² H01B *1/06*

U.S. Cl. 252—521 **7 Claims**

1. A green ceramic article useful after firing as an electrical resistor element which is a modified stannic oxide semi-conductor, said article consisting essentially of stannic oxide, a modifying oxide selected from the group consisting of tantalum pentoxide, and niobium pentoxide, a barium, calcium or strontium compound, a boron compound and silica, the amount of said modifying oxide, based on the total weight of the article, when tantalum pentoxide, ranging from 1 to 18 percent by weight and, when niobium pentoxide, ranging from ½ to 5 percent by weight, the total barium, calcium or strontium content of the article, calculated as CaO, BaO, or SrO respectively, ranging from 1 to 26 percent by weight, the total boron content of the article, calculated as B_2O_3, ranging from 4 to 25 percent by weight, and the total silica, calculated as SiO_2, ranging from ½ to 4 percent by weight wherein a plot of the resistance versus the amount of the modifying oxide present in the fired resistor has a positive slope as the tantalum pentoxide varies from 1 to 18 percent or as the niobium pentoxide varies from ½ to 5 percent by weight of the green ceramic article.

7. A method for producing a sintered electrical resistor element, said method comprising the steps of preparing a batch which is a uniform mixture of finely divided particles, said batch consisting essentially of stannic oxide, a modifying oxide selected from the group consisting of tantalum pentoxide and niobium pentoxides, a barium, calcium or strontium compound, a boron compound and silica, the amount of said modifying oxide, based on the total weight of the batch, when tantalum pentoxide, ranging from 1 to 18 percent by weight and, when niobium pentoxide, ranging from ½ to 5 percent by weight, the total barium, calcium or strontium content, calculated as CaO, BaO or SrO respectively, ranging from 1 to 26 percent by weight, the total boron content of the batch, calculated as B_2O_3, ranging from 4 to 25 percent by weight, and up to 4 percent by weight silica, based upon the total weight of the batch, pressing a shape from the batch at a pressure of about 10,000 to 40,000 pounds per square inch, and firing the shape to a temperature within the range of about 2300°–2700° F. for a time sufficient to form said resistor element.

4,005,051

WATER-COMPATIBLE SOLVENTS FOR FILM-FORMING RESINS AND RESIN SOLUTIONS MADE THEREWITH

Josef Klemens Brunner, Scheuchzerstrasse 47, Zurich, Switzerland

Filed Nov. 4, 1974, Ser. No. 520,901

Claims priority, application Austria, Nov. 5, 1973, 9267/73

Int. Cl.² C09D *3/40, 3/48;* **B01F** *1/00*

U.S. Cl. 260—29.4 R **5 Claims**

1. A water-miscible film-forming composition in the liquid state comprising one or more film-forming resins dissolved in a solvent, which solvent consists essentially, apart from any water content, of between 0.5 and 80% of at least one dimethyl ester of an aliphatic dicarboxylic acid which acid contains not less than four nor more than six carbon atoms, with the remainder of the non-water component or components of said solvent consisting of the methyl ester of 6-hydroxycaproic acid and at least one substance selected from the group consisting of monomethyl, monoethyl and monobutyl ethers of ethylene glycol, monomethyl, monoethyl and monobutyl ethers of diethylene glycol, and acetates of the aforesaid ethers of ethylene glycol and of diethylene glycol.

4,005,052

AQUEOUS POLYMERIZATION OF UNSATURATION CARBOXYLIC ACID MONOMERS USING ANIONIC SURFACTANT MIXED WITH THE MONOMER AND POLYHYDRIC ALCOHOL PRIOR TO REACTION

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed June 9, 1975, Ser. No. 585,039

Int. Cl.² C08L *25/14*

U.S. Cl. 260—29.6 TA **12 Claims**

1. A method of producing a dispersion of copolymer particles in water comprising, forming a liquid mixture of monoethylenic monomers and from 2% up to about 50%, based on the weight of said monomers, of water insoluble polyhydric alcohol selected from trihydric alcohols and tetrahydric polyhydric alcohols, said polyhydric alcohol having a molecular weight of from 300 up to about 6000, said mixture including from 1–30% of anionic surfactant, based on the weight of said polyhydric alcohol, said monomers including from about 1 to about 30% by weight of monoethylenic carboxylic acid, dispersing said mixture in water to form a dispersion, said dispersion including a free radical polymerization catalyst, subjecting the dispersed liquid mixture in said dispersion containing the said catalyst to agitation at an elevated polymerization temperature, with said monomers being in solution in the dispersed mixture, until polymerization of said monomers has been completed and copolymer particles have been formed, and then neutralizing at least 10% of the acidity in said copolymer particles with a base.

4,005,053

POLYMER-OIL-BLACK MASTERBATCH

George James Briggs; Ernest Jack Buckler, and Yung-Kang Wei, all of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed May 27, 1975, Ser. No. 581,086

Claims priority, application Canada, June 25, 1974, 203375

Int. Cl.² C08F *216/04, 226/02;* **C08K** *5/01*

U.S. Cl. 260—33.6 AQ **17 Claims**

9. An improved masterbatch of synthetic rubber, oil and carbon black which comprises 100 parts by weight of a synthetic C_4–C_8 conjugated diolefin polymer containing from 0.2 to about 2.5 weight percent of copolymerized monomer containing reactive groups selected from one of tertiary amine, hydroxyl and aldehyde, from about 50 to about 150 parts by weight of oil and from about 50 to about 250 parts by weight of carbon black and a sufficient amount of cross-linking agent to react with the reactive groups of the polymer to cause an improvement in the strength and non-flow characteristics of the polymer.

4,005,054

PRODUCTION OF POLYOLEFIN-REINFORCED RUBBER PRODUCTS

Alain Bonnefon, Espinay sur Seine, and Jack Benard, Asnieres, both of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Feb. 8, 1973, Ser. No. 330,619

Int. Cl.² C08J *3/22;* **C08L** *7/00, 23/06*

U.S. Cl. 260—42.56 **17 Claims**

1. A flexible, homogeneous rubbery product comprising a matrix of a rubber selected from the group consisting of a natural elastomer and a synthetic elastomer in which there is uniformly dispersed at least 5% by weight based on the weight of the elastomer of a crystalline polyolefin whose molecular weight is equal to or greater than 500,000, characterized in that the polyolefin is in the condiition of fine particles which are drawn out in the form of a plurality of elongated fibrils having a diameter smaller than 5 microns and a length on the order of from about 2 to 20 millimeters, said polyolefin fibrils being uniformly dispersed within the elastomer matrix with a dominant directional orientation thereby imparting to the product a very high resistance to elongation in accordance with the direction of orientation of the fibrils.

4,005,055

ANAEROBIC AMINIMIDE CURING COMPOSITIONS

Jerry Miron, Livingston; Manilal Savla, Parsippany, and Irving Skeist, Summit, all of N.J., assignors to Skeist Laboratories, Incorporated, Livingston, N.J.

Filed May 22, 1975, Ser. No. 580,047

Int. Cl.² C08F *120/02, 120/52, 124/00, 18/24*

U.S. Cl. 260—47 UA **18 Claims**

1. A sealant composition having extended shelf life in the presence of oxygen and being rapidly polymerizable upon the exclusion of oxygen which comprises a mixture of an unoxygenated aminimide monomer selected from the group consisting of (A) hydroxy substituted aminimides corresponding to the general formula $[CH_2{=}CR-CO-N^--N^+(R_1R_2]n-R_3$, wherein *n* is an integer having a value of 1 or 2, R is hydrogen, loweralkyl, fluorine, chlorine, bromine or a cyano group, R_1 and R_2 are each loweralkyl radicals, R_3 is selected from the group consisting of hydroxyalkyl and substituted hydroxyalkyl radicals and (B) modified aminimides produced by reaction of the aminimides of (A) with reactants of the group consisting of organic isocyanates, epoxides, organic acids and anhydrides; with from about 0.01 to about 20% by weight, based on the weight of the composition, of an organic hydroperoxide.

4,005,056

PROCESS FOR THE PREPARATION OF POLYHYDANTOINS AND POLYPARANIC ACIDS

Willi Dunwald, Leverkusen; Jürgen Lewalter, Cologne, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

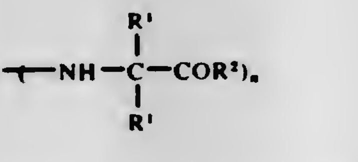
Filed Jan. 30, 1975, Ser. No. 545,380

Claims priority, application Germany, Feb. 1, 1974, 2404741

Int. Cl.² C08G *18/00*

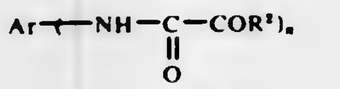
U.S. Cl. 260—77.5 CH **25 Claims**

1. A process for the production of a foil, coating or other shaped product of a polyhydantoin or polyparabanic acid, wherein, in order to prepare the polyhydantoin, a bis- or polyglycine derivative of the formula



$$Ar\left(NH-\underset{R^1}{\overset{R^1}{C}}-COR^2\right)_n$$

wherein Ar is an *n*-valent aromatic group; the groups R^1, which may be the same or different, are hydrogen, aryl or alkyl; R^2 is hydroxyl, amino, alkylamino, dialkylamino, alkoxy or aroxy and *n* is 2, 3 or 4, or, in order to prepare the polyparabanic acid, a bis- or polymonoamidooxalic acid of the formula



$$Ar\left(NH-\underset{\underset{O}{\|}}{C}-COR^2\right)_n$$

wherein Ar, R^2 and *n* are as aforesaid, is heated in the absence of a solvent with at least one blocked reaction product of a di- or poly(thio) isocyanate and a compound containing Zerewitinoff-active hydrogen atoms, to a temperature which obtains a highly fluid melt having a melt viscosity of at most 40,000 m.Pa.s without unblocking said blocked reaction product and the resulting melt is subjected to a shaping process and polycondensed at a temperature of from 150° to 400° C.

4,005,057

ANTISTATIC COMPOSITION CONTAINING AN N-ALKYL POLYCARBONAMIDE AND A PHOSPHONIUM SALT

Gurdial Singh, Hockessin, Del., and Richard Edward von Rutte, Riehen-Basel, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 403,334, Oct. 9, 1973, abandoned. This application Sept. 17, 1975, Ser. No. 614,230

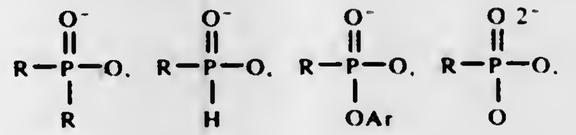
Int. Cl.² C08G *69/46*

U.S. Cl. 260—78 S **4 Claims**

1. An antistatic composition having a log R_s of less than 8 and consisting essentially of an N-alkylpolycarbonamide having a Tg (NMR) of less than 25° C and from 0.02 to 35 weight percent based on the weight of the composition of a phosphonium salt of the formula

$$[R_1R_2R_3R_4P^+]_n\ X^{n-}$$

where $R_1R_2R_3$ and R_4 each represents a monovalent hydrocarbon group of from 1–18 carbon atoms; X^{n-} is an organic anion selected from the group of



$$R-\underset{R}{\overset{\overset{O^-}{\|}}{P}}-O,\quad R-\underset{H}{\overset{\overset{O^-}{\|}}{P}}-O,\quad R-\underset{OAr}{\overset{\overset{O^-}{\|}}{P}}-O,\quad R-\underset{O}{\overset{\overset{O\ 2^-}{\|}}{P}}-O.$$

and $R(SO_3^-)_m$

wherein Ar is an aromatic hydrocarbon radical; R is an aliphatic or an aromatic hydrocarbon radical; *m* is 1 or 2; and *n*, the valence of the anion, is 1 or 2.

4,005,058

PROCESS FOR THE FORMATION AND RECOVERY OF POLY(BISBENZIMIDAZOENZOPHENANTHROLINE)

Edward C. Chenevey, North Plainfield, and Harry T. Hanson, Millburn, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,339

Int. Cl.² C08G *20/00, 20/32, 33/02, 20/20*

U.S. Cl. 260—78.41 **10 Claims**

1. An improved process for the production and recovery of poly(bisbenzimidazobenzophenanthroline) comprising:

a. condensing substantially equimolar quantities of 1,4,5,8-tetracarboxy naphthalene dianhydride and 3,3',4,4'-tetraaminobiphenyl while dissolved in a reaction zone in molten antimony trichloride in a total concentration of about 3 to 10 percent by weight based upon the total weight of said reactants and said antimony trichloride while heating at a temperature of about 150 to 200° C. for about 2 to 10 hours.

b. discharging while at an elevated temperature the resulting reaction mass wherein said poly(bisbenzimidazobenzophenanthroline) is dissolved in antimony trichloride from said reaction zone into a precipitation zone containing hydrochloric acid having a hydrogen chloride content of about 10 to 20 percent by weight which is agitated and maintained at a temperature of about 50° to 100° C. wherein said poly(bisbenzimidazobenzophenanthroline) is precipitated in particulate form and said antimony trichloride is dissolved,

c. substantially separating said precipitated poly(bisbenzimidazobenzophenanthroline) particles from said hydrochloric acid and said antimony trichloride,

d. drying said poly(bisbenzimidazobenzophenanthroline) particles,

e. distilling said hydrochloric acid containing dissolved antimony trichloride resulting from step (c) to recover hydrochloric acid and antimony trichloride, and

f. recycling said antimony trichloride resulting from said distillation of step (e) to said reaction zone of step (a), and recycling said hydrochloric acid resulting from said distillation step (c) to said precipitation zone of step (b).

4,005,059

COPOLYMER OF N-VINYLCARBAZOLE

Adolphe Chapiro, Gif sur Yvette, and Zbigniew Mankowski, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, France

Filed Apr. 30, 1974, Ser. No. 465,639

Claims priority, application France, May 3, 1973, 73.15931

Int. Cl.² C08F *220/06, 226/12*

U.S. Cl. 526—259 **3 Claims**

1. A copolymer made up of units of N-vinyl-carbazole alternated with units of a polymerisable ethylenically unsaturated carboxylic acid selected from acrylic acid and methacrylic acid

2. An at least semi-finished product composed of a copolymer as set forth in claim 1 cross-linked with at least one polyvalent metal ion.

4,005,060

METHOD, APPLIED IN THE PRODUCTION OF TALL OIL, OF PREVENTING OR REDUCING THE EMISSION OF ODOROUS SULPHUR COMPOUNDS AND/OR ACID SULPHUR COMBUSTION PRODUCTS FROM THE BLACK LIQUOR RECOVERY PROCESS IN ALKALINE PULPING

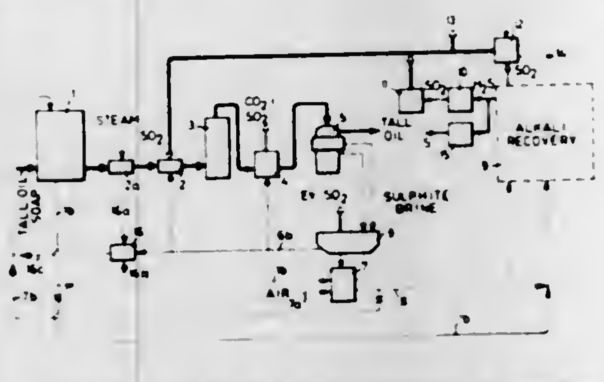
Nils Viktor Mannbro, Asarum, Sweden, assignor to Skogsagarnas Industri Aktiebolag, Vaxjo, Sweden

Filed Dec. 23, 1974, Ser. No. 535,343

Claims priority, application Sweden, Jan. 11, 1974, 7400366

Int. Cl.² C09F *1/00*

U.S. Cl. 260—97.7 **1 Claim**



1. In a method of reducing the emission of sulphur compounds from chemical regeneration processes for black liquor from alkaline wood pulping, in which crude soap is separated from the black liquor and subjected to acid soap splitting using sulphur dioxide and bisulphite, an acid reaction mixture being formed containing tall oil and sulphite brine and lignin sludge from which the tall oil is separated from the sulphite brine and the lignin sludge fraction, all the brine and lignin sludge being introduced into the chemical regeneration process for pulping liquor containing sulphide compounds; the improvement comprising preventing the emission of odorous and toxic sulphide-derived compounds from the soap-splitting by conducting said splitting in a single stage in which the soap is heated by steam injection to a temperature of about 110° C for a period of up to 1 hour in a closed soap-splitting vessel at super-atmospheric pressure while simultaneously injecting sulphur dioxide into said vessel to react with odorous and toxic compounds, reducing the contents of said vessel to atmospheric pressure whereby substantially only SO_2 and CO_2 are emitted from said brine.

4,005,061

METHOD FOR RECOVERING POTASSIUM HYDROXIDE AND ZINC OXIDE FROM POTASSIUM ZINCATE SOLUTIONS

Gilbert Lemaire, Douai, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France and Compagnie Royale Asturienne des Mines, Brussels, Belgium

Continuation of Ser. No. 477,826, June 10, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,724

Claims priority, application France, June 26, 1973, 73.23374

Int. Cl.² C01G *9/02;* **C01D** *1/32*

U.S. Cl. 423—102 **5 Claims**

1. Method of recovering decarbonated potassium hydroxide electrolyte for re-use in electrochemical cells and also zinc oxide from a waste potassium zincate solution extracted from a discharged electrochemical cell comprising the steps of agitating such extracted solution while adding 1 to 5 parts by volume of a solvent selected from the group consisting of methanol, ethanol, and mixtures thereof to said waste zincate solution to effect precipitation of said zinc oxide together with potassium carbonate therefrom, removing the precipitate and leaving a residual mother liquor comprising potassium hydroxide and said solvent and thereafter distilling said mother liquor to effect separation of decarbonated potassium hydroxide electrolyte from said mother liquid for direct re-use as electrolyte in electrochemical cells and recovering the distilled solvent for re-use with other waste potassium zincate solutions

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4,005,062

PROCESS OF PREPARING WATER-SOLUBLE WHIPPABLE EXTRACT FROM MICROORGANISM PROTEIN MATERIAL

Philip G. Schnell, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 16, 1974, Ser. No. 497,844

Int. Cl.² A23J *1/18, 3/02*

U.S. Cl. 260—112 R **13 Claims**

1. A process for the isolation of a whippable protein fraction from microbial cells, consisting of the steps of:

a. providing an aqueous slurry containing from 1 to 20 wt. % (dry basis) microbial cells;

b. heating the slurry to a temperature within the range from about 30° to about 35° C.;

c. separating the heated slurry into a solid phase comprising residual cell material and a liquid supernatant phase comprising pigment and color ingredients;

d. reslurrying the residual cell material by adding water;

e. heating the reslurried residual cell material at temperatures of about 80° to 100° C. for a time period of about 45 to 75 minutes.

f. separating the heated slurry into a solid phase comprising residual cell material and an aqueous supernatant phase comprising a water-soluble protein fraction;

g. recovering the water-soluble protein fraction; and

h. drying the water-soluble protein fraction to produce a product having light color, high foam expansion and stability, bland taste and heat stability.

4,005,063

[DES-GLY]^{10}-GNRH NONAPEPTIDE ANIDE ANALOGS IN POSITION 6 HAVING OVULATION-INDUCING ACTIVITY

Ronald Lee Gendrich, Waukegan; Riemond Henry Rippel, Gurnee, and John Hunter Seely, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 405,334, Oct. 11, 1973, Pat. No. 3,914,412. This application May 15, 1975, Ser. No. 577,815

Int. Cl.² C07C *103/52;* **C08H** *1/00*

U.S. Cl. 260—112.5 LH **1 Claim**

1. A nonapeptide of the formula:

pGlu—His—Trp—Ser—Tyr—X—Leu—Arg—-Pro—NHC_2H_5

wherein all aminoacids are present in their optical L-configuration and wherein X represents leucyl in the D-configuration.

4,005,064

LIQUID CRYSTAL OR MESOMORPHIC 4-METHOXYALKOXY-4'-ALKYL AZOXYBENZENE COMPOUNDS

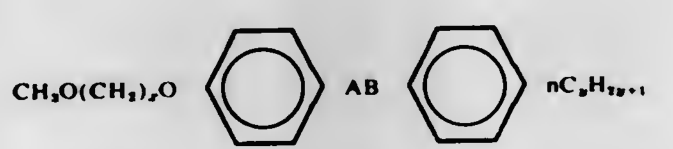
Heinz J. Dietrich, and Edward L. Steiger, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 18, 1971, Ser. No. 144,669

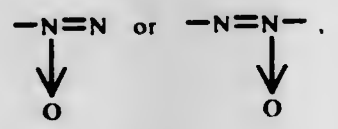
Int. Cl.² C07C *105/00*

U.S. Cl. 260—143 **2 Claims**

1. As a composition of matter, a compound having the chemical structure



where *x* and *y* are the same or different integers of 1 to 10 and where AB is selected from



$$-\underset{\underset{O}{\downarrow}}{N}=N \quad \text{or} \quad -N=\underset{\underset{O}{\downarrow}}{N}- .$$

said compound exhibiting liquid-crystal properties.

4,005,065

UNSYMMETRICAL PHENYL AZO NAPHTHYL CHROMIUM COMPLEX DYES

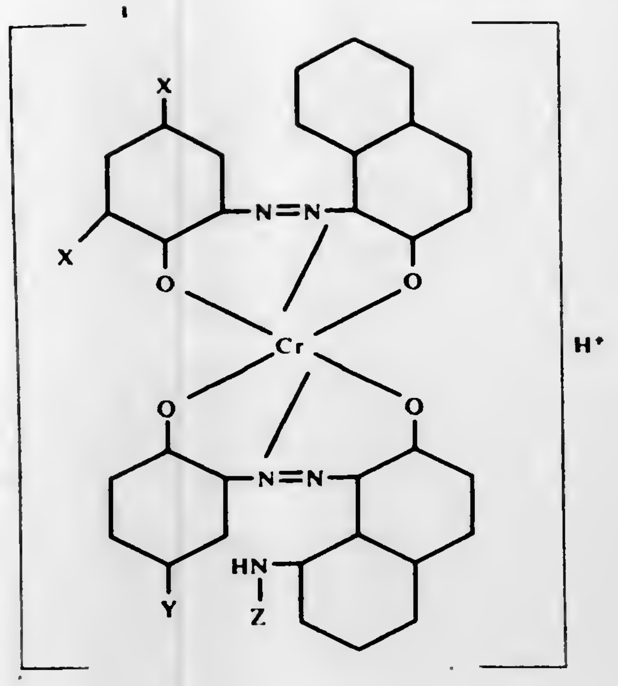
Fabio Beffa, Riehen, Switzerland, and Gerhard Back, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 17, 1974, Ser. No. 479,918

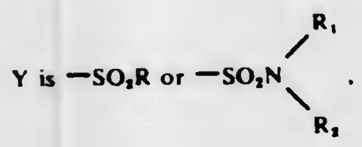
Int. Cl.² C09B *45/06, 45/16;* **D06P** *1/10, 3/02*

U.S. Cl. 260—145 A **4 Claims**

1. A chromium complex dye, which, in the form of its free acid, has the formula



wherein one X is sulfo and the other X is nitro,



$$Y \text{ is } -SO_2R \text{ or } -SO_2N\begin{smallmatrix} R_1 \\ R_2 \end{smallmatrix} .$$

where R is lower alkyl; lower alkyl substituted by chloro or phenyl; cyclohexyl; phenyl or phenyl substituted by chloro, bromo, nitro, methyl or methoxy,

- R_1 and R_2 independently represent hydrogen, lower alkyl or lower alkyl substituted by hydroxy, cyano, lower alkoxy, phenyl, chloro or bromo; and
- R_2 additionally represents cyclohexyl, phenyl or phenyl, substituted by fluoro, chloro, bromo, lower alkyl or lower alkoxy; and
- Z is lower alkanoyl, lower alkoxycarbonyl, lower alkylsulfonyl, or is arylcarbonyl, aryloxycarbonyl or arylsulfonyl wherein "aryl" is phenyl or phenyl substituted by chloro, bromo, nitro, lower alkyl or lower alkoxy.

4,005,066

ISOTRIDECYLAMMONIUM SALTS OF CHROMIUM OR COBALT 1:2 COMPLEX AZO DYES

Peter Gottschalk; Alfred Schoellig, both of Limburgerhof, and Guenther Riedel, Heidelberg-Wieblingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 26, 1974, Ser. No. 483,241

Claims priority, application Germany, July 5, 1973, 2334228

Int. Cl.² C09B *43/00*

U.S. Cl. 260—145 A **6 Claims**

1. An isotridecylammonium salt of a chromium or cobalt 1:2 complex azo dye.

4,005,067

PROCESS FOR THE SYNTHESIS OF NITRITE ION-CONTAINING 1:1 COMPLEXES OF COBALT AND METALLIZABLE MONOAZO OR AZOMETHINE COMPOUNDS AND SUCH COMPLEXES

Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. Nos. 189,767, Oct. 15, 1971, abandoned, and Ser. No. 533,521, Dec. 17, 1974, which is a continuation-in-part of Ser. No. 189,768, Oct. 15, 1971, abandoned. This application June 2, 1975, Ser. No. 583,335

Claims priority, application Switzerland, Oct. 28, 1970, 15925/70; June 11, 1971, 8519/71; June 23, 1971, 9173/71

Int. Cl.² C07C *119/00, 131/00;* **C09B** *45/10, 45/20*

U.S. Cl. 260—151 **27 Claims**

1. A process for the synthesis of a 1:1 complex of cobalt and an azo or azomethine dye having metallizable substituents in ortho and ortho' positions relative to an azo or azomethine group, said complex containing a nitrite ion bound to the cobalt atom, which process comprises reacting at a pH of 3 to 7 an azo or azomethine dye having said metallizable substituents with cobalt ion and nitrite ion, said cobalt ion and nitrite ion being present in amounts sufficient to produce a 1:1 complex of cobalt and said dye containing a nitrite ion bound to the cobalt atom, whereby such a complex is produced.

21. A 1:1 complex of cobalt and an azo or azomethine dye having metallizable substituents in ortho and ortho' positions relative to one azo or azomethine group, said complex containing a nitrite ion bound to the cobalt atom, produced according to the process of claim 1.

4,005,068

DISAZO COMPOUNDS FROM DIPHENYLENE SULFONES AND ACETOACETYLBENZIMIDAZOLONES

Klaus Hunger, Kelkheim, Taunus, and Bernhard Mees, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 4, 1974, Ser. No. 476,267

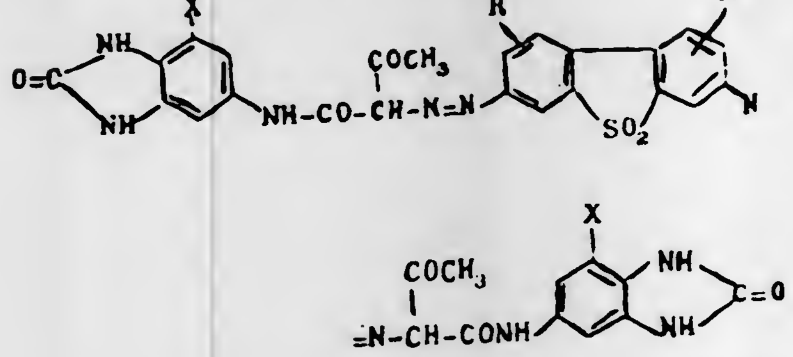
Claims priority, application Germany, June 6, 1973, 2328678

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.² C09B *35/34;* **D06P** *3/00, 3/24, 3/52*

U.S. Cl. 260—157 **3 Claims**

1. A disazo pigment of the formula



wherein R is hydrogen, methyl, methoxy, chlorine or bromine and X is hydrogen or chlorine.

4,005,069

AZO DYES HAVING A 3-HALO-4-CYANO OR ACYL-6-HYDROXYPYRIDONE-2 COUPLING COMPONENT RADICAL

Ulrich Zirngibl, Binningen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

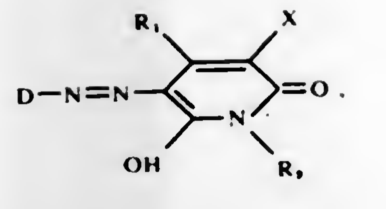
Continuation of Ser. No. 253,410, May 15, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,512

Claims priority, application Switzerland, May 18, 1971, 7276/71

Int. Cl.² C09B *29/36, 43/00*

U.S. Cl. 260—156 **26 Claims**

1. A compound of the formula



wherein

- D is phenyl, naphthyl, pyridyl, thienyl, thiazolyl, benzothiazolyl, benzoisothiazolyl, thiadiazolyl, imidazolyl, triazolyl, quinolyl or isoquinolyl, or a substituted derivative thereof,
  - wherein each substituent of each substituted derivative is independently halo, hydroxy, cyano, thiocyano, nitro, acyl, acyloxy, acylamino, alkyl, alkoxy, phenyl, phenoxy, phenoxy substituted by chlorine or bromine, phenoxysulfonyl, alkylmercapto, phenylmercapto or phenylazo,
- R_1 is cyano, $-COOR_3$ or $-CONR_4R_5$,
  - wherein R_3 is alkyl or phenyl,
  - R_4 is hydrogen, alkyl, alkoxyalkyl, phenyl, amino, alkylamino, dialkylamino, phenylamino, N-alkyl-N-phenylamino, morpholino, piperidino or sulfolyl, and
  - R_5 is hydrogen, alkyl or phenyl,
- R_2 is hydrogen, alkyl, alkyl substituted by alkoxy, hydroxy, cyano, alkylcarbonylamino, phenyl or alkoxycarbonyl, phenyl, amino, alkylamino, dialkylamino, phenylamino, N-alkyl-N-phenylamino, morpholino, piperidino or sulfolyl, and
- X is chloro or bromo,

wherein each acyl and acyl radical of each acyloxy and acylamino is independently $R-Y-$ or $R'-Z-$,

wherein

- R is alkyl or phenyl,
- Y is $-OCO-$ or $-SO_2-$,
- R' is hydrogen, alkyl or phenyl, and
- Z is $-CO-$, $-NR'-CO-$ or $-NR'SO_2-$, and each alkyl, alkoxy, alkyl moiety and alkoxy moiety independently has 1 to 6 carbon atoms.

4,005,070

POLYMER DERIVATIVE OF -DIETHYLAMINOETHYL ESTER OF P-AMINOBENZOIC ACID WITH CELLULOSEGLYCOLIC ACID, METHOD OF PRODUCING AND APPLICATION THEREOF

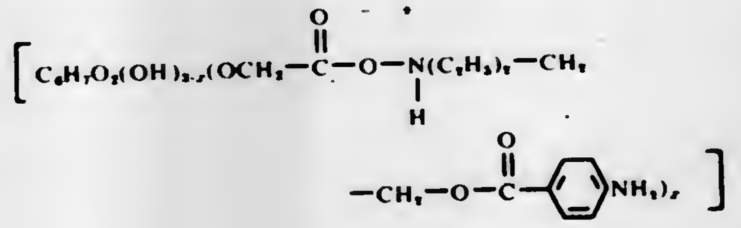
Milda Jaovna Pormale, ulitsa Suvorova, 104, kv. 10; Nadezhda Alexandrovna Kashkina, ulitsa Talsu, 9/11, kv. 22; Arvid Janovich Kalninsh, ulitsa Sverdlova, 8, kv. 3; Varvara Nikolaevna Sergeeva, bulvar Rainisa, 11, kv. 2; Janis Alexandrovich Surna, ulitsa M.Kalju, 3, kv. 3; Janis Shusters, ulitsa Kveles, 15, korpus 4, kv. 30; Modris Jaowich Melzobs, ulitsa Veidenbauma, 1/3, kv. 3a; Waldis Danielowich Mikazhan, ulitsa Marupes, 17, kv. 32; Indulis Waldowich Purwinsh, ulitsa Marupes, 17, kv. 35; Antons Petrowich Skutelis, ulitsa Marupes, 17, kv. 32, and Martinsh Aleksandrowich Liepinsh, ulitsa dzirtsiema, 91, kv. 40, all of Riga, U.S.S.R.

Filed Nov. 30, 1971, Ser. No. 203,470

Int. Cl.² A61K *31/245;* **C08B** *13/00*

U.S. Cl. 536—66 **4 Claims**

1. The salt of β-diethylaminoethyl p-aminobenzoate with celluloseglycolic acid having the following general formula:



$$\left[C_6H_7O_2(OH)_{3-x}(OCH_2-\overset{O}{\overset{\|}{C}}-O-\underset{\underset{H}{|}}{N}(C_2H_5)_2-CH_2-CH_2-O-\overset{O}{\overset{\|}{C}}-C_6H_4-NH_2)_x\right] .$$

where:

x is the degree of substitution ranging from 75 to 100
n is the degree of polymerization ranging from 30 to 120.

4,005,071
P-CHLOROBENZYL N,N-HEXAMETHYLENETHIOLCARBAMATE

Masahiro Aya; Masao Miyamoto; Nobuo Fukazawa, and Masaaki Yamagishi, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

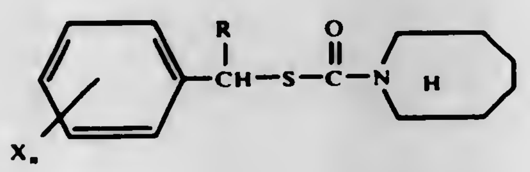
Continuation of Ser. No. 114,031, Feb. 9, 1971. This application Apr. 16, 1975, Ser. No. 568,750

Claims priority, application Japan, Feb. 14, 1970, 45-12463

Int. Cl.^{2} C07D *295/20*

U.S. Cl. 260—239 BF **1 Claim**

1. Thiolcarbamic acid ester compound of the formula



wherein R is hydrogen, *n* is 1, X is chloro and the substituted position is para.

4,005,072
OIL-SOLUBLE AZIRIDINYL UREA COMPOUNDS AS LUBRICATING OIL DETERGENTS

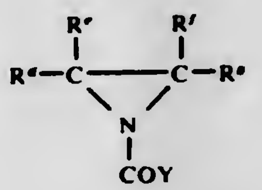
Louis De Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 5,129, Jan. 22, 1970, abandoned. This application Apr. 25, 1975, Ser. No. 571,885

Int. Cl.^{2} C07D *203/20*

U.S. Cl. 260—239 E **4 Claims**

1. A compound of the formula

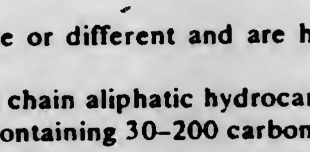


wherein

R$^{d\text{-}f}$ are the same or different and are hydrogen or lower alkyl;

R^g is a branched chain aliphatic hydrocarbon group free of unsaturation containing 30–200 carbon atoms and having at least 1 branch of from 1 to 2 carbon atoms per 4 carbon atoms along the chain; and

Y is a monovalent radical of the formula



$$-\overset{X^b}{\overset{|}{N}}\!\left(U^a-\overset{X^b}{\overset{|}{N}}\right)_{n^1}\!\!-H$$

wherein

U^a is an alkylene of from 2–3 carbon atoms, there being at least 2 carbon atoms between nitrogen atoms,

X^b is an alkyl of from 1–2 carbon atoms, and

n^1 is an integer of from 2–4.

4,005,073
6-ACYL DERIVATIVES OF AMINOPENICILLANIC ACID

Roland Reiner, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

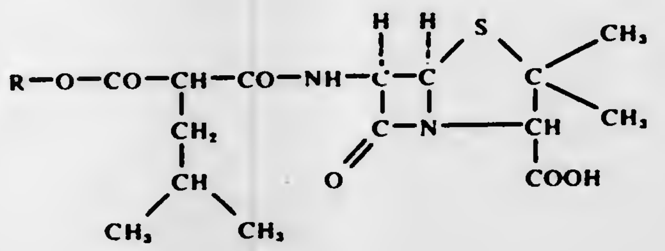
Filed Feb. 24, 1975, Ser. No. 552,485

Claims priority, application Switzerland, Mar. 12, 1974, 3415/74

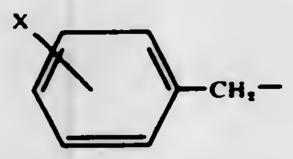
Int. Cl.^{2} C07D *499/66*

U.S. Cl. 260—239.1 **4 Claims**

1. Compounds represented by the formula



wherein R is represented by the formula



wherein X is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or lower alkoxy-lower alkyl

and pharmaceutically acceptable salts and hydrated forms thereof.

4,005,074
PROCESS FOR CLEAVING AN IMIDO SIDE CHAIN FROM PENICILLINS AND CEPHALOSPORINS

Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

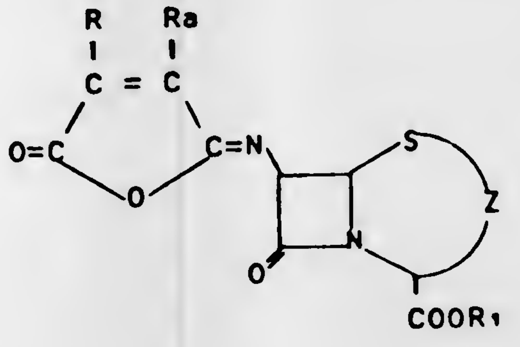
Filed June 18, 1973, Ser. No. 371,095

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

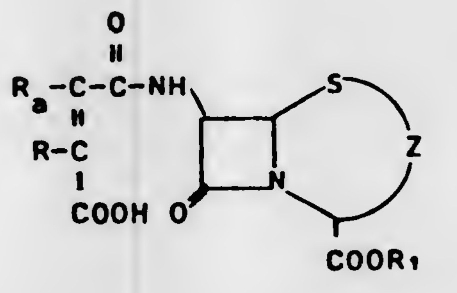
Int. Cl.^{2} C07D *501/20*

U.S. Cl. 260—239.1 **59 Claims**

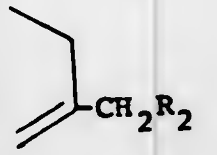
1. A process for preparing an isoimide of the formula



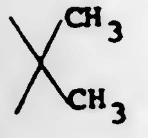
which comprises the step of dehydrating an amic acid of the formula



in which, in the above formulae, R and R$_a$ are hydrogen, or R and R$_a$ taken together with the carbon atoms to which they are attached represent an ortho-phenylene ring:



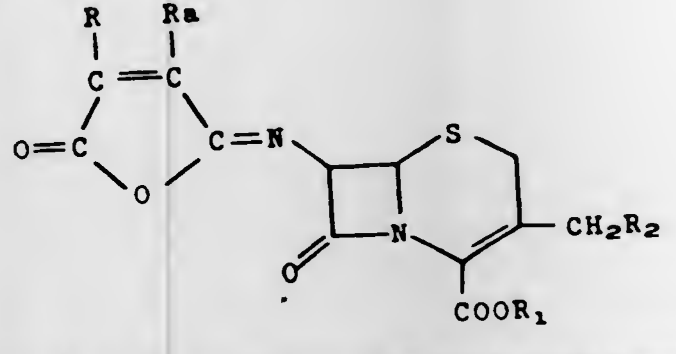
or



;

R$_1$ is hydrogen or a carboxy protecting group; and R$_2$ is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio.

46. A compound of the formula



in which R and R$_a$ are hydrogen, or R and R$_a$ taken together with the carbon atoms to which they are attached represent an orthophenylene ring; R$_1$ is hydrogen or a carboxy protecting group; and R$_2$ is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio.

4,005,075
PENICILLINS AND THEIR PREPARATION

Hirotada Yamada, Nishinomiya; Hisao Tobiki, Toyonaka; Iwao Nakatsuka, Nishinomiya; Norihiko Tanno; Kozo Shimago, both of Takarazuka, and Takenari Nakagome, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

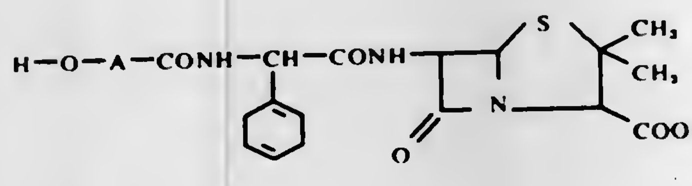
Division of Ser. No. 458,417, April 5, 1974, Pat. No. 3,945,995. This application Sept. 5, 1975, Ser. No. 610,754

Claims priority, application Japan, Apr. 5, 1973, 48-39358

Int. Cl.^{2} C07D *499/68*

U.S. Cl. 260—239.1 **4 Claims**

1. A penicillin of the formula:



wherein A represents a heterocyclic aromatic ring selected from the group consisting of pyridine, pyrimidine, pyridazine, triazine, pyrazine, quinoline, isoquinoline, cinnoline, naphthyridine, quinoxaline, pyrazolopyridine, thiazolopyrimidine and pyridopyrimidine.

4,005,076
HYDRAZONES OF 3-FORMYLRIFAMYCIN SV

Renato Cricchio, Via Carcano Varese, and Giancarlo Lancini, Via Vittadini Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

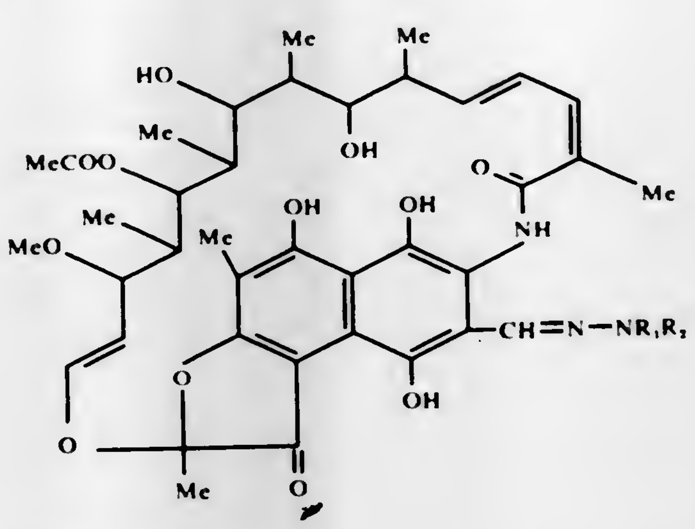
Continuation-in-part of Ser. No. 263,238, June 15, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,306

Claims priority, application Italy, June 24, 1971, 89608/71

Int. Cl.^{2} C07D *498/08*

U.S. Cl. 260—239.3 P **11 Claims**

1. A compound of the formula



wherein

R$_1$ is selected from hydrogen, 1 to 12 carbon alkyl, phenyl and benzyl; R$_2$ is selected from 5 to 12 carbon alkyl; 3 to 5 carbon alkenyl; phenyl; phenyl substituted with one to three groups each independently selected from lower alkyl, halo, nitro, lower alkoxy, trifluoromethyl, amino, sulfo, fluorosulfonyl, lower alkylsulfonyl and fluoro-lower alkylsulfonyl; phenoxy-lower alkyl wherein the lower alkyl moiety has 2 to 4 carbons and the phenoxy group may have one to three substituents each independently selected from halo, amino, and acetamino; 5 to 15 carbon cycloalkyl; 4-biphenyl; 4-phenylbenzyl; heterocyclic ring selected from pyridine, pyridine substituted with 1 to 2 groups each independently selected from lower alkyl and nitro, N-lower alkyl-substituted piperidine, pyrimidine, pyrimidine substituted with 1 to 2 groups, each independently selected from lower alkyl, hydroxy and nitro, pyridazine, pyridazine substituted with 1 to 2 groups each independently selected from amino, chloro, phenoxy, piperidino, N-lower alkyl-piperazino and bis(hydroxyethyl-)amino, quinoline, quinoline substituted with 1 to 2 groups each independently selected from lower alkyl, lower alkoxy, fluoro, trifluoromethyl and phenyl; with the proviso that when R$_1$ is hydrogen or 1 to 4 carbon alkyl, R$_2$ is not phenyl; and their 16, 17; 18, 19; 28, 29-hexahydro and 27-demethoxy-27-hydroxy analogous compounds.

4,005,077
ANTIBIOTICALLY ACTIVE COMPOUNDS

Hans Bickel, Binningen, and Wilhelm Kump, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 342,222, March 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 5,899, Jan. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 571,413, Aug. 10, 1966, abandoned. This application Sept. 25, 1974, Ser. No. 508,974

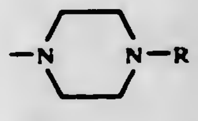
Claims priority, application Switzerland, Aug. 24, 1965, 11879/65; Aug. 11, 1969, 12131/69; Dec. 8, 1969, 18249/69

Int. Cl.^{2} C07D *491/06*

U.S. Cl. 260—239.3 P **10 Claims**

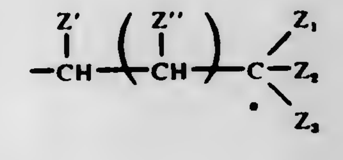
1. A member selected from the group consisting of a 3-amino rifamycin SV, a 3-amino-16,17; 18,19-tetrahydro-rifamycin SV, a 3-amino-16,17; 18,19; 28,29-hexahydro-rifamycin SV, the corresponding quinonic forms of these compounds

derived from rifamycin S, alkali metal salts of the hydroquinonic form of these compounds, therapeutically acceptable acid addition salts, and quarternary ammonium salts with hydrohalic, sulphuric or sulphonic acid esters of alkanols having from 1 to 16 C atoms, of these compounds, wherein the 3-amino group is a member selected from the group consisting of a 1-piperazinyl group of the formula



and of such group alkylated by lower alkyl radicals at any of the carbon atoms of the piperazine ring, wherein R is a member selected from the group consisting of

- A. Hydrogen
- B. a hydrocarbon radical selected from the group consisting of
  - 1.
    - a. an unsubstituted alkyl group having not more than 6 C atoms or an alkyl group having such number of C-atoms substituted by
      - a'. one or two groups selected from the group consisting of hydroxy groups, lower alkoxy groups, carbo-lower alkoxy groups, or
      - b'. by one group selected from the group consisting of phenyl and phenyl substituted by one or two identical or different radicals selected from the group consisting of lower alkyl, lower alkoxy and halogen atoms
    - b. phenyl and phenyl substituted by one or two identical or different radicals selected from the group consisting of lower alkyl, lower alkoxy and halogen atoms, the terms "lower" as referred to alkyl, alkoxy and carbo-lower alkoxy groups having the meaning "from 1 to 6 C-atoms",
  - 2. a hydrocarbon radical with not more than 35 C atoms of the formula



$$-\overset{Z'}{\overset{|}{CH}}-\left(\overset{Z''}{\overset{|}{CH}}\right)-\overset{Z_1}{\underset{Z_3}{C}}-Z_2 \qquad (III)$$

in which

n=0 or 1, and

Z₁ represents, when taken alone,

- a. an unsubstituted lower alkyl or lower alkenyl group
- b. a lower alkyl or lower alkenyl group substituted by
  - a'. phenyl or phenyl substituted by 1 to 3 lower alkyl groups or halogen atoms or
  - b'. C_3–C_8 cycloalkyl or C_3–C_8 cycloalkenyl
- c. phenyl or phenyl substituted by 1 to 3 lower alkyl groups or halogen atoms
- d. C_3–C_8 cycloalkyl or C_3–C_8 cycloalkenyl

Z_2 represents, when taken alone, hydrogen, or a lower alkyl or lower alkenyl group,

Z_3 represents, when taken alone, a lower alkyl or lower alkenyl group,

Z' and Z'', when taken alone, each represent hydrogen or an alkyl group of 1–4 carbon atoms,

Z_3 taken together with Z'' represents a double bond,

Z_2 taken together with Z_3 represents a lower alkylidene or lower alkenylidene group,

Z_1 taken together with Z_2 represents an unsubstituted lower alkylene or lower alkenylene group,

Z_1 taken together with Z_3 represents an lower alkylene or lower alkenylene group in the case that Z_2 taken together with Z'' represents a double bond,

with the proviso that the cycloaliphatic groups mentioned, or those formed by an alkylene or alkenylene group $Z_1 + Z_3$ or $Z_1 + Z_2$ together with the C atom indicated in formula (III) to which Z_1, Z_2 and Z_3 are bonded, include such having unsubstituted cycloaliphatic rings as well as such whose rings are substituted by alkyl groups having 1 to 4 C atoms, and such in which two non-adjacent C atoms of the ring are bonded to one another directly or through an alkylidene or alkylene group having 1–4 C atoms and such in which another cycloaliphatic ring having from 3 to 5 C atoms is spirocyclically attached to one C atom of the ring, with the proviso that all such cycloaliphatic groups have not more than a total of 12 carbon atoms and from 3 to 8 ring carbon atoms, any lower alkyl, alkenyl, alkylidene or alkenylidene group containing from 1 to 7 carbon atoms,

3. the allyl group.

4,005,078

DITHIOKETAL DERIVATIVES OF 13-POLYCARBONALKYLGON-4-EN-3-ONES

Gordon Alan Hughes, Haverford, and Herchel Smith, Wayne, both of Pa., assignors to Herchel Smith, Bryn Mawr, Pa.

Continuation-in-part of Ser. Nos. 228,384, Oct. 4, 1962, Pat. No. 3,850,911, Ser. No. 337,823, Jan. 15, 1964, and Ser. No. 388,820, Aug. 11, 1964. This application June 29, 1966, Ser. No. 561,365

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C07J *33/00*

U.S. Cl. 260—239.5 **5 Claims**

1. The composition of matter selected from the group consisting of 17-ethynyl-17β-hydroxy-gon-4-en-3-thioketal having an alkyl group containing 2 to 4 carbons at the 13-position, 17-chloroethynyl-17β-hydroxy-gon-4-en-3-thioketal having an alkyl group containing 2 to 4 carbons at the 13-position, and the acetate esters thereof.

4,005,079

TETRAHYDROPYRANYL ETHERS OF ESTROGENS

Pietro De Ruggieri, and Orazio Sighinolfi, both of Milan, Italy, assignors to Farmila Farmaceutici Milano S.p.A., Italy

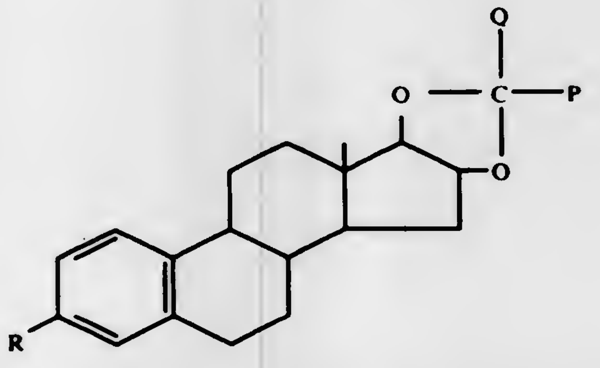
Filed Nov. 19, 1975, Ser. No. 633,476

Claims priority, application Italy, Dec. 13, 1974, 30574/74

Int. Cl.² C07J *21/00*

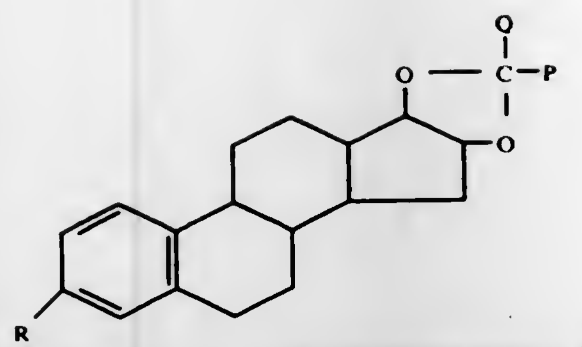
U.S. Cl. 260—239.55 D **5 Claims**

1. Compound of the formula

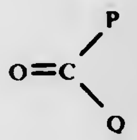


in which R is benzyloxy or 2'-tetrahydropyranyloxy; P is hydrogen, lower alkyl, monocyclic cycloalkyl or monocyclic aryl; Q is lower alkyl, monocyclic cycloalkyl or monocyclic aryl;

2. Process for preparing a compound of the formula



in which R is benzyloxy or 2'-tetrahydropyranyloxy; P is hydrogen, lower alkyl, monocyclic cycloalkyl or monocyclic aryl; Q is lower alkyl, monocyclic cycloalkyl or monocyclic aryl; which comprises reacting a corresponding 3-benzyloxy-16β,17β-dihydroxy compound with a ketone or aldehyde having the formula



wherein P and Q are as above in the presence of an acid catalyst; subjecting the cyclic 3-benzyloxy-16β,17β-acetal thus obtained to hydrogenalysis of the benzyl group and finally etherifying the phenolic function thus liberated with 2,3-dihydropyran in the presence of an acid catalyst.

4,005,080

SUBSTITUTED 2-IMIDAZOLIN-5-ONES

Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

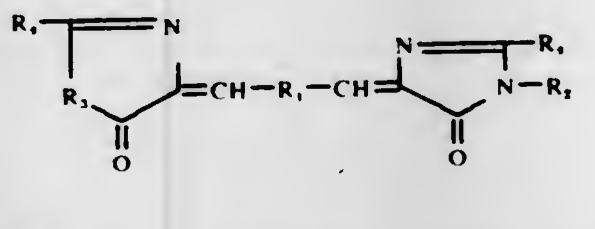
Continuation-in-part of Ser. No. 525,759, Nov. 21, 1974, abandoned. This application Nov. 26, 1974, Ser. No. 527,472

Claims priority, application Switzerland, Nov. 28, 1973, 16697/73; Aug. 16, 1974, 11255/74

Int. Cl.² C07D *403/10, 413/10*

U.S. Cl. 260—240 F **38 Claims**

1. A compound of formula I,



wherein

R_1 is 1,4-phenylene, naphthylene, substituted 1,4-phenylene or substituted naphthylene, wherein substituted 1,4-phenylene or substituted naphthylene has one or two substituents independently selected from chloro, bromo, hydroxy, methyl, methoxy, ethoxy, trifluoromethyl, $(C_{2\text{-}4})$ alkanoylamino, benzoylamino and nitro, with the proviso that not more than one substituent is trifluoromethyl, $(C_{2\text{-}4})$ alkanoylamino, benzoylamino or nitro,

R_2 is hydrogen, $(C_{1\text{-}4})$ alkyl, monosubstituted $(C_{1\text{-}4})$ alkyl, wherein the substituent of monosubstituted $(C_{1\text{-}4})$ alkyl is chloro, bromo, hydroxy, $(C_{1\text{-}4})$ alkoxy, $(C_{1\text{-}4})$ alkylamino, di-$(C_{1\text{-}4})$ alkylamino, $(C_{2\text{-}4})$ alkanoyloxy, $(C_{1\text{-}4})$ alkoxycarbonyl, $(C_{1\text{-}4})$ alkoxycarbonyloxy or benzoyloxy, naphthyl, phenyl or substituted phenyl, wherein substituted phenyl has one, two or three substituents independently selected from chloro, bromo, methyl, $(C_{1\text{-}4})$ alkoxy, $(C_{1\text{-}4})$ alkoxycarbonyl, cyano, nitro, hydroxy, $(C_{1\text{-}4})$ alkylamino, di-$(C_{1\text{-}4})$ alkylamino, $(C_{2\text{-}4})$ alkanoylamino and $(C_{1\text{-}4})$ alkoxycarbonylamino, with the proviso that not more than two substituents are $(C_{1\text{-}4})$ alkoxy, $(C_{1\text{-}4})$ alkoxycarbonyl, cyano or nitro, and not more than one substituent is hydroxy, $(C_{1\text{-}4})$ alkylamino, di-$(C_{1\text{-}4})$ alkylamino, $(C_{2\text{-}4})$ alkanoylamino or $(C_{1\text{-}4})$ alkoxycarbonylamino,

R_3 is oxygen or a group of the formula

$>N-R_5$

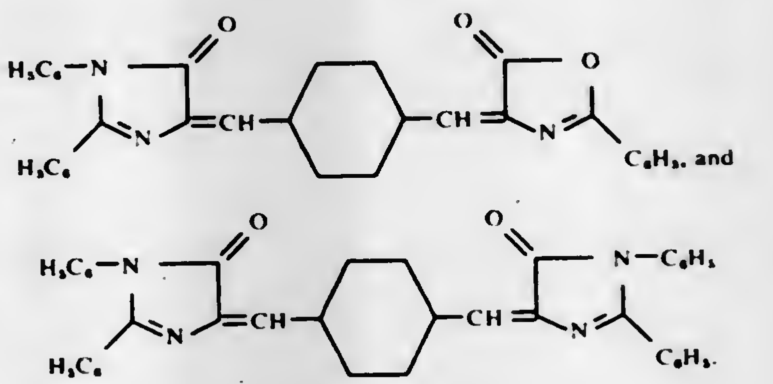
wherein R_5 has one of the significances given above for R_2, and

each of the

R_4's is, independently, phenyl, naphthyl, substituted phenyl or substituted naphthyl, wherein substituted phenyl or substituted naphthyl has one, two or three substituents independently selected from chloro, bromo, methyl, $(C_{1\text{-}4})$ alkoxy, nitro, hydroxy, cyano, $(C_{1\text{-}4})$ alkylamino, di-$(C_{1\text{-}4})$ alkylamino, $(C_{1\text{-}4})$ alkoxycarbonyl, $(C_{1\text{-}4})$ alkoxy $(C_{1\text{-}4})$ alkoxy-caronyl, $(C_{2\text{-}4})$ alkanoyloxy, $(C_{2\text{-}4})$ alkanoylamino, $(C_{1\text{-}4})$ alkoxycarbonylamino and sulpho, with the proviso that not more than two substituents are $(C_{1\text{-}4})$ alkoxy or nitro, and not more than one substituent is hydroxy, cyano, $(C_{1\text{-}4})$ alkylamino, di-$(C_{1\text{-}4})$ alkylamino, $(C_{1\text{-}4})$ alkoxycarbonyl,)$C_{1\text{-}4}$) alkoxy $(C_{1\text{-}4})$ alkoxycarbonyl, $(C_{2\text{-}4})$ alkanoyloxy, $(C_{2\text{-}4})$ alkanoylamino, $(C_{1\text{-}4})$ alkoxycarbonylamino or sulpho,

or a mixture of compounds of formula I.

33. A mixture of compounds according to claim 1, of the formulae



4,005,081

3-HETEROTHIOMETHYL-7α-METHOXY-7β-TETRAZOLYLMETHYLTHIOACETAMIDO-3-CEPHEM DERIVATIVES

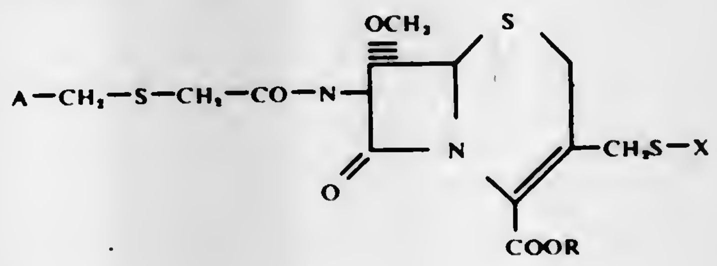
Tetsuo Miyadera, Kanagawa, Japan; Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 11, 1975, Ser. No. 612,387

Int. Cl.² C07D *501/56*

U.S. Cl. 260—243 C **8 Claims**

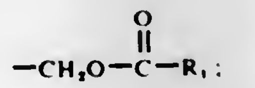
1. A compound of the formula



wherein

A is a tetrazole ring attached by a nitrogen atom, unsubstituted or substituted by lower alkyl;

R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, alkali metal, alkaline earth metal, lower alkylamine, tri (lower alkyl) amine, (C_3-C_8-cyclo-lower alkyl)amine or



$$-CH_2O-\overset{O}{\overset{\|}{C}}-R_1\,;$$

R_1 is lower alkyl, phenyl or phenyl-lower alkyl; and

X is one of the heterocyclic rings oxadiazoloyl, thiadiazolyl, thiatriazolyl, triazolyl or tetrazolyl, unsubstituted or substituted with lower alkyl;

said lower alkyl groups having up to seven carbon atoms.

4,005,082
1H-2,3-BENZOXAZINES

Giorgio Pifferi, Milan, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 761,835, Sept. 23, 1968, abandoned. This application Mar. 19, 1971, Ser. No. 126,357

Claims priority, application United Kingdom, Sept. 25, 1967, 43621/67

Int. Cl.^{2} C07D *265/20*

U.S. Cl. 260—244 R **2 Claims**

1. 6-Chloro-4-(isopropylidene-hydrazino)-1H-2.3-benzoxazine.

4,005,083
METAL COMPLEXES OF AZOLYL ETHERS

Karl Heinz Büchel; Wolfgang Kramer, both of Wuppertal; Helmut Kaspers, and Hans Scheinpflug, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

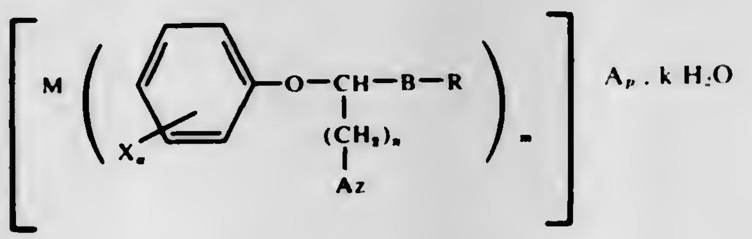
Filed Apr. 30, 1975, Ser. No. 573,212

Claims priority, application Germany, May 17, 1974, 2423987

Int. Cl.^{2} A01N *9/22;* **C07D** *249/08, 233/60*

U.S. Cl. 424—245 **12 Claims**

1. A metal complex of an azolyl ether of the formula



in which

M is copper, zinc, manganese, magnesium, tin iron or nickel,

X is halogen, nitro, nitrile, amino, alkyl or cycloalkyl with in either case up to 6 carbon atoms, halogenoalkyl with 1 or 2 carbon atoms and up to 5 halogen atoms, hydroxymethyl, phenyl, halogenophenyl, phenyl-substituted phenyl, carboxyl, alkoxycarbonyl or alkylcarbonyloxy with in either case a total of up to 5 carbon atoms, alkoxy or alkylthio with in either case 1 or 2 carbon atoms, halogenoalkoxy or halogenoalkylthio with in either case 1 or 2 carbon atoms and up to 5 halogen atoms, phenoxy, benzoyloxy, chlorophenoxy, chlorobenzoyloxy, benzoyl, chlorobenzoyl, dialkylamino with a total of up to 6 carbon atoms, alkylcarbonyl amino with a total of up to 4 carbon atoms, alkylsulfonyl or alkylsulfonyloxy with in either case 1 or 2 carbon atoms, phenylsulfonyl and phenylsulfonyloxy,

Az is an imidazolyl radical, a 1,2,4-triazolyl-(1) radical or a 1,2,4-triazolyl-(4) radical,

B is CO or CH(OH),

R is alkyl with up to 6 carbon atoms or optionally phenyl substituted in o- or p-position with halogen, nitro, nitrile or methyl,

A is a chloride, bromide, iodide, nitrate, sulfate or phosphate anion,

a is 0 or an integer from 1 to 4,

n is 0 or 1,

m is an integer from 1 to 4,

p is an integer from 1 to 4, and

k is an integer from 0 to 8.

4,005,084
THIENYLMETHYL PHENOXY MORPHOLINE COMPOUNDS

Tomio Muro, Nakatsu; Yasuaki Chihara, Fukuoka; Sogo Fukuzawa, Nakatsu; Kiyoshi Ogawa, Fukuoka, and Akira Nakanishi, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed July 10, 1975, Ser. No. 594,913

Int. Cl.^{2} C07D *413/12*

U.S. Cl. 260—247.1 P **5 Claims**

1. The compound:

2-[2-(2-thenyl)phenoxymethyl]morpholine.

4,005,085
BENZOPHENONE DERIVATIVES

Joseph Hellerbach, and André Szente, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

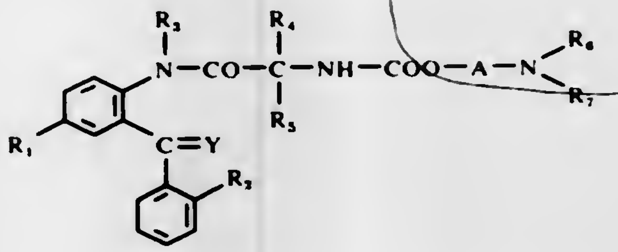
Filed Nov. 22, 1974, Ser. No. 522,678

Claims priority, application Switzerland, Nov. 15, 1973, 16101/73

Int. Cl.^{2} C07D *95/00*

U.S. Cl. 260—247.2 B **6 Claims**

1. A compound of the formula



wherein

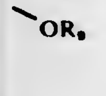
R_1 is selected from the group consisting of hydrogen, nitro, halogen and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and halogen;

R_3, R_4 and R_5 are selected from the group consisting of hydrogen and lower alkyl;

R_6 and R_7 are lower alkyl or together with the nitrogen atom are a morpholino, 4-(lower alkyl)-1-piperazinyl, 1-pyrrolidinyl or piperidino group;

A is a C_2–C_8 alkylene group; and Y is selected from the group consisting of oxygen and the group



wherein

R_8 and R_9 are lower alkyl or together are lower alkylene; and the pharmaceutically acceptable acid addition salts thereof.

4,005,086
HYDROXYCITRIC ACID DERIVATIVES

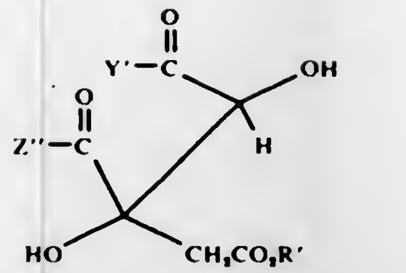
Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 376,478, July 5, 1973, Pat. No. 3,919,254, which is a division of Ser. No. 204,288, Dec. 2, 1971, Pat. No. 3,767,678. This application Aug. 1, 1975, Ser. No. 601,065

Int. Cl.^{2} C07D *295/18, 401/08, 403/06, 413/06*

U.S. Cl. 260—247.2 A **1 Claim**

1. A compound of the formula



where R' is lower alkyl, aryl lower alkyl, wherein aryl is selected from the group consisting of phenyl or phenyl monosubstituted with chlorine, bromine, iodine, fluorine, lower alkyl, hydroxy, lower alkoxy, nitro, cyano, carboxy or lower alkanoyl-amino or aryl, wherein aryl is as defined above; Y' is one of the groups OR_2' or NR_3R_4; Z'' is one of the groups OR_2'' or NR_5R_6, wherein R_2' and R_2'' are lower alkyl, aryl lower alkyl, wherein aryl is as defined above or aryl, wherein aryl is as defined above; R_3, R_4, R_5 and R_6 each taken independently is hydrogen, lower alkyl, monocyclic or polycyclic cycloalkyl having 3 to 8 carbon atoms in each ring, aryl, wherein aryl is as defined above or aryl lower alkyl, wherein aryl is as defined above; R_3 and R_4 taken together with the adjacent nitrogen atom and R_5 and R_6 taken together with the adjacent nitrogen atom each independently form a 5- or 6-membered heterocyclic ring selected from the group consisting of morpholino, piperidino and pyrrolidino; but with the added proviso that Y' cannot be OR_2' when Z'' is OR_2''.

4,005,087
SPRAY GRAINING TECHNIQUE FOR PREPARING GRANULAR HYDRATED ALKALI METAL DIHALOISOCYANURATE

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 29, 1975, Ser. No. 617,879

Int. Cl.^{2} C07D *251/36*

U.S. Cl. 260—248 C **26 Claims**

1. Granular particles of alkali metal dihaloisocyanurate each having a smooth rounded surface comprised of a core of alkali metal dihaloisocyanurate encapsulated with a plurality of individual coating layers of hydrated alkali metal dihaloisocyanurate, wherein said core ranges in diameter from about 200 to about 2000 microns and the outside diameter of said particles ranges from about 400 to about 5000 microns.

4,005,088
PROCESS FOR THE CHEMICAL SEPARATION OF RACEMIC MODIFICATIONS OF α-AMINOCARBOXYLIC ACID DERIVATIVES, AND CINCHONIDINE SALT INTERMEDIATES

Jan M. H. Gubbels, Venlo, and Johannes P. M. Houbiers, Tegelen, both of Netherlands, assignors to Andeno B.V., Venlo, Netherlands

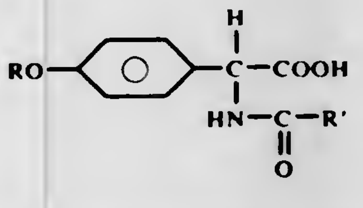
Filed Oct. 30, 1973, Ser. No. 410,990

Claims priority, application Luxembourg, Nov. 11, 1972, 66433

Int. Cl.^{2} C07C *99/12*

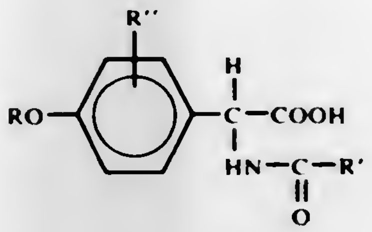
U.S. Cl. 260—284 **16 Claims**

1. Cinchonidine salt of a D-antipode of an α-aminocarboxylic acid of the formula



wherein R is either a hydrogen atom or a methyl or an acetyl radical, and R' stands for a hydrogen atom or a methyl radical.

2. A process for the chemical separation of racemic modifications of, possibly substituted, α-aminocarboxylic acid derivatives, which process comprises reacting a N-acylated DL-form of an α-aminophenylacetic acid in a solvent, at a temperature in the range from about room temperature to the boiling point of the solvent, with cinchonidine in an amount sufficient at least to form a cinchonidine salt with the amount of D-antipode contained in said acylated DL-form, said reacting being effected for a period of hours, and with cooling of the reaction mixture if it was heated, sufficient to cause the formation of a crystalline precipitate containing a cinchonidine salt of said D-antipode, and selectively isolating said salt from said precipitate; said DL-form being a compound of the formula



in which R is a hydrogen atom, an acyl group, an alkyl group having 1 to 4 carbon atoms or an aralkyl group having up to 11 carbon atoms, R' is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms or an aryl radical having up to 10 carbon atoms, and R'' stands for hydrogen or hydrogen and one or two halogen atoms.

4,005,089
COMPOUNDS WITH ERGOLINE SKELETON

Erzsébet Magó nee Karácsony; József Borsi; Endre Csányi; Katalin Pik, and Lajos Wolf, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

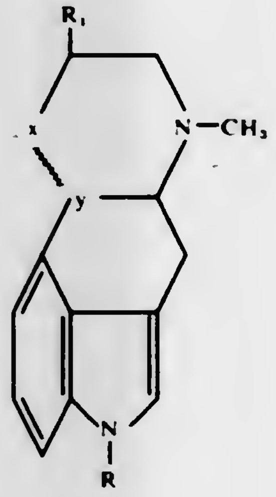
Filed May 22, 1975, Ser. No. 579,979

Claims priority, application Hungary, May 28, 1974, G01272

Int. Cl.^{2} C07D *457/06*

U.S. Cl. 260—285.5 **5 Claims**

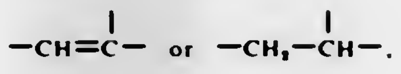
1. A compound of the formula



wherein

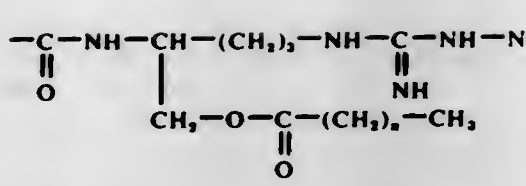
R is hydrogen or methyl,

$\overset{\frown}{x\,y}$ is



$$-CH=\overset{|}{C}- \quad \text{or} \quad -CH_2-\overset{|}{C}H-.$$

and R_1 is



$$-\underset{\underset{O}{\|}}{C}-NH-\underset{\underset{CH_2-O-\underset{\underset{O}{\|}}{C}-(CH_2)_n-CH_3}{|}}{CH}-(CH_2)_3-NH-\underset{\underset{NH}{\|}}{C}-NH-NO_2$$

wherein *n* is an integer of from 4 to 10,
or a pharmaceutically acceptable acid addition salt thereof.

4,005,090

8-(β-AMINOETHYL)ERGOLINES-I

Miroslav Semonsky; Antonin Cerny; Oldrich Nemecek; Karel Rezabek; Miroslav Seda; Vaclav Trcka, and Jaroslava Grimova, all of Prague, Czechoslovakia, assignors to Spofa United Pharmaceutical Works, Prague, Czechoslovakia

Filed Mar. 19, 1975, Ser. No. 560,106

Claims priority, application Czechoslovakia, Mar. 19, 1974, 1971-74

Int. Cl.^{2} C07D *457/02*

U.S. Cl. 260—285.5 **2 Claims**

1. D-6-methyl-8-(β-nicotinoylaminoethyl)ergoline-I.

2. D-1,6-dimethyl-8-(β-nictinoylaminoethyl)ergoline-I.

4,005,091

SUBSTITUTED TRIMETHYLENE CYCLOPROPANES, SALTS THEREOF, INTERMEDIATES AND METHODS OF MAKING THE SAME

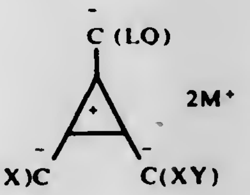
Tadamichi Fukunaga, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 535,138, Dec. 20, 1974, Pat. No. 3,963,769. This application Mar. 2, 1976, Ser. No. 663,101

Int. Cl.^{2} C07C *49/61*

U.S. Cl. 260—286 R **15 Claims**

1. A compound having the formula:



wherein X and Y are selected from —COO (lower alkyl) or —CO (lower alkyl); L and Q are independently selected from —COO (lower alkyl) or —CO (lower alkyl) or pairwise from —H and nitro, lower alkyl and nitro, hydrogen and lower alkyl sulfono, or lower alkyl and lower alkyl sulfono; and M+ is one equivalent of an inert cation.

4,005,092

PYRYLIUM DYES HAVING A FUSED, RIGIDIZED NITROGEN-CONTAINING RING

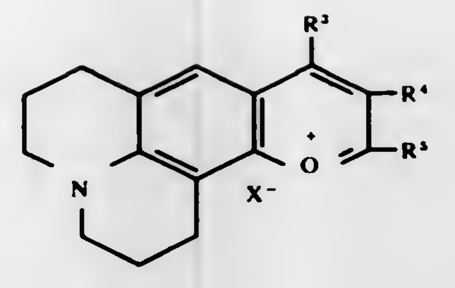
George A. Reynolds, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 389,936, Aug. 20, 1973, Pat. No. 3,932,415, which is a division of Ser. No. 244,916, April 17, 1972, Pat. No. 3,822,270, said Ser. No. 244,916, is a continuation-in-part of Ser. No. 170,349, Aug. 9, 1971, abandoned. This application Oct. 29, 1975, Ser. No. 626,795

Int. Cl.^{2} C07D *491/06*

U.S. Cl. 260—287 P **5 Claims**

1. A compound having the formula:



wherein

R^3 represents hydrogen, alkyl having 1 to 10 carbon atoms, phenyl, carboxyphenyl, ethoxycarbonyl phenyl or when taken together with R^4 represents the carbon atoms necessary to complete a 5- to 7-membered fused ring;

R^4 represents hydrogen or with R^3 represents the carbon atoms necessary to complete a 5- to 7-membered fused ring or when taken together with R^5 represents a 4-hydroxy substituted benzo ring;

R^5 represents hydrogen, hydroxy or when taken together with R^4 represents 4-hydroxy substituted benzo ring; and

X^- is an anion.

4,005,093

2-NAPHTHYL-LOWER-ALKYLAMINES

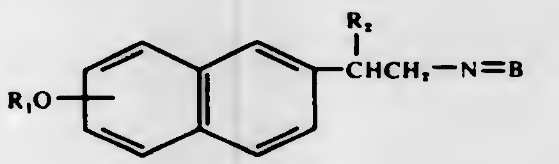
Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,546

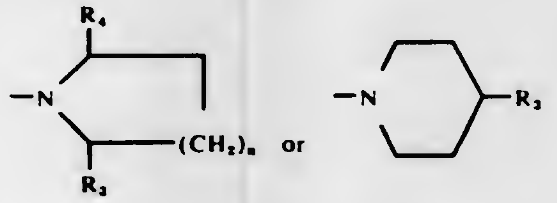
Int. Cl.^{2} C07D *211/14*

U.S. Cl. 260—293.62 **7 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where R_1 and R_2 each represent hydrogen or lower-alkyl and N=B represents one of the groups



where R_3 represents lower-alkyl, cyclohexyl or cyclohexyl-lower-alkyl; R_4 represents hydrogen or lower-alkyl; and *n* represents one of the integers 1, 2 and 3 and (B) pharmaceutically acceptable acid-addition salts thereof.

4,005,094

PIPERIDINE-SPIRO-HYDANTOIN DERIVATIVES

Keisuku Murayama; Syoji Moriyama; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohata, and Hisayou Ohsawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

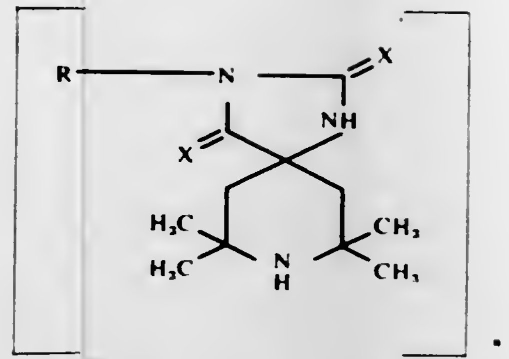
Continuation of Ser. No. 366,575, June 4, 1973, abandoned, which is a continuation of Ser. No. 265,313, June 22, 1972, abandoned. This application Jan. 10, 1975, Ser. No. 540,241

Claims priority, application Japan, July 2, 1971, 46-48646

Int. Cl.^{2} C07D *471/10, 401/14*

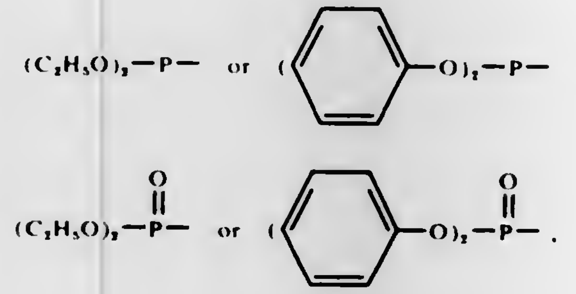
U.S. Cl. 260—293.66 **9 Claims**

1. A compound having the formula

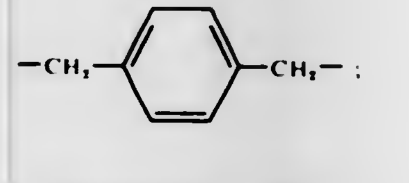


wherein X represents oxygen atom or sulfur atom; *n* is an integer of 1 to 4 inclusive; and

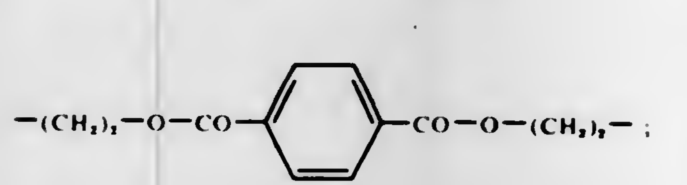
R represents, when *n* is 1: alkenyl of 3 or 4 carbon atoms which may be substituted by halogen; 2-propynyl which may be substituted by phenyl; benzyl or phenethyl which may be substituted by halogen, alkyl of 1 to 4 carbon atoms or halomethyl; hydroxyalkyl of 2 to 4 carbon atoms; methoxyalkyl or ethoxyalkyl with 1 to 8 carbon atoms in the alkyl moiety; 2-vinyloxyethyl; 2-phenoxyethyl; 2-methylthioethyl; 2-acetoxyethyl, 4-decanoyloxybutyl; 2-acryloyloxyethyl, 2-methacryloyloxyethyl; 2-benzoyloxyethyl, 2-m-toluoyloxyethyl; 2,3-epoxypropyl; 2-dimethylaminoethyl; ethoxycarbonylalkyl having 1 to 8 carbon atoms in the alkyl moiety; phenoxycarbonylmethyl; acetyl, propionyl, butyryl; ethoxycarbonyl;



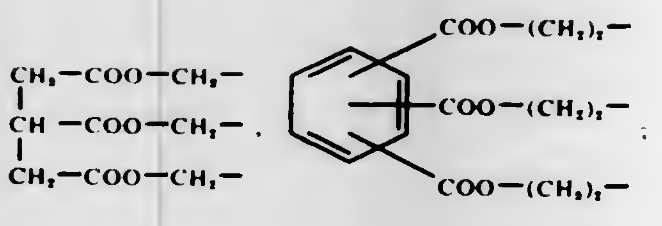
when *n* is 2: an alkenylene group of 4 to 18 carbon atoms; $-(CH_2)_2-O-(CH_2)_2-$;



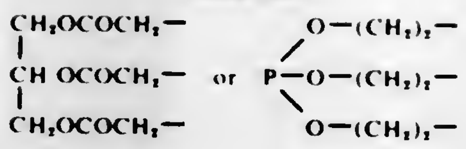
$-(CH_2)_2-O-CO-CO-O-(CH_2)_2-$; $-(CH_2)_2-O-CO-(CH_2)_2-CO-O-(CH_2)_2-$; $-(CH_2)_2-O-CO-(CH_2)_4-CO-O-(CH_2)_2-$;



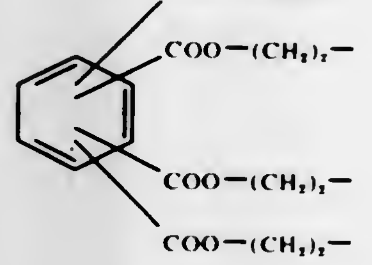
or $-CH_2-CO-O-(CH_2)_2-O-CO-CH_2-$; when *n* is 3:



-continued



and, when n is 4:



4,005,095

SUBSTITUTED THIENYL-ACETIC ACID ESTERS

Max Fernand Robba, and Michel Emile Marie Aurousseau, both of Paris, France, assignors to Innothera, Arcueil, France

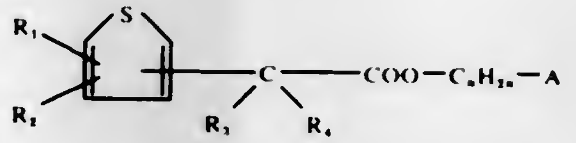
Filed May 20, 1975, Ser. No. 579,069

Claims priority, application France, May 30, 1974, 74.18747

Int. Cl.^{2} C07D *409/12, 333/24*

U.S. Cl. 260—293.68 **5 Claims**

1. A compound of the formula:



in which R_1 and R_2 are independently H, CH_3, C_2H_5, C_3H_7, OCH_3, SCH_3, Cl, Br or NO_2, R_3 and R_4 together are cyclohexylidene, n is 2 or 3, and A is monoalkylamino or dialkylamino, each alkyl radical having 1 to 4 carbon atoms, pyrrolidino or piperidino, racemates, optical isomers, and their pharmaceutically acceptable acid addition salts and quaternary ammonium salts obtained with alkyl halides.

4,005,096

THERAPEUTICALLY ACTIVE PHENOXYALKYLAMINES

Rudolf Theodor Petersen, Wohltorf, and Wolfgang Fleck, Hamburg, both of Germany, assignors to Biersdorf Aktiengesellschaft, Hamburg, Germany

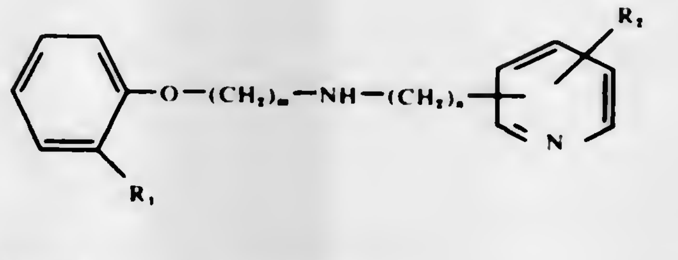
Division of Ser. No. 532,673, Dec. 13, 1974, Pat. No. 3,960,878. This application Feb. 25, 1976, Ser. No. 661,156

Claims priority, application Germany, Dec. 27, 1973, 2364685

Int. Cl.^{2} C07D *213/38*

U.S. Cl. 260—294.9 **3 Claims**

1. Compounds of the formula I:



(I)

wherein

R_1 represents a cyano group;

R_2 represents a hydrogen atom or a methyl or hydroxy group;

m is 2, 3 or 4; and

n is 1 or 2 and their physiologically acceptable acid addition salts.

4,005,097
OXYFORMAMIDATES

John Langshaw Brooks; Richard Budziarek; James William Crook, and Edward Jervis Vickers, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

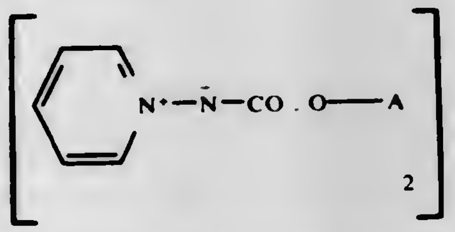
Division of Ser. No. 524,948, Nov. 18, 1974. This application Feb. 20, 1976, Ser. No. 659,636

Claims priority, application United Kingdom, Nov. 30, 1973, 55659/73

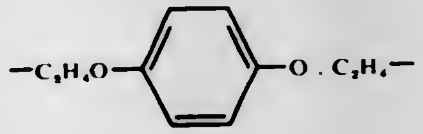
Int. Cl.^{2} C07D *213/20*

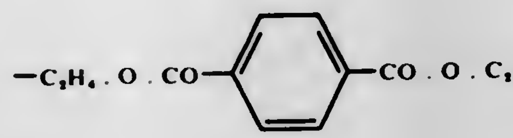
U.S. Cl. 260—295 Q **1 Claim**

1. A compound of the formula



wherein A is a divalent radical selected from the class consisting of





—(CH2) n — where *n* is 4 to 10 and
$-CH_2CH_2(OCH_2CH_2)_m$ — where *m* is 1 to 6.

4,005,098
TRIAZOLYL-COUMARINS

Alfons Dorlars, Leverkusen; Carl-Wolfgang Schellhammer, Opladen, and Wolf-Dieter Wirth, Cologne-Stammheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

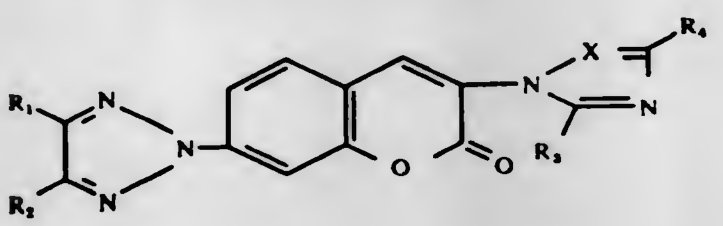
Filed Mar. 12, 1969, Ser. No. 806,732

Claims priority, application Germany, Mar. 16, 1968, 1670999

Int. Cl.^{2} C07D *405/14*

U.S. Cl. 260—308 A **8 Claims**

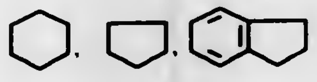
1. A triazolyl coumarin of the formula



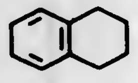
wherein
R_1 is
a. hydrogen;
b. C_{1-12}-alkyl which may be substituted by halogen, hydroxy, C_{1-4} alkoxy, C_{1-4} alkyl carbonyl, COOH, C_{1-4} alkoxycarbonyloxy, phenyl, halo-phenyl, lower alkyl phenyl, or lower alkoxy phenyl;
c. cyclohexyl; or
d. phenyl which may be substituted by fluoro, chloro, bromo, CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, phenyl C_{1-4}-alkyl, carboxy C_{1-4}-alkyl, phenyl C_{1-4}-alkoxy, carboxy C_{1-4}-alkoxy, C_{1-5}-alkoxy carbonyl, C_{1-4}-alkyl sulfonyl, phenyl or phenoxy;

R_2 is H or is
a. R_1;
b. CN;
c. COOH;
d. C_{1-4}-alkoxy carbonyl;
e. $CONH_2$;
f. N-C_{1-4}-alkyl carbonamide;
g. N,N-di-C_{1-4}-alkyl carbonamide;
h. or acylamino wherein acyl is selected from the class consisting of alkoxycarbonyl with 1–4 carbon atoms in the alkoxy group; alkyl carbonyl with 1–10 carbon atoms in the alkyl radical; phenyl carbonyl; or substituted acyl as defined above but additionally containing a substituent selected from the class consisting of halogen, amino, phenyl, ethoxy, methoxy, propoxy, methyl, dimethylamino, diethylamino, or dipropylamino;

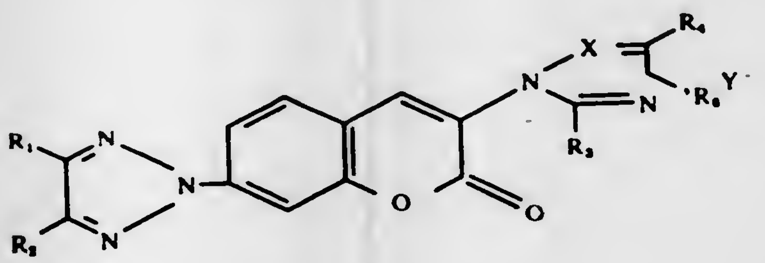
R_1 and R_2 together with the two carbon atoms of the triazole ring may form a member selected from the group consisting of



and



and
R_3 and R_4, independently of one another are selected from the group consisting of hydrogen, alkyl with 1–4 carbon atoms and phenyl;
X is N or C-R_5 where R_5 is H or alkyl with 1–4 carbon atoms or their quaternization products of the formula



where Y^- is an anion, and
R_6 is selected from the group consisting of alkyl with 1–12 carbon atoms, which is unsubstituted or substituted by a member of the class consisting of halogen; OH; alkoxy with 1–4 carbon atoms;
alkyl carbonyloxy with 1–4 carbon atoms in the alkyl radical; COOH; alkoxy carbonyl with 1–4 carbon atoms in the alkyl group; phenyl; halophenyl; lower alkyl phenyl, and alkoxy-phenyl.

4,005,099
1-[(DIMETHYLAMINO)-METHYL]-6-ARYL-4H-IMIDAZO[1,5-A][1,4]BENZODIAZEPINES

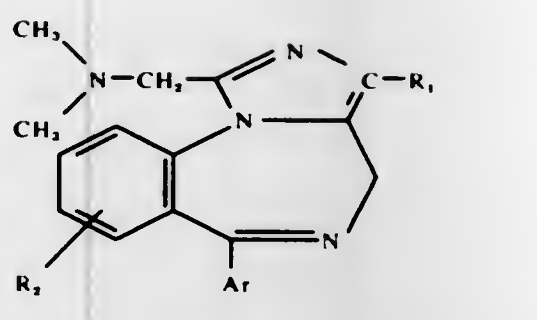
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 21, 1975, Ser. No. 634,076

Int. Cl.^{2} C07D *487/04*

U.S. Cl. 260—309 **10 Claims**

1. A compound of the formula III:



III

wherein R_1 is hydrogen or methyl; wherein R_2 is hydrogen, fluoro, chloro, bromo, trifluoromethyl, or nitro; and wherein A_r is phenyl, o-chlorophenyl, o-fluorophenyl, o,o-difluorophenyl, or 2-pyridyl, and the pharmacologically acceptable acid addition salts thereof.

4,005,100
PYRAZOLE-5-CARBOXAMIDES

Hermann Bretschneider; Wilhelm Klotzer, both of Innsbruck, Austria; Gunther Bader, Grafelfing-Lochham, Germany, and August Lutz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

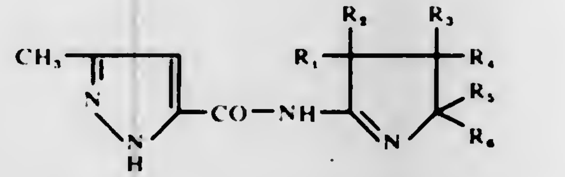
Division of Ser. No. 335,396, Feb. 23, 1973, Pat. No. 3,875,182. This application Jan. 15, 1975, Ser. No. 541,184

Claims priority, application Switzerland, Feb. 28, 1972, 2769/72

Int. Cl.^{2} C07D *403/12*

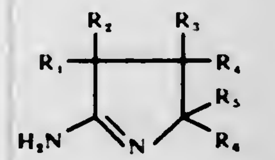
U.S. Cl. 260—310 R **3 Claims**

1. A process for the manufacture of a compound of the formula



I

wherein R_1 and R_2 each represent phenyl, lower alkylphenyl or lower alkoxyphenyl and R_3, R_4, R_5 and R_6 each represent a hydrogen atom or a lower alkyl group
which process comprises reacting a compound of the general formula



II

wherein R_1, R_2, R_3, R_4, R_5 and R_6 have the above significance,
with a 3-methylpyrazole-5-carboxylic acid ester or with 2,7-dimethyl-4,9-dioxo-4H,9H-dipyrazolo[1,5-a: 1′,5′-d]pyrazine.

4,005,101
METHOD FOR MOLDING PLASTIC COVERS FOR CONTAINERS

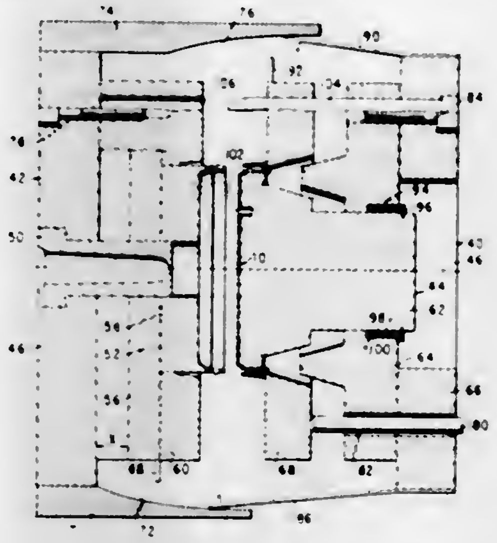
Heinz Ruch, Basel, Switzerland, assignor to Albert Obrist AG, Reinach, Switzerland

Division of Ser. No. 349,256, April 9, 1973, Pat. No. 3,915,613. This application June 27, 1975, Ser. No. 591,102

Int. Cl.^{2} B29F *1/14*

U.S. Cl. 264—318 **2 Claims**

1. A method for molding a plastic cover for an open mouthed container having a circumferential extending projection on its outer wall in the region of the top thereof, said cover having an inwardly extending portion and an inverted U-shaped rim in the form of a pair of upstanding circumferential sidewalls including an outer sidewall having an outer surface substantially straight line in cross-section and an inner surface having a circumferential recess, which comprises
injecting a molten plastic into a mold shaped to form said plastic cover and including fixed and movable sections forming molding surfaces, said fixed section having a fixed member and a movable member and said movable section having a plurality of movable members,



disengaging the mold from the outer sidewall of said cover by axial movement of said cover relative to the fixed member of said fixed section of said mold,
disengaging the mold from the inner surfaces of said U-shaped rim by axial movement of said cover relative to the movable member of said fixed section of said mold,
disengaging subsequently the mold from the remainder of said cover by axial movement of said cover relative to the movable members of said movable section of said mold, and
removing the molded cover from said mold.

4,005,102
PROCESS FOR MAKING 4-NITRO-N-METHYLPHTHALIMIDE

Newell C. Cook, Schenectady, and Gary C. Davis, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 486,356, July 8, 1974. This application Aug. 18, 1975, Ser. No. 605,397

The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

Int. Cl.^{2} C07D *209/34*

U.S. Cl. 260—326 N **1 Claim**

1. The process for making 4-nitro-N-methylphthalimide which comprises forming a solution of N-methylphthalimide with methylene chloride and concentrated sulfuric acid having a concentration of at least 90%, treating the said phthalimide solution with concentrated nitric acid of at least 90% concentration at a temperature of from −42° to −45° C., the said nitric acid being close to the stoichiometric amount required to attach one nitro group to the N-methylphthalimide, and thereafter extracting the 4-nitro N-methylphthalimide from the reaction mixture with methylene chloride.

4,005,103
PYRROLIDINE DERIVATIVES

Jean-Marie Teulon, La Celle St-Cloud, France, assignor to Societe Anonyme dite: Hexachimie, Rueil-Malmaison, France

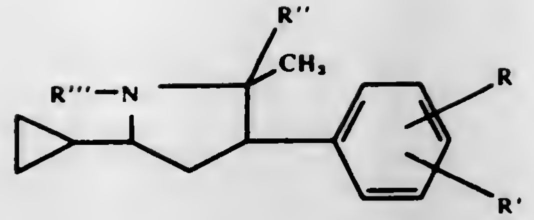
Filed Sept. 11, 1974, Ser. No. 505,084

Claims priority, application United Kingdom, Sept. 27, 1973, 45395/73

Int. Cl.^{2} C07D *207/08*

U.S. Cl. 260—326.5 CA **21 Claims**

1. A compound of formula



wherein each of the groups R and R', which may be the same or different is a hydrogen or halogen atom, a lower alkyl or alkoxy group, or a trihalomethyl or hydroxy group, the groups R and R'being in the meta- or para-position, or R and R', taken together, is a methylenedioxy group, R'' is a hydrogen atom or a methyl group, and R''' is a hydrogen atom or a lower alkyl, benzyl, propargyl or hydroxyethyl group, or a non-toxic pharmaceutically acceptable salt thereof.

4,005,104
PRODUCTS FROM THE REACTION OF SULFUR TRIOXIDE WITH ACYCLIC INTERNAL VIC-DIALKOXYPOLYFLUOROALKENES

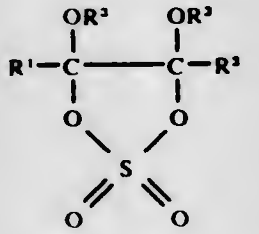
Carl George Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1975, Ser. No. 604,932

Int. Cl.² C07D *327/10*

U.S. Cl. 260—327 H **8 Claims**

1. A compound of the formula



wherein: R^1 and R^2, alike or different, are perfluoroalkyl of up to 6 carbons, and R^3 is methyl or ethyl.

4,005,105
SUBSTITUTED 10-ETHYNYLDIBENZO[e,f]THIEPINS AND DIBENZ[b,f]OXEPINS

Jean-Pierre Kaplan, Le Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

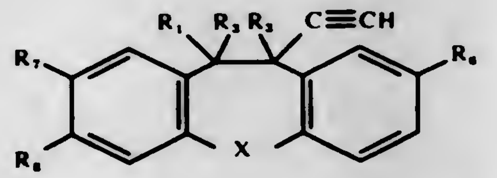
Division of Ser. No. 500,770, Aug. 26, 1974, Pat. No. 3,928,383, which is a continuation-in-part of Ser. No. 380,653, July 12, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,680

Claims priority, application Switzerland, June 8, 1973, 8354/73; May 10, 1974, 6421/74

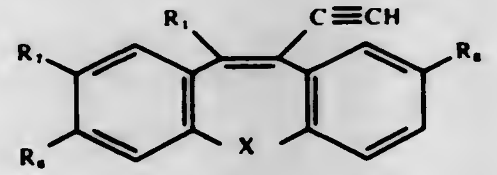
Int. Cl.² C07D *337/14*

U.S. Cl. 260—327 B **2 Claims**

1. A compound of the formula



and



wherein X is oxygen or sulfur; R_1 and R_2, independently, are hydrogen or lower alkyl; R_3 is hydrogen; R_6 is lower alkyl, lower alkyl-sulfonyl, hydroxy, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl)-amino; and R_7 and R_8, independently, are hydrogen, lower alkyl-sulfonyl, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl)-amino.

4,005,106
3β-[(METHOXALYL)OXY]-2α-(3-OXO-1-OCTENYL)-5-OXO-1β-CYCLOPENTANEHEPTANOIC ACID AND PROCESS

Norman L. Wendler, Summit; David Taub, Metuchen; Harry L. Slates, Westfield, and Zbigniew S. Zelawski, Piscataway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 435,812, Jan. 23, 1974, Pat. No. 3,915,994, which is a division of Ser. No. 201,979, Nov. 24, 1971, Pat. No. 3,833,612. This application May 7, 1975, Ser. No. 575,278

Int. Cl.² C07D *317/08*

U.S. Cl. 260—340.9 **2 Claims**

1. 3β-[(methoxalyl)oxy]-2α-(3-oxo-1-octenyl)-5-oxo-1β-cyclopentaneheptanoic acid, 5-cyclic ethylene acetal, and stereoisomers and loweralkyl, benzyl, or xylyl esters thereof.

4,005,107
13-OXABICYCLO(10,4,0)HEXADEC-1(12)-EN-14-ONE

Tsuyoshi Morinaga; Yuji Nakazawa; Kyozo Arimoto; Katuhiko Takahashi, and Yoshiyuki Arai, all of Saitama, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

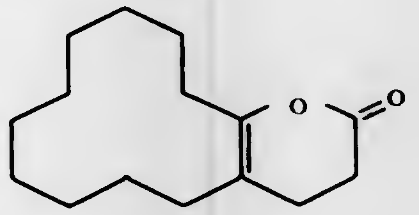
Filed Nov. 6, 1975, Ser. No. 629,391

Claims priority, application Japan, Nov. 11, 1974, 49-129698

Int. Cl.² C07D *311/94*

U.S. Cl. 260—343.2 R **3 Claims**

1. A compound having the formula:



4,005,108
NOVEL ANTI-LEUKEMIC DITERPENOID TRIEPOXIDES

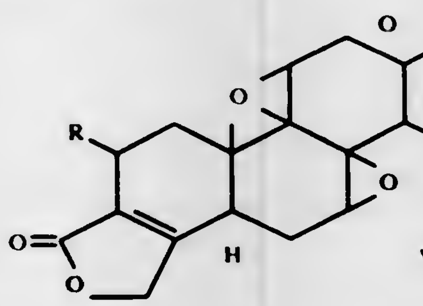
S. Morris Kupchan, Charlottesville, Va., and William A. Court, Delhi, Canada, assignors to Research Corporation, New York, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,599

Int. Cl.² C07D *493/22*

U.S. Cl. 260—343.3 R **4 Claims**

1. A compound selected from the group having the formula:



wherein:

R is hydrogen or hydroxy.

4,005,109
PREPARATION OF PROSTAGLANDIN INTERMEDIATES

Lawrence Libit, 639 Library Place, Evanston, Ill. 60201

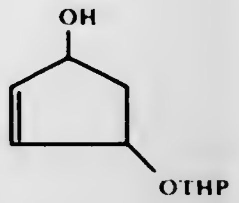
Filed June 24, 1974, Ser. No. 482,083

Int. Cl.² C07D *307/83*

U.S. Cl. 260—343.3 R **6 Claims**

1. In a process for producing intermediates useful in the production of prostaglandins, the steps which comprise:

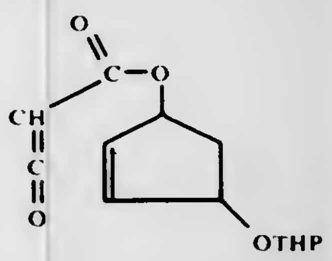
a. providing a solution of monotetrahydropyranyl ether in diethyl ether and pyridine, said mono-tetrahydropyranyl ether having the formula



where THP is tetrahydropyranyl,

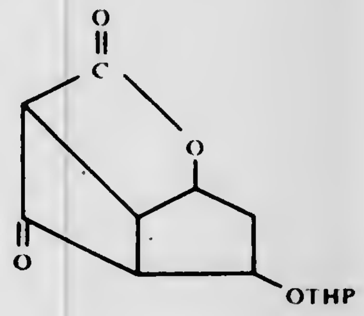
b. admixing said solution with a malonyl dichloride product in proportions to produce a malonic acid mono-ester chloride of mono-tetrahydropyranyl ether, and

c. then reacting the same with triethylamine in a diethyl ether medium to produce a compound having the formula



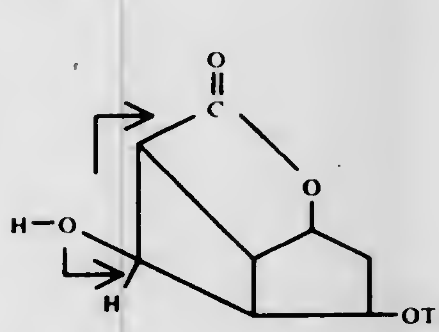
(III)

d. heating the Compound (III) in a diethyl ether medium to produce a compound having the formula



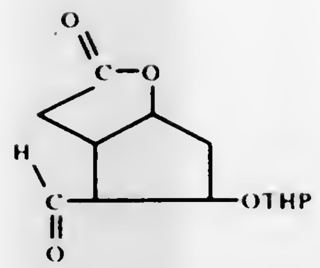
(IV)

e. reducing Compound (IV) with a reducing agent in the presence of methanol to produce a compound having the formula



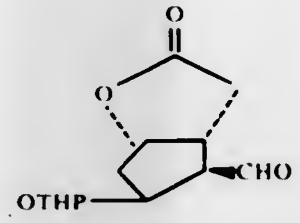
(V)

f. effecting cyclobutyl cleavage of Compound (V) to produce a compound having the formula



(VI)

g. and epimerizing Compound (VI) to produce the compound having the formula



(VII)

4,005,110
2H-CYCLOPENTA(b)FURAN-2-ONES

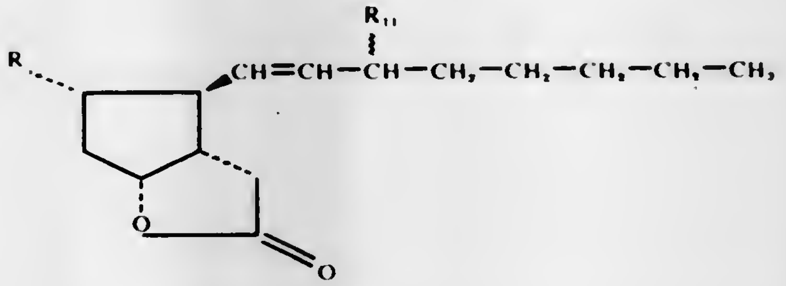
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Sept. 15, 1975, Ser. No. 613,137

Int. Cl.² C07D *307/87*

U.S. Cl. 260—343.3 R **4 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, carboxy or carboxy protected with a group convertible thereto by hydrolysis; and R_{11} is hydroxy or hydroxy protected with a hydrolyzable ether or ester group;

or enantiomers or racemates thereof.

4,005,111
FLUORESCENT DYES

Wolfgang Mach, Hockenheim, and Horst Scheuermann, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

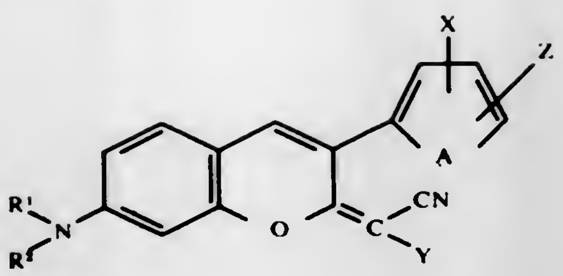
Continuation-in-part of Ser. No. 286,416, Sept. 5, 1972, Pat. No. 3,904,642. This application Jan. 2, 1975, Ser. No. 537,909

Claims priority, application Germany, Sept. 7, 1976, 2144591

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **6 Claims**

1. A dye of the formula



in which:

R^1 is C_1- to C_4-alkyl, C_2- or C_3-hydroxyalkyl, cyanoethyl or C_3- to C_6-alkoxyalkyl;
R^2 is hydrogen, C_1- to C_4-alkyl or hydroxyethyl;
A is $-CH{=}CH-$;
X is hydrogen, cyano or nitro;
Z is hydrogen, chlorine or bromine; and
Y is cyano.

4,005,112
MULTISTEP METHOD FOR PREPARATION OF TETRAHYDROFURAN STARTING FROM PROPYLENE, OXYGEN AND A CARBOXYLIC ACID

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 420,581, Dec. 3, 1973, abandoned. This application May 27, 1975, Ser. No. 581,265

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 R **2 Claims**

1. A process for preparing tetrahydrofuran which comprises the steps of:

a. reacting propylene, oxygen and a carboxylic acid in the presence of a catalyst comprising a Group VIII noble metal, or its salts, or its oxides or mixtures thereof at a temperature sufficiently high to provide the desired rate of formation of the corresponding allyl carboxylate but below the temperature at which substantial degradation of the allyl carboxylate occurs;
b. converting the allyl carboxylates under hydroformylation-hydrogenation conditions to a mixture comprising the carboxylic acid esters of 1,4-butanediol, 1,2-butanediol and 2-methyl-1,3-propanediol;
c. heating said mixture in the vapor phase in the presence of a dehydroacyloxylation catalyst selected from the group consisting of zeolites, silica, alumina, silica-aluminas, silica-magnesias and acidic clays under substantially anhydrous conditions to produce tetrahydrofuran and the carboxylic acid; and
d. isolating the carboxylic acid in a form suitable for recycling to (a).

4,005,113
MULTI-STEP PROCESS FOR PREPARATION OF TETRAHYDROFURAN STARTING FROM PROPYLENE, OXYGEN AND A CARBOXYLIC ACID

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 420,853, Dec. 3, 1973, abandoned. This application May 27, 1975, Ser. No. 581,266

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 R **2 Claims**

1. A process for preparing tetrahydrofuran which comprises the steps of:

a. reacting propylene, oxygen, and a carboxylic acid in the presence of a catalyst comprising a Group VIII noble metal, or its salts, or its oxides or mixtures thereof at a temperature sufficiently high to provide the desired rate of formation of the corresponding allyl carboxylate but below the temperature at which substantial degradation of the allyl carboxylate occurs;
b. converting the allyl carboxylate under hydroformylation-hydrogenation conditions to a mixture comprising the carboxylic acid mono and di esters of 1,4-butanediol, 1,2-butanediol and 2-methyl-1,3-propanediol;
c. heating said mixture in the vapor phase at a temperature from about 180° to about 270° C with water in the presence of a hydrolysis-dehydroacyloxylation catalyst selected from the group consisting of zeolites, silica, alumina, silica-aluminas, silica-magnesias and acidic clays to produce tetrahydrofuran and the carboxylic acid; and
d. isolating the carboxylic acid in a form suitable for recycling to (a).

4,005,114
DISTILLATION OF PROPYLENE OXIDE FROM PROPYLENE OXIDATION REACTION PRODUCT IN MIXTURE WITH A PHOSPHORIC ACID ESTER

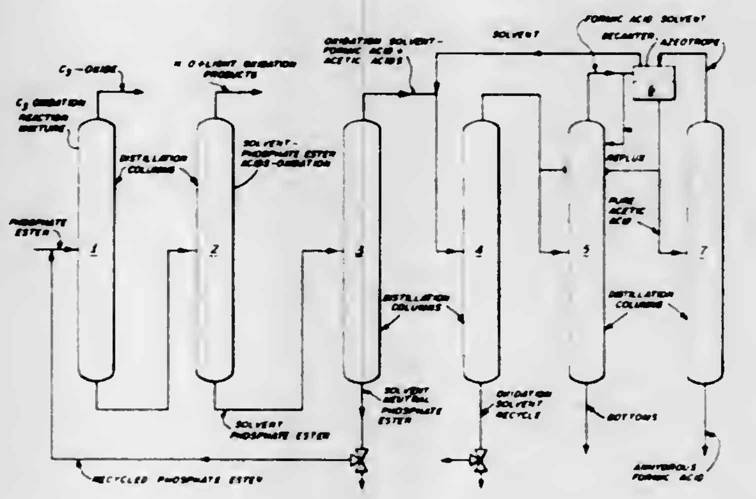
Georges Biola, Venissieux; Alain Fabre, Meyzieu, and Gerard Schneider, Caluire, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 3, 1975, Ser. No. 546,443

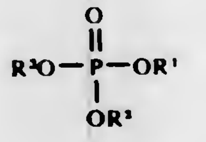
Claims priority, application France, Feb. 11, 1974, 74.05094

Int. Cl.² C07D *301/02*

U.S. Cl. 260—348.5 L **10 Claims**



1. A method for the separation of propylene oxide from the reaction mixture resulting from the oxidation of propylene, which method comprises adding a neutral ester of phosphoric acid having the structural formula:



$$R^2O-\underset{\underset{\displaystyle OR^3}{|}}{\overset{\overset{\displaystyle O}{\|}}{P}}-OR^1$$

wherein R^1, R^2 and R^3 may be the same or different and are independently selected from the group consisting of lower alkyl having 1 to 8 carbon atoms, phenyl and alkylphenyl with one or two alkyl groups having from 1 to 3 carbon atoms to said reaction mixture and distilling said reaction mixture to recover a propylene oxide enriched distillate and a distilland.

4,005,115
PHENYL-SUBSTITUTED PROSTAGLANDIN-A TYPE ANALOGS

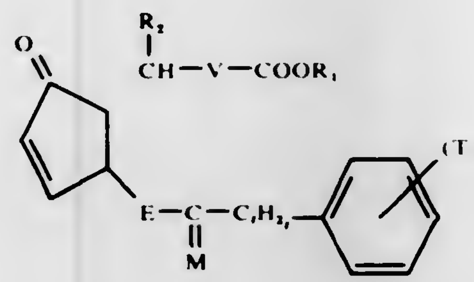
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,011, Jan. 7, 1974, Pat. No. 3,987,087, which is a continuation-in-part of Ser. No. 167,446, July 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 86,303, Nov. 2, 1970, abandoned. This application Dec. 29, 1975, Ser. No. 645,278

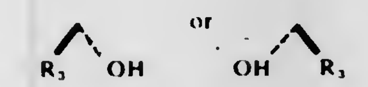
Int. Cl.² C07C *5/22, 69/76*

U.S. Cl. 260—410.9 R **105 Claims**

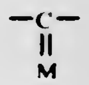
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein E is $-CH_2CHR_4-$ or trans $-CH{=}CR_4-$; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein M is



wherein R_2, R_3 and R_4 are hydrogen or alkyl or one to 4 carbon atoms, inclusive; wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between



$$-\underset{\underset{\displaystyle M}{\|}}{C}-$$

and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, or alkyl of one to 4 carbon atoms, inclusive, and *s* is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein V is (a) alkylene of 3 to 12 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with 3 to 7 carbon atoms, inclusive, between $-CHR_2-$ and $COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, (b) $-CH{=}CH-A-$, cis or trans, or (c) $-C\equiv C-A-$, wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, 2, 3, or 4 fluoro, with one to 5 carbon atoms, inclusive, between $=CH-$ (or $\equiv C-$) and $-COOR_1$, with the proviso that when 3 or 4 fluoro are present, they are all substituents of the carbon atoms alpha and beta to $-COOR_1$, with the further proviso that when E is $-CH_2-CHR_4-$ V is (a) above; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,005,116
ORGANOSILICON COMPOUNDS

Brian John Griffiths, Coytrahen, near Bridgend, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed Nov. 6, 1975, Ser. No. 629,269

Claims priority, application United Kingdom, Nov. 27, 1974, 49029/74

Int. Cl.² C07F *7/10, 7/18*

U.S. Cl. 260—448.2 N **5 Claims**

1. Disilazanes having the general formula

$$HN(R_2SiR'SR'')_2$$

wherein each R represents a monovalent radical having from 1 to 8 carbon atoms and free of aliphatic unsaturation which is a hydrocarbon radical, halogenated hydrocarbon radical or hydrocarbonoxy radical, R' represents a divalent aliphatic hydrocarbon radical having from 2 to 6 inclusive carbon atoms and R'' represents a monovalent hydrocarbon radical free of aliphatic unsaturation and having from 1 to 8 inclusive carbon atoms.

4,005,117
ORGANOSILANE COMPOUNDS

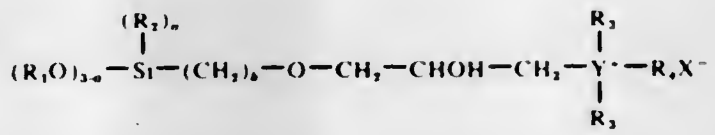
David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 570,531

Int. Cl.² C07F *7/10, 7/18*

U.S. Cl. 260—448.8 R **11 Claims**

1. An organosilane of the formula



$$(R_1O)_{3-a}-\overset{\overset{\displaystyle (R_2)_a}{|}}{Si}-(CH_2)_b-O-CH_2-CHOH-CH_2-\underset{\underset{\displaystyle R_3}{|}}{\overset{\overset{\displaystyle R_3}{|}}{Y^+}}-R_4X^-$$

or siloxane oligomers thereof wherein R_1 is an alkyl group containing 1 to 4 carbon atoms or

$$Z(OC_xH_{2x})_m$$

where *x* is 2 to 4, *m* is 1 to 20, *Z* is hydrogen, an alkyl group containing 1 to 18 carbon atoms or an acyl group containing 1 to 4 carbon atoms; *a* is 0 to 2; R_2 is an alkyl group containing 1 to 18 carbon atoms; *b* is 1 to 3; R_3 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$$(C_xH_{2x}O)_mZ$$

where *x*, *m* and *Z* are as defined above, or oxygen provided only one R_3 is oxygen and further provided that when R_3 is oxygen there is no X^-; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms; *X* is halide; and *Y* is nitrogen, phosphorus, or sulfur.

4,005,118
ORGANOSILANE COMPOUNDS

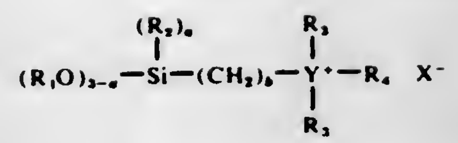
David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 570,532

Int. Cl.² C07F *7/10, 7/18*

U.S. Cl. 260—448.8 R **11 Claims**

1. An organosilane having the formula



$$(R_1O)_{3-a}-\overset{(R_2)_a}{Si}-(CH_2)_b-\overset{R_3}{\underset{R_3}{Y^+}}-R_4\quad X^-$$

or siloxane oligomers thereof, wherein R_1 is an alkyl group containing 1 to 4 carbon atoms; *a* is 0 to 2; R_2 is an alkyl group containing 1 to 18 carbon atoms; *b* is 1 to 3; at least one R_3 is a carboxy-substituted alkyl group containing 1 to 4 carbon atoms or

$(C_xH_{2x}O)_mZ$

wherein *x* is 2 to 4, *m* is 1 to 20, Z is hydrogen, an alkyl group containing 1 to 18 carbon atoms, or an acyl group containing 1 to 4 carbon atoms provided *m* is greater than 1 when Z is hydrogen, while the other R_3 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms; X is halide; and Y is nitrogen, phosphorus or sulfur.

4,005,119

ORGANOSILANE COMPOUNDS

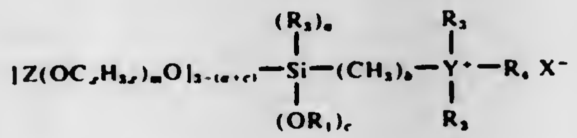
David C. Heckert, Oxford; David M. Watt, Jr., Cincinnati, both of Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 570,539

Int. Cl.^{2} C07F *7/10, 7/18*

U.S. Cl. 260—448.8 R **14 Claims**

1. An organosilane having the formula



$$[Z(OC_xH_{2x})_mO]_{3-(a+c)}-\overset{(R_2)_a}{\underset{(OR_1)_c}{Si}}-(CH_2)_b-\overset{R_3}{\underset{R_3}{Y^+}}-R_4\ X^-$$

or siloxane oligomers thereof, wherein *x* is 2 to 4, *m* is 1 to 20, Z is hydrogen, an alkyl group containing 1 to 18 carbon atoms or an acyl group containing 1 to 4 carbon atoms; *a* is 0 to 2; *c* is 0 to 2 provided a+c does not exceed 2; R_1 is an alkyl group containing 1 to 4 carbon atoms; R_2 is an alkyl group containing 1 to 18 carbon atoms, *b* is 1 to 3; R_3 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_xH_{2x}O)_mZ$

where *x*, *m*, and Z are as defined above, or oxygen provided only one R_3 is oxygen and further provided that when R_3 is oxygen there is no X^-; R_4 is an alkyl, aryl, or arylalkyl group containing 1 to 22 carbon atoms; X is halide; and Y is nitrogen, phosphorus, or sulfur.

4,005,120

PROCESS FOR MAKING DIALKOXIBORACETYLACETONATE CONTAINING MIXTURES

Gerhard Kunstle, Raitenhaslach, and Herbert Siegl, Haiming, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

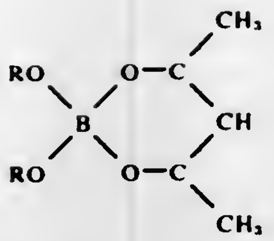
Filed Jan. 7, 1975, Ser. No. 539,132

Claims priority, application Germany, Jan. 18, 1974, 2402426

Int. Cl.^{2} C07F *5/04*

U.S. Cl. 260—462 R **5 Claims**

1. A process for making mixtures containing dialkoxiboracetylacetonate of the general formula



wherein R represents a member selected from the group consisting of aliphatic straight chain and branched chain, saturated and unsaturated hydrocarbon group with 1–8 carbon atoms, the process consisting of reacting boric acid trialkyl esters of the general formula $B(OR)_3$, wherein R has the meaning defined above, with acetylacetone at temperatures ranging from 10°–150° C while removing ROH alcohol formed in the reaction by continuous distillation at reduced pressure.

4,005,121

PROCESS FOR THE PREPARATION OF OLIGOCARBONATES WITH TWO CATALYSTS

Jean-Pierre G. Senet, Vaux le Penli, France, assignor to Societe Nationale des Poudres et Explosifs, France

Filed Dec. 4, 1975, Ser. No. 637,758

Claims priority, application France, Dec. 11, 1974, 74.40839

Int. Cl.^{2} C07C *68/06*

U.S. Cl. 260—463 **9 Claims**

1. A process for the preparation of aliphatic polycarbonatediols by transesterification between a diol and diethyl carbonate, which comprises the following two stages:

I. transesterification carried out in the presence of a basic catalyst at a temperature below about 140° C, and

II. after complete destruction of the basic catalyst, the transesterification is completed in the presence of an acid catalyst at a temperature of from about 200° to about 250° C.

4,005,122

POLYHALO POLY CYCLOCARBOXYLIC ACID COMPOUNDS

Steven A. Cerefice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 23, 1975, Ser. No. 625,191

Int. Cl.^{2} C07C *61/28, 69/74*

U.S. Cl. 260—468 G **6 Claims**

1. A polyhalocompound selected from at least one member of the group consisting of 7,7-dihalobicyclo [4.1.0] hept-4-ene-2,3-dicarboxylic acid ester and 5,5,8,8-tetrahalotricyclo [5.1.0.0^{4,6}] octane-2,3-dicarboxylic acid ester wherein said halo groups are selected from at least one member of the group consisting of fluoro, chloro and bromo and said ester groups are at least one member selected from the group consisting of aliphatic groups containing from 1 to 24 carbon atoms, aromatic groups containing from 6 to 24 carbon atoms and aralkyl groups containing from 7 to 25 carbon atoms.

4,005,123

SUBSTITUTED PHENYLISOTHIOUREAS AND PROCESSES FOR THEIR PREPARATION AND USE

Heinrich Kolling, Haan; Herbert Thomas, Wuppertal; Arno Widdig, Blecher, and Hartmund Wollweber, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

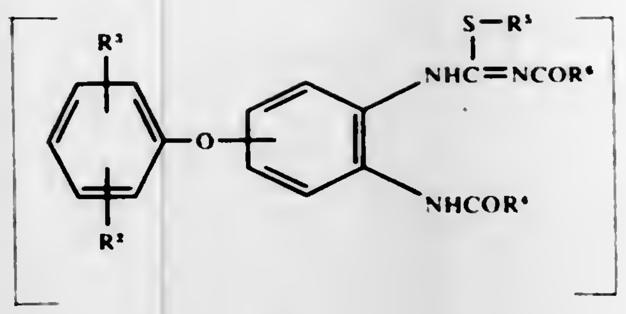
Filed July 11, 1975, Ser. No. 595,040

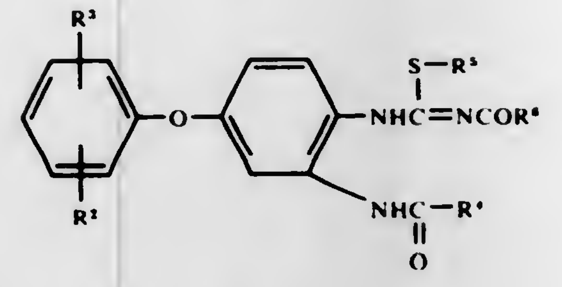
Claims priority, application Germany, July 16, 1974, 2434183

Int. Cl.^{2} C07C *149/40*

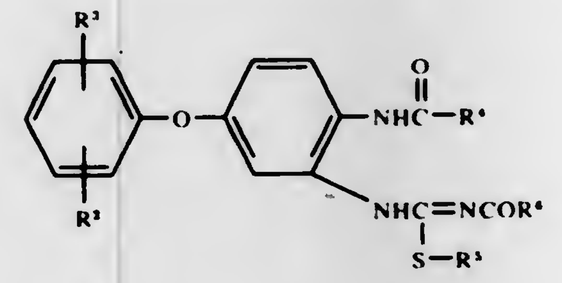
U.S. Cl. 260—470 **10 Claims**

1. A compound selected from the group consisting of a 4-phenoxy-2-amidophenylisothiourea of the formula:





and a 5-phenoxy-2-amidophenylisothiourea of the formula.



wherein

R^4 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, phenyl, phenylalkyl of 7 to 12 carbon atoms, alkoxyalkyl of 2 to 12 carbon atoms, phenoxyalkyl of 7 to 12 carbon atoms;

R^5 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms of alkynyl of 2 to 6 carbon atoms; and

R^6 is alkoxy of 1 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkynyloxy of 2 to 6 carbon atoms, or alkoxyalkoxy of 2 to 12 carbon atoms;

each of R^2 and R^3 independent of the other is hydrogen, halogeno, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, trifluoromethyl, alkanoyl of 1 to 6 carbon atoms, amino, alkanoylamino of 1 to 6 carbon atoms, or carbalkoxy of 2 to 7 carbon atoms.

4,005,124

PROCESS FOR RECOVERING THE MOTHER LIQUOR PRODUCED BY THE ESTERIFICATION OF TEREPHTHALIC ACID WITH METHANOL

Ferdinand List, Marl; Wilfried Uhlenbrock, Bochum; Norbert Wilke, and Kurt Wember, both of Marl, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Nov. 20, 1974, Ser. No. 525,516

Claims priority, application Germany, Nov. 28, 1973, 2359199

Int. Cl.^{2} C07C *69/82*

U.S. Cl. 260—475 R **23 Claims**

1. In a process for the preparation of dimethyl terephthalate comprising the steps of esterifying with excess methanol a crude terephthalic acid containing as impurities terephthaldehyde acid, acetic acid and tolic acid to obtain a solid phase of crystallized high purity dimethylterephthalate and predominantly methanolic mother liquor containing minor quantities of dissolved dimethyl terephthalate, monomethyl terephthalate, methyl ester of terephthaldehydic acid, methyl ester of toluic acid, and methyl acetate; separating said crystallized high purity dimehyl terephthalate from said mother liquor, the improvement comprising adjusting said separated mother liquor containing esterification water and about 1.0 to 6.0 percent by weight dissolved solids to a specific gravity of about 0.85 to 0.98 by addition of water to the mother liquor and by evaporation of methanol from the mother liquor at a temperature of about 65°–85° C, cooling said separated mother liquor to a temperature of about 10°–30° C to precipitate said solids and separating said solids from a twice separated mother liquor.

4,005,125

PREPARATION OF HALOALKYL ESTERS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 5, 1975, Ser. No. 574,493

Int. Cl.^{2} C07C *67/24*

U.S. Cl. 260—476 R **13 Claims**

1. A process for the preparation of a haloalkyl ester which comprises reacting a hydrocarbon carboxylic acid containing from 1 to about 20 carbon atoms or anhydride thereof and a hydrogen halide or hydrohalic acid with a saturated cyclic ether selected from the group consisting of tetrahydrofuran, tetrahydropyran, halogen-substituted tetrahydrofurans and tetrahydropyrans and alkyl-substituted tetrahydrofurans and tetrahydropyrans in which the alkyl contains from 1 to about 6 carbon atoms in the presence of a Friedel-Crafts metal halide catalyst at a temperature of from about 20° to about 250° C., and recovering the resultant haloalkyl ester.

4,005,126

PREPARATION OF HALOALKYL ESTERS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 5, 1975, Ser. No. 574,494

Int. Cl.^{2} C07C *67/24*

U.S. Cl. 260—476 R **10 Claims**

1. A process for the preparation of a haloalkyl ester which comprises reacting, at a temperature of from about ambient to about 100° C., a hydrocarbon carboxylic acid containing from 1 to about 20 carbon atoms or anhydride thereof and a hydrogen halide or hydrohalic acid with a saturated cyclic ether selected from the group consisting of tetrahydrofuran, tetrahydropyran, halogen-substituted tetrahydrofurans and tetrahydropyrans and alkyl-substituted tetrahydrofurans and tetrahydropyrans in which the alkyl contains from 1 to about 6 carbon atoms, and recovering the resultant haloalkyl ester

4,005,127

L-DOPA PROCESS AND INTERMEDIATES

William S. Knowles, St. Louis; Milton J. Sabacky, Ballwin, and Billy D. Vineyard, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 122,185, March 8, 1971, abandoned. This application Aug. 6, 1975, Ser. No. 602,484

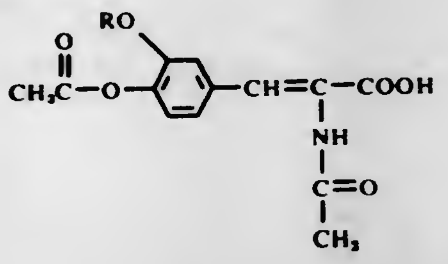
Int. Cl.^{2} C07C *103/27*

U.S. Cl. 260—479 R **13 Claims**

1. A process comprising catalytically asymmetrically hydrogenating α-acetamido-4-hydroxy-3-alkoxy-cinnamic acid acetate, in the presence of a homogeneous, optically active coordination complex of a metal selected from the group consisting of rhodium, iridium, ruthenium, osmium, palladium and platinum in combination with at least one optically active phosphine or arsine ligand to form N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-L-alanine acetate in a major amount and N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-D-alanine acetate in a minor amount and recovering a portion of the N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-L-alanine acetate by crystallization and hydrolyzing the recovered N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-L-alanine acetate to 3-(3,4-dihydroxyphenyl)-

L-alanine; provided that said α-acetamido-4-hydroxy-3-alkoxy-cinnamic acid acetate, N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-L-alanine acetate and N-acetyl-3-(4-hydroxy-3-alkoxyphenyl)-D-alanine acetate may be present as the acid, a salt formed with a base or mixtures of the acid and a salt formed with a base.

11. A compound represented by the structural formula



and its salts formed with a base, wherein, R is alkyl of from 1 to 3 carbon atoms.

4,005,128

PROCESS FOR THE PREPARATION OF OXALATE ESTERS

Lee R. Zehner, Media, Pa.; Richard W. Sauer, deceased, late of Cherry Hill, N.J., and John J. Heffron, executor, Morrisville, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 2, 1975, Ser. No. 564,242
Int. Cl.^{2} C07C *69/36*
U.S. Cl. 260—485 R **17 Claims**

1. A process for the preparation of oxalate esters of an alcohol having from 1 to 20 carbon atoms which comprises reacting under substantially anhydrous conditions, a saturated monohydric aliphatic or alicyclic alcohol which may contain other substituents which do not interfere with the reaction or an aromatic alcohol selected from the group consisting of benzyl, chlorobenzyl and methoxy-benzyl alcohols with carbon monoxide at a pressure of between about 1 and 700 atmospheres and at a temperature in the range of about 50° to 250° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium (II), rhodium (III), platinum (II) and copper (I) or (II) salt compounds and at least a stoichiometric amount of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia and at least a stoichiometric amount of a copper (II) or iron (III) oxalate, sulfate, acetate, or trifluroacetate oxidant salt compound and recovering the desired oxalate ester.

4,005,129

PROCESS FOR THE OXIDATIVE CARBONYLATION OF ALCOHOLS AND METHOD FOR THE REOXIDATION OF REDUCED COPPER SALTS PRODUCED BY THE OXIDATION CARBONYLATION

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 4, 1975, Ser. No. 583,810
Int. Cl.^{2} C07C *69/36*
U.S. Cl. 260—485 R **22 Claims**

1. A cyclic process for the oxidative carbonylation of an alcohol having from 1 to 20 carbon atoms which comprises the steps of

reacting under substantially anhydrous conditions, a saturated monohydric aliphatic or alicyclic alcohol which may contain other substituents which do not interfere with the reaction or an aromatic alcohol selected from the group consisting of benzyl, chlorobenzyl and methoxy-benzyl alcohols with carbon monoxide at a pressure of between about 1 to 700 atmospheres and at a temperature in the range of about 50° C. to 250° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium (II), rhodium (III), platinum (II) and copper (I) or (II) salt compounds, at least a stoichiometric amount of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia, a stoichiometric quantity of a copper (II) oxalate, sulfate, acetate, or trifluroacetate oxidant salt compound, and an excess over that normally formed in the carbonylation reaction of an ammonium or substituted ammonium sulfate, acetate or trifluroacetate salt compound, to produce the desired oxalate ester;

separating the oxalate ester by distillation leaving a distillation residue comprised of catalyst, amine, reduced oxidant salt and ammonium salt compound;

dissolving the distillation residue in alcohol and purging the resulting solution with oxygen or an oxygen-containing gas at pressures above 0.2 atmospheres and at a temperature in the range of from 20° C. to 200° C. to reoxidize the reduced copper oxidant salt and form co-product water;

removing the reoxidation co-product water by the addition of water scavengers or azeotropic distillation leaving a residue comprised of catalyst, amine, copper (II) oxidant salt and ammonium salt compound; and

recovering said residue for reuse in an oxidative carbonylation process.

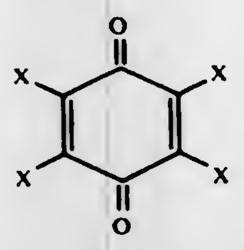
4,005,130

PREPARATION OF OXALATE ESTERS FROM CARBON MONOXIDE AND ALCOHOL OVER A METAL CATALYST AND A DIONE OXIDANT

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 26, 1975, Ser. No. 590,527
Int. Cl.^{2} C07C *69/36*
U.S. Cl. 260—485 R **10 Claims**

1. A process for the oxidative carbonylation of an alcohol having from 1 to 20 carbon atoms, which may contain other substituents which do not interfere with the reaction, to produce oxalate esters which comprises reacting under substantially anhydrous conditions, a saturated monohydric aliphatic or alicyclic alcohol or an aromatic alcohol selected from the group consisting of benzyl, chlorobenzyl and methoxy-benzyl alcohols with carbon monoxide at a pressure of from 200 psi to 5000 psi and at a temperature in the range of about 80° to 200° C. in the presence of an effective amount of a catalyst selected from the group consisting of a copper, nickel, cobalt, cadmium and zinc metal salt compounds and at least a stoichiometric amount of a 2,5-cyclohexadiene-1,4-dione oxidant having the formula



wherein x may be hydrogen or halogen and recovering the desired oxalate ester.

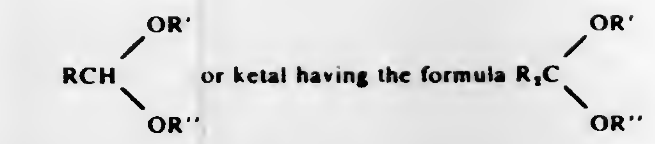
4,005,131

SYNTHESIS OF OXALATE ESTERS FROM CARBON MONOXIDE AND ACETALS OR KETALS

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 2, 1976, Ser. No. 646,118
Int. Cl.^{2} C07C *69/36*
U.S. Cl. 260—485 R **25 Claims**

1. A process for the preparation of oxalate esters which comprises reacting under substantially anhydrous conditions, an acetal having the formula



$RCH(OR')(OR'')$ or ketal having the formula $R_2C(OR')(OR'')$

wherein R may be an alkyl, aryl or alicyclic group R′ and R″ may be an alkyl or aralkyl group which may contain substituents which do not interfere with the reaction, with carbon monoxide and oxygen at a pressure of between about 500 psi and 3000 psi and at a temperature in the range of about 50° C. to 200° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium, platinum, rhodium, cadmium, cobalt, zinc and copper salt compounds and a catalytic amount of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia and a monohydric aliphatic, alicyclic or aromatic alcohol and recovering the desired oxalate ester.

4,005,132

PROCESS FOR REACTING TRIALKYL BORANES WITH COMPOUNDS CONTAINING PROTONS

Roland Koster, Mulheim (Ruhr), and Hans Bellut, Wanne-Eickel, both of Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Filed Oct. 12, 1972, Ser. No. 297,146
Claims priority, application Germany, Oct. 14, 1971, 2151233
Int. Cl.^{2} C07F *5/02*
U.S. Cl. 260—502.3 **19 Claims**

1. A process for reacting trialkyl borane with a compound containing a proton for protolysis of the trialkyl borane and said compound involving said proton, said compound being a compound having the proton bonded to 0 or N, with the proviso that when the proton is bonded to the residue by 0, the residue is other than acyl, an HS compound wherein H in said HS is said proton, or hydrogen halide, wherein the hydrogen in said hydrogen halide is said proton, which comprises carrying out the reaction in the presence of catalytic amount of a carboxylic acid derivative which is a catalyst for the reaction.

4,005,133

PGF$_{2\alpha}$, L-ARGININE SALT

Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 14, 1975, Ser. No. 622,129
Int. Cl.^{2} C07C *101/24*
U.S. Cl. 260—501.11 **2 Claims**

1. PGF$_{2\alpha}$, L-arginine salt.
2. The free-flowing solid form of PGF$_{2\alpha}$, L-arginine salt.

4,005,134

METHOD FOR MAKING AROMATIC BIS(ETHER DICARBOXYLIC ACID)

Ronald L. Markezich, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,368
Int. Cl.^{2} C07C *51/00*
U.S. Cl. 260—520 E **6 Claims**

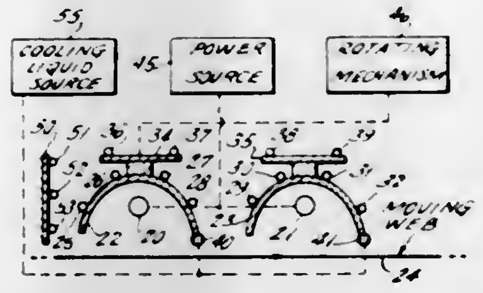
1. In a method for making an aromatic bis(ether dicarboxylic acid) based on the hydrolysis of an aromatic bis(ether N-organophthalimide), the improvement which comprises heating a mixture of aromatic bis(ether N-organophthalimide, acetic acid, water and mineral acid in a closed system at a temperature in the range between about 80° C to 200° C, where the mineral acid is used in the mixture at a concentration sufficient to provide from 2 to 8 moles of mineral acid per mole of bisimide and there is utilized a proportion by weight of from about 1 part to 20 parts of glacial acetic acid and from about 1 part to 10 parts of water per part of bisimide which is used in the mixture in a proportion of from 10% by weight to 30% by weight, whereby the direct hydrolysis of the aromatic bis(ether N-organophthalimide) is achieved without resort to a base hydrolysis step followed by acidification of the resulting tetraacid salts.

4,005,135

ROTATABLE ULTRAVIOLET LAMP REFLECTOR AND HEAT SINK

Norman A. Helding, Chicago, Ill., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,601
Int. Cl.^{2} B01K *1/00;* **F21V** *29/00;* **F26B** *3/28*
U.S. Cl. 250—527 **12 Claims**



1. Apparatus for curing photopolymerizable materials which are moved in a plane, comprising a plurality of spaced parallel disposed lamp and reflector assemblies which are elongated along lines parallel to said plane and generally perpendicular to the direction of movement of said photopolymerizable materials; each of said lamp and reflector assemblies consisting of an elongated lamp disposed within an elongated reflector which is generally curved partially around said lamp and which terminates on two parallel-extending edges which are parallel to said lamp, whereby said generally curved reflector focuses the radiation of said lamp beyond said two parallel-extending edges of said reflector and toward objects which face said lamp; means for rotatably mounting each of said lamp and reflector assemblies comprising pivotal mounting means which is generally coaxial with corresponding ones of said two parallel-extending edges of each of said reflectors; and means for simultaneously rotating each of said lamp and reflector assemblies between a first position at which the radiation of said lamps is directed toward said plane to a second position at which the radiation of at least one of said lamps is directed toward the rear surface of the reflector of an adjacent lamp and reflector assembly.

4,005,136

GRANULES OF SALTS OF POLY-α-HYDROXYACRYLIC ACIDS AND A PROCESS FOR THEIR MANUFACTURE

Jean Brichard, Vilvoorde, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed June 10, 1975, Ser. No. 585,587
Claims priority, application France, July 11, 1974, 74-24603
Int. Cl.^{2} C07C *59/17*
U.S. Cl. 260—535 P **10 Claims**

1. Granules of alkali metal or ammonium salts of substituted or unsubstituted poly-α-hydroxyacrylic acids, wherein their apparent specific gravity under free flow is between 0.35 and 0.55 kg/dm^3 and their ability to flow, expressed by the time taken for a weight of 250 g to flow through a 16 mm diameter orifice of an analysis funnel with a short stem, does not exceed 10 seconds.

4,005,137

PROCESS FOR THE PURIFICATION AND SEPARATION OF PERHALOALKANOIC ACIDS FROM MIXTURES THEREOF WITH PERHALOALKANES

Werner Rudolph, Anderten, Hannover, and Joachim Massonne, Hannover, both of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Feb. 10, 1975, Ser. No. 548,818

Claims priority, application Germany, Feb. 19, 1974, 2407834

Int. Cl.^{2} C07C *5/42, 53/34*

U.S. Cl. 260—539 R **6 Claims**

1. A process for the separation and purification of a perhaloalkanoic acid or mixture of perhaloalkanoic acids having the formula

$$A—(CFX—CFY)_n—CFX—COOH$$

in which A is a perfluoromethyl, perfluoroethyl, perfluoropropyl or perfluoroisopropyl radical, X is a fluoro or a trifluoromethyl radical, Y is a fluoro or chloro radical and n is an integer from 1 to 4, from a mixture containing the said acid or mixture of acids and a perhaloalkane or mixture of perhaloalkanes having the formula

$$A—(CFX—CFY)_n—CFX—CFYZ$$

in which formula A, X, Y and n have the same significance as hereinbefore, and Z is an iodo, chloro or bromo radical, which comprises adsorbing the said mixture in the form of a liquid upon a chromatographic column of adsorbent silica gel particles and subsequently eluting the perhaloalkane or perhaloalkanes therefrom first with a weakly polar eluent selected from the group consisting of chlorofluoroalkanes, tetrachloromethane, chloroform, benzene and petroleum ether, and then with a strongly polar eluent selected from the group consisting of ethyl acetate, diethyl ether, acetone and methanol.

4,005,138

PROCESS FOR THE MANUFACTURE OF SULPHONIC ACID FLUORIDES

Eric Plattner, Seltisberg, and Christos Comninellis, Prilly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,582

Claims priority, application Switzerland, Sept. 11, 1973, 13025/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.^{2} C07C *143/70*

U.S. Cl. 260—543 F **13 Claims**

1. A process for the manufacture of sulphonic acid fluorides of the formula

$R\ SO_2F$,

wherein R represents a straight-chain or a branched alkyl or cycloalkyl radical, which comprises reacting thio compounds of the formula

$R—S—X$,

wherein R has the meaning previously assigned to it and X represents hydrogen or the radical —S—R, with nitrogen dioxide or dinitrogen tetroxide in the presence of liquid hydrogen fluoride.

4,005,139

PROCESS FOR COOKED POTATO PRODUCTS

Cornelis Kortschot, Willowdale, and James Joseph Miller, Toronto, both of Canada, assignors to Corporate Foods Limited, Toronto, Canada

Filed Nov. 19, 1973, Ser. No. 416,795

Claims priority, application Canada, Sept. 28, 1973, 182190

Int. Cl.^{2} A23L *1/10*

U.S. Cl. 426—550 **12 Claims**

1. A continuous method for the production of cooked potato products which comprises the steps of:

a. rapidly mixing dehydrated potato solids with water in an amount sufficient to hydrate the potato solids and to form a stiff dough suitable for frying, said mixing being sufficiently rapid and severe to form a homogeneous, pourable, low viscosity slurry of said potato solids and water before formation of said stiff dough;

b. pouring said slurry onto a surface to form said slurry into a desired shape while it is still pourable and before formation of said stiff dough;

c. permitting the shaped slurry to transform by hydration into a stiff dough suitable for frying; and

d. cooking said stiff dough.

4,005,140

UREIDOTETRALIN COMPOUNDS

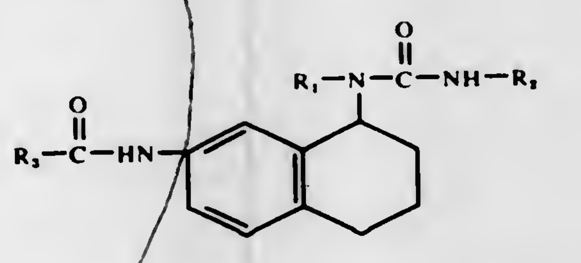
Larry Dean Spicer, Princeton; Joseph Michael Pensack, Trenton; Robert Daniel Wilbur, Titusville, and Gary Michael Demkovich, Cranbury, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 440,625, Feb. 7, 1974, Pat. No. 3,953,506. This application Jan. 26, 1976, Ser. No. 652,353

Int. Cl.^{2} A01N *9/20;* **A61K** *31/17;* **C07C** *127/19, 157/09*

U.S. Cl. 260—553 A **8 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and alkyl having up to four carbon atoms, R_2 is selected from the group consisting of hydrogen and alkyl having up to four carbon atoms, and R_3 is selected from the group consisting of methyl and monoalkylamino having one to twelve carbon atoms.

4,005,141

PERFLUOROALKYLSULFONAMIDOARYL COMPOUNDS

George G. I. Moore, Birchwood, and Joseph Kenneth Harrington, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

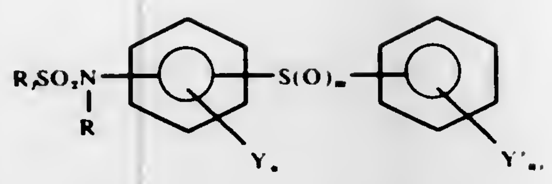
Continuation-in-part of Ser. No. 268,661, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 118,476, Feb. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 28,148, April 13, 1970, abandoned. This application Apr. 15, 1974, Ser. No. 460,883

The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

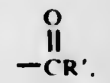
Int. Cl.^{2} C07C *143/74*

U.S. Cl. 260—556 F **50 Claims**

1. A compound of the formula



wherein R_f is a lower perfluoroalkyl radical having one or two carbon atoms, R is hydrogen, alkyl, alkylsulfonyl, a horticulturally acceptable cation or



$$—\overset{O}{\overset{\|}{C}}R'.$$

where R' is alkyl, *m* is 0–2, Y is halogen, alkyl, alkoxy, nitro, amino, alkanamido, hydroxy, dialkylamino, alkylthio, alkylsulfonyl, alkanoyl, dialkylsulfamoyl or alkylsulfinyl, Y' is fluorine, alkyl, alkoxy, nitro, amino, alkanamido, hydroxy, dialkylamino, alkylthio, alkylsulfonyl, alkanoyl, dialkylsulfamoyl or alkylsulfinyl and *n* and *n'* are independently 0–2 provided that the individual aliphatic groups appearing in the R, R', Y and Y' moieties contain from one to four carbon atoms each.

4,005,142

FLUOROCARBON ETHER BIS(O-AMINOPHENOL) COMPOUNDS

Robert C. Evers, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,470

Int. Cl.^{2} C07C *91/44, 93/14*

U.S. Cl. 260—571 **3 Claims**

1. As a new composition of matter, a compound selected from the group consisting of 1,14-bis(3-amino-4-hydroxyphenyl)perfluoro-5,10-dimethyl-3,6,9,12-tetraoxatetradecane and 1,17-bis(3-amino-4-hydroxyphenyl)perfluoro-3,6,9,15-tetraoxaheptadecane.

4,005,143

PROCESS FOR MANUFACTURING AROMATIC DIAMINES

Walter Bohm, Leverkusen; Helmuth Kritzler, Odenthal, and Lutz Neumann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

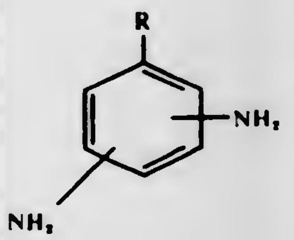
Filed July 9, 1975, Ser. No. 594,417

Claims priority, application Germany, July 25, 1974, 2435818

Int. Cl.^{2} C07C *93/26, 85/11*

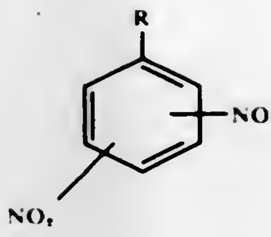
U.S. Cl. 260—575 **7 Claims**

1. Process for preparing an aromatic diamine having the formula



wherein

R is an alkyl or alkoxy group having up to 6 carbon atoms which comprises contacting in the presence of a solvent selected from the group consisting of aniline, O-toluidine and m-toluidine a dinitro compound of the formula



wherein

R is as defined above with hydrogen in the presence of a catalyst containing at least one metal of period 5 or 6 of Group VII of the Periodic Table, said catalyst being present in an amount of 0.0005 to 0.1% by weight metal, based upon the amount of dinitro compound being reacted.

4,005,144

ETHYNYL-SUBSTITUTED AROMATIC ORTHO DIAMINES AND METHOD OF SYNTHESIS

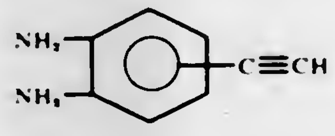
Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 578,847, May 19, 1975, Pat. No. 3,975,444. This application Apr. 9, 1976, Ser. No. 675,677

Int. Cl.^{2} C07C *87/50, 93/06*

U.S. Cl. 260—578 **3 Claims**

1. A compound having the following formula:



4,005,145

PROCESS FOR THE MANUFACTURING OF OXO COMPOUNDS

Erich Widmer, Munchenstein, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 21, 1975, Ser. No. 551,945

Claims priority, application Switzerland, Mar. 1, 1974, 2933/74; Jan. 30, 1975, 1124/75

Int. Cl.^{2} C07C *45/00*

U.S. Cl. 260—586 R **15 Claims**

1. A process for isomerizing an α,β-unsaturated oxo compound to a β,γ-unsaturated oxo compound comprising boiling an α,β-unsaturated oxo compound in the presence of a catalyst, said catalyst being an acid having a pK value at room temperature and atmospheric pressure of from 2 to 5, a boiling point of greater than that of said β,γ-unsaturated oxo compound and which is stable under the reaction conditions, said catalyst being selected from the group consisting of

a. monocyclic, aromatic or alicyclic monocarboxylic, dicarboxylic or polycarboxylic acids which may contain a hetero atom and/or be ring-substituted;

b. an acid selected from the group consisting of adipic acid, 12-hydroxystearic acid, benzilic acid and diglycolic acid; and

c. aliphatic or aromatic amino acids;

to form said β,γ-unsaturated oxo compound which is collected in the distillate.

4,005,146

RESOLUTION OF DL-ALLETHROLONE

Bernard Goffinet, Paris, France, assignor to Roussel-UCLAF, Paris, France

Continuation-in-part of Ser. No. 315,999, Dec. 18, 1972, abandoned. This application Sept. 24, 1975, Ser. No. 616,413

Claims priority, application France, Dec. 28, 1971, 71.46981

Int. Cl.² C07C *45/24*

U.S. Cl. 260—586 R **15 Claims**

1. A process for the resolution of dl-allethrolone comprising reacting dl-allethrolone with an excess of succinic acid anhydride to form the hemisuccinate of dl-allethrolone, reacting the latter with ephedrine in an appropriate organic solvent selected from the group consisting of aromatic hydrocarbon, lower alkyl esters of lower alkanoic acids, lower aliphatic nitriles and lower aliphatic alcohols to form the ephedrine salt of the said hemisuccinate and crystallizing from the organic solvent a member selected from the group consisting of dextro ephedrine salt of the hemisuccinate of d-allethrolone and levo ephedrine salt of the hemisuccinate of l-allethrolone, reacting the recovered ephedrine salt with a dilute aqueous acid to form the resulting hemisuccinate and hydrolysing the latter by heating in an aqueous acid media to form the corresponding optical isomer of allethrolone.

4,005,147

PRODUCTION OF α,β-UNSATURATED KETONES

Roman Fischer, Ludwigshafen; Norbert Goetz, Bobenheim-Roxheim, and Herbert Mueller, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

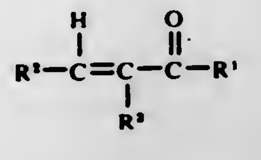
Filed Oct. 10, 1972, Ser. No. 295,959

Claims priority, application Germany, Oct. 13, 1971, 2150992

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R **9 Claims**

1. A process for the production of at least α,β-unsaturated ketones of the formula (I):

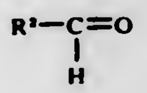


$$R^2-\overset{H}{C}=\underset{R^3}{C}-\overset{O}{\overset{\|}{C}}-R^1 \qquad (I)$$

in which

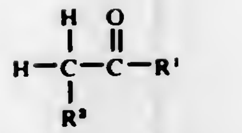
R¹ and R² are branched or linear, saturated or unsaturated, aliphatic or cycloaliphatic-aliphatic hydrocarbon radicals of one to 20 carbon atoms or saturated or unsaturated cycloaliphatic hydrocarbon radicals of five to 20 carbon atoms which may also contain an alkyl group as a substituent and/or an endoalkylene group or an araliphatic hydrocarbon radical of seven to 15 carbon atoms or an aromatic hydrocarbon radical,

R³ is hydrogen or an aliphatic hydrocarbon radical of one to 10 carbon atoms and moreover R¹ and R³ together with the two adjacent carbon atoms may be common members of an alicyclic ring, by reaction of an aldehyde of the formula (II):



$$R^2-\underset{H}{C}=O \qquad (II)$$

in which R² has the meanings given above with a ketone of the formula (III):



$$H-\overset{H}{\underset{R^3}{C}}-\overset{O}{\overset{\|}{C}}-R^1 \qquad (III)$$

in which R¹ and R³ have the meanings given above, in liquid phase wherein the reaction is carried out in the presence of a catalyst which consists essentially of zinc oxide.

4,005,148

DERIVATIVES OF PROPARGYL OR ALKENYL PHENYL ETHER AND USE THEREOF AS ACARICIDE

Yukio Aoki, Omiya; Shizuo Wakita; Shoichi Kato, both of Ageo, and Shuichi Ishida, Omiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

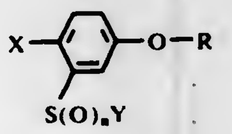
Filed Aug. 5, 1975, Ser. No. 602,069

Claims priority, application Japan, Aug. 9, 1974, 49-90760

Int. Cl.² C07C *147/14*

U.S. Cl. 260—607 AR **3 Claims**

1. A compound represented by the formula:



(1)

wherein X represents methyl group or chlorine atom, Y represents ethyl group, n-propyl group, or allyl group, R represents propargyl group, allyl group, buten-2-yl group, 3-methyl buten-2-yl group, 1-methylallyl group, 3-chloroallyl group, and *n* represents 0 or 1.

4,005,149

MERCAPTANS BY HYDROGEN SULFIDE-CLEAVAGE OF ORGANIC SULFIDES IN PRESENCE OF CARBON DISULFIDE

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1975, Ser. No. 573,486

Int. Cl.² C07C *148/00*

U.S. Cl. 260—609 R **5 Claims**

1. In the preparation of mercaptans by catalytic cleavage of organic sulfides with hydrogen sulfide in the presence of a sulfactive catalyst a method for increasing the total conversion of reactants to mercaptans comprises conducting the reaction in the presence of carbon disulfide in a mole ratio of at most about 50/1 of organic sulfide/carbon disulfide and at a temperature and pressure sufficient for carrying out the reaction.

4,005,150

PHENYL ETHERS HAVING JUVENILE HORMONE ACTIVITY

František Šorm; Miroslav Svoboda; Jiří Žavada; Karel Slama, and Zdenek Arnold, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

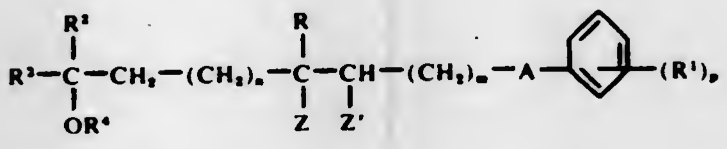
Filed May 18, 1971, Ser. No. 144,631

Claims priority, application Czechoslovakia, May 22, 1970, 3600-70; Nov. 27, 1970, 8032-70

Int. Cl.² C07C *43/20*

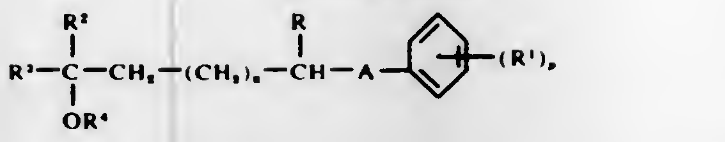
U.S. Cl. 260—613 D **13 Claims**

1. A compound selected from those of formulas I and II:



(I)

-continued



(II)

wherein, A is oxygen, R¹ is nitro or halo; each of R, R² and R³ is lower alkyl; R⁴ is hydrogen, lower alkyl, cycloalkyl or aralkyl; *m* is the positive integer one or two; *n* is the positive integer two or three; *p* is zero or the positive integer one to five; and each of Z and Z′ is hydrogen or together form a carbon-carbon bond.

4,005,151

PROCESS FOR PRODUCING POLYHALOGENATED PHENOLS

Masataka Wataya, Nagareyama; Nobuo Onodera, Hiratsuka, and Shosuke Imamura, Yokohama, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

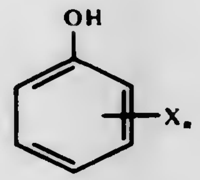
Filed Mar. 5, 1975, Ser. No. 555,627

Claims priority, application Japan, Mar. 7, 1974, 49-25755

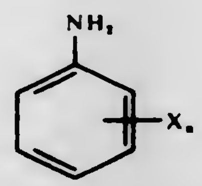
Int. Cl.² C07C *39/30, 39/32*

U.S. Cl. 260—623 R **10 Claims**

1. In a process for producing a polyhalogenated phenol represented by the formula,



wherein X is chlorine or bromine atom and *n* is 2 to 3, diazotizing a polyhalogenated aniline represented by the formula,



wherein X and *n* are as defined above to obtain a benzenediazonium salt and hydrolyzing the benzenediazonium salt to obtain the polyhalogenated phenol, the improvement which comprises mixing the polyhalogenated aniline with an aqueous sulfuric acid solution to obtain the polyhalogenated aniline sulfate, pulverizing the polyhalogenated aniline sulfate according to a wet pulverizing process to obtain a suspension of fine particles of the polyhalogenated aniline sulfate having a particle size of 2 to 50 microns, adding sodium nitrite to the polyhalogenated aniline sulfate suspension and effecting the diazotization of the polyhalogenated aniline sulfate at −10° C to +40° C, hydrolyzing the resulting polyhalogenated benzenediazonium sulfate by heating it as such at a temperature from 90° C to the apparent boiling temperature of the aqueous sulfuric acid and recycling to the diazotization step the aqueous sulfuric acid solution from which the desired polyhalogenated phenol has been separated.

4,005,152

CYCLOALKENYNES AND A METHOD FOR THE PREPARATION THEREOF

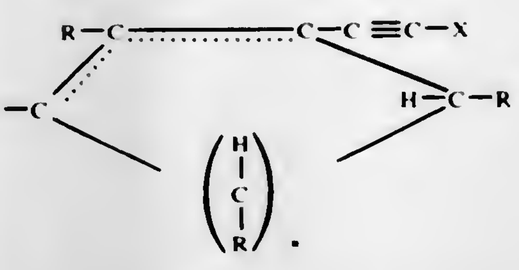
Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 428,635, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 196,792, Nov. 8, 1971, Pat. No. 3,799,997. This application Apr. 21, 1975, Ser. No. 569,899

Int. Cl.² C07C *23/08, 23/10, 23/14*

U.S. Cl. 260—648 R **6 Claims**

1. A compound possessing the generic formula:



in which R is independently selected from the group consisting of hydrogen and lower alkyl radicals, X is selected from the group consisting of chlorine and bromine radicals and *n* is an integer from 1 to 3, and wherein C C C denotes a double bond between the middle carbon atom and either of the other two carbon atoms and a single bond between the middle carbon atom and the remaining carbon atom.

4,005,153

POLYHALOCYCLOPENTENYL PHENYL COMPOUNDS

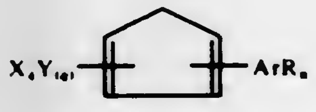
Samuel Gelfand, Niagara Falls, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 381,846, July 23, 1973, which is a division of Ser. No. 142,054, May 10, 1971, Pat. No. 3,839,454, which is a continuation-in-part of Ser. No. 758,684, Sept. 10, 1968, which is a continuation-in-part of Ser. No. 318,522, Oct. 24, 1963, Pat. No. 3,450,768. This application June 9, 1975, Ser. No. 585,207

Int. Cl.² C07C *25/18*

U.S. Cl. 260—650 R **7 Claims**

1. A compound of the following formula:



wherein:

- a. X is a halogen selected from the group consisting of chlorine and bromine;
- b. Y is selected from the group consisting of chlorine, bromine, hydrogen and an alkyl radical of from 1 to 8 carbon atoms;
- c. R is selected from the group consisting of chlorine, bromine, fluorine and trifluoromethyl;
- d. Ar is a phenyl radical having R_n substituents and containing a hydrogen substituent on a ring position adjacent to the point of polyhalocyclopentadiene attachment; and
- e. *n* is an integer from 2 to 4 and *q* is either 0 or 1.

4,005,154
CURING 1,2-EPOXY WITH PREPOLYMER BASED ON POLYAMINES AND OLIGOMERS POSSESSING IMIDE GROUPS

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

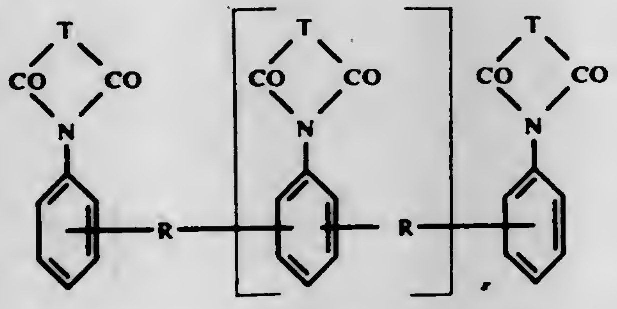
Continuation of Ser. No. 264,723, June 21, 1972, Pat. No. 3,883,486. This application Jan. 27, 1975, Ser. No. 544,571

Claims priority, application France, June 24, 1971, 71.23065

Int. Cl.^{2} C08L *63/10, 63/00*

U.S. Cl. 260—837 R **24 Claims**

1. A process for curing a 1,2-epoxy resin which comprises mixing the epoxy resin with a curing amount of a prepolymer composition, said composition being prepared by heating (a) an oligomer having the average general formula:

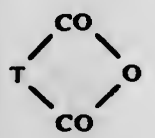


(I)

in which *x* represents a number from 0.1 to about 2, R represents a divalent hydrocarbon radical with 1 to 8 carbon atoms, which is derived from an aldehyde or a ketone of the general formula:

$$O = R \qquad (II)$$

in which the oxygen atom is bonded to a carbon atom of the radical R, and T represents a divalent organic radical possessing 2 to 24 carbon atoms, the free valencies of which are on adjacent carbon atoms and which is derived from an internal anhydride of the general formula:



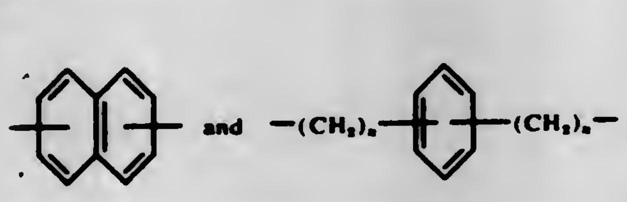
(III)

at least 60% of the T radicals in the oligomer containing a polymerisable carbon-carbon double bond, the remaining T radicals, if any, being alkylene, cycloalkylene, phenylene or naphthylene radicals with (b) a polyamine of the general formula:

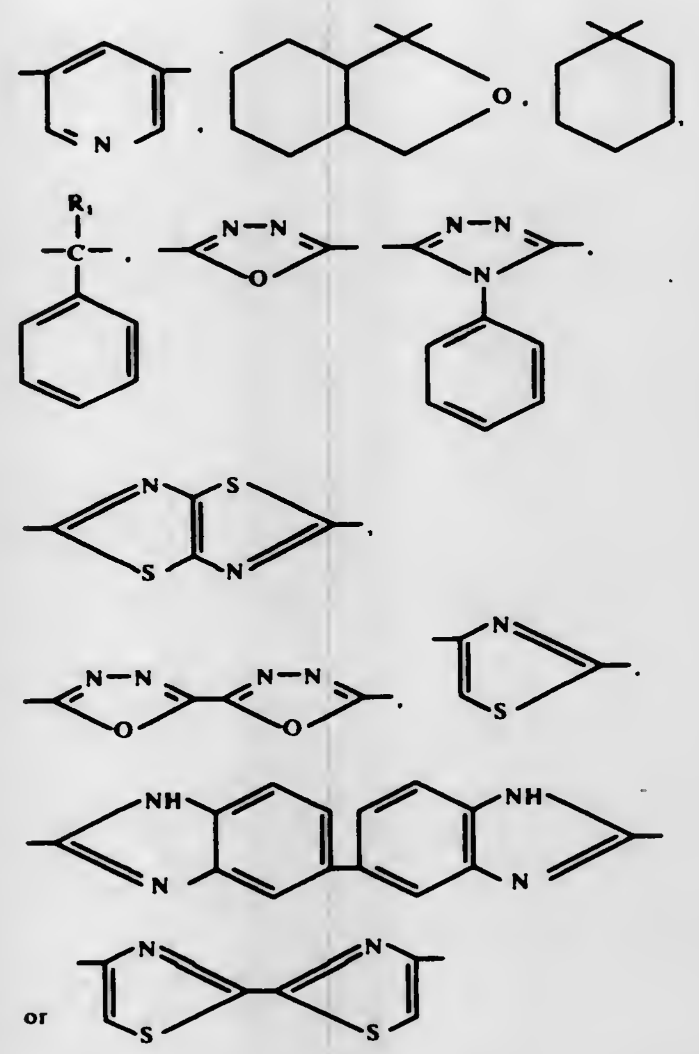
$$Q(NH_2)_y$$

in which *y* represents an integer at least equal to 2 and Q represents:

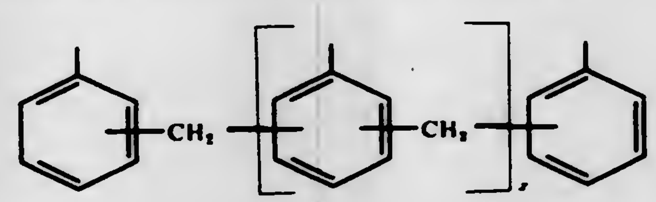
a divalent organic radical E selected from the group consisting of a linear or branched alkylene radical with less than 13 carbon atoms, a phenylene radical, a cyclohexylene radical, a phenylene radical substituted by a methyl radical, a cyclohexylene radical substituted by a methyl radical, radicals of the formulae:



wherein *n* represents an integer from 1 to 3, a radical consisting of a plurality of phenylene, cyclohexylene, phenylene substituted by methyl or cyclohexylene substituted by methyl, radicals connected to one another by a simple valency bond or by —O— or —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, —CONH—, —COO—, $-P(O)R_1-$, —CONH—X—NHCO—,



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical, and X represents an alkylene radical with less than 13 carbon atoms, and a 2- to 4-valent radical of the formula:



in which *x* represents a number from 0.1 to 2, the relative amounts being such that the oligomer supplies 1.1 to 50 T radicals containing a polymerisable carbon-carbon double bond per $-NH_2$ group supplied by the polyamine at a temperature from about 80° C. to about 200° C. until a homogeneous liquid or paste-like mixture is obtained, and the mixture of prepolymer and epoxy resin is then cured by subsequent heating at between 150° C. and 300° C.

4,005,155
POLYMERIC COMPOSITIONS

Keith George Sampson, Clophill; Victor Frederick Jenkins, St. Albans, and Anthony John Bunker, Kempston, all of England, assignors to Laporte Industries Limited, Luton, England

Division of Ser. No. 311,528, Dec. 4, 1972, abandoned. This application Feb. 5, 1975, Ser. No. 547,215

Claims priority, application United Kingdom, Dec. 9, 1971, 57175/71

Int. Cl.^{2} C08L *61/26, 61/20, 33/08*

U.S. Cl. 260—851 **7 Claims**

1. A process for the preparation of a crosslinked modified copolymer having the desirable combination of flexibility, hardness and chemical durability which comprises:

a. reacting together at least two ethylenically unsaturated monomers at least one of which is an ethylenically unsaturated hydroxyalkyl ester of formula $CH_2 = CR_1 - COOR_2$ in which R_1 is H or an alkyl group and R_2 is an alkyl group to which one or more $-CH_2OH$ groups are attached, to form a copolymer,

b. modifying said copolymer by reacting it with from 10% to 60% by weight of an epsilon caprolactone, and

c. crosslinking the modified copolymer of (b) with from 10% to 40% by weight of an amino resin selected from the group consisting of urea formaldehydes, melamine formaldehydes and benzoguamine formaldehydes.

4,005,156
NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER

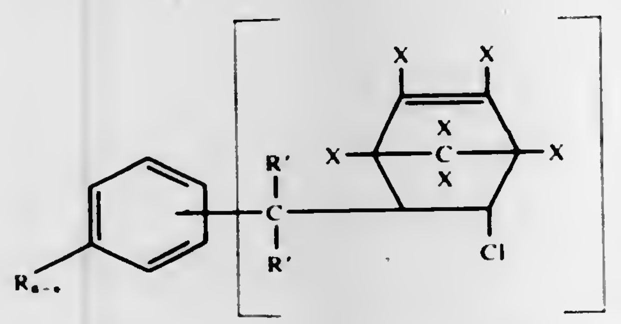
Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 397,197, Sept. 13, 1973, Pat. No. 3,892,815. This application Feb. 7, 1975, Ser. No. 548,503

Int. Cl.^{2} C08K *5/03*

U.S. Cl. 260—880 R **9 Claims**

1. A novel flame retardant composition of matter comprising a polymer and a compound having the generic formula:



in which X is hydrogen, chlorine or bromine, at least two X's being chlorine or bromine, R' is selected from the group consisting of hydrogen and lower alkyl radicals, R is selected from the group consisting of hydrogen and lower alkyl radicals containing from 1 to about 4 carbon atoms and n is an integer of from 3 to about 6.

4,005,157
COATING COMPOSITIONS FOR METAL SUBSTRATES BASED ON ETHYLENE-TETRAFLUOROETHYLENE COPOLYMERS

Andrea Mattiussi, and Mario Modena, both of Bollate (Milan), Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Division of Ser. No. 373,163, June 25, 1973, Pat. No. 3,906,060. This application Apr. 7, 1975, Ser. No. 566,029

Claims priority, application Italy, June 28, 1972, 26325/72

Int. Cl.^{2} C08F *29/22;* **C08L** *23/08*

U.S. Cl. 260—897 C **10 Claims**

1. A coating composition comprising an ethylene-tetrafluoroethylene copolymer mixture and at least one latent solvent, said ethylene-tetrafluoroethylene copolymer mixture being constituted by

a. 20–90% of at least one ethylene-tetrafluoroethylene copolymer having a melting point from about 250° C. to about 315° C. and containing between 52 and 58 mol % of chemically combined tetrafluoroethylene, and

b. 80–10% of at least one ethylene-tetrafluoroethylene copolymer having a melting point from about 180° C. to about 285° C. and containing 68 mol % of chemically combined tetrafluoroethylene.

4,005,158
O-(2-VINYLPHENYL)-THIOL-PHOSPHATES

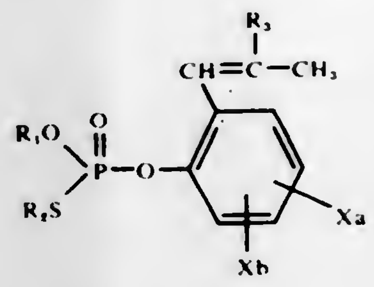
Manfred Böger, Haltingen, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 449,416, March 8, 1974, Pat. No. 3,898,306. This application May 27, 1975, Ser. No. 581,068

Int. Cl.^{2} C07F *9/165*

U.S. Cl. 260—949 **7 Claims**

1. A compound of the formula



wherein R_1 represents methyl or ethyl, R_2 represents n-propyl, isopropyl, isobutyl, sec.butyl or n-amyl; R_3 represents hydrogen or methyl; Xa represents methylthio or methylsulphinyl; and Xb represents hydrogen when Xa is methylsulphinyl and represents hydrogen or methyl when Xa is methylthio.

4,005,159
HYDROXY CONTAINING PHOSPHONATES

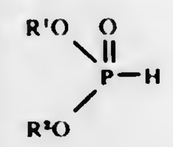
Frederick William Koch, Willoughby Hills, and Jerry Lee Musser, Chardon, both of Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 403,373, Oct. 4, 1973, Pat. No. 3,932,290. This application Aug. 5, 1975, Ser. No. 602,036

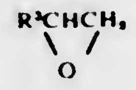
Int. Cl.^{2} C07F *9/40*

U.S. Cl. 260—953 **8 Claims**

1. A composition of matter prepared by reacting at least one phosphorus compound of the formula



wherein each of R^1 and R^2 is a lower alkyl-based radical, with at least one epoxide of the formula



$$R^3CHCH_2 .$$

wherein R^3 is an alkyl radical having 10–20 carbon atoms.

4,005,160
PREPARATION OF α-AMINO PHOSPHONIC ACID DERIVATIVES

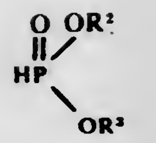
Derek Redmore, Ballwin, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 5, 1975, Ser. No. 574,262

Int. Cl.^{2} C07F *9/40*

U.S. Cl. 260—970 **11 Claims**

1. A process of preparing an α-aminophosphonic acid derivative which comprises reacting a nitrile with a phosphite ester of the general formula


$$HP(=O)(OR^2)(OR^3)$$

where R^3 and R^3 are alkyl, aryl, aralkyl or where R^2 and R^3 together form a ring structure in a ratio of nitrile to phosphite of about 1:1 to about 1:10 or more at a temperature from about 20° C. to about 150° C. and hydrogen pressures of about 40 to about 200 psi under hydrogenation conditions.

4,005,161
VARIABLE STAGE TYPE CARBURETOR

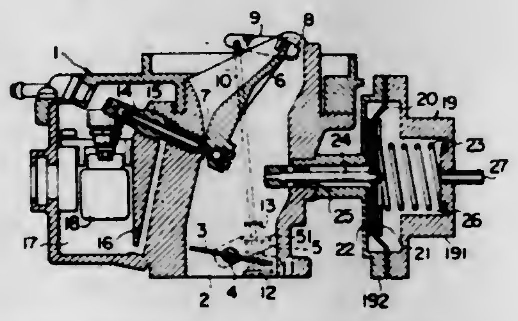
Shoji Shimo; Yukio Hosho, both of Katsuta; Hideo Usui, Hitachi, and Satosi Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,279

Claims priority, application Japan, Feb. 22, 1974, 49-20562

Int. Cl.² F02M *9/14*

U.S. Cl. 261—44 R **14 Claims**



8. A variable stage carburetor comprising
an intake passage,
venturi means including a movable venturi vane within said intake passage for defining a variable venturi portion with respect to said intake passage,
throttle valve means including a throttle valve disposed in said intake passage downstream of said venturi vane, and mounted for rotation on a fixed throttle valve shaft for varying opening of said throttle valve within said intake passage,
link means for interconnecting said venturi vane and said throttle valve to move said venturi vane commensurate with opening movement of said throttle valve to vary the venturi area of said venturi portion, and
vane-opening control means for controlling movement of said venturi vane independently of said throttle valve in response to changes of venturi negative pressure in said venturi portion, said control means forcedly displacing said venturi vane in a closing direction for increasing said venturi negative pressure when said throttle valve is in a substantially open position but the quantity of intake air is relatively small,
wherein said control means comprise first means for detecting variations in said negative pressure, and second means responsive to said first means for displacing said venturi vane in said closing direction when said negative pressure decreases.

4,005,162
PROCESS FOR THE CONTINUOUS PRODUCTION OF PARTICLE BOARD

Gunter Bucking, Springe, Deister, Germany, assignor to Bisonwerke Bahre & Greten GmbH & Co. KG, Germany

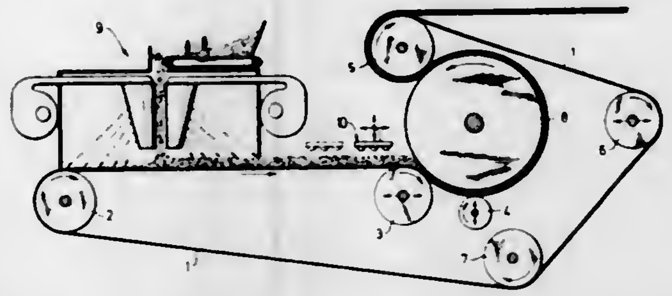
Filed Jan. 20, 1975, Ser. No. 542,292

Claims priority, application Germany, Jan. 18, 1974, 2402410; Apr. 22, 1974, 2419320

Int. Cl.² B29D *27/00*

U.S. Cl. 264—25 **7 Claims**

1. In a process for continuously producing particle board in which (a) wood cellulose-containing particles are mixed with a binding agent, (b) the mixture so obtained is spread onto an endless conveyor belt to form a layer having a high content of fines and dust of said wood cellulose-containing particles at least on an upper surface thereof, (c) the layer so formed is moved into a press at a speed causing at least some of the fines and dust on the upper surface of said layer to be blown away from said layer, and (d) the layer is then compressed in said press under the influence of heat so that said binding agent is hardened and said particle board is thereby formed, the improvement wherein prior to entry of said layer into said press the upper surface of said layer is heated in such a manner that blowing off of fines and dust from said layer as said layer moves into said press is prevented.



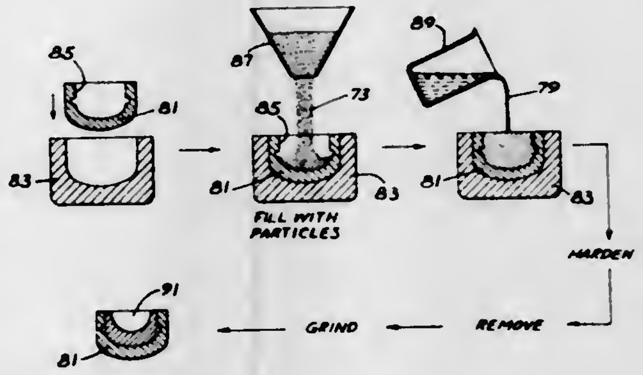
4,005,163
CARBON BEARINGS VIA VAPOR DEPOSITION

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 23, 1974, Ser. No. 500,026

Int. Cl.² B29C *13/00;* **C10M** *7/04*

U.S. Cl. 264—81 **13 Claims**



1. A method of making a bearing or seal device comprising coating lubricating graphite substrate material with nongraphitic carbon at least about 25 microns thick by a vapor deposition process, and selectively removing said vapor-deposited carbon from a portion of said coated substrate to expose the underlying graphite and produce a strong, self-lubricating surface adapted for contact with a relatively movable object, said lubricating graphite constituting at least about one percent of said surface.

4,005,164
METHOD OF MAKING PLASTIC CONTAINERS

Brian Procter, Stroud, England, assignor to Hayssen Manufacturing Co., Sheboygan, Wis.

Continuation of Ser. No. 456,074, March 29, 1974, abandoned. This application July 28, 1975, Ser. No. 599,838

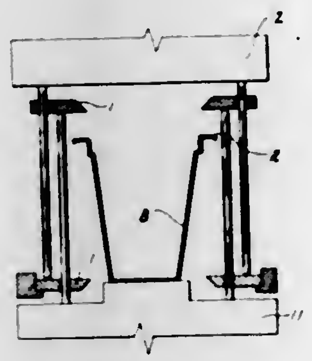
Claims priority, application United Kingdom, Apr. 10, 1973, 1727/73

Int. Cl.² B29C *7/00*

U.S. Cl. 264—97 **1 Claim**

1. The method of making plastic containers comprising:
A. molding a pre-form of thermoplastic material, said preform being adapted to be molded into a container, with a rim for the container molded as an integral part of the

pre-form, said pre-form being molded utilizing a transfer means having opposite sides, an aperture therethrough from one side to the other, and a groove formation surrounding the aperture adapted to receive thermoplastic material during the molding of the pre-form and defining the configuration for the rim of the container whereby the rim of the container is molded as an integral part of the pre-form, said pre-form being molded by
1. closing said aperture on both sides of the transfer means to define a closed space including said aperture and said groove formation for molding of the pre-form,
2. introducing into said space from one side of said transfer means a volume of thermoplastic material less than the volume of said space, said material flowing into said space through a passage on said one side of said transfer means,
3. closing said passage to close said space,
4. mechanically compressing the material within said space by applying pressure from the other side of said transfer means while maintaining said space closed to form said material into said pre-form with the material filling said groove formation thereby to mold the rim of the container which is to be formed from the pre-form as an integral part of of the pre-form, and also to retain the pre-form in the transfer means,



B. applying the transfer means carrying the pre-form to a mold having a cavity corresponding to the shape of the container,
C. forming the pre-form into a container in the mold cavity, and
D. separating the container and the transfer means without cutting the container and with the portion of the material molded in said groove formation intact with the container and constituting its rim;
E. the transfer means comprising two parts which are separable axially with respect to the container for separation from said two parts of said rim, one part being formed to form part of the groove formation for forming the top of the rim and the other part being formed to form part of the groove formation for forming the bottom of the rim,
E. said two parts of the transfer means being held together during said mechanical compression, and
G. the container being removed from said transfer means by axially separating said parts and relatively moving said one part away from the top of the rim and the other part away from the bottom of the rim and to a position wherein said parts are spaced a distance greater than the height of the container and the said other part is sufficiently clear of the bottom of the container to enable the container to be removed laterally between said parts.

4,005,165
METHOD FOR PRODUCING BOOKCOVERS

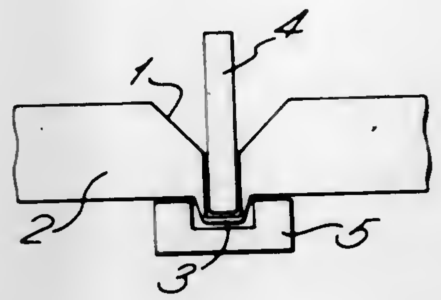
Charles Vivian Hawkes, Leatherhead, England, assignor to The Research Association for the Paper and Board Printing and Packaging Industries, Leatherhead, England

Filed July 9, 1975, Ser. No. 594,362

Claims priority, application United Kingdom, Feb. 17, 1975, 6584/75

Int. Cl.² B29D *31/00*

U.S. Cl. 264—135 **9 Claims**



1. A method of producing book covers, which method includes cutting at least one elongated notch along the length of one side of a sheet of comparatively semi-rigid plastics material having a tendency to return to its undeformed state after having been deformed by folding along the notched part of said sheet, and stretching the plastics defining the floor of the notch to alter its molecular structure so as to provide a readily foldable hinge, said stretching being effected by pressing the plastics defining the floor of the notch outwardly from the notch to raise a ridge on the other side of said sheet.

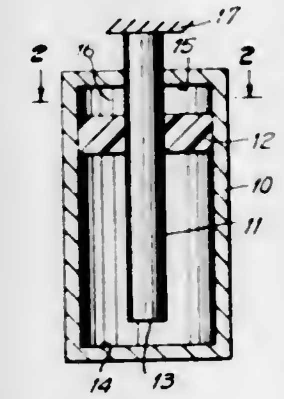
4,005,166
PROCESS OF MOLDING A CATHETER

James R. Quick, Warwick, N.Y., assignor to International Paper Company, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,881

Int. Cl.² B29C *1/14*

U.S. Cl. 264—154 **9 Claims**



1. The process of manufacturing a catheter which comprises:
a. providing a mold with a first wire longitudinally disposed therein, said first wire having a widened cross-section at its proximal end;
b. providing a second wire spaced distally from said first wire and longitudinally aligned therewith;
c. positioning a follower about the first wire on close abutment with both the first wire and inside of the mold, said follower maintaining the first wire spaced from the inside wall of the mold so as to define an annular space between the first wire and the inside of the mold, said follower being initially positioned proximally of the distal end of the mold and distally of the widened cross-section of the wire;
d. introducing a molding material into said annular space

proximally of the proximal side of said follower under a pressure sufficient to distally displace said follower whereby molding material is molded around the widened and unwidened portions of the first wire;

e. continuing to introduce said molding material into said mold until said follower is displaced off said first wire and onto said second wire whereby there is formed a catheter including a drainage lumen, a funnel and a catheter tip;
f. stripping the resulting catheter from the first wire; and
g. providing at least one hole at the distal end of the catheter in communication with said drainage lumen.

4,005,167
PLASTICIZING APPARATUS

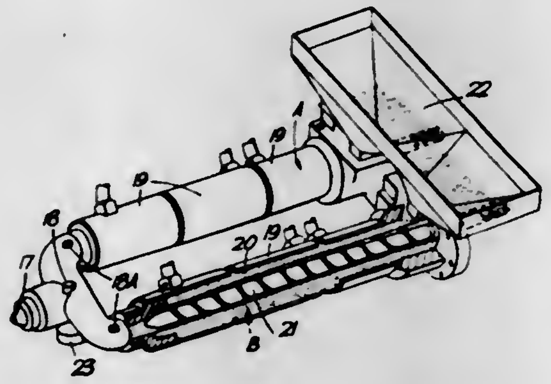
David Stern, Windsor, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 98,457, Dec. 15, 1970, abandoned, which is a division of Ser. No. 747,297, July 24, 1968, abandoned. This application Jan. 2, 1973, Ser. No. 320,286

Claims priority, application United Kingdom, July 28, 1967, 34896/67

Int. Cl.² B29F *1/12*

U.S. Cl. 264—329 **3 Claims**



1. In a process for moulding plastic materials by providing plasticised plastic materials in first and second separate chambers and forcing the plasticised plastic materials from the separate chambers through a common outlet and into a mould, the improvement comprising:

1. connecting the first chamber to the common outlet and forcing the plasticised plastic material from that chamber through the common outlet and into the mould to partially fill the mould;
2. while continuing to force plasticised plastic material from the first chamber, connecting the second chamber to the common outlet and forcing the plasticised plastic materials from both chambers through the common outlet into the mould;
3. discontinuing the forcing of plasticised plastic material from the first chamber by disconnecting that chamber from the common outlet and continuing to force plasticised plastic material from the second chamber through the common outlet into the mould to further fill the mould; and
4. discontinuing the forcing of plasticised plastic material from the second chamber by disconnecting that chamber from the common outlet after the desired amount of plasticised plastic material from the second chamber has been forced into the mould.

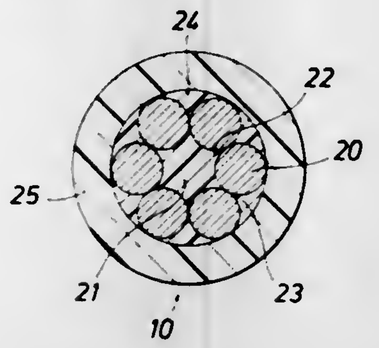
4,005,168
METHOD FOR MAKING A GAS BLOCKED LOGGING CABLE

William A. Whitfill, Jr., and Richard P. McNerney, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 302,159, Oct. 30, 1972, Pat. No. 3,800,066. This application June 13, 1973, Ser. No. 369,665

Int. Cl.² H01B *7/24, 7/02*

U.S. Cl. 264—103 **3 Claims**



1. A process for making a gas blocked electrical cable, comprising the steps of: twisting a plurality of conductive wire strands around a thermoplastic monofilament; embedding said strands at least partially in the outer surface of said monofilament to eliminate internal void spaces between strands; said embedding step being performed by heating said conductor while applying tension thereto to soften said monofilament and force said strands at least partially into the external surfaces thereof; applying a thermoplastic filler material around said strands to fill the external void spaces between said strands and thereby form a completely filled conductor; extruding a layer of insulation material over said filled conductor; cabling a plurality of solid insulated conductors around said filled conductor; and disposing all of said conductors within a void-free matrix forming material.

4,005,169
NON-WOVEN FABRICS

David Charles Cumbers, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1975, Ser. No. 568,837

Claims priority, application United Kingdom, Apr. 26, 1974, 18326/74

Int. Cl.² B29D *3/02*

U.S. Cl. 264—103 **14 Claims**

1. In a method of making a thermally segmentally bonded non woven fabric comprising compressing a fibrous web containing distributed thermally bondable material between two members whose opposed co-operating surfaces each have different surface land patterns heated sufficiently to activate the thermally bondable material in contact with them, the improvement comprising using regular patterns of lands which are isolated discontinuous projections spaced-apart on all sides from adjacent projections opposed pairs of lands, one on each member, differing from at least some other such pairs in their degrees of relative register in two directions at right angles the differences in register between different opposed pairs of lands ranging in each direction from zero to half of the corresponding interland spacings whereby uncontrolled variations in register between the members as a whole cause no visible difference in the segmental bond pattern in the resultant fabric and no intermeshing can occur between the members.

4,005,170
PREPARATION OF PELLETIZED CARBON BLACKS

Howard R. Harris, Morgan City, La., assignor to Cabot Corporation, Boston, Mass.

Continuation of Ser. No. 397,236, Sept. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 199,030, Nov. 15, 1971, abandoned. This application Oct. 16, 1975, Ser. No. 622,981

Int. Cl.² B01J *2/12*

U.S. Cl. 264—117 **4 Claims**

1. In a process for wet pelletizing carbon black wherein fluffy carbon black is agitated in a pelletizer in the presence of sufficient pelletizing liquid to agglomerate the particles of carbon black into free-flowing pellets, the improvement comprising:

a. intimately admixing said fluffy carbon black with a portion of about 3 to about 75% of said pelletizing liquid in a mixer having rotational means operating at a speed in excess of 550 r.p.m., and
b. agitating the resulting wet mixed carbon black with the remaining portion of said pelletizing liquid to agglomerate said carbon black into said free-flowing pellets.

4,005,171
CATALYTIC PREPARATION OF SOLUBLE POLY(DICHLOROPHOSPHAZENES)

Kennard A. Reynard, and Arthur H. Gerber, both of Cleveland, Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

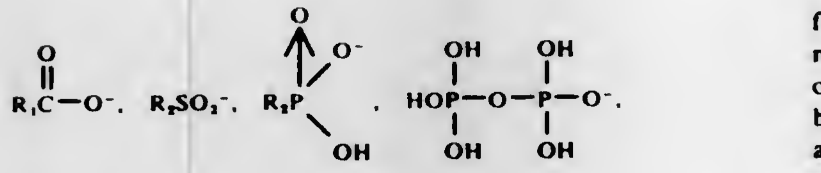
Filed May 28, 1974, Ser. No. 474,055

Int. Cl.² C01B *25/10*

U.S. Cl. 423—300 **9 Claims**

1. A process for the preparation of soluble polyhalophosphazene polymer consisting essentially of recurring structural units represented by the formula $[X_2PN]$ and having an intrinsic viscosity of about 0.01 to about 3.0 dl/g (benzene, 30° C), said polymer being soluble in benzene, toluene, chlorobenzene, and dichlorobenzene, which comprises heating at least one cyclic oligomer represented by the formula $(X_2PN)_m$ where *m* is 3–7, wherein X is a halogen selected from the group consisting of F, Cl, and Br and all of the X's are not required to be identical, at temperatures of about 130° C to 220° C in the presence of an effective amount of at least one catalyst which is selected from the group consisting of A and B and mixtures thereof wherein:

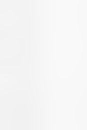
Group A consists of metallic or quaternary ammonium salts in which the anion is represented by one of the following formulae:



$$R_1\overset{\overset{O}{\|}}{C}-O^-,\quad R_2SO_2^-,\quad R_2\overset{\overset{O}{\uparrow}}{P}\begin{smallmatrix}O^-\\ OH\end{smallmatrix},\quad HO\underset{OH}{\overset{OH}{P}}-O-\underset{OH}{\overset{OH}{P}}-O^-,$$

$(O_2N)_3C_6H_2O^-$, and $H_2PO_4^-$,

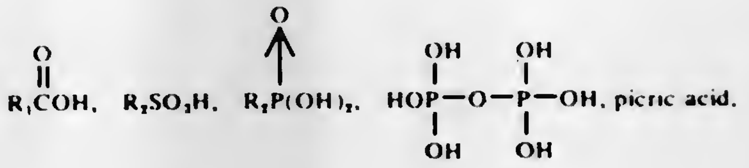
where R_1 is a monovalent member selected from the group consisting of polyhaloalkyl, where the halogen is F, Cl or mixtures thereof, perfluoroaryl and perchloroaryl; R_2 is a monovalent member selected from the group consisting of F, Cl, lower alkyl (C_1–C_8), aryl, substituted alkyl and substituted aryl with the proviso that R_2 is not halogen when bonded to



$$-\overset{\overset{O}{\uparrow}}{P}<$$

and the metal of the salt is a metal selected from the group consisting of Li, Na, K, Mg, Ba, Hg, Ag, Mn and Zn;

Group B consists of at least one acid selected from the group consisting of acids represented by the following formulae:



$$R_1\overset{\overset{O}{\|}}{C}OH,\quad R_2SO_3H,\quad R_2\overset{\overset{O}{\uparrow}}{P}(OH)_2,\quad HO\underset{OH}{\overset{OH}{P}}-O-\underset{OH}{\overset{OH}{P}}-OH,\ \text{picric acid,}$$

H_3PO_4 and its dehydrated derivatives and wherein R_1 and R_2 are as defined in Group A.

4,005,172
SOLID COMPLEX PHOSPHATE OF ALUMINUM

James Derek Birchall, and John Edward Cassidy, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 274,964, July 25, 1972, Pat. No. 3,870,737, and a continuation of Ser. No. 42,499, June 1, 1970, abandoned. This application Oct. 21, 1974, Ser. No. 516,778

Claims priority, application United Kingdom, June 12, 1969, 29862/69

Int. Cl.² C01B *25/10*

U.S. Cl. 423—300 **7 Claims**

1. A solid water-soluble inorganic halogen-containing complex phosphate of aluminum wherein the ratio of the number of gram atoms of aluminum to the number of gram atoms of phosphorus is substantially 1:1, the ratio of the number of gram atoms of aluminum to the number of gram atoms of halogen is substantially 1:1, and which contains at least one chemically-bound molecule of water.

4,005,173
STEAM STRIPPING OF AMMONIACAL SOLUTIONS AND SIMULTANEOUS LOADING OF METAL VALUES BY ORGANIC ACIDS

J. Paul Pemsler, Lexington, and John K. Litchfield, Bedford, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,416

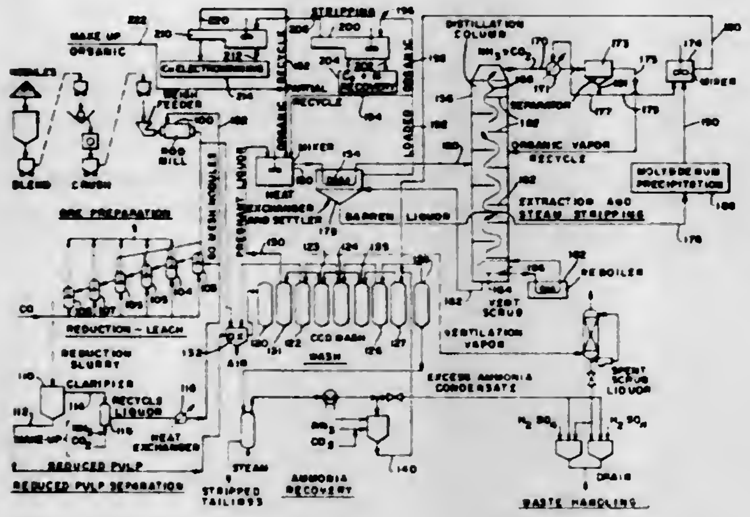
Int. Cl.² C01G *3/00, 51/00, 53/00*

U.S. Cl. 423—24 **18 Claims**

10. In a process of the type in which metal values selected from the group of copper, nickel, cobalt, molybdenum and mixtures thereof are recovered from a manganese containing ore by introducing the ore into a reaction vessel containing a basic aqueous ammoniacal leach liquor having a pH above 9 and containing ammonia, carbon dioxide and cuprous ions and in which the cuprous ions reduce the manganese oxides in the ore to enable the metal values to be solubilized and in which cuprous ions are continuously regenerated by a reducing gas wherein the improvement comprises:

a. adding an organic acid ion extractant to the aqueous ammoniacal leach liquor containing solubilized copper, nickel, cobalt and molybdenum;
b. thereafter driving off a sufficient amount of ammonia and carbon dioxide from said aqueous ammoniacal leach liquor to lower the pH of said aqueous ammoniacal leach

liquor to a level where the organic acid is insoluble in said aqueous ammoniacal leach liquor and is capable of extracting metal values therefrom;



c. separating the loaded organic acid from the aqueous ammoniacal leach liquor; and,
d. selectively stripping metal values from the loaded acid.

4,005,174

PROCESS FOR THE ELIMINATION OF CHLORIDE FROM ZINC SULPHATE SOLUTIONS

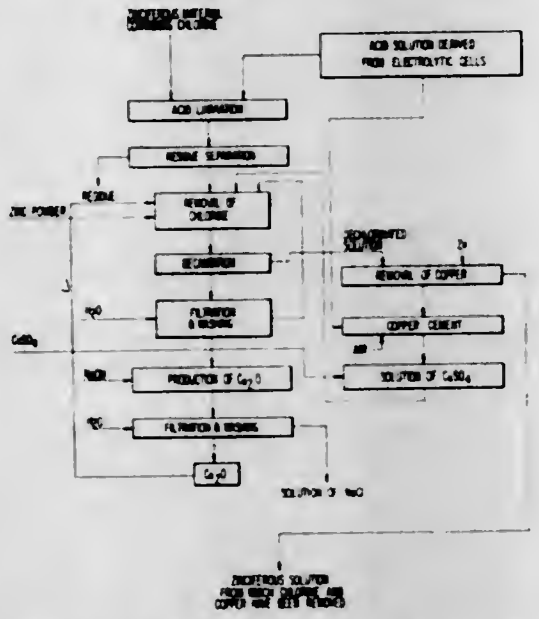
Fernand Jacques Joseph Bodson, 35, Quai Saint Paul de Sincay, B.4900 Angleur, Belgium

Filed June 17, 1975, Ser. No. 587,629

Claims priority, application Belgium, June 17, 1974, 816468

Int. Cl.^{2} C01G *3/04*

U.S. Cl. 423—43 **9 Claims**



1. A cyclic process for removing chloride ions from a sulfuric acid solution of zinc sulphate, wherein the pH of said solution is below 2.6 and the cupric ion content of said solution is at such a value that after removal of the chlorine by precipitation as cuprous chloride, as hereinafter recited, the cupric ion concentration of said solution is at least 0.5 g/l, said process comprising adding cuprous oxide to said solution in an amount which is at least equal to the stoichiometrical amount needed for the formation of a cuprous chloride precipitate with the chloride ions present in the solution, separating the cuprous chloride precipitate from the solution and converting the cuprous chloride to cuprous oxide which is used again.

4,005,175

PROCESS FOR THE JOINT PRODUCTION OF SODIUM TRIPOLYPHOSPHATE AND TITANIUM DIOXIDE

Benedetto Calcagno; Luigi Piccolo; Antonio Paolinelli; Giorgio Cozza, all of Milan, and Gabriele Bottai, Varese, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Mar. 21, 1975, Ser. No. 560,750

Claims priority, application Italy, Mar. 25, 1974, 67939/74

Int. Cl.^{2} C01G *23/04;* **C01B** *25/30*

U.S. Cl. 423—83 **7 Claims**

1. A process for the joint production of titanium dioxide and sodium tripolyphosphate from ores of titanium and phosphorous and from sulphuric acid comprising:

a. contacting, at an elevated temperature, ilmenite or titanium bearing slags with concentrated sulphuric acid to form a solid product which is subsequently dissolved in water or weak acid to yield a solution containing titanium sulphates and iron sulphates;
b. converting entirely said iron sulphates to their reduced, ferrous form by reducing the ferric iron present to ferrous iron, and clarifying the resulting solution;
c. separating the ferrous sulphate in the form of ferrous sulphate heptahydrate;
d. subjecting the remaining solution from which the ferrous sulphate heptahydrate has been separated to hydrolysis so that the titanium dioxide is precipitated in hydrated form, leaving an aqueous solution of sulphuric acid;
e. converting said precipitated hydrated titanium dioxide to pigments of rutile or anatase;
f. concentrating said aqueous solution of sulphuric acid resulting from the separation of hydrated titanium dioxide to a concentration of between 40% and 70% by weight of free acid;
g. contacting the concentrated solution of sulphuric acid at an elevated temperature with phosphatic ores, the quantity of concentrated solution of sulphuric acid being in excess of the stoichiometric quantity necessary to liberate phosphoric acid from said ores;
h. separating the fluorine and silicon from the solution resulting from the acid attack of the phosphatic ores and purifying the solution from sulphate ions, free sulphuric acid, arsenic and organic substances present;
i. separating vanadium, chronium and iron by the addition of sodium hydroxide in an amount sufficient also to cause salification of the phosphoric acid; and
j. converting sodium phosphates thus-produced to sodium tripolyphosphate.

4,005,176

PROCESS FOR THE RECOVERY OF ANTIMONY PENTACHLORIDE FROM USED CATALYST SOLUTIONS

Gunter Fernschild; Werner Rudolph, and Joachim Massonne, all of Hannover, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Aug. 14, 1975, Ser. No. 604,540

Claims priority, application Germany, Aug. 17, 1974, 2439540

Int. Cl.^{2} C01B *9/00*

U.S. Cl. 423—87 **13 Claims**

1. A process for the recovery of antimony pentachloride from used catalyst solution comprising:

a. chlorinating used catalyst solution containing Sb^{3+} and high boiling halogen-containing hydrocarbons to convert said Sb^{3+} to Sb^{5+};
b. reacting said solution with hydrogen fluoride to give $SbCl_xF_y$ wherein x is 4–2 and y is 1–3, the sum of x and y being 5, and fluorinated lower boiling hydrocarbons;
c. removing said fluorinated lower boiling hydrocarbons having lower boiling temperatures than said $SbCl_xF_y$ compounds from said solution by distillation;
d. reacting said $SbCl_xF_y$ compounds with carbon tetrachloride to $SbCl_5$; and
e. separating said $SbCl_5$ from said solution by distillation.

4,005,177

CATALYTIC TREATMENT OF AUTOMOTIVE EXHAUST GAS

Guenther Weidenbach, Anderten; Karl Hermann Koepernik, Hannover, and Hans Braeutigam, Grossburgwedel, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Jan. 17, 1975, Ser. No. 541,775

Claims priority, application Germany, Jan. 19, 1974, 2402519

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—213.5 **13 Claims**

1. In a process for removing harmful components from automobile exhaust gas or industrial waste gas containing nitrogen oxides (NO_x), carbon monoxide (CO) and unburned hydrocarbons, including the steps of oxidizing said CO and said hydrocarbons and/or reducing of said NO_x by contacting said gas at an elevated temperature between about 200° and 1000° C. with a catalyst wherein the improvement comprises said catalyst comprising a solid catalytically active carrier material consisting essentially of aluminum oxide and having admixed therewith between about 0.2 and 15% by weight of zinc oxide, said zinc oxide having been incorporated in said aluminum oxide as preformed zinc oxide, and carried upon said carrier, a catalytically active metal component consisting essentially of at least one noble metal, whereby said process can be carried out over extended periods of time at said elevated temperatures without said catalyst losing its activity and therefore requiring replacement.

4,005,178

METHOD FOR CONVERTING UF5 TO UF4 IN A MOLTEN FLUORIDE SALT

Melvin R. Bennett; Carlos E. Bamberger, and A. Donald Kelmers, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 10, 1975, Ser. No. 594,823

Int. Cl.^{2} C01G *43/06;* **B01J** *23/42, 23/52*

U.S. Cl. 423—259 **4 Claims**

1. A method of reducing UF_5 to UF_4 in a molten fluoride salt comprising reacting said salt with hydrogen in the presence of an effective catalytic amount of platinum.

4,005,179

WORKING UP SYNTHESIS SOLUTIONS OBTAINED IN PRODUCTION OF HYDRAZINE

Kurt-Wilhelm Eichenhofer, Leverkusen; Reinhard Schliebs, Cologne, both of Germany; Hermann Brandl, Baytown, Tex., and Heinrich Kohnen, Leverkusen Schlebusch, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1975, Ser. No. 597,263

Claims priority, application Germany, July 27, 1974, 2436335

Int. Cl.^{2} C01B *21/16*

U.S. Cl. 423—407 **24 Claims**

1. In the production of hydrazine wherein aqueous ammonia is oxidized in the presence of a ketone to form an aqueous solution containing at least one of a hydrazone and a ketazine along with ammonia, the hydrazone and ketazine are concentrated and the hydrazone and ketazine are subsequently hydrolyzed to hydrazine and ketone, the improvement which comprises effecting the concentration of the hydrazone and ketazine by extracting the aqueous solution with a substantially water-immiscible higher alcohol with 5 to about 18 carbon atoms whereby the hydrazone and ketazine preferentially enter the water-immiscible higher alcohol, and separating the water-immiscible higher alcohol extract from the aqueous solution.

4,005,180

METHOD FOR PRODUCING SYNTHETIC DIAMONDS

Geoffrey Harvey Greenhalgh, Sussex, England; Roger John Wedlake, and Pieter Willem Gideon DeJager, both of Johannesburg, both of South Africa, assignors to De Beers Industrial Diamond Division Limited, South Africa

Continuation of Ser. No. 286,678, Sept. 6, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 543,871

Int. Cl.^{2} B01J *3/06;* **C01B** *31/06*

U.S. Cl. 423—446 **1 Claim**

1. A method of producing diamond including the step of subjecting a compound selected from the group consisting of hexachlorobenzene, hexachloroethane and tetrachloroquinone, to a temperature of 300° to 1150° C. and a pressure of 25 to 50 kilobars, said temperature and pressure being below the Berman-Simon line, for 15 to 30 minutes, and then releasing said pressure.

4,005,181

METHOD TO MAKE CARBON BLACK UTILIZING POLYMERS

George R. Hill, Houston, Tex., and Homer M. Fox, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 324,393, Jan. 17, 1973, Pat. No. 3,903,249, which is a continuation-in-part of Ser. No. 841,567, July 14, 1969, abandoned. This application June 23, 1975, Ser. No. 589,509

The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.

Int. Cl.^{2} C09C *1/48, 1/50*

U.S. Cl. 423—449 **3 Claims**

1. A process for producing carbon black by the pyrolytic decomposition of hydrocarbon feedstock comprising:

a. introducing a hydrocarbon feedstock selected from the group of liquid and gaseous hydrocarbons into a carbon black reactor;
b. combusting a normally liquid fuel having dissolved therein a normally solid polymer selected from the group consisting of polyethylene, polypropylene, polyvinyl chloride and polystyrene and mixtures thereof with a gaseous oxidant selected from the group consisting of air, oxygen-enriched air, and oxygen to produce hot combustion gases,
c. contacting the hydrocarbon feedstock in the carbon black reactor with the hot combustion gases;
d. pyrolytically decomposing said feedstock in the heat created by the combustion of step (b), such as to convert said feedstock into a carbon black-containing smoke;
e. separating said carbon black from said smoke; and
f. recovering said carbon black.

4,005,182

STABLE SODIUM SULFATE-HYDROGEN PEROXIDE-SODIUM CHLORIDE ADDUCT AND PROCESS FOR PREPARING SAME

Yoshio Ito, and Toshio Mashiko, both of Kohriyama, Japan, assignors to Kao Soap Co., Ltd. and Nippon Peroxide Co., Ltd., both of Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,202

Int. Cl.^{2} C01B *17/46, 17/98, 15/00;* **C11D** *3/395*

U.S. Cl. 423—467 **5 Claims**

1. An adduct having the formula: $4Na_2SO_4\cdot 2H_2O_2\cdot NaCl$.

4,005,183
HIGH MODULUS, HIGH STRENGTH CARBON FIBERS PRODUCED FROM MESOPHASE PITCH

Leonard Sidney Singer, Berea, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 239,490, March 30, 1972, abandoned. This application Mar. 5, 1973, Ser. No. 338,147

Int. Cl.^{2} C01B *31/07*

U.S. Cl. 423—447.2 **35 Claims**

1. A fiber having a structure possessing the three-dimensional order characteristic of polycrystalline graphite, said fiber having a diameter no greater than 30 microns; an electrical resistivity less than 250×10^{-6} ohm centimeters; a tensile strength greater than 200×10^3 psi.; a Young's modulus of elasticity greater than 50×10^6 psi.; an X-ray diffraction pattern characterized by the presence of the (112) cross-lattice line, and resolved (100) and (101) lines; a preferred orientation of carbon crystallites parallel to the fiber axis such that the preferred orientation parameter for the fiber is no greater than 10° (determined by microdensitometer scanning of the (002) band of the exposed X-ray film of the fiber and expressed as the full width at half maximum of the azimuthal intensity distribution); an interlayer spacing *d* no greater than 3.37 A; and containing oriented elongated domains preferentially aligned parallel to the fiber axis, said domains characteristically being greater than 5000 A in diameter and visible under polarized light at a magnification of 1000 X.

4,005,184
THERMOCHEMICAL PROCESS FOR THE PRODUCTION OF HYDROGEN USING CHROMIUM AND BARIUM COMPOUND

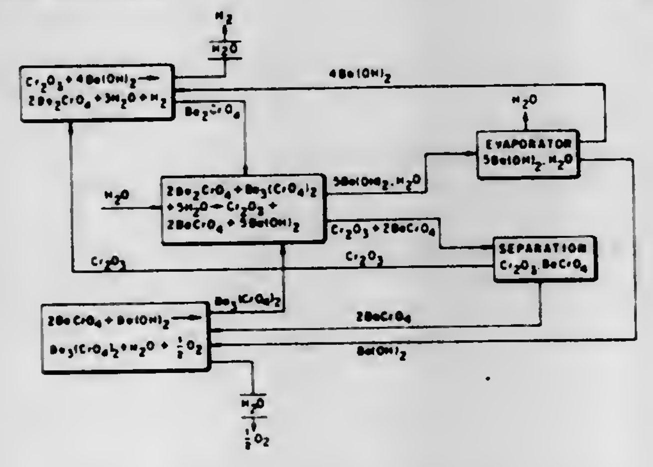
Carlos E. Bamberger, and Donald M. Richardson, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,918

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.^{2} C01B *13/02*

U.S. Cl. 423—579 **4 Claims**


H2
H2O
Cr2O3 + 4Ba(OH)2 → 2Ba2CrO4 + 3H2O + H2
4Ba(OH)2
Ba2CrO4
H2O
EVAPORATOR
5Ba(OH)2·H2O
H2O
2Ba2CrO4 + Ba3(CrO4)2 + 5H2O → Cr2O3 + 2BaCrO4 + 5Ba(OH)2
5Ba(OH)2·H2O
Cr2O3 + 2BaCrO4
SEPARATION
Cr2O3, BaCrO4
Cr2O3
Cr2O3
Ba3(CrO4)2
2BaCrO4 + Ba(OH)2 → Ba3(CrO4)2 + H2O + ½O2
2BaCrO4
Ba(OH)2
H2O
½O2

1. A cyclic process for splitting water into hydrogen and oxygen, comprising the steps of:

reacting (1) chromium oxide with barium hydroxide to produce hydrogen, water and Ba_2CrO_4 as reaction products;

separating hydrogen and water from the reaction environment;

reacting (2) said Ba_2CrO_4 with $Ba_3(CrO_4)_2$ and water to form said chromium oxide, $BaCrO_4$ and barium hydroxide;

reusing a part of said barium hydroxide and said chromium oxide in said first mentioned step of reacting;

reacting (3) the remainder of said barium hydroxide with said $BaCrO_4$ to produce said $Ba_3(CrO_4)_2$, water and oxygen;

separating said water and oxygen from the reaction environment; and

reusing said $Ba_3(CrO_4)_2$ in said second mentioned step of reacting.

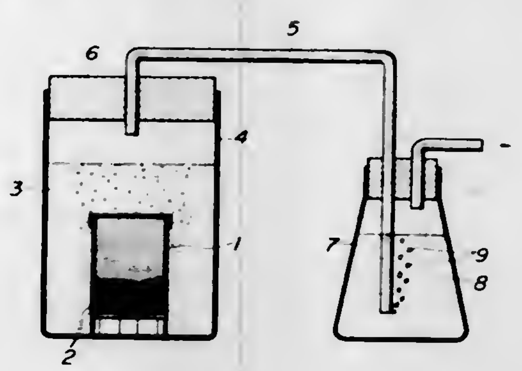
4,005,185
METHOD FOR HYDROGEN GENERATION

Otaharu Ishizaka, c/o Tohwa-mansion No. 1303, 12-12 Hohman 2-chome, Suginami, Tokyo, Japan

Filed Apr. 10, 1974, Ser. No. 459,723

Int. Cl.^{2} C01B *1/02, 1/07;* **C01C** *1/00;* **C01B** *21/00*

U.S. Cl. 423—648 **9 Claims**



1. A method for generating hydrogen comprising contacting

a. metallic zinc with

b. an ammonium-complex salt of a metal other than zinc in an aqueous solution maintained under alkaline conditions of a member selected from the group consisting of:

  i. neutral ammonium carbonate ($(NH_4)_2CO_3$),

  ii. neutral ammonium carbonate and an ammonium salt of an inorganic acid,

  iii. an ammonium salt of an inorganic acid and ammonia water, and

  iv. neutral ammonium carbonate, an ammonium salt of an inorganic acid and ammonia water

and at a reaction temperature of from about 10° to 40° C, whereby hydrogen is generated through the transformation of the ammonium salt of the metal other than zinc into an ammine coordinated complex salt of the metal other than zinc.

4,005,186
METHODS OF INCREASING CATALYTIC ACTIVITY

Peter J. Ficalora, R.D. No. 1, Tully, N.Y. 13159, and Geoffrey Hao-Wen Liu, 106 Cherry Hill, Dewitt, N.Y. 13214

Continuation-in-part of Ser. No. 459,460, April 10, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,629

Int. Cl.^{2} B01J *23/74, 35/02;* **C01G** *49/00*

U.S. Cl. 423—659 **7 Claims**

1. A method of performing a catalytic chemical reaction comprising:

a. attaching a solid body of a catalyst of the type wherein catalysis occurs at the site of surface defects to a base support material which may be physically deformed by the application of at least one of an electrical and magnetic field, said catalyst and base support being attached over mutually opposing surfaces, whereby physical distortion of said base at said opposing surface is thereof transmitted to said catalyst;

b. placing said base support with said catalyst attached within a reaction vessel;

c. applying said field to said base support to a degree sufficient to deform said base to an extent creating plastic deformation defects in an exposed surface of said catalyst;

d. introducing into said reaction vessel the materials to be reacted for contact with said exposed surface; and

e. withdrawing the products of the reaction from said vessel.

4,005,187
DIAGNOSTIC TEST METHOD

Gustave F. Klithau, and Diana R. Loftin, both of Houston, Tex., assignors to Data Diagnostic Corporation, Houston, Tex.

Filed June 3, 1974, Ser. No. 475,797

Int. Cl.^{2} G01N *33/00;* **G01T** *1/16;* **G21H** *5/02*

U.S. Cl. 424—1.5 **52 Claims**

1. A method of isolating a diagnostically significant component in a test fluid mixture comprising contacting at least 2 solutes in said test fluid mixture, which solutes react to form in situ a solid absorbent, said solid absorbent formed of material other than said diagnostically significant component and being of a nature so as to selectively adsorb at least a portion of said diagnostically significant component.

4,005,188
X-RAY CONTRAST MEDIA

Guy Tilly; Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

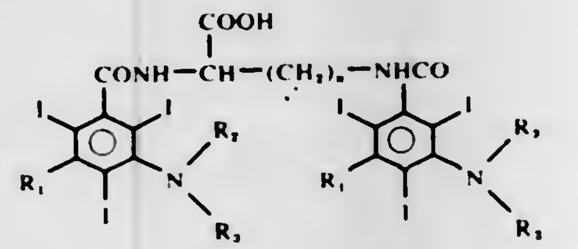
Filed May 20, 1975, Ser. No. 579,280

Claims priority, application United Kingdom, May 31, 1974, 24169/74

Int. Cl.^{2} A61K *29/02;* **C07C** *65/20, 65/22*

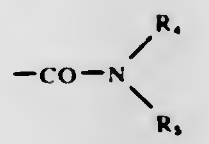
U.S. Cl. 424—5 **5 Claims**

1. Compounds of the formula :



in which:

R$_1$ is selected from the group consisting of hydrogen and a radical of the formula



$$-CO-N\begin{matrix} R_4 \\ R_5 \end{matrix}$$

in which R$_4$ and R$_5$, independently of each other, are selected from the group consisting of hydrogen and a lower alkyl radical,

R$_2$ is selected from the group consisting of hydrogen and a lower alkanoyl radical,

R$_3$ is selected from the group consisting of hydrogen, a lower alkyl radical and a lower alkanoyl radical, n is 3 or 4,

and their lower alkyl esters and their salts with pharmaceutically acceptable bases.

4,005,189
PROCESS OF SUPPRESSING ODORS EMPLOYING DEODORANTS CONTAINING ESTERS OF ALIPHATIC HYDROXYCARBOXYLIC ACIDS

Gunter Reese, Dusseldorf-Holthausen, and Rainer Osberghaus, Dusseldorf-Urdenbach, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Apr. 2, 1975, Ser. No. 564,554

Claims priority, application Germany, Apr. 16, 1974, 2418362

Int. Cl.^{2} A61K *7/32*

U.S. Cl. 424—47 **5 Claims**

1. A process for suppressing body odor in a warmblooded animal comprising applying topically to said warmblooded animal an effective deodorizing amount of a substantially anhydrous cosmetic preparation containing from 1% to 25% by weight based upon the total weight of at least one ester of an aliphatic acid having from 2 to 4 carbon atoms selected from the group consisting of a hydroxyalkanoic acid, a dihydroxyalkanoic acid, a hydroxyalkanedioic acid and a dihydroxyalkanedioic acid with an alcohol selected from the group consisting of an alkanol having from 1 to 6 carbon atoms, a cycloalkanol having from 5 to 6 carbon atoms and an alkanepolyol having 2 to 6 carbon atoms and 2 to 6 hydroxy groups, and the remainder of inert cosmetic ingredients

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4,005,190
INFUSION SOLUTION FOR PARENTERAL FEEDING

Helmut Mader, Furth; Werner Fekl, Erlangen, and Klaus Schultis, Frankfurt, all of Germany, assignors to J. Pfrimmer & Co., Erlangen, Germany

Filed Apr. 2, 1975, Ser. No. 564,453

Claims priority, application Germany, July 10, 1974, 2433173

Int. Cl.^{2} A61K *33/00*

U.S. Cl. 424—127 **1 Claim**

1. In an infusion solution for parenteral feeding which comprises water-soluble amino acids, polyols, minerals and vitamins and water-insoluble components comprising phosphatides or phosphatides and vitamins A, E, D and K, the improvement which comprises including in the infusion solution an amount sufficient to solubilize the water-insoluble components of a solubilizing mixture of ethanol and at least one member selected from the group consisting of 3α, 12α-dihydroxy-5β-cholanic acid and 3α, 7α, 12α-trihydroxy-5β-cholanic acid or their salts, the said cholanic acid compounds or their salts being present in the infusion solution in an amount sufficient to yield a weight ratio of water-insoluble phosphatides to cholanic acid compounds or their salts of from about 1:1 to 3:1, whereby the infusion solution is maintained in clear solution.

4,005,191
TOPICAL OINTMENT COMPOSITION

Mary G. Clark, 121 W. Grace St., Old Forge, Pa. 18518

Continuation of Ser. No. 476,294, June 4, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 628,972

Int. Cl.^{2} A61K *33/06*

U.S. Cl. 424—154 **13 Claims**

1. A topical ointment composition consisting essentially of an admixture of:

a. a mixture of non-systemic bases consisting of from about 7 to about 82 weight percent calcium carbonate, from about 5 to about 77 weight percent magnesium hydroxide and from about 6 to about 80 weight percent aluminum hydroxide, with the proviso that the percentages of said components in said mixture total 100% thereof; and

b. a mixture of carrier materials consisting essentially of anhydrous lanolin and hydrophilic ointment said carrier materials being present in said carrier mixture in a weight ratio of approximately 2:1 to 1:2; said ointment containing a weight ratio of said mixture of 1:21 to 1 to 213, effective to promote growth of normal healthy body tissues.

4,005,192

COMPOSITION IN SUBSTANTIALLY RIGID BLOCK FORM FOR CONTROLLING OR PREVENTING BLOAT IN ANIMALS

Clifford Arthur Andrew Graham, Nunawading, and Kevin Lawrence Linehan, Burwood East, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed July 17, 1974, Ser. No. 489,437

Claims priority, application Australia, July 27, 1973, 4265/73

Int. Cl.² A61K *33/08, 31/70, 31/08*

U.S. Cl. 424—157 **5 Claims**

1. A therapeutic composition of matter in the form of a substantially rigid block for use in controlling or preventing bloat in animals, said composition comprising an effective amount of the reaction product obtained by mixing together at a temperature not in excess of 90° C molasses, magnesium oxide, and a nonionic polyoxyalkylene surface active compound and maintaining the resultant mixture at a temperature not in excess of 90° C until the evolution of self-generated heat from the mixture has ceased substantially and the mixture has been converted to a substantially rigid form, the surface active compound being one of formula

$$R^1-O\left(CH_2CH_2-O\right)_nH$$

wherein R^1 is a linear C_{8-18} alkyl group and *n* lies in the range 10 to 30 inclusive.

4,005,193

MICROBIOCIDAL POLYMERIC QUATERNARY AMMONIUM COMPOUNDS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 495,328, Aug. 7, 1974, Pat. No. 3,929,990, which is a continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application Oct. 20, 1975, Ser. No. 623,750

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² A01N *9/04, 9/20, 9/24, 17/10*

U.S. Cl. 424—168 **3 Claims**

1. A method of controlling the proliferation of fungi in a water-in-oil emulsion which comprises incorporating into said emulsion as a fungicidal agent a condensation product and an amine oxide as an emulsifier, said condensation product being formed by mixing 1,4-dihalo-2-butene and 1,4-bis-dimethylamino-2-butene dissolved in a solvent at room temperature whereby an exothermic reaction is obtained causing the temperature of the mixture to rise, then maintaining the mixture at no higher than reflux temperature until the reaction is complete, the reactants being present in the reaction in relative molar proportions to each other of between about 1:3 and about 3:1, said condensation product being present in the emulsion in a fungicidally effective amount, and said amine oxide being present in an amount to effectively emulsify the composition.

4,005,194

TREATMENT OF PROSTATIC HYPERPLASIA

Edwin Samuel Johnson, Antioch, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,236

Int. Cl.² A61K *37/02*

U.S. Cl. 424—177 **6 Claims**

1. The method of reducing or preventing undesirable prostatic growth in a warm-blooded animal consisting essentially of administering to said animal a sufficient daily amount to prevent prostatic growth or to reduce prostate size, of a nonapeptide of the formula

L-pGlu-L-His-L-Trp-L-Ser-L-Tyr-X-L-Leu-L-Arg-L-Pro-NH-R

wherein X denotes the optically active D-form of an aminoacid moiety of the formula —NH—CHR'—CO— with R' being a linear or branched carbon chain of 1–4 carbon atoms and wherein R is lower alkyl.

4,005,195

COMPOSITIONS FOR TREATING HYPERCHOLESTEROLEMIA

Ronald James Jandacek, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 12, 1976, Ser. No. 657,528

Int. Cl.² A61K *31/72, 31/23*

U.S. Cl. 424—180 **64 Claims**

1. A composition of matter, comprising:

a. an edible, non-absorbable, non-digestible liquid polyol fatty acid polyester having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and sugar alcohols containing from 4 to 8 hydroxyl groups and wherein each fatty acid group has from about 8 to about 22 carbon atoms; and

b. sufficient anti-anal leakage agent to prevent leakage of said liquid polyester through the anal sphincter.

4,005,196

VITAMINIZED COMPOSITIONS FOR TREATING HYPERCHOLESTEROLEMIA

Ronald James Jandacek, and Fred Hugh Mattson, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 12, 1976, Ser. No. 657,529

Int. Cl.² A61K *31/72, 31/23, 31/59*

U.S. Cl. 424—180 **66 Claims**

1. A composition of matter, comprising

a. an edible, non-absorbable, non-digestible liquid polyol fatty acid polyester having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and sugar alcohols containing from 4 to 8 hydroxyl groups and wherein each fatty acid group has from about 8 to about 22 carbon atoms;

b. sufficient anti-anal leakage agent to prevent leakage of said liquid polyester through the anal sphincter; and

c. sufficient fat-soluble vitamin selected from the group consisting of vitamin A, vitamin D, vitamin E and vitamin K to prevent abnormally low levels of any of said fat soluble vitamins in animals ingesting said composition.

4,005,197

COMBATING INSECTS, ACARIDS AND NEMATODES WITH S-ALKOXYETHYL-PHENYL-DI- AND TRI-THIOPHOSPHONIC ACID ESTERS

Shigeo Kishino, Tokyo; Akio Kudamatsu, Kanagawa, and Shozo Sumi, Tokyo, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

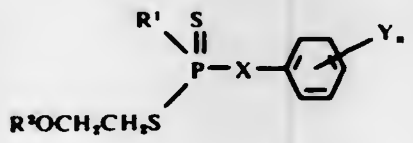
Division of Ser. No. 344,799, March 26, 1973, Pat. No. 3,894,124. This application Apr. 23, 1975, Ser. No. 570,972

Claims priority, application Japan, Apr. 6, 1972, 47-33844

Int. Cl.² A01N *9/36*

U.S. Cl. 424—216 **11 Claims**

10. An insecticidal, acaricidal or nematocidal composition comprising an insecticidally, acaricidally or nematocidally effective amount of a compound of the formula



in which

R^1 and R^2 each independently is C_1-C_6 alkyl,

X is oxygen or sulfur,

Y is C_1-C_6 alkyl, C_1-C_6 alkylmercapto or halogen, and

n is 1 or 2,

in admixture with a diluent.

4,005,198

TREATMENT OF ACNE VULGARIS

Scott D. Skillern, South Bend, Ind., assignor to Robert H. Van Aman, Jupiter, Fla.

Filed Sept. 12, 1975, Ser. No. 612,686

Int. Cl.² A61K *31/65, 31/54*

U.S. Cl. 424—227 **2 Claims**

1. A method for the treatment of acne vulgaris in a patient having acne vulgaris which comprises orally administering methyclothiazide in a dosage of 2.5 to 5.0 mg. bi-daily.

4,005,199

SUBSTITUTED BENZENESULFONAMIDES AS ANTHELMINTICS

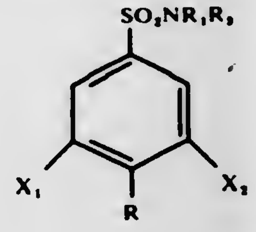
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 541,540, Jan. 16, 1975, abandoned, which is a division of Ser. No. 472,002, May 22, 1974, which is a division of Ser. No. 326,652, Jan. 26, 1973, abandoned, which is a continuation of Ser. No. 135,433, April 19, 1971, abandoned. This application Oct. 6, 1975, Ser. No. 619,981

Int. Cl.² A61K *31/63*

U.S. Cl. 424—228 **6 Claims**

1. A method for the treatment of mature and immature liver fluke which comprises administering to an animal susceptible to infestation with mature or immature liver fluke a fasciolicidally effective amount of a compound having the formula:



wherein R is amino; X_1 and X_2 are each halogen, trifluoromethyl or nitro; and R_1 and R_2 are each hydrogen or loweralkyl.

4,005,200

METHOD FOR IMPROVING THE MATURITY OF THE PARTURIENT CANAL AND THE SENSITIVITY TO OXYTOCIN

Isamu Utsumi, Kyoto; Tomio Endo, Kobe; Tadaaki Kamata, Ibaraki, and Masayasu Ando, Takatsuki, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed July 17, 1975, Ser. No. 596,741

Int. Cl.² A61K *31/565*

U.S. Cl. 424—243 **5 Claims**

1. A method for improving the maturity of parturient canal and the sensibility of uterine musculature to oxytocin, which comprises administering to a living pregnant human a therapeutically effective amount of dehydroepiandrosterone sulfate or a pharmaceutically acceptable salt thereof at the 37th to 39th week of pregnancy.

4,005,201

7-(HYDROXYPHENYL)PYRIDO(3,4-d)PYRIDAZINES

Shojiro Yurugi, Kyoto, and Shintaro Kikuchi, Hyogo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

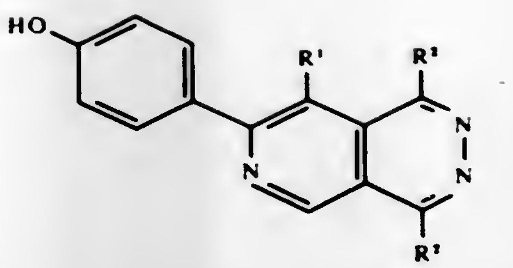
Filed Mar. 25, 1975, Ser. No. 562,034

Claims priority, application Japan, Mar. 25, 1974, 49-33679

Int. Cl.² C07D *405/14, 471/14*

U.S. Cl. 424—248.57 **10 Claims**

1. A pyrido [3,4-d] pyridazine shown by the formula:



wherein R^1 stands for hydrogen or methyl, R^2 stands for morpholino, methyl-morpholino, ethyl-morpholino, piperidino, methyl-piperidino or ethyl-piperidino or a pharmaceutically acceptable nontoxic cation salt or a pharmaceutically acceptable nontoxic acid addition salt thereof.

4,005,202

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

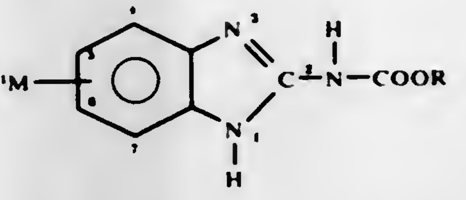
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 441,222, Feb. 11, 1974, Pat. No. 3,935,209, which is a continuation-in-part of Ser. No. 340,581, March 12, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,257

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **29 Claims**

1. A composition for controlling helminths in mammals comprising a pharmaceutically acceptable non-toxic excipient and an anthelmintically effective amount of a compound represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is selected from the group consisting of thiazolyl, pyridyl, imidazolyl, pyrimidinyl, thienyl, pyridazinyl, pyrazinyl, pyrrolyl, pyrazolyl, oxazolyl, furyl, isothiazolyl, isoxazolyl, thiadiazolyl, and triazolyl; and M is O, S, or

$$\overset{\textstyle S:}{\underset{\textstyle O}{\downarrow}}$$

the R^1M-substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

4,005,203

TREATMENT OF MENINGEAL LEUKEMIA WITH DIAMINO DICHLOROPHENYL PYRIMIDINE

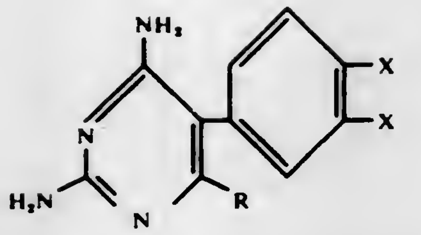
Dwight R. Stickney; William S. Simmons; Charles A. Nichol; George H. Hitchings, all of Durham, and Gertrude B. Elion, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 344,179, March 23, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,454

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **5 Claims**

1. A method of treating a human infected with meningeal leukemia which comprises internally administering to the infected human an effective non-toxic meningeal leukemia treatment amount of a compound of Formula I



where R is lower alkyl containing 1 or 2 carbon atoms and X is a chlorine atom or a pharmaceutically acceptable salt thereof.

4,005,204
TREATMENT OF NEOPLASMS IN THE BRAIN WITH DIAMINO DICHLOROALKYL PYRIMIDINE

Dwight R. Stickney; William S. Simmons; Charles A. Nichol; George H. Hitchings, all of Durham, and Gertrude B. Elion, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Triangle Park, N.C.

Division of Ser. No. 344,179, March 23, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,453

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 6 Claims

1. A method of treating neoplasms in the brain of a mammal which comprises administering to the infected mammal a non-toxic anti-neoplastic effective amount of the compound 2,4-diamino-5-(3′,4′, dichlorophenyl)-6-methylpyrimidine or a pharmaceutically acceptable salt thereof.

4,005,205
COMPOSITIONS AND METHODS FOR INHIBITING H_2HISTAMINE RECEPTORS

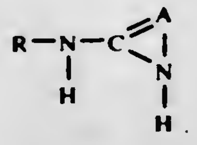
Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 463,647, April 24, 1974, Pat. No. 3,932,644. This application Oct. 6, 1975, Ser. No. 619,985

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 13 Claims

1. A pharmaceutical composition to inhibit H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, comprising a pharmaceutical carrier and in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a pyrimidine ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het-CH_2Z(CH_2)_n-$$

wherein Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and *n* is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,005,206
[9H]-PYRIDO-[3,4-b]-INDOLES

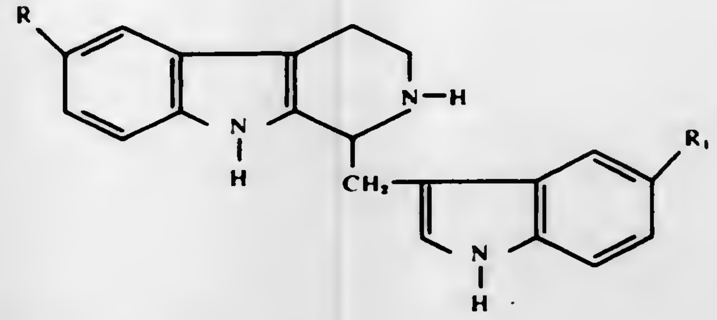
Jean-Cyr Gaignault; Jean Vacher, and Daniel Frechet, all of Paris, France, assignors to Roussel-UCLAF, Paris, France

Filed Apr. 7, 1976, Ser. No. 674,415

Int. Cl.^{2} C07D *401/14*

U.S. Cl. 424—263 13 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein R and R_1 are individually selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy of 1 to 5 carbon atoms and benzyloxy with the proviso that R_1 is not hydroxy when R is halogen, alkoxy or benzyloxy and their non-toxic, pharmaceutically acceptable acid addition salts.

4,005,207
SYNERGISTIC THERAPEUTIC COMPOSITION FOR THE TREATMENT OF MYCOBACTERIOSES

Enno Freerksen, Borstel, Germany, assignor to Saarstickstoff-Fatol GmbH, Schiffweiler, Germany

Filed Aug. 7, 1974, Ser. No. 495,421

Claims priority, application Germany, Aug. 10, 1973, 2340515

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 8 Claims

7. A process for treating mycobacterioses in mammals which comprises administering orally to mammals having mycobacterial diseases a synergistic composition comprising about 5 to 10 mg isonicotinic acid hydrazide, about 5 to 10 mg 2-propyl-thioisonicotinic acid amide, and about 1 to 2 mg 4,4′-diaminodiphenyl-sulfone per kilogram of body weight.

4,005,208
N-HETEROCYCLIC-9-XANTHENYLAMINES

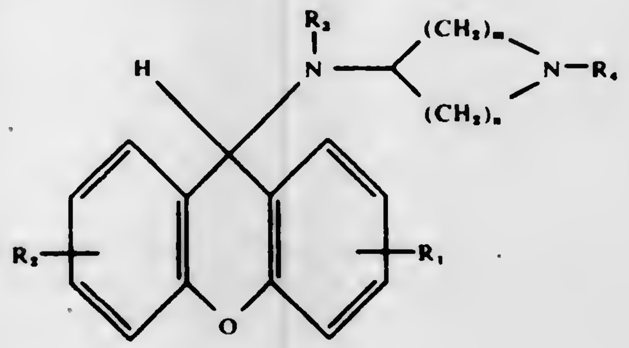
Paul E. Bender, Willingboro, N.J., and Bernard Loev, Broomall, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed May 16, 1975, Ser. No. 578,226

Int. Cl.^{2} C07D *405/12*

U.S. Cl. 424—267 6 Claims

1. A compound of the formula:



in which:

R_1 is hydrogen, halogen, hydroxy, lower alkyl or lower alkoxy;

R_2 is hydrogen, halogen, lower alkyl or lower alkoxy;

R_3 is hydrogen or lower alkyl;

R_4 is hydrogen, lower alkyl, allyl, propargyl, cycloalkyl having 3 to 6 carbon atoms, lower alkanoyl, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, phenyl or benzyl;

m is 1 or 2 and *n* is 2 or 3, the sum of *m* and *n* being 3 or 4 or a pharmaceutically acceptable acid addition salt thereof.

4,005,209
ANTIARRHYTHMIC METHOD UTILIZING FLUOROALKOXY-N-PIPERIDYL AND PYRIDYL BENZAMIDES

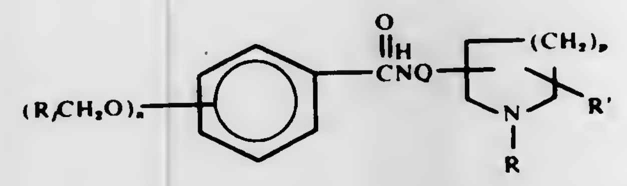
Elden H. Banitt, Woodbury, and William R. Bronn, St. Paul, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 457,099, April 1, 1974, Pat. No. 3,900,481. This application May 27, 1975, Ser. No. 580,891

Int. Cl.^{2} A61K *31/445, 31/40*

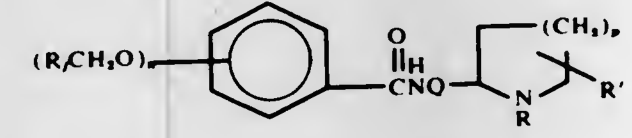
U.S. Cl. 424—267 15 Claims

1. A method for the treating and prevention of arrhythmias in a mammal in need thereof comprising administering an effective dose less than the toxic amount of the compound of the formula:



wherein R_f is a perfluoroalkyl radical containing from one to three carbon atoms, *n* is one to three, *p* is one or two, Q is a carbon-nitrogen bond, methylene or methylmethylene and R and R′ are hydrogen, methyl or ethyl, or a pharmaceutically acceptable salt thereof, to said mammal.

5. A method for the treating and prevention of arrhythmias in a mammal in need thereof comprising administering an effective dose less than the toxic amount of a compound of the formula:



wherein R_f is a perfluoroalkyl radical containing from one to three carbon atoms, *n* is one to three, *p* is one or two, Q is methylene or methylmethylene and R and R′are hydrogen, methyl or ethyl, or a pharmaceutically acceptable salt thereof to said mammal.

4,005,210
PROTEIN CONTAINING EMOLLIENT COMPOSITION FOR A SKIN MOISTURIZER

Joseph Gubernick, Port Washington, N.Y., assignor to Estee Lauder, Inc., New York, N.Y.

Filed July 3, 1975, Ser. No. 593,136

Int. Cl.^{2} A61K *7/48*

U.S. Cl. 424—359 2 Claims

1. An emollient composition comprising from about 2 to about 20% isodecyl neopentanoate, from about 0.25 to 2% oleolyl polypeptide which is a hydrolyzed animal protein, and up to 97% mineral oil.

4,005,211
LACTATION STIMULATION EMPLOYING PIMOZIDE

Robert P. H. M. Marsboom, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Sept. 10, 1975, Ser. No. 611,940

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 2 Claims

1. A process of stimulating lactation in milk secreting mammals which comprises the systemic administration to said mammals of an effective lactation stimulating amount of a member selected from the group consisting of 1- 1-[4,4-bis(4-fluorophenyl)butyl]-4-piperidinyl -1,3-dihydro-2H-benzimidazol-2-one and the pharmaceutically acceptable acid addition salts thereof.

4,005,212
IMIDAZO[2,1-b]THIAZOLE DERIVATIVES

Francois Debarre, Antony; Claude Jeanmart, Brunoy, and Pierre Edouard Simon, Hauts-de-Seine, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 419,900, Nov. 28, 1973. This application May 12, 1975, Ser. No. 576,297

Claims priority, application France, Nov. 30, 1972, 72.42580; Nov. 2, 1973, 73.35158

Int. Cl.^{2} A61K *31/425*

U.S. Cl. 424—270 1 Claim

1. A pharmaceutical composition having antidepressant, psychoenergising and anorexigenic activity which comprises as active ingredient
  an effective amount of 2-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole, or a non-toxic acid addition salt thereof,
  in association with a significant amount of a pharmaceutically acceptable carrier.

4,005,213
2,5-SUBSTITUTED-1,3,4-THIADIAZOLES AS FUNGICIDES

Ludwig Nüsslein; Ernst Albrecht Pieroh, and Kurt Röder, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

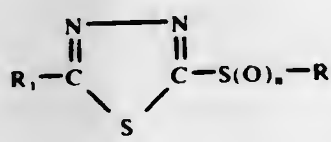
Continuation-in-part of Ser. No. 298,274, Oct. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 883,253, Dec. 8, 1969, abandoned. This application Dec. 11, 1974, Ser. No. 531,901

Claims priority, application Germany, Dec. 21, 1968, 1817069

Int. Cl.^{2} A01N *9/12, 9/20*

U.S. Cl. 424—270 7 Claims

1. A method for the protection of plants against infestation by fungi which comprises applying to said plants a fungi controlling amount of a compound having the structure:



wherein R_1 is a lower haloalkyl having from 1 to 7 carbon atoms, R_2 is an alkyl group having from 1 to 8 carbons, and *n* is 1 or 2.

4,005,214
WATER-SOLUBLE AMOXICILLIN SALTS

André Furlenmeier, Basel, and Peter Quitt, Fullinsdorf, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 11, 1975, Ser. No. 603,406

Claims priority, application Switzerland, Aug. 21, 1974, 11433/74; June 26, 1975, 8309/75

Int. Cl.² C07D *499/68*

U.S. Cl. 424—271 **4 Claims**

1. The choline salt of amoxicillin.

4,005,215
PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

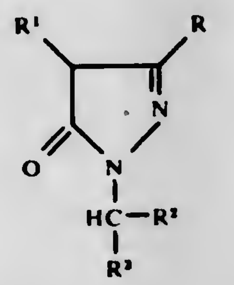
Division of Ser. No. 461,282, April 15, 1974, Pat. No. 3,957,814. This application Jan. 14, 1975, Ser. No. 540,815

Claims priority, application Germany, Apr. 17, 1973, 2319280; Dec. 19, 1973, 2363139

Int. Cl.² A61K *31/415*

U.S. Cl. 474—273 **40 Claims**

1. A pharmaceutical composition useful for effecting diuresis and saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretically effective amount, a saluretically effective amount, or an antihypertensively effective amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof, wherein

R is trifluoromethyl;

R¹ is hydrogen, lower alkyl or lower alkenyl;

R² is lower alkyl; and

R³ is aryl of 6 to 10 carbon atoms substituted by:

- a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, lower alkyl, lower alkenyl and lower alkoxy;
- b. cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;
- c. nitro; or
- d. a substituent selected from the group consisting of trifluoromethyl and nitro, and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl; or naphthyl;

in combination with a pharmaceutically acceptable, nontoxic, inert diluent or carrier.

4,005,216
PHENYL CARBAMATE

Madhukar Subraya Chodnekar, Seltisberg, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

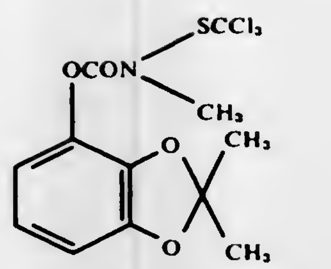
Filed Feb. 12, 1976, Ser. No. 657,507

Claims priority, application Switzerland, Mar. 7, 1975, 2905/75

Int. Cl.² A61K *31/36*

U.S. Cl. 424—282 **4 Claims**

1. 2,3-(Isopropylidenedioxy)phenyl-methyl[(trichloromethyl)thio]carbamate of the formula:



(I)

2. A composition effective against flies, caterpillars, bettles, aphids and Hemiptera comprising an insecticidal effective amount of the compound 2,3-(isopropylidenedioxy)phenyl-methyl[(trichloromethyl)thio]carbamate and a compatible inert carrier.

3. A method for providing a locus subject to or subjected to attack by insects selected from the group consisting of flies, caterpillars, beetles, aphids, and Hemiptera free from such attack comprising applying to said locus an insecticidal effective amount of 2,3-(isopropylidenedioxy)phenyl-methyl[(trichloromethyl)thio]carbamate.

4,005,217
TREATMENT OF HELMINTH INFECTIONS WITH SUBSTITUTED PHENYL-THIOUREA DERIVATIVES

Samuel Sidney Berg, Ilford; David Conwil Jenkins, Gidea Park; George Christopher James Martin; Ronald Frederick Phillipson, both of Brentwood, and Garth Molesdale Thompson, Upminster, all of England, assignors to May & Baker Limited, England

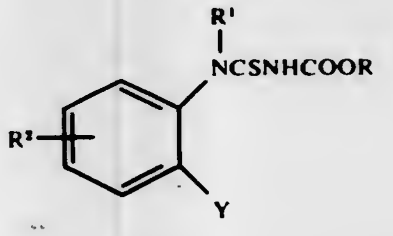
Filed June 15, 1971, Ser. No. 153,407

Claims priority, application United Kingdom, June 26, 1970, 31209/70; Dec. 11, 1970, 59111/70; Mar. 25, 1971, 7850/71; Apr. 1, 1971, 8462/71; Apr. 1, 1971, 8466/71

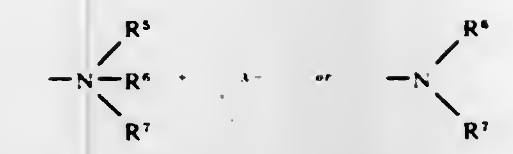
Int. Cl.² A61K *31/27*

U.S. Cl. 424—300 **16 Claims**

1. Method for the treatment of helminth infections in man and domestic animals which comprises administering to man or a domestic animal infected with helminths an anthelmintically effective amount of at least one benzene derivative of the formula:



wherein R represents an aliphatic hydrocarbon group of 1 to 4 carbon atoms which is unsubstituted or substituted by halogen or alkoxy of 1 to 4 carbon atoms, R¹ represents hydrogen or methyl, R² represents hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkanoylamino of 1 to 4 carbon atoms which is unsubstituted or substituted by cycloalkyl of 3 to 6 carbon atoms, alkoxycarbonylamino of 2 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, benzoyl or N-methylmethanesulphonylamino, and Y represents a group —NR³R⁴, wherein R³ and R⁴ each represent hydrogen, or R³ represents hydrogen or methyl and R⁴ represents alkanoyl of 1 to 4 carbon atoms which is unsubstituted or substituted by cycloalkyl of 3 to 6 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, or a group —COAZ, wherein A represents a straight chain aliphatic hydrocarbon group of 1 to 4 carbon atoms which is unsubstituted or substituted by methyl, and Z represents carboxy or a group of the formula:



wherein R⁵ represents hydrogen or alkyl of 1 to 4 carbon atoms, R⁶ represents hydrogen, alkyl of 1 to 4 carbon atoms or phenylalkyl with 1 or 2 carbon atoms in the alkyl moiety, and R⁷ represents hydrogen or alkyl of 1 to 4 carbon atoms, and X⁻ represents a pharmaceutically acceptable anion, or where Y represents a primary amino group, an acid addition salt thereof having a pharmaceutically acceptable anion.

4,005,218
ANTIPARASITIC SALICYLANILIDE DERIVATIVES

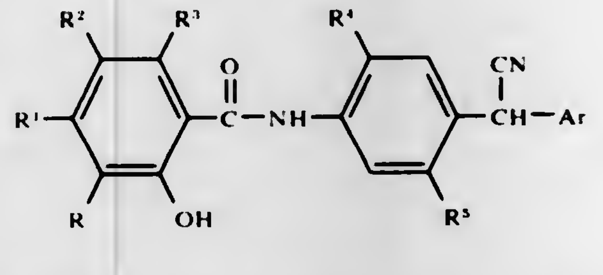
Marcel A. C. Janssen, Vosselaar, and Victor K. Sipido, Merksem, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 559,616, March 18, 1975, abandoned. This application Jan. 13, 1976, Ser. No. 648,681

Int. Cl.² A61K *31/38, 31/275;* **C07D** *333/24;* **C07C** *121/80*

U.S. Cl. 424—304 **11 Claims**

1. A chemical compound selected from the group consisting of a salicylanilide having the formula:



and the pharmaceutically acceptable salts thereof, wherein:

R is a member selected from the group consisting of hydrogen, halo, lower alkyl and nitro;

R¹ is a member selected from the group consisting of hydrogen and halo;

R² is a member selected from the group consisting of hydrogen, halo, lower-alkyl and nitro;

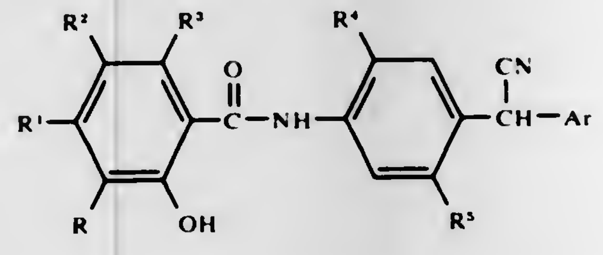
R³ is a member selected from the group consisting of hydrogen, hydroxy and lower alkyl, provided that when said R³ is hydroxy or lower alkyl then said R¹ is hydrogen;

R⁴ is a member selected from the group consisting of hydrogen, halo and lower alkyl;

R⁵ is a member selected from the group consisting of hydrogen, halo, lower alkyl, cyano and trifluoromethyl; and

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, wherein said "substituted phenyl" represents phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

6. An antiparasitic composition comprising an effective antiparasitic amount of a compound selected from the group consisting of a salicylanilide having the formula:



and the pharmaceutically acceptable salts thereof, wherein:

R is a member selected from the group consisting of hydrogen, halo, lower alkyl and nitro;

R¹ is a member selected from the group consisting of hydrogen and halo;

R² is a member selected from the group consisting of hydrogen, halo, lower alkyl and nitro;

R³ is a member selected from the group consisting of hydrogen, hydroxy and lower alkyl, provided that when said R³ is hydroxy or lower alkyl then said R¹ is hydrogen;

R⁴ is a member selected from the group consisting of hydrogen, halo and lower alkyl;

R⁵ is a member selected from the group consisting of hydrogen, halo, lower alkyl, cyano and trifluoromethyl; and

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, wherein said "substituted phenyl" represents phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

in admixture with a pharmaceutically acceptable carrier.

4,005,219
PHARMACEUTICAL COMPOSITIONS AND THEIR ADMINISTRATION FOR THE PROPHYLAXIS OF ASTHMA, HAYFEVER AND RHINITIS

Derek Richard Buckle, Redhill, and Harry Smith, Horsham, both of England, assignors to Beecham Group Limited, Great Britain

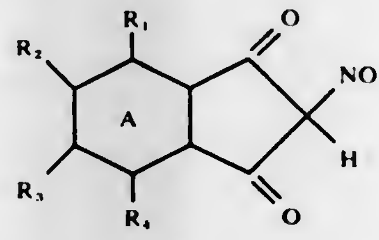
Division of Ser. No. 409,164, Oct. 24, 1973, Pat. No. 3,920,725. This application Mar. 21, 1975, Ser. No. 560,733

Claims priority, application United Kingdom, Apr. 11, 1974, 52203/74

Int. Cl.² A61K *31/215*

U.S. Cl. 424—305 **22 Claims**

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to humans which comprises an amount of a compound of the formula (I) or a salt thereof:



(I)

wherein R₁, R₂, R₃ and R₄ are each hydrogen, lower alkyl, phenyl, benzyl, lower alkoxy, lower acyloxy, carboxy, lower alkoxycarbonyl or halogen, and wherein the ring marked A contains 1 or 2 double bonds, sufficient to be effective for the prophylaxis of asthma, hayfever or rhinitis in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier suitable for said administration form.

4,005,220
HEMOSTATIC COMPOSITIONS COMPRISING SALTS OF SUBSTITUTED HYDROQUINONE SULFONIC ACID

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios del Dr. Esteve, S.A., Barcelona, Spain

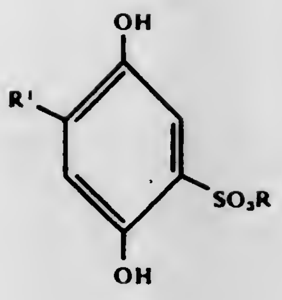
Division of Ser. No. 441,415, Feb. 11, 1974. This application Apr. 3, 1975, Ser. No. 564,735

Claims priority, application Switzerland, Feb. 20, 1973, 2395/73

Int. Cl.² A61K *31/185, 31/205*

U.S. Cl. 424—315 **14 Claims**

1. A medicament having a hemostatic effect and a protective effect on the capillaries, comprising a pharmaceutically acceptable carrier and a hemostatically effective amount of a compound of the formula.



in which R^1 is selected from the group consisting of a linear and a branched alkyl group with 1 to 6 carbon atoms and R is selected from the group consisting of lithium, sodium, ammonium an equivalent of calcium, the cation of a lower alkyl amine and the cation of cyclohexylamine.

4,005,221
USE OF PROSTAGLANDINS TO INDUCE MENSTRUATION

Sultanali M. M. Karim, 82 Eng Neo Ave., Singapore 11
Continuation of Ser. No. 457,006, April 1, 1974, abandoned, which is a continuation of Ser. No. 151,898, June 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 73,670, Sept. 18, 1970, abandoned. This application Sept. 29, 1975, Ser. No. 617,888
Int. Cl.² A61K *31/215, 31/19*
U.S. Cl. 424—317 **8 Claims**

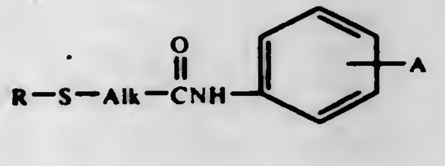
1. A method of inducing menstruation in a sexually-mature, nonpregnant, nonmenopausal human female which consists essentially of administering intravaginally to a said female within a period of from about 4 days before to about 6 days after said female's expected day of onset of menses a vaginal dosage unit form supplying an effective, nontoxic amount for inducing the menstruation of a prostaglandin selected from the group consisting of PGE_1, PGE_2, PGE_3, dihydro-PGE_1, $PGF_{1\alpha}$, $PGF_{2\alpha}$, $PGF_{3\alpha}$, dihydro-$PGF_{1\alpha}$, $PGF_{1\beta}$, $PGF_{2\beta}$, $PGF_{3\beta}$, dihydro-$PGF_{1\beta}$, pharmaceutically acceptable salts thereof, acylates thereof wherein the acyl radical is that of a lower alkanoic acid having 1 to 8 carbon atoms, inclusive, and carboxylate esters thereof wherein the esterfying radical has 1 to 8 carbon atoms, inclusive.

4,005,222
MUCOLYTIC MERCAPTOACYLAMIDOBENZOIC AND BENZENESULFONIC ACID COMPOUNDS AND PROCESS

Tellis Alexander Martin, and William Timmey Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.
Filed May 21, 1975, Ser. No. 579,650
Int. Cl.² A61K *31/195*
U.S. Cl. 424—319 **8 Claims**

1. A process for liquiefaction of mucus which comprises contacting said mucus with a mucolytically effective amount of a member selected from the group consisting of compounds having Formula I

Formula I

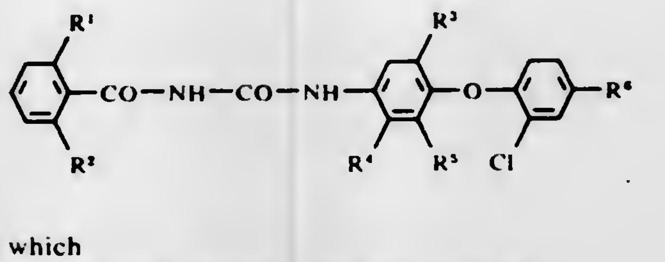


wherein
- A is meta or para CO_2H;
- Alk is a straight or branched divalent alkylene radical of from 1 to 3 carbon atoms inclusive;
- R is hydrogen or alkanoyl having up to 18 carbon atoms inclusive; and a pharmaceutically acceptable salt thereof.

4,005,223
INSECTICIDAL 2-CHLORO-4'-[N-(N'-BENZOYL)-UREIDO]-DIPHENYL ETHERS

Wilhelm Sirrenberg, Sprockhoevel; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Feb. 3, 1976, Ser. No. 654,835
Claims priority, application Germany, Feb. 6, 1975, 2504982; Feb. 6, 1975, 2504984; June 28, 1975, 2528917; Aug. 22, 1975, 2537413
Int. Cl.² A01N *9/20*
U.S. Cl. 424—322 **12 Claims**

1. A 2-chloro-4'-[N-(N'-benzoyl)-ureido]-diphenyl ether of the formula



(I)

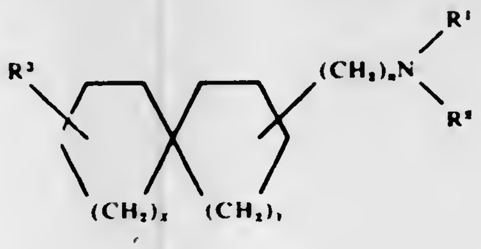
in which
- R^1 is fluorine, chlorine, bromine or methyl,
- R^2 is hydrogen, fluorine or chlorine,
- R^3 is hydrogen or chlorine,
- R^4 is hydrogen, chlorine or methyl,
- R^5 is hydrogen or chlorine and
- R^6 is nitro or trifluoromethyl.

11. A method of combating insects which comprises applying to the insects or an insect habitat an insecticidally effective amount of a compound according to claim 1.

4,005,224
METHOD OF COMBATING INFLUENZA TYPE A AND B AND PARAINFLUENZA TYPE 3 VIRUSES WITH AMINOSPIRANES AND AMINOALKYLSPIRANES

Robert Walker Tankersley, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
Continuation-in-part of Ser. No. 487,950, July 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,606, April 12, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 674,016
Int. Cl.² A61K *31/13*
U.S. Cl. 424—325 **13 Claims**

1. A method for treating viral infections caused by influenza types A and B or parainfluenza type 3 which consists of administering to a living animal body in need of said treatment against said viruses from about 25 milligrams to about 250 milligrams of a compound selected from the group consisting of aminospiranes of the formula:



wherein;
- Y is one or two,
- X is one or two,
- *n* is zero to three inclusive,
- R^1 and R^2 are hydrogen or lower alkyl,
- R^3 is hydrogen or methyl, and
- pharmaceutically acceptable salts thereof.

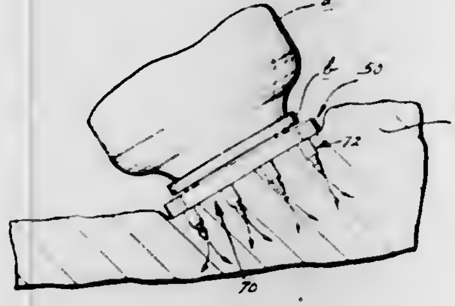
4,005,225
BAKERY PROCESS AND DEVELOPER COMPOSITION THEREFOR

Theodore W. Craig, Lafayette; Juan Lopez, Livermore, and Richard G. Henika, Alamo, all of Calif., assignors to Patent Technology Inc., San Francisco, Calif.
Continuation-in-part of Ser. No. 604,197, Aug. 13, 1975, abandoned. This application July 30, 1976, Ser. No. 710,215
Int. Cl.² A21D *2/22, 2/28*
U.S. Cl. 426—21 **13 Claims**

1. A short time process for the manufacture of leaven bread and like bakery products, particularly characterized by a very soft and fine-grained texture and also by a very low specific volume, comprising the steps of adding to conventional dough ingredients including flour, yeast, salt, and water from 0.05 to 0.15% on the weight of the flour of a developer composition in the form of a blended dry mixture of (a) 0.003 to 0.009% of an amino acid reducing substance selected from the group consisting of cysteine, glutathione and mixtures thereof (b) 0.005 to 0.015% ascorbic acid (c) 0.030 to 0.060% of monocalcium phosphate, together with 0.020 to 0.050% of a dry blending agent, thereafter mixing said dough ingredients and developer composition to form a dough, forming said dough into units for baking, and thereafter proofing and baking said units to provide final baked products having the particular desired characteristics described.

4,005,226
MULTIPLE NOZZLE DISPENSER HEAD

Dewey B. Dykes, Birmingham; E. Michael Powers, Mountain Brook; T. Kenneth Foster, Birmingham, and Robert E. Rogers, Mountain Brook, all of Ala., assignors to The Jim Dandy Company, Birmingham, Ala.
Filed June 9, 1975, Ser. No. 585,400
Int. Cl.² A23B *1/16*
U.S. Cl. 426—281 **2 Claims**

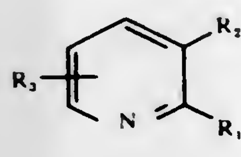


1. The method of causing a liquid to permeate meat for tenderizing, flavoring and the like, comprising the steps of
- penetrating the surface of the meat, along a plurality of parallel axes, with parallel spaced-apart prong-like nozzles, whereby to form apertures,
- then, while maintaining such nozzles within such apertures, pressing a surface perpendicular to their axes against the entire outer surface of the meat between them,
- thereby causing the meat to spread sideward about such nozzles and hold such apertures sealed, and
- while so holding such apertures sealed, discharging liquid under super-atmospheric pressure through such nozzles into the meat,
- whereby to permeate the meat without escaping about such nozzles through such apertures.

4,005,227
FLAVORING AGENT

Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland
Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,694
Int. Cl.² A23L *1/234*
U.S. Cl. 426—537 **88 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formula:



wherein R_1, R_2, and R_3 are hydrogen, vinyl, propenyl, methyl, ethyl, isobutyl, allyl, phenyl or benzyl; provided that the symbols R_1, R_2, and R_3 are not all hydrogen.

4,005,228
MILK FAT CONTAINING PRODUCTS AND PROCESSES THEREFOR

Robert Norris, Private Bag, Palmerston North, New Zealand
Filed Sept. 30, 1974, Ser. No. 510,626
Int. Cl.² A23D *3/02;* **A23C** *23/00*
U.S. Cl. 426—586 **12 Claims**

1. A process for producing a soft dairy spread comprising the steps of
- a. fractionating a milkfat into three fractions, said fractions comprising a first fraction in which substantially all the milk fat is solid at 20° C, said first fraction melting increasingly at higher temperatures, a second fraction in which substantially all the milk fat is solid at 0° C and liquid at 20° C, and a third fraction in which substantially all the milk fat is melted at 0° C; and
- b. blending said first and third fractions in a ratio of about 1:3 such that the solid fat content of the soft dairy spread remains substantially constant over a temperature range of 5° to 22° C.

4,005,229
NOVEL METHOD FOR THE RAPID DEPOSITION OF GOLD FILMS ONTO NON-METALLIC SUBSTRATES AT AMBIENT TEMPERATURES

Richard G. Miller, Pittsburgh, and Roy L. Cavitt, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 23, 1975, Ser. No. 589,234
Int. Cl.² C23C *3/02*
U.S. Cl. 427—304 **31 Claims**

1. In a method of preparing gold films on non-metallic substrates comprising the steps of sensitizing and activating a surface of the substrate and then contacting the activated surface with an aqueous solution of a gold salt and a complexing agent in the presence of a hydrazine or hydroxylamine reducing agent, the improvement which comprises aging the gold solution until it has faded from bright yellow to almost colorless prior to the step of contacting the activated surface of the substrate and carrying out said contacting step in the presence of divalent mercury, cadmium, lead or a mixture of such divalent ions.

4,005,230

PROCESS FOR THE TREATMENT, PARTICULARLY DYEING AND PRINTING OF GOODS

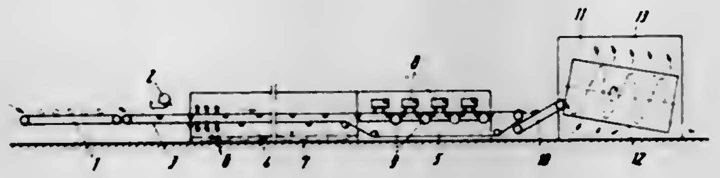
Hans Fleissner, Riehen, Basel, Switzerland, assignor to Vepa AG, Switzerland

Filed Dec. 12, 1974, Ser. No. 532,179

Claims priority, application Germany, Dec. 14, 1973, 2362109

Int. Cl.^{2} D06P *5/02*

U.S. Cl. 427—354 **5 Claims**



1. A process for dyeing and printing of a plurality of piece goods of finite length at the same time, said piece goods comprising medium fluid-permeable textile goods as well as medium fluid-impermeable flat goods in a continuous manner, which comprises successively applying a dye to a plurality of said piece goods, thereafter setting the dye with a heated gas, washing away any residue components with a washing liquid and drying the goods; a plurality of said piece goods being constantly turned about, fulled, and surrounded with a heated gas during said drying.

4,005,231

TREATMENT OF FIBRES

Charles Smith, South Glamorgan, Wales, assignor to Dow Corning Limited, Barry, Galmorgan, Wales

Filed May 15, 1975, Ser. No. 577,583

Claims priority, application United Kingdom, May 28, 1974, 23480/74

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—387 **7 Claims**

1. A process for the treatment of keratinous fibres which comprises applying thereto from 0.1 to 10% by weight of a composition comprising the product obtained by mixing (A) a polydiorganosiloxane having terminal silicon-bonded hydroxyl radicals and a molecular weight of at least 750, at least 50% of the organic substituents in the polydiorganosiloxane being methyl radicals, any other organic substituents being monovalent hydrocarbon radicals having from 2 to 30 carbon atoms, (B) an organosilicon compound selected from the group consisting of organosilanes of the general formula $RSiR'_nX_{3-n}$ wherein R represents a monovalent radical composed of carbon, hydrogen, nitrogen and, optionally, oxygen, which radical contains at least two amine groups and is attached to silicon through a silicon to carbon linkage, R' represents an alkyl radical or an aryl radical, each X represents an alkoxy radical having from 1 to 14 inclusive carbon atoms and *n* is 0 or 1, and partial hydrolysates and condensates of said organosilanes, and (C) from 1 to 15% by weight based on the total weight of (A) and (B) of an organic or organosilicon compound containing at least one hydroxyl radical attached to an aliphatic carbon atom, and thereafter curing the applied composition.

4,005,232

COATINGS OF METAL PHOSPHATES ON METALS OR GLASS

Neville Colebourne; Nicholas Rolfe, and Kevin Thomas McAloon, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

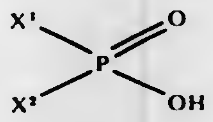
Division of Ser. No. 272,495, July 17, 1972, abandoned. This application Feb. 25, 1975, Ser. No. 552,748

Claims priority, application United Kingdom, Oct. 29, 1971, 50354/71; Nov. 4, 1971, 51293/71; Nov. 26, 1971, 55002/71

Int. Cl.^{2} B32B *17/06*

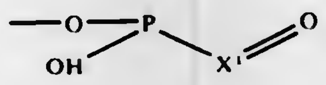
U.S. Cl. 428—35 **7 Claims**

1. A coated glass article comprising a glass substrate and a coating thereon which has a thickness of 0.01 to 5 microns and is transparent to visible light but ultra-violet light absorbing, said coating being identifiable as the dried residue of a liquid coating composition containing an organic component and a solution of a metal phosphate compound wherein the metal of the compound is selected from the group consisting of iron, titanium, a mixture of iron and titanium and a mixture of iron and chromium, and wherein the phosphate of the compound is an oxyacid of phosphorus, or a compound capable of forming such an oxyacid in the solution of the said compound, the oxyacid being an ortho- or meta-acid of the structure (1)



(1)

where X^1 and X^2 are the same or different and are selected from hydrogen, hydroxyl, halide or which may have the structure (2) to provide pyrophosphoric acid



(2)

4,005,233

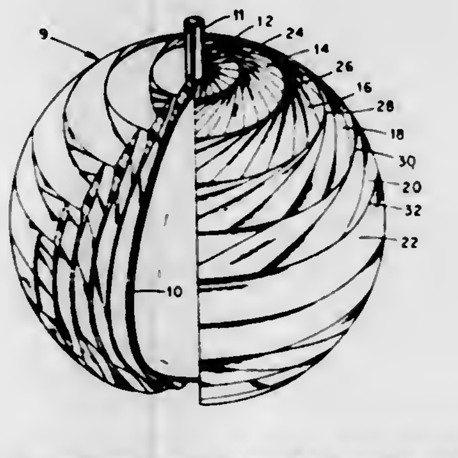
FILAMENT WOUND STRUCTURE AND METHOD

William S. Dritt, Oak Ridge; Howard L. Gerth, Knoxville; Charles E. Knight, Jr., Knoxville, and Robert M. Pardue, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 30, 1975, Ser. No. 627,394

Int. Cl.^{2} B65D 7/42

U.S. Cl. 428—35 **10 Claims**



1. A filament wound structure having a substantially spherical configuration comprising a mandrel, a plurality of sequentially applied filament band sets disposed axisymmetrically about the surface of said mandrel and spaced sequentially along the longitudinal plane thereof, each filament band in each filament band set being formed of a continuous filament circumferentially wound about said mandrel a predetermined

number of circuits with each circuit of filament about said mandrel being along a plane parallel to and in a side-by-side abutting relationship with the immediate previously wound circuit of filament, the filament bands of each band set being disposed in an overlapping arrangement at a latitute nearest the poles of the sphere and in a substantially side-by-side relationship at the equator of the sphere except for the first and last bands being displaced radially from each other, the number of bands forming each band set being equal to the total number of bands required to cover the mandrel at the equator thereof with the bands disposed in the side-by-side relationship, and with the total thickness of the outermost set of filament bands plus any underlying segments of any other band sets being essentially uniform between the poles and the equator of said sphere.

4,005,234

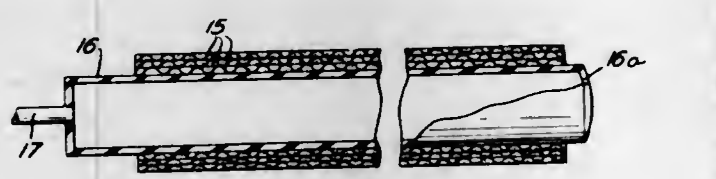
TUBULAR ARTICLE AND METHOD OF MAKING THE SAME

James D. Stroupe, Newtown, Pa., assignor to Sipler Plastics, Inc., Doylestown, Pa.

Division of Ser. No. 402,131, Oct. 1, 1973. This application Oct. 10, 1974, Ser. No. 513,524

Int. Cl.^{2} F16L *9/00*

U.S. Cl. 428—36 **9 Claims**



1. In a monolithic tubular article comprising
a light weight non-metallic rigid tubular body having a varying cross section between its ends and a fixed tortuous non-planar longitudinal axis between its ends and a plurality of interior circumferentially expanded tubular continuous seamless knitted fabrics conforming to the shape of the surface of the body and surrounded by and impregnated with an integral rigid cured resin the improvement which comprises
an outer lamina modifying the action of the exterior surface of the body consisting of a single layer held in secured relation to the body by the resin of the body and extending over a selected limited part of the exterior of the body.

4,005,235

DENSE SINTERED BORON CARBIDE CONTAINING BERYLLIUM CARBIDE

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,496

Int. Cl.^{2} C04B *35/52;* **B22F** *3/00*

U.S. Cl. 428—36 **4 Claims**

1. A polycrystalline sintered body comprised of boron carbide wherein the boron/carbon molar ratio ranges from 3.5 to 4.5 and beryllium carbide in an amount ranging from 0.5% by weight to 3% by weight of said boron carbide, said sintered body having a substantially uniform microstructure composed of substantially equiaxed grains of said boron carbide having a grain size ranging from about 30 microns to about 300 microns with said beryllium carbide distributed substantially uniformly throughout said boron carbide and having a grain size less than 10 microns, said sintered body having a density ranging from 85% to about 96% of the theoretical density for said boron carbide.

4,005,236

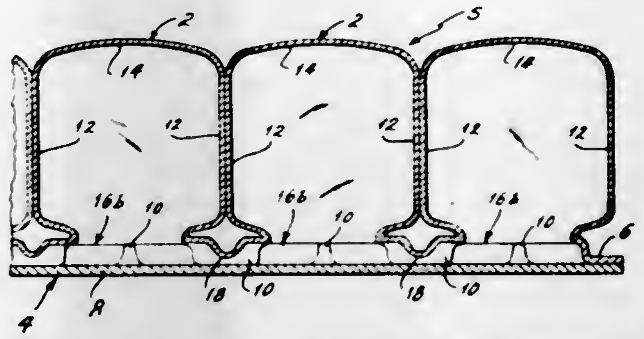
EXPANDABLE MULTICELLED CUSHIONING STRUCTURE

Robert H. Graebe, 4 Signal Hill Blvd., Belleville, Ill. 62223

Division of Ser. No. 360,743, May 16, 1973, Pat. No. 3,870,450. This application Feb. 28, 1975, Ser. No. 554,117

Int. Cl.^{2} A47C *27/08*

U.S. Cl. 428—72 **11 Claims**



1. A cushion device comprising: a base formed from a fluid impervious material and having at least one cavity therein which is isolated from the surrounding atmosphere and is capable of retaining a fluid under pressure; and a plurality of cells connected to the base and formed from a fluid impervious material which is flexible, the cells having hollow interiors which are isolated from the surrounding atmosphere and open into the cavity of the base such that the interiors of all of the cells communicate through the cavity of the base, the cells having side walls with the sidewalls of adjacent cells being located opposite each other, the cells when deflated being generally spaced apart and having flutes along their side walls, the flutes of each cell being generally parallel and arranged around the entire cell and further extending away from the base, the cells being sufficiently flexible that when pressurized they will expand laterally such that the flutes are generally obliterated and the side walls of adjacent cells are in contact for substantial portions of their lengths so as to interfere with each other, the cells when pressurized further being such that the ends of the cells form a generally continuous outwardly presented surface which conforms to the shapes of objects brought against it.

4,005,237

NON-BLEED PRE-PRINTED SPIRIT DUPLICATING MASTERS

Irving Panken, Dayton, Ohio, assignor to The Mazer Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 490,979, July 23, 1974, Pat. No. 3,962,526. This application Mar. 25, 1976, Ser. No. 670,427

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.^{2} B41M *5/04*

U.S. Cl. 428—195 **7 Claims**

1. A non-bleed pre-printed spirit duplicating master comprising:
a. a substantially opaque paper sheet having a front surface and a back side,
b. said paper sheet having an oleophobic resinous barrier material treated front surface to give said sheet a kit test rating of three or more,
c. a positive image printed on the front surface and overlying said oleophobic resinous barrier material, and
d. a hot melt spirit duplicating ink reverse printed directly on said back side so as to form a pre-printed master.

4,005,238

METALLIZED ARTICLES AND METHOD OF PRODUCING THE SAME

Joachim Gaehde; Adolf Gesierich, and Ingrid Loeschcke, all of Berlin, Germany, assignors to Akademie der Wissenschaften der DDR, Berlin-Adlershof, Germany

Continuation-in-part of Ser. No. 514,702, Oct. 15, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 556,770

Claims priority, application Germany, Oct. 25, 1973, 174378

Int. Cl.^{2} B32B *5/18;* **B37B** *15/08*

U.S. Cl. 428—313 **8 Claims**

1. A metallized article consisting essentially of a polymeric substrate, a non-tacky, milky, opaque poromeric polymer adhesive coating selected from the group consisting of polyurethane, polyethyleneterephthalate, and polyvinyl formal, said poromeric adhesive coating prepared by the method of depositing from a solution or dispersion thereof, coagulating in an atmosphere above 40 percent humidity and at a temperature of about 23°-30° C, washing with water and subsequently drying at temperatures above 50° C, and a top metal coating securely bound thereto by means of said poromeric adhesive.

4,005,239

DECORATIVE LAMINATED PANEL AND PROCESS FOR PREPARING THE SAME

Walter Thomas Davis, and Peter Bernard Kelly, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Continuation of Ser. No. 306,973, Nov. 15, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,479

Int. Cl.^{2} B32B *3/26*

U.S. Cl. 428—315 **4 Claims**

1. A decorative laminate foam panel comprising a heat and pressure consolidated decorative laminate adhesively bonded to a compressible, flexible, closed-cell, polypropylene plastic foam sheet by means of a uniform layer of an elastomeric adhesive wherein said heat and pressure consolidated decorative laminate is comprised of a plurality of paper core sheets impregnated with a thermosetting phenolic resin and surfaced with a decorative sheet which is impregnated with a noble thermosetting resin, each of said resins having been converted to the thermoset state during heat and pressure consolidation and wherein said foam sheet is bonded to the back flat surface of said laminate, the decorative side of said laminate is on the reverse side of said back surface and the back most surface of said panel is coated with a uniform layer of an elastomeric adhesive.

4,005,240

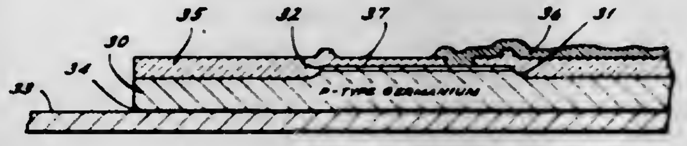
GERMANIUM DEVICE PASSIVATION

Michael M. Schlacter, Irvine, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Mar. 10, 1975, Ser. No. 556,719

Int. Cl.^{2} C23C *11/00;* **H01L** *23/00, 31/02*

U.S. Cl. 428—333 **6 Claims**



1. A germanium semiconductor device with a passivating coating comprising a mixture of silicon dioxide and phosphorous pentoxide in direct, intimate contact with the surface of said germanium semiconductor device, said coating being formed by a low temperature, high rate vapor plating process and containing between about 4 percent and about 8 percent phosphorous by weight.

4,005,241

METAL PLATED POLYMERIC ARTICLE

Francis J. O'Neill, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 301,448, Oct. 27, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 547,889

Int. Cl.^{2} B32B *25/16, 15/06, 15/08*

U.S. Cl. 428—335 **5 Claims**

1. A metal plated article of manufacture which exhibits low smoke evolution under flaming conditions which article comprises a molded thermoplastic article having a metal plated exterior surface wherein the metal plating is approximately 2 mils thick and wherein the metal used is selected from the group consisting of nickel, copper and chromium and wherein the thermoplastic article is molded from a polyblend composition comprising:

A. a polymer of a monovinylidene aromatic monomer and an ethylenically unsaturated nitrile monomer wherein the ethylenically unsaturated nitrile monomer moiety constitutes from 20% to about 70% by weight of the polymer;

B. from 15 to 40% by weight, based on the total weight of the polyblend, of a crosslinked polychloroprene rubber having a Mooney viscosity of at least 200 (MS-2½ min., 212° F.), which is grafted with:

1. at least one monovinylidene aromatic monomer; and
2. an ethylenically unsaturated nitrile monomer;

wherein the ethylenically unsaturated nitrile monomer moiety constitutes from 20% to about 70% by weight of the grafted polymer; wherein the percent graft of aromatic monomer and nitrile monomer onto the polychloroprene rubber is in the range of from 10 to 100% by weight, based on the weight of the polychloroprene rubber;

C. from 5 to 10% by weight, based on the total weight of the polyblend of an inorganic compound selected from the group consisting of Sb_2O_3, Bi_2O_3, MoO_3, SnO_2, WO_3, and mixtures of the same; and

D. from 0.5 to 5.0% by weight of a butadiene rubber said butadiene rubber being grafted with

1. at least one monovinylidene aromatic monomer, and
2. an ethylenically unsaturated nitrile monomer,

wherein the total amount of polymer formed from the vinylidene aromatic monomer and the unsaturated nitrile monomer in the polyblend composition is in the range of from 45 to 84% by weight, based on the total weight of the polyblend.

4,005,242

MAGNETIC RECORDING MEDIUM CONTAINING LUBRICANTS

Helmut Kopke, Ludwigshafen; Hans-Joerg Hartmann, Freinsheim; Dieter Mayer, and Herbert Motz, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 23, 1974, Ser. No. 536,008

Claims priority, application Germany, Dec. 28, 1973, 2364879

Int. Cl.^{2} C08G *77/42;* **H01F** *1/26*

U.S. Cl. 428—425 **6 Claims**

1. A magnetic recording medium comprising a non-magnetic base material and a magnetic coating applied thereon in the form of a dispersion, containing a lubricant, of a finely divided magnetic pigment in a polymeric binder, wherein the lubricant in the magnetic coating is a block copolymer containing alkyl-, aryl- or aralkyl-siloxane units which contain from about 1 to 8 carbons per alkyl, aryl or aralkyl radical and alkyleneoxy units of 2 to 4 carbon atoms, the alkyleneoxy units being bonded to the polysiloxane radical through a Si—O—C or Si—C group.

4,005,243

FREELY MACHINABLE ALUMINUM ALLOY

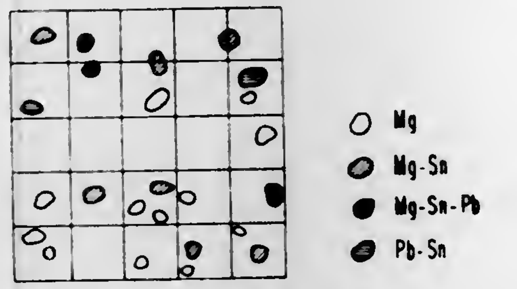
Yoshio Baba, and Akira Takashima, both of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed July 18, 1975, Ser. No. 597,374

Claims priority, application Germany, Dec. 2, 1974, 2456866

Int. Cl.^{2} B32B *15/04*

U.S. Cl. 428—469 **8 Claims**



1. An aluminum base alloy of free machinability and of corrosion resistance, consisting essentially of: from 0.6 to 1.2 weight percent magnesium, from 1.2 to 2.4 weight percent of the sum of tin and lead, wherein the weight quantity of tin exceeds that of lead; from 0.5 to 0.8 weight percent silicon; from 0.1 to 0.4 weight percent copper; and the balance essentially aluminum and inevitable impurities.

2. An aluminum base alloy according to claim 1 further containing chromium in an amount from 0.05 to 0.3 weight percent.

7. A product made of an aluminum base alloy according to claim 2 with a portion thereof being anodically oxidized, coated with resinous paint thereon and cured at an elevated temperature higher than 160° C.

4,005,244

ULTRAVIOLET LIGHT CURABLE OPACIFYING COMPOSITIONS

Marco Wismer, Gibsonia; Paul J. Prucnal, Monroeville, and Kenneth E. Miller, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,187

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 428—480 **33 Claims**

1. An ultraviolet light curable coating composition which is transmissive of visible and ultraviolet light and which upon curing produces opaque coatings having a Kubelka-Munk scattering coefficient greater than or equal to 0.1 reciprocal mil at 560 nanometers, said ultraviolet light curable coating composition consisting essentially of a mixture of:

a. a first component which shrinks upon curing and which is one or more organic ultraviolet light curable polymers;

b. a second component, which is substantially miscible with said first component at room temperature before said first component is gelled and which is not significantly ultraviolet light curable, selected from the group consisting of organic plasticizers, organic thermoplastic polymers and mixtures thereof; and

c. a photoinitiator which under the influence of ultraviolet light produces free radicals,

wherein

d. said first component and said second component undergo phase separation as said first component gels under the influence of ultraviolet light; and

e. dendritic microfractures appear at phase boundaries under the influence of ultraviolet light, heat or both ultraviolet light and heat, which dendritic microfractures function as light scattering sites to thereby provide opacity to cured coatings of said ultraviolet light curable coating composition.

18. A method comprising:

a. coating a substrate with an ultraviolet light curable coating composition consisting essentially of a visible and ultraviolet light transmissive mixture of:

1. a first component which shrinks upon curing and which is one or more organic ultraviolet light curable polymers;
2. a second component, which is substantially miscible with said first component at room temperature before said first component is gelled and which is not significantly ultraviolet light curable, selected from the group consisting of organic plasticizers and organic thermoplastic polymers; and
3 a photoinitiator which under the influence of ultraviolet light produces free radicals;

b. exposing said coated substrate to ultraviolet light to gel said first component and to cause said first component and said second component to undergo phase separation; then

c. exposing said coated substrate to ultraviolet light, heat or both ultraviolet light and heat to cure said first component and to produce dendritic microfractures at phase boundaries, which dendritic microfractures function as light scattering sites to thereby provide opacity to the thusly cured coating of said ultraviolet light curable coating composition, said cured coating having a Kubelka-Munk scattering coefficient greater than or equal to 0.1 reciprocal mil at 560 nanometers.

24. An article comprising a substrate having a cured coating thereon, said coating:

a. comprising at least two organic phases

1. one organic phase being one or more cured organic ultraviolet light curable polymers,
2. the other organic phase being selected from the group consisting of organic plasticizers which are not significantly ultraviolet light curable, organic thermoplastic polymers which are not significantly ultraviolet light curable and mixtures thereof,
3. both of said organic phases being transmissive of visible light;

b. containing dendritic microfractures at phase boundaries, which dentritic microfractures function as light scattering sites to thereby provide opacity to said coating; and

c. having a Kubelka-Munk scattering coefficient greater than or equal to 0.1 reciprocal mil at 560 nanometers.

4,005,245

TAPERED PLASTIC PREFORM FOR TELESCOPIC APPLICATION

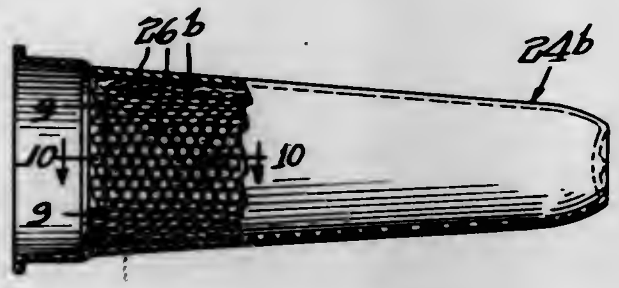
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 268,710, July 3, 1972, abandoned. This application Apr. 15, 1975, Ser. No. 568,228

Int. Cl.^{2} B32B *9/04;* **B65D** *1/00*

U.S. Cl. 428—542 **9 Claims**

1. A plastic preform for telescopic application onto a complementary smooth surfaced heated mandrel in a plastic molding machine for re-shaping the preform under heat and applied differential air pressure, said preform comprising an elongate hollow thermoplastic member the inner surface of which in the aggregate conforms generally with the shape defined by the peripheral surface of said smooth surfaced mandrel, said elongate hollow thermoplastic member being longitudinally tapered from an open end to a closed opposite end, said inner surface of said hollow thermoplastic member being formed between an axially extending rim portion and said closed opposite end as a plurality of uniformly spaced-apart surface portions engageable in a heat conducting relationship with said peripheral surface of said mandrel upon close telescopic application thereto, the inner surface of said axially extending rim portion of said hollow thermoplastic member being substantially circumferentially smooth to cooperate in an air sealing relationship with the surface of said mandrel upon close telescopic application thereto, the spaces between said spaced-apart surface portions forming substantially uniformly distributed and interconnected air passageways over substantially the entire inner surface of said hollow thermoplastic member between said axially extending rim portion and said closed opposite end for uniform air evacuation from between the inner peripheral surface of said hollow thermoplastic member below said axially extending rim portion and the smooth peripheral surface of said mandrel upon close telescopic application thereto and with uniform heat conducting engagement of said spaced-apart surface portions with said peripheral surface of said mandrel.



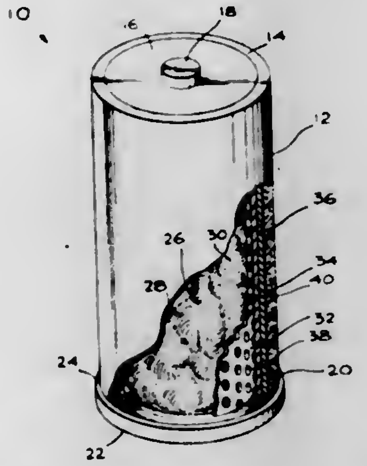
4,005,246
RESERVE-TYPE CELL

Stephen F. Schiffer, Waterford, and Renato DiPasquale, New Milford, both of Conn., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Feb. 20, 1973, Ser. No. 333,992

Int. Cl.² H01M *6/30*

U.S. Cl. 429—94 **9 Claims**



1. An improved reserve-type electrochemical cell, said cell comprising, in combination:

a. a pair of closely spaced electrodes;

b. a thin inert separator disposed between said electrodes;

c. electrolyte storage means comprising a storage space containing bibulous material disposed behind and in direct contact with one of said electrodes along the length thereof and out of contact with the other of said electrodes; and

d. dry electrolyte disposed on said bibulous material, said one electrode in contact with said storage means containing said electrolyte being porous, whereby electrolyte in said storage means when dissolved is freely and directly transferable in liquid form through said one electrode into contact with the other of said electrodes along the length hereof for activation and maintenance of activity of said cell.

4,005,247
PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Curtis Michael Graham, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 30, 1975, Ser. No. 627,165

Int. Cl.² C08F *8/42*

U.S. Cl. 526—15 **23 Claims**

1. A pressure-sensitive adhesive composition which when dry forms a tacky adhesive of high cohesive strength, said composition comprising an adhesive polymer formed by the reaction of

A. a normally tacky interpolymer of monomers consisting essentially

   1. at least 40 percent by weight of one or more alkyl acrylates having up to about 18 carbon atoms in the alkyl group,
   2. at least about 0.2% of an $\alpha-\beta$ unsaturated acid anhydride
   3. up to about 59.8 percent of one or more copolymerizable monomers containing an ethylenically unsaturated linkage as the only reaction functional group, said copolymerizable monomers having no more than 25 carbon atoms in the molecule; and

B. a metal alkoxide having the formula $R_nT(OR_1)_z$ wherein T is a metal selected from the group consisting of Groups II, III, IV, and V of the Periodic Table, R is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms and aryl radicals of from 6 to 16 carbon atoms, R_1 is selected from the group consisting of aliphatic and substituted aliphatic radicals containing from 1 to 18 carbon atoms, n is an integer whose value is 0 or greater and z is an integer whose value is at least 2 wherein the sum of $n+z$ is greater than 1 and is equal to the valence of the metal represented by T.

4,005,248
SMOKE-INHIBITED POLYMER COMPOSITIONS

David Francis Lawson, Akron, and Jung Wong Kang, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 10, 1975, Ser. No. 585,553

Int. Cl.² C08F *8/42, 8/44, 12/08, 212/08*

U.S. Cl. 526—20 **9 Claims**

1. Smoke-inhibited combustible composition containing polymeric materials having a backbone or network containing repeating aromatic units, either incorporated in the backbone or network or pendant to the backbone or network, at least a portion of said aromatic units being complexed with chromium tricarbonyl so as to form π-phenyl chromium tricarbonyl units, in which composition the chromium content is chemically bonded to said aromatic units, and is 0.4 to 10 percent of the weight of the polymeric material, as determined by IR analysis.

4,005,249
POLYMERIZATION OF VINYL CHLORIDE

Harold E. Peterson, Lambertville, Mich., and Philip P. Rathke, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 15, 1972, Ser. No. 226,417

Int. Cl.² C08F *14/06*

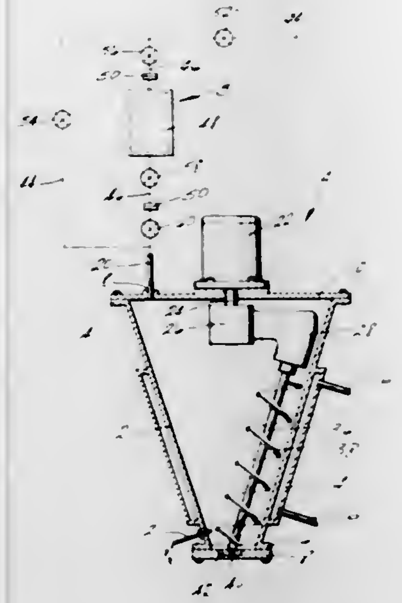
U.S. Cl. 526—60 **9 Claims**

1. A dual temperature process for the bulk polymerization of vinyl chloride to obtain vinyl chloride polymers substantially in the form of a powder which comprises:

a. contacting vinyl chloride and an initiator in the absence of high turbulence at a first temperature of about room temperature to about 110° F until a conversion of approximately 0.1 to 10 percent by weight is obtained, and

b. thereafter raising the temperature to about 120° to about 150° F and carrying out the polymerization reaction to at least about 65% conversion;

with the proviso that at least step (b) is carried out under conditions of mild agitation and low turbulence sufficient to ensure complete mixing of the reaction mixture.



4,005,250
LOW MOLECULAR WEIGHT COPOLYMERS

Richard William Greiner, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,373

Int. Cl.² C08F *222/02, 222/06*

U.S. Cl. 526—204 **7 Claims**

1. A copolymer having a weight average molecular weight of from about 500 to about 6000 derived by free radical polymerization of a vinyl ester and maleic anhydride in the presence of a chain transfer agent selected from the group consisting of dioxane and tetrahydrofuran.

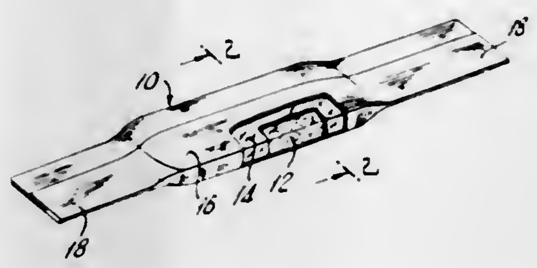
4,005,251
PROCESS FOR PREPARATION OF ALKALI CELLULOSE ESTER SULFATES

Deger C. Tunc, East Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 431,455, Jan. 7, 1974, Pat. No. 3,897,782. This application Feb. 20, 1975, Ser. No. 551,570

Int. Cl.² C08B *7/00*

U.S. Cl. 536—59 **7 Claims**



1. A process for the preparation of alkali cellulose ester sulfates having a degree of sulfate substitution of from about 0.1 to about 0.45 and a degree of acyl substitution of from 1.63 to 2.69 which comprises:

a. slurrying the cellulose in an inert organic liquid;

b. sulfating the cellulose by reacting the cellulosic slurry with a sulfating mixture comprising an alkali acetyl sulfate;

c. esterifying the sulfated cellulose in a reaction mixture comprising said inert organic liquid, said sulfated cellulose, and an acylating agent; and

d. precipitating said alkali cellulose ester sulfate by combining said reaction mixture with an aqueous precipitation medium maintained at a pH of from about 3 to about 8.

4,005,252

APPARATUS FOR GAS COLLECTION IN OPEN ELECTRIC SMELTING FURNACES

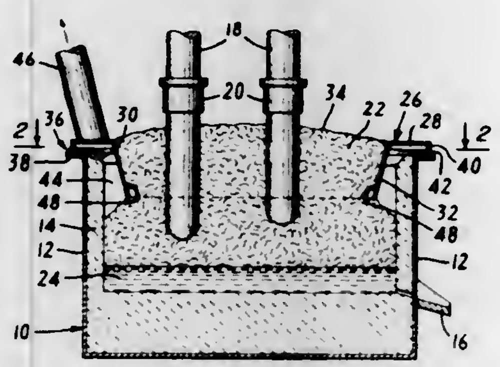
Harald Krogsrud, Gjettum, Norway, assignor to Elkem-Spigerverket, Oslo, Norway

Filed Sept. 17, 1975, Ser. No. 614,160

The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² F27D *3/00*

U.S. Cl. 13—33 **4 Claims**



1. In an open electric smelting furnace having a furnace pot for containing a charge, said furnace pot having an annular side wall, the improvement comprising gas collecting apparatus, said gas collecting apparatus comprising:

- a. an annular top member spaced from the top of the said annular side wall;
- b. sealing means for sealing the space between the said annular member and the top of the said annular side wall, said sealing means comprising a granular material;
- c. a sloped wall spaced inwardly from the said annular side wall, said sloped wall being affixed to said annular member;
- d. said sloped wall being of sufficient length to extend into the charge when the charge is at its normal operating height;
- e. means for moving said sloped wall in an annular direction; and
- f. means on the sloped wall effective to move the charge towards the center of the furnace pot when the sloped wall is moved in annular direction.

4,005,253

GRADE-LEVEL ENCLOSURE FOR ELECTRICAL APPARATUS

Gerald W. Walter, 1326 S. 52nd Terrace, Kansas City, Kans. 66106

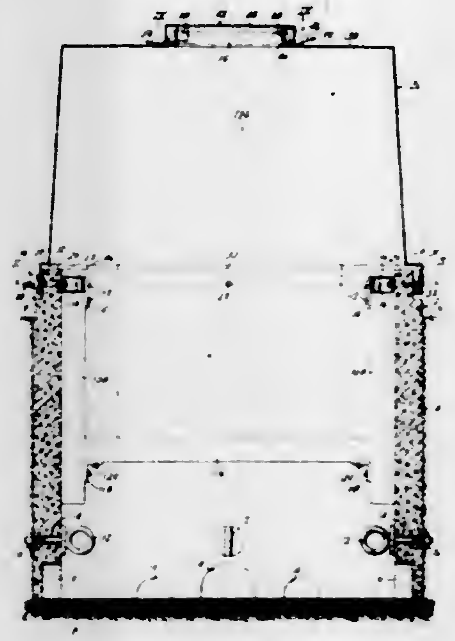
Filed May 14, 1975, Ser. No. 577,229

Int. Cl.² H02G *9/10;* **E02D** *29/14;* **E04H** *5/06*

U.S. Cl. 174—37 **7 Claims**

1. A grade-level enclosure for electrical or other apparatus comprising:

- a. an open-topped box adapted to be embedded in the ground with its upper end extending above ground level,
- b. support means carried by said box and operable to support electrical apparatus disposed within said box and extending above the top thereof,
- c. a cover of waterproof, electrical insulating material having the form of an open-bottomed box adapted to cover said box and the apparatus contained therein, said cover having a horizontal configuration at its bottom generally corresponding to the horizontal configuration of said box at its top, the lower portion of said cover, when closed, surrounding and enclosing the upper portion of said box with a horizontal spacing therebetween, and
- d. securing means fastening the bottom of said cover securely but releasably to the top of said box, said securing means comprising:
  1. a pair of hinges securing the lower edge of one side of said cover pivotally to the upper edge of the corresponding side of said box, for pivotal movement in a vertical plane, each of said hinges comprising a hinge plate affixed to said box and including a horizontal cylindrical hinge barrel, a second hinge plate affixed to said cover, and a hinge pin affixed to said second hinge plate and being slidably and rotatably inserted into said hinge barrel, the pin being detachable from said barrel only by horizontal movement of said cover relative to said box, whereby to detach said cover from said box, by a distance greater than the horizontal-spacing between the box and the lower edge portion of said cover, whereby said cover cannot be detached from said box when said cover is closed, and



  2. a locking device operable to secure the lower edge of the opposite side of said cover releasably to the upper edge of the opposite sides of said box.

4,005,254

PRESSURELESS CURE SYSTEM FOR CHEMICALLY CROSS-LINKING ETHYLENE CONTAINING POLYMERS, AND PRODUCT FORMED THEREBY

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 518,384, Oct. 29, 1974, Pat. No. 3,946,099, which is a division of Ser. No. 305,544, Nov. 10, 1972, Pat. No. 3,859,247, which is a continuation-in-part of Ser. No. 91,357, Nov. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 748,816, July 30, 1968, abandoned. This application Nov. 5, 1975, Ser. No. 629,055

Int. Cl.² B32B *5/16, 27/20*

U.S. Cl. 174—110 PM **2 Claims**

1. An electrical cable with a relatively dense and substantially non-porous cured insulation composition comprising a conductor and a layer of insulation overlying said conductor, said cured insulation composition comprising the cured product of; (a) an ethylene containing polymer, (b) a curing agent, and (c) a mineral filler treated with about 0.15 to 4.0 percent of tetramethyltetravinylcyclotetrasiloxane by weight of the filler, and which has been cured by heating at about atmo-

spheric pressure in an non-aqueous heat transfer medium to a temperature and for a dwell time sufficient to cure substantially in situ the ethylene containing polymer to relatively dense and substantially non-porous cured filled polymer insulation composition about the conductor.

4,005,255
EXTRUDED COMPOSITE SECTION

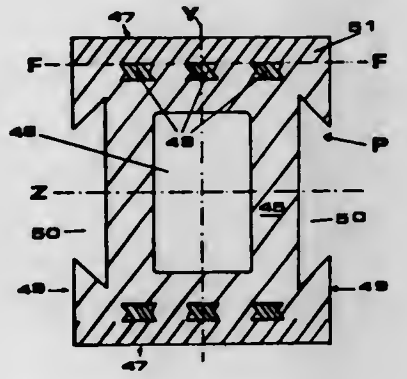
Alfred Wagner, Steisslingen, and Hermann Kidratschky, Hilzingen, both of Germany, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Filed Apr. 4, 1975, Ser. No. 564,998

Claims priority, application Germany, Apr. 8, 1974, 7412358[U]

Int. Cl.² H01B *5/02*

U.S. Cl. 174—126 CP **8 Claims**



1. An extruded composite section, suitable for use as an electrical conductor,
comprising, in combination:
a longitudinal body composed of an aluminum alloy; and
at least one insert having non-circular cross section and being composed of a substance having a greater strength and wear-resistance than said aluminum alloy; said insert being disposed in said body with its periphery entirely surrounded by said aluminum alloy and extending throughout at least a major portion of the length of said body;
said insert having a cross section for engaging said body securely.

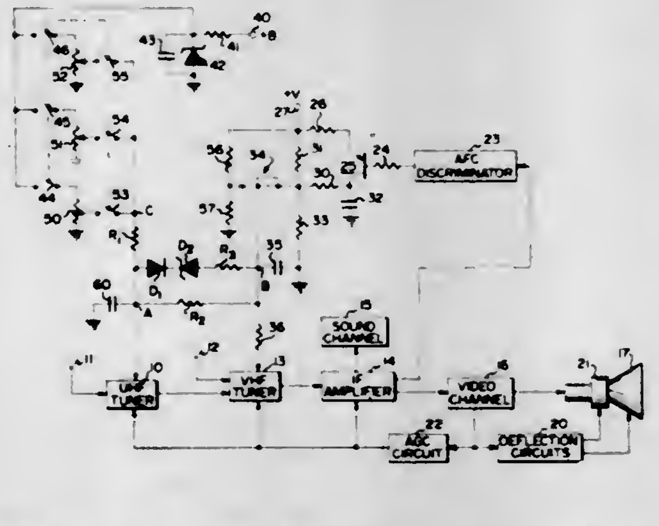
4,005,256
AFC CIRCUIT

Rangaswamy Arumugham, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,072

Int. Cl.² H04B *1/16*

U.S. Cl. 358—195 **6 Claims**



1. In a television receiver having a voltage controlled radio frequency tuning means, bias means for providing one of a plurality of bias voltages each of which correspond to a particular television channel to be received, and automatic frequency control means for providing an error voltage, a signal combining circuit comprising:
first resistance means connecting said bias means to an input of said tuning means for coupling the bias voltage to said input;
second resistance means connecting said automatic frequency control means to said input of said tuning means for coupling a predetermined portion of the error voltage to said input; and
third resistance means connected in parallel with said second resistance means, said third resistance means including a threshold device which is nonconductive for bias voltages below a predetermined threshold and which has a dynamic resistance characteristic for bias voltages above said predetermined threshold, for coupling a portion of the error voltage to said input which portion increases with the bias voltage provided by said bias means beyond said predetermined bias voltage.

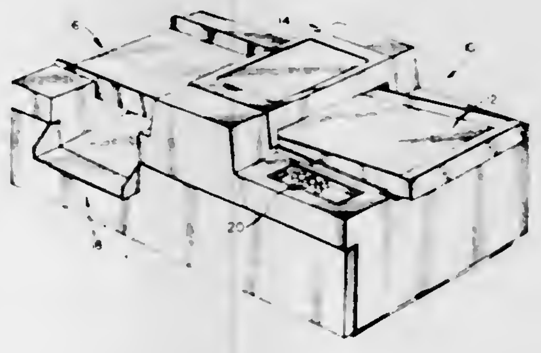
4,005,257
FACSIMILE TRANSCEIVER

Robert E. Krallinger, New Milford; Vladimir Ignatjev, Norwalk; Ralph K. Rand, New Milford, and Matthew Joseph Costello, Bethel, all of Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Filed May 5, 1975, Ser. No. 574,709

Int. Cl.² H04N *1/02*

U.S. Cl. 358—256 **44 Claims**



1. A facsimile transceiver comprising a transmitter arranged to feed a first document in substantially straight line motion from a document store, through a scanner, into a first receiving tray, and a receiver positioned beneath said first tray and arranged to feed paper on which a document is to be reproduced from a paper store, through a writing head, into a second receiving tray in a direction transverse to the direction in which said first document is fed.

4,005,258
ULTRASONIC EXAMINATION

Jacques Dory, Meaux, France, assignor to Realization Ultrasoniques, France

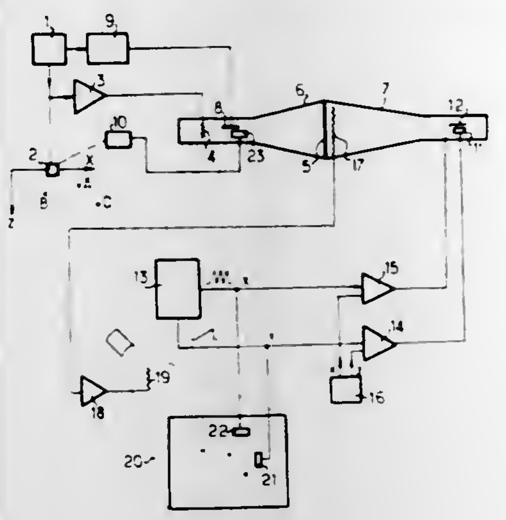
Filed Nov. 26, 1974, Ser. No. 527,199

Claims priority, application France, Nov. 26, 1973, 73.42026

Int. Cl.² H04N *7/18*

U.S. Cl. 358—112 **4 Claims**

1. In a device for examination of an object by ultransonic pulses, said device including a transmitter of recurrent electric pulses, a transmitting-receiving ultrasonic transducer energized by this transmitter and subjected to a linear displacement, a receiver of reflected pulses coupled to said transducer, a recording tube coupled to said receiver and having a memory target, a writing electron beam with an horizontal and a vertical scan and a reading electron beam, means for synchronizing said horizontal scan with the displacement of the transducer and for synchronizing the said vertical scan with the repetition rate of the transmitted pulses, a television scan generator supplying scan signals which control the scanning of the memory target by the reading electron beam, and a display tube controlled by said scan generator and modulated by the reading signal supplied by the recording tube, the improvement which consists in that the said device further comprises



a function generator supplying further scan signals and means coupled to said function generator for modulating the scanning of the memory target by the reading electron beam by means of the said further scan signals, thereby to move the reading electron beam along successive curve portions arranged on a plurality of horizontal scanning lines.

4,005,259
SIGNAL REPRODUCING SYSTEMS EMPLOYING A SEMICONDUCTIVE LIGHT SOURCE

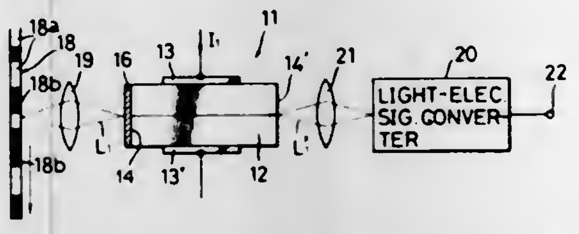
Takeo Kaneko, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1975, Ser. No. 546,996

Claims priority, application Japan, Feb. 12, 1974, 49-17017

Int. Cl.² G11B *7/00;* **H01S** *3/10*

U.S. Cl. 358—128 **12 Claims**



1. An information reproducing system comprising: a record medium having the information recorded thereon as reflective and non-reflective portions of the record medium; and a pickup device including a semiconductor PN junction diode having opposed side surfaces crossing the plane of said PN junction and at least one of which is non-reflective, means for supplying a bias current to said diode to cause the latter to radiate light from said PN junction, said diode being positioned in respect to said record medium so that light radiated from said PN junction is guided through said one non-reflective side surface to impinge selectively on said reflective and non-reflective portions of the record medium with the light, when reflected by said reflective portions of the record medium, reentering said diode through said one non-reflective side surface, said reflective and non-reflective portions of the record medium having respective reflectivities to cause resonance of said diode and the emission of laser light through the other of said opposed side surfaces only when light impinges on said reflective portions of the record medium, whereby to effect the ON-OFF control of the emission of said laser light in response to the selective impingement of the radiated light on said reflective and non-reflective portions, respectively, of the record mediun, and means receiving said laser light emitted through said other side surface of the diode for converting the same to the recorded information.

4,005,260
DEVICE FOR READING A DISK-SHAPED RECORD CARRIER WITH TIME BASE CORRECTION

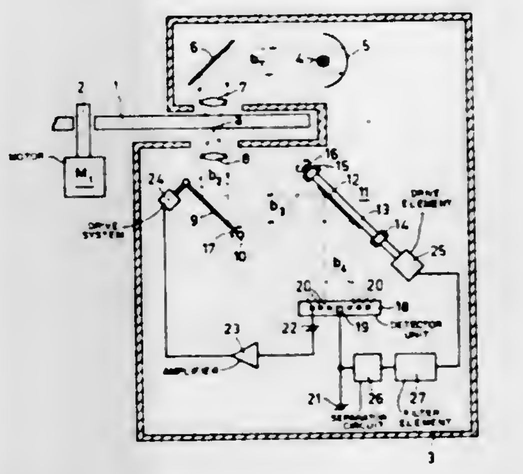
Peter Johannes Michiel Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 409,420, Oct. 25, 1973, abandoned. This application June 17, 1975, Ser. No. 587,636

Claims priority, application Netherlands, Nov. 11, 1972, 7215306

Int. Cl.² H04N *5/76*

U.S. Cl. 358—128 **5 Claims**



1. Apparatus for reading a rotating disc-shaped record carrier on which signals including a synchronizing signal are stored in tangentially arranged tracks, comprising read unit means for scanning the tracks of the record carrier, signal controlled means for tangentially moving the scanning of the read unit means with respect to the record carrier, a read detector means for converting the scanned stored signals into an electrical signal, filter element means for deriving the recorded synchronizing signal from the electrical signal, as a control signal, and means connecting said control signal to said signal controlled means, the read unit means, signal controlled means, read detection means, filter means and connecting means comprising a single loop servo control system, said control system having a band-pass characteristic wherein the frequency corresponding to the speed of the record carrier is proximate the peak of said pass-band.

4,005,261
METHOD AND APPARATUS FOR PRODUCING A COMPOSITE STILL PICTURE OF A MOVING OBJECT IN SUCCESSIVE POSITIONS

Hiroki Sato, Yokohama, and Hiroh Takahashi, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,686

Claims priority, application Japan, Nov. 26, 1974, 49-136551

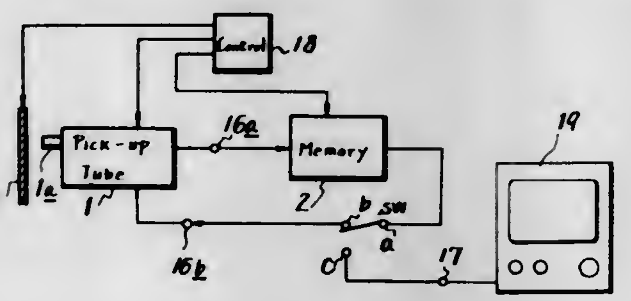
Int. Cl.² H04N *7/18;* **A63B** *69/00*

U.S. Cl. 358—83 **4 Claims**

3. Apparatus for producing a composite video signal representing a moving object in an initial position and changes from said position of the object at intervals over a period of time, comprising:
shutter means having an open condition and a closed condition;
storage-type image pick-up means shielded by said shutter means in said closed condition of the latter and including an input terminal and an output terminal, said pick-up means having a storage mode for storing a signal applied to said input terminal and an image pick-up mode for picking-up an image of the object through said shutter

means in the open condition of the latter and producing a corresponding video signal from which any signal previously stored in said pick-up means is subtracted for providing a resultant video signal at said output terminal;

memory means connected with said output terminal of the pick-up means and having a writing mode in which a video signal appearing at said output terminal is stored in said memory means in superposed relation to any signal previously stored in said memory means, and a read-out mode in which the signal stored in said memory means is read-out therefrom;



means for applying the read-out signal from said memory means to said input terminal of said pick-up means for storage in the latter; and

control means which, at intervals during said period of time, simultaneously establishes said open condition of the shutter means, said pick-up mode of the pick-up means and said writing mode of the memory means, and, between said intervals, simultaneously establishes said closed condition of the shutter means, said storage mode of the pick-up means and said read-out mode of the memory means.

4,005,262

BRIGHTNESS AND CONTRAST CONTROL FOR TELEVISION RECEIVER

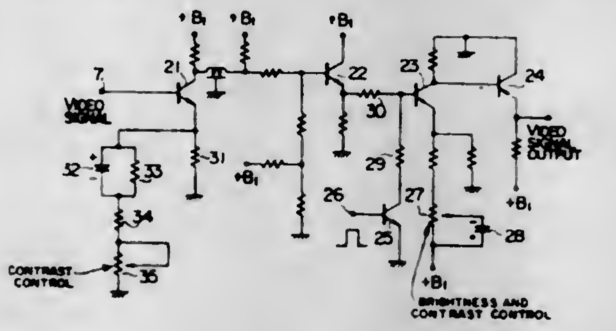
Seiji Fijisawa, Ikoma; Norio Meki, Takatsuki, and Hiroyuki Irie, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 375,921, July 2, 1973, abandoned. This application July 21, 1975, Ser. No. 597,332

Claims priority, application Japan, June 30, 1972, 47-66141; June 30, 1972, 47-66142

Int. Cl.² H04N *5/58*

U.S. Cl. 358—168 **8 Claims**



1. A television receiver of the type including an automatic gain control circuit having a video amplifier circuit provided with means for simultaneously varying both brightness and contrast and means for varying contrast alone, wherein said means for simultaneously varying both brightness and contrast comprises a circuit for combining a video signal and a blanking pulse signal having the same polarity as a sync signal of the video signal and having an amplitude within the range from 3 to 6 times as large as that of the video signal, a first transistor receiving at a base thereof an output of said combining circuit and producing at a collector thereof an output signal, and a picture control circuit having a variable resistor and a capacitor, said picture control circuit being connected to an emitter of said first transistor for controlling an a-c signal gain, and wherein said means for varying contrast alone comprises a second transistor for amplifying the video signal and a means for varying the amplification degree of an amplifier circuit constituted by said second transistor, an output of said second transistor being applied as a video signal to said combining circuit.

4,005,263

DEVICE FOR ADJUSTING THE DISTANCE BETWEEN THE OBJECTIVE AND THE PICK-UP TUBE IN A TELEVISION CAMERA

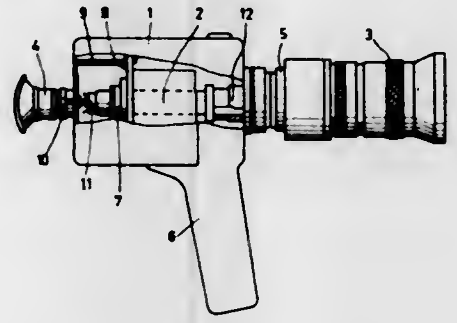
Pierre Jacques Collet, Louviers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,023

Claims priority, application France, Jan. 14, 1975, 75.00955

Int. Cl.² H04N *5/26*

U.S. Cl. 358—227 **10 Claims**



1. A television camera comprising an objective, a pick-up tube and a device for adjusting a distance between the objective and the pick-up tube, the said device comprising a displacement mechanism, including a return mechanism, for the longitudinal displacement of the pick-up tube, characterized in that the displacement mechanism comprises a fixed ring which at least partly encloses the pick-up tube, an abutment piece, and an adjusting member, the abutment piece being arranged between the said adjusting member and the pick-up tube, the return mechanism comprising a resilient member which is arranged between the rigidly arranged objective and the movably arranged pick-up tube.

4,005,264

ARRANGEMENT FOR SCANNING A DISC-SHAPED TYPE CARRIER

Rolf Humbs, and Robert Weinke, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 8, 1975, Ser. No. 594,044

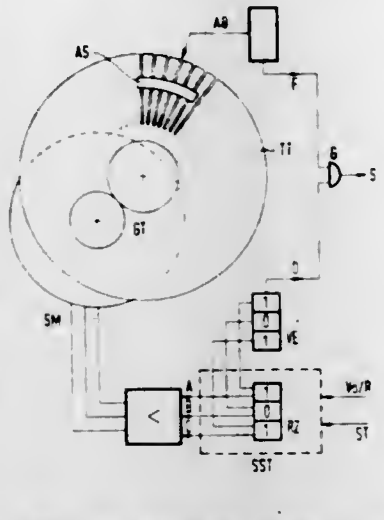
Claims priority, application Germany, Sept. 6, 1974, 2442688

Int. Cl.² H04L *15/34;* **G06K** *15/06*

U.S. Cl. 178—34 **5 Claims**

1. In an arrangement for scanning a disc-shaped type carrier in a code controlled printing device having a stepping motor which is controllable in the forward and backward directions for setting the type carrier, the improvement comprising: a stepping motor control including a repetitively stepped ring counter for producing a sequence of binary combinations connected to the stepping motor and defining angular positions of the type carrier, a comparator connected to said ring counter for producing an output signal in response to receipt of a binary combination assigned to a specific character, a scanning sector on the type carrier extending over a plurality of type characters including the specific character, a scanning device for producing a scanning pulse in response to rotation

of the scanning sector to a point in proximity to the scanning device and means for conjunctively linking the output pulse of the comparator and the scanning pulse to provide a synchronizing pulse.



4,005,265

VIDEOPHONE SYSTEM SYNCHRONIZER

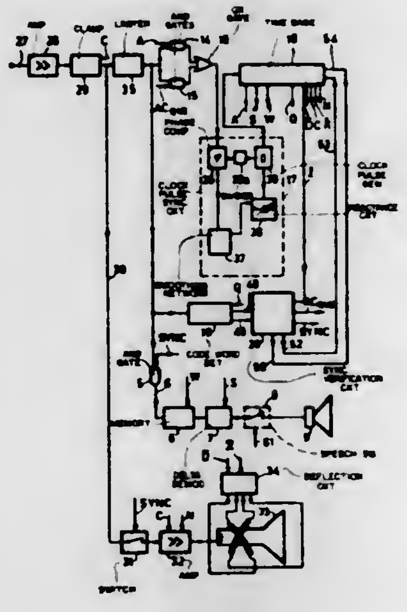
Nicolaas Alphonsus Maria Verhoeckx, Emmasingel; Herman van der Hoff, Hilversum; Cornelis Henricus Johannes Vos, and Johannes Wilhelmus Coenders, both of Emmasingel, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 382,897, July 26, 1973, abandoned, which is a continuation of Ser. No. 195,321, Nov. 3, 1971, abandoned. This application Dec. 19, 1974, Ser. No. 535,044

Claims priority, application Netherlands, Nov. 13, 1970, 7016628

Int. Cl.² H04N *5/10*

U.S. Cl. 358—145 **9 Claims**



1. A transmitter comprising means for transmitting in analog form a line and field scanned video signal requiring three synchronization signals at a receiver for proper display; means for transmitting only two of said synchronization signals comprising a clock pulse generator means coupled to said transmitting means for generating clock pulses having a frequency from which field and line frequencies are derivable and a code word generator coupled to said transmitting means for generating at least one field code word phase synchronized with said clock pulses during the field flyback period; whereby at said receiver line and field synchronizing signals can easily be extracted from said clock frequency for display of said video signal.

8. A receiver for composite signal having a line and field scanned analog video component and a synchronization component having only two synchronization signals said synchronization signals respectively comprising a digital clock pulse component having a frequency from which field and line frequencies are derivable, and a digital field code word component phase synchronized with said clock pulse component during the field flyback period; said receiver comprising code word detector means adapted to receive said transmitted code words and for supplying same; a clock pulse generator means; means coupled to said clock generator for synchronizing said generator; a frequency divider coupled to said clock generator for providing at least the line and field synchronization signals from said clock pulses; and a synchronization verification means having inputs coupled to said code word detector and said divider respectively; and an output means coupled to a reset input of said divider for resetting said divider to obtain phase equality between said detected and transmitted code word.

4,005,266

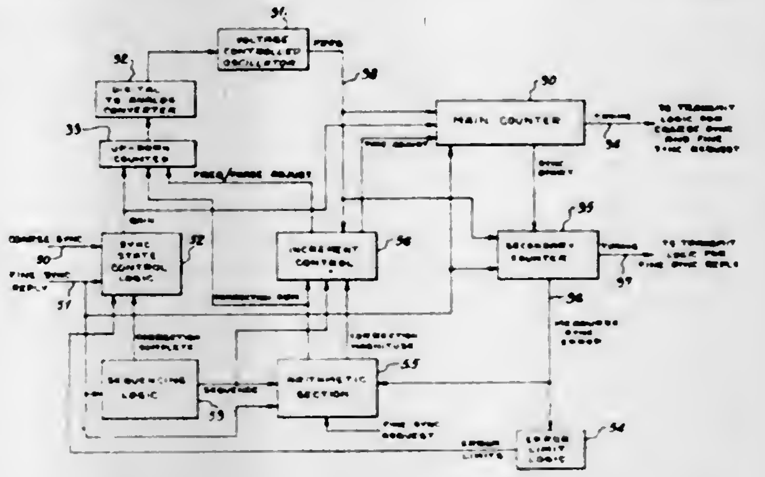
METHOD AND APPARATUS FOR SYNCHRONIZING MASTER AND LOCAL TIME BASE SYSTEMS

Stanley Lehr, New Rochelle; Philmore Coralnick, Spring Valley, both of N.Y., and Gary William Blauth, Glen Ridge, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed July 14, 1975, Ser. No. 595,629

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.1 **15 Claims**



1. A time base synchronization system for synchronizing a local time base consisting of a cyclically recurring series of sequential time slots generated by a voltage controlled local oscillator and local digital main counter with a master time base consisting of a cyclically recurring series of sequential time slots generated by a master oscillator and master main digital counter comprising coarse sycnhronizing means for bringing said time bases into coarse synchronization, said coarse synchronizing means comprising

means coupled to the master main counter for generating a coarse synchronization signal at the beginning of the first time slot in said series of time slots in the master time base, and

means coupled to the local main counter and responsive to said coarse synchronization signal for adjusting the local main counter to begin generating the said first time slot in the series of slots in the local time base upon receipt of said coarse signal; and

fine synchronizing means for bringing said time bases into fine synchronization, said fine synchronizing means comprising

means coupled to the local main counter for generating a fine synchronization request signal at the start of a predetermined one of the remaining time slots in the local time base,

means including a master secondary counter coupled to the master main counter for measuring the elapsed time between the receipt of said fine synchronization request signal by the master main counter and the beginning of said predetermined one time slot in the master time base and for generating a fine synchronization reply signal at the beginning of a time period before the end of said predetermined one slot in the master time base which is equal to said elaspsed time,

means including a local secondary counter coupled to the local main counter for measuring the elapsed time between the receipt of said fine synchronization reply signal by the local and the end of said predetermined one time slot in the local time base to produce a digital synchronization error signal,

means for computing from said digital synchronization error signal a frequency error, time error and phase error,

means for coupling said frequency and phase errors as corrections to said local oscillator and said time error as a correction to said local main counter,

synchronization state logic means obtaining as inputs said coarse synchronization signal and fine synchronization reply signal for generating a time varying gain output in dependence on the number of cycles of said time slots between error corrections, said gain outputs coupled respectively to said local oscillator and said local main counter to control the gain at which said correction signals are entered thereto,

error limit logic means coupled to said synchronization error measuring means for producing error limit signals when said error exceeds a predetermined range of values, and

sequencing logic means having as inputs said fine synchronization reply signal and the error limit signal output of said error limit logic means and having outputs coupled to to said synchronization state logic means and said means for computing and responsive to said fine synchronization and error limit signals for producing said sequencing signals to cause said synchronization system to follow a programmed control state sequence in which transfer between control states for large initial errors is made automatically for a predetermined number of sequentially occurring corrections and is dependent upon the magnitude of the synchronization error for subsequent corrections.

4,005,267

ARRANGEMENT FOR CONVERTING OSCILLATIONS IN HEADPHONES

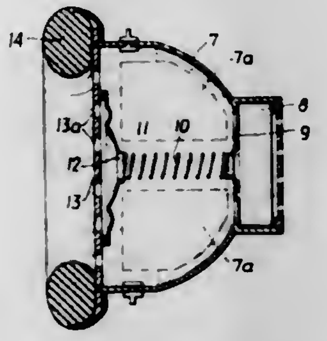
Rudolf Görike; Ernst Pless, both of Vienna; Werner Fidi, Baden, and Alexander Fritz, Vienna, all of Austria, assignors to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Austria

Filed May 12, 1975, Ser. No. 576,431

Claims priority, application Austria, May 17, 1974, 4123/74; June 14, 1974, 4931/74; Mar. 28, 1975, 2412/75

Int. Cl.² H03H *9/30*

U.S. Cl. 179—1 J **26 Claims**



1. An arrangement for headphones for converting frequency modulated audio oscillations into amplitude modulated oscillations, particularly for rendering audible the vibrato of electronic musical instruments, such as electronic organs, comprising a housing, an electroacoustic transducer in said housing having a diaphragm with smooth frequency response zones, and at least one mechanical transit-time member having a transit time from one end to the other not greater than 20 ms connected to said diaphragm.

4,005,268

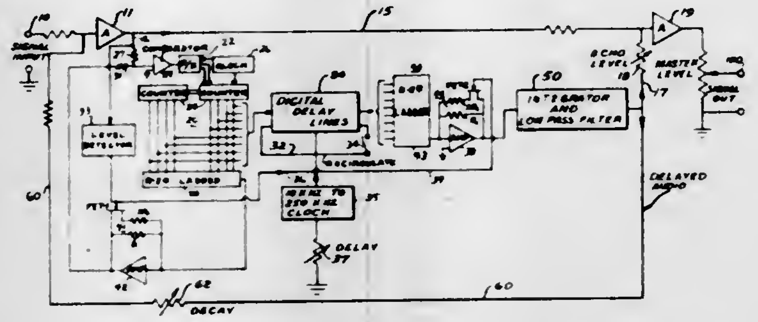
SOLID STATE ECHO PRODUCING SYSTEM

George Canell, Chicago, and Larry A. Schotz, Arlington Heights, both of Ill., assignors to Lynn Industries, Chicago, Ill.

Filed Apr. 7, 1975, Ser. No. 565,802

Int. Cl.² H04R *3/00*

U.S. Cl. 179—1 J **4 Claims**



1. An electronic signal echo producing system for producing and coupling a delayed secondary signal echoing a primary audio signal comprising, in combination, input means for receiving audio signals as an analog signal, output means, transmission means for transmitting the input signals received by said input means as a primary audio signal to said output means, analog to digital signal converting means coupled to said transmission means for producing from the input signal transmitted thereby a secondary signal in digital data format, signal delay means coupled to said signal converting means for receiving the secondary input signal in digital format and selectively actuable to delay the transmission of the digital format signals, first digital to analog signal converting means coupled to said signal delay means for converting the secondary signals transmitted thereto into analog format, means for combining the primary audio signal and the secondary signal in analog format at the output means, second digital to analog signal converting means for converting the digital data into an analog reference signal, and feedback circuit means for coupling said analog reference signal back to the input of said first analog to digital converting means, electronic switch means, signal amplitude divider means electronically connectible by said switch means into said feedback circuit means, level detector means connected to said input means and operable in response to a selected signal level to cause said switch means to connect said divider means into said feedback circuit means causing the amplitude of said reference signal to be divided to thereby improve the resolution of said system when operating at low signal levels.

4,005,269

APPARATUS FOR INTERFACING BETWEEN TELEPHONE AND WIRELESS COMMUNICATION SYSTEMS

Hilda Willis, Los Altos, Calif., assignor to Harry H. Hicks, Jr., San Mateo, Calif.

Filed Jan. 6, 1975, Ser. No. 538,796

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 C **8 Claims**

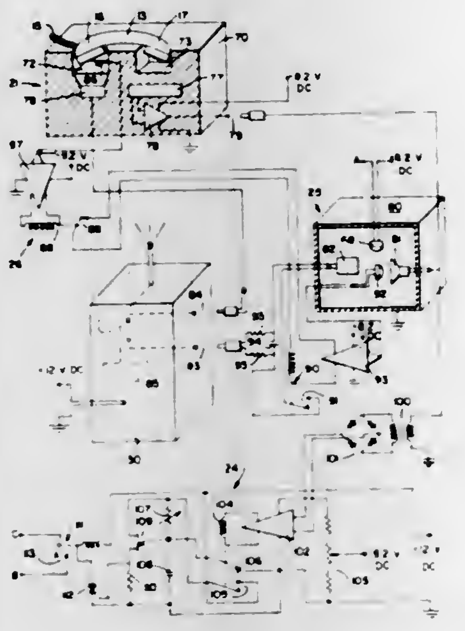
1. In apparatus for interfacing between a telephone instrument of a conventional telephone network and a conventional wireless communication system including at least one voice actuated transceiver having an audio signal input means and an audio signal output means, which apparatus includes

a. electromechanical control means removably mounted on said telephone instrument for simulating the removal and return of the handset of said telephone instrument from and to the cradle thereof, respectively;

b. audio transducer means receiving the mouthpiece and earpiece of said handset of said telephone instrument, said audio transducer means being adapted to acoustically insulate said mouthpiece and said earpiece from each other and including speaker means for applying acoustic signals to said mouthpiece as well as means for detecting and amplifying audio signals present at said earpiece and audio signal sensor means for sensing the application of said acoustic signal to said mouthpiece;

c. electrical means for transmitting the amplified audio signals detected at said earpiece from said transducer means to said audio signal input means of said transceiver;

d. voice loop means for interrupting said means transmitting audio signals from said earpiece to said audio signal input of said transceiver when said audio signal sensor means senses the application of said acoustic signals to said mouthpiece; and



e. answering means for sensing the ringing of said telephone instrument by said telephone network and actuating said control means to simulate the removal of said handset of said telephone instrument from the cradle thereof;

the improvement comprising audio mixing means in addition to said audio transducer means and interposed in said means for transmitting said amplified audio signals detected at said earpiece from said transducer to said audio signal input means of said transceiver, said audio mixing means including a hollow acoustic chamber and a speaker within said chamber for acoustically reproducing said amplified audio signal whereby a conventional microphone coupled to said audio signal input means of said transceiver may be located within said chamber .for acoustic coupling to said speaker within said chamber.

4,005,270

REMOTE CONTROL FOR OPERATING A TELEPHONE ANSWERING SYSTEM FROM A REMOTE POINT OVER THE TELEPHONE LINE

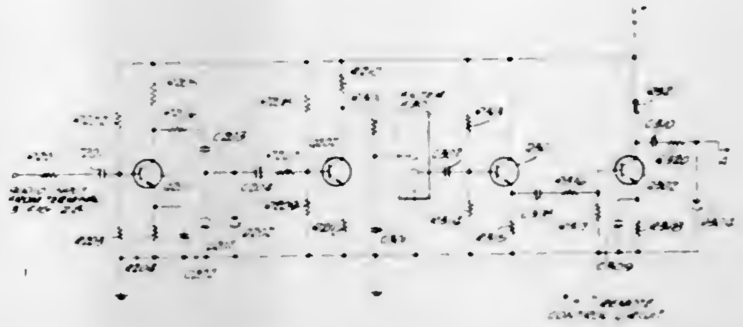
James R. Darwood, Cerritos, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Filed May 29, 1975, Ser. No. 581,842

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 E **4 Claims**

1. In a telephone answering system which responds to a ring signal received over a telephone line to transmit a recorded announcement over the telephone line to a calling party, in which the recorded announcement is recorded on a loop magnetic member having electromagnetic transducing means magnetically coupled thereto for recording announcements in the magnetic member and for playing back announcements previously recorded on the magnetic member, switching means controlled by said magnetic member to be actuated to a particular state when the magnetic member is moved from a reference position and to remain actuated in said particular state for the duration of a T-1 operating cycle and until the magnetic member returns to the reference position, and which includes a drive system for controlling the movement of the magnetic member, and audio amplifying circuit means; the combination of: a switching circuit for selectively connecting said audio amplifying circuit means to the telephone line and to the transducing means to cause the announcement recorded on the magnetic member to be transmitted over the telephone line in one operating condition of the switching circuit and to cause a new announcement from the telephone line to be recorded on the magnetic member in a second operating condition of the switching circuit; a tone sensing circuit coupled to the telephone line for sensing a tone signal of a predetermined frequency received over the telephone line and for providing a control signal in response thereto; a first control circuit coupled to said tone sensing circuit and to said switching means and responsive to said control signal to switch said switching circuit from said first condition to said second condition only while said switching means is actuated to said particular state during said T-1 operating cycle; and an inhibit control circuit interposed between said first control circuit and said switching circuit to prevent switching of said switching circuit to said second condition until the completion of a first T-1 operating cycle.



4,005,271

AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS

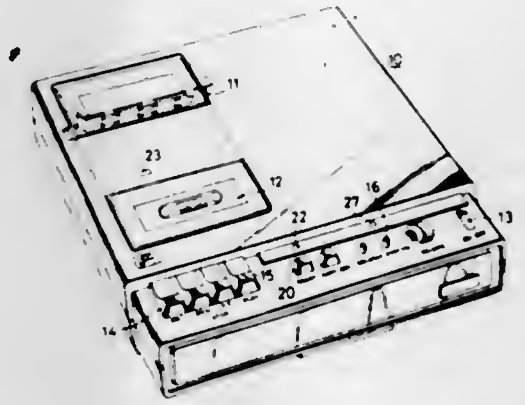
Yuji Urayama, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 389,596, Aug. 20, 1973, abandoned. This application May 5, 1975, Ser. No. 574,411

Claims priority, application Japan, Aug. 23, 1972, 47-83705; Aug. 26, 1972, 47-84984; Sept. 8, 1972, 47-89544

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 R **4 Claims**



1. An automatic telephone answering and recording apparatus comprising:

a first cassette tape recorded previously with an answering message;

answering means connected to a telephone line and operable automatically in response to a call arriving over the telephone line from a caller when the called person is absent for actuating reproducing means for play back of the answering message of the first cassette tape and for actuating connecting means for connecting to the line a transmitting means for sending said message through the telephone line toward the caller;

a second cassette tape having a still unrecorded portion;

caller's message recording means which is adapted to operate after the completion of the operation of said answering means for recording on the second cassette tape a message arriving from the caller through the telephone line;

detecting means connected to said caller's message recording means for detecting the fact that the second cassette tape has been paid out to its extreme end and accordingly maintaining an output detection signal so long as said tape is paid out;

answering message inhibit means connected to said detecting means and to said transmitting means, for preventing the transmitting means from sending the answering message to the caller after the connecting means is operated when the output detecting signal is maintained by said detecting means; and

delay means operably connected to said connecting means and to said detecting means, for operating only when the output detection signal from said detecting means is being maintained, and adapted when a call arrives, to increase the period of time required for actuation of said connecting means over the time normally required, said answering message inhibit means preventing said answering message from being transmitted after said connecting means is actuated with delay through said delay means.

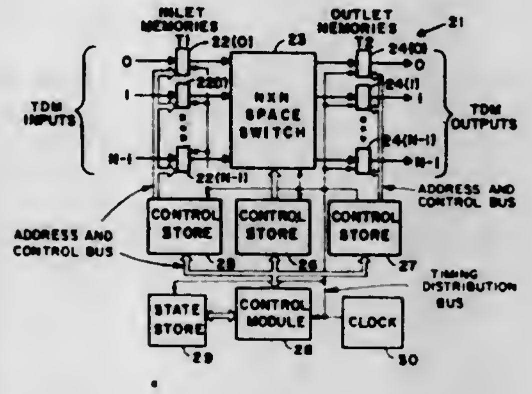
4,005,272
TIME FOLDED TST (TIME SPACE TIME) SWITCH

Arthur A. Collins; Robert D. Pedersen, and John C. Bellamy, II, all of Dallas, Tex., assignors to Arthur A. Collins, Inc., Dallas, Tex.

Filed Aug. 14, 1974, Ser. No. 497,214

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AQ **4 Claims**



1. In a time folded time-space-time telecommunication system switch for interconnecting digital time division multiplex communication lines: first path selection means establishing a communication path through the switch in a first direction; second path selection means automatically establishing a communication path through the switch in an opposite second direction; communication time slot control means establishing communication paths in said first direction in even time slots, and communication paths in said second direction, symmetrically, relative to said first direction paths, during respective following odd time slots in selectively interconnecting digital bi-directional time division multiplexed tranmission paths; and including space switch staging means with control memory means associated with output link means of said space switch staging means; said control memory means being the specifying selective control means acting through control decoding circuitry means for selectively connecting space switch staging input links to said output links during successive time slot channel times; and including, switch clock means; input time staging with inlet data memory means; output time staging with outlet data memory means; and with said inlet data memory control means being structured to write data from the inlet link time slots in sequential inlet data memory locations in synchronism with the input connecting link time slots, and to read data randomly in response to read addresses supplied through connecting circuitry from inlet data control store means; and with said outlet data memory control means being structured to write data randomly into outlet data memory means with addresses being supplied through connective circuitry from outlet data memory control store means, and said outlet data memory word locations being read sequentially in synchronism with the output connecting link time slots; with data from the input link time slots being written sequentially into said inlet data memory means in synchronism with the input connecting link time slots, and with the data, having been stored sequentially in the inlet data memory means, subsequently being read in a random access mode with the successive inlet memory addresses being supplied from the inlet data control store means; data being written into said outlet data memory means in a random access mode with successive outlet memory addresses being supplied from said outlet control store means; and, for data, having been written into said outlet memory means in a random access mode, being subsequently read in a sequential manner in synchronism with output connecting link time slots; and with the data transfers being made under control of said switch clock means.

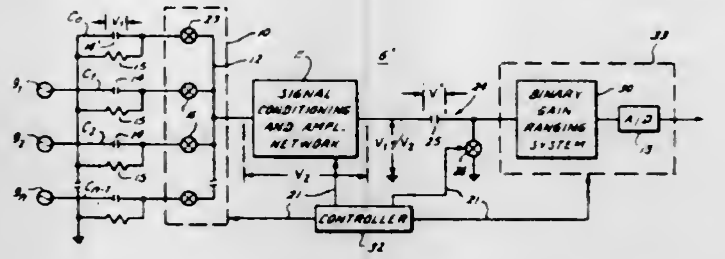
4,005,273
MULTIPLEXER OFFSET REMOVAL CIRCUIT

Lee E. Siems, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,615

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 BL **8 Claims**


SIGNAL CONDITIONING AND AMPL. NETWORK
BINARY GAIN RANGING SYSTEM
A/D
CONTROLLER
32
33

1. An analog-to-digital signal acquisition system comprising:

a plurality of input channels;

a multiplexer having a plurality of inputs and a common output bus;

a capacitor connected between each of said input channels and one of said multiplexer inputs, each said capacitor having a spurious voltage developed thereacross;

means for connecting one of said input channels to ground;

circuit means including an amplifier for connecting said multiplexer bus to a utilization device; and

a sample-and-hold circuit connected between said circuit means and said utilization device, said sample-and-hold circuit means comprising a shunt switch and a series capacitor for developing a sample voltage thereacross equal and of opposite polarity to said spurious voltage each time that the grounded input channel is scanned by said multiplexer and said shunt switch is closed, whereby in use, the sample voltage will successively cancel out the spurious voltages from said signal-receiving channels, as the multiplexer scans the signal-receiving channels.

4,005,274
PULSE-CODE MODULATION COMMUNICATION SYSTEM

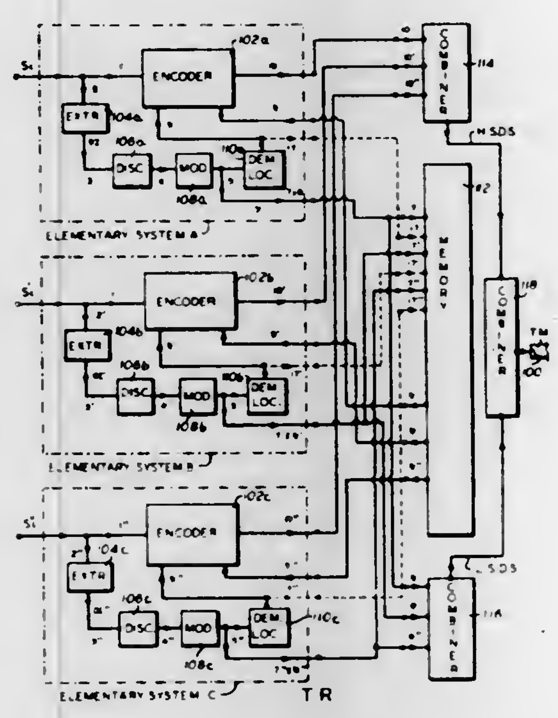
Federico Vagliani, Milan, and Alicide Molinari, Vimercate, both of Italy, assignors to TELETTRA-Laboratori di Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed May 27, 1975, Ser. No. 580,914

Claims priority, application Italy, May 27, 1974, 23193/74

Int. Cl.² H04J *3/18;* **H04B** *1/66*

U.S. Cl. 179—15.55 R **14 Claims**



1. A system for reducing the redundancy of pulse code modulation encoded signals subjected to either compression or expansion comprising: means for transmitting and reducing redundancy of said signals, said transmitting means comprising encoding means for receiving an input speech signal having a variable modulation envelope signal associated with at least one particular talker and encoding said input signal with one of *m* variable compression laws; second means connected to receive said input signal for extracting said envelope signal to provide an extracted signal; means connected to said extracting means for receiving said extracted signal and for discriminating said extracted signal and assigning it to one volume slot out of *n* possible volume slots, said volume slot corresponding to the volume state of said envelope signal; digital modulation means for encoding said assigned volume slot envelope signal connected to said discriminating means output; means connected to said modulation means output for demodulating said assigned volume slot envelope signal for providing said variable compression law to said encoding means for accomplishing said encoding in accordance with said provided variable compression law and for providing a variable number of bits per sample that vary in accordance with the value of said specific input envelope signal and said volume state of all speech channels processed by said system, said encoding means output signal being a high speed digital signal, said digital modulation means further providing a low speed digital output signal for enabling subsequent reconstructing of said volume states, first combiner means connected in parallel to said digital modulation means output and said encoder means output for combining said high and low speed digital signals for transmitting said reduced redundancy pulse code modulation encoded signals.

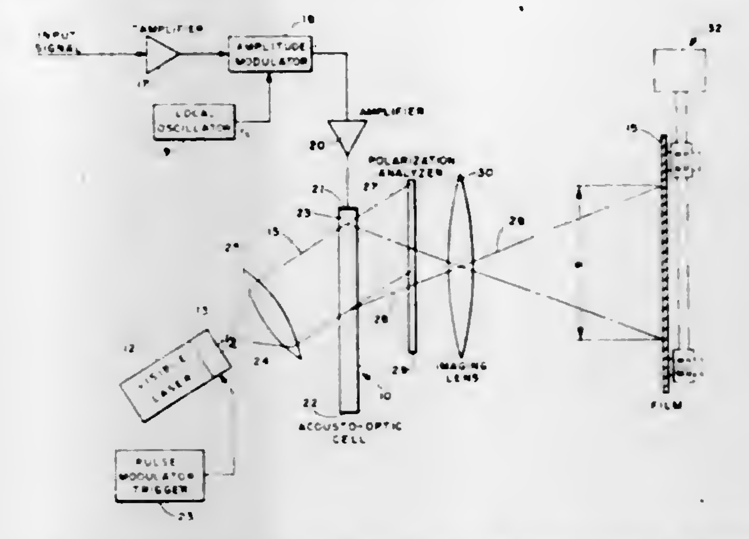
4,005,275
WIDEBAND ANALOG PHOTORECORDING APPARATUS AND METHOD

Richard A. Coppock, San Jose, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Continuation-in-part of Ser. No. 528,807, Dec. 2, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 623,797

Int. Cl.² G11B *7/00;* **G02B** *21/18;* **G11C** *13/04*

U.S. Cl. 179—100.3 G **7 Claims**



5. A method of real time recording of electrical signals consisting of the steps of

converting the electrical signal into an analogous acoustic wave in a transparent Bragg cell,

generating an intermittently pulsed laser beam,

directing said intermittently pulsed laser beam through said cell in a direction transversely of the direction of acoustic wave propagation therein to produce a pulsed output diffracted light beam, and

moving an optical recording medium transversely of said output beam so as to intercept and record same in successive lines at the rate of one line for each laser beam pulse.

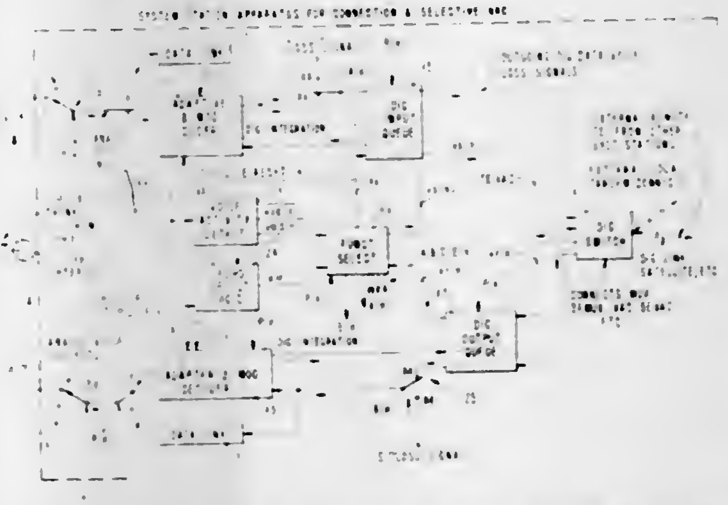
4,005,276
DIGITAL VOICE SIGNALING WITH DIGITAL ECHO DETECTION AND VOICE ACTIVITY COMPRESSION USED TO CANCEL ECHO

Paul Abramson, Raleigh, N.C., and Ulrich Appel, Munich, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,423

Int. Cl.² H04B *3/20*

U.S. Cl. 179—170.2 **12 Claims**



1. In a multiplex digital communication system for mixed handling of data and telephone information between switching stations, said system including station apparatus for connectively processing digital signals representing digital data and audible telephone information between internal circuits of the station and multiplex channels linked to remote stations said circuits comprising multiple input and output circuits asso-

ciated in pairs with respective pairs of space-separated sending and receiving lines served by said apparatus, said apparatus including threshold activity detection means coupled to said input circuits for detecting telephone information signals representing audible telephone activity exceeding a threshold and including multiplex digital switch channel assignment means for assigning subsets of said circuit selectively to be connected with said channels in repetitive multiplex frames of recurrence of said channels, by assigning said channels connectively only to input curcuits handling signals which represent data activity or above-threshold audible telephone activity, there being fewer said channels than said circuits, the improvement in said station apparatus comprising:

- means coupled to repetitively scan said input and output circuits in pairs in coordination with said multiplex frames for providing first control signal indications distinguishing audible telephone signal activity in said input circuits due only to echo coupling between respective associated telephone line pairs;
- means responsive to above-threshold activity indications supplied by said activity detction means and to said first control signal indications for producing second control signal indications distinguishing above-threshold audible telephone activity in said input circuits due to sources other than echo coupling only; and
- means for supplying said second control signal indications to said digital switch means, in time and space association with signals representing samples of respective input activity, for use in determining said channel assignments; whereby samples of telephone activity in said input circuits due only to echo coupling in associated lines may be indirectly suppressed by non-assignments of channels to carry said samples.

4,005,277
ECHO CONTROLLER COMPRISING A MODE SWITCH FOR SWITCHING ECHO SUPPRESSOR AND CANCELLER

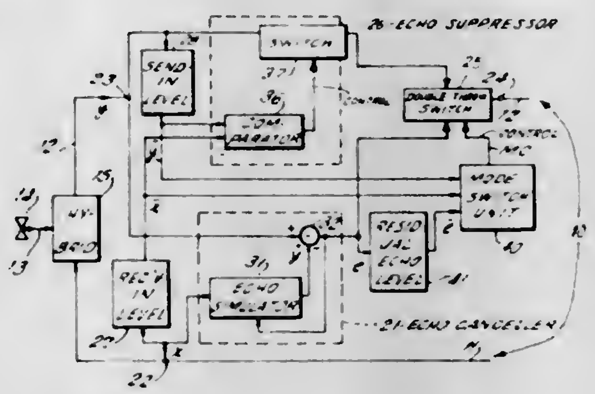
Takashi Araseki; Kazuo Ochiai; Takashi Ogihara, and Shunji Tanaka, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,372

Claims priority, application Japan, Sept. 5, 1974, 49-102794

Int. Cl.² H04B *3/20*

U.S. Cl. 179—170.2 **5 Claims**



1. An echo controller responsive to a received signal supplied from a receiving path of a four-wire line of a long-distance telephone network and to an unprocessed signal supplied to the input of a sending path of said four-wire line for supplying said sending path with a transmitted signal substantially free from an echo signal inevitably produced by an echo path formed at a jucntion of said four-wire line and a two-wire line of said network, said echo controller comprising:

- a self-adaptive echo canceller which comprises an adjustable echo simulator responsive to said received signal for producing an echo simulation signal simulating said echo signal, a subtractor for substracting said echo simulation signal from said unprocessed signal to produce an echo cancelled signal, and means responsive to said echo cancelled signals for adjusting said echo simulator during the absence of double talk in said four-wire line to improve simulation by said echo simulation signal of said echo signal;
- an echo suppressor comprising a comparator for comparing levels of said received and unprocessed signals for producing a switching signal when the former is higher than the latter and means responsive to said switching signal for producing said unprocessed signal as an echo suppressed signal; and
- mode switch means responsive to levels of said received, unprocessed, and echo cancelled signals for detecting the absence of double talk and evaluating the simulation of said echo signal with respect to a predetermined criterion to switch, during the absence of double talk, said transmitted signal from said echo cancelled signal to said echo suppression signal when said simulation is worse than said criterion.

4,005,278
HEADPHONE

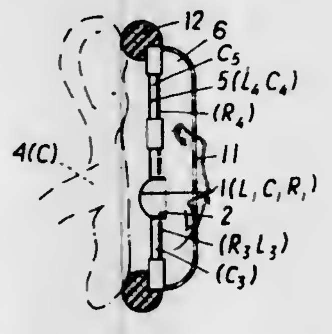
Rudolf Görike, Vienna, Austria, assignor to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria

Filed Sept. 15, 1975, Ser. No. 613,578

Claims priority, application Austria, Sept. 16, 1974, 7454/74; Nov. 19, 1974, 9261/74; Nov. 29, 1974, 9593/74; Apr. 24, 1975, 3170/75; May 2, 1975, 3380/75

Int. Cl.² H04R *1/20*

U.S. Cl. 179—181 R **44 Claims**



1. In a headphone of the type comprising a toroidal seal ring which, in the operational position of the headphone, rests against or surrounds the user's ear, is constituted by a soft, yielding, and elastic material, and, with the headphone positioned on the head of the user, forms a coupling space between an active diaphragm, actuated by an electroacoustic transducer, and the auditory canal of the user's ear, and which coupling space is substantially sealed from the exterior of the headphone, the improvement comprising, in combination, said coupling space being formed with at least one opening; a respective passive oscillatory diaphragm, having a definite self-resonance, mounted in each opening and associated with a sound path leading therefrom and providing, with the associated passive diaphragm, an optimum frequency characteristic.

4,005,279
LOCKABLE COVER FOR PUSH BUTTON TELEPHONES

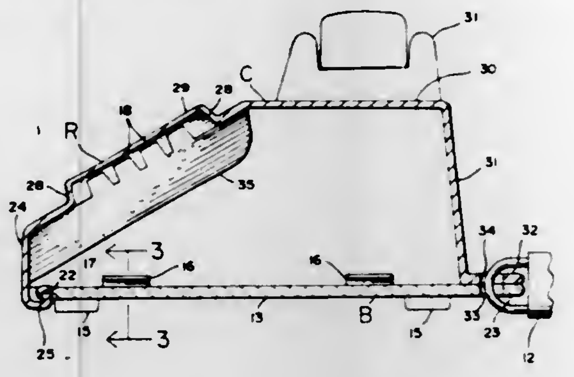
Julian Richter, 8500 Biscayne Blvd., Miami, Fla. 33138

Filed May 24, 1976, Ser. No. 689,669

Int. Cl.² H04M *1/66*

U.S. Cl. 179—189 D **1 Claim**

1. A lockable cover device for push button telephones comprising a base member, means adapted to removably secure said base member to the base of said telephone, a cover member adapted to be mounted over a front, top and rear walls of said telephone, said cover member having a raised portion for receiving and enshrouding the push buttons, means pivotally attaching said cover member to said base member along a front edge thereof, said pivotal means consisting of an open slotted portion having an arcuate cross sectional configuration along a cooperating edge of said cover member and an arcuate member of similar cross sectional shape on said front edge of said base member and slidably positioned in said slotted portion, said removable securing means having upstanding members mounted along sides of said base member adapted to be inserted between the base and side walls of said telephone and shoulder means mounted on the free ends of said upstanding members engaging the base wall of said telephone and tab portions mounted on a side opposite to said one side and locking means for securing said tabs together.



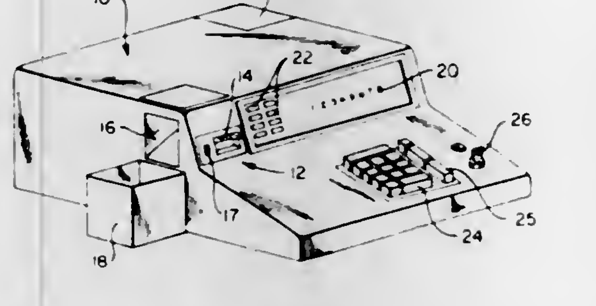
4,005,280
TICKET READER

Napoleone Nunzio, Worcester, and Donald James Musgrave, Woodville, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 10, 1975, Ser. No. 566,735

Int. Cl.² G06K *13/08*

U.S. Cl. 235—61.11 R **13 Claims**



1. A ticket reader comprising

- a carrier that is movable between loading, reading and eject positions;
- means for locating a ticket on said carrier;
- means for reading information encoded on said ticket and converting it to output signals when the carrier is in said reading position;
- means for locking the carrier in said reading position and biasing it for movement to the eject position when the lock is released; and
- means for ejecting the ticket from the carrier, said eject position coinciding with said loading position and said carrier being pivotal from said reading position to said eject position.

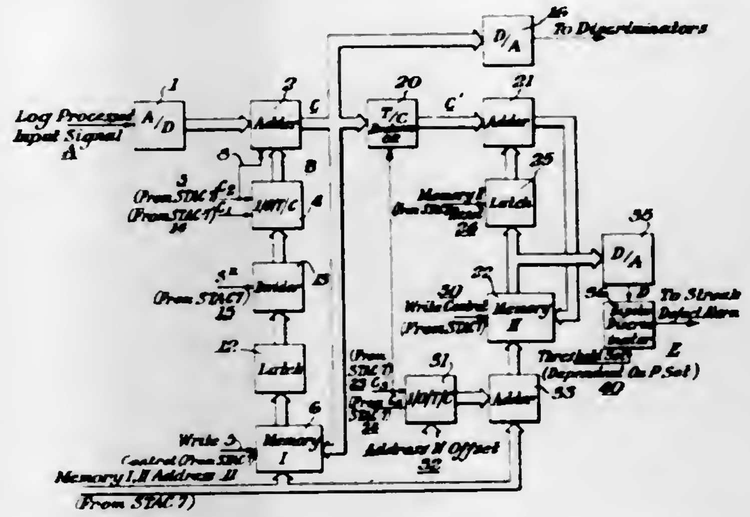
4,005,281
DEFECT IDENTIFICATION WITH NORMALIZING OF GAIN FUNCTION IN OPTICAL-ELECTRICAL INSPECTION

Mark Edwin Faulhaber, and Edmund Haislett Smith, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1975, Ser. No. 577,394

Int. Cl.² G06F *15/00*

U.S. Cl. 235—151.3 **12 Claims**


To Discriminators
D/A
Log Processed Input Signal A
A/D
Adder
T/C
Adder
Latch
Memory II
Divider
Latch
Memory I
D/A
To Streak Defect Alarm
Write Control (From STAC 7)
Threshold Set (Dependent On P Set)
Adder
Address II Offset
Memory I, II Address II (From STAC 7)

4. Apparatus for defect identification with normalizing of the optical-electrical inspection system gain function of scans across a full width of a running product web comprising, in electrical circuit in the sequence recited, a source of electrical scan signals A, a memory storing a sufficient accumulation of a number of said signals A to permit the resolution of an acceptable average reference signal R, means computing said average signal R as the quotient of said accumulation of said number of said signals A divided by said number of said signals A accumulated, means computing the difference signal A-R for succeeding scan signals A, thereby effectively equalizing each successive scan signal A while preserving defect-related signals, and means identifying said defect-related signals by amplitude discrimination of said difference signal A-R.

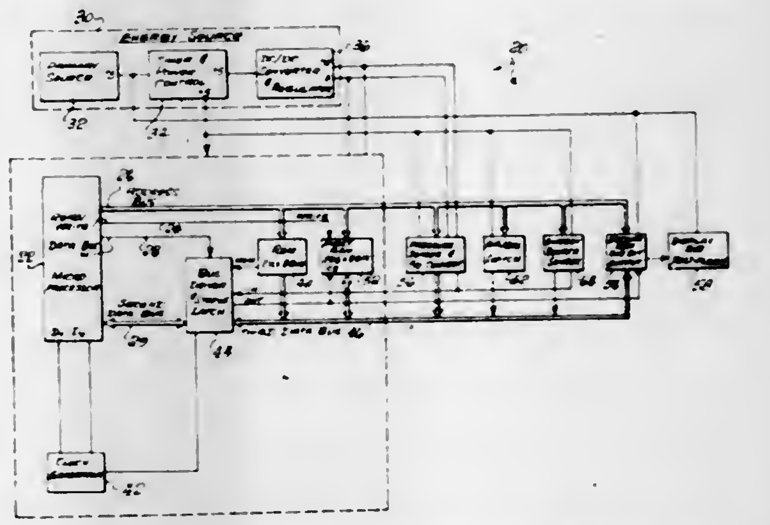
4,005,282
DECOMETER

Kirk E. Jennings, Kaneohe, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1975, Ser. No. 616,786

Int. Cl.² G06F *15/42*

U.S. Cl. 235—151.3 **8 Claims**



1. A portable decompression computer, which is capable of providing a diver's current depth and safe ascent depth, comprising:

- a source of energy, for energizing and timing various components of the computer;

a micro processor, energized by the energy source, connected to an address bus, a read-write bus, a data bus in, and a second dated bus;
a clock generator for timing various components of the computer;
a bus driver and status latch, timed by the clock generator and connected by the data bus in and the second data bus to the micro processor, which decodes data signals received from the micro processor and converts them to compatible voltage levels for the second and a third data bus, the status latch decoding information from the micro processor and relaying it to various memory input and output devices;
a read-only memory (ROM), which has the main programs for the computer stored within it which can be addressed programmatically by the micro processor, and which makes its stored data available on the third data bus, connected to the bus driver and status latch;
a first random-access memory (RAM), which can be written into by the read-write bus connected to the micro processor, which can write data into and be read by the bus driver and status latch by means of the third data bus, the memory storing program variables;
a pressure sensor and A/D converter which multiplexes depth information onto the third data bus;
a second random-access memory, which receives information on the address bus from the read-write data bus regarding the current depth and safe ascent depth and stores it; and
a display and multiplexer which is energized by the source of energy, has as an input from the second random access memory the current depth and safe ascent depth, and receives timing pulses from the source of energy, the function of the display and multiplexer being to decode the address of the digit selected and determine the time on, or duty cycle, of each digit.

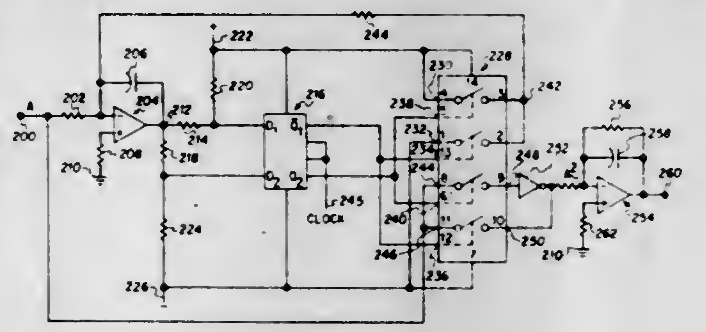
4,005,283
SQUARING CIRCUIT APPARATUS

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 22, 1975, Ser. No. 615,753

Int. Cl.² G06G *7/16, 7/20*

U.S. Cl. 235—194 **3 Claims**



1. Squaring apparatus comprising, in combination:
apparatus input means for supplying an analog input signal to be squared;
duty cycle means, connected to said input means for receiving signals therefrom, for providing output control signals having a duty cycle representative of the amplitude of said input signals; and
apparatus gating means, including input means connected to said apparatus input means, control means connected to said duty cycle means for receiving control signals therefrom and first and second output means, for supplying output signals from one of said first and second output means in accordance with the polarity of said analog input signal and representative in amplitude of the square of said input signal, wherein said duty cycle means is a converter including,
first switch means including first and second gating means each having an input means, an output means and a control means for controlling a conductive path between said input means and said output means of the gating means,
first and second feedback signal source means connected to said input means of said first and second gating means respectively of said first switch means;
integrating means including input means and output means,
analog signal supplying means for supplying the input signal to be squared,
means connecting said analog signal supplying means and said output means of said first switch means to said input means of said integrating means,
voltage sensitive second switch means including input means and control signal first and second output means, said second switch means providing an output of a given polarity at said first output means thereof when a signal at said input means thereof exceeds a first reference level and the second output means thereof providing an output signal of said given polarity when a signal provided to said input thereof exceeds a second reference level,
means connecting said output means of said integrating means to said input means of said second switch means,
means connecting said control output means of said second switch means to said control means of said first switch means, the output signal from said control output means of said voltage sensitive switch means being representative in duty cycle of the amplitude of signals provided by said analog signal supplying means, and wherein said apparatus gating means includes inverting means connected within said apparatus gating means and to the one of said output means providing output signals with negative polarity analog input signals; and
means connecting an output of said inverting means to the other output means of said apparatus gating means for supplying apparatus output signals whereby the squared apparatus signal is positive regardless of the polarity of said input signal to be squared.

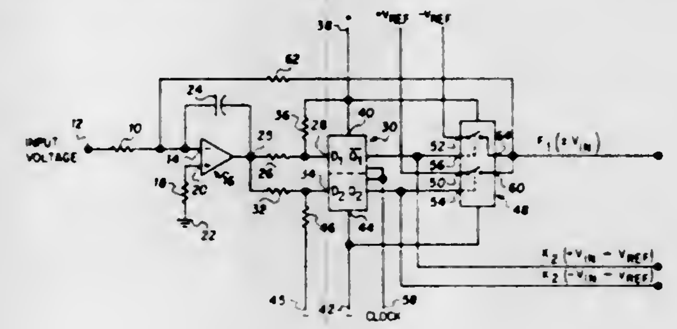
4,005,284
ANALOG SIGNAL TO DUTY CYCLE CONVERSION APPARATUS

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 22, 1975, Ser. No. 615,758

Int. Cl.² G06G *7/16*

U.S. Cl. 235—194 **5 Claims**



1. Analog to pulse density converting apparatus comprising, in combination:
first switch means including first and second gating means each having an input means, an output means and a control means for controlling a conductive path between said input means and said output means of the gating means;
first and second feedback signal source means connected to said input means of said first and second gating means respectively of said first switch means;
integrating means, including input means and output means;
analog signal supplying means;

means connecting said analog signal supplying means and said output means of said first switch means to said input means of said integrating means for supplying two signals thereto to be integrated;
voltage sensitive second switch means including input means and first and second output means, said second switch means providing a given polarity output at said first output means thereof when a signal at said input means thereof exceeds a first polarity reference level and the second output means thereof providing an output signal of said given polarity when a signal provided to said input means thereof exceeds a second polarity reference level;
means connecting said output means of said integrating means to said input means of said second switch means; and
means connecting said first and second output means of said second switch means to said control means of said first and second gating means respectively of said first switch means, the output signal from said first output means of said voltage sensitive switch means being representative in pulse density of the amplitude of positive signals provided by said analog signal supplying means and the output signal at said second output means of said second switch means being representative in pulse density of the amplitude of negative signals supplied by said analog signal supplying means.

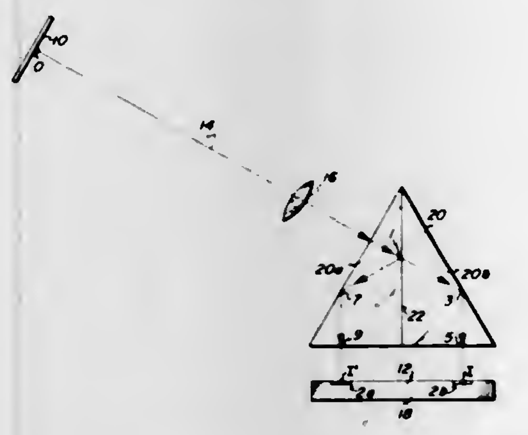
4,005,285
OPTICAL SYSTEM FOR EXTENDING PHOTOSENSOR ARRAY RESOLUTION

Edgar E. Price, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1975, Ser. No. 627,498

Int. Cl.² H01J *39/12*

U.S. Cl. 250—208 **7 Claims**



1. An image sensing system optically disposed relative to a conjugate object plane as follows:
a plurality of discrete photosensor elements arranged in a first linear array and separated by a center-to-center spacing *d* ,
a plurality of discrete photosensor elements arranged in a second linear array and separated by a center-to-center spacing *d*,
said first and second arrays of photosensor elements being disposed in an image plane in optical communication with said conjugate object plane,
a beam splitter disposed in the optical path between said object plane and said image plane,
a reflector disposed in each of the divided optical paths between said beam splitter and said image plane, said reflectors disposed in mutually inward facing relationship at an angle bisected by said beam splitter
said first and second arrays of photosensor elements being in conjugate relationship to the same object line of said object plane, and being linearly offset relative to each other with respect to said object line by an amount *d*/2 so as to optically double the spatial density of said photosensor elements relative to said object line for increased resolution of image sensing by said elements.

4,005,286
COMPACT ILLUMINATION SYSTEM WITH LIGHT ABSORBING AND REFLECTING WALLS

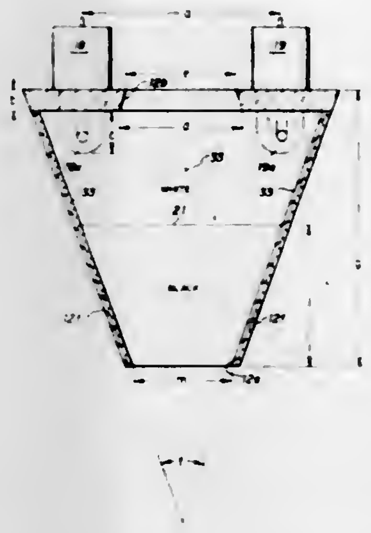
Hubert D. Faulkner, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Continuation of Ser. No. 554,659, March 3, 1975, abandoned.

This application Aug. 11, 1976, Ser. No. 713,329

Int. Cl.² H01J *3/14, 5/16, 39/12*

U.S. Cl. 250—216 **11 Claims**



1. A data field illuminator for uniformally brightening a data field viewed by a photo sensor array in an optical character recognition system comprising: an enclosure having side walls converging from an enclosure plate to a first aperture, said enclosure plate enclosing one end of said enclosure and having a second aperture therein for the passage of light to said photo sensor array reflected from a data field in registration with said first aperture, a light absorbing inner surface on two of said side walls extending from the first aperture toward the closure plate to a boundary line located intermediate the first aperture in said closure plate, and a light reflecting surface extending from the boundary line to said closure plate, a light reflecting surface on two other said side walls and a light source supported by said closure plate for illumination of the data field.

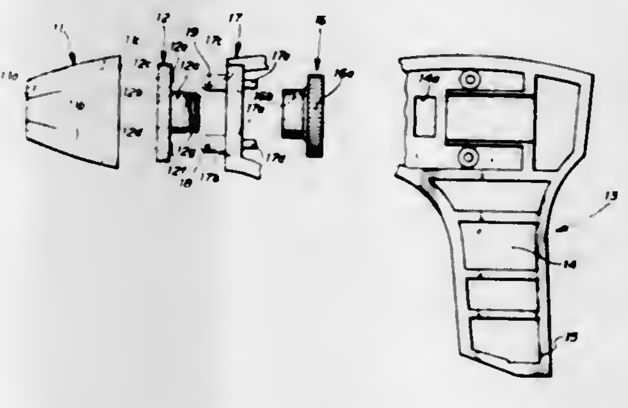
4,005,287
NOSE ATTACHMENT FOR OCR WAND

Paul A. Cook, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed July 28, 1975, Ser. No. 599,474

Int. Cl.² H01J *5/02*

U.S. Cl. 250—239 **7 Claims**



1. A hand-held wand for an optical reader constructed to accommodate element replacement which comprises:
a. a wand body having a light sensitive array mounted therein on an optical axis for receiving light reflected

from an external data field, and further having illuminating means adjacent to but spaced from said optical axis and facing away from said body to illuminate said field;

b. a nose section having an aperture symmetrical about said optical axis and encompassed by a threaded extension passing into said body from the end of said body facing said field; and

c. a rotatable threaded cap engaging said extension within said body, said cap having a bore therethrough coaxial with said optical axis and said cap having an outer flange thereon extending in a direction transverse to the optical axis and extending through said wand body.

4,005,288

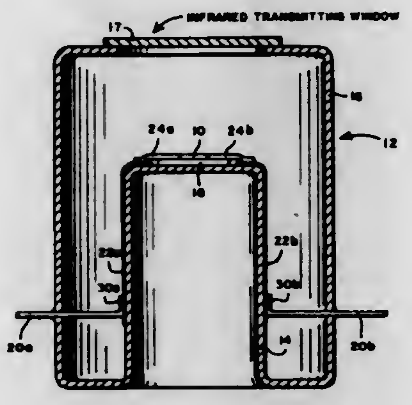
PHOTODETECTOR MOUNTING AND CONNECTING

Gene A. Robillard, Stoneham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 19, 1975, Ser. No. 614,804

Int. Cl.² H01J *5/02*

U.S. Cl. 250—239 2 Claims



1. Photodetector apparatus comprising:

photodetector mounting apparatus of the Dewar type having an outer flask and an inner flask having top and side surfaces;

a photodetector mounted on the top surface of the inner flask;

an electrical conductive path comprising an electrically conductive film extending from the side surface on to the top surface of the inner flask; and

an electrical lead tab having a first part attached to the photodetector and a second part projecting from the photodetector and having first and second major surfaces, the second part being attached to the electrical conductive path on the top surface of the inner flask, with the first major surface being essentially parallel to and in electrical contact with a surface of the electrical conductive path.

4,005,289

METHOD FOR IDENTIFYING ANOMALOUS TERRESTRIAL HEAT FLOWS

Nancy Kerr Del Grande, San Leandro, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 5, 1976, Ser. No. 646,444

Int. Cl.² G01V *5/00*

U.S. Cl. 250—253 7 Claims

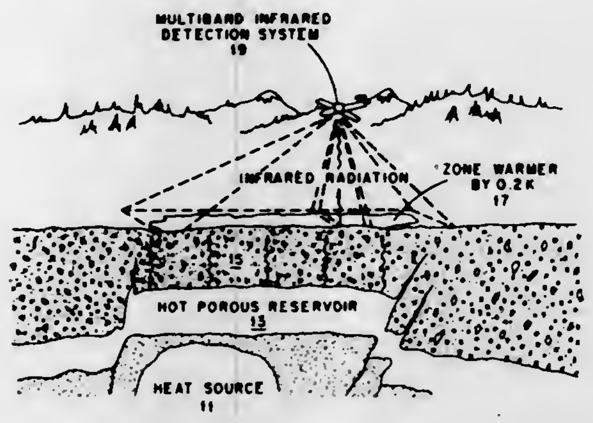
1. The method of locating and mapping the magnitude and extent of small anomalous terrestrial heat flows, comprising the steps of:

a. detecting radiation emitted by areas of the Earth's surface;

b. detecting at least two infrared bands where the spectral radiation is described by Planck's Radiation Law, at periodic intervals, as needed to characterize the spectral, spatial, thermal, temporal, and statistical radiation features of the terrestrial radiation;

c. relating the ratio of at least two infrared bands to the true temperature of the surface terrain;

d. determining the normal surface temperature for the ambient non-thermally modified terrain;



e. locating and mapping areas where the true surface temperature is significantly different from the ambient normal-surface temperature;

f. relating the statistically significant residual temperature difference to a heat flow anomaly;

g. determining the magnitude and extent, and mapping the heat flow anomaly.

4,005,290

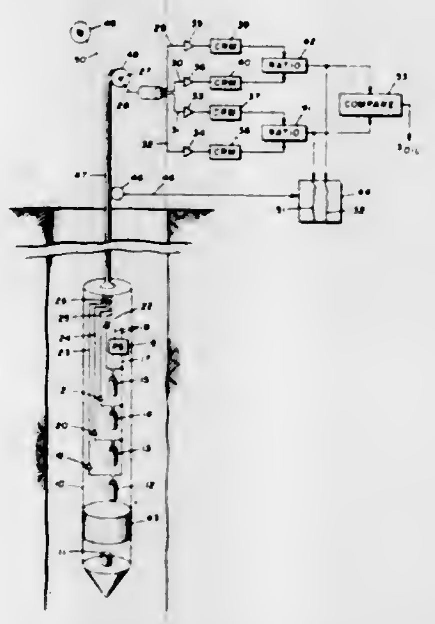
NEUTRON-NEUTRON LOGGING

Linus S. Allen, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,362

Int. Cl.² G01V *5/00*

U.S. Cl. 250—266 6 Claims



1. A method of logging the formations traversed by a borehole, comprising the steps of:

a. locating a steady-state source of primary radiation within the borehole to irradiate the formations with fast neutrons,

b. at first and second spaced-apart positions within said borehole measuring secondary radiation that represents predominantly the epithermal neutron parameters of the formation being logged,

c. at third and fourth spaced-apart positions within said borehole measuring secondary radiation that represents both the epithermal and the thermal neutron parameters of the formation being logged,

d. producing a first ratio of the secondary radiation measured at said first and second spaced-apart positions, said first ratio being indicative predominantly of the porosity of the formation being logged,

e. producing a second ratio of the secondary radiation measured at said third and fourth spaced-apart positions, said second ratio being indicative predominantly of both the porosity and the macroscopic absorption cross section of the formation being logged, and

f. determining the differential between said first and second ratios as an indication of the salinity of the formation being logged, said first ratio being unaffected by such salinity and said second ratio increasing and decreasing as such salinity increases and decreases respectively.

4,005,291

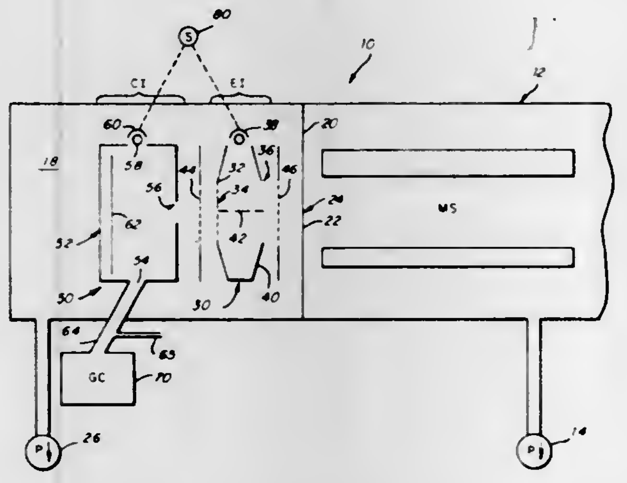
IONIZATION METHOD FOR MASS SPECTROMETRY

Guy P. Arsenault, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 215,373, Jan. 4, 1972. This application Sept. 27, 1973, Ser. No. 401,284

Int. Cl.² H01J *39/34*

U.S. Cl. 250—282 23 Claims



1. A method for analyzing a gaseous, vaporous or aerosol substance comprising the steps of chemically ionizing said substance in a chemical ionization zone at a chemical ionization pressure in the presence of a first gas comprising at least one selected from the group consisting of hydrogen and charge exchange reactant gases and a second gas comprising a chemical ionization reaction gas, said first and second gases being admixed with said substance in sufficient amount to effect chemical ionization of said substance,

passing the first and second gases and the chemically ionized substance produced in said chemical ionization zone into an electron-impact ionization zone through an aperture sufficiently small to maintain a pressure drop between said zones, said electron-impact ionization zone being maintained at an electron-impact ionization pressure and

obtaining the mass spectra of the ionized substances formed in said chemical ionization zone by passing the output of the electron-impact ionization zone to the input of a mass spectrometer.

4,005,292

MASS COUNTING OF RADIOACTIVITY SAMPLES

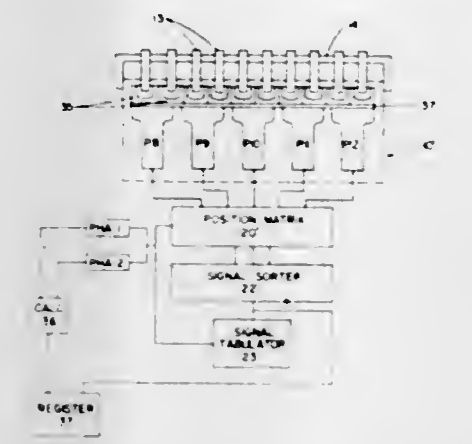
Donald L. Oesterlin, Roselle, and Raymond F. Obrycki, Mount Prospect, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 436,101, Jan. 24, 1974, abandoned. This application May 12, 1975, Ser. No. 576,343

Int. Cl.² G01T *1/00, 1/20*

U.S. Cl. 250—364 2 Claims

1. A method of analyzing a plurality of separate samples for the presence of the radioisotope iodine-125 comprising positioning said samples in an array at spaced intervals from each other at predetermined stationary positions proximate to a plurality of separate scintillation crystals having uniform lateral dimensions and contiguously positioned in optical isolation from each other in a planar two dimensional array whereby the spacing of said samples from each other is coordinated with the lateral dimensions of said separate crystals so tat individual ones of said crystals in a one-to-one relationship, viewing said crystals with an array of photodetectors each of which is positioned in overlapping optical communication with at least a plurality of said crystals to generate electrical signals from at least a plurality of photodetectors in response to each scintillation observed in said scintillation crystals to provide positional information concerning each scintillation observed, establishing a plurality of coterminous spatial sectors of the area encompassed in the plane of the aforesaid two dimensional array each such sector corresponding to the location of a single one of the aforesaid crystals, concurrently



tabulating the detection of radioactive events according to the sector of origin within which radioactive events from said samples cause light emissions in said crystals, thereby concurrently registering separately the number of radioactive events detected from each of the aforesaid samples, analyzing said electrical signals from said photodetectors to determine separately the intensities of the observed scintillations, tabulating separately those scintillations generating electrical pulses characteristic of the detection of single radioactive rays emitted by iodine-125 and those scintillations characteristic of the detection of coincident radioactive rays emitted by iodine-125, and calculating therefrom the actual rate of disintegration of atoms of iodine-125 occurring in each of the aforesaid samples.

4,005,293

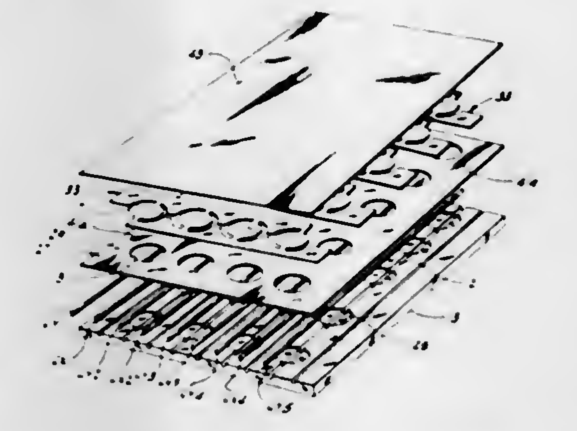
PUSHBUTTON KEYBOARD SWITCH ASSEMBLY HAVING INDIVIDUAL CONCAVE-CONVEX CONTACTS INTEGRALLY ATTACHED TO CONDUCTOR STRIPS

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1974, Ser. No. 528,180

Int. Cl.² H01H *13/70, 1/06*

U.S. Cl. 200—5 A 17 Claims



1. A pushbutton keyboard system comprising an electrically insulative substrate, a plurality of actuating elements arranged

in an array of columns and rows on one face of said substrate, a plurality of conductors on said one face of said substrate, said conductors being parallel to one another and extending in the common direction of said columns to terminate adjacent a common edge of said substrate, there being one conductor for each row of elements constituting a row conductor and another conductor for each column of elements constituting a column conductor, each column conductor extending along the substrate between the substrate and the elements of its respective column and said row conductors extending along the substrate with at least some of the row conductors disposed between said column conductors in spaced relation to adjacent column conductors, each of said elements being of a flexible electrically conductive material and having an initial position in which it is clear of its respective column conductor, each of said elements being resiliently deformable from its initial position to an actuated position in which at least one point on the element is in contact with its respective column conductor, and means for electrically connecting the elements in each said row to their respective common row conductor whereby, upon moving any one of said actuating elements in any row to its actuated position, a circuit is completed extending from said common substrate edge through the column conductor of said element and the row conductor of said row of actuated elements back to said common substrate edge.

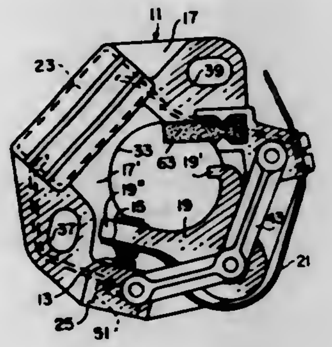
4,005,294
IGNITION BREAKER POINT ARRANGEMENT

Elwin J. Brayley, East Longmeadow; Allen L. Brownlee, Westfield, and John C. Garen, West Springfield, all of Mass., assignors to Eltra Corporation, Toledo, Ohio

Filed May 2, 1975, Ser. No. 574,174

Int. Cl.² H01H *19/00*

U.S. Cl. 200—19 A **14 Claims**



1. In a contact breaker assembly including a breaker plate supporting a stationary breaker point thereon and a breaker lever carrying another breaker point and being pivotally supported on the breaker plate for movement into engagement with the stationary breaker point, a capacitor having a pair of electrically conductive plates and means for electrically connecting one of the capacitor plates to the stationary breaker point and electrically connecting the other capacitor plate to the breaker point carried by the breaker lever, the improvement comprising:
- said breaker plate being constructed integrally from an electrically insulating material and having wall means defining a receptacle, and
- said capacitor being disposed in the receptacle of said breaker plate.

4,005,295
COMPONENT CONTAINER

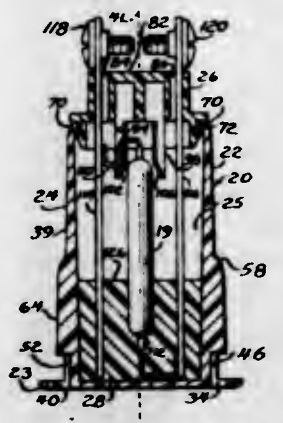
James P. Mitchell, 5412 W. Henderson St., and Henry J. Lakoma, 5347 W. School St., both of, Chicago, Ill. 60641

Filed Nov. 17, 1975, Ser. No. 632,464

Int. Cl.² H01H *3/16*

U.S. Cl. 200—61.62 **9 Claims**

1. A component container comprising: a vessel portion, said vessel portion having a plurality of rigid tines connected to an outside wall of said vessel portion, said vessel portion holding an electrical component; and a cap, engaging said vessel portion.



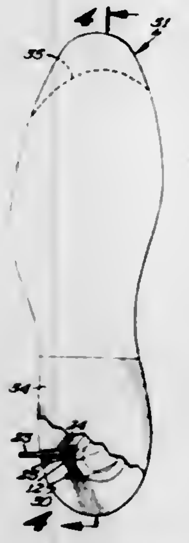
4,005,296
DISC SWITCH

Robert K. Olson, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 29, 1974, Ser. No. 518,496

Int. Cl.² H01H *3/14*

U.S. Cl. 200—85 R **18 Claims**



1. Apparatus adapted for cooperation with the human foot for performing a switching function in response to ambulation comprising:
- substrate means;
- first and second contact means carried by said substrate means on opposing sides thereof;
- first and second flexible contact means; and
- means for supporting each of said flexible contact means in a first position spaced from a different one of said first and second contact means while allowing at least a portion of said flexible contact means to flex into a second position in electrical communication with the first or second contact means from which it is spaced.

4,005,297
VACUUM-TYPE CIRCUIT INTERRUPTERS HAVING HEAT-DISSIPATING DEVICES ASSOCIATED WITH THE CONTACT STRUCTURES THEREOF

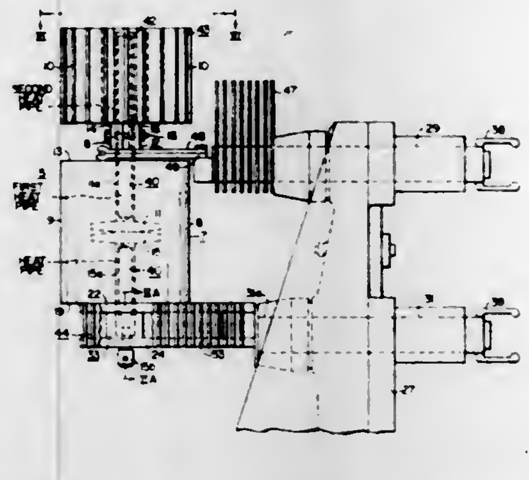
Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1972, Ser. No. 298,689

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **3 Claims**

1. A vacuum-type circuit interrupter including means defining an evacuated envelope and a pair of separable contacts disposed therewithin, means for effecting the opening and closing motions of at least one of said separable contacts, heat-exchanger means disposed within the contact-stem of at least one of said separable contacts, a heat pipe provided in the contact-stem of one of the contacts, and externally-provided finned cooling structure being provided having a core, and a second heat pipe being disposed in end-to-end relationship with the first said heat pipe.



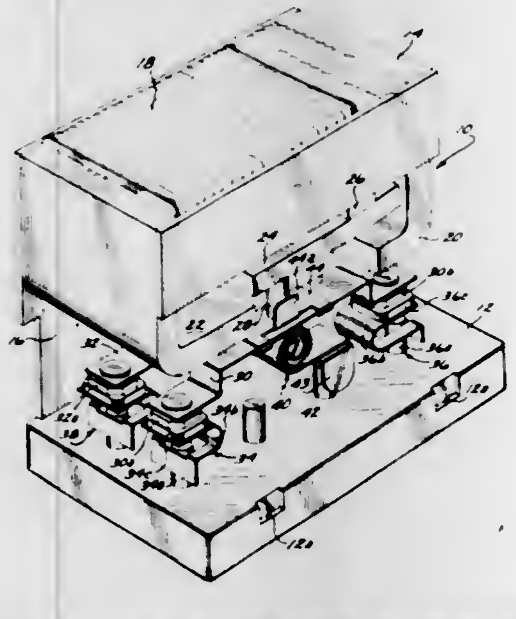
4,005,298
ELECTRICALLY CONDUCTIVE MOVEABLE SUPPORT MEMBER FOR USE IN ELECTRICAL SWITCHES

Jack M. Brown, Costa Mesa, Calif., assignor to Esterline Electronics Corporation, Costa Mesa, Calif.

Filed May 19, 1975, Ser. No. 578,387

Int. Cl.² H01H *3/00*

U.S. Cl. 200—153 R **6 Claims**



1. An electrical switch comprising in combination,
- a base,
- a stationary contact fixed relative to said base,
- a moveable contactor having a moveable contact fixed thereto for cooperation with said stationary contact,
- motive power means operatively connected to said contactor for moving the latter, and
- an elongated strip of electrically conductive material formed with substantially equal right-hand and left-hand convolutions along its length and having one end connected relative to said base and another end connected to said contactor to thereby afford a cantilever member for said contactor during movement of said moveable contact between engaged and disengaged positions with said stationary contact, said cantilever member generating minimum resistance to such movement while conducting electrical energy.

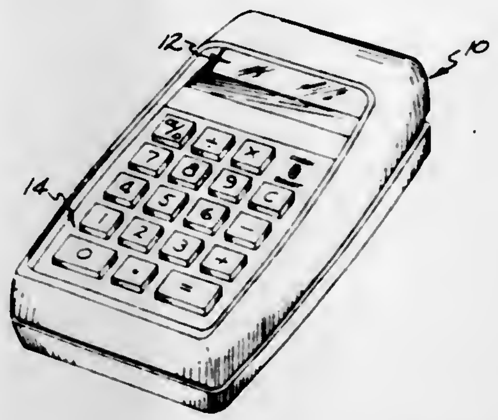
4,005,299
ELECTRICAL CONTACT MEMBER HAVING LOW ELECTRICAL RESISTANCE

Laurence J. Keough, Walpole, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1974, Ser. No. 465,220

Int. Cl.² H04Q *3/00*

U.S. Cl. 200—159 B **3 Claims**



1. In a calculator having a keyboard, a circuit board on which are disposed sets of spaced stationary contact members, snap acting electrically conductive bridging contact elements having a first at rest configuration and a second opposite configuration adapted to make electrical contact between the stationary contact members of a set when in the second configuration, the improvement comprising the disposition of a metal layer having high electrical conductivity on a portion of one surface of the elements, the portion covering an area less than the area of one surface of the elements, the portion so located that it is aligned with the respective stationary contact members, the portion comprising the berm of one side of the disc and an area located centrally within each berm.

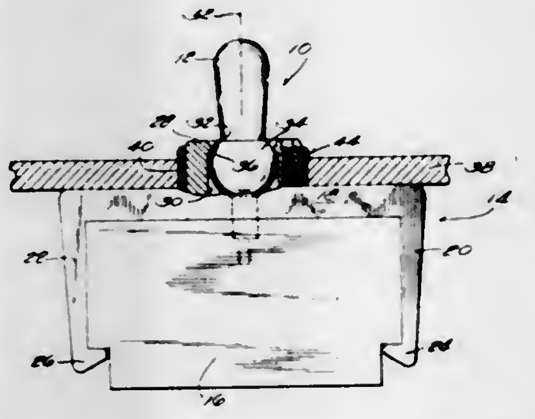
4,005,300
PANEL MOUNTED DEVICE INCLUDING PRESS-IN RETENTION MEANS

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 580,625

Int. Cl.² H01H *9/00*

U.S. Cl. 200—296 **5 Claims**



1. A mounting arrangement for a device adapting the device to be mounted from the back of and through an aperture in a support panel to secure the device on the panel so that a part of the device is accessible from the front of the panel comprising
- an elongated bushing carrying the accessible part of the device, having an axial length greater than the thickness of the panel and having an outer end portion adapted to be inserted through the panel aperture; and
- a retainer mounted on said bushing end portion, said retainer including a supporting material secured to the outer peripheral surface of said bushing end portion and

carrying a plurality of stiff, normally straight fibers having one end secured at spaced locations to said supporting material, each of said fibers extending from the outer surface of said supporting material in a plane generally perpendicular to the outer peripheral surface of said bushing at the location of said secured end and downwardly in a direction away from the outer end of said bushing at an acute angle with the free ends of said fibers normally extending outwardly beyond the inner periphery of the panel aperture, whereby said fibers, upon engagement with the inner wall of the panel aperture, can be deflected inwardly to permit the outer end portion of said bushing to be pressed through the panel aperture and a portion of said fibers thereafter will return to their normally extended position and grip the front of the panel in the area surrounding the panel aperture to lock the device on the panel.

4,005,301
MICROWAVE HEAT TREATING FURNACE

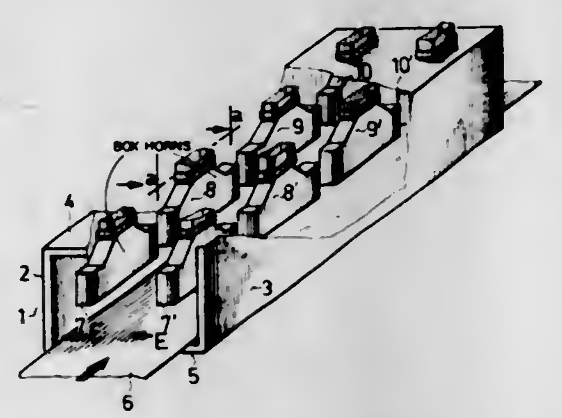
Leo Y. Thourel, Castanet, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed June 20, 1975, Ser. No. 588,723

Claims priority, application France, June 21, 1974, 74.21570

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 A **13 Claims**



1. Tunnel furnace for microwave frequency heating, comprising, a tunnel-shaped enclosure through which in operation articles to be treated are caused to move in longitudinal direction of the tunnel-shaped structure; paired coherent sources of microwave electromagnetic radiation coupled to develop in cross sections of the tunnel-shaped enclosure electromagnetic fields; a phase shifter connected to said sources and which is variable in time to vary the relative phase shift of said coherent sources cyclically to effect for all points of each cross section of said tunnel-like structure an average value of electromagnetic energy density constant over a cycle of variation of a phase shift.

4,005,302
INDUCTIVELY HEATED DRAWROLL

Felix Graf, Winterthur, and Armin Wirz, Dietlikon, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 24, 1974, Ser. No. 517,587

Claims priority, application Switzerland, Nov. 2, 1973, 15429/73

Int. Cl.² H05B *5/00, 3/02;* **D02J** *13/00*

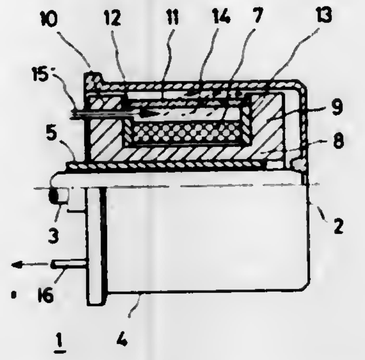
U.S. Cl. 219—10.61 **10 Claims**

1. A heatable drawroll for drawtwisting, draw-winding and spin-draw winding machines comprising

a rotatable jacket,

a stationary inductive heating means mounted inside said jacket for heating said jacket, said heating means including a coolable induction coil,

a sleeve of heat and electrically insulating material stationarily disposed inside said jacket in radially spaced relation to said jacket and said coil to circumferentially surround said coil and form an intermediate space therewith for receiving a coolant, and



means for supplying coolant to and removing coolant from said space.

4,005,303
EDM PARAMETER CONTROL SYSTEM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japan Research Inc., Yokohama, Japan

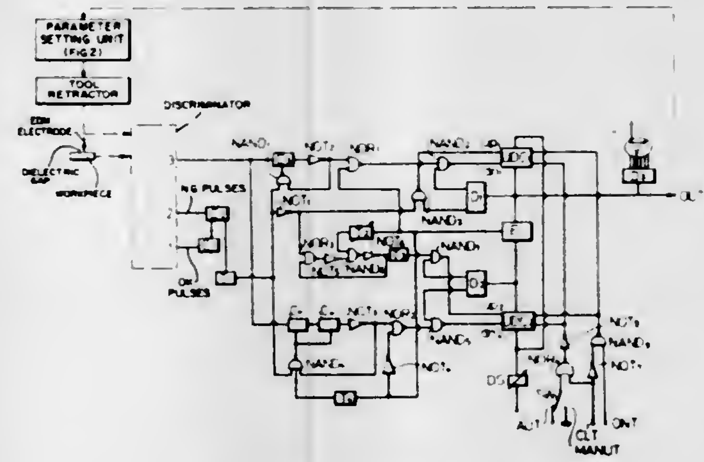
Division of Ser. No. 338,849, March 7, 1973, Pat. No. 3,875,374. This application Jan. 14, 1975, Ser. No. 540,970

Claims priority, application Japan, Mar. 7, 1972, 47-23334

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **20 Claims**



1. A system for controlling an EDM parameter in the operation of an EDM apparatus, comprising:

input circuit means having an input terminal connected in circuit with an electrical discharge machining gap formed between a tool electrode and a workpiece and adapted to respond to the state of electrical discharge machining performance in the gap for providing a first signal upon detection of the occurrence of a predetermined condition in the gap within a first time period and providing a second signal upon non-detection of such a condition in the gap throughout a second time period, and timing means for establishing said second period with a duration greater than that of said first period;

memory means connected to said input circuit means and adapted to receive said first and second signals and having a memory level arranged to be changed in accordance with the latest-received of these signals; and

setting means with an ordered set of positions arranged to establish respective values of said parameter corresponding to memory levels in said memory means and to be altered in respective directions in the ordered set in accordance with change in corresponding directions of the memory levels of said memory means; said circuit means including:

a first preset counter means with a input terminal connected in circuit with said machining gap adapted to count electric pulses effected therethrough with an unsatisfactory machining result selectively for issuing said first signal upon counting up a preset number of such pulses within said first period, the first counter means being arranged for resetting upon termination of said first period;

a second preset counter means with an input terminal connected in circuit with said machining gap and coupled to said first counter means and adapted to count electric pulses effected through the gap of a satisfactory machining result selectively and arranged for resetting upon counting up a preset number of such pulses to define said first period; and

a third preset counter means connected with a pulse source and arranged for resetting upon counting up a preset number of pulses to define said second period.

4,005,304
ELECTRICAL DISCHARGE MACHINING PROCESS WITH FLUID CONTAINING A CATIONIC ORGANIC SURFACTANT

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 30, 1975, Ser. No. 591,345

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 D **10 Claims**

1. In a process for electrical discharge machining which comprises passing a spark generated by pulsed application of an electrode at a relatively high voltage to a work piece through a spark gap flooded by a dielectric fluid wherein the process generates in said fluid a dispersion of negatively charged particles from metal droplets melted off the work piece and/or electrode wear fragments, the improvement which comprises at least partially coagulating said dispersed particles with an oil-soluble cationic organic surfactant addition to a dielectric fluid composition consisting essentially of a predominant portion of an inert base fluid selected from the group consisting of hydrocarbon, oxygenated hydrocarbon, silicone oils and mixtures thereof.

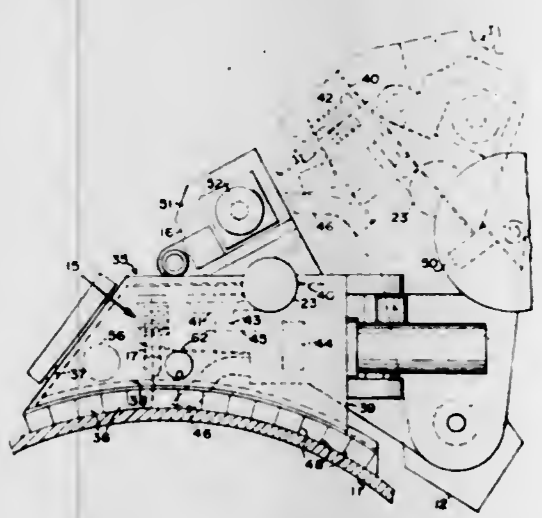
4,005,305
SHIELDING APPARATUS

Jerome W. Nelson; Ford S. Miller, and James B. Randolph, all of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

Filed June 11, 1974, Ser. No. 478,288

Int. Cl.² B23K *9/16*

U.S. Cl. 219—72 **5 Claims**



1. In apparatus for arc welding around a curved surface, such as the surface of a pipeline, which is subjected to external air currents that tend to interfere with the welding, and in which an arc-producing torch means is supported on a traveling carriage guided over said curved surface, and wherein the torch means is arranged to be moved selectively on the carriage from a working position adjacent the surface to a non-working position remote from said surface, the improvement which comprises a housing structure supported on said carriage separately from said torch means but normally surrounding the torch means in its working position and arranged to protect said torch means in said working position and during carriage travel from said air currents by maintaining substantially air current-exclusing contact with said surface regardless of the position of the torch means in either working or non-working positions, said housing having an access opening on its side remote from the said surface, and a closure plate for said opening associated with the welding torch means and arranged to close the access opening when the torch means is in working position and to open said access opening when the torch means is in non-working position.

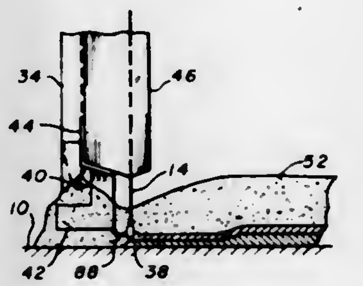
4,005,306
FLUX BREAKER FOR SUBMERGED ARC STRIP CLADDING OF METALLIC WORK PIECES

Clarence Winfred Overby, Rossville, Ga., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 17, 1975, Ser. No. 596,876

Int. Cl.² B23K *9/04*

U.S. Cl. 219—76 **3 Claims**



1. In combination with weld cladding apparatus for cladding a workpiece to be plated, a plating material strip mounted above said workpiece, and means for creating an electric arc between said workpiece and said strip to melt said strip and to deposit a plating layer on said workpiece to one side of said strip in a generally linear plating zone and wherein means are provided for submerging said arc welding zone in a layer of welding flux material, the improvement which comprises means disposed adjacent said electric arc on the other side of said plating strip for breaking up an accumulation of slag material which forms with continued use on said other side of said plating strip, said slag accumulation, if permitted to form, being capable of blocking the flux feed into the welding arc on said other side of said electrode strip.

4,005,307
METHOD AND APPARATUS FOR JUDGING QUALITY OF SPOT WELD

Yukio Tamura; Yoshikazu Tanaka; Satoshi Kurolwa, and Mikiji Suzuki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 3, 1975, Ser. No. 583,252

Claims priority, application Japan, Sept. 17, 1974, 49-106895

Int. Cl.² B23K *11/24*

U.S. Cl. 219—109 **5 Claims**

1. In a method of resistance spot welding by passing current between two confronting electrodes, one movable and one fixed, which squeeze therebetween workpieces to be welded to a product, the improvement wherein said method further comprises the steps of:

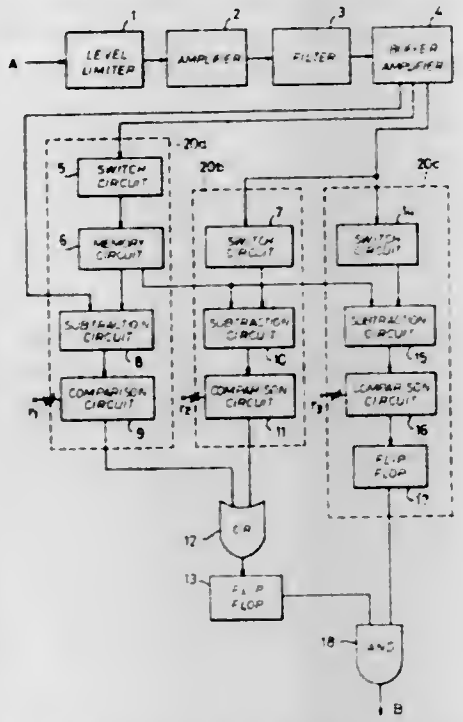
sensing the maximum displacement (M) between the two electrodes during flow of the current;

sensing the rate of displacement with time (R) in an initial stage of flow of the current during welding; and

rejecting the weld only if both of the following conditions occur -

i. the maximum displacement (M) is less than a reference value for maximum displacement (M_L) pre-established for the product as being the minimum displacement necessary to achieve a lower limit (S_L) of strength required, and

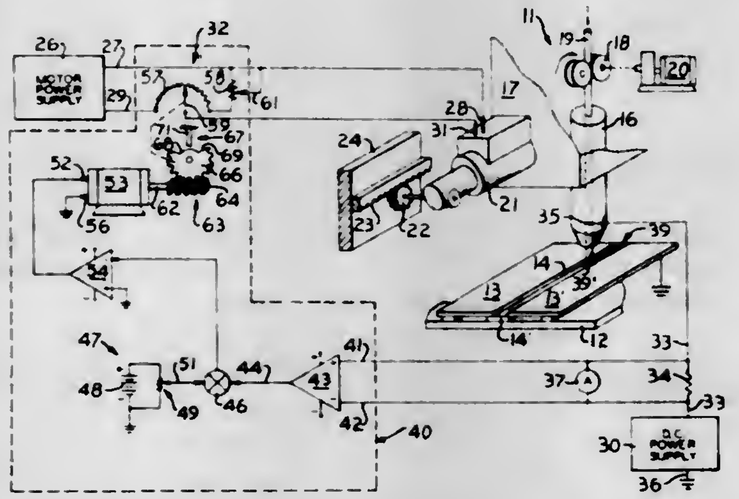
ii. the sensed rate of displacement (R) is less than a reference value for rate of displacement (R_L) pre-established for the product as being between a first rate value (R_L) which is the minimum rate necessary to achieve the lower limit (S_L) of strength required and a second rate value (R_E) which corresponds to a maximum weld strength (S_E) to obtain which some splash will necessarily occur.



4,005,308

WELD FILL HEIGHT REGULATING SYSTEM FOR ARC WELDING APPARATUS

Elwood Chaney, Peoria, and John W. Crayton, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 23, 1974, Ser. No. 536,049
Int. Cl.^{2} B23K *9/12*
U.S. Cl. 219—125 R **4 Claims**



1. In an electrical arc welding apparatus, the combination comprising:

a welding head having means for supporting consumable welding material in spaced apart relationship to a juncture between workpieces which are to be joined,

an electrical travel motor coupled to said welding head for producing relative motion between said welding head and said workpieces in a direction parallel to said juncture,

a travel motor power supply,

a travel rate control means for said travel motor including a variable resistance having a first resistive element connected between said travel motor and said travel motor power supply and having a first movable contact which may be adjusted to vary the voltage applied to said travel motor from said travel motor power supply to vary the speed of said relative movement,

a welding current power supply for creating an electrical arc between said welding material and said workpieces to cause welding material to be melted and deposited along said juncture,

a first signal source coupled to the current path between said welding current power supply and said welding material and said workpieces and having means for producing a first signal which has a magnitude varying in accordance with variations of current flow in said path,

a reference signal source having means for producing a reference signal of predetermined selectable magnitude and of opposite polarity from said first signal,

a summing junction coupled to said first signal source and to said reference signal source for producing a summation signal having a magnitude and polarity equal to the algebraic sum of said first signal and said reference signal,

servomeans coupled between said summing junction and said travel rate control element for increasing the speed of said travel motor in response to summation signals of a first polarity and for decreasing the speed of said travel motor in response to summation signals of opposite polarity, said servomeans including a servomotor coupled to said first movable contact of said variable resistance and responsive to said summation signals from said summing junction to increase the voltage applied to said travel motor in response to summation signals of a first polarity and to decrease the voltage applied to said travel motor in response to summation signals of opposite polarity, and

minimum travel rate establishing means coupled to said travel rate control for maintaining said speed of said travel motor at least equal to a predetermined minimum value irrespective of the action of said servomeans.

4,005,309

FABRICATED WELDING WIRE FOR CORROSIVE-RESISTANT STAINLESS

Albert J. Zvanut, Whittier, Calif., and Masahiro Nakabayashi, Ashtabula, Ohio, assignors to Stoody Company, Industry, Calif.
Continuation of Ser. No. 402,440, Oct. 1, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,849
Int. Cl.^{2} B23K *35/22*
U.S. Cl. 219—146 7 Claims

1. An arc-welding electrode comprising:

an elongated metallic sheath defining an internal space;

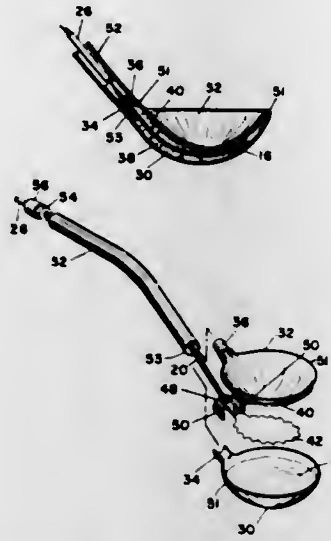
particulate material in said space of said sheath;

said sheath and said material in composite along the length of said sheath consisting essentially of a major percentage of iron, between about 9.0 and 14.0 percent by weight of chromium, from about 0.01 to about 0.08 percent by weight of carbon, an effective amount of deoxidizer material, up to 0.03 percent by weight each of sulfur and phosphorous, and further including titanium in the form of ferrotitanium having less than 80 percent by weight of titanium but an amount at least six times the percentage by weight of said carbon in said composite and not in excess of 3% by weight of said electrode, a major portion of said ferrotitanium being reduced to a size not larger than 40 mesh.

4,005,310

ELECTRICALLY HEATED GRAVY WARMING LADLE

Thelma E. Baisch, P.O. Box 615, Whittier, Calif. 90608
Division of Ser. No. 426,820, Dec. 20, 1973, Pat. No. 3,886,345. This application Mar. 7, 1975, Ser. No. 556,563
Int. Cl.^{2} H05B *1/00;* A47J *43/28;* H05B *3/80*
U.S. Cl. 219—227 **3 Claims**



1. A ladle, comprising:

a bowl formed by

a pair of concavo-convex shell-like upper and lower parts, with the upper part received within the lower part, the bottoms of said parts being spaced from each other and shaped to form a hollow cavity therebetween that tapers from a maximum size at the center to a minimum size at the edges, said edges being united in a relatively thin free edge;

a handle secured to said bowl for manipulation thereof, said handle being inclined upwardly from said bowl;

an electric heating element in the space between said upper and lower shell-like parts of the bowl;

heat storing insulation for the heating element between said upper and lower shell-like parts and filling the space between said parts;

means for connecting the electric heating element to a source of electricity;

the heat storing insulation comprising electrical insulating material;

said electrical insulating material being asbestos;

each of the parts of the bowl having a projection semi-cylindrical in cross section, said projections fitting together to form a neck extending from the bowl and wherein the handle is tubular with the end adjacent the bowl receiving said neck and being secured thereto.

4,005,311

DIAGNOSTIC X-RAY SYSTEMS

Robert S. Ledley, Silver Spring, Md., assignor to Georgetown University, Washington, D.C.
Continuation-in-part of Ser. No. 443,042, Feb. 15, 1974, Pat. No. 3,922,552. This application Nov. 4, 1975, Ser. No. 628,708
Int. Cl.^{2} G01N *21/34*
U.S. Cl. 250—445 T **18 Claims**

1. An improved diagnostic medical machine utilizing beams of radiation of small cross-sectional diameter for the purpose of mapping cross-sections of a patient's body in combination with a computer, comprising,

a table for supporting a patient in a generally horizontal position,

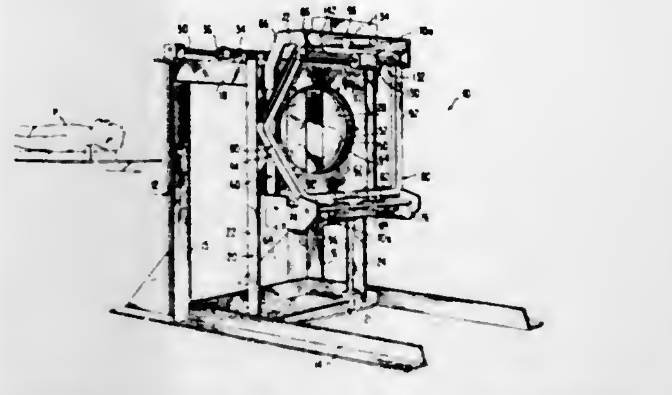
a generally vertical first frame having an opening therethrough of a size sufficiently large to permit the patient and said table to move therethrough,

a carrier frame rotatably mounted on said first frame and having a second opening generally coextensive with said first opening,

a narrow beam from a radiation source,

a collector to receive said beam of radiation,

first means mounting said source and collector to said carrier frame for translational movement with respect to said carrier and to carry said beam of radiation across said patient's body,



second means for rotating said carrier about said patient's body,

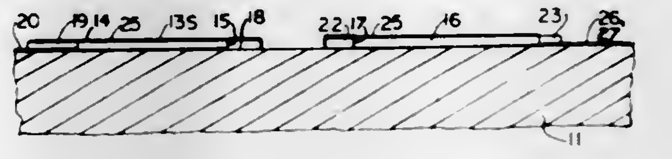
a shutter means disposed between said source and the patient's body and interrupting said beam, and

means to move said shutter from the path of said beam just prior to its approach to said patient's body as it is carried by said first means.

4,005,312

ELECTRO-OPTICAL CIRCUITS AND MANUFACTURING TECHNIQUES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 413,983, Nov. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 849,115, Aug. 11, 1969, abandoned, and a continuation-in-part of Ser. No. 422,875, Nov. 25, 1964, Pat. No. 3,461,347, which is a continuation-in-part of Ser. No. 425,618, Dec. 17, 1973, abandoned, and a continuation-in-part of Ser. No. 115,208, Feb. 16, 1971, Pat. No. 3,801,366. This application Mar. 6, 1975, Ser. No. 555,794
Int. Cl.^{2} G02B *27/00*
U.S. Cl. 250—551 **10 Claims**



1. A method of producing an electro-optical circuit comprising:

fabricating a composite article of a laminate of a substrate and a layer of light transmitting material by bonding said layer of light transmitting material to a selected portion of the surface of said substrate wherein said light transmitting material defines a flat strip-like light pipe capable of conducting light along its length,

securing an electrically activated light emitting means to said composite article in optical coupling relationship with an end of said flat strip-like light pipe of light transmitting material,

connecting said light emitting means to a source electrical signals defining information being processed,

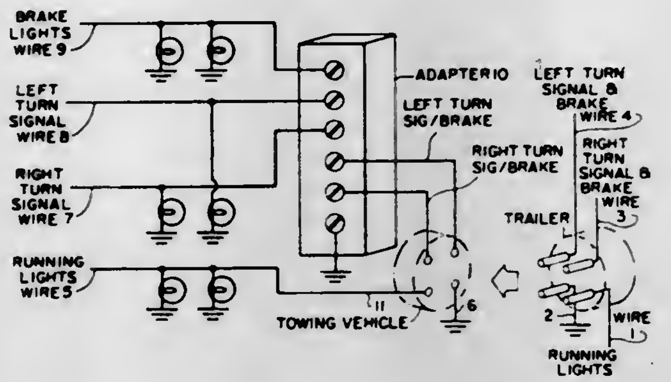
providing a photosensitive electro-optical transducing means in optical coupling relationship with said light pipe and securing said photosensitive transducing means to said composite article, and

securing electrical interconnecting means between said photosensitive means and an output circuit for utilizing and processing the signals generated by said photosensitive transducing means.

4,005,313
AUTOMOTIVE TRAILER LIGHT ADAPTER

Richard Paul Tibbits, Rochester, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 14, 1975, Ser. No. 577,431
Int. Cl.² B60D *1/08*
U.S. Cl. 307—10 R **4 Claims**



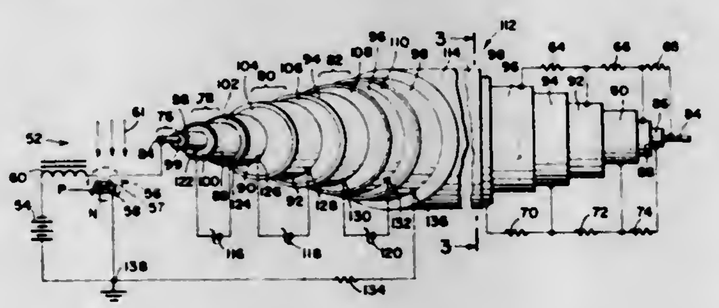
1. An automotive trailer light adapter for adapting an automotive trailer having a four wire tail light configuration having a running lights wire, a trailer ground wire, a combination right turn signal and brake wire and a combination left turn signal and brake wire to a towing vehicle having a five wire tail light configuration having a running lights wire, a chassis ground wire, a right turn signal wire, a left turn signal wire and a brake lights wire, said adapter comprising

- a lead for connecting a running lights wire of a towing vehicle to a running lights wire of a trailer;
- a ground lead for connecting a chassis ground wire of the vehicle to a trailer ground wire of the trailer; and
- relay means connecting a right turn signal wire of the vehicle, a left turn signal wire of the vehicle and a brake lights wire of the vehicle to a combination right turn signal and brake wire of the trailer and a combination left turn signal and brake wire of the trailer, said relay means comprising four relay energizing windings each having one end connected to the ground lead, the other end of one of the windings being connected to the right turn signal wire, the other end of another of the windings being connected to the left turn signal wire, and four pairs of double pole double throw relay contacts each pair being controlled in operation by a corresponding one of the windings.

4,005,314
SHORT PULSE GENERATOR

Mortimer H. Zinn, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,255
Int. Cl.² H02M *3/18*
U.S. Cl. 307—110 **14 Claims**



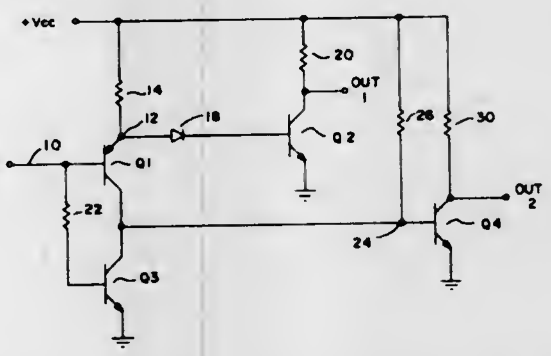
1. A device for obtaining a relatively high voltage output pulse adapted to be coupled to an electrical switching means and a source of charging voltage, said device comprising:

- a. a plurality of co-axially disposed electrically conductive tubular elements, a plurality of separate co-axially disposed insulating layers radially spacing and insulating said conductive elements, adjacent pairs of said conductive elements having respective said insulating layers disposed therebetween extending axially and forming a plurality of capacitors;
- b. first means for providing a current path for charging said capacitors in parallel; and
- c. second means for providing a current path for serially discharging said capacitors into a load.

4,005,315
TRIPLE STATE TO BINARY CONVERTER

Robert A. Blauschild, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sept. 22, 1975, Ser. No. 615,476
Int. Cl.² H03K *19/28, 19/08*
U.S. Cl. 307—209 **8 Claims**



1. A triple state to binary converter having a one line ternary input and providing a two line binary output from a single polarity voltage supply, said output having four possible binary states and providing two of such states in response to a low or high input and a third of such states in response to an open or floating condition of said input, said converter comprising: a pair of output transistors connected to operate exclusively from a single fixed polarity voltage supply for providing said two line binary output; and logic level means connected to said supply for sensing said low, high and floating input conditions, and distinguishing between such conditions to drive said transistor pair to provide a unique one of said three states for each of said input conditions.

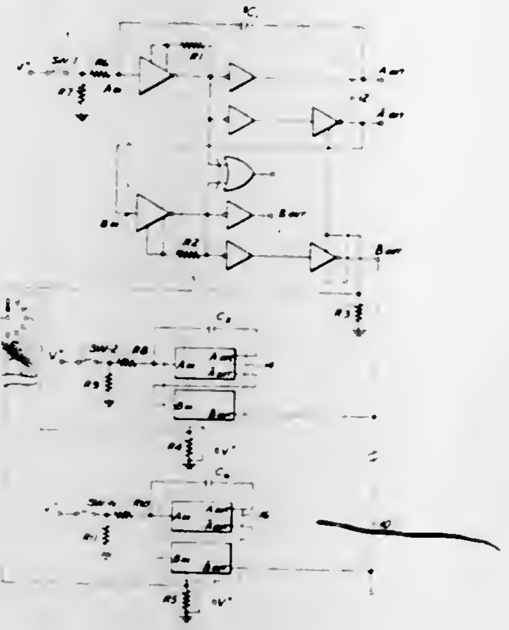
4,005,316
SWITCHING TRANSIENT SUPPRESSION CIRCUIT

John H. Tomlinson, Bridgeport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,974
Int. Cl.² H03K *5/01;* **H01H** *33/58, 7/00*
U.S. Cl. 307—247 A **9 Claims**

1. A circuit responsive to the change in state of a switch for suppressing spurious electrical pulses associated with switch contact opening and closing comprising:

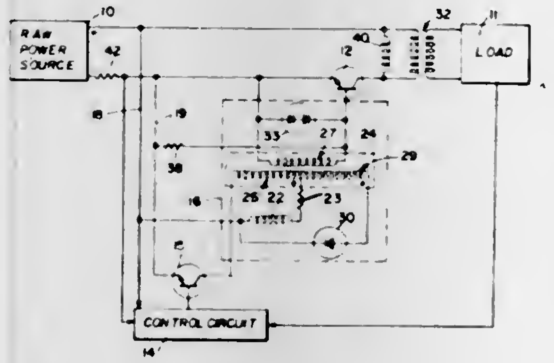
- trigger circuit means, said trigger circuit means including a pair of series connected Schmitt trigger circuits, said trigger circuits each having an input terminal and a pair of output terminals, a first output of each of said trigger circuits having the capability of assuming either of two logic states or a high resistance state, said trigger circuit means having an output disable input which may be employed to cause the first outputs of the trigger circuits to assume the high resistance state;
- means for delivering a signal commensurate with the state of a switch to the input terminal of the first of said series connected trigger circuits of said trigger circuit means;
- means for connecting the first output terminal of the second of said series connected trigger circuits of said trigger circuit means to a logic output bus;
- means for clamping the second output terminal of the first of said trigger circuits of said trigger circuit means to said input terminal of said first of said trigger circuits; and
- means for generating and selectively applying a signal to said trigger circuit means output disable input whereby said trigger circuit means will apply to the logic output bus either a logic signal commensurate with the signal delivered to the input terminal of the first of said series connected trigger circuits or will present a high resistance to the logic output bus.



4,005,317
SWITCHING CIRCUITRY

Karl Hinrichs, Downey, Calif., assignor to Dressen-Barnes Electronics Corporation, Pasadena, Calif.

Filed May 27, 1975, Ser. No. 580,587
Int. Cl.² H03K *17/60, 17/04*
U.S. Cl. 307—253 **7 Claims**



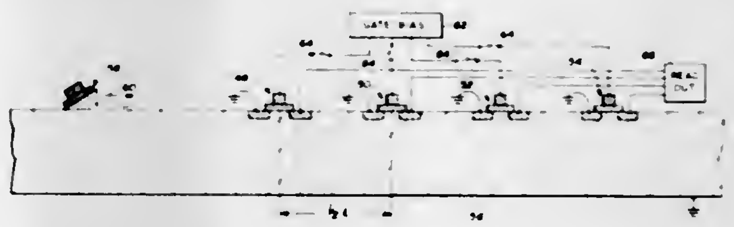
1. Switching circuitry comprising:

- a control switch;
- a drive circuit comprising a charge circuit and a discharge circuit;
- a drive inductor;
- a drive transformer;
- said drive transformer having a charge primary winding, a discharge primary winding, and a secondary winding;
- said charge circuit comprising said secondary winding and a series circuit of said drive inductor, said control switch, and said charge primary winding;
- whereby when said control switch assumes its ON state, a charge current in said charge circuit charges said drive inductor, and produces an enabling signal in said secondary winding;
- a power switch adapted to permit the flow of an electric current therethrough;
- means for applying said enabling signal to said power switch, for causing said power switch to quickly and positively assume its ON state and for permitting the flow of a load current;
- said discharge circuit comprising said secondary winding and a series circuit of said drive inductor and said discharge primary winding;
- whereby, when said control switch assumes its OFF state, the energy of said charged drive inductor directly produces a discharge current, and said discharge current in said discharge circuit produces a disabling signal in said secondary winding;
- means for applying said disabling signal to said power switch for causing said power switch to quickly and positively assume its OFF state, and for terminating the flow of the load current.

4,005,318
ELASTIC WAVE DETECTOR

Lewis T. Claiborne, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 856,953, Sept. 11, 1969, abandoned. This application Nov. 4, 1971, Ser. No. 195,726
Int. Cl.² H01L *27/20, 29/78*
U.S. Cl. 307—304 **3 Claims**



1. A multicode correlator comprising:

- a. a piezoresistive semiconductor substrate;
- b. means on the surface of said substrate for generating an acoustic surface wave defining a plurality of sequential components respectively corresponding to portions of a preselected coded input signal;
- c. a plurality of arrays of spaced-apart field-effect transistors defined in the surface of said substrate, each array extending radially along the surface of said substrate away from said surface wave generating means;
- d. means for selectively biasing transitors in each of said arrays to produce a preselected pattern of charge inversion layers, the pattern in each array corresponding to a preselected coded word, the minority carrier mobility in said inverted layers detectably variable responsive to an acoustic surface wave; and
- e. output means connected to each of said arrays and operably responsive to variations in minority carrier mobility, such that responsive to a coded input signal corresponding to the pattern defined by selectively biasing transistors in one of said arrays, an output signal is generated by that array when said coded surface wave propagates to a position where each of said plurality of components corresponds to a change inversion layer in said pattern.

4,005,319
PIEZOELECTRIC GENERATOR OPERATED BY FLUID FLOW

Jan Nilsson, Ronninge, and Rune Swänson, Ljungsbro, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

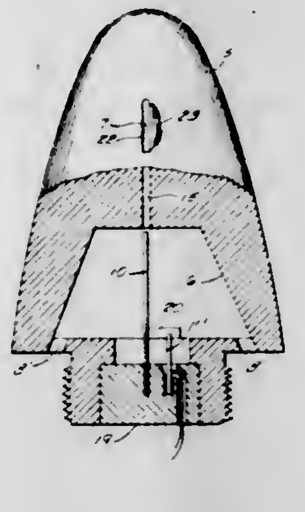
Continuation-in-part of Ser. No. 353,323, April 23, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,422
Int. Cl.² H01L *41/04*
U.S. Cl. 310—8.3 **5 Claims**

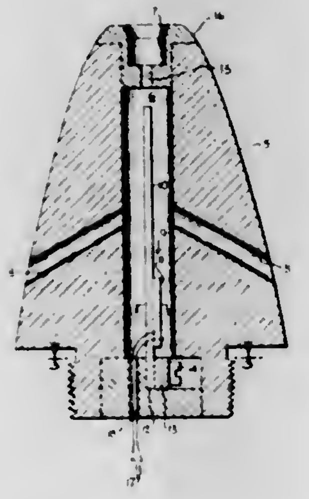
5. An electrical generator that can serve as a power source for electrical apparatus and which is of the type comprising a

piezoelectric element and excitation means for imposing oscillatory mechanical stresses upon the piezoelectric element to transfer energy to it from fluid under pressure at a source thereof such as an inlet for ambient fluid in a moving body that carries said element, said excitation means comprising:

A. an elongated, resiliently flexible tongue that has one end which is substantially fixed and has its other end free, said tongue
  1. having a major width dimension and a smaller minor width dimension extending in directions transverse to its width dimension so that its free end is capable of flexing oscillation in said directions, and
  2. when relaxed, being straight along a substantial portion of its length from its free end;

B. nozzle means communicating with said source of fluid under pressure and having an outlet from which fluid from said source can flow in a stream, said nozzle means





  1. having its outlet near the free end of said tongue and its inlet remote from the tongue,
  2. having its outlet end portion straight and smooth so that the stream of fluid issuing therefrom towards the free end of the tongue tends to be steady, and
  3. having its outlet axis lengthwise aligned with the central plane of said minor width of the tongue when the tongue is relaxed so that such stream, in flowing along the tongue, imparts vigorous oscillation to the tongue in said directions; and

C. means providing a force transmitting connection between said peizoelectric element and said tongue, near said one end of the tongue, by which oscillatory flexing of the tongue in said directions imposes oscillatory mechanical stresses upon the piezoelectric element.

4,005,320
BATTERY-POWERED ELECTRIC MOTOR ASSEMBLY

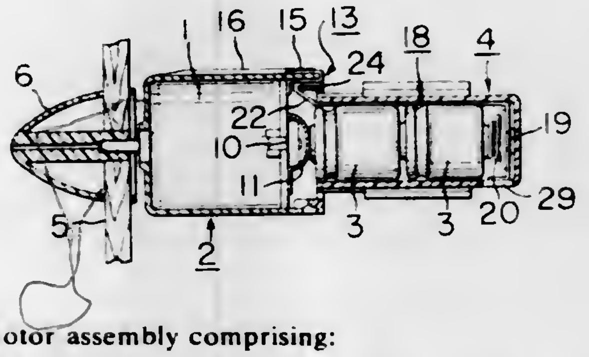
Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed July 26, 1974, Ser. No. 492,027

Claims priority, application Japan, July 31, 1973, 48-86200; July 31, 1973, 48-90613[U]; July 31, 1973, 48-90616[U]; July 31, 1973, 48-90617[U]

Int. Cl.^{2} H02K *11/00*

U.S. Cl. 310—40 MM **17 Claims**



1. A motor assembly comprising:
- a electric motor;
- a generally tubular motor casing to fixedly retain the motor therein, said motor casing having ridges formed on a surface thereof and a groove positioned between the ridges;
- a generally tubular battery casing adapted to fixedly retain a battery therein, the motor and battery casing being axially aligned and rotatably connected at their ends so that an end of battery casing is slidably disposed inside an end of the motor casing, said battery casing having an enlarged diameter portion at the end thereof engaging with the motor casing and a groove formed on the surface of the enlarged diameter portion;
- a battery contact connected to one terminal of the motor and adapted to contact one terminal of the battery;
- a first electrical contact having a tongue portion and a U-shaped member, said first electrical contact being connected by said tongue portion to the other terminal of the motor, carried by the motor casing at substantially the inner periphery of the end thereof engaging with the battery casing, and inserted by said U-shaped member in said groove between the ridges on the motor case; and
- a second electrical contact adapted to contact the other terminal of the battery, carried by the battery casing at substantially the outer periphery of the end thereof engaging with the motor casing, and held at said groove formed on the battery casing so that the first and second contacts ohmically engage to complete an electrical circuit between the battery and the motor at an expected position when the battery casing rotates relative to the motor casing.

4,005,321
QUARTZ CRYSTAL VIBRATOR MOUNTING

Shin Shibata, Suwa, and Kikuo Oguchi, Shimosuwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

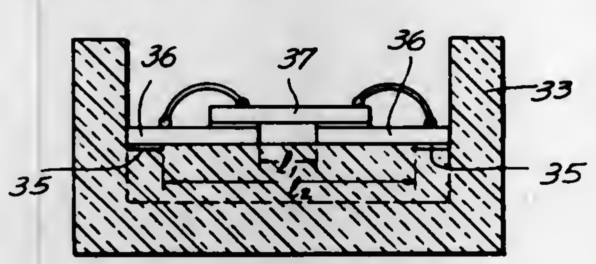
Filed Dec. 27, 1974, Ser. No. 537,028

Claims priority, application Japan, Dec. 27, 1973, 49-979

Int. Cl.^{2} H01L *41/08*

U.S. Cl. 310—9.1 **12 Claims**

1. A mounting fo- supporting a flexural mode quartz crystal vibrator having two opposed surfaces with two electrodes disposed on at least one of the opposed surfaces comprising a non-conductive member having first and second conductive surfaces, spaced apart by an interval l_2, the non-conductive member having a lesser thermal coefficient of expansion than the quartz crystal vibrator, and a conductive plate secured to said first conductive surface of said quartz crystal vibrator for physically and electrically coupling said first electrode to said first conductive surface, said conductive plate having a thermal coefficient of expansion less than the non-conductive member, and conductive means constructed and arranged to secure, rigidly fix and electrically couple said second spaced apart conductive surface to said second electrode, said conductive means being spaced apart from said first conductive plate by an interval l_1, wherein the ratio of l_1 to l_2 is less than one and is substantially equal to the ratio of the differences between the respective thermal coefficients of expansion of the non-conductive member and the conductive plate to the difference between the respective thermal coefficients of expansion of the quartz crystal vibrator and the conductive plate.



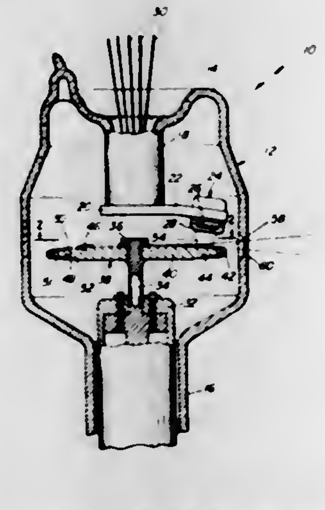
4,005,322
ROTATING ANODE TARGET STRUCTURE

Thomas J. Koller, Huntington, Conn., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,832

Int. Cl.^{2} H01J *35/08*

U.S. Cl. 313—60 **9 Claims**



1. An X-ray target of the rotating anode type comprising:
- a disc having an annular marginal portion disposed adjacent an outer peripheral edge and provided with opposed bevel surfaces convergent toward the edge; and
- a focal track layer of X-ray emissive material disposed annularly on one of the bevel surfaces and extended around the peripheral edge to terminate on the other bevel surface in a feather edge.

4,005,323
MICROCHANNEL PLATES IN GLASS MOUNTINGS

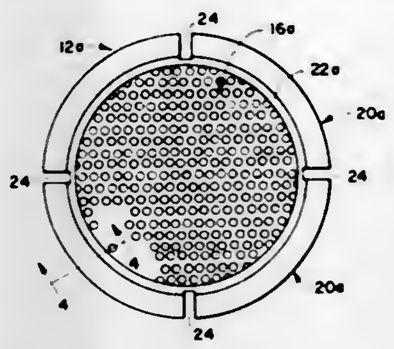
Colin K. Yates, and Eugene C. Jastrzebski, both of Dudley, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 15, 1971, Ser. No. 203,098

Int. Cl.^{2} H01J *43/04*

U.S. Cl. 313—105 CM **5 Claims**

1. A glass microchannel plate comprising:
- a multichannelled structure of electrically semi-conductive glass;
- a rim of glass surrounding said multichannelled structure;
- a substantial thickness of solder glass interconnecting said multichannelled structure and said rim; and



- said rim having at least one slot extending completely therethrough.

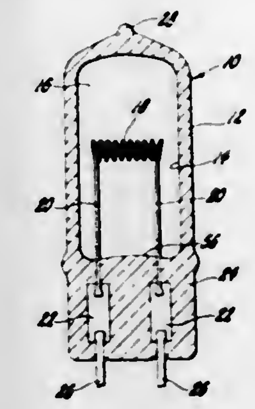
4,005,324
TUNGSTEN-FLUORINE LAMP WITH NATIVE RETAINED OXYGEN THEREIN AND METHOD OF MANUFACTURE

Arthur Dolenga, Sterling Heights, and John C. Hill, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1976, Ser. No. 667,616

Int. Cl.^{2} H01J *9/395*; **H01K** *1/50*

U.S. Cl. 313—222 **2 Claims**



1. A tungsten halogen lamp comprising a glass bulb having walls defining a sealed cavity, a tungsten filament within said bulb having spaced apart legs, a filament support means on one end of said bulb including metallic current leads and metallic foil means for connecting said metallic current leads to the legs of said tungsten filament, a fill gas mixture in said cavity including an inert gas and a gaseous fluorinated hydrocarbon consisting only of carbon, fluorine and bromine and having a composition of 3.2×10^{-7} to 8×10^{-7} gram atoms of carbon, 2.1×10^{-6} to 5.2×10^{-6} gram atoms of bromine and 1.5×10^{-6} to 3.8×10^{-6} gram atoms of fluorine per cc of cavity volume, said bulb walls, tungsten filament and filament support means having native retained oxygen thereon releasable upon bulb operation to add a further fill gas constituent of free oxygen in the range of 1.3×10^{-6} to 3.3×10^{-6} gram atoms per cubic centimeter of cavity volume to balance the gram atom constituent of the fill gas in the form of free fluorine released during bulb operation.

4,005,325
CARBON ELECTRODE FOR EMITTING LIGHT SIMILAR TO SUNSHINE FOR LIGHT-FASTNESS TESTING

Shigeru Suga, Yoyogi 5-20:2, Shibuya, Tokyo, Japan

Filed July 22, 1975, Ser. No. 598,076

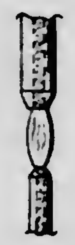
Int. Cl.^{2} H01J *1/02, 1/14, 1/38, 1/48*

U.S. Cl. 313—352 **3 Claims**

1. A carbon electrode assembly for a carbon arc lamp used for simulating sunlight in light-fastness and weathering testors, said assembly comprising:
- a first elongated upper electrode element fitted at one end into said arc lamp;

an elongated second lower electrode element fitted at one end into said arc lamp, the free end thereof being opposite the free end of said first electrode and spaced therefrom;

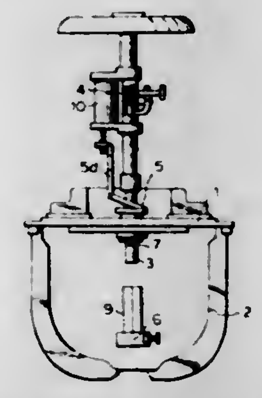
one of said first and second electrodes being smaller in diameter than the other electrode; and



said upper and lower electrodes each being comprised of a homogeneous mixture of carbon and an incandescent material, said incandescent material being present in an amount from 6 to 12 percent by weight of the total weight of the carbon and incandescent material, and a copper metal coating surrounding the outside of said electrodes other than at the end thereof which is spaced from and opposite the other electrode.

4,005,326
ELECTRODE MOUNTING IN AN ARC LAMP FOR USE IN LIGHT FASTNESS TESTERS

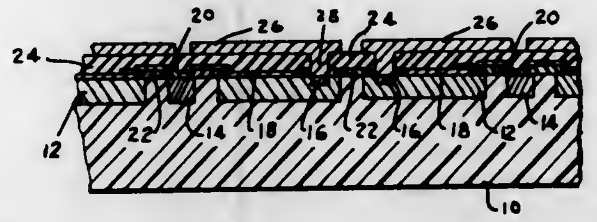
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan
Filed Oct. 31, 1975, Ser. No. 627,879
Int. Cl.² H01J *1/00, 17/04, 19/00*
U.S. Cl. 313—357 **3 Claims**



1. In an arc lamp for use in light fastness testers and the like and having an upper plate and a globe detachably mounted on the lower side thereof, a lower electrode holder in said globe and depending from said plate, and an upper electrode holder above said plate having a recess for receiving the end of a cylindrical electrode therein, the improvement comprising a ring clutch between the upper electrode holder and the plate through which the upper electrode is intended to pass, a control means connected to said ring clutch for actuating said ring clutch to engage the electrode extending therethrough for moving the electrode up and down, a cylindrical metal rod having the same diameter as an electrode and extending into the recess in the upper electrode holder and extending through the ring clutch and through said upper plate into the space within said globe and opposed to said lower electrode holder, and a cylindrical carbon electrode on the lower end of said metal rod, and threaded connecting means threadedly connecting said metal rod and said electrode.

4,005,327
LOW BEAM VELOCITY RETINA FOR SCHOTTKY INFRARED VIDICONS

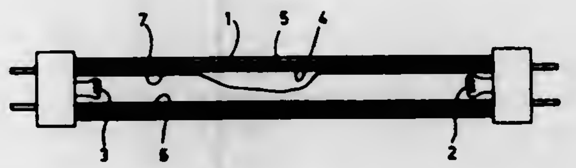
Sven A. Roosild, Framingham; Freeman D. Shepherd, Jr., Chelmsford, and Andrew C. Yang, Concord, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 28, 1975, Ser. No. 625,799
Int. Cl.² H01J *29/45, 31/49*
U.S. Cl. 313—367 **6 Claims**



1. A solid state retina sensing layer for infrared vidicon tubes comprising a base having one conductivity type; a plurality of cells of a second conductivity type, arranged in a two dimensional array and forming junctions with said base, a contact formed near the surface of said cell; infrared photoemitter means affixed to at least one surface of each cell; a plurality of contact means in said base located between said cells; buss means for connecting the photoemitter means with the base contact means; a dielectric coating covering the surface of the base receiving the electron beam, a metal electrode for each cell positioned on the surface of said dielectric coating and extending through the coating to the contact of said cell whereby electrons reaching the electrode will place a charge on the cell, and a resistance means connecting the base to ground potential where the amount of charge lost by the cell due to infrared radiation may be measured.

4,005,328
MERCURY VAPOR DISCHARGE LAMP FOR USE IN COLOR COPYING BY MEANS OF ELECTROPHOTOGRAPHIC PROCESSES

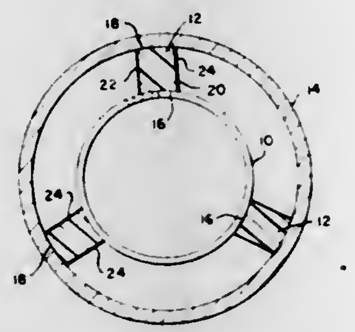
Dragutin Radielović, and Cornelis Machiel Verheij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 26, 1974, Ser. No. 527,241
Claims priority, application Netherlands, Dec. 3, 1973, 7316494
Int. Cl.² C09K *11/12, 11/16, 11/30;* **H01J** *61/44*
U.S. Cl. 313—487 **5 Claims**



1. A mercury vapor discharge lamp particularly useful for color copying by electrophotographic processes, said lamp comprising: a sealed radiation-transmitting envelope having discharge electrodes disposed at approximately the ends thereof and containing a small amount of mercury and inert ionizable gas, said envelope being coated on the interior surface thereof with a luminescent layer emitting in bands in the blue, green and red regions of the spectrum, said luminescent layer consisting essentially of two phosphors, the first of said phosphors emitting in bands both in the blue and in the green regions of the spectrum, the blue band having a maximum between 410 and 470 nm and a half-value width of less than 100 nm and the green band having a maximum of between 485 and 550 nm and a half value width of less than 100 nm and being a divalent europium and divalent manganese activated aluminate of barium, strontium or mixtures thereof and having a hexagonal crystal structure similar to that of the hexagonal ferrites and the second of said phosphors containing trivalent europium as an activator and emitting in a band in the red part of the spectrum, said red band having a maximum of between 600 and 650 nm and a half-value width of less than 10 nm.

4,005,329
SLOW-WAVE STRUCTURE ATTENUATION ARRANGEMENT WITH REDUCED FREQUENCY SENSITIVITY

Arthur E. Manoly, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 22, 1975, Ser. No. 643,048
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 **3 Claims**



1. A slow-wave structure arrangement comprising:

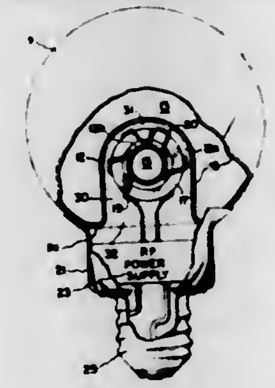
a helical slow-wave structure;

a plurality of dielectric rods disposed about the peripheral surface of said slow-wave structure and extending parallel to the axis of said slow-wave structure, each of said rods having a substantially rectangular cross-section and defining first and second opposing lateral surfaces disposed substantially circumferentially with respect to said slow-wave structure and third and fourth opposing lateral surfaces disposed substantially radially with respect to said slow-wave structure; and

at least one of said rods having a coating of attenuating material disposed on a portion of said third and fourth surfaces, with said first and second surfaces being free from attenuating material.

4,005,330
ELECTRODELESS FLUORESCENT LAMP

Homer H. Glascock, Jr., and John M. Anderson, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 542,375, Jan. 20, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 642,056
Int. Cl.² H05B *41/24*
U.S. Cl. 315—57 **29 Claims**



1. A fluorescent lamp structure comprising:

an evacuable, light-transmissive, substantially globular envelope having a reentrant channel therein;

a gaseous medium within said envelope adapted to sustain an electric discharge due to an electric field induced therein, said ionizable medium emitting radiation at a first wavelength when sustaining said discharge;

means for inducing said electric field in said gaseous medium including,

a closed loop magnetic core having a central opening and being at least partially contained within said channel whereby said core links said gaseous medium; and

a luminescent phosphor dispossed on the interior of said envelope and adapted to emit visible light when excited by said first wavelength radiation.

21. A fluorescent lamp base structure comprising:

a substantially rectangular member defining a cavity having approximately square front and back surfaces, said front and back surfaces each having a centrally-located perforation, the bottom surface of said cavity having a substantially rectangular perforation adapted to allow access to the interior of said cavity;

a tubular dielectric member, having sectional dimensions approximately equal to the dimensions of said perforations, extending between said front surface and said back surface and sealed thereto at the edges of said perforations; and

a closed loop magnetic core disposed on said tubular member and contained within said cavity.

27. A method of making a fluorescent lamp comprising:

preforming a glass capsule having a perforated bottom portion with a flare extending therefrom;

wrapping at least one conductive winding on a closed loop magnetic core;

inserting a tubular glass member through a central opening in said magnetic ore, the length of said tubular member being approximately equal to the width of said capsule;

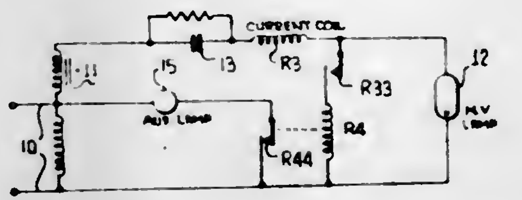
aligning said tubular glass member and core within said capsule so that said tubular member is parallel to the width dimension of said capsule;

perforating said capsule at the ends of said tubular member; and

fusing the walls of said capsule to the ends of said tubular member.

4,005,331
HIGH INTENSITY DISCHARGE LAMP WITH AUXILIARY LIGHT

Victor Horowitz, Oceanside, N.Y., assignor to Current Industries, Inc., Oceanside, N.Y.
Continuation-in-part of Ser. No. 371,503, June 19, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,064
Int. Cl.² H05B *41/46*
U.S. Cl. 315—92 **3 Claims**



1. A lighting system comprising, in combination, a high intensity discharge lamp, a first means to provide power to said high intensity discharge lamp, ballast means connected between said discharge lamp and said first power means, an auxiliary lamp, a second means to provide power to said auxiliary lamp, said second power means being electrically isolated from said first power means, and control means automatically responsive to hot and cold starting conditions for turning on said auxiliary lamp during and only during both hot and cold starts; said control means comprising first and second switching means; said first switching means comprising a first relay having a first coil and normally open pair of first contacts, said coil being connected in series with said discharge lamp and said ballast, said pair of contacts having a closed state when

the current through said discharge lamp is greater than a first predetermined value and an open state when said current is less than said first predetermined value; said second switching means connected in series with said auxiliary lamp and said second power means; said second switching means being in a normally closed state and including additional means responsive to said first switching means to open said second switching means to place it into its open state; said auxiliary lamp being lit solely when said second switching means is in said closed state; said additional means being disabled by said open state of said relay contacts and enabled by said closed state of said relay contacts; when enabled by said relay contacts, said additional means being responsively coupled to the voltage across said high intensity discharge lamp and said second switching means having said closed state when said voltage is less than a second predetermined value and having said open state when said voltage is greater than said second predetermined value; when disabled by said relay contacts, said additional means being electrically decoupled from said high intensity discharge lamp, said second switching means being in said closed state when said additional means is so decoupled.

4,005,332

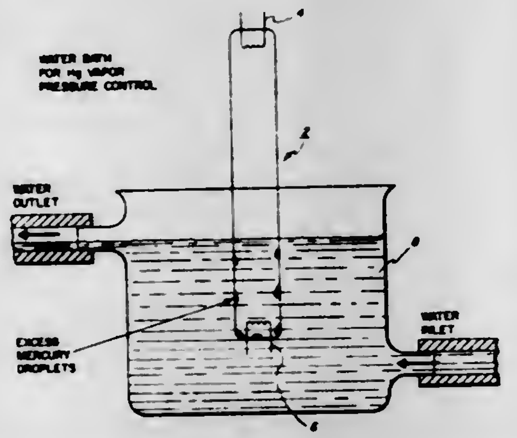
EFFICIENT DC OPERATED FLUORESCENT LAMPS

Charles F. Gallo, and Thomas J. Hammond, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 14, 1975, Ser. No. 595,936

Int. Cl.² H01J *61/52, 7/24*

U.S. Cl. 315—112 **5 Claims**



1. A method of optimizing the operation of a fluorescent lamp having a pair of electrodes and containing an excess of mercury in a lamp tube at a cold spot therein, to optimize its radiant output, including the steps of:
   orienting said lamp and electrodes so that said cold spot is adjacent to one of said electrodes,
   controlling the temperature at said cold spot to thereby control the pressure of mercury vapor within said lamp tube,
   applying DC voltage to said lamp between said electrodes to establish a direct current through said lamp,
   adjustably varying the temperature at said cold spot to achieve maximum output intensity from said lamp at said current.

4,005,333

APPARATUS FOR INCREASING OUTPUT EFFICIENCY OF AN OPTICALLY PUMPED Nd:YAG LASER

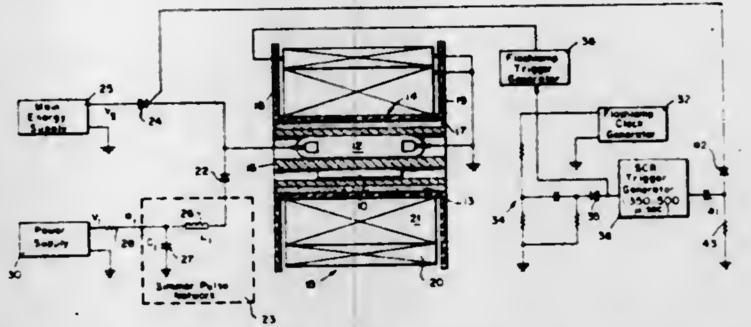
Richard W. Nichols, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 3, 1974, Ser. No. 475,685

Int. Cl.² H05B *37/00*; H01S *3/00*

U.S. Cl. 315—173 **3 Claims**

1. An apparatus for optically pumping a laser, said apparatus comprising a longitudinal flashlamp having first and second electrodes adapted to be mounted parallel to and coextensive with an element of laser material, said first electrode being maintained at a substantially fixed reference potential level; a main energy storage device for storing an electric charge at a first potential relative to said reference potential level; an auxiliary power supply for providing direct-current energy at a second potential level relative to said reference potential level, said second potential level being no greater than the first potential level; a current limiting resistor, and inductor and a diode serially connected in the order named from said auxiliary power supply to said second electrode of said flashlamp, said diode being poled to allow current flow towards said flashlamp; a storage capacitor having a first electrode connected to the junction between said current limiting resistor and said inductor and a second electrode maintained at a reference potential level whereby said first electrode of said storage capacitor charges to said second potential level; means for preionizing said flashlamp thereby to allow said storage capacitor to discharge serially through said inductor and said flashlamp; and means coupled from said main energy storage device to said second electrode of said flashlamp for electronically releasing energy therefrom through said flashlamp at a predetermined interval of time subsequent to said flashlamp being pre-ionized during the discharge of said storage capacitor.



4,005,334

ELECTRIC INCANDESCENT LAMP COMBINATION FIXTURE DEVICE

Peter Andrews, 190 Gebhardt Road, Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 240,605, April 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 25,994, April 6, 1970, abandoned. This application Feb. 12, 1974, Ser. No. 442,082

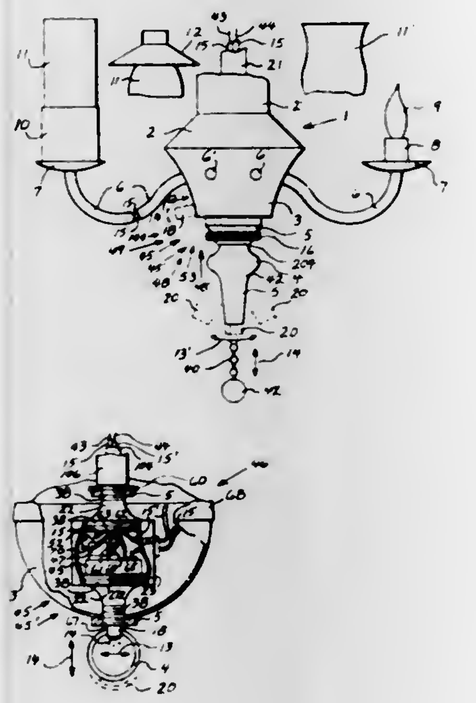
Int. Cl.² H05B *37/00*

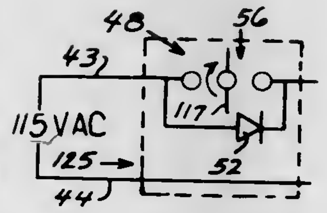
U.S. Cl. 315—208 **21 Claims**

1. An improved hung type of electric current incandescent lamp dimming combination fixture device, for electrical connection to a source of alternating electric current, comprising in combination:

a. an electric current incandescent lamp combination fixture having
   1. at least one portion of a first electrical conducting wire member and a second electrical conducting wire member electrically connected to at least one electrical circuit portion thereof;
   2. at least one alternating electric current incandescent lamp socket member having at least one receptacle portion having at least one first electrical contact member and a second electrical contact member therein;
   2. at least one subcombination means substantially housed in at least one portion of said fixture and consisting of a 2-position electric selectively switching means and at least one half-wave diode rectifying means being electrically connected between a first portion and a second portion of said first electrical conducting wire member which is also electrically connected substantially to said first electrical contact member;

b. said fixture having at least one portion of said first electrical conducting wire member and said second electrical conducting wire member housed in at least one portion thereof for electrical connection to said source of said electric current and for passing at least one electrical portion of said source of said electrical current through at least one portion of said first said conducting wire member and through at least one portion of said subcombination means and through at least one said contact member of said socket member and through at least one filament member enclosed in said lamp and substantially back through said second said contact member of said socket member and through said second conducting wire member to said source of said electric current when at least one electrical base portion of said lamp is removably inserted into said receptacle portion and when said source of said current is passed substantially to said switching means;





c. said switching means having a conventional manually operative means which is alternatingly manually operable at said fixture device into a half-wave diode rectified substantially half-on "dim" electrical switching position or into an "on" electrical switching position for selectively passing a half-wave rectified and a non-rectified full-wave portion of said source of said electric current to said filament member

while at least an expensive 24-volt electrical relay switching means is otherwise saved when said subcombination means is electrically connected between said relay and said first said contact member of said socket member.

4,005,335

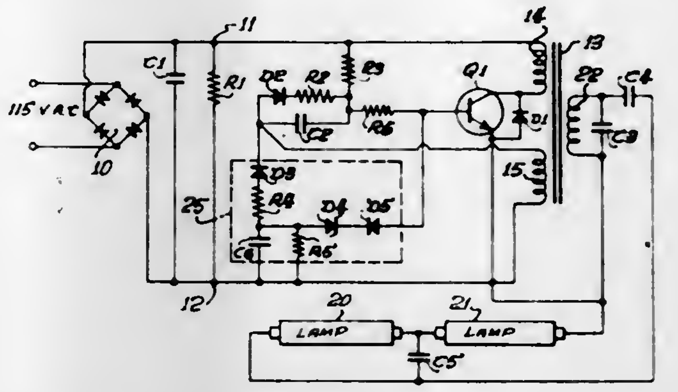
HIGH FREQUENCY POWER SOURCE FOR FLUORESCENT LAMPS AND THE LIKE

Lloyd J. Perper, Tucson, Ariz., assignor to Iota Engineering Inc., Tucson, Ariz.

Filed July 15, 1975, Ser. No. 596,069

Int. Cl.² H05B *41/29*

U.S. Cl. 315—224 **14 Claims**



1. In a high frequency power source for a load such as gas discharge lamps, and having an inverter with oscillator circuit and transformer, said transformer having primary, secondary and feedback windings, said oscillator circuit including a transistor having emitter and collector electrodes connected in series with said primary winding across a pair of dc input terminals and having the base and one of said electrodes connected across said feedback winding, the improvement comprising:
   a detector circuit connected across the transistor output developed at a winding of said transformer for developing a control signal varying as a function of said transistor output; and
   first means for connecting said control signal to the base of said transistor in parallel with the output of said feedback winding in current controlling relation when said control signal exceeds a predetermined value, said first means including a zener diode and a second diode connected in series in opposing polarity between said detector circuit and transistor base.

4,005,336

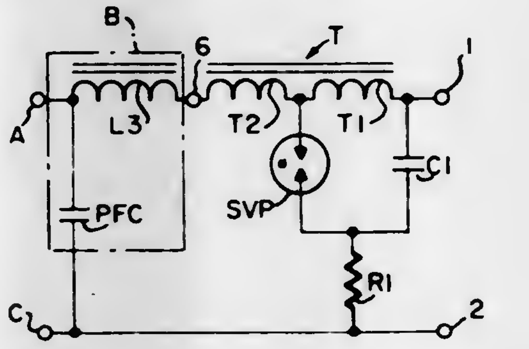
HIGH INTENSITY DISCHARGE LAMP STARTING CIRCUIT

Daniel C. Casella, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jan. 3, 1975, Ser. No. 538,349

Int. Cl.² H05B *41/18*

U.S. Cl. 315—239 **2 Claims**



1. A starting circuit for a high intensity discharge lamp comprising:
   alternating current line terminals,
   lamp terminals having connections to the line terminals, at least one connection including an inductance,
   a voltage responsive current switching surge voltage protector breakdown device connected to the inductance inter-

mediate its ends, said device having a switching time in the order of a microsecond,

a capacitor and the breakdown device connected to each other through a portion of the inductance, and

a resistance in series with the capacitor across the lamp terminals,

wherein the inductance includes an inductive reactor and at least one winding of a pulse transformer connected between the reactor and one lamp terminal.

4,005,337

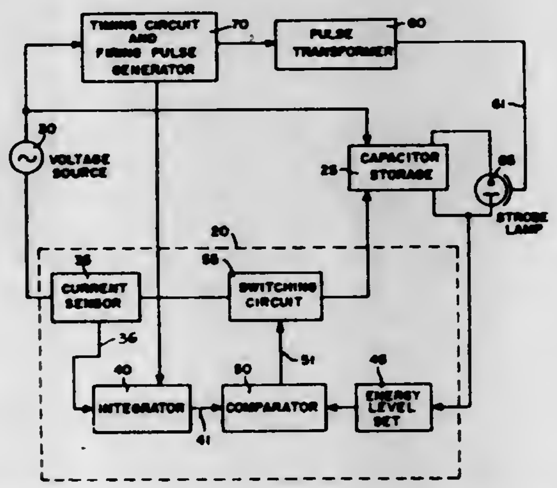
CONSTANT ENERGY STROBE SOURCE

Blaine R. Rabe, Urbana, Ohio, assignor to Grimes Manufacturing Company, Urbana, Ohio

Filed July 21, 1975, Ser. No. 597,893

Int. Cl.² H05B *41/32, 41/29*

U.S. Cl. 315—241 S **9 Claims**



1. In a lighting system in which a capacitor means for storing energy is successively charged by a power source and then discharged through a strobe lamp,

the improvement comprising:

control means, connected between said power source and said capacitor means, for monitoring the amount of energy applied to said capacitor means for disconnecting said power source from said capacitor means when the amount of energy applied to said capacitor means equal a predetermined constant amount of energy, said control means comprising:

sensor means for sensing the current applied to said capacitor means and for supplying an output proportional thereto,

and, integrator means for integrating the output of said sensor means.

4,005,338

LAMP-STARTING DEVICE

Donald J. Ries, 3923 Cranberry Lane, St. Louis, Mo. 63121

Filed Nov. 26, 1975, Ser. No. 635,649

Int. Cl.² H05B *39/02*

U.S. Cl. 315—362 **7 Claims**

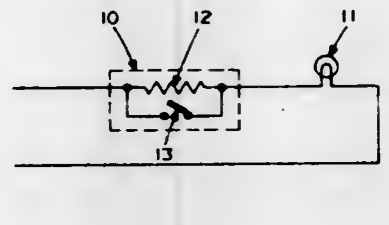
1. A lamp-starting device for use in a lamp socket adapted to receive the base of the lamp, comprising:

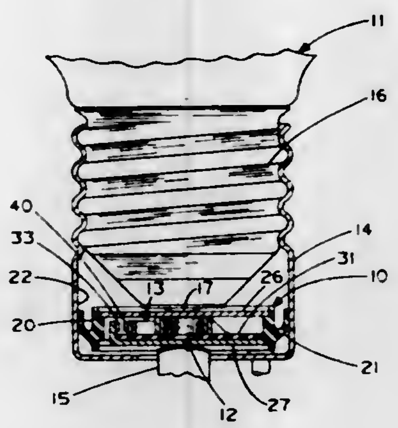
a. a housing,

b. a pair of electrically-conductive plates disposed in spaced relation in the housing, and electrically insulated from each other, one of the plates having a first contact located between the plates,

c. an electrical resistor located between, engaging and electrically connecting the plates, the resistor being in the circuit when the lamp is initially energized, and

d. a temperature-responsive bimetal strip located between the plates, the bimetal strip being electrically insulated from the said one plate, and electrically connected to and engaging the other of said plates that is adapted to engage the lamp base, the strip having a second contact movable into engagement with the first contact when the bimetal strip is heated by conductive heat from the lamp socket to by-pass the resistor in the circuit after initial energization.





4,005,339

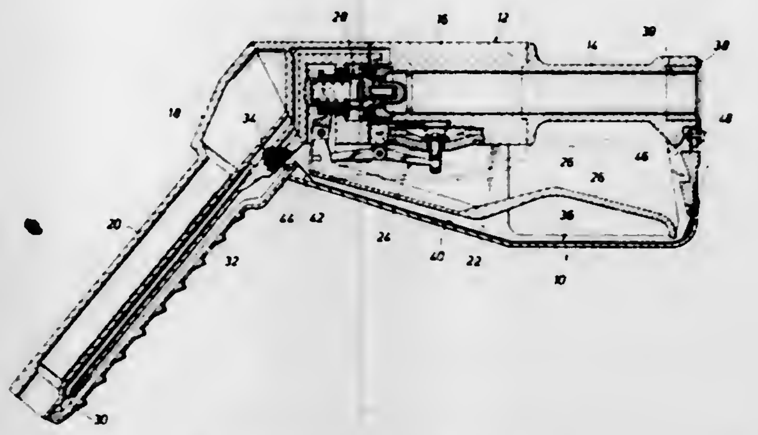
PLASTIC FILLING NOZZLE FOR USE AT FILLING STATIONS

Maurice Plantard, Antony, France, assignor to Shell Oil Company, Houston, Tex.

Filed June 2, 1975, Ser. No. 583,124

Int. Cl.² H05F *3/00;* B65B *3/04*

U.S. Cl. 217—2 J **1 Claim**



1. An electrically conductive nozzle assembly for delivery of a liquid from a source to a liquid receiver having an inlet, said nozzle assembly comprising: (1) a rigid plastic nozzle including a nozzle inlet adapted for connection to a source of liquid, said source having electrical path means communicating with an electrical ground; a nozzle outlet; a nozzle housing coupling said nozzle inlet and said nozzle outlet; control means for controlling liquid flow from said nozzle inlet through said nozzle housing to said nozzle outlet; and a proper insertion safety valve for preventing discharge of liquid through said control valve unless the nozzle is properly inserted into the liquid receiving inlet; and (2) means for conducting an electrical charge comprising an annular conductor disposed on said nozzle and adapted to make electrical connection with the electrical path means of said liquid source; electrical conductive means disposed on said nozzle outlet to make contact with said liquid receiver inlet, said electrical conductive means being a lever pivoting on said nozzle and operatively connected to said safety valve for opening said safety valve when the nozzle outlet is introduced into the liquid receiver inlet; and electrical connective means for coupling said electrical conductive means with said annular conductor.

4,005,340

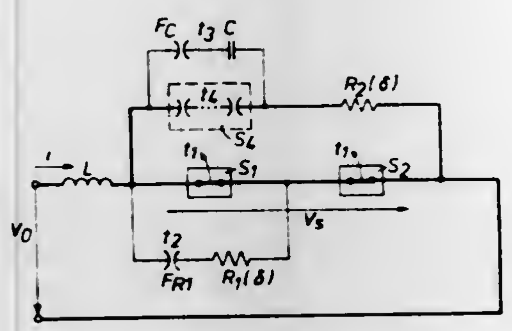
APPARATUS FOR THE CURRENT LIMITING INTERRUPTION OF CURRENTS AT HIGH VOLTAGES

Hagen Härtel, Braunschweig, Germany, assignor to Dieter Kind, Braunschweig, Germany

Filed May 9, 1975, Ser. No. 576,235

Int. Cl.² H02H 7/22

U.S. Cl. 317—11 A **3 Claims**



1. In a circuit arrangement for the current-limiting interruption of high-voltage direct and alternating currents including a commutation switch connected in a high-voltage main, a residual current switch connected to said commutating switch, and a shunt path connected in parallel with said commutation switch with said shunt path including the series connection of a spark path and a temperature dependent resistor having a strongly positive temperature coefficient, the firing voltage of said spark path being such that said spark path responds after a predetermined arc voltage has been reached at said commutation switch upon opening thereof to cause the current to commutate to said shunt path, and said temperature dependent resistor being dimensioned so that in its cold state it can fully take over the maximum current of said commutation switch at said threshold value for the series-connected spark path and is heated to such an extent that, at maximum energy absorption, it reaches its highest permissible rise in resistance without being destroyed; the improvement comprising: a further commutation switch connected in series with said first mentioned commutation switch; a further shunt path connected in parallel with the series connection of said first mentioned commutation switch and said further commutation switch, said further shunt path including the series connection of a quenching spark path, with constitutes said residual current switch, and a further temperature dependent resistor having a strongly positive temperature coefficient; an auxiliary shunt path connected in parallel with said quenching spark path and including the series connection of another spark path and a capacitor; and said quenching spark path has a firing voltage which is substantially higher than that of said first mentioned spark path and that of said another spark path.

4,005,341

CASING CONSTRUCTION FOR POLE TYPE DIELECTRIC CONTAINING TRANSFORMER

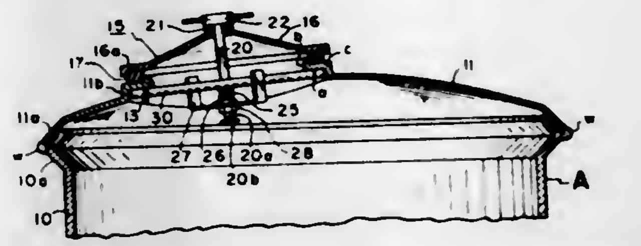
Roy E. Uptegraff, Jr., Scottdale; Charles C. Dixon, Connellsville, and Ravindra N. Rahangdale, Mount Pleasant, all of Pa., assignors to R. E. Uptegraff Manufacturing Company, Scottdale, Pa.

Filed Dec. 17, 1975, Ser. No. 641,387

Int. Cl.² H01F *27/02;* H02H *7/04*

U.S. Cl. 317—15 **17 Claims**

1. In an improved overhead transformer enclosure construction which is adapted to carry a dielectric liquid therein, a hollow elongated casing having sealing-off side and top and bottom end walls and that generally has an outwardly convex curvature, an open hole portion through the top end wall defining a combined pressure relief and maintenance hand hole having a seating flange thereabout, and an easily removable and insertable pressure relief and hand hole cover assembly; said assembly comprising: a cover member of outwardly curved shape provided with a sealing flange thereabout, said sealing flange being adapted to cooperate with said seating flange for closing-off said open hole portion, an operating stem rotatably extending through said cover member and having an outer handle portion and an inner threaded end portion, spring and clamping means positioned on said stem beneath said cover member, said clamping means being adapted to extend across said open hole portion to engage an underside of said seating flange, a nut carried on said threaded end portion and retained by said spring and clamping means in a non-rotating position with respect to and on said stem for moving said spring and clamping means inwardly and outwardly thereon and with respect to said cover member when said stem is rotated by said handle means relative thereto, said spring means being positioned between said nut and said clamping means, said stem being adapted to, in one direction of rotation, apply an increasing cover member closing force to said spring and clamping means and to, in an opposite direction of rotation, release the cover member closing force on said spring and clamping means and permit a tilting in and out insertion and removal of said cover assembly with respect to said open hole portion.



4,005,342

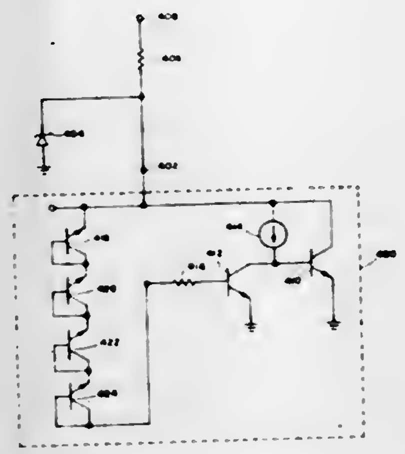
INTEGRATED CIRCUIT OVERVOLTAGE PROTECTION CIRCUIT

William Folsom Davis, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 332,949, Feb. 15, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,186

Int. Cl.² H02H *3/22*

U.S. Cl. 317—16 **5 Claims**



1. A protection circuit for increasing the capability of a first transistor in a circuit including first and second terminals to withstand severe overvoltages in an automotive environment between said first and second terminals comprising:

protection circuit means connected between a base and an emitter of said first transistor and also connected to said first terminal for increasing the breakdown voltage of said first transistor from its BV_{CBO} breakdown voltage to its BV_{CES} breakdown voltage in response to an overvoltage occurring between said first and second terminals;

said protection circuit means including a second transistor having a collector connected to a base of said first transistor and an emitter connected to said second terminal, a plurality of reverse biased diode-connected transistors connected in series with a resistor, said resistor and said reverse biased diode-connected transistors being connected between said first terminal and a base of said second transistor, said first transistor having an emitter connected to said second terminal and a collector connected to said first terminal;

wherein said first transistor is selected so that said BV_{CEO} breakdown voltage is of sufficiently low magnitude that said first transistor would ordinarily be destroyed by said severe overvoltages in the absence of said protection circuit means, and said BV_{CES} breakdown voltage is of sufficiently high magnitude that said first transistor will not be destroyed by said severe overvoltage.

4,005,343

CIRCUIT FOR PRODUCING A SPARK DISCHARGE

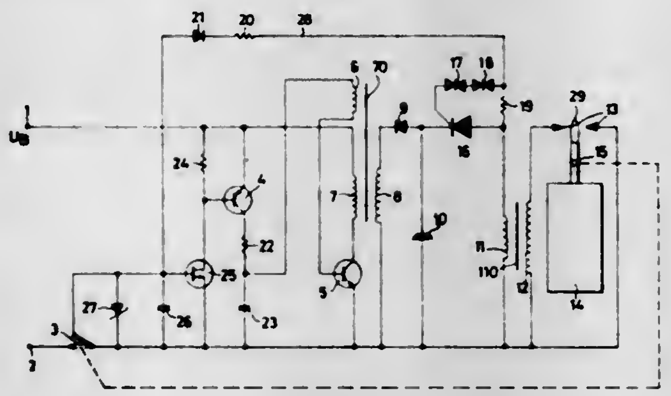
Adolf Lamprecht, Hausen, Germany, assignor to Rowenta-Werke GmbH, Offenbach (Main), Germany

Filed Apr. 18, 1975, Ser. No. 569,586

Claims priority, application Germany, Apr. 23, 1974, 2419403

Int. Cl.² F23Q *2/28, 3/01*

U.S. Cl. 317—96 **1 Claim**



1. A circuit for producing a spark discharge comprising, an ignition capacitor connected so as to be chargeable by a voltage converter from a d.c. source and connected to a discharge circuit through an automatically triggerable electric switch, said voltage converter comprising by a control transistor, a switching transistor, and a converter transformer having a feedback winding, said automatically triggerable electric switch comprising by a thyristor connected to said ignition capacitor and by a pair of trigger diodes and a current-limiting resistor connected in series between the anode and the gate of said thyristor, means for automatically turning off said voltage converter and simultaneously disconnecting said voltage converter from said d.c. source upon said electric switch being triggered, said latter means comprising a field-effect transistor having its collector and emitter connected across said d.c. source, having its collector connected to the base of said control transistor, and having its control input gate connected through a trigger path to a junction between said trigger diodes and said current-limiting resistor of said automatically triggerable electric switch, a capacitor connected to the control input gate of said field-effect transistor, and a zener diode connected in parallel with the capacitor connected to said field-effect transistor.

4,005,344

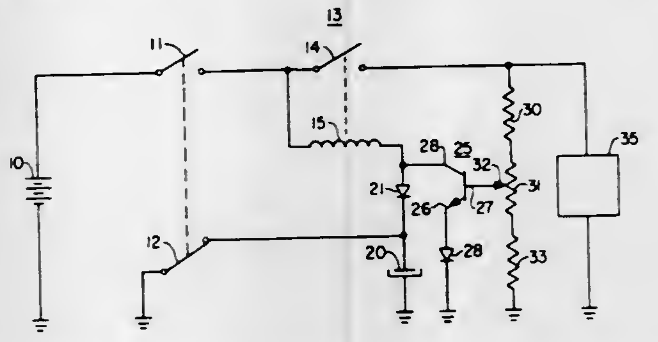
PROTECTION CIRCUIT FOR BATTERY POWERED ELECTRONIC DEVICES

Jagjit R. Galnd, Forest Park, and Philip J. Nowaczyk, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,639

Int. Cl.² H02H *3/24*

U.S. Cl. 317—31 **2 Claims**



1. For use in a television receiver utilizing a battery source of operating voltage, susceptible to being damaged by discharge below a predetermined potential, a protection circuit comprising:

a viewer operable on-off switch coupled to said battery;

a relay, having a normally open switch path in series with said on-off switch on said television receiver and a control winding having first and second ends, said first end coupled to said on-off switch;

a capacitor;

a diode coupling said capacitor to said second end of said control winding, said capacitor being charged through said control winding and said diode, when said on-off switch is moved to its on position, to momentarily energize said relay; and

a transistor having a collector electrode coupled to said second end of said control winding, an emitter electrode coupled to ground, and a base electrode coupled to said television receiver, said transistor conducting to hold said relay energized if said battery potential exceeds said predetermined potential.

4,005,345

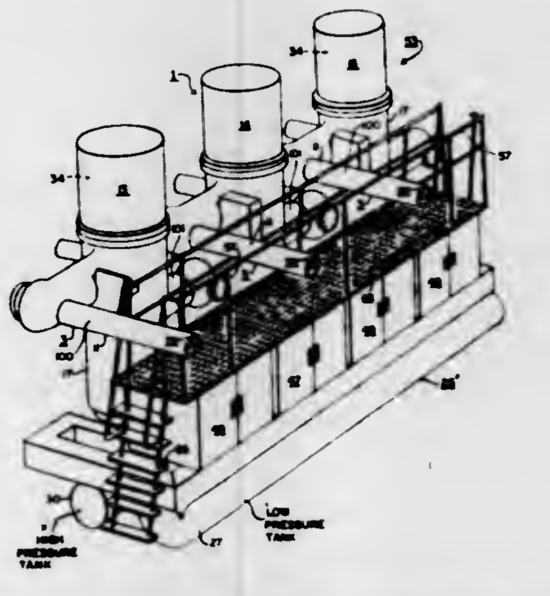
MULTI-PHASE GAS-TYPE CIRCUIT-INTERRUPTER SUBSTITUTION MODULAR CONSTRUCTION

Richard E. Kane, Monroeville, and Charles E. LeRow, Jr., Jeannette, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,931

Int. Cl.² H01H *9/00, 33/54*; H02B *1/20*

U.S. Cl. 317—103 **6 Claims**



1. A multiphase compressed-gas circuit-breaker installation comprising, in combination, means defining a generally-rectangularly-shaped lower-disposed main metallic support frame, a plurality of laterally-spaced upstanding generally-cylindrically-shaped circuit-breaker assemblies (13, 14) extending upwardly from, and supported by said lower-disposed main metallic generally-rectangularly-shaped support frame, first line-terminal connecting means (100) for each circuit-breaker assembly (13, 14) disposed adjacent the upper end of the respective circuit-breaker assembly (13, 14), cooperable second line-terminal connecting means (101) disposed below the aforesaid first-mentioned first line-terminal connecting means (100), yet spaced upwardly from said main lower-disposed generally-rectangularly-shaped metallic support frame (25), pressure-operated separable power contact means for each circuit-breaker assembly disposed internally thereof and interposed between the respective pair of first and second line-terminal connecting means (100, 101), valve means provided for each circuit-breaker assembly (13, 14) for causing the actuation of the pressure-operated power contacts thereof, horizontally-extending valve-rod actuating linkage supported by said lower-disposed metallic support frame and extending generally horizontally below the several circuit-breaker assemblies (13, 14) and mechanically interconnected with the several interiorly-disposed valve means for the respective circuit-breaker assemblies (13, 14), said valve-rod actuating linkage (65) being disposed in the available space between the support frame and the foundation level, two horizontally-extending, generally-parallel, high and low-pressure gas-reservoir tanks (27, 30) extending longitudinally lengthwise of the circuit-breaker assembly and disposed below said generally-rectangularly-shaped lower-disposed support frame, gas-conduit means interconnecting said high pressure gas-reservoir tank (30) and each circuit-breaker assembly (13, 14), an operating-mechanism housing compartment disposed above the lower-disposed generally-rectangularly-shaped support frame and interposed between two adjacentally-disposed circuit-breaker assemblies, said mechanism compartment housing containing an operating mechanism for operating said horizontally-extending valve-rod linkage, and said low-pressure gas-reservoir tank (27) extending longitudinally lengthwise of said circuit-breaker installation and constituting the sole side support for said lower-disposed metallic generally-rectangularly-shaped support frame along one lower longitudinal side thereof.

4,005,346

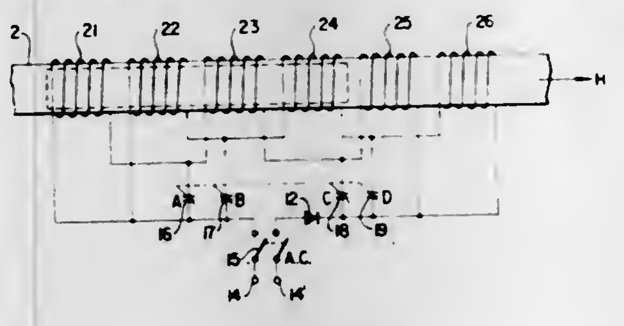
DIRECT ELECTROMAGNETIC RECIPROCATING MOTOR

Tsang-Chen Hsia, 58, Lane 72, Sec. 3, Ho Pin East Rd., Taipei, China /Taiwan

Filed Oct. 29, 1975, Ser. No. 626,853

Int. Cl.² H02K *33/10*

U.S. Cl. 318—128 **10 Claims**



1. A reciprocating motor, comprising:

a hollow, tubular guide having a first coil mounted about a first end thereof, a third coil mounted about a central portion thereof, and a second coil mounted about a second end thereof;

a ferromagnetic piston mounted in sliding engagement within said hollow guide, having a length which overlaps said first and third coils when located at said first end and which overlaps said second and third coils when located at said second end;

a first ferromagnetic pole piece mounted on the central portion of said guide and spaced at said piston length from said first end thereof;

a second ferromagnetic pole piece mounted on the central portion of said guide and spaced at said piston length from said second end thereof;

a ferromagnetic pivot plate, pivotally mounted on the central portion of said guide, having a first end which contacts said first pole piece at a first pivotal position and a second end which contacts said second pole piece at a second pivotal position;

a first ferromagnetic yoke having a first end mounted on said first end of said guide and a second end spaced from said central portion of said guide and contacting said second end of said pivot plate at said first pivotal position;

a second ferromagnetic yoke having a first end mounted on said second end of said guide and a second end spaced from said central portion of said guide and contacting said first end of said pivot plate at said second pivotal position;

said plate pivoting into said first pivotal position forming a first magnetic circuit with said piston, first pole piece, and first yoke when said piston is at said first end of said guide;

said plate pivoting into said second pivotal position forming a second magnetic circuit with said piston, second pole piece, and second yoke when said piston is at said second end of said guide;

an electrical switching means mounted on said pivot plate and electrically connected to said first and second coils, for energizing said first coil when said plate is at said second pivotal position and for energizing said second coil when said plate is at said first pivotal position;

whereby said piston is forced into reciprocating motion within said guide.

4,005,347

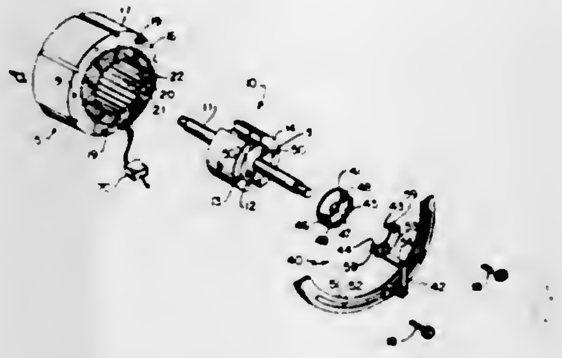
ELECTRONICALLY COMMUTATED MOTOR AND METHOD OF MAKING SAME

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 24, 1974, Ser. No. 482,409

Int. Cl.² H02K *29/00*

U.S. Cl. 318—254 **23 Claims**



1. A brushless DC motor having a stationary armature comprising an armature core and a plurality of winding turns disposed on said armature core, a permanent magnet rotor adapted to rotate about a longitudinal axis in response to magnetic fields established by said armature, means for developing position control signals indicative of the rotational position of said rotor and operative for causing commutation of each of the windings at an advancement angle before the rotor rotates to a position such that the center of a magnetic pole thereof of a first polarity is displaced 135 electrical degrees from the center of a magnetic pole of a polarity opposite to said first polarity and established by the winding being commutated.

4,005,348
CONTROL SYSTEM FOR DC MOTORS

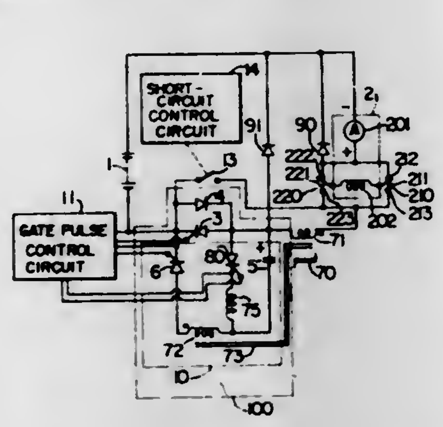
Masayoshi Niimi, Toyota, and Kinya Ishida, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 16, 1975, Ser. No. 578,337

Claims priority, application Japan, May 21, 1974, 49-57535; Apr. 2, 1975, 50-45291U]

Int. Cl.² H02P ***5/16***

U.S. Cl. 318—373 **7 Claims**



1. A DC motor control system used for controlling a DC motor (2), comprising:

a. a main circuit including a DC power source (1), a main thyristor (3) and a DC motor (2) which are connected in series with one another, said main circuit controlling power supplied to said DC motor (2) from said DC power source (1) in accordance with on and off operations of said main thyristor (3);

b. a diode (4) connected in reverse parallel relation with said main thyristor (3);

c. a commutation circuit having a reversing circuit including a commutating capacitor (5), a commutating reactor (75) and a first unidirectional element (80, 80*a*), said reversing circuit reversing a charge stored on said commutating capacitor (5) by a resonance circuit composed of said commutating capacitor (5) and said commutating reactor (75) through said first unidirectional element (80, 80*a*), and a reverse biasing charging circuit including a second unidirectional element (6) connected across the terminals of said main thyristor (3) through said commutating capacitor (5), said reverse biasing charging circuit reverse biasing said main thyristor (3) by causing a reversed charge on said commutating capacitor (5) to flow through said second unidirectional element (6) and said diode (4) and charging said commutating capacitor (5) from said DC power source (1) through said second unidirectional element (6), at least one of said first and second unidirectional elements (80, 6) consisting of a thyristor;

d. a gate pulse control circuit (11) connected to said main thyristor (3) and said thyristor (80, 6) in said commutation circuit for generating gate pulses to turn on said thyristors (3, 80, 6); and

e. a saturable transformer (70) having a primary winding (71) provided in series circuit relation in said main circuit, a secondary winding (72) provided in series circuit relation in said reverse biasing charging circuit and a core (73) having said primary winding (71) and said secondary winding (72) wound thereon whereby current flows in each of said windings (71, 72) in such a manner that a magnetic flux produced by the current flowing in one of said windings (71, 72) cancels a magnetic flux produced by the current flowing in the other of said windings (71, 72) and said core (73) is saturated by a magnetic flux produced by the current flowing in said primary winding (71), said saturable transformer (70) returning the current flowing in said main circuit to said reverse biasing charging circuit for improving the commutation efficiency of said reverse biasing charging circuit.

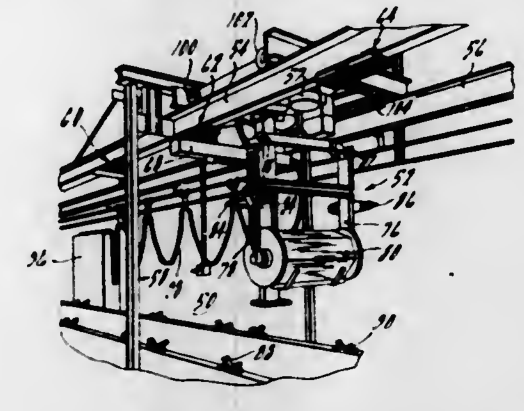
4,005,349
CONTROL SYSTEM FOR CONVEYING APPARATUS

Michael A. Brian, St. Clair Shores, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 122,820, March 10, 1971, Pat. No. 3,764,990. This application May 25, 1973, Ser. No. 363,788

Int. Cl.² G05B ***19/18***

U.S. Cl. 318—569 **10 Claims**



1. In a control system for an electrochemical workpiece processing apparatus and including programming means, having a tape reader, wherein the workpiece is sequenced between or among a plurality of work stations in response to commands generated by the programming means with each of the work stations having a preselected address and with at least one of the work stations having a plurality of positions and with that one of the work stations having a preselected main address, with each of the plurality of positions having a separate subaddress, said system comprising: binary coded decimal address storage means for storing the main address and having a predetermined plurality of possible subaddresses sequentially derived from the main address, storage circuit means for storing information as to which of said predetermined subaddresses are used, and which subaddresses are not used and being selectively settable as to which are to be used or not, and means connected to said storage means for incrementing said storage means in response to an indication of whether a subaddress has been selectively set to be used or not used, including a binary coded decimal-to-decimal converter circuit having a digital output circuit for at least some digits between 0 and N, N being an integer, with each said subaddress having a corresponding digit in said digital output circuit, output gate means having an input circuit adapted to be connected to each said digital output circuit, and circuit means interconnecting said digital output circuit to said input circuit of said output gate means in response to said indication of whether a digit, and hence a corresponding subaddress, was selectively set to be used or not used, and pulse circuit means for providing incrementing pulses to said storage means sequentially through each of said predetermined subaddresses, said gate means enabling said pulsing means when a digit and hence a corresponding subaddress is not used and disabling said pulse means when a digit and hence a corresponding subaddress is used.

4,005,350
ARRANGEMENT FOR PROTECTION OF SELF-CONTROLLED INVERTER FED FROM AN INTERMEDIATE D.C. VOLTAGE LINK

Jörg Brenneisen, Mannheim, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

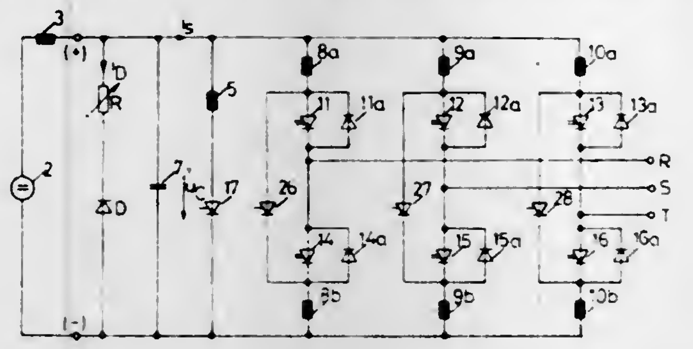
Filed Sept. 23, 1974, Ser. No. 508,675

Claims priority, application Germany, Sept. 29, 1973, 2349161

Int. Cl.² H02M ***1/18***

U.S. Cl. 321—11 **2 Claims**

1. Arrangement for protection of a self-controlled polyphase bridge type inverter utilizing controllable valves of the semi-conductor type such as thyristors with anti-parallel connected diodes and series connected inductances in each of the bridge branches and which is fed from the output of a rectifier by way of an intermediate d.c. voltage link circuit and wherein said link circuit includes at least one series connected smoothing inductance preceding the inverter and at least one parallel connected smoothing condenser the improvement where in the event of a throughgoing ignition fault in the valves of any one of the bridge branches which would short-circuit said d.c. voltage link circuit all controllable valves of the inverter are activated simultaneously by an ignition pulse, said smoothing condenser together with the sum of all inductances included in the converter form an oscillating circuit while all of the valves are simultaneously ignited, and wherein a diode in series with an adjustable resistor is connected electrically in parallel with said smoothing condenser, said diode being connected in the blocking direction relative to the normal polarity of the d.c. voltage link circuit and providing an electrically conducting connection between the poles of said smoothing condenser only in the event of any fault after the change in polarity of the smoothing condenser caused by the oscillation beginning with the second half-cycle of the oscillation voltage.



4,005,351
VOLTAGE-REGULATED AND OVERCURRENT-PROTECTED POWER SUPPLY

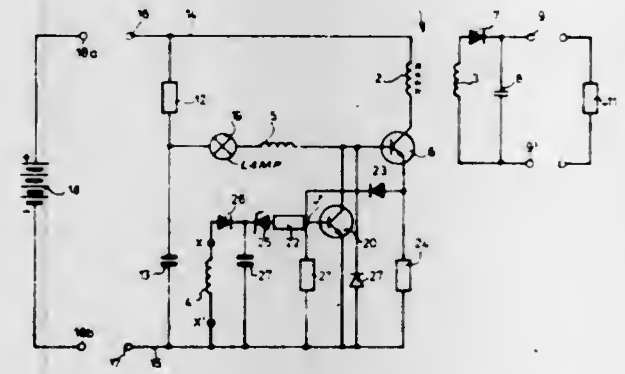
Rudolf Blum, Wendlingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 9, 1975, Ser. No. 621,001

Claims priority, application Germany, Dec. 6, 1974, 2457664

Int. Cl.² H02M ***3/335***

U.S. Cl. 321—14 **6 Claims**



1. Voltage-regulated and overcurrent-protected power supply for energization by a power source of widely varying voltage comprising

a blocking oscillator circuit including a transformer (1) and a switching transistor (6), the primary (2) of the transformer being connected into the output circuit of the switching transistor (6);

an output circuit including a first secondary winding (3, 34) of the transformer, a rectifier (7) connected in series with one terminal of the first secondary winding a main capacitor (8) connected across the other terminal of the first secondary winding (3) and the free terminal of the rectifier (7) and output terminals (9, 9′) connected across the main capacitor (8);

a single control transistor (20) having its output circuit connected to the blocking oscillator to control the conduction state of the switching transistor (6);

and two control branch circuits (4, 27, 25; 23, 24) connected to control conduction of the control transistor (20), said control branch circuits being connected to a common control junction (J) connected to control the control transistor (20), wherein

the voltage sensing branch (4, 26, 27) includes a second secondary transformer winding (4, Y) a rectifier (26) and an auxiliary capacitor (27) connected in a circuit configuration similar to the circuit configuration of the output circuit,

a reference element (25) and means (22, 21) applying the output from said voltage sensing branch circuit to the common control junction (J) of the control transistor (20) when the output voltage rises above the reference voltage as determined by said reference element to control the control transistor (20) to in turn control the main switching resistor (6) to blocked state; and

wherein the second branch comprises a sensing resistor (24) connected in series with the main switching path of the main switching transistor (6) and a coupling circuit (23) connecting a sensing voltage across the sensing resistor (24) and representative of current flow to the common control junction (J) of the control transistor (20).

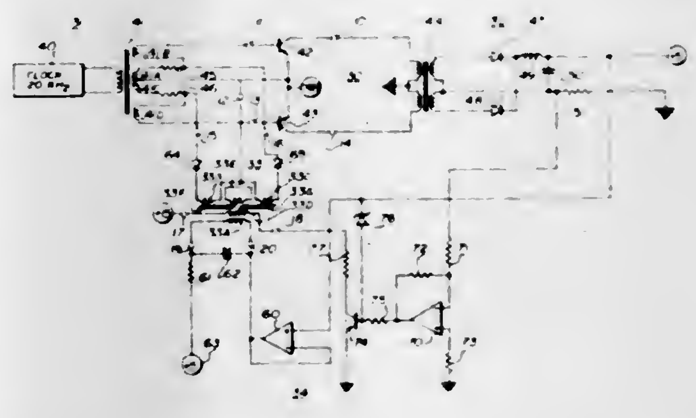
4,005,352
PROTECTION CIRCUIT FOR MAGNETICALLY CONTROLLED D-C TO D-C CONVERTER

Jindrich Kugler; Alfred Dvorak, both of Ottawa, and Charles John Elliott, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 5, 1976, Ser. No. 673,715

Int. Cl.² H02M ***3/335***

U.S. Cl. 321—19 **5 Claims**



1. In a pulse-width modulated d-c to d-c converter comprising:

a pair of transformer coupled power transistors connected in a push-pull configuration to a source of d-c voltage;

a drive circuit for alternately switching said transistors into conduction;

a transformer having a primary coupled to the output of the drive circuit and a center tapped secondary to the inputs to the pair of power transistors for coupling switching signals from the drive circuit to the transistors;

a rectifier and filter network coupled to the outputs of the pair of power transistors for producing the d-c output voltage of the converter;

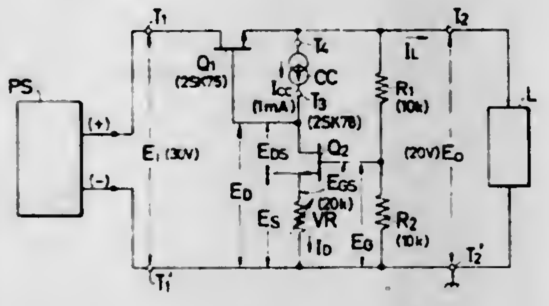
a magnetic amplifier having a pair of serially connected gate windings coupled via alternately conducting diodes across at least part of said secondary winding to substantially short-circuit the switching signals to the power transistors during saturation thereof and thereby alter the duty cycle of said signals;

said secondary having a larger winding and a smaller winding connected in series opposition to the input to each of

said power transistors with each larger winding being coupled through said diodes to a separate one of said gate windings;
said magnetic amplifier also having a first control winding for controlling said saturation;
a first control circuit responsive to said d-c output voltage for controlling a first control signal applied to said first control winding to vary the firing angle and hence the saturation interval of said magnetic amplifier so as to maintain a substantially constant output voltage with varying loads;
the magnetic amplifier additionally having a second control winding; and
a second control circuit responsive to the output current of the converter, for controlling a second control signal applied to the second control winding to vary the firing angle and hence the saturation interval of said magnetic amplifier so as to limit said output current.

4,005,353
DIRECT CURRENT VOLTAGE REGULATING CIRCUITRY

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Apr. 23, 1975, Ser. No. 570,964
Claims priority, application Japan, Apr. 25, 1974, 49-47016
Int. Cl.² G05F *1/56*
U.S. Cl. 323—22 R **7 Claims**

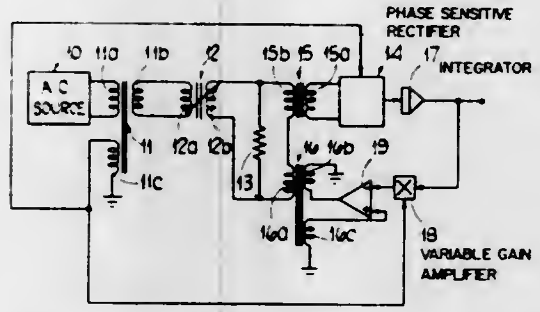


1. A direct current voltage regulating circuit comprising:
an input terminal;
an output terminal for delivering an output voltage;
a variable resistance element connected in series between said input terminal and said output terminal, said variable resistance element having a control terminal, the internal resistance of said variable resistance element being controlled by an electric signal coupled to said control terminal;
a detecting circuit for providing a detected voltage representing said output voltage; and
a voltage amplifying circuit having an input and an output, and including an FET having a triode characteristic, a constant current circuit serving as the load of said FET, said detected voltage being coupled to the input of said voltage amplifying circuit, the output of said voltage amplifying circuit being connected to the control terminal of said variable resistance element.

4,005,354
ELECTROMAGNETIC POSITION TRANSDUCERS

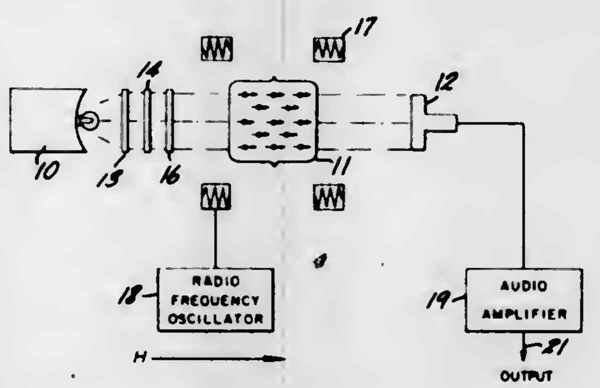
Anthony Brian Plant, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England
Filed May 7, 1975, Ser. No. 575,178
Claims priority, application United Kingdom, May 11, 1974, 20941/74
Int. Cl.² G01L *9/10*
U.S. Cl. 323—51 **3 Claims**

1. An electromagnetic position tranducer of the kind comprising an a.c. source, a variable transformer the coupling of the windings of which is varied in use by movement of a position input element and a phase sensitive detector for producing a d.c. output determined by the position of said position input element, the transducer including an input coupling transformer coupling the a.c. source to the variable transformer, an output coupling transformer with its secondary winding connected to the phase-sensitive rectifier, a feedback transformer having its secondary winding connected in a closed series circuit with the primary winding of the output coupling transformer and the output winding of the variable transformer, an integrator connected to the output terminal of the phase-sensitive rectifier and a variable gain amplifier driving the primary winding of the feedback transformer, the amplifier producing an a.c. signal derived from said a.c. source and of magnitude dependent on the output of the integrator, whereby in equilibrium there is substantially no voltage across the primary winding of the output coupling transformer.



4,005,355
METHOD AND APPARATUS FOR STIMULATING NARROW LINE RESONANCE CONDITIONS

William Happer, 560 Riverside Drive, New York, N.Y. 10027, and Henry Y. S. Tang, 155 E. 93 St., New York, N.Y. 10028
Filed July 9, 1974, Ser. No. 486,863
Int. Cl.² G01R *33/08*
U.S. Cl. 324—.5 F **22 Claims**



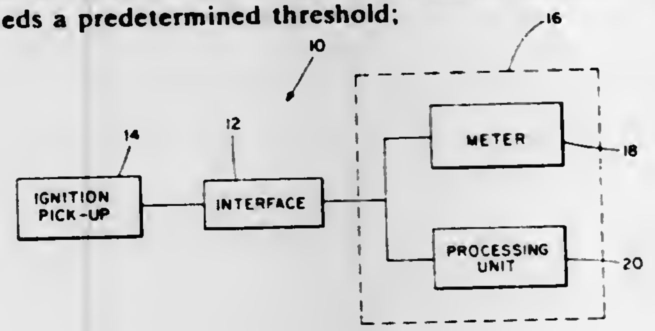
1. Apparatus for monitoring polarization induced by optical pumping of a system of quantum mechanical spins in a magnetic field, comprising means for containing a gaseous sample of the spin system in which angular momentum is exchanged between the spins at a rate which is substantially greater than the rate of precession of the spins with respect to the magnetic field together with an inert buffer gas at a pressure sufficient to diminish the optical depth of the spin system, means for polarizing said spin system and means for detecting polarization in said spin system.

4,005,356
IGNITION WAVE ANALYZER INTERFACE

Gerald C. Trussell, Park Ridge, Ill., assignor to Sun Electric Corporation, Chicago, Ill.
Filed June 16, 1975, Ser. No. 587,519
Int. Cl.² F02P *17/00*
U.S. Cl. 324—15 **17 Claims**

1. In an ignition wave analyzer having coupling means for producing a primary ignition signal and a secondary ignition

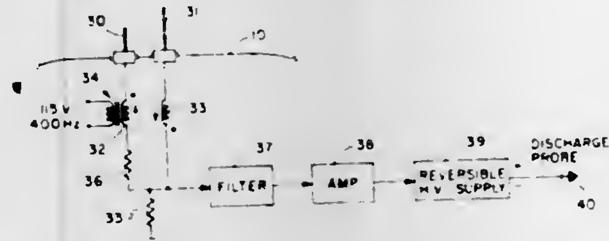
signal in response to an automobile ignition system and output means, an interface for interconnecting said coupling means and said output means comprising, in combination:
input means for receiving said secondary ignition signal, said secondary ignition signal having a secondary amplitude;
store means for storing said secondary amplitude of said secondary ignition signal to define a stored amplitude;
comparator means for comparing said secondary amplitude and said stored amplitude, said comparator means generating a command pulse whenever the difference between said secondary amplitude and said stored amplitude exceeds a predetermined threshold;



PSTROB means for generating a signal PSTROB in response to said comparator means;
PSAMP means for generating a signal PSAMP in phase with said primary ignition signal;
first gate means for gating said signal PSTROB* and said signal PSAMP to produce a store command signal;
first controllably conductive means for interconnecting said input means and said store means in response to said store command signal; and
coupling means for interconnecting said output means and said store means.

4,005,357
ELECTROSTATIC FIELD SENSOR

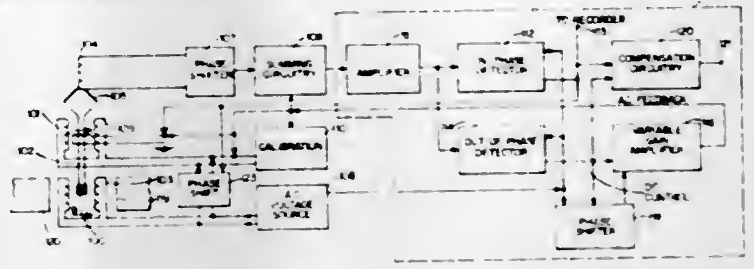
Gerald W. Parkinson, Stratford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 13, 1976, Ser. No. 658,146
Int. Cl.² G01R *5/28;* **H05F** *3/06*
U.S. Cl. 324—32 **6 Claims**



1. A probe arrangement for determining the magnitude and polarity of the electrostatic charge accumulated on an aircraft, comprising in combination
a pair of unequal length probes insulated from said aircraft and projecting different distances therefrom into the surrounding atmosphere so as to sense the electric field present thereat;
means for energizing said probes with equal and out-of-phase A.C. Voltages,
said voltages being of a sufficient magnitude so as to result in corona currents flowing through said probes in opposite directions when said electric field has zero intensity; and
means for combining said corona currents so as to develop a signal whose amplitude indicates the magnitude of the electrostatic charge accumulated on said aircraft and whose sign indicates the polarity of this accumulated charge.

4,005,358
MAGNETOMETER WITH OUT-OF-PHASE CORRECTION

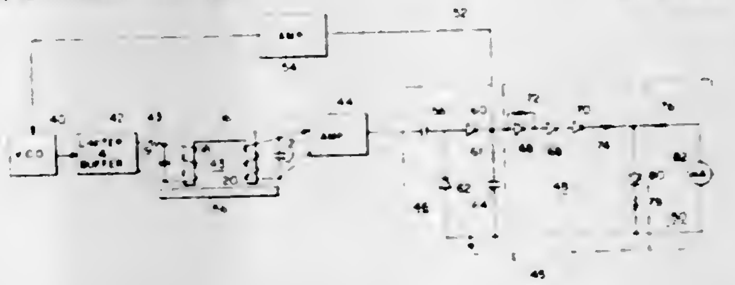
Simon Foner, 31 Payson Terrace, Belmont, Mass. 02178
Filed Oct. 7, 1974, Ser. No. 513,090
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 R **22 Claims**



1. A magnetometer including:
a sample and predetermined sample environment:
driving means for applying an AC driving signal to said sample and for providing an AC output indication representative of the response of said sample to said driving signal;
said sample and predetermined sample environment being of a type whereby said output indication contains a first signal component indicating magnetic moment of said sample in an expected phase relationship with the *n*'th harmonic (where *n* is a positive integer) of said driving signal and at least one second signal component, out of phase with said first signal component and not correspondingly representative of magnetic moment of said sample;
means for substantially compensating for said at least 1 second signal component in said output indication comprising:
detector means responsive to said at least 1 second signal component for providing in response to said second signal component an output signal indicating said at least 1 second signal component;
correction means operative in response to said detector output signal and said output indication to substantially cancel said at least 1 second signal component in said output indication, thereby to provide a corrected output indication more accurately representing magnetic moment.

4,005,359
RESONANT FREQUENCY MEASURING DEVICE FOR GAUGING COATING THICKNESS

William N. Smoot, 9 E. Irving St., Chevy Chase, Md. 20015
Filed Nov. 7, 1975, Ser. No. 629,742
Int. Cl.² G01R *33/00, 33/12*
U.S. Cl. 324—34 TK **4 Claims**



1. An electronic coating guage for measuring the thickness of a coating on a conductive, non-magnetic or magnetic substrate comprising:
double-tuned over-coupled transformer means with a primary and a secondary winding each tuned to the same frequency, said transformer means having a U-shaped core which is adapted to have its open face flush with the coating of the substrate to be tested;
A.C. input means for applying an A.C. signal to said primary winding; and
means for measuring the voltage response at said secondary winding of said transformer means;

- said measuring means providing changes in the resonant frequency response characteristics of said transformer, which changes are indicative of the thickness of said coating.

4,005,360
PROBE WITH BALL BEARING BALL

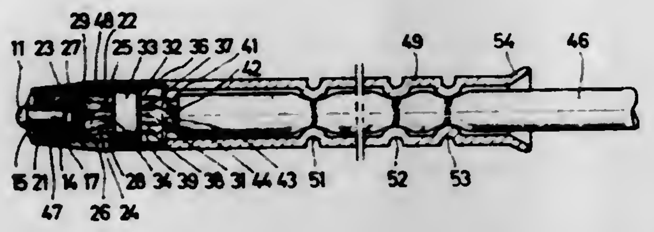
Albert Ott, Sindelfingerstrasse 118, 7032 Sindelfingen 6, Germany

Filed Dec. 10, 1975, Ser. No. 639,574

Claims priority, application Germany, Dec. 14, 1974, 7441607[U]

Int. Cl.² G01R *33/12;* **G01N** *27/72*

U.S. Cl. 324—34 TK **16 Claims**



1. A probe having a soft magnetic pole piece and a magnetizable carrier, for measuring the thickness of thin non-ferromagnetic layers on a ferromagnetic base by substantially detecting the reluctance of said thin layers between said base and said pole piece,

said pole piece comprising a spherical sector comprised of a ball bearing ball having a flat side provided by grinding and an elongated fastening element connected to the ground side of said spherical sector and being interchangeably fastened to said magnetizable carrier,

said magnetizable carrier carrying transmission coil means for generating an a.c. magnetic field penetrating through the non-ferromagnetic layer and into the ferromagnetic base therebelow and for generating an electric response signal depending on the thickness of said thin non-ferromagnetic layer,

wherein,

a. said fastening element is a cylindrical pin having a flat end surface, which is coaxial with said spherical sector and connected thereto by solder between the ground side of said spherical sector and said flat end surface of said pin, the crystalline structure of said spherical sector being substantially maintained the same as that of the original ball bearing ball, a rim portion of the ground side of said spherical sector projecting beyond the end surface of said cylindrical pin,

b. said carrier is a thin-walled steel tube coaxially surrounding said cylindrical fastening element and abutting with its complete ring-shaped end surface against said rim portion of the ground side of said spherical sector, and

c. said steel tube is interchangeably force-and/or form-locked to said cylindrical fastening element and is considerably longer than said cylindrical fastening element.

4,005,361
PERFORMANCE ASSURANCE APPARATUS FOR PHASED ANTENNA ARRAY DRIVES

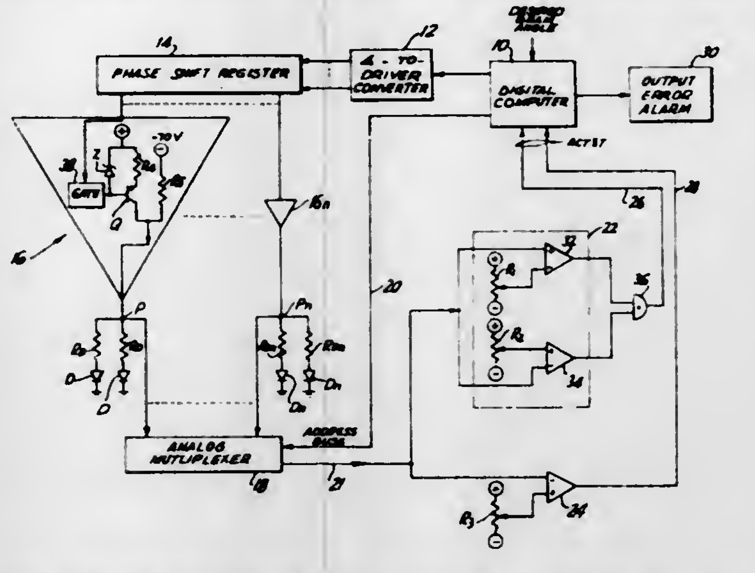
David S. Lerner, Fanwood, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 4, 1975, Ser. No. 628,464

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **5 Claims**

1. In an r.f. phase shift system including a plurality of diodes, digital phase shift specifying means for supplying a binary signal specifying bias states for said diodes, and means for selectively biasing said diodes to operate in one of a conducting and a nonconducting state to bring about a predetermined r.f. phase shift in response to the phase shift dictated by said phase shift specifying means, each of said diodes exhibiting characteristic first and second potentials when biased to said conducting and nonconducting states, a monitoring circuit for determining whether said diodes are properly biased to bring about said predetermined phase shift, said monitoring circuit comprising means coupled to each of said diodes for sensing the bias state indicating characteristic potential there across, means coupled to said sensing means for producing a diode bias state indicating first additional binary signal corresponding to said obtaining characteristic potential, means coupled to said first additional binary signal producing means and to said phase shift specifying means for comparing said first additional binary signal with said binary signal corresponding to the desired bias condition at said diodes to achieve a predetermined phase shift, and indicating means connected to said comparing means to provide a warning indication upon the sensing of a lack of correspondence between said binary signal and said first additional binary signal.



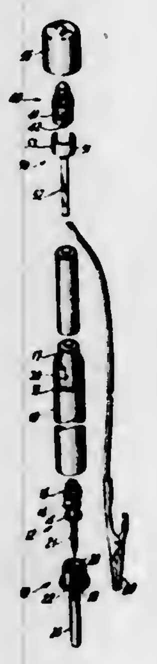
4,005,362
ELECTRICAL CIRCUIT CONTINUITY TESTER

Samuel S. Fortino, 24 Lisa Drive, Dix Hills, N.Y. 11746

Filed Jan. 26, 1976, Ser. No. 652,544

Int. Cl.² G01R *31/02, 1/06*

U.S. Cl. 324—51 **5 Claims**



1. An electrical circuit continuity tester of the battery employing type comprising:

a cylindrical tube of insulating material dimensioned radially and longitudinally to receive at least one standard battery;

a needle contact mounted in and extending from one end of said cylindrical tube forming a first probe;

a longitudinal slit communicating with the other end of said cylindrical tube and running longitudinally therefrom for a predetermined distance, said slit including at the closed end thereof a circumferential communicating portion;

a bulb having cylindrical and button electrodes;

a cylindrical-electrode clip circumferentially embracing at least 180° of the bulb arc electrode and including integral therewith a second probe, dimensioned to protrude through said longitudinal slit portion sliding longitudinally thereof and through said circumferential slit portion rotating circumferentially thereof, locking said bulb in position;

a spring for normally urging bulb-battery-probe contact.

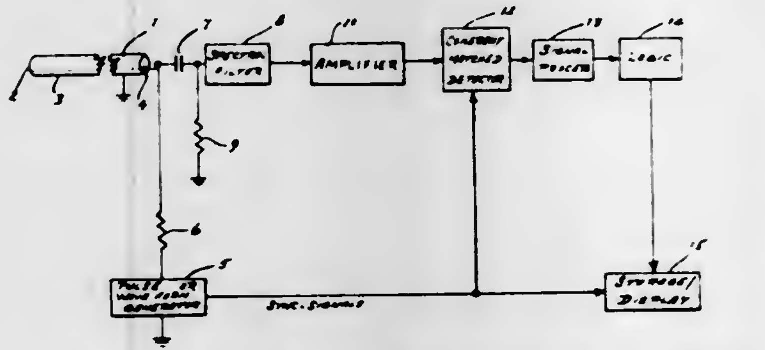
4,005,363
RANGE RESOLVING GROUND LINE SENSOR

Ralph W. Mifflin, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,932

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 B **3 Claims**



1. A range resolving ground sensor system to detect pressure, seismic, and acoustic changes in the earth, water and air and the range for each change of pressure, comprising a pressure sensitive-impedance change type line of a predetermined length incorporated in the earth, said line having first and second conductors, means to generate a predetermined time resolving waveform of bias voltage said time resolving waveform being of the time limited pulse type, said time resolving waveform being received by said first and second conductors for propagation down and back along said first and second conductors to provide a time history of the impedance changes as a function of distance along said first and second conductors, a detector receiving an amplitude and phase modulated signal output from said line representative of a pressure or disturbance change of said earth, said detector simultaneously receiving said predetermined time resolving waveform for synchronous purposes, means for displaying a visual sweep, said display means receiving a synchronizing signal from said means to generate said predetermined time resolving waveform for initiation of said visual sweep, said display means also receiving the detected signal to also be displayed on said visual sweep, the position upon said sweep of said detected signal being a measure of the range of the change of pressure or a disturbance along said line.

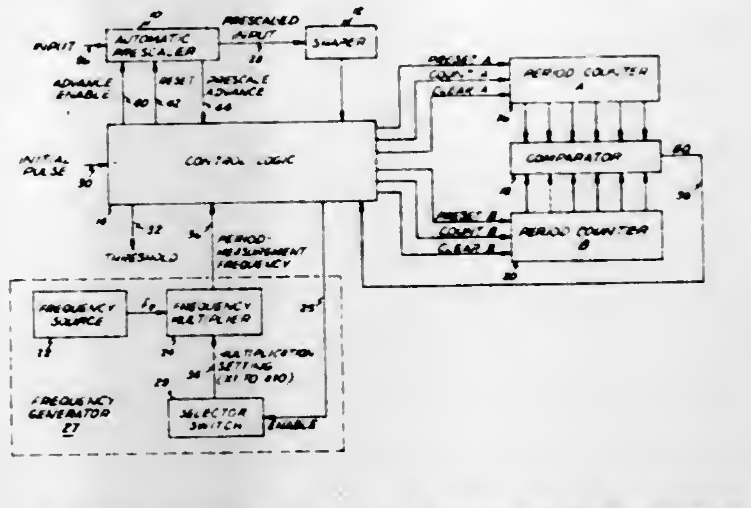
4,005,364
DIGITAL CIRCUIT FOR MEASURING RELATIVE FREQUENCY IN SEPARATE PULSE TRAINS

Timothy M. Harrington, Sierra Madre, Calif., assignor to MDH Industries, Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 524,368, Nov. 15, 1974, abandoned. This application June 21, 1976, Ser. No. 698,103

Int. Cl.² H03K *5/18;* **G01R** *23/10*

U.S. Cl. 324—79 D **14 Claims**



1. A digital circuit for measuring when and if the instantaneous frequency of a pulse train, by which is meant the reciprocal of the time between individual pulses in the same pulse train, bears a selected relationship to the maximum instantaneous frequency of a previous pulse train, comprising:

a. prescaler means having an adjustable scaling factor, which can be automatically varied such that the instantaneous frequency of the output pulse train from the prescaler in response to an input pulse train with a wide range of instantaneous frequencies is less than a predetermined maximum, and having storage for the value of said scaling factor so that the same scaling factor can be used with subsequent pulse trains;

b. frequency-generating means for generating pulses with a single repetition frequency selected from a multiplicity of possible frequencies;

c. digital period-measurement means for measuring and storing the value of the time interval between individual pulses produced at the prescaler-means output, said measurement using the frequency of the pulses produced at the output of the frequency-generating means;

d. comparator means for comparing the stored and measured values within the digital period-measurement means; and

e. control means for operating the prescaler means, frequency-generating means, digital period-measurement means, and comparator means in a first mode to determine a digital value representative of the maximum instantaneous frequency in a pulse train, and in a second mode to indicate when the instantaneous frequency in a subsequent pulse train bears a selected relationship to the maximum frequency determined in the first mode.

4,005,365
VOLTAGE COMPARATOR AND INDICATING CIRCUIT

Robert L. Berger; William H. Hailey, both of Kansas City; George Mallick, Jr., Ellisville; Donald H. Mannbeck, St. Charles, and Wilber J. Weight, Lee's Summit, all of Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,322

Int. Cl.² G01R *31/02, 19/14, 19/16*

U.S. Cl. 324—133 **7 Claims**

1. A device for comparing and indicating the polarity of voltages with respect to a reference range about a reference voltage, which comprises:

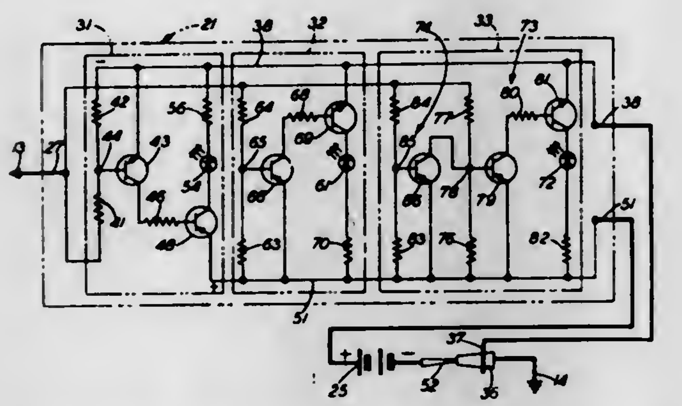
means for supporting electrical circuit elements;

an input terminal located on the supporting means;

a reference terminal located on the supporting means;

a first circuit means, including a first indicator element located on the supporting means and coupled to the input terminal and to the reference terminal, for sensing and indicating the presence at the input terminal of a voltage applied to the input terminal which is at least as positive as a first voltage value, the first voltage value being positive with respect to the reference voltage applied at the reference terminal;

a second circuit means, including a second indicator element located on the supporting means and coupled to the input terminal and to the reference terminal, for sensing and indicating the presence at the input terminal of a voltage applied to the input terminal which is at least as negative as a second voltage value, the second voltage value being negative with respect to the reference voltage applied at the reference terminal; and



a third circuit means, including a third indicator element located on the supporting means and coupled to the input terminal and to the reference terminal for sensing and indicating the presence at the input terminal of a voltage applied to the input terminal which falls within the reference range, the reference range encompassing the first and the second voltage values.

4,005,366

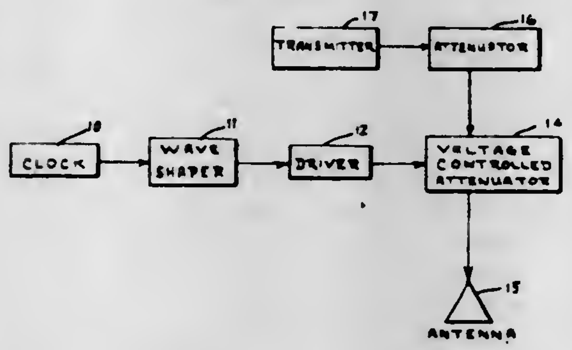
SYSTEM TO SIMULATE MOTION AND PLASMA INDUCED SIGNAL VARIATIONS FROM REENTRY VEHICLES

Joseph L. Poirier, Chelmsford, and David H. Tropea, Brocton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1975, Ser. No. 605,578

Int. Cl.^{2} G09B *9/02*

U.S. Cl. 325—67 **3 Claims**



1. A system to simulate motion and plasms induced variations in the attenuation of signals transmitted from a reentry vehicle being comprised of means to generate RF power for transmission, a voltage controlled attenuator having first and second inputs and an output, a transmitting antenna connected to said output of said voltage controlled attenuator, fixed attenuator means interconnecting said means to generate RF power and said first input of said voltage controlled attenuator to provide a predetermined magnitude of RF power to said voltage controlled attenuator to simulate attenuation due to range and average reflection loss due to plasma, clock means providing a predetermined output waveform and having a frequency corresponding to the spin rate of said reentry vehicle, wave shaping means to modify the predetermined clock output waveform to produce a voltage waveform whose amplitude as a function of time duplicates the fast cyclical variations attributable to said reentry vehicle, driver means interconnecting the wave shaping means and said second input of said voltage controlled amplifier to provide additional predetermined wave shaping to include polarization effects and to establish predetermined bias levels to control the instantaneous level of said voltage controlled attenuator and thus the RF power radiated from said transmitting antenna.

4,005,367

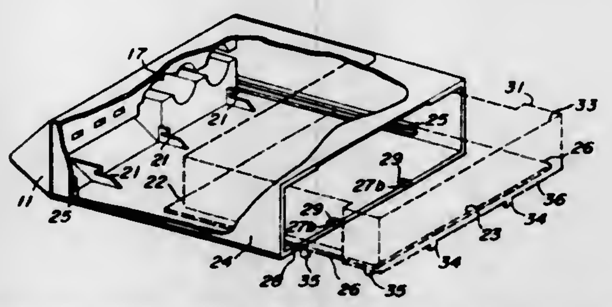
MOBILE TRANSCEIVER HOUSING ASSEMBLY

Arnold Vincent Dano, Park Ridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1975, Ser. No. 627,988

Int. Cl.^{2} H04B *1/08*

U.S. Cl. 325—352 **8 Claims**



1. An improved housing arrangement for mobile electronic apparatus having a resilient housing, a printed circuit board, a frame for supporting the printed circuit board and a multiplicity of electro-mechanical components including rotary controls, the arrangement comprising:

locking tabs integrally formed on the support frame;

first support means integrally formed on the interior of the housing for positioning and locking the printed circuit board;

second support means integrally formed on the interior of the housing for mating with and supporting the rotary controls; and

locking means integral with the housing for receiving and locking the locking tabs of the support frame into the housing.

4,005,368

MEMORY TUNING SYSTEM WITH AUTOMATIC TWO SPEED DISPLAY

Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 5, 1976, Ser. No. 646,720

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—455 **11 Claims**

1. A television tuning system including:

counting means, generating sequential channel numbers for tuning all channels;

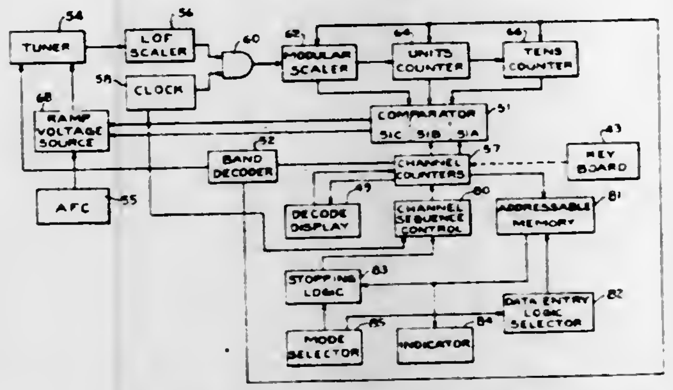
read/write memory means coupled to said counting means accessed by said generated channel numbers and having a plurality of addressable locations for storage and recall of signals related to selected channel numbers;

mode selection means coupled to said counting means and said memory means for establishing a program mode for storage of said signals and an operate mode for recall from said memory means of said signals to cause tuning to channels corresponding to the addresses of individual locations of said memory means;

clock means producing timing pulses at regular intervals;

counting pulse means coupled to said clock means generating counting pulses at two distinct predetermined rates; and

channel skip control means, coupled between said counting pulse means and said counting means and responsive to said signals in said memory means, in said operate mode, for increasing the counting speed of said counting means from the slower to the faster of said rates whenever non-selected channel numbers are generated by said counting means and for decreasing the counting speed of said counting means from the faster to the slower of said rates whenever selected channel numbers are generated by said counting means.



4,005,369

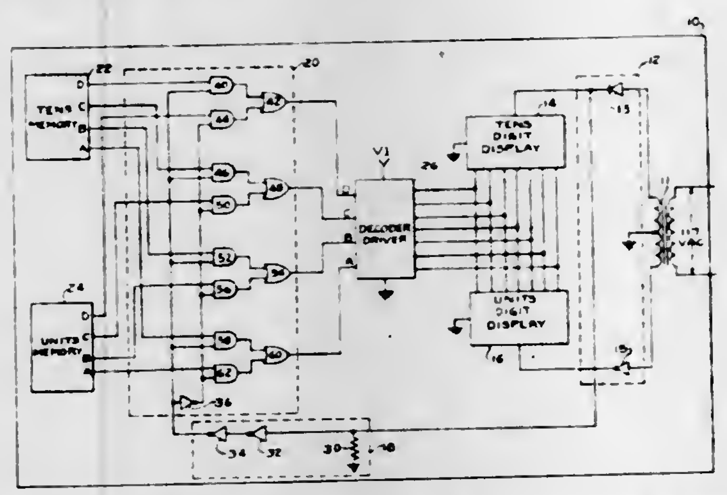
AC LINE MULTIPLEXING FOR A MULTI-DIGIT DISPLAY SYSTEM

Wilbert Parisoe, Highland Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,562

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—455 **5 Claims**



1. In a television receiver deriving power from a single phase source of AC line voltage, a multi-digit display system comprising:

a pair of display devices corresponding to the tens and units digits of two digit channel numbers;

circuit means including rectification means utilizing the positive and negative portions of said single phase AC line voltage to generate two half-wave rectified AC timing voltages 180° out-of-phase for selective activation of said two display devices;

a source of digital information; and

multiplex means coupled to said source of digital information for supplying said digital information in synchronism with the activation of individual ones of said tens and units display devices.

4,005,370

POWER SUPPLY MEANS FOR MAGNETRON

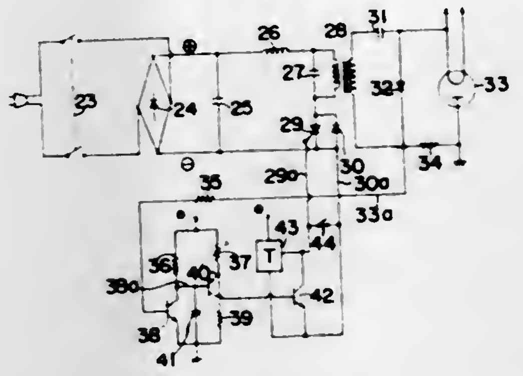
Shigeru Kusunoki, Yamato-Koriyama; Teruhisa Takano, Osaka; Hirofumi Yoshimura, Nara, and Noboru Kurata, Yamato-Koriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 2, 1975, Ser. No. 609,727

Claims priority, application Japan, Sept. 10, 1974, 49-104495; Sept. 10, 1974, 49-104496; Dec. 3, 1974, 49-139316; Dec. 3, 1974, 49-139317

Int. Cl.^{2} H03K *1/12*

U.S. Cl. 328—267 **9 Claims**



1. Magnetron power supply means for supplying converted AC power to a magnetron from a source of AC power comprising:

a. rectifying means connected to said AC power source for rectifying said AC power to DC power;

b. frequency converting means having at least one set made up of a resonant circuit and at least one thyristor switching circuit, and which frequency converting means is connected to said rectifying means;

c. a step-up transformer having the primary side thereof connected to said resonant circuit;

d. said magnetron being connected to the secondary side of said step-up transformer;

e. an energizing transformer having the primary side connected to said AC power source and the secondary side connected to said magnetron for heating said magnetron;

f. a power regulator including an adjustable reference circuit and coupled to said frequency converting means for controlling the power produced from said frequency converting means to a predetermined amount established by said adjustable reference circuit; and

g. signal generating means coupled in said magnetron power supply means for generating a signal having a value proportional to the value of said converted AC power supplied to said magnetron, and having the output coupled to said power regulator for supplying said signal to said power regulator for controlling said power regulator for increasing the power produced from said frequency converting means when said signal is below the reference level determined by said adjustable reference circuit and decreases said power when said signal is above said reference level.

4,005,371

BIAS CIRCUIT FOR DIFFERENTIAL AMPLIFIER

Masayuki Hongu, Komae, and Masahiro Tada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,215

Claims priority, application Japan, July 19, 1974, 49-83069

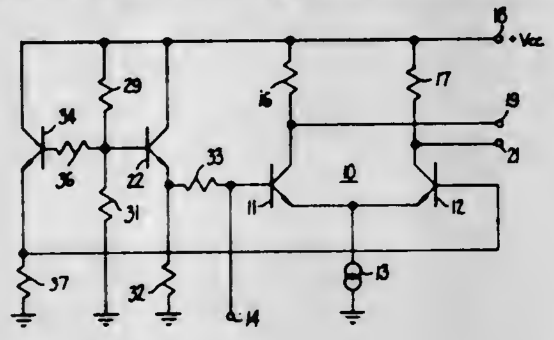
Int. Cl.^{2} H03F *3/45*

U.S. Cl. 330—30 D **5 Claims**

1. A circuit comprising:

A. a differential amplifier comprising first and second differentially connected transistors, each having an input electrode, said input electrode of said first transistor comprising a signal input terminal for said differential amplifier;

B. a first emitter-follower bias circuit and first resistance means connecting said bias circuit to said input electrode of said first transistor;
C. a second emitter-follower bias circuit connected to said input electrode of said second transistor;
D. first means for supplying a first predetermined bias voltage to a base circuit of said first emitter-follower bias circuit;

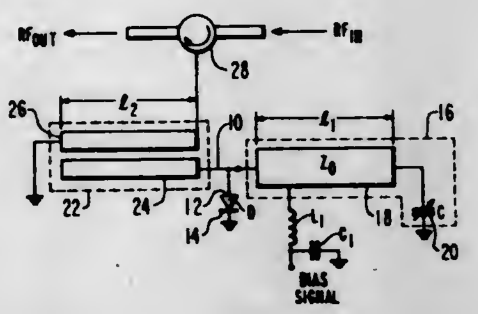


E. second means comprising second resistance means for supplying a second predetermined bias voltage to a base circuit of said second emitter-follower bias circuit; and
F. means for deriving an output terminal from said differential amplifier.

4,005,372

FREQUENCY TUNABLE MICROWAVE APPARATUS HAVING A VARIABLE IMPEDANCE HYBRID IDLER CIRCUIT

Pang-Ting Ho, Lawrenceville, and Arye Rosen, Camden, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Jan. 26, 1976, Ser. No. 652,162
Int. Cl.^{2} H03F *3/10*
U.S. Cl. 330—34 **8 Claims**

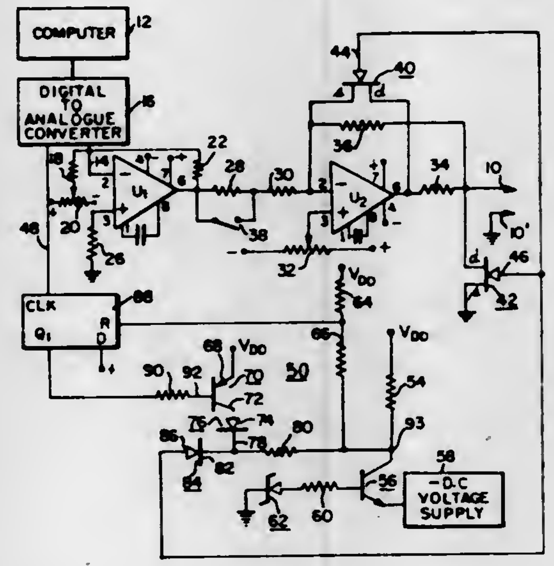


1. A broad-band frequency tunable microwave apparatus of the type including a transmission line, a semiconductor element in said line for generating, in response to a threshold signal, a microwave signal having fundamental, second and third harmonically related frequency components, means for applying said threshold signal to said semiconductor element, and output means to provide a substantially resistive impedance electrically connected to said semiconductor element for transmitting a signal component at the second harmonic frequency to a terminating load impedance, wherein the improvement comprises:
- a variable input impedance idler circuit connected in parallel with said semiconductor element including a distributed transmission line having a predetermined characteristic impedance serially connected to a lumped variable capacitor connected to ground, said input impedance of said idler circuit being substantially reactive and determining the fundamental and harmonic frequencies of said apparatus,
- said fundamental frequency and its harmonics being tunable over a selected frequency range by changing the input circuit impedance of said idler circuit by varying the capacitance of said variable capacitor,
- whereby said apparatus provides said microwave signal to said terminating load impedance only at said second harmonic frequency throughout the tunable frequency range.

4,005,373

TRANSIENT ELIMINATION CIRCUIT

Emery Salesky, Denville, and Kent W. Luehman, Parsippany, both of N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 14, 1976, Ser. No. 676,847
Int. Cl.^{2} H03F *1/14*
U.S. Cl. 330—51 **2 Claims**



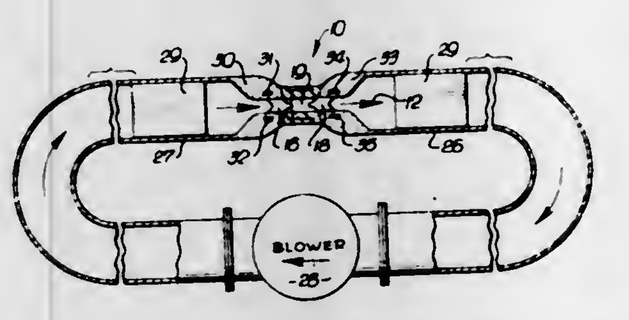
1. In a direct current amplifier comprising in combination a first operational amplifier having at least one input and an output, a second operational amplifier having an inverting input, a non-inverting input and an output, means providing a direct current path having a predetermined resistance between the output of said first operational amplifier and the said inverting input of said second operational amplifier, a first output terminal, a first resistor connected between said output of said second operational amplifier and said output terminal, a second resistor connected between said inverting input terminal of said second operational amplifier and said output terminal, a first junction field effect transistor having source, drain and gate electrodes, said source electrode being connected to said inverting input of said second operational amplifier and said drain electrode being connected to said output of said second operational amplifier, a source of reference potential, a second output terminal connected to said source, a second junction field effect transistor having source drain and gate electrodes, said source electrode being connected to said first output terminal and said drain electrode being connected to said second output terminal, circuit means having an input and an output, a direct current connection between said output and said first and second gate electrodes, said circuit means responding to a given voltage at its input to produce zero volts at its output and responding to a different voltage at its input to produce a voltage other than zero at its output.

4,005,374

PULSED GAS LASER WITH LOW-INDUCTANCE FLOW-THROUGH ELECTRODES

Jeffrey I. Levatter, Palo Alto, and Shao-Chi Lin, La Jolla, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.
Filed Mar. 31, 1975, Ser. No. 563,713
Int. Cl.^{2} H01S *3/097, 3/22*
U.S. Cl. 331—94.5 PE **13 Claims**

1. A low inductance discharge electrode assembly for an electrically pumped pulsed electrical discharge laser having an optical axis, including in combination:
- a set of blade shaped upstream electrodes;
- a set of blade shaped downstream electrodes;
- means for mounting said upstream electrodes in parallel spaced relation substantially perpendicular to said optical axis to form an upstream electrode array;
- means for mounting said downstream electrodes in parallel spaced relation substantially perpendicular to said optical axis to form a downstream electrode array;
- means for mounting said arrays on opposite sides of said optical axis with a discharge space therebetween including spaced electrical insulator plates defining opposite walls of said discharge space and providing electrical insulation between said arrays, with said upstream electrodes having trailing sections and said downstream electrodes having leading sections projecting into said discharge space toward each other and spaced from said insulator plates, with ionization occurring between said trailing and leading sections;
- means for directing a gas flow through said upstream array, said discharge space, and said downstream array including an electrically conducting upstream tube with opposing generally flat surfaces and an electrically conducting downstream tube with opposing generally flat surfaces;



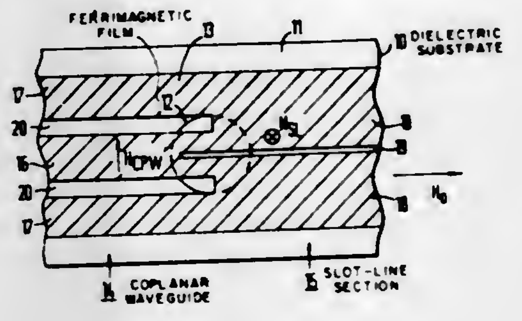
- said blade shaped electrodes having a length-to-thickness ratio of at least 10 to 1, where the length is measured along the gas flow path;
- an electrical insulator overlying said tubes;
- a first electrical conducting sheet on the corresponding flat surfaces of said upstream and downstream tubes and the insulating plate therebetween;
- a second electrically conducting sheet on the flat surfaces of said upstream and downstream tubes and the insulating plate therebetween opposing said first sheet; and
- means for connecting an electrical pulse power supply across said arrays to provide electrical discharges between said upstream and downstream electrodes across said discharge space.

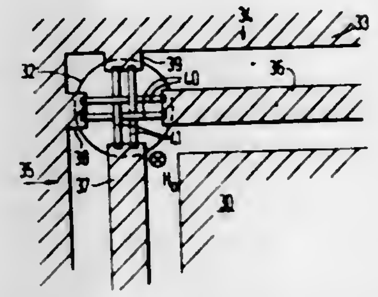
4,005,375

DEVICE INCLUDING FERRIMAGNETIC COUPLING ELEMENT

Robert D. Pringle, and Ian F. Morton, both of Edinburgh, Scotland, assignors to Microwave and Electronic Systems Ltd., Newbridge, Scotland
Filed Dec. 9, 1974, Ser. No. 531,124
Claims priority, application United Kingdom, Dec. 7, 1973, 56944/73
Int. Cl.^{2} H01P *1/16, 5/00, 5/08*
U.S. Cl. 333—21 R **16 Claims**

1. A radio frequency coupling device comprising a non-magnetic, dielectric, single crystal substrate; a film of single crystal ferrimagnetic material epitaxial with said substrate and located at a substrate surface essentially co-planar therewith; first and second surface-oriented transmission line sections formed on said substrate surface and having respective end portions thereof overlying said ferrimagnetic film, said film of ferrimagnetic material when subjected to a biasing direct magnetic field serving to couple the magnetic fields of such first and second surface-oriented transmission line sections, said end portions being terminated to present an RF discontinuity therebetween which prevents significant mutual coupling directly between said first and second transmission line sections, and said end portions cooperating with said ferrimagnetic film in the presence of said biasing magnetic field to couple thereto and establish a reciprocal RF coupling between said first and second transmission line sections at a frequency dependent on said biasing magnetic field.

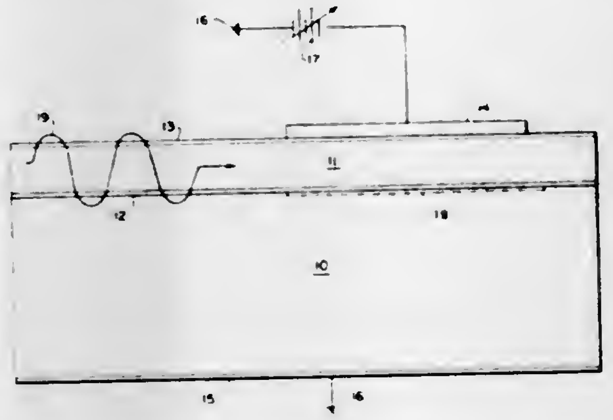




4,005,376

ELECTRONICALLY VARIABLE SURFACE ACOUSTIC WAVE PHASE SHIFTER

Kenneth L. Davis, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 15, 1976, Ser. No. 677,191
Int. Cl.^{2} H03H *9/30*; H01L *41/08, 29/76*
U.S. Cl. 333—30 R **5 Claims**



1. An electrically variable surface acoustic wave phase shifter which comprises:
- a substrate formed of a semiconductor material and having an upper and lower face;
- a bottom electrode covering the bottom face of said substrate;
- a thin film of electrically insulating material on the upper face of said substrate;
- a layer of piezoelectric material deposited onto said thin film of insulating material on said substrate;
- an upper electrode electrically connected with and covering a portion of said piezoelectric layer; and
- a variable voltage source for applying a dc bias connected between said upper electrode and said bottom electrode.

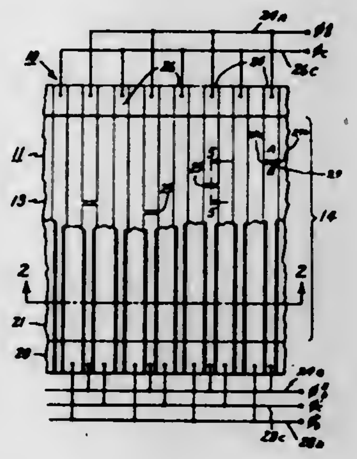
4,005,377
CONDUCTIVITY COUPLED SPLIT CAPACITOR SIGNAL PROCESSING DEVICE AND APPARATUS THEREFOR

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,414

Int. Cl.² H03H *7/28*; **H01L** *29/78, 29/10*; **H03K** *25/02*

U.S. Cl. 333—70 T **8 Claims**



1. A transversal filter comprising
a substrate of one conductivity type semiconductor material,
a plurality of electrodes insulatingly overlying said substrate and forming therewith a plurality of stages of a charge transfer shift register, one electrode of each of said stages being split into a first and a second part with a gap therebetween, a region of opposite conductivity type underlying a portion of each of said gaps to couple electrically the pair of storage regions underlying the first and second parts of respective ones of said electrodes,
a first clock line connected to said first parts of said one electrodes,
a second clock line connected to the second parts of said one electrodes,
means for applying phase related voltages to each of the stages of said shift register to effect transfer of charge from stage to stage, the same phase related voltage being applied to said first and second clock lines.

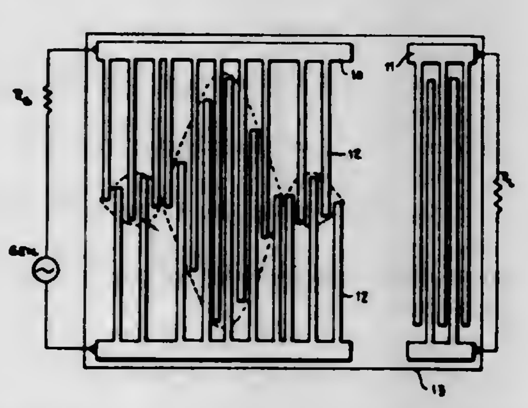
4,005,378
SURFACE ACOUSTIC WAVE FILTER

Andrew J. Slobodnik, Jr., Malden, and Kenneth R. Laker, Arlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1975, Ser. No. 635,005

Int. Cl.² H03H *9/04, 9/26, 9/32*; **H01L** *41/10*

U.S. Cl. 333—72 **2 Claims**



1. A surface acoustic wave filter transducer having $4(f_o\tau)+2$ interdigital fingers and finger overlap coefficients $H_n[N]$ determined by the equation

$$H_o[N] = \left\{ \frac{\sin\pi BN/2f_o}{\pi N/2f_o} + \frac{2K\cos\pi BN/2f_o}{K^2+(\pi N/f_o)^2} - \frac{(2\pi N/f_o)\sin\pi BN/2f_o}{K^2+(\pi N/f_o)^2} \right\} \left\{ \frac{I_o[W_o]\sqrt{\tau^2-(N/2f_o)^2}}{I_o[W_o\tau]} \right\}$$

wherein N is the number of gaps between interdigital fingers τ is the filter time length parameter, f_o is the filter center frequency, B is the filter bandwidth, K is the transistor bandwidth fall off parameter, I_o is a modified Bessel function of the first kind and zero order and W_n is the ripple reduction parameter.

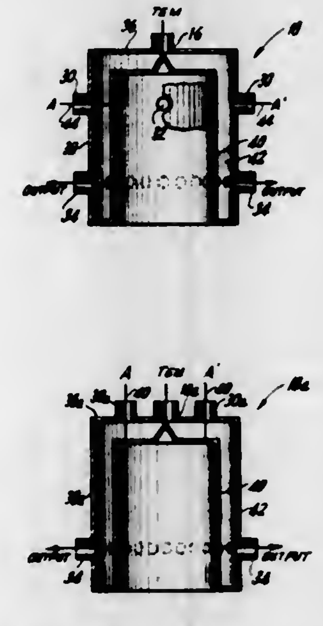
4,005,379
R.F. POWER DISTRIBUTION NETWORK FOR PHASED ANTENNA ARRAY

David S. Lerner, Fanwood, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 4, 1975, Ser. No. 628,469

Int. Cl.² H01P *5/12, 7/06*

U.S. Cl. 333—6 **5 Claims**



1. An r.f. power distribution network comprising a source of an r.f. input signal, means for dividing said input signal into a first signal and a second signal, a cavity resonator having first and second inlet port means, means for respectively applying said first and second signals to said first and second inlet port means, said cavity resonator being in the form of a first generally cylindrical member having a first annular upper wall and a first circumferential wall depending from said first annular upper wall, a second generally cylindrical member disposed within said first cylindrical member, said second cylindrical member having a second upper annular wall within said first cylindrical member and substantially parallel to said first annular wall and a second circumferential wall depending therefrom and coaxial with said first circumferential wall, the diameter of said second circumferential wall being the greater part of the diameter of said first circumferential wall, and wall means for connecting the ends of said first and second circumferential walls remote from said first and second upper walls, said first inlet port means being centrally formed on one of said upper walls, and said second inlet port means comprising a plurality of ports formed on one of said first upper wall and said first circumferential wall, and a plurality of spaced outlet ports arranged about the periphery of said first circumferential wall and axially spaced from said first and second inlet ports.

4,005,380
CLIP-ON INDUCTIVE PULSE PICK-UP

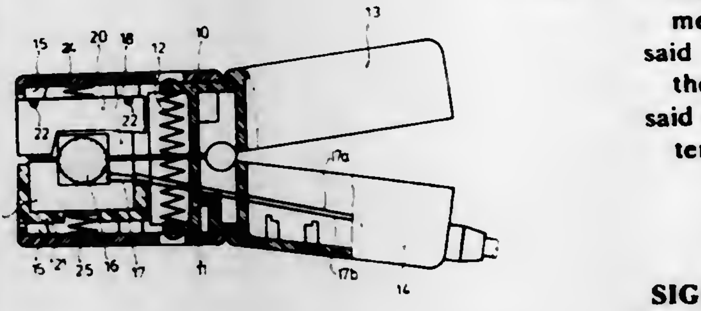
Wolfgang Hellmann, Weinstadt; Kurt Groetzner, and Bernhard Frohnwieser, both of Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 19, 1976, Ser. No. 687,748

Claims priority, application Germany, June 12, 1975, 2526302; Feb. 20, 1976, 2606868

Int. Cl.² H01F *15/04, 27/26*

U.S. Cl. 336—84 **5 Claims**



1. A clip-on inductive pulse detector for detecting current pulses in an electric conductor and generating a trigger pulse in response thereto, comprising a pair of clip jaw shells provided with clip-opening handles, a hinge, a first spring arranged to move the jaw shells together, a ferrite core in two separate halves mounted respectively in recesses in said respective jaw shells, said core halves being shaped so as to fit together and to surround an electric conductor when said jaw shells are closed thereover, and a winding provided on said ferrite core having leads for connection to an electrical circuit, and also comprising the improvement wherein:
at least one of said core halves (18, 19) is mounted with a compression spring (24 and/or 25) held between it and the jaw shell in which it is mounted and is movable against said compression spring by the force of said first spring (12) when the jaw shells (10, 11) are closed together.

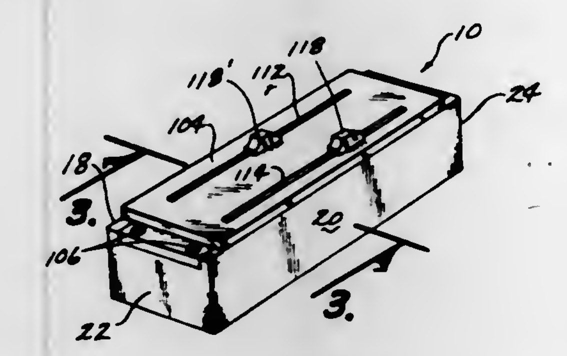
4,005,381
SLIDE POTENTIOMETER

Robert F. Klug, Hemet, Calif., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed June 9, 1975, Ser. No. 585,092

Int. Cl.² H01C *10/00*

U.S. Cl. 338—119 **9 Claims**



1. A slide potentiometer comprising,
an elongated housing having opposite ends, a bottom, an interior compartment and an open upper end communicating with said interior compartment,
a flat support member positioned in said interior compartment and having opposite sides and opposite ends,
an elongated resistance means on one side of said flat support member,
an elongated collector means on said one side of said flat support member parallel to and spaced from said resistance means,
first and second terminals electrically connected to the opposite ends of said resistance means,
a third terminal electrically connected to said collector means,
a wiper block slidably mounted in said interior compartment and having first and second electrically connected wiper elements in slidable electrical contact with said resistance means and said collector means respectively,
said wiper block having an actuator member extending upwardly therefrom,
a cover means secured to said housing upper end and having an elongated slot formed therein which receives said actuator member extending therethrough,
and means for maintaining said wiper elements in electrical contact with said resistance means and said collector means respectively,
said housing bottom having an elongated slot formed therein,
said flat support member having a lower end portion extending downwardly through said elongated slot.

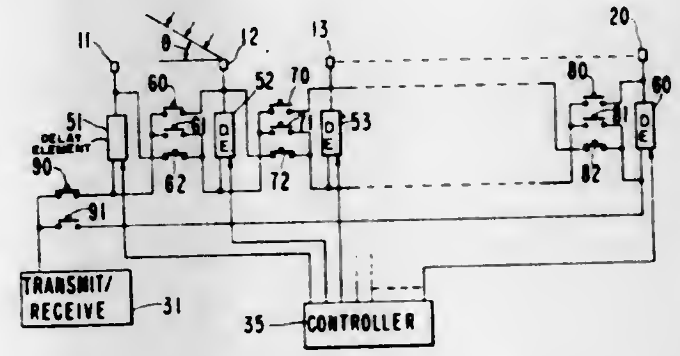
4,005,382
SIGNAL PROCESSOR FOR ULTRASONIC IMAGING

William L. Beaver, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 7, 1975, Ser. No. 602,700

Int. Cl.² G01S *9/66, 3/80*

U.S. Cl. 340—1 R **7 Claims**



1. An ultrasonic imaging system comprising first and second electromechanical transducer elements, first and second electronic variable delay elements, each delay element having an input terminal and an output terminal, said first transducer element being connected to said input terminal of said first delay element and said second transducer element being connected to said input terminal of said second delay element, and switching means for selectively providing electrical connection between either said output terminal of said second delay element and said input terminal of said first delay element, or said output terminal of said first delay element and said input terminal of said second delay element, or said output terminal of said second delay element and said output terminal of said first delay element.

4,005,383
CATACOUSTIC NAVIGATING SYSTEM

Phillip R. Anderson, Ellicott City, and Robert P. van Eepoel, Catonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

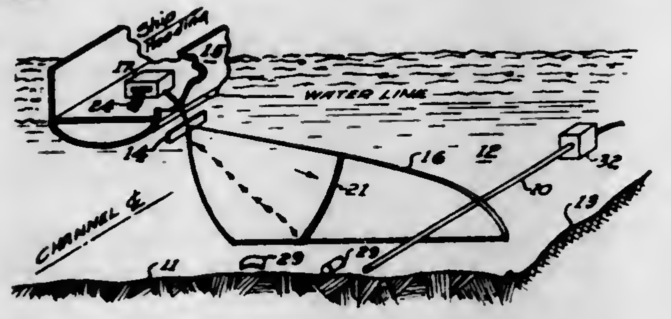
Filed Feb. 12, 1960, Ser. No. 8,471

Int. Cl.² G01S *9/66*

U.S. Cl. 340—3 R **1 Claim**

1. A channel defining system for aiding the navigation through a body of water of a vessel equipped with a high resolution pulsed catacoustic system adapted to scan the bottom in range abeam of the vessel comprising
an elongated buoyant ridge-like strip of acoustic reflecting material extending lengthwise of the channel on the channel bottom and laterally spaced from the center line of

the channel by a substantially constant known distance, and



anchoring weights secured to said strip at spaced positions along its length.

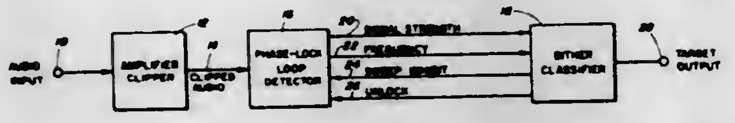
4,005,384
VEHICLE DETECTOR

Cabell N. Pryor, Jr., Silver Spring, Md.; Edward Hug, McLean, Va., and Michael H. Stripling, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1970, Ser. No. 8,158

Int. Cl.² G08B *13/00*

U.S. Cl. 340—15 **9 Claims**



1. A motor vehicle detector comprising:
means for amplifying and clipping an audio input signal,
means for locking onto and tracking prominent spectral components of said audio input signal,
said locking and tracking means including
means for producing a first signal representing the signal-to-noise ratios of said prominent spectral components,
means for producing a second signal representing the frequency fluctuations of said prominent spectral components; and
classifying means coupled to said locking and tracking means for producing a detected target output only if said first and second signals possess a selected temporal relationship.

4,005,385
PATTERN RECOGNITION MACHINE FOR ANALYZING LINE ORIENTATION

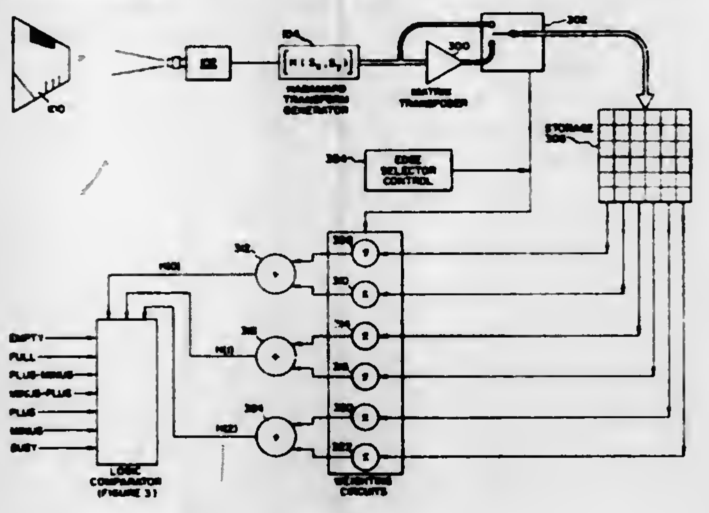
Reuben E. Joynson, Alplaus; Joseph L. Mundy, Schenectady, both of N.Y., and Ranan Banerji, Philadelphia, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed June 23, 1975, Ser. No. 589,432

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 AE **22 Claims**

1. A machine for classifying peripheral pattern characteristics in two dimensional scene data, comprising in combination:
means responsive to electrical signal representative of two dimensional scene data and for producing therefrom a zeroth-coefficient signal representative of a one dimensional Hadamard transform coefficient of sequency zero from data patterns along a peripheral segment of said scene data, a first-coefficient signal representative of a one dimensional Hadamard transform coefficient of sequency one from data patterns along said peripheral scene segment, and a second-coefficient signal representative of a one dimensional Hadamard transform coefficient of sequency two from data patterns along said peripheral scene segment; and
a logic means connected for comparing the values of said zeroth-coefficient signal, said first-coefficient signal, and said second-coefficient signal with a plurality of signals of known value and for producing therefrom pattern classification signals representative of the data patterns in said peripheral scene segments.



4,005,386
CLEARING SYSTEM

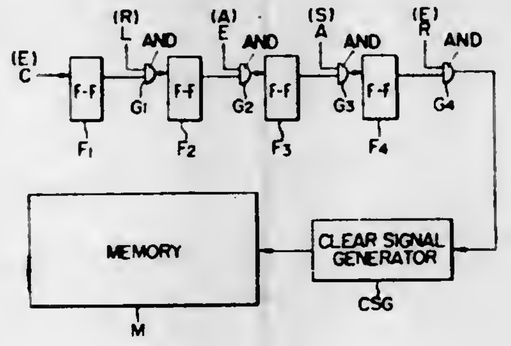
Mitsuaki Seki, Tokyo, and Tamotu Nakazawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,420

Claims priority, application Japan, May 21, 1974, 49-56935; May 12, 1975, 50-56999

Int. Cl.² G08F *7/38*; **G06F** *1/00*

U.S. Cl. 340—172.5 **8 Claims**



1. A memory clearing system comprising:
a keyboard having a plurality of keys;
a memory;
logic means coupled to said keyboard and responsive only to the depression of preselected ones of said keys in a predetermined order for producing a corresponding output signal; and
clear signal generating means coupled to said logic means and to said memory for generating a clear signal operative to clear the contents of said memory in response to said output signal.

4,005,387
COMPUTER CONTROL SYSTEM

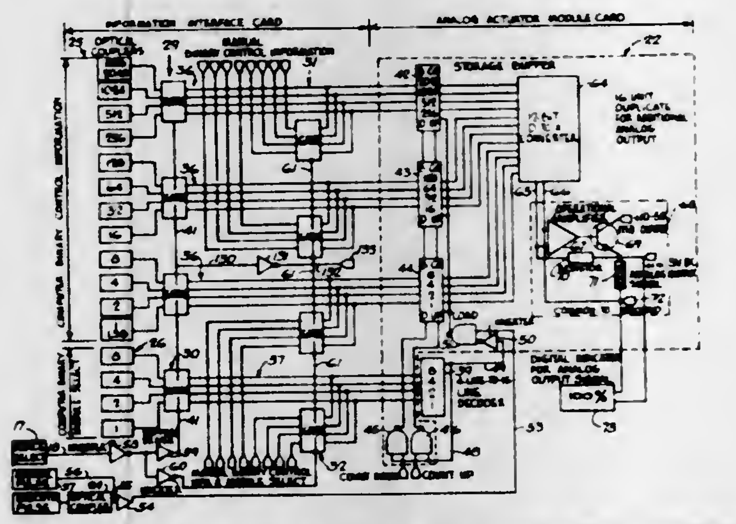
William M. Herring, Campton Township, Kane County, and Dennis B. Walling, Darien, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 514,495, Oct. 15, 1974, Pat. No. 3,968,487. This application Dec. 22, 1975, Ser. No. 643,350

Int. Cl.² G06F *15/46, 3/00*

U.S. Cl. 340—172.5 **16 Claims**

1. A computer control system, useful at a local area to translate digital control information from an online computer located at a remote area into operations of devices of process equipment at the local area and useful to translate digital control information provided by manual operation of an entry station at the local area, which comprises:
an information interface means including:
first gate means comprising a first set of gates, each gate having a first input and a second input and an output, said first inputs of said first set of gates being connectable to a first set of bits of a digital information output channel of a bus connected to the computer and at least some of these bits connected to additional systems, that are at the local area or at another area containing another process equipment and that are constructed to receive and use digital information from the computer;
second gate means comprising a second set of gates, each gate having a first input and a second input and an output, said first inputs of said second set of gates being connectable to a second set of bits of the digital information output channel of the bus connected to the computer and at least some of these bits connected to these additional systems;
first inverter means comprising a first inverter having an input and an output, said input being connectable to one output of a number of mutually exclusive outputs of a decoder/demultiplexer of device selector means that has the data inputs of the decoder/demultiplexer connected to a third set of bits of the digital information output channel of the bus to provide at that output of the decoder/demultiplexer a signal when particular digital information is placed on the third set of bits by the computer to select said system, instead of another system, to use digital information placed on the first and second sets of bits, and said output of said first inverter being connected to said second inputs of said first set of gates and of said second set of gates;



third gate means comprising a third set of gates, each gate having a first input and a second input and an output, said first input being connectable to a different output of a first set of outputs of a manually-operated entry station to provide digital information to said first inputs of said third set of gate means;
fourth gate means comprising a fourth set of gates, each gate having a first input and a second input and an output, said first inputs being connectable to a different output of a second set of outputs of the entry station to provide digital information to said first inputs of said fourth set of gates;
second inverter means comprising a second inverter having an input and an output, said output of said second inverter being connected to said second inputs of said third set of gates and of said fourth set of gates; and decoder/-demultiplexer means comprising a decoder-demultiplexer having a number of data inputs, each connected to a different output of the gates of said second set of gates and to a different output of said fourth set of gates to provide at one of its number of mutually exclusive outputs a signal, that output being dependent upon the digital information provided at the data inputs of said decoder/demultiplexer of said decoder/demultiplexer means;
a number of actuator modules, each actuator module including:
storage buffer means having a set of data inputs corresponding in number to the number of outputs of said gates of said first set of gates, a corresponding number of data outputs and a load input, said storage buffer means being constructed to load and retain at said data output signals, corresponding to the data input signals of said storage buffer means, as a result of a signal to said load input of said storage buffer means, and each of said data inputs of said storage buffer means being connected to a different one of said outputs of said first set of gates and also connected to a different one of said outputs of said third set of gates;
gate means including:
a gate having a first input and a second input and an output, said output being connected to said load input of said storage buffer means; and
an inverter having an input and an output, said output being connected to said first input of said gate of said actuator module and said input being connected to one output of said decoder/demultiplexer of said decoder/demultiplexer means, and said input of said inverter of each actuator module being connected to a different output of that decoder/demultiplexer; and
means connected to at least one of said data outputs of said storage buffer means and responsive to the signals at said outputs of said storage buffer means to operate at least one device of the process equipment when there is a change in the signal provided to that device by at least one of said data outputs of said storage buffer means;
means to transmit an execute pulse to said second input of said gate of each actuator module, said means being connectable to another bit of the digital information output channel of the bus, that bit being connected to all other systems that are connected to at least some of the first set of bits and connected to at least some of the second set of bits of the digital information output channel of the bus, said additional bit having placed on it said execute pulse by the computer during the time that the first and second sets of bits have placed on them digital information by the computer; and
switch means to provide a manual pulse when momentarily closed, said switch means being connected to said second input of said gate of each actuator module,
said second inverter means providing a signal at the output of said second inverter to said second inputs of said third and fourth sets of gates to open those gates only when said output of said first inverter does not provide a signal to said second inputs of said first and second sets of gates that opens said first and second sets of gates.

4,005,388
HAND-HELD INTERACTIVE TERMINAL

Richard E. Morley, Greenville, and George G. Schwenk, Nashua, both of N.H., assignors to Termiflex Corporation, Nashua, N.H.

Continuation of Ser. No. 417,827, Nov. 21, 1973, abandoned. This application July 31, 1975, Ser. No. 600,575

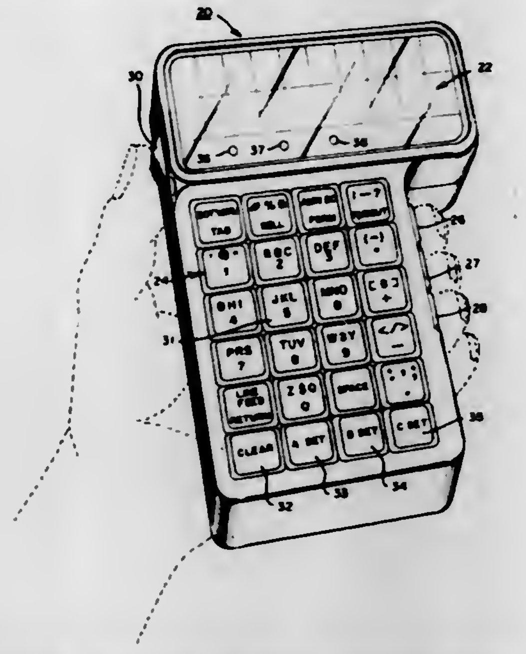
Int. Cl.² G06F *3/02, 3/04, 3/14*; **G08C** *1/00*

U.S. Cl. 340—172.5 **32 Claims**

1. An interactive terminal, for communication with external data processing means, comprising:
A. an alpha-numeric display for visually presenting data received and transmitted;
B. a data memory communicating with said display for storage of at least a portion of information received and transmitted;
c. an information entry keyboard operable by the user's first hand wherein each of a plurality of said keys represents the transmission of "*n*" different information levels, "*n*" being an integer greater than 1;

d. at least "*n–l*" shift level control keys simultaneously operable by the user's second hand for selecting the desired information level for transmission of all "n" information levels;

e. information transmission means communicating with said keyboard and said shift level control keys for transmitting selected keyboardinformation to at least said external data processing means;



f. information receiving means communicating with said external data processing means and said data memory for receipt of information; and

g. housing means dimensioned for the palm of the user's second hand having a front face dimensioned for mounting said keyboard, and at least one side dimensioned for mounting said shift level control keys;

whereby the fingers of the user's second hand select desired shift level control keys and the user's first hand selects desired keys of the information entry keyboard.

4,005,389

ARRANGEMENT FOR REDUCING THE ACCESS TIME IN A STORAGE SYSTEM

Hans-Joerg Penzel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

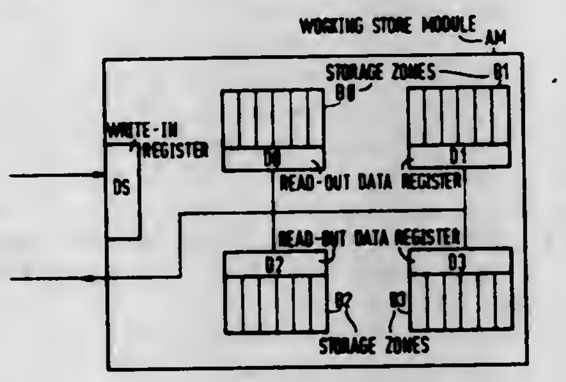
Filed Sept. 17, 1974, Ser. No. 506,839

Claims priority, application Germany, Sept. 21, 1973, 2347632

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **3 Claims**



1. An arrangement for reducing the access time in a storage system, which system comprises a working store including store modules, by intermediately storing a plurality of items of data read out from the working store, said arrangement comprising:

a plurality of storage zones in each of said store modules which can be read out independently of one another;

a plurality of read-out data registers each assigned to a respective storage zone; and

a common write-in register assigned to all storage zones of a store module.

4,005,390

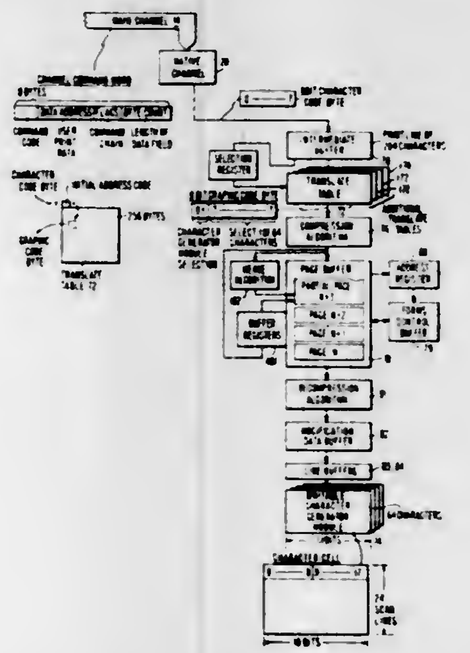
MERGER AND MULTIPLE TRANSLATE TABLES IN A BUFFERED PRINTER

Gerald I. Findley, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,994

Int. Cl.² G06F *3/12, 7/32, 13/00*

U.S. Cl. 340—172.5 **19 Claims**



1. An arrangement for printing lines of characters in response to sequentially occurring lines of coded data, each line of coded data including a command, comprising:

data storage means having a plurality of storage locations therein, each storage location being capable of storing a line of coded data;

selecting means for selecting a particular one of the storage locations of the data storage means to receive the sequentially occurring lines of coded data, the selecting means being responsive to the commands of the sequentially occurring lines of coded data to continue to select the previously selected storage location in response to a first type of command and to advance to and select the next storage location in response to a second type of command from the first type;

means responsive to each of the sequentially occurring lines of coded data for merging the line of coded data with any line of coded data already in the storage location selected by the selecting means in accordance with a predetermined algorithm, said means for merging including means for comparing portions of the line of coded data with portions of any line of coded data already in the storage location and means responsive to the means for comparing for recording selected ones of the compared portions in accordance with the results of the comparison; and

means responsive to the lines of coded data in the storage locations of the data storage means for printing characters represented by the coded data in each line.

4,005,391

PERIPHERAL INTERRUPT PRIORITY RESOLUTION IN A MICRO PROGRAM DATA PROCESSOR HAVING PLURAL LEVELS OF SUBINSTRUCTION SETS

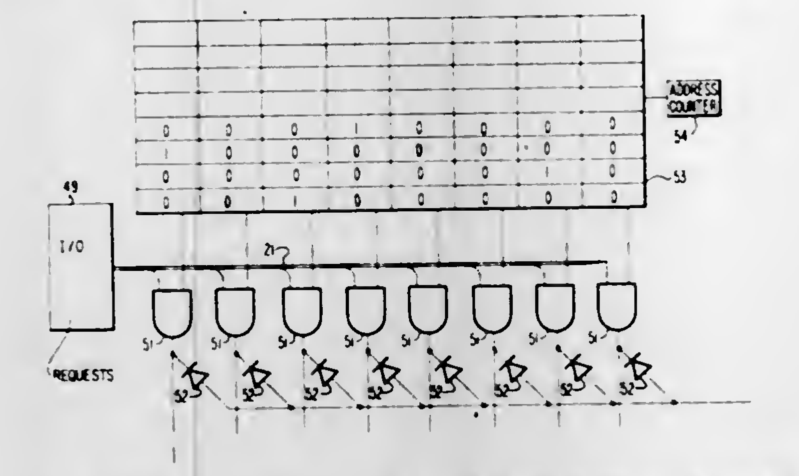
Alastair George MacPherson, Linlithgow, West Lothian, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed June 6, 1975, Ser. No. 584,359

Claims priority, application United Kingdom, Jan. 7, 1975, 512/75

Int. Cl.² G06F *9/18*

U.S. Cl. 340—172.5 **9 Claims**



1. A data processing system having a first memory, a plurality of peripheral devices each having a service request line and a processor, said processor comprising:

a function unit to perform logical operations on data;

a control memory coupled to said function unit and containing control instructions to control data transfers to and from said function unit;

micro instruction fetch means coupled to said first memory to fetch a sequence of micro instructions;

control instruction fetch means coupled to said micro instruction fetch means and to said control memory to fetch individual control instructions in response to the respective micro instructions;

priority resolution means connected to said service request lines, said function unit and said first memory to receive sets of signals from said first memory for comparison by said function unit with all of said service request line signals, each set of signals from said first memory indicating that only one particular peripheral divice is to be serviced; and

signal fetch means coupled to said first memory, said control memory and to said priority resolution means to fetch said sets of signals in a sequence, said sequence representing priority levels of the respective peripheral devices from the highest priority to the lowest priority, said sequence fetching being under control of a control instruction.

4,005,392

METHOD AND APPARATUS FOR DETECTING AND RECORDING ABNORMAL CONDITIONS IN THE OPERATION OF SPINNING MACHINES

Takeaki Akatsuka; Akinori Kato; Teiryo Kojima; Sinji Inaba, all of Otsu, and Kohichi Higashino, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,712

Claims priority, application Japan, Aug. 2, 1974, 49-88683; Aug. 2, 1974, 49-88686; Aug. 2, 1974, 49-88687

Int. Cl.² G06F *3/04, 3/14, 11/06*

U.S. Cl. 340—172.5 **7 Claims**

1. A method of controlling spinning machines comprising the steps of:

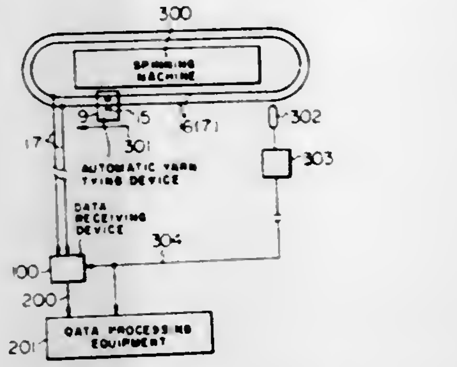
providing at least one rail and transmission lines around a plurality of spinning machines in blocks;

circulating at least one working machine having a detector along said rail for monitoring the running conditions of said spinning machines;

detecting said running conditions of each spinning machine by said detector and transmitting a first information signal having unique characteristic portions indicative of the nature of possible abnormal conditions of each spinning machine in accordance with the detected signals through said transmission lines;

receiving said information signal at a remote central station having data receiving and registering means and a data processor;

generating a second information signal having unique characteristic portions indicative of the nature of abnormal



conditions of spinning machines in accordance with the first signal and registering successively said characteristic portions of said second signal into registers;

reading the contents of registers into said data processor successively during one cycle of monitoring operations only when an interrupt signal, indicating that the occurrence of an abnormal condition, is generated;

tabulating the data thus read in the data processor, and;

updating the data in a memory in the processor each time said working machine moves once around the spinning machines.

4,005,393

BIPOLAR SEMICONDUCTOR MEMORY WITH RECHARGING CIRCUIT FOR CAPACITIVELY LOADED LINES

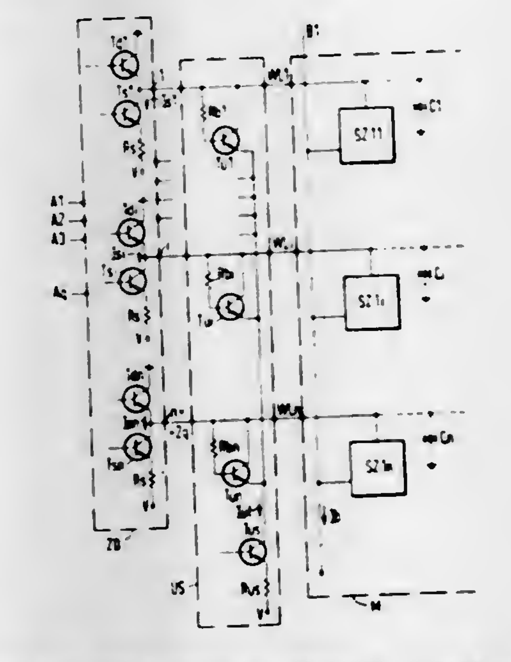
Reinhard Schuerba, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 4, 1975, Ser. No. 583,690

Claims priority, application Germany, June 26, 1974, 2430784

Int. Cl.² G11B *11/40*; **G11C** *7/00*

U.S. Cl. 340—173 FF **2 Claims**



1. A bipolar semiconductor memory system comprising:

a word organized memory including a plurality of memory cells arranged in a matrix of columns and rows, a plurality of bit lines each connected to each memory cell of a

respective column, and a plurality of word lines each connected to each memory cell of a respective row, said memory cells constituting a capacitive load connected to said lines;
a decoder for receiving address signals for selecting memory words, said decoder including a plurality of emitter follower output switches each connected to a respective word line; and
a recharging circuit connected to each word line of said memory, said recharging circuit including a common constant current generator for said word lines, and a plurality of coupling circuits each connecting a respective word line to said constant current generator, each of said coupling circuits comprising a diode structure connected between a respective word line and said common constant current generator.

4,005,394
HOLOGRAPHIC STORAGE DEVICE

Horst Kiemle, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany, DT

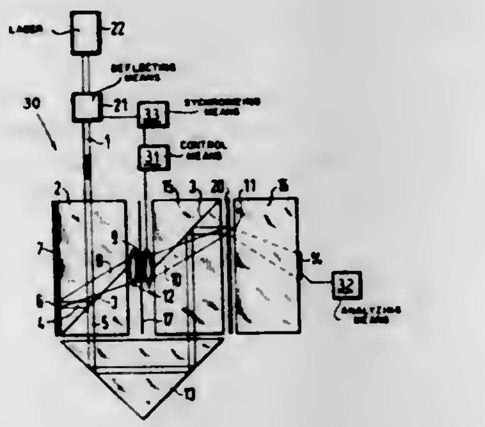
Filed Mar. 20, 1974, Ser. No. 453,067

Claims priority, application Germany, Mar. 29, 1973, 2315776

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² G11C *13/04*

U.S. Cl. 340—173 LM **10 Claims**



1. A device for recording information in a holographic storage and for retrieving the information from the storage, comprising at least one transparent body having flat rectangular surfaces, a storage medium positioned adjacent a flat surface of said one body, a source providing a beam of coherent illumination directed through said one body onto the storage medium, means selectively deflecting the beam onto different portions of the storage medium; a retrodirective mirror positioned to receive the beam passing through the storage medium, an illumination hologram containing a plurality of subholograms positioned to be in the path of the beam from the retrodirective mirror, a detector matrix spaced from the storage medium, and a modulator matrix disposed adjacent a surface of said one body opposite said storage medium, said modulator matrix being associated with a condensing optical system for receiving an illuminating beam reconstructed by the redirected beam impinging on a sub-hologram of the illumination hologram and focusing an object beam created from the illuminating beam by the modulator matrix onto the storage medium to record a hologram thereon.

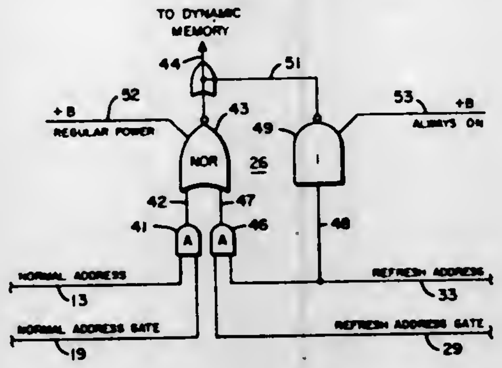
4,005,395
COMPATIBLE STANDBY POWER DRIVER FOR A DYNAMIC SEMICONDUCTOR

Dick E. Fosler, Jr., and Thomas L. Krocheski, both of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,541

Int. Cl.² G11C *7/00*

U.S. Cl. 340—173 DR **10 Claims**



10. In a dynamic semiconductor memory system of the type having a matrix comprised of rows and columns of dynamic semiconductor memory elements, row address driving means for generating address representing signals indicative of a row in said matrix, column address driving means for generating address representing signals indicative of a column in said matrix, the improvement comprising X column address driver circuits including
a. a high power driving gate adapted to be connected to a source of normal interruptible power;
b. a low power driving gate adapted to be connected to a source of always-on power;
c. means for logically combining the output terminals of said high power driving gate and said low power driving gate;
d. means for selectively applying normal or refresh address representing signals to the input of said high power driving gate; and
e. means for also connecting said refresh address representing signals to the input of said low power driving gate, whereby an output is produced at the output of said column address driver circuit even in the absence of said normal interruptible power.

4,005,396
DIGITAL DISPLACEMENT SENSOR WITH ZIGZAG COILS

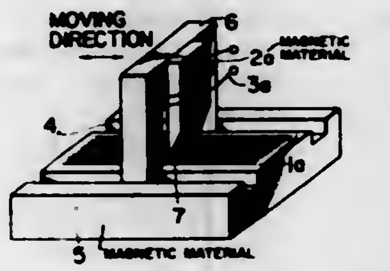
Hideo Fujiwara, Tachikawa; Yukio Ichinose, Kokubunji; Kazuo Ichino, Hamura; Isamu Orita, Kokubunji; Yasutaro Uesaka, Hachioji; Michiyasu Itoh, Kodaira, and Hisashi Thuruoka, Oume, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 18, 1974, Ser. No. 524,867

Claims priority, application Japan, Nov. 16, 1973, 48-128903; Dec. 24, 1973, 48-143479; Dec. 24, 1973, 48-143480

Int. Cl.² G08C *9/04, 19/28*

U.S. Cl. 340—196 **12 Claims**



1. A digital displacement sensor comprising:

a substantially flat plate made of magnetic material;
a plurality of sensing coils disposed adjacent one another on said plate, each coil having alternate concave and convex portions, the pitches of the alternate concave and convex portions of adjacent sections of each coil differing from those of adjacent coils; and
a moving element displaceable in a direction parallel to said sensing coils and including a magnetic head, an edge of which is positioned adjacent to but spaced apart from said coils, and a coil wound around said head which is supplied with a high frequency current.

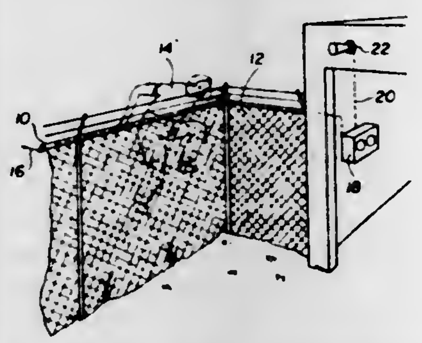
4,005,397
FENCE ALARM

Raymond Blair, Brentwood, N.Y., assignor to International Fence Alarm Corporation, Sayville, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,413

Int. Cl.² G08B *23/00*

U.S. Cl. 340—223 **4 Claims**



1. An alarm for detecting the surmounting of a fence or other vertical barrier, said alarm comprising plural pulse-emitting switches strategically located in supported relation along said fence so as to cause the transmission of an electrical pulse in response to a vibratory movement of said fence, a stepping switch having circumferentially spaced plural contacts including a starting contact and successively encountered vibration-detecting contacts electrically connected to be operated by said transmitted pulses so as to be urged through movement from said starting contact into contact with said successively encountered vibration-detecting contacts, said stepping switch also having an electrically operated reset coil for being returned to said starting contact from a position at any one successively encountered vibration-detecting contact in response to an electrical pulse transmitted to said reset coil, a timer electrically connected to pulse said reset coil to cause the positioning of said stepping switch at said starting contact at each conclusion of a successive timing interval of operation of said timer, an alarm electrically connected to be selectively operated by said transmitted pulses, and a rotary switch having cooperating contacts in substantial relation therewith as said successively encountered contacts are related to said stepping switch, said rotary switch being electrically connected in circuit-completing interposed position between said stepping switch and said alarm so that said circuit therebetween is completed only when said stepping switch and said rotary switch are each at cooperating corresponding circuit-completing contacts, whereby an imposed condition for operation of said alarm is the completion of said circuit as provided by the selection of a rotary switch contact within said timing interval of said timer, and thus a condition contributing to minimal false alarms.

4,005,398
METHOD OF DETERMINING THE DRIVER'S SUFFICIENT ALERTNESS TO DRIVE A MOTOR VEHICLE SAFELY

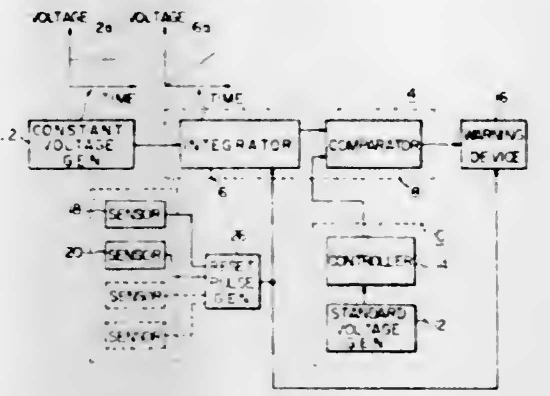
Naohiko Inoue; Takayuki Yanagishima, both of Yokohama; Hiromichi Nakamura, Yokohama, and Noburu Fukasawa, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 19, 1975, Ser. No. 559,922

Claims priority, application Japan, Apr. 16, 1974, 49-41749

Int. Cl.² G08B *21/00*

U.S. Cl. 340—279 **3 Claims**



1. A method of determining driver's alertness and warning the driver when his alertness falls below a preselected level while driving a vehicle, which comprises the steps of:
generating a first signal having a preselected constant potential;
integrating the first signal with respect to time;
generating a second signal which is a standard potential indicative of a minimum allowable limit of the driver's degree of alertness;
comparing the magnitudes of the integrated first and the second signals;
warning the driver when the magnitude of the integrated first signal exceeds that of the second signal; and
sensing the driver's sufficient alertness for safe driving to reset the integrating and to stop the warning.

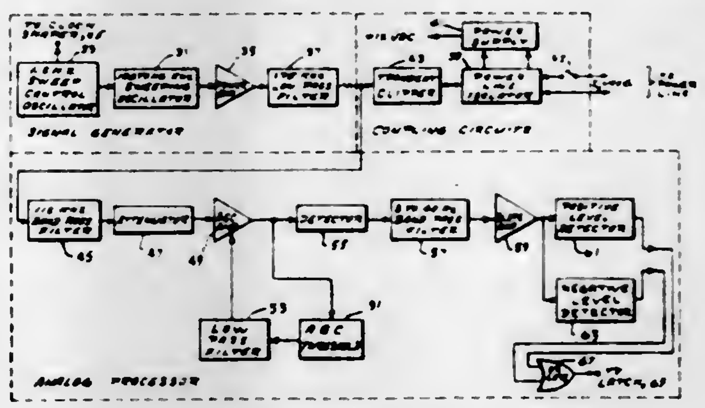
4,005,399
IMPEDANCE SENSITIVE POWER LINE INTRUSION ALARM SYSTEM

Vytautas V. Pazemenas, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 14, 1975, Ser. No. 550,091

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 R **2 Claims**

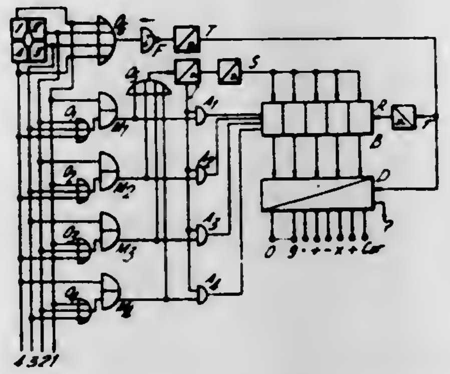


1. A system for transmitting an alarm through a power line upon detection of an alteration of impedance thereon, comprising:
a. a time control means;
b. a sweeping oscillator fed by the output of the time control means;

c. a power line;
d. means for altering the impedance on the power line upon an intrusion, the impedance altering means being connected to the power line;
e. means for coupling the sweeping oscillator to the power line, including
  2. a transient clipper connected to the output of the sweeping oscillator for protecting same, and
  2. a power line isolator fed by the output of the transient clipper, the isolator being connected to the power line;
f. an automatic gain control circuit connected to the transient clipper;
g. an envelope detector fed by the output of the automatic gain control circuit for extracting an intrusion signal;
h. a slope amplifier whose output is a function of the slope of the intrusion signal fed by the output of the envelope detector;
i. a positive detector for detecting positive slopes of the signal pulses and fed by the output of the slope amplifier;
j. a negative detector for detecting negative slopes of the signal pulses and fed by the output of the slope amplifier;
k. an OR gate fed by the output of the positive detector and the negative detector;
l. a latching flip-flop fed by the output of the OR gate and reset by the time control means;
m. an up/down counter fed by the output of the time control means for counting pulses therefrom, the direction of the up/down counter being controlled by the latching flip-flop;
n. a decoder circuit fed by the output of the up/down counter for recognizing a predetermined count in the up/down counter; and
o. an alarm system fed by the output of the decoder upon reaching the predetermined count in the up/down counter.

4,005,400
DATA ENTRY AND DECODING SYSTEM FOR SCRIPTED DATA

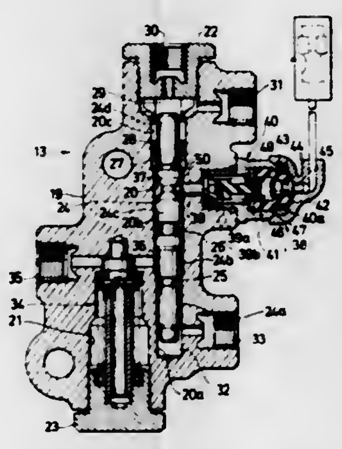
Jean Engdahl, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horologere Management Services S.A., Bienne, Switzerland
Filed Apr. 22, 1975, Ser. No. 570,453
Claims priority, application United Kingdom, Apr. 30, 1975, 18902/75
Int. Cl.^{2} G08C *1/00*
U.S. Cl. 340—365 R **9 Claims**



1. A data entry and decoding system comprising: a surface divided into a plurality of discrete electrically conducting zones electrically insulated from one another, an electric contact device for transmitting electric signals to said zones as said electric contact device is moved over said surface in a path forming a data character; logic circuit means connected to said zones for generating a sequence of multi-bit combinations of signals, each multi-bit combination of signals representing a zone contacted by said contact device as said contact device is moved over said surface to form said data character, and the position of each multi-bit combination in said sequence corresponding to the sequence in which said zones are contacted; storing means responsive to said logic circuit means and having means for storing said multi-bit combinations of signals in accordance with the sequence in which they are generated; and decoder means responsive to said storage means for generating a pattern of signals representing said data character.

4,005,401
ELECTRICAL SWITCH FOR A BRAKING FLUID PRESSURE FAULT ALARM DEVICE

Masakazu Ishikawa, Toyota; Takaaki Ota, Okazaki; Noriakira Ishigami, Chiryu, and Asao Kozakai, Anjyo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed May 21, 1975, Ser. No. 579,689
Claims priority, application Japan, May 22, 1974, 49-59071
Int. Cl.^{2} B60T *17/22*; H01H *35/38*
U.S. Cl. 340—52 C **9 Claims**

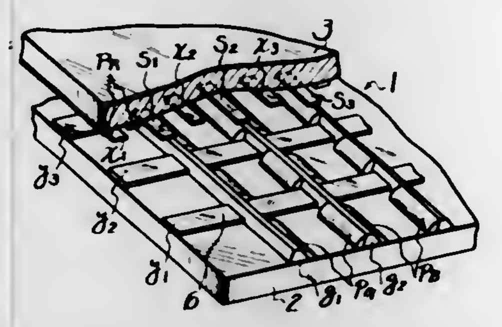


1. In a braking fluid pressure fault alarm device for a vehicular dual brake system, including a fluid control body having a cylindrical passageway defined therein, a piston slidably inserted in said cylinder and receiving a plurality of oppositely exerting braking fluid pressures, said piston adapted for sliding movement from an initial inoperative position to a second operative position in response to leakage of one of the braking fluid pressures, and an electric alarm circuit having alarm signal means for generating an alarm signal when said electric alarm circuit is deenergized, the improvement comprising:

an electric switch in engagement with said piston for being switched from a normal conductive condition to an actuated nonconductive condition in response to the sliding movement of said piston for deenergizing said electric alarm circuit, said electric switch including a switch body screwed into said fluid control body and being in electrical contact therewith, said switch body being formed with a stepped through bore having larger and smaller diameter portions; an annular plate-like support fixedly mounted in the larger diameter portion of said switch body and being in electrical contact therewith; an electrically insulating terminal holder fixedly mounted in the larger diameter portion of said switch body and having a recess facing said support; an electrically conductive plate disposed in the recess of said terminal holder; a terminal fixedly mounted in a central portion of said terminal holder, a first spring disposed in the recess of said terminal holder for biasing said plate into abutting engagement with said support and for providing electrical contact between said terminal and said plate; said first spring being weak; a plunger inserted in the smaller diameter portion of said switch body and having an electrically insulating end portion; and a second spring interposed between said plunger and said support and in a state of compression; said second spring being loaded at a preset level so as to bias said plunger in the direction away from said plate, whereby said plunger can be moved, in response to the sliding movement of said piston from an inoperative position to an operative position, toward said plate to bring its end portion into abutting engagement with said plate to thereby separate said plate from said support.

4,005,402
FLAT PANEL DISPLAY APPARATUS

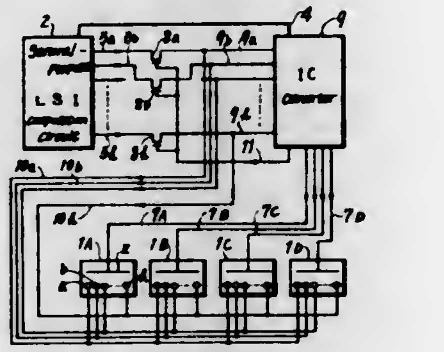
Yoshifumi Amano, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 9, 1975, Ser. No. 566,258
Claims priority, application Japan, Apr. 16, 1974, 49-42955
Int. Cl.^{2} H01J *17/48*
U.S. Cl. 340—324 M **12 Claims**



1. A flat panel display apparatus comprising: a first insulator plate, a second insulator plate, a plurality of first parallel electrodes attached to said first plate, a plurality of parallel barrier ribs mounted on said first plate over said plurality of first electrodes, said barrier ribs intersecting said first electrodes and projecting toward said second plate to define a plurality of parallel band spaces, a plurality of second parallel electrodes attached to said second plate, said second electrodes being parallel with said barrier ribs and positioned in said band spaces respectively, at least two different phosphors emitting different color lights, a first of said at least two different phosphors being mounted in a first position of a first band space, a second of said at least two different phosphors being mounted in a second position of a second band space which is different than a first position of said second band space corresponding to the first position in said first band space, the edges of said first and second plates being sealed, and a gas capable of glowing when charged between said first and second plates.

4,005,403
INFORMATION STORAGE AND FREQUENCY CONVERTER FOR LIQUID CRYSTAL DISPLAY

Isamu Washizuka, Kyoto, and Hirohide Nakagawa, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 28, 1975, Ser. No. 553,933
Claims priority, application Japan, Mar. 1, 1974, 49-24352
Int. Cl.^{2} G09F *9/32*
U.S. Cl. 340—336 **7 Claims**

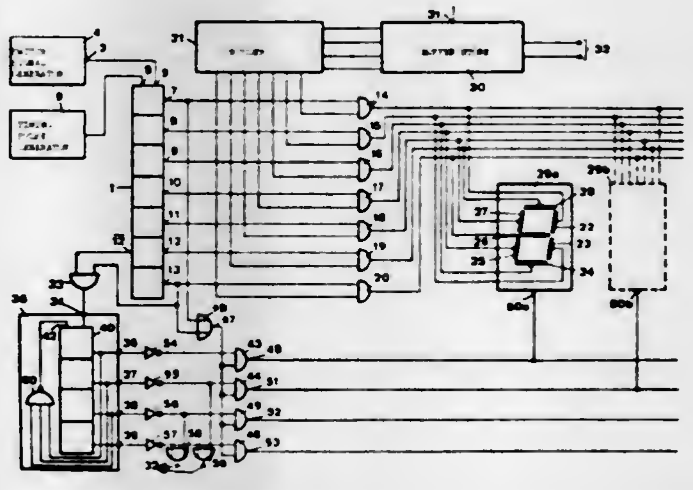


1. A liquid crystal drive network including a source of indication information, and a liquid crystal display unit having a common electrode and segment electrodes, the improvement comprising:

a converter for temporarily storing the indication information;
an input wire including a switching means for introducing the indication information to the converter; and
a wiring means for applying the stored information within the converter to the segment electrodes with the use of the input wires to the converter;
said wiring means including second switching means precluding application of stored information to said segment electrodes during introduction to said converter.

4,005,404
CIRCUIT FOR CONTROLLING A DISPLAY DEVICE

Lembit Soobik, Kranzberg, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 23, 1975, Ser. No. 625,357
Claims priority, application Germany, Oct. 29, 1974, 2451237
Int. Cl.^{2} G09F *9/32*
U.S. Cl. 340—336 **9 Claims**



1. Control circuit for a display device comprising a plurality of display segments selectively actuable to display desired characters, including segment actuation circuit means for producing output signals according to a character to be displayed, first control circuit means for producing in sequential time overlapping relation, a plurality of equal duration control signals equal in number to said plurality of segments, and means operably responsive to said control signals to supply said output signals to selectively actuate said segments in sequence to cause a display by said display device having the appearance of a complete character.

4,005,405
ERROR DETECTION AND CORRECTION IN DATA PROCESSING SYSTEMS

Joseph Thomas West, Boxborough, Mass., assignor to Data General Corporation, Southboro, Mass.
Filed May 7, 1975, Ser. No. 575,357
Int. Cl.^{2} G06F *11/10*
U.S. Cl. 340—146.1 AL **9 Claims**

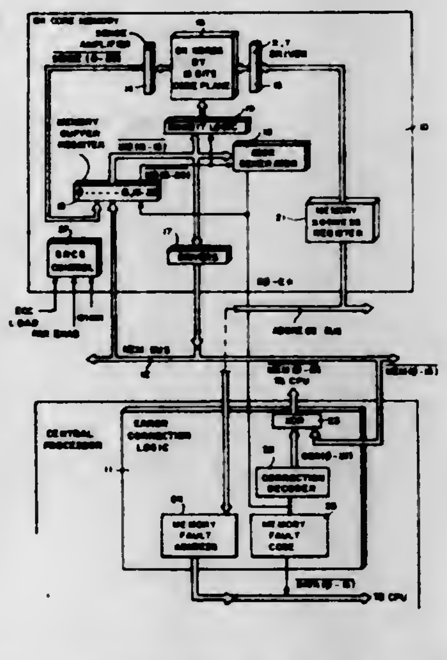
1. An error detection and correction system for use in a data processing system having at least one central processor unit and at least one memory unit, said error detection and correction system comprising

error coding means associated with each said memory unit for performing, during the write portion of a memory operating cycle, parity checks on a predetermined number of different, selected combinations of bits in each data word of said data processing system, each combination having the same total number of bits, said error coding means comprising
parity check means for providing a plurality of parity check bits, said parity check means performing odd parity checks on a first group of said predetermined number of selected combinations and even parity checks on a sec-

ond group of said predetermined number of selected combinations, each parity check bit being associated with one of said selected combinations;

means for forming an extended data word comprising the data bits of said data word and said parity check bits and for storing said extended data word in said memory unit;

said parity check means further performing, during the read portion of said memory operating cycle, parity checks on the same said predetermined number of selected combinations of bits of said extended data word, each said selected combination comprising the same selected combination of data bits as selected during said write portion and the parity check bit associated therewith, said parity check means performing odd parity checks on a first group of said predetermined number of selected combinations and even parity checks on a second group of said predetermined number of selected combinations, said odd and even parity checks thereby providing a plurality of error bits;



decoding means associated with said central processor unit responsive to said plurality of error bits for producing correction bits which identify the presence and location of a single bit error in said data word; and

means connected to said decoding means and responsive to the correction bits from said decoding means for correcting said single bit error in said data word.

4,005,406
DIGITAL-ANALOG CONVERTER

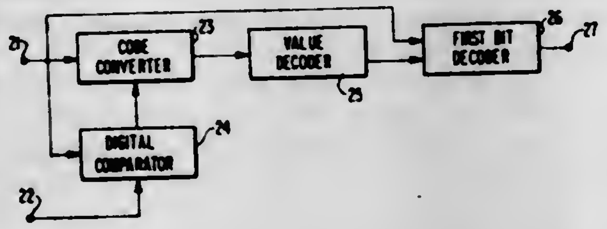
Haruo Kaneko; Yoshio Katagiri, and Kaoru Yano, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,859

Claims priority, application Japan, July 14, 1973, 48-79420

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 DA **8 Claims**



1. A digital-analog converter serving to improve quality in terms of noise by suppressing low level indicating digital input signals corresponding to analog amplitudes below a predetermined absolute value below which said low level indicating digital input signals are assumed to be uncertain but providing conversion of high level indicating digital input signals corresponding to analog amplitudes greater than said predetermined absolute value, said converter comprising:

means for detecting said low level indicating digital input signals corresponding to analog signals whose absolute amplitudes are smaller than said predetermined absolute value and for delivering a detection output signal upon detection of such low level indicating digital input signals, said predetermined absolute value being different from zero;

code converting means for converting said low level indicating digital input signals to a zero code signal when said detection output signal is delivered and, in the absence of said detection output signal, for delivering as the output signal thereof said high level indicating digital input signals corresponding to analog signals whose absolute amplitudes are larger than said predetermined absolute value; and

digital-to-analog converting means for converting the output digital signals from said code converting means into corresponding analog signals.

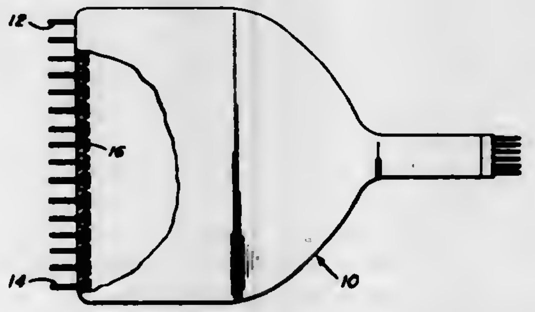
4,005,407
CATHODE RAY TUBE DIGITIZER

John D. Parks, Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1975, Ser. No. 575,855

Int. Cl.^{2} H03K *13/18*

U.S. Cl. 340—347 AD **7 Claims**



1. A CRT for digitizing a single valued function analog plot comprising:

a plurality of conductor means disposed along a single line across the inner surface of the tube face, against which an electron beam, inside the tube, impinges;

a corresponding number of electrodes protruding through the face of the tube, each electrode connected at an inward end thereof to respective conductor means, the electrodes individually transmitting digitized electrical signals to the exterior of the tube, when respective conductor means are impinged;

an encoding means connected to the outward ends of the electrodes which reduces the binary state of the electrodes by gating means to a digital output having binary bit positions fewer in number than the electrodes;

a first storage register connected between the electrodes and the encoding means for temporarily storing the outputs of the electrodes, prior to unloading to the encoding means;

a second storage register means connected to the output of the encoding means for temporarily storing the digital output thereof;

a clock means connected to the first storage means for sequentially unloading the register at a selected frequency;

a clock means connected to the second storage means for sequentially unloading the register at a frequency that is the same as the clock frequency of the first storage register; and

a means connecting the output of the second storage register to a computer for comparing three consecutive outputs from the second storage register to a look-up table in a digital computer which determines the corresponding point on the plot;

wherefore, the digitized electrical signals relate to points along the analog plot.

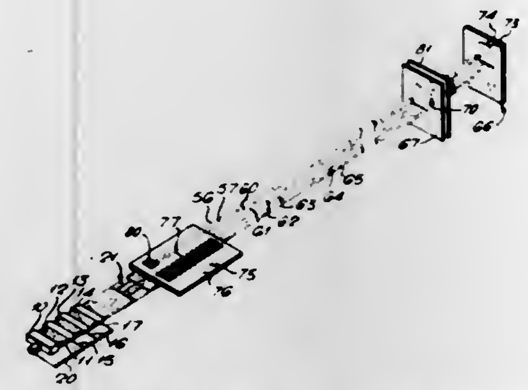
4,005,408
MULTIPLE ELECTRON BEAM ANALOG TO DIGITAL CONVERTER

George W. Taylor, Brielle, and Mortimer H. Zinn, Elberon, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1975, Ser. No. 620,686

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 P **7 Claims**



1. An electron beam analog signal to digitally coded electrical signal conversion device, comprising; a cathode for generating a sheet beam of electrons, a traveling wave electron beam deflection system spaced from said cathode and in alignment with said electron sheet beam for dividing said electron sheet beam into a plurality of separate electron beams and for selectively aligning said separate electron beams with the analog to digital signal conversion device, a traveling wave analog deflection system spaced from said time deflection system and in alignment with said separate electron beams for sweeping said beams through angles that are related to the analog signal, a target plate having a plurality of apertures formed therein, said apertures being aligned in columns, each of said columns being individual to a respective one of said separate electron beams, said columns and apertures corresponding to the digital code, and an electron beam semiconductor target array spaced from said target plate and in alignment with said target plate apertures to permit said target plate apertures to enable said separate electron beams to selectively pass through at least some of said target plate apertures in response to the analog signal and to impact on at least some of said electron beam semiconductors in said target array to produce a digital signal that corresponds to the analog signal.

4,005,409
MULTIPLE MODE INPUT ANALOG CONTROLLER HAVING STANDBY POWER SUPPLY AND ABSENCE-OF-INPUT SENSING

Mervyn L. Feuer, Los Angeles, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 10, 1975, Ser. No. 556,999

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 C **5 Claims**

1. A controller circuit comprising

a memory having an input and a plurality of outputs for generating digital signals;

digital-to-analog converting means responsive to the digital signals from the memory for converting the digital signals to an analog signal;

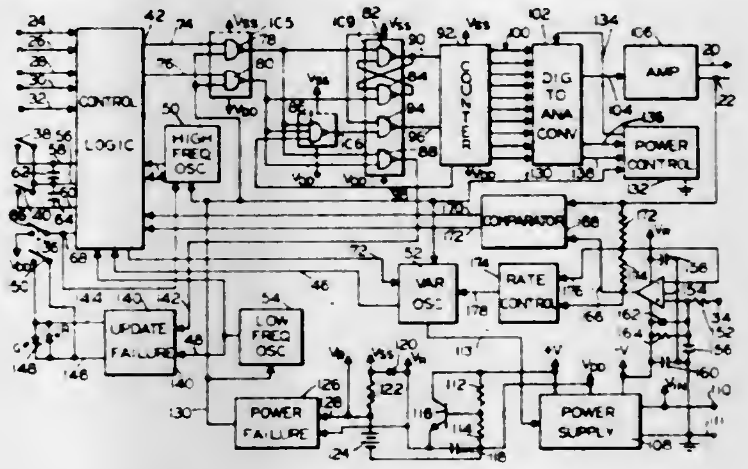
first digital input means responsive to digital input signals for incrementally changing the digital signals in the memory;

second digital input means responsive to digital input signals and including a first oscillator for changing the digital signals in the memory in proportion to the length of the digital input signal;

analog input means including a second oscillator generating a digital signal for changing the digital signals in the memory;

data gating means for selectively connecting one of the first digital input means, the second digital input means and the analog input means to the memory;

main power supply means for the memory, the digital-to-analog converting means, the data gating means, and the input means;



standby power means;

means responsive to failure of the main power means and energized by the standby power means for maintaining power to the memory means and the data gating means;

means operated by the power maintaining means for blocking current flow from the plurality of outputs of the memory; and

means operated by the power maintaining means for disabling input to the memory during failure of the main power supply means by inhibiting the operation of the data gating means, the input disabling means also disabling the first and second oscillators to minimize power drain on the standby power means.

4,005,410
ANALOGUE-TO-DIGITAL-CONVERTERS

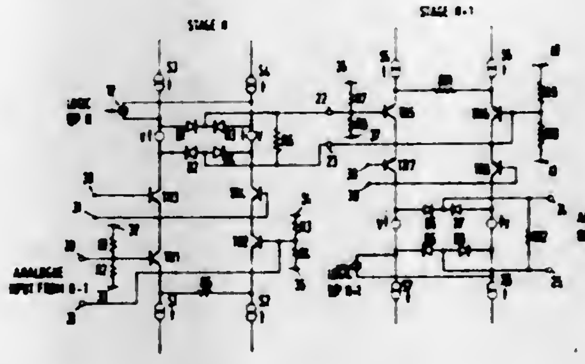
Peter Colin Michael, Newbury, and Paul Roderick Noel Kellar, Abingdon, both of England, assignors to Micro Consultants Limited, Surrey, England

Filed June 12, 1975, Ser. No. 586,445

Claims priority, application United Kingdom, June 15, 1974, 26613/74

Int. Cl.^{2} H03K *13/02*

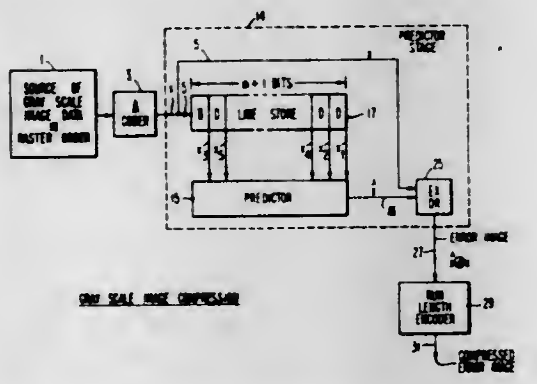
U.S. Cl. 340—347 AD **9 Claims**



1. In an analogue-to-digital converter including a plurality of stages in series, each stage including a full wave rectifier having rectifier arms and having two inputs and two outputs, each of said inputs receiving an analogue signal together with a constant current such that the full wave rectifier current

reverses direction when said analogue signal reaches a predetermined level as determined by said input constant current, the provision of temperature compensation means comprising voltage generators connected in series between the arms of said full wave rectifier to provide a voltage bias thereto of such magnitude and polarity that said level of reversal of the rectifier current will remain constant over a wide range of ambient temperatures, said voltage generators having a temperature coefficient of voltage corresponding in magnitude and acting in the same sense as the bridge rectifier arms to which they are connected, thereby to provide a stage bandwidth substantially constant with temperature.

4,005,411
COMPRESSION OF GRAY SCALE IMAGERY TO LESS THAN ONE BIT PER PICTURE ELEMENT
Thomas Harvey Morrin, II, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 30, 1974, Ser. No. 537,164
Int. Cl.² H03K *13/22*
U.S. Cl. 340—347 DD **6 Claims**



1. An apparatus for compressing an $m\times n$ array of delta coded points, the location of each point being defined as an ordered pair (i,j) for $1 \leq i \leq m$ and $1 \leq j \leq n$, comprising:

means (1,3) for generating delta coded values x of the array in row major order;

an exhaustive non-linear predictor stage (14) comprising a predictor (15–17) and a correlator (25), said predictor (15–17) being responsive to the delta coded values $\hat{x}$ from the generating means for predicting a value x at the array location (i,j) based upon previous values x_1,x_2,x_3 at corresponding locations $(i-1,j-1)$, $(i-1,j)$, $(i,j-1)$ according to the relation:

$$X = x_3x_2+x_3x_1+x_1x_2;$$

the correlator generating a value y correlating the acutal x and predicted values $\hat{x}$ according to the relation $y=x\oplus\hat{x}$; and

means (29) for variable length encoding runs of like consecutive values of y from the correlator.

4,005,412
APPARATUS FOR TRANSFERRING INFORMATION BETWEEN ELECTRONIC DISPLAY DEVICES AND MEANS FOR TRANSMITTING AND RECEIVING INFORMATION AND FOR SUPPLYING OPERATING CURRENT TO THE ELECTRONIC DISPLAY DEVICES
Bo Ingvar Leander, Tygelsjo, Sweden, assignor to Aktiebolaget Ljungmans Verkstader, Malmo, Sweden
Filed Mar. 7, 1975, Ser. No. 556,507
Claims priority, application Sweden, Mar. 8, 1974, 7403110
Int. Cl.² G09F *9/32*
U.S. Cl. 340—380 **5 Claims**

1. A system for displaying information transferred between a fuel dispensing nozzle and a remotely located information receiving and transmitting data source comprising

a nozzle operative for the dispensing of fuel.

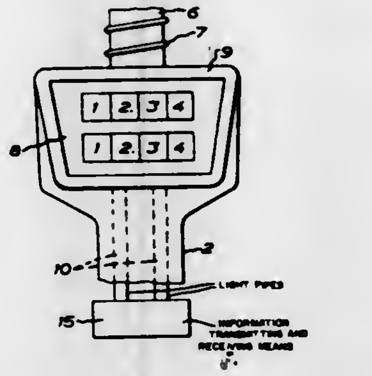
a data source located at a site remote from said nozzle,

an information display device on said nozzle for displaying information data pertaining to fuel being dispensed,

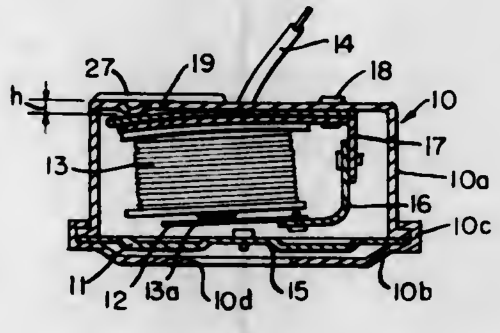
a battery energized operating circuit located inside said nozzle for supplying operating current to said display device.

energizing means operative only when said nozzle is inoperative for transferring electrical energy to said operating circuit, said energizing means including a first inductive means connected to said operating circuit and located inside said nozzle and a second inductive means for coupling electromagnetically with said first inductive means located outside said nozzle, and

information conductor means connecting said display device with said data source for conducting information between said display device and said data source.

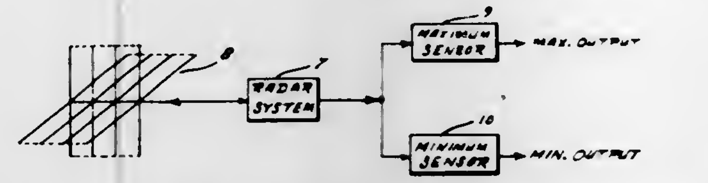


4,005,413
BUZZER CONSTRUCTION AND METHOD OF ADJUSTING THE SAME
Charles Berns, New Milford, Conn., assignor to General Signal Corporation, Rochester, N.Y.
Division of Ser. No. 431,802, Jan. 8, 1974, Pat. No. 3,864,823. This application Feb. 11, 1975, Ser. No. 549,111
Int. Cl.² G01K *1/08;* **G08B** *3/00*
U.S. Cl. 340—402 **6 Claims**



1. A buzzer assembly comprising a housing, an electrically energizable coil unit mounted within said housing with one side of said coil unit being adjacent an interior wall of said housing, and diaphragm means within said housing mounted for vibratory motion adjacent said coil unit on the side of said unit remote from said interior wall, a deformed portion of said interior wall being bent away from the adjacent portion of said interior wall to protrude inwardly of said interior wall into engagement with said coil unit, said deformed portion thereby defining the spacing between said one side of said coil unit and said interior wall of said housing to define in turn the dimensions of the gap between the other side of said coil unit and said diaphragm means.

4,005,414
METHOD FOR PROVIDING MEANS TO ELIMINATE AMBIGUOUS POLARIZATION EFFECTS ON PHASE AND AMPLITUDE OF RADAR BACKSCATTER DUE TO UNKNOWN TARGET ASPECT ANGLE
William B. Goggins, Jr., Locke Mills, Maine, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed June 24, 1975, Ser. No. 589,805
Int. Cl.² G01S *9/00*
U.S. Cl. 343—5 SA **2 Claims**



1. A method of radar system operation adapted to provide determination of the major axis of a target of unknown aspect angle comprising the steps of

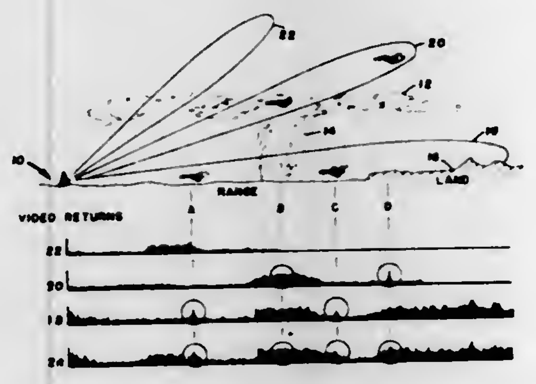
operating a radar transmit antenna in a circular polarization mode,

operating a radar receive antenna in a variable linear polarization mode, said linear polarization being varied over a 180° range,

acquiring data for return signal values versus receive antenna polarization orientations for all receive antenna polarization angles, and

determining the target major axis as being coincident with the receive antenna polarization angle corresponding to the maximum return signal value and orthogonal to the receive antenna polarization angle corresponding to the minimum return signal value.

4,005,415
AUTOMATED RADAR DATA PROCESSING SYSTEM
Alexander Kossiakoff, Brookville, and James R. Austin, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 31, 1975, Ser. No. 563,908
Int. Cl.² G01S *9/02*
U.S. Cl. 343—5 VQ **20 Claims**



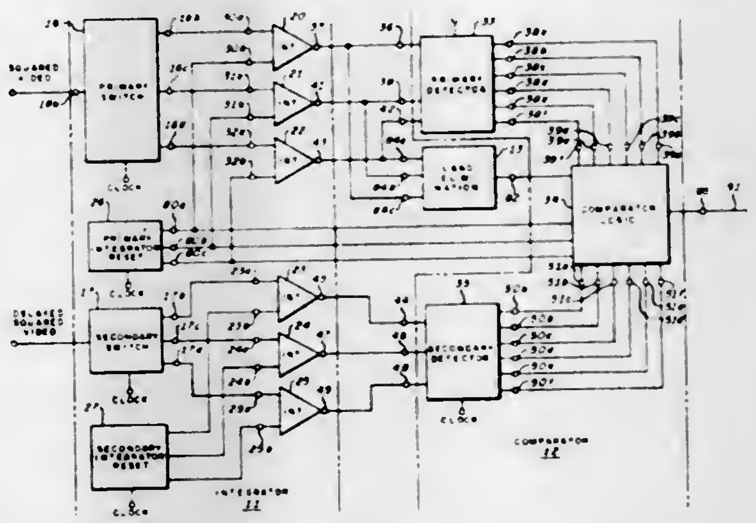
1. An automatic system for processing data from a radar system in accordance with the radar video returns, radar coordinate signals and radar trigger pulses produced within radar system comprising, in combination,

video processor circuit means for processing said radar video returns for overlapping radar beam groups to produce processed video output signals indicating when the radar video returns in each beam group exceed a threshold level indicating the presence of a radar target,

said video processor circuit means including threshold level generating circuit means for causing said threshold level to vary in accordance with the magnitude of radar video returns in a plurality of radar resolution cells adjacent a resolution cell of interest in both range and elevation, whereby said threshold level is adaptive to the radar environment of said cell of interest, and

programmed computer means responsive to said processed video output signals, said radar coordinate signals and said radar trigger pulses for storing and updating continuously data defining target tracks.

4,005,416
APPARATUS FOR PROCESSING RADAR VIDEO SIGNALS
Terry Allen Tucker, Charlottesville, and Jeffrey Clarus Rice, McLean, both of Va., assignors to Sperry Rand Corporation, New York, N.Y.
Filed June 18, 1975, Ser. No. 587,940
Int. Cl.² G01S *9/02*
U.S. Cl. 343—5 VQ **14 Claims**



1. A radar video processor comprising:

input means for receiving sets of primary sequential signals of a predetermined time duration;

primary integrating means, coupled to said input means, for integrating each of said primary signals over said predetermined time duration, thereby providing an integrated value for each of said primary signals; and

comparator means, coupled to said primary integrating means, for comparing said integrated value of one of said primary sequential signals with said integrated values of primary signals preceding and succeeding said one, and for providing a target indication whenever said comparison of said integrated value of said one to said integrated values of said preceding and succeeding primary signals each exhibit a ratio greater than a predetermined value.

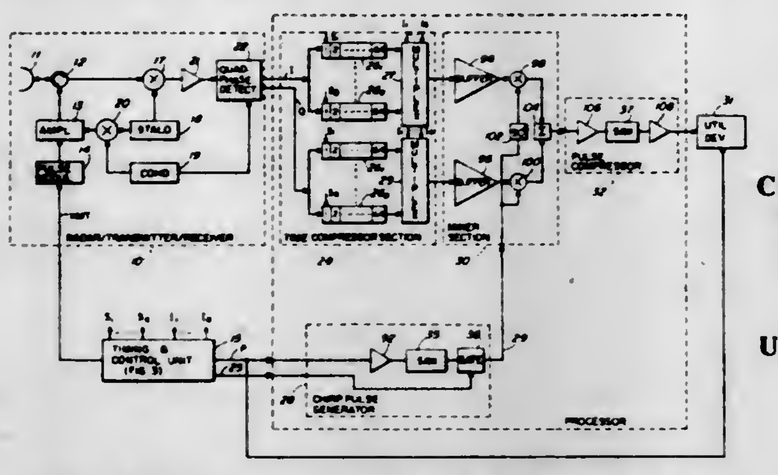
4,005,417
FREQUENCY SPECTRUM ANALYZER
John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Aug. 14, 1975, Ser. No. 604,692
Int. Cl.² G01S *9/02*
U.S. Cl. 343—5 SA **10 Claims**

1. In a radar system for producing a plurality of sets of radar returns, each one of such sets corresponding to radar returns from objects disposed in each one of a like plurality of range cells, the radar returns in each one of the sets thereof being stored at the radar system pulse repetition frequency, a signal processor for determining the Doppler frequency of the objects in each one of such range cells, comprising:

a. time compressor means for serially retrieving each one of the plurality of sets of stored radar returns, the stored radar returns in each one of the sets thereof being retrieved at a rate greater than the radar system pulse repetition frequency and being retrieved in a time duration K τ to produce a series of time compressed signals;

b. means, operative synchronously with the time compressor means, for serially producing a like plurality of chirp pulses, each one of such pulses having a dispersive time K τ and a dispersive bandwidth $K\beta$;

c. means for mixing each one of the time compressed signals with a corresponding one of the chirp pulses to produce a series of mixed signals; and,



d. means for pulse compressing each one of the mixed signals to produce a series of pulses, each one of such pulses occurring at a time related to the Doppler frequency of any object in the range cell producing such associated radar returns.

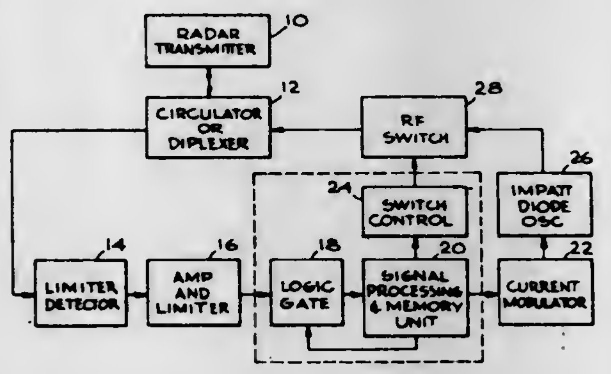
4,005,418
COOPERATIVE SIGNAL PROCESSING BEACON TRANSPONDER

Ashok K. Gorwara, San Jose, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Mar. 28, 1975, Ser. No. 562,829

Int. Cl.² G01S *9/56*

U.S. Cl. 343—6.8 R **3 Claims**



1. In a radar system of the type having a transmitter for transmitting a train of pulse signals and a receiver for receiving said train of pulse signals reflected from a target, a target signal enhancement circuit comprising

inoperative oscillator means for generating, when operative, a train of pulse signals having the same frequency and duration as is transmitted by said transmitter, said inoperative oscillator means requiring a first interval for reaching its steady state condition after being rendered operative,

inoperative switch means for applying the output of said oscillator means to said transmitter for transmission when operative,

first means responsive to said receiver receiving said train of pulse signals reflected from a target for generating a first pulse having a width equal to said first interval plus a second interval equal to the time required for generating said train of pulse signals,

second means responsive to said receiver receiving said train of pulse signals reflected from a target for generating a second pulse which is delayed for said first interval and which has a width equal to said second interval,

means for respectively applying said first pulse and said second pulse to said respective inoperative oscillator means and said inoperative switch means whereby said signals reflected from said target are enhanced, and

means for preventing said first and second means responsive to said receiver receiving said train of pulse signals, from responding to another received train of pulse signals while operating in response to an already received train of pulse signals.

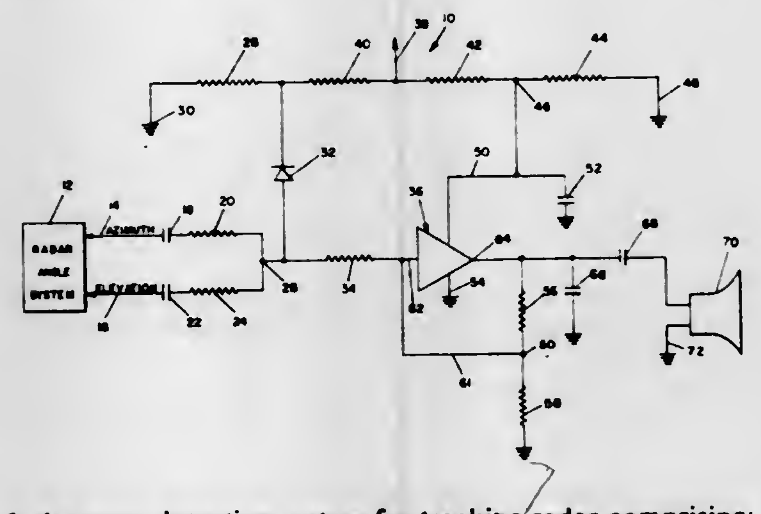
4,005,419
BEACON SIDE LOBE DETECTOR

Clinton L. Wilcox, Sun Spot, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1976, Ser. No. 649,952

Int. Cl. G01s *7/02*

U.S. Cl. 343—7.4 **5 Claims**



1. An error detection system for tracking radar comprising:

a radar angle system having outputs for azimuth and elevation error signals;

an audio amplifier;

isolation means connected between the angle system outputs and an input of the audio amplifier; and

a speaker connected to an output of the audio amplifier for producing different audible tones in response to different azimuth and elevation error signals.

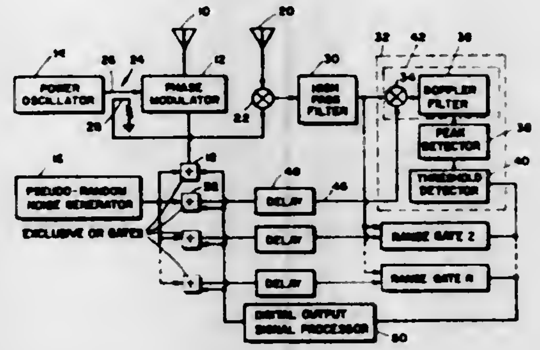
4,005,420
CW RADAR SYSTEM

Thomas Wayne McDonald, Dana Point, Calif., assignor to Esterline Electronics Corporation, Costa Mesa, Calif.

Filed Mar. 12, 1975, Ser. No. 557,479

Int. Cl.² G01S *9/39*

U.S. Cl. 343—7.5 **9 Claims**



1. The method of measuring distance to a first object which is moving relative to a second object, which includes the steps of:

transmitting a radar signal from the second object toward the first object, the radar signal comprising a continuous carrier phase modulated by a repetitive digital code;

simultaneously receiving echoes of said radar signal returning to said second object from said first object;

multiplying said echo by a delayed sample of said digital code to device a signal corresponding to their product which includes a Doppler component; and

developing and transmitting a telemetry signal by modulating said carrier as a function of the amplitude of said Doppler component.

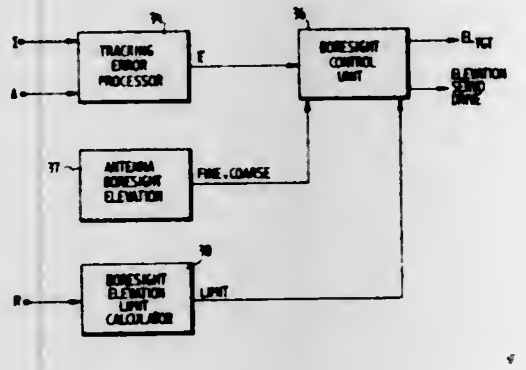
4,005,421
MONOPULSE RADAR SYSTEM AND METHOD FOR IMPROVED LOW ELEVATION TRACKING

Peter R. Dax, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1973, Ser. No. 365,245

Int. Cl.² G01S *9/22*

U.S. Cl. 343—16 M **12 Claims**



1. In a monopulse tracking radar system, apparatus for tracking low elevation targets comprising:

antenna means for receiving wave energy reflected from a target, said antenna means having a predetermined boresight;

means for generating an elevation tracking error signal related to an angular difference in elevation between a line-of-sight to the target and the antenna means boresight in response to the received wave energy;

means for driving said antenna means in a direction tending to minimize said elevation tracking error signal; and,

means for disabling said driving means in response to approximate coincidence between actual antenna means boresight elevation angle and a predetermined lower limit of antenna means boresight elevation angle, wherein said antenna means includes:

a sum receiving channel for providing a sum signal in response to received wave energy;

an elevation difference receiving channel for providing an elevation difference signal in response to received wave energy;

means for modifying said sum signal and said elevation difference signal so that, with the antenna means boresight positioned in approximate coincidence with said predetermined lower limit, the ratio of said elevation difference signal to said sum signal for targets below said antenna means boresight is approximately the same for wave energy received along a direct path and for wave energy received along a reflected path.

4,005,422
RADAR WITH SAMPLING GATE CIRCUIT FOR VIDEO SIGNAL

Hiroshi Noda, and Yukiyasu Watanabe, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,490

Claims priority, application Japan, Mar. 2, 1974, 49-24947

Int. Cl.² G01S *7/28*

U.S. Cl. 343—17.1 R **4 Claims**

1. A radar comprising:

an antenna for transmitting and receiving waves;

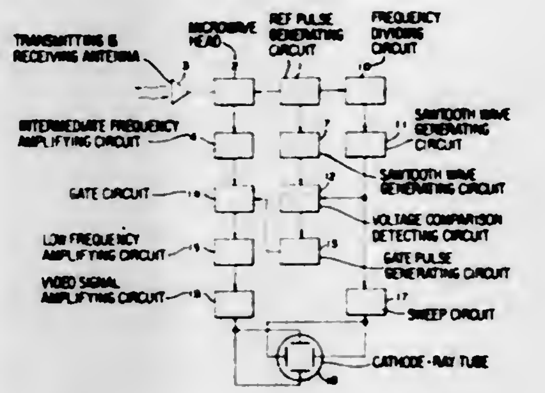
a transmitting and receiving device for transmitting a signal from the antenna corresponding to reference pulses of a reference pulse generator and receiving with the antenna the reflected signal from a target to generate an intermediate frequency signal;

a gate pulse generator under the control of the reference pulses for generating gate pulses which determine the sampling position of the intermediate frequency signal;

a sampling gate circuit for detecting a video signal by sampling the intermediate frequency signal from the transmitting and receiving device in accordance with the gate pulses;

a display for displaying the video signal;

the gate pulse generator comprising


TRANSMITTING & RECEIVING ANTENNA
MICROWAVE HEAD
REF PULSE GENERATING CIRCUIT
FREQUENCY DIVIDING CIRCUIT
INTERMEDIATE FREQUENCY AMPLIFYING CIRCUIT
SAWTOOTH WAVE GENERATING CIRCUIT
GATE CIRCUIT
SAWTOOTH WAVE GENERATING CIRCUIT
LOW FREQUENCY AMPLIFYING CIRCUIT
VOLTAGE COMPARISON DETECTING CIRCUIT
VIDEO SIGNAL AMPLIFYING CIRCUIT
GATE PULSE GENERATING CIRCUIT
SWEEP CIRCUIT
CATHODE-RAY TUBE

a first signal generator for determining the sampling position in accordance with the reference pulses;

a frequency divider for frequency-dividing the reference pulses;

a second signal generator for determining the sampling position in accordance with the output of the frequency divider;

a comparator for determining the sampling position by comparing the outputs of the first and second signal generators; and

a gate pulse generating circuit for generating gate pulses in accordance with the output signal of the comparator.

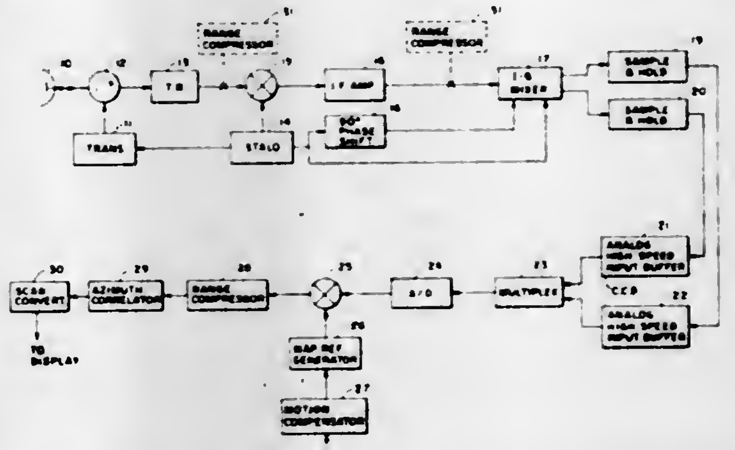
4,005,423
SYNTHETIC APERTURE RADAR UTILIZING A LOW-SPEED ANALOG-TO-DIGITAL CONVERTER

William R. Webb, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 9, 1975, Ser. No. 594,415

Int. Cl.² G01S *7/28*

U.S. Cl. 343—17.2 PC **4 Claims**



3. In a radar system of the type where detected echo signals are converted into video signal samples that are stored during part of the time interval between the transmission of successive search pulses by said radar system and thereafter converted into corresponding digital signals by an analog-to-digital converter for subsequent processing in the radar system, the improvement of

utilizing as the storage means for the video signal samples a high-speed input buffer in the form of a charge-coupled register that accepts these samples at a comparatively high data rate during a first portion of the above time interval and transfers these samples to the analog-to-digital converter at a lower data rate during the remaining portion of this time interval, whereby the analog-to-digital converter can operate at a comparatively low speed while the radar system can still achieve a high degree of range resolution.

4,005,424

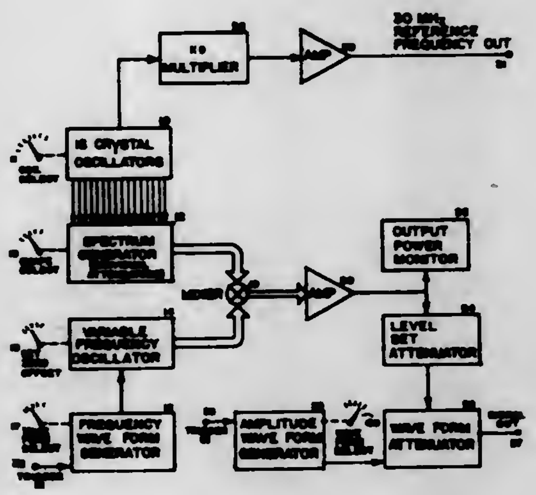
SIMULATOR FOR DOPPLER RADAR RETURNS FROM PRECIPITATION

Richard W. Fetter, Warrenville, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1975, Ser. No. 625,392

Int. Cl.² G01S *7/40*

U.S. Cl. 343—17.7 **9 Claims**


MULTIPLIER
AMP
30 MHz REFERENCE FREQUENCY OUT
CRYSTAL OSCILLATORS
SPECTRUM GENERATOR
OUTPUT POWER MONITOR
MIXER
LEVEL SET ATTENUATOR
VARIABLE FREQUENCY OSCILLATOR
FREQUENCY WAVE FORM GENERATOR
AMPLITUDE WAVE FORM GENERATOR
WAVE FORM ATTENUATOR

1. A device for simulating Doppler radar returns comprising:

a. means for generating a plurality of signals, each being of an individual frequency and each having an individual amplitude, said plurality of signals having a selected mean frequency;

b. means coupled to said means for generating a plurality of signals for selectively attenuating either any one of said plurality of signals or all of such signals and for summing said plurality of signals to provide a desired frequency spectrum signal;

c. variable frequency oscillator (VFO) means for generating a VFO signal whose frequency can be controllably varied;

d. signal mixing means for mixing said VFO signal with said frequency spectrum signal to provide a sum or difference frequency output signal.

4,005,425

DUAL QUADRATURE POLARIZATION RADAR SYSTEM

Louis L. Nagy, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1975, Ser. No. 631,852

Int. Cl.² G01S *7/40*

U.S. Cl. 343—17.7 **2 Claims**

1. A dual quadrature polarization radar system for measuring the co-linear and cross-polarization characteristics of a target, comprising:

an RF generator effective to generate an RF signal;

first and second magic tees, each magic tee having first, second, third and fourth ports and being effective to couple equal portions of RF inputs to the first and third ports to the second and fourth ports and couple equal portions of RF inputs to the second and fourth ports to the first and third ports;

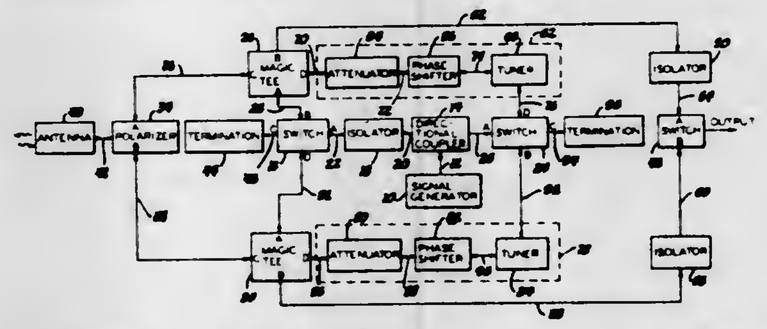
a first RF switch RF coupled to the RF generator and the first port of each of the first and second magic tees, the first RF switch being selectively operable to couple the RF signal generated by the RF generator to a selected one of the first ports of the first and second magic tees;

an RF antenna effective to transmit RF signals toward a target and receive reflected RF signals from the target;

an RF signal polarizer including a first portion RF coupled between the third port of the first magic tee and the RF antenna and effective to vertically polarize and couple RF signals from the third port of the first magic tee to the RF antenna and couple vertically polarized RF signals from the RF antenna to the third port of the first magic tee and a second portion RF coupled between the third port of the second magic tee and the RF antenna and effective to horizontally polarize and couple RF signals from the third port of the second magic tee to the RF antenna and couple horizontally polarized RF signals from the RF antenna to the third port of the second magic tee;

a second RF switch RF coupled to the second port of each of the first and second magic tees, the second RF switch having an output port and being selectively operable to couple RF signals from a selected one of the second ports of the first and second magic tees to the output port;

means effective to generate and couple a first co-linear RF null signal to the fourth port of the first magic tee when the first RF switch is selectively operated to couple the RF signal from the RF generator to the first port of the first magic tee and to generate and couple a first cross-polarized RF null signal to the fouth port of the first magic tee when the first RF switch is selectively operated to couple the RF signal from the RF generator to the first port of the second magic tee, the first co-linear RF null signal being effective to cancel residual RF reflections when the first RF switch is selectively operated to couple the RF signal from the RF generator to the first magic tee and the first cross-polarized RF null signal being effective to cancel residual RF reflections when the first RF switch is selectively operated to couple the RF signal from the RF generator to the second magic tee; and



means effective to generate and couple a second co-linear RF null signal to the fourth port of the second magic tee when the first RF switch is selectively operated to couple the RF signal from the RF generator to the first port of the second magic tee and to generate and couple a second cross-polarized RF null signal to the fourth port of the first magic tee when the first RF switch is operated to selectively couple the RF signal from the RF generator to the first port of the second magic tee, the second co-linear RF null signal being effective to cancel residual RF reflections when the first RF switch is selectively operated to couple the RF signal from the RF generator to the second magic tee and the second cross-polarized RF null signal being effective to cancel residual RF reflections when the first RF switch is selectively operated to couple the RF signal from the RF generator to the second magic tee, whereby selective operation of the first and second RF switches provides an RF output from the output port of the second RF switch which selectively provides a measurement of the co-linear and cross-polarization characteristics of the target wherein the RF signal at the output of the second RF switch is free from residual RF reflections in the radar system for each of the vertical, horizontal and cross-polarization measurements.

4,005,426

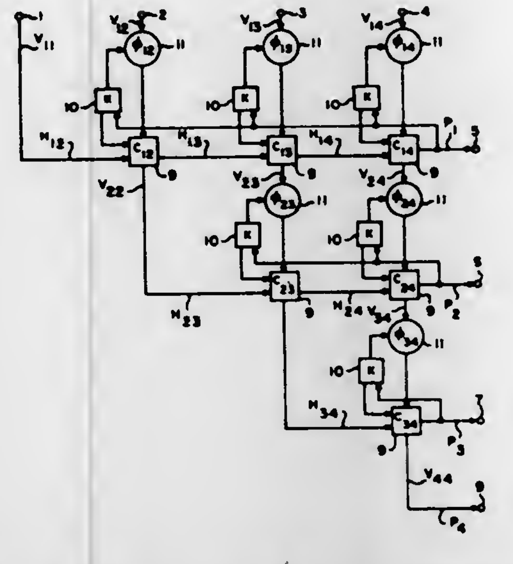
SIGNAL PROCESSING METHOD AND APPARATUS

Warren D. White, Northport, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sept. 10, 1975, Ser. No. 612,101

Int. Cl.² H04B *7/00*

U.S. Cl. 343—100 LE **15 Claims**



1. The method of processing a composite of raw input signals having common components in separately variable proportions to produce an output wherein one of said components predominates, and at least one other output wherein said one component does not predominate, comprising the steps of:

a. diverting portions of all said raw inputs and passing the remainders thereof,

b. combining said diverted portions to produce a first output,

c. adjusting the phases of said raw inputs to maximize said first output, and

d. combining said remainders of said raw inputs to produce at least one further output.

4,005,427

FACILITY FOR MONITORING THE CARRIER-FREQUENCY AND SIDEBAND SIGNALS RADIATED BY A DVOR GROUND STATION

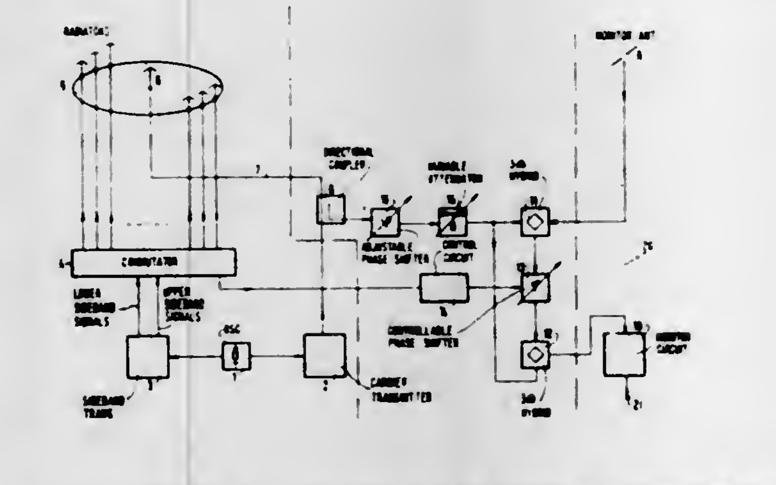
Günter Höfgen, Kornwestheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,172

Claims priority, application Germany, Feb. 12, 1975, 2505723

Int. Cl.² G01S *1/44*

U.S. Cl. 343—106 D **9 Claims**



1. In a DVOR ground station system which includes a plurality of first radiators in a generally circular arrangement, commutating means for exciting said radiators according to a predetermined sequence from a sideband transmitter, a second radiator located substantially at the center of said circular arrangement, said second radiator being excited from a carrier transmitter, and a monitor circuit for generating an output signal whenever the radiations of said ground station vary from predetermined signal tolerances, the combination comprising:

antenna first means for intercepting said ground station radiations in the near field and for separating the sideband signals therefrom;

second means responsive to said separated sideband signals and to said commutating means for applying a discrete predetermined phase delay to said sideband signals during the commutation time of each of said first radiators;

and third means for mixing a portion of said carrier with the output of said second means to form a corrected input signal for said monitor circuit approaching the monitor circuit input obtainable if the antenna of said first means were located in the far field.

4,005,428

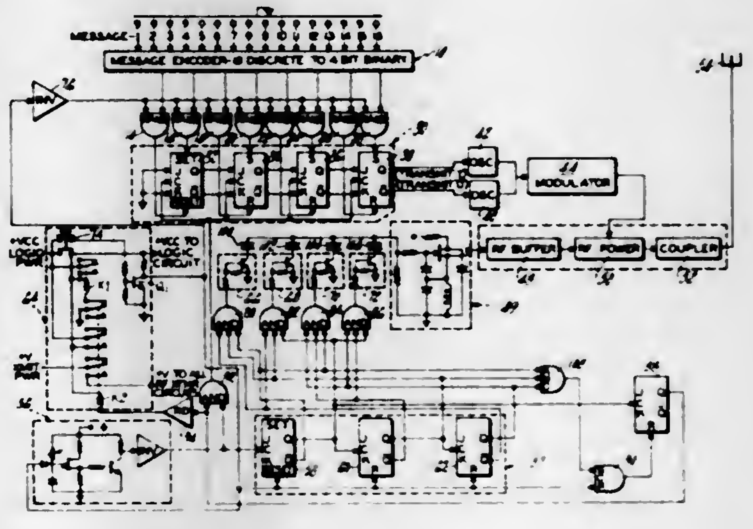
SECURE REMOTE CONTROL COMMUNICATION SYSTEMS

Jerry P. Graham, Fairfax, Va., assignor to Sound Technology, Inc., Enfield, Conn.

Filed May 15, 1975, Ser. No. 577,876

Int. Cl.² H04B *7/00*

U.S. Cl. 343—228 **20 Claims**



1. A communications system comprising:

means for generating a plurality of carrier frequency signals individually in a preselected sequence;

means for modulating each of said carrier frequency signals in accordance with digitally coded information;

means for transmitting the modulated carriers in the sequence in which generated;

means for receiving the transmitted signals, said receiving means being initially responsive to only the first carrier frequency in the preselected sequence;

means for detecting the presence of modulation on each received carrier frequency signal and for generating a signal commensurate therewith;

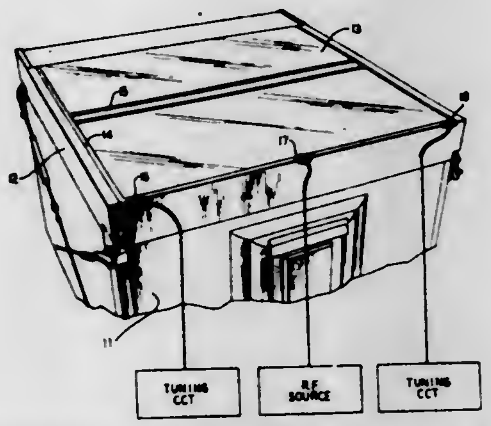
means responsive to said signals commensurate with the presence of modulation provided by said detecting means for tuning the receiving means to the next carrier frequency in the preselected sequence; and

means responsive to said signals commensurate with the presence of modulation provided by said detecting means for storing a signal commensurate with the nature of the modulation, said storing means retaining the transmitted coded information at the end of a transmitting sequence.

4,005,429
CAMOUFLAGED VHF ANTENNA

Kurt Ikrath, Elberon; William Kennebeck, Sea Bright, both of N.J.; Edward C. Shaffer, Augusta, Ga., and Peter J. Pingitore, Wayside, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1975, Ser. No. 620,684
Int. Cl.² H01G *1/32*
U.S. Cl. 343—713 **6 Claims**



1. In combination with a vehicle, or the like, having a metal body, an antenna which comprises:
- a false, metal roof substantially co-extensive and parallel with the roof of said body, but spaced apart therefrom, said false roof having:
- a U-shaped slot parallel to the left, right and rear edges of said false roof;
- means for energizing said slot with a source of r.f. energy; and
- antenna tuning means connected to said slot for producing a controlled radiation pattern at the frequency of interest by surface currents induced in said vehicle.

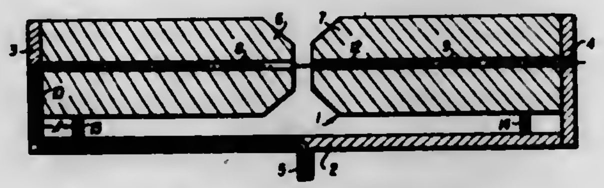
4,005,430
THICK FOLDED DIPOLE WHICH IS TUNEABLE WITHIN A FREQUENCY BAND OF TWO OCTAVES

Gerard Dubost, Briand Rennes, and Henri Albert Havot, Cesson-Sevigne, both of France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, France

Filed Jan. 12, 1976, Ser. No. 648,290

Claims priority, application France, Jan. 17, 1975, 75.01379

Int. Cl.² H01Q *9/26*
U.S. Cl. 343—747 **9 Claims**



1. A thick folded dipole, comprising:
- a. a folded strand having a bore hole;
- b. a thick fed strand having a diameter which is about ten times greater than the diameter of said folded strand; said fed strand including two spaced apart symmetrical cylindrical half strands having ends in the form of conical frustums and coaxial bore holes;
- c. a coaxial cable for carrying signals to be emitted or received by the dipole, said cable including a center conductor extending through the bore hole of said folded strand, the bore hole of one half strand, the space between said half strands and into the bore hole of the other half strand; and
- d. symmetrical spaced apart short circuit means for matching the radiation impedance of the dipole by varying the distance between said short circuit means, said means being provided between said fed strand and said folded strand, wherein the operating frequency of the dipole is far less than the first resonance frequency.

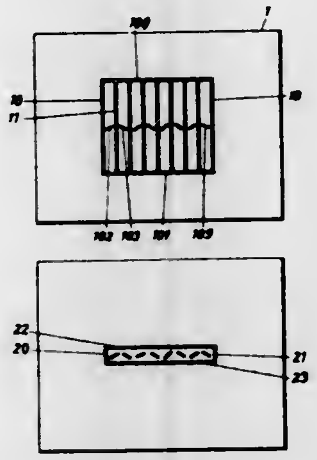
4,005,431
SLOT ANTENNA WITH WAVEGUIDE COUPLING

Anders B. Hammarström, Lindome, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 30, 1975, Ser. No. 582,085

Claims priority, application Sweden, June 26, 1974, 7408385

Int. Cl.² H01Q *13/10*
U.S. Cl. 343—771 **4 Claims**



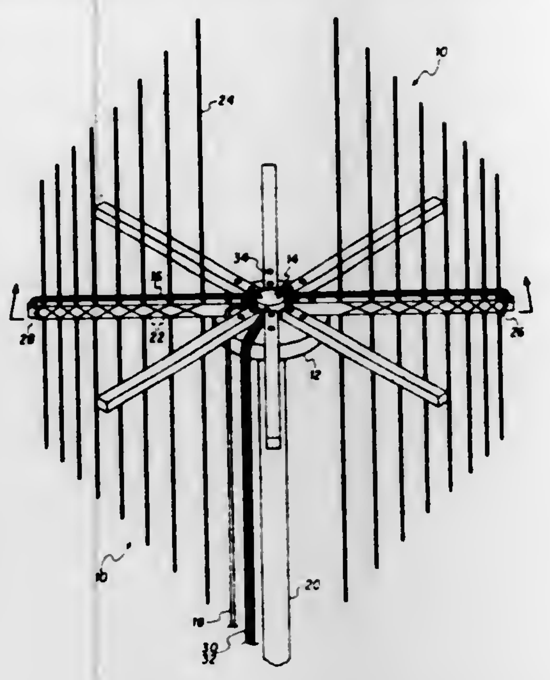
1. Antenna apparatus comprising: a plate having input and output sides; a plurality of first tracks cut into the output side of said plate, said first tracks being mutually parallel; a pair of second tracks cut into the output side of said plate, one of said second tracks being connected to first ends of each of said first tracks, and the other end of each of said second tracks being connected to second ends of each of said first tracks whereby a plurality of output-waveguide-wall-accepting means are formed, each having a major axis along a first direction; a pair of third tracks cut into the input side of said plate; a pair of fourth tracks cut into the input side of said plate, one of said fourth tracks being connected to first ends of said third tracks, and the other of said fourth tracks being connected to second ends of said third tracks whereby an input-waveguide-wall-accepting means is formed having a major axis which intersects the major axis of each of the formed output-waveguide-wall-accepting means; and said plate being provided with an opening in the region of each of the major axis intersections.

4,005,432
COMMUTATED LOG PERIODIC ANTENNA ARRAY FOR AUTOMATIC DIRECTION FINDING

Michael J. Beccario, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 11, 1975, Ser. No. 630,831
Int. Cl.² H01Q *3/24*
U.S. Cl. 343—792.5 **5 Claims**

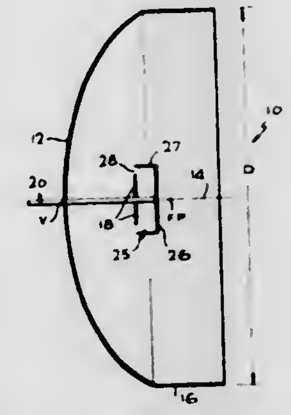
1. A commutated antenna array for amplitude modulating an RF signal to generate a cardioid pattern for use in automatic direction finding, comprising:
- a plurality of log periodic antennas, each having coplanar parallel dipoles, arranged as equiangularly spaced radii in a circular geometric pattern with all the antenna dipoles being perpendicular to the plane of the circle;
- a plurality of conductors, there being one connected to each antenna;
- a common terminal for connection to radio signal equipment, and
- commutating means for sequentially connecting said antennas to said common terminal via their respective conductors.



4,005,433
SMALL WAVELENGTH HIGH EFFICIENCY ANTENNA

George I. Tsuda, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 5, 1975, Ser. No. 638,101
Int. Cl.² H01Q *19/30*
U.S. Cl. 343—819 **20 Claims**

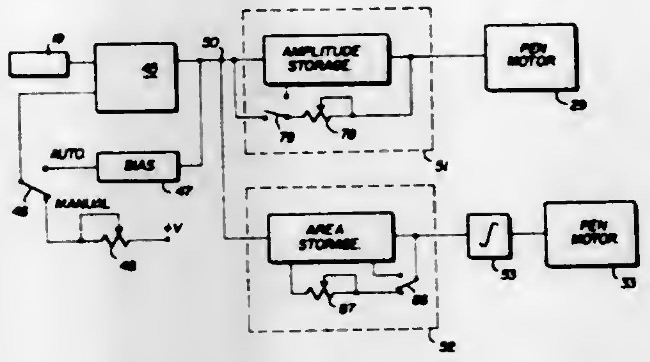


1. An antenna comprising:
- a paraboloidal reflector defining a circular opening of a diameter D, said opening being symmetrically aligned about an antenna longitudinal axis with the circular opening in a plane perpendicular to said axis, said paraboloidal reflector having a focal point on said axis;
- feed means spaced apart from the vertex of said reflector and symmetrically positioned about said axis, at other than said focal point; and
- a circular cup-shaped cavity spaced symmetrically about said axis on the other side of said feed means remote from said reflector, with the open end of said cavity toward said reflector.

4,005,434
METHOD AND APPARATUS FOR GRAPHIC DENSITOMETER DISPLAY

Tipton L. Gollas, and Gene A. Butts, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Mar. 24, 1975, Ser. No. 561,618
Int. Cl.² G01D *9/28*
U.S. Cl. 346—1 **14 Claims**



1. In a method of graphically displaying optical density patterns of a sample of blood or the like for subsequent evaluation, including scanning said sample by relatively moving said sample and a light source and a photo-responsive element, converting the output of said photo-responsive element into analog signals with a converting circuit, and driving two display devices with said analog signals to provide graphical representations of the relative optical density and the cumulative optical desnity of said sample, respectively, the improvement of separately storing the maximum amplitude of said analog signals and the amplitude of said cumulative analog signals, and modifying said analog signals by said stored signals prior to driving said display devices to display a normalized optical density curve and a normalized cumulative optical density curve, respectively, said step of separately storing the maximum amplitude of the analog signals including the steps of comparing the instantaneous amplitude of said analog signals with the maximum prior stored analog signals obtained during said scan and if the instantaneous signal is greater than the prior stored maximum signal, actuating an oscillator and converting the oscillator output into a stored signal having an amplitude equal to the instantaneous analog signal.

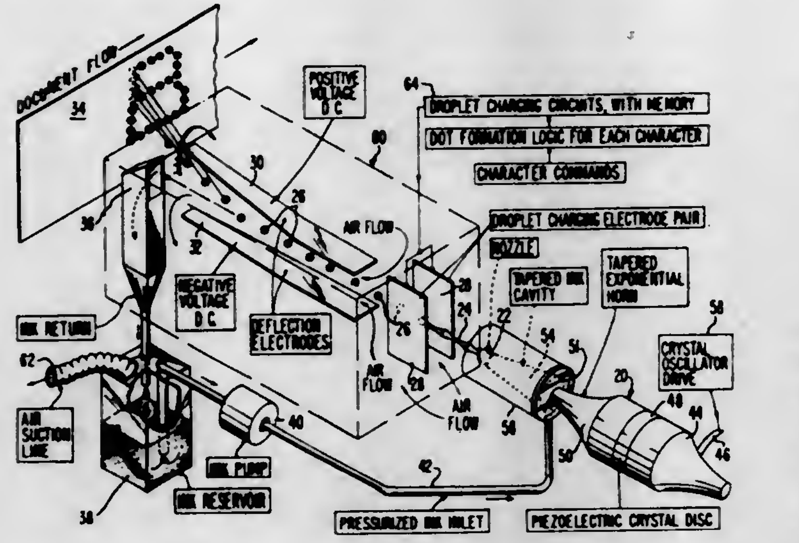
4,005,435
LIQUID JET DROPLET GENERATOR

David E. Lundquist, Birmingham, Mich.; Paul R. Hoffman, Exton, Pa.; Chauchang Su, W. Bloomfield Township, Mich.; Benjamin T. Sung, Southfield, Mich., and Steven A. Eichhardt, Bloomfield Township, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 15, 1975, Ser. No. 577,667
Int. Cl.² G01D *9/00, 15/18;* **B01F** *15/00*
U.S. Cl. 346—1 **16 Claims**

1. The method of recording on a record member by use of liquid ink droplets which includes the steps of supplying ink to the wider end of a tapered cavity having a discharge orifice in the apex end thereof under such pressure that a jet stream is projected from the discharge orifice toward the record member, superimposing a cyclically varying pressure energy upon the liquid ink content of the cavity to cause the jet stream issuing from the discharge orifice to break up into a succession of separately spaced apart ink droplets which move in free flight toward the record member, and applying said pressure energy at such a frequency as to cause the establishment in the liquid ink content of the cavity of a standing wave pattern of

pressure nodes and antinodes and such that one such pressure node is located at the wider ink supplying end of the cavity



and one such pressure antinode is located at the discharge orifice.

4,005,436

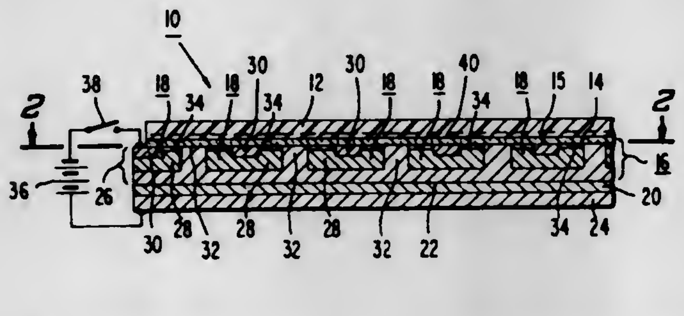
APPARATUS FOR MAKING A RECORDING OF AN ELECTROSTATIC CHARGE PATTERN

Hans Peter Kleinknecht, Bergdietikon, Aargau, and Helmut Gustav Kiess, Niedersteinmaur, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed July 10, 1975, Ser. No. 594,868

Int. Cl.² G11C *11/40;* **G03G** *15/056*

U.S. Cl. 346—153 **7 Claims**



1. Apparatus for making a recording of an electrostatic charge pattern disposed on an electrically insulating film comprising:

an array of a plurality of field-effect devices,

each of said devices comprising source and drain regions of one conductivity type separated from each other by a channel region of the opposite conductivity type adjacent one face of said array,

means to dispose said charge pattern adjacent to said one face,

means to apply a current-sensitive recording element adjacent an opposite face, to said one face, of said array, and

means in circuit with said source and drain regions to cause current to flow in each of said devices in accordance with the intensity of each elemental portion of said charge pattern adjacent a respective channel region of each of said devices whereby said current can flow through said recording element to change it in accordance with its intensity.

4,005,437

METHOD OF RECORDING INFORMATION IN WHICH THE ELECTRON BEAM SENSITIVE MATERIAL CONTAINS

4,4'-BIS(3-DIAZO-3-4-OXO-1-NAPHTHALENE SULFONYLOXY)BENZIL

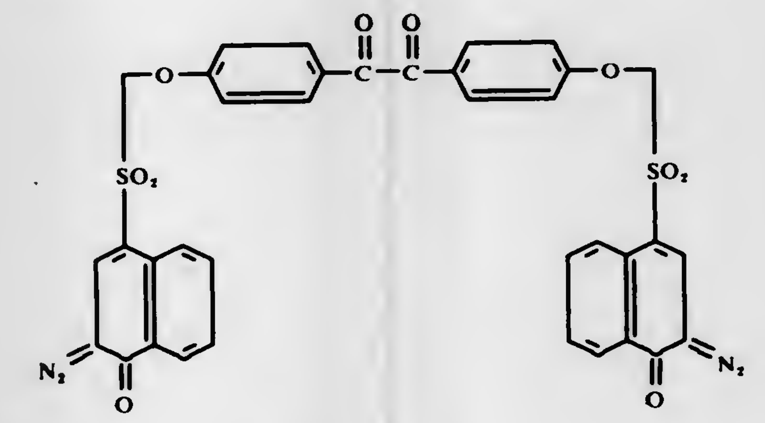
Daniel Louis Ross, Princeton, and Lucian Anthony Barton, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,399

Int. Cl.² C07C *113/00;* **G01D** *15/06;* **G11B** *9/00*

U.S. Cl. 346—165 **5 Claims**

1. In a method of recording information whereby a modulated beam of electrons is scanned across a surface of an electron beam sensitive material which becomes more soluble in a developer solvent when impinged upon by a beam of electrons and the electron beam sensitive material is developed with a developer solvent so as to remove the solubilized portion, the improvement which comprises employing as the electron beam sensitive material a mixture containing from about 1 to about 50% by weight of an active compound of the structure



and an alkali-soluble resin.

4,005,438

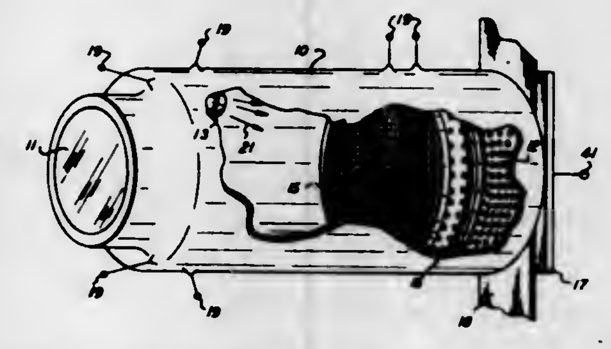
DEVICE WITH CONTROL GRID FOR ELECTROSTATOGRAPHIC REPRODUCTION OF AN OPTICAL IMAGE

David W. Meltzer, Miami, Fla., and Narendra S. Goel, Henrietta, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1975, Ser. No. 581,011

Int. Cl.² G03G *15/04*

U.S. Cl. 346—158 **13 Claims**



1. Apparatus for converting an optical image to an electrostatic image comprising:

an enclosure for maintaining an internal pressure below atmospheric pressure;

an array of electrically conducting elements, forming one wall of said enclosure;

a source of electrons located in said enclosure, said electron source including means for propagating electrons generally toward said array of elements;

light sensitive means disposed between said electron source and said array of elements, said light sensitive means having a multiplicity of apertures permitting passage of electrons from said electron source through said light sensitive means to said array of elements; means for providing a substantially uniform charge distribution on said light sensitive means, and

entrance means in said enclosure for permitting a radiation likeness of said optical image to be applied to said light sensitive means whereby said charge distribution on said light sensitive means is dissipated in accordance with the radiation likeness of said optical image.

4,005,439

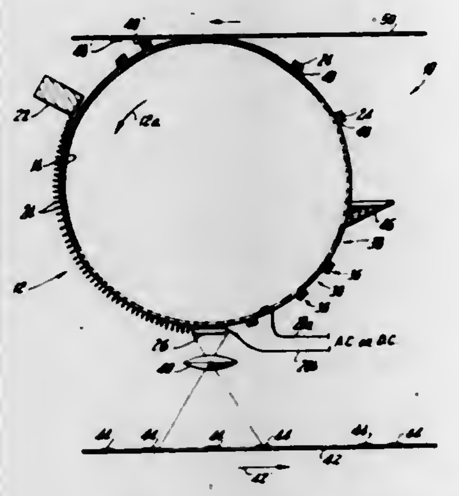
MAGNETIC IMAGING METHOD FOR PHOTOCOPYING

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107

Filed Jan. 28, 1975, Ser. No. 544,814

Int. Cl.² G03G *19/00*

U.S. Cl. 346—74.1 **19 Claims**



1. A magnetic imaging apparatus comprising a layer of magnetic material, selected surface portions of which may be magnetized and demagnetized upon local application of corresponding magnetic fields; a photoconductive layer selected surface portions of which exhibit changes in resistivity as a function of light intensity of an image impinging thereon; a source of electrical potential applied to said photoconductive layer to permit the generation of a current density over said photoconductive layer which corresponds to an image intensity distribution impinging on said photoconductive layer, said current density generating a magnetic field having a distribution over said photoconductive layer which corresponds to said current intensity distribution, said photoconductive layer being proximate to said layer of magnetic material, whereby selected portions of said magnetizable layer may be magnetized and demagnetized by said magnetic field distribution; magnetic ink supply means for imparting magnetic ink to said magnetic layer at the magnetized portions thereof; and means for transferring said ink from said magnetic layer to a surface on which the image is to be reproduced.

4,005,440

PRINTING HEAD FOR INK JET PRINTER

Jan Roger Amberntsson; Rober Ingemar Andersson, both of Angered, and Stig Bertil Sultan, Floda, all of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

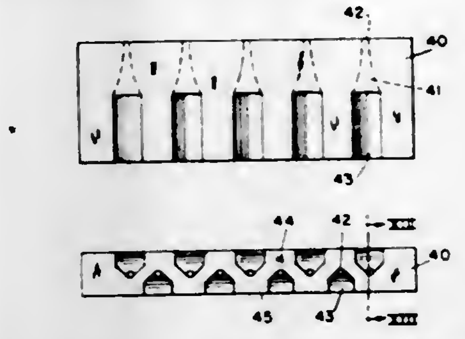
Filed Mar. 10, 1975, Ser. No. 557,228

Claims priority, application Sweden, Mar. 12, 1974, 7403312; Oct. 1, 1974, 7412233

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 A **5 Claims**

1. Printing head for an ink jet printer comprising a first plate having spaced channels in one surface of said first plate, a separate plate having a pumping chamber for each of said channels and means for pumping fluid in each of said chambers, a plurality of capillary tubes each opening into another surface of said first plate, means connecting one end of each of said channels to a respective one capillary tube, one end of each of said capillary tubes forming an orifice for exiting the drops of printing fluid, each of said capillary tubes tapering in the direction from said channels to the opening of said tube



and lying substantially in a straight line relative to a respective channel, and each of said capillary tubes opening into a surface of said first plate which is substantially perpendicular to the large surfaces of said first plate.

4,005,441

PHOTOMETRIC DEVICE OF THROUGH THE LENS TYPE EXPOSURE METER IN A SINGLE-LENS REFLEX CAMERA

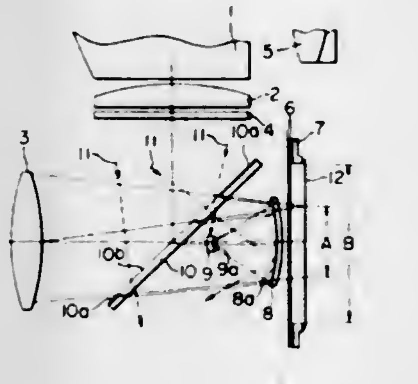
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed July 22, 1975, Ser. No. 598,040

Claims priority, application Japan, July 31, 1974, 49-90603[U]

Int. Cl.² G03B *17/00*

U.S. Cl. 354—23 R **6 Claims**



1. A single lens reflex camera comprising:

an objective;

a view finder optical system;

beam splitting means for reflecting part of a light beam passing through said objective to said view finder optical system and for transmitting the remainder of the light beam;

a light reflecting and concentrating member of which the optical axis coincides substantially with that of said objective, said light reflecting and concentrating member being positioned behind said beam splitting means in the direction of travel of light beam transmitted through said beam splitting means; and

photoelectric converting means positioned between said beam splitting means and said light reflecting and concentrating member and substantially on the optical axis of said objective, the light receiving surface of said photoelectric converting means facing said light reflecting and concentrating member to receive the light beam reflected and concentrated by said reflecting and concentrating member.

4,005,442

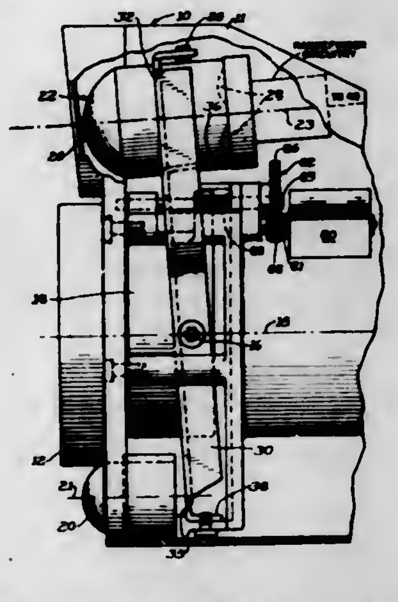
AUTOMATIC FOCUSING MECHANISM

John A. Gallagher, Barrington, and Milan A. Broderick, Riverwoods, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 26, 1974, Ser. No. 536,667

Int. Cl.² G03B *3/02, 3/10*

U.S. Cl. 354—25 **9 Claims**



1. An automatic focusing mechanism for an optical instrument with an objective lens having an adjustable focusing cell for maintaining the focus setting of said objective lens in correspondence with the distance between said optical instrument and an object, said mechanism comprising:

means for emitting a beam of light from the optical instrument to the object;

means defining a longitudinal axis, spaced from said emission means, for receiving the image of said light beam reflected from said object; said reception means having detection means for producing an output corresponding to the alignment of said longitudinal axis of said reception means with said reflected light beam;

means for pivoting said reception means so that said reception means may track said reflected light beam through the angular displacement caused by variations in the distance between said optical instrument and said object; said pivoting means including plate means having a distal end pivotally secured to said optical instrument, a proximal end in mounting relationship with said reception means, and means coupling said focusing cell to said plate means intermediate said ends;

a rangefinder circuit, responsive to the output of said detection means, for producing a signal to operate a motor; and

a motor, having means engaging said pivoting means for pivotal movement of said reception means, responsive to said signal to move said reception means so that the longitudinal axis thereof is in alignment with said reflected light beam, thereby maintaining the focus setting of said objective lens in correspondence with the distance between said optical instrument and the object.

4,005,443

SCANNING DEVICE AND METHOD FOR AUTOMATIC FOCUSING

Fritz Albrecht, Rte. 4, Box 240, Brevard, N.C. 28712

Filed Sept. 11, 1975, Ser. No. 612,295

Int. Cl.² G03B *7/08*

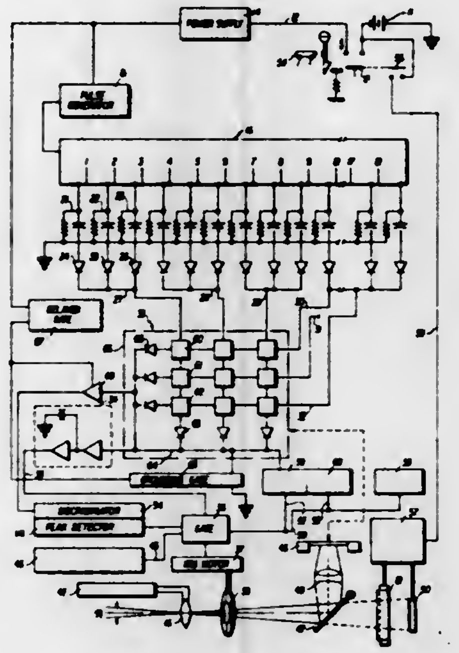
U.S. Cl. 354—25 **4 Claims**

1. A device for automatically focusing an image in an optical system comprising:

a photosensitive array having a plurality of discrete sites positioned in the focal plane of the optical system to dissect the image into segments crosswise and determine the light intensity at each segment,

means interposed in the focal plane to vary the focus of the image, the illumination of the photosensitive array being dependent on the degree of focus of the image, said discrete sites having a charge produced depending on the degree of illumination,

plural means to scan vertically and horizontally the photosensitive array and read out the charges on said discrete sites to form a pulse train, and



discrimination means connected to the address means to determine when the frequency of the pulse train is maximized to indicate sharp focusing of the image, as the focus of the image is varied;

means connected to the photosensitive array to delay activation of the discrimination means for a predetermined time sufficient to clear spurious charges from sites on the photosensitive array to preclude erroneous indication of sharp focusing of the image.

4,005,444

EXPOSURE CONTROL SYSTEM FOR FLASH PHOTOGRAPHY

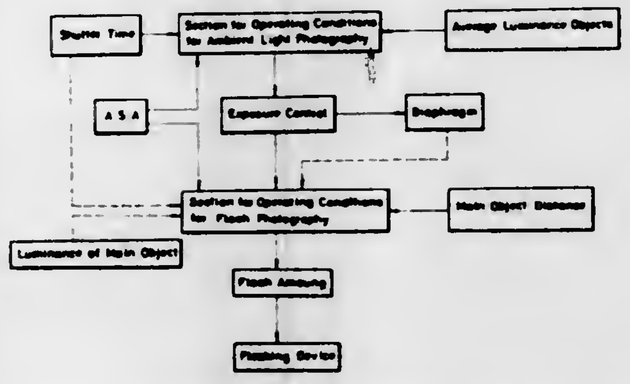
Takashi Uchiyama, Yokohama; Yukio Mashimo, Tokyo; Tetsuya Taguchi, Kawasaki, and Zenzo Nakamura, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 399,743, Sept. 21, 1973. This application July 15, 1974, Ser. No. 488,441

Claims priority, application Japan, Sept. 25, 1972, 47-95998; Dec. 27, 1972, 48-3923

Int. Cl.² G03B *7/14, 7/16*

U.S. Cl. 354—27 **32 Claims**


Shutter Time
Section for Operating Conditions for Ambient Light Photography
Average Luminance Objects
A S A
Exposure Control
Diaphragm
Section for Operating Conditions for Flash Photography
Main Object Distance
Luminance of Main Object
Flash Amount
Flashing Device

1. An exposure interval preselection flash exposure control system for a camera, said camera including a shutter mechanism, comprising:

an adjustable camera-diaphragm device for limiting an exposure light in accordance with a scene brightness under natural light, said device including:

photoresponsive means having a first photoresponsive element responsive to the luminance of objects to be photographed;

shutter interval setting means for permitting the preselection of shutter speed;

a computing circuit coupled to said photoresponsive means and shutter interval setting means for computing the exposure aperture of the diaphragm corresponding to circuit parameters derived from said photoresponsive means and shutter interval setting means;

a diaphragm aperture adjusting means connected with said diaphragm device for setting the aperture value of the diaphragm, the adjusting means being operatively connected to said computing circuit; and

a means connected with said diaphragm aperture adjusting means for generating an electrical signal correspondng to a diaphragm aperture adjusted value, and

a flash device including means for controlling the amount of flash energy in response to the exposure aperture value determined by said computing means, said flash energy control means including:

means for forming a control signal in accordance at least. with the distance to the subject of principal photographic interest, said forming means including a second photoresponsive element responsive to the luminance of the subject of principal photographic interest in a scene to be photographed the element having a delaying characteristic the value of which is representative of the luminance of object after a significant time period so that the element is non-responsive to the flashing light constituent of the luminance of object;

timing means electrically coupled to said forming means and said electric signal generating means for a measure of an interval of time correspondng to the control signal in consideration of the value of said second photoresponsive element, whereby an appropriate exposure is provided for the main portion and other portion of the object by illumination of external light and to the main portion of the subject by illumination of an auxiliary light and the external light corresponding to the preset shutter speed respectively;

switching means, electrically coupled to said timing means, having the duration of its conducting state controlled by the time interval measure;

power source means for providing flash energy; and

flash discharge means coupled by way of said switching means to said power source means.

4,005,445

AUTOMATIC EXPOSURE CONTROL MEANS

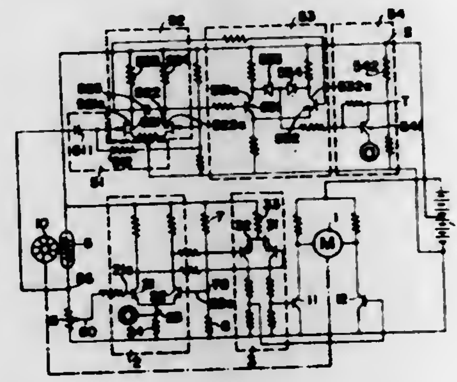
Kunio Ando, Warabi, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 15, 1974, Ser. No. 442,755

Claims priority, application Japan, Apr. 4, 1973, 48-38580

Int. Cl.² G03B *7/08*

U.S. Cl. 354—44 **5 Claims**



1. In an automatic exposure control means for a camera wherein a diaphragm of the camera is controlled by a servomotor which is actuated with an imbalance output of a bridge circuit including aa an element thereof a photodetector to receive light from the object to be photographed, said imbalance output of the bridge circuit being amplified by a transistor amplifier, the improvement comprising a servomotor braking means including a differentiation circuit connected to said photodetector and differentiating the output of said photodetector and an amplifier connected between said differentiation circuit and said transistor amplifier for putting the output of the differentiation circuit into said transistor amplifier to control emitter current thereof.

4,005,446

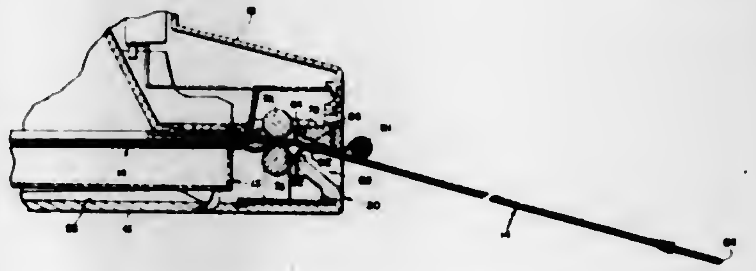
PHOTOGRAPHIC FILM PROCESSING APPARATUS

Harvey S. Friedman, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,638

Int. Cl.² G03B *17/50*

U.S. Cl. 354—86 **11 Claims**



1. Photographic apparatus comprising:

means for receiving and locating a stacked array of resiliently flexible, substantially flat, rectangular self-processable film units with a foremost one in position for exposure, each of the film units having a leading edge and a trailing edge spaced from its leading edge and including a container of processing fluid mounted adjacent its leading edge, each of the film units thus arranged to have its fluid spread across preselected portions thereof as a pressure is progressively applied to it from its leading to its trailing edge;

a pair of juxtaposed fluid spreading rollers that form an elongated pressure generating gap between them that is positioned to receive the leading edge of a foremost film unit after its exposure to progressively apply a pressure to the film unit as it advances therethrough;

means for defining an elongated film exit and for releasably gripping the film unit when a portion thereof is disposed in said exit, said exit being offset with respect to the path of travel that the leading edge of the film unit would normally follow as it emerges from said gap, said exit further being positioned so that a major portion of the film unit extends therethrough and outside of said apparatus when the trailing edge of the film unit leaves said gap;

actuable means for advancing the foremost film unit from said exposure position and introducing its leading edge into said gap;

actuable means for driving at least one of said rollers to advance the foremost film unit through said gap; and

means for engaging the leading edge of the foremost film unit and directing it toward said exit as the foremost film unit is being advanced through said gap and for preventing the trailing edge of the foremost film unit, when it leaves said gap, from flipping out of said normal path of travel under the influence of its resiliently flexible characteristic so that the leading edge of the next film unit advancing through said gap will engage the trailing edge of the prior advanced film unit to push it entirely outside of said apparatus.

4,005,447

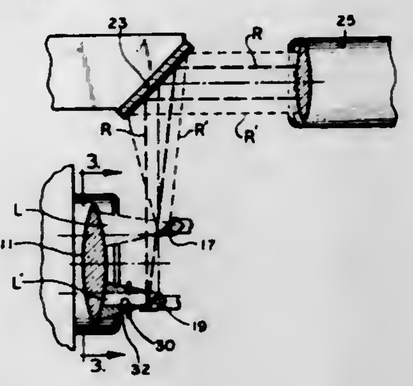
DUAL BEAM RANGEFINDER

Danny Filipovich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 2, 1975, Ser. No. 582,702

Int. Cl.² G03B *13/20*

U.S. Cl. 354—166 **7 Claims**



1. In a single lens reflex camera having a viewfinder system and an objective lens defining an optical path between first and second lens cells, said first lens cell transmitting light rays along said optical path, a rangefinder system to facilitate focusing said objective lens on a subject, the rangefinder system comprising:

a first means mounted in said optical path between the lens cells of said objective lens for reflecting a portion of said light rays in a predetermined direction;

a second means mounted in said optical path between the lens cells of said objective lens for reflecting another portion of said light rays in a predetermined direction;

an optical system arranged in said camera to receive the light rays reflected by said first and second reflecting means to form a superimposed image in a predetermined plane in said viewfinder system when the objective lens is in focus on the subject and to form separate images in said plane when the objective lens is not focused on the subject; and

means mounted in said optical path for masking from one of said reflecting means a sufficient amount of the off-axis light rays otherwise incident thereto to restrict the transmission of the image from said one reflecting means to a finite central portion of the predetermined plane of said viewfinder, thereby limiting the superimposition of said images to said central portion.

4,005,448

PROGRAMMED SHUTTER

Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Daito, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Oct. 31, 1974, Ser. No. 519,653

Claims priority, application Japan, Nov. 5, 1973, 48-124806; Dec. 28, 1973, 49-2837

Int. Cl.² G03B *7/08, 9/02*

U.S. Cl. 354—30 **13 Claims**

1. A programmed shutter comprising:

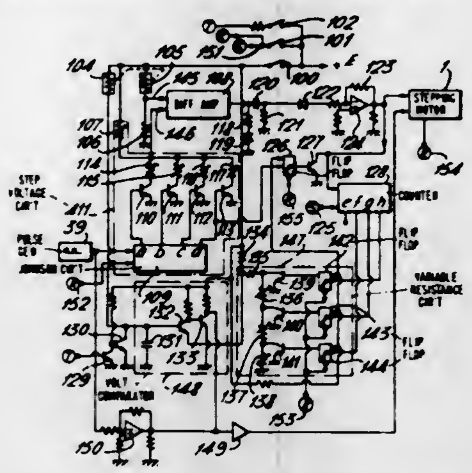
a plurality of blades adapted to serve both as shutter blades and as diaphragm blades;

a reversible stepping motor operatively connected to said blades to actuate same when the motor is energized, said stepping motor comprising first and second concentric rings rotatably related to one another and having a central opening through which light may pass, means for pivotally connecting said first ring to the blades, and means for slidably connecting the second ring to said blades whereby during relative rotation of the first and second rings the blades move with respect to one another to vary the amount of light passing through said opening;

gating means joined to said motor;

a pulse generator operatively connected to said gating means;

means responsive to brightness for controlling said gating means to develop a predetermined number of pulses at the output of the gating means to step the motor in one direction thereby opening the blades to an aperture value which is a function of the brightness; and



means responsive to both the brightness and said aperture value for controlling said gating means, after a period of time which is a function of the brightness and aperture value, to apply pulses to the motor to step the motor in a reverse direction thereby closing the blades.

4,005,449

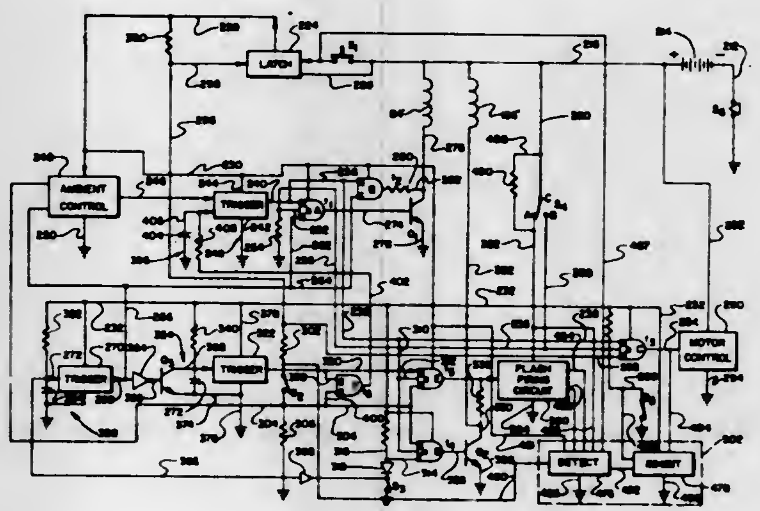
FLASH PHOTOGRAPHIC SYSTEM WITH CAMERA INHIBIT FEATURE

Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 424,551, Dec. 13, 1973, abandoned. This application June 24, 1974, Ser. No. 482,379

Int. Cl.² G03B *15/04*

U.S. Cl. 354—128 **18 Claims**



1. A flash exposure system for use with photographic apparatus of a variety actuable to automatically carry out a sequence of operational events from first to last defining a photographic cycle, comprising:

means for mounting an array of flashlamps in an orientation for ignition to illuminate a scene and including terminals means for providing electrical connection with each said flashlamp and for exhibiting a predetermined electrical state in the presence of a condition representing an ignition of all said flashlamps within said array;

firing circuit means connected with said terminal means for selecting one of said flashlamps in predetermined order from first to last and igniting said selected flashlamp in synchronism with a predetermined one of said operational events;

electrical detector means responsive to said terminal means electrical state for deriving a unique electrical signal condition representative thereof, said detector means including:

a comparison network coupled with said terminal means, said comparison network incorporating said predetermined electrical state as a compared component thereof and providing a predetermined output condition in the presence of said terminal means electrical state, and

a differential amplifier means responsive to said predetermined output condition for deriving said unique electrical signal condition; and

inhibit means responsive to said unique electrical signal condition for preventing the carrying out of select said operational events following the completion of a number of photographic cycles expending all said arrayed flashlamps in said orientation to illuminate a scene.

4,005,450

INSULATED GATE FIELD EFFECT TRANSISTOR HAVING DRAIN REGION CONTAINING LOW IMPURITY CONCENTRATION LAYER

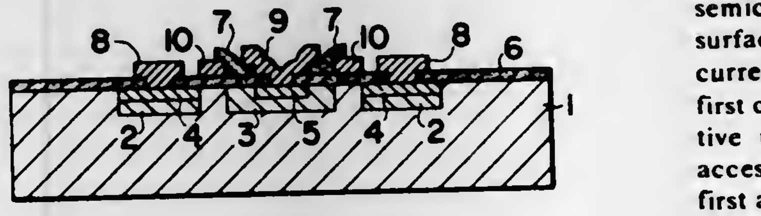
Isao Yoshida, Nishitama; Takeshi Tokuyama, Higashikurume; Shigeru Nishimatsu, Kokubunji, and Takahide Ikeda, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

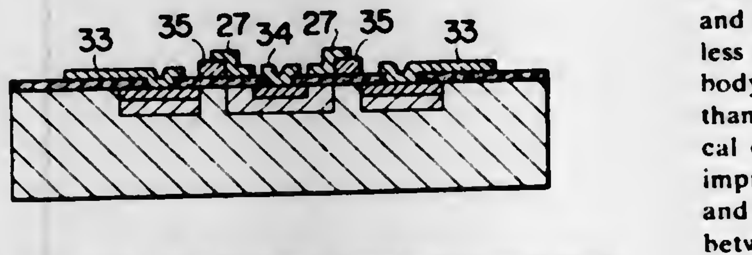
Continuation-in-part of Ser. No. 391,047, Aug. 24, 1973, abandoned, which is a division of Ser. No. 142,933, May 13, 1971, Pat. No. 3,787,962. This application Dec. 16, 1974, Ser. No. 532,923

Claims priority, application Japan, May 13, 1970, 45-40114

Int. Cl.² H01L *29/78*

U.S. Cl. 357—23 **13 Claims**





1. An insulated gate field effect transistor comprising:

a semiconductor substrate of a first conductivity type;

a source region of a second conductivity type, opposite said first conductivity type and having an impurity concentration higher than that of said substrate, disposed in a first surface portion of said substrate and defining with said substrate a first p-n junction which extends to the surface of said substrate;

a drain region disposed in a second surface portion of said substrate spaced apart from said source region by a third surface portion of said substrate therebetween, said drain region comprising

a first semiconductor region having a second conductivity type and forming a second p-n junction with said substrate which extends to the surface of said substrate, and

a second semiconductor region having said second conductivity type and an impurity concentration higher than the impurity concentration of said first region and the same as that of said source region, disposed in a surface portion of said first region and being separated from said third surface portion of said substrate by said first semiconductor region therebetween;

a first insulating film disposed on said substrate at least between said source and drain regions;

a gate electrode disposed on said first insulating film between said source and drain regions so that one edge of said gate electrode is aligned with the termination of said first p-n junction at the surface of said substrate, and the other edge of said gate electrode opposing to said one edge of said gate electrode is aligned with the termination of said second p-n junction at the surface of said substrate;

a second insulating film disposed on said second surface portion of said substrate at least between said third surface portion and said second semiconductor region; and

electrodes connected to said source region and to said second semiconductor region, respectively.

4,005,451

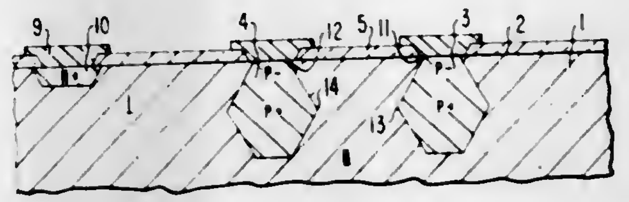
LATERAL CURRENT DEVICE

Ramon Ubaldo Martinelli, Hightstown, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 572,615

Int. Cl.² H01L *29/72, 29/06*

U.S. Cl. 357—35 **9 Claims**



1. A generally lateral current flow device comprising a semiconductor body having a surface, a surface layer on said surface of the body of a nature liable to perturb local lateral current flow therein, first and second electrode regions of a first conductivity type extending within the body from respective portions of said surface thereof, respective electrical access terminals on the body contacting at said surface the first and second electrode regions, a third electrode region of a second conductivity type lying between the first and second electrode regions and having an outer portion located along and close to the surface of the body and an inner portion lying less close thereto, a third electrical access terminal on the body contacting a region of said surface thereof located other than between the first two surface regions but being in electrical communication with the third electrode region; and the improvement providing a relative configuration of the first and second electrode regions leading to a shorter distance between them through said inner portion of the third region than that through said outer portion thereof.

4,005,452

METHOD FOR PROVIDING ELECTRICAL ISOLATING MATERIAL IN SELECTED REGIONS OF A SEMICONDUCTIVE MATERIAL AND THE PRODUCT PRODUCED THEREBY

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 15, 1974, Ser. No. 524,296

Int. Cl.² H01L *27/12*

U.S. Cl. 357—49 **37 Claims**

1. A method for providing electrical isolation regions in a semiconductive material, comprising the steps of:

forming a protective dielectric layer on a surface of the semiconductive material;

removing the dielectric and a portion of the semiconductive material in said regions;

depositing a metal over said surface to cover both the regions and the dielectric layer, said metal having a thickness so that the metal on the dielectric layer does not contact the metal in the regions;

anodizing the metal in the regions by submerging the semiconductive material into an anodizing solution and applying and anodizing potential to the metal in the regions so that the metal in the regions becomes an anode and is anodized to form a dielectric insulating material in the regions, the metal on the dielectric layer remaining unanodized because of the electrical insulation provided by the dielectric layer which separates the metal from the semiconductive material; and

removing the unanodized metal from the dielectric layer by etching in a solution that does not attack the anodized metal.

4,005,453

SEMICONDUCTOR DEVICE WITH ISOLATED CIRCUIT ELEMENTS AND METHOD OF MAKING

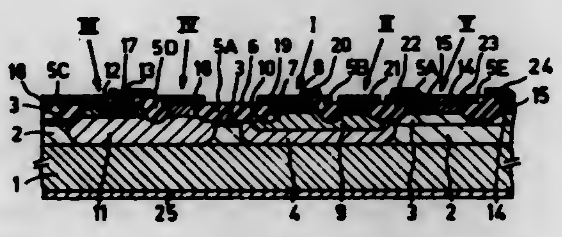
Claude Jan Principe Frederic Le Can, Nijmegen; Else Kool, Eindhoven, and Walter Steinmaier, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 399,860, Sept. 24, 1973, Pat. No. 3,909,318, which is a division of Ser. No. 237,460, March 23, 1972, abandoned. This application Jan. 9, 1975, Ser. No. 539,634

Claims priority, application Netherlands, Apr. 14, 1971, 7105000

Int. Cl.² H01L *27/12, 27/04, 29/34, 29/06*

U.S. Cl. 357—49 **6 Claims**



1. A semiconductor device comprising a semiconductor body having a lower region of a first conductivity type, a first epitaxial layer on said lower region, a second epitaxial layer on said first epitaxial layer and having an upper surface, a first buried layer of a second conductivity type present in the body and extending from said lower region up through the first epitaxial layer and having its maximum impurity concentration at the lower region - first layer interface, a second buried layer of said first conductivity type present in the body and extending between said first buried layer and into the second epitaxial layer and having its maximum impurity concentration at the first layer-second layer interface, a pattern of insulating material inset in the second layer, said inset insulating material pattern including a first portion substantially entirely surrounding a region of second layer and adjoining the first buried layer along is preipheral portions and having a second portion within the first portion and dividing the said second layer region into at least a first island region and a second island region enclosed laterally by the first insulating pattern portion and below by the first buried layer, said first and second island regions both adjoining the first buried layer, said second island region being of the first conductivity type, said second insulating pattern portion being spaced from the first buried layer by at least a part of the thickness of the second buried layer, and a first semiconductor circuit element built at least partly in the first island region.

4,005,454

SEMICONDUCTOR DEVICE HAVING A SOLDERABLE CONTACTING COATING ON ITS OPPOSITE SURFACES

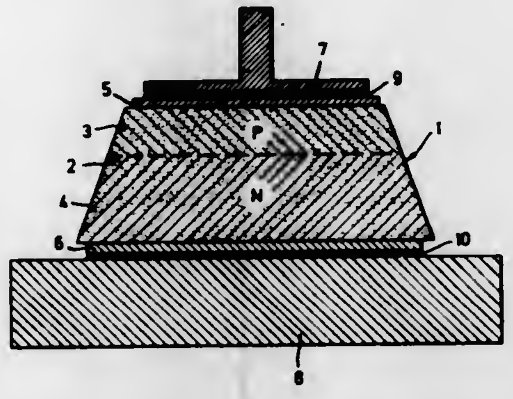
Helmut Froloff, Schwabach, and Theodor Tovar, Bubenreuth, both of Germany, assignors to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnbeg, Germany

Filed Mar. 26, 1976, Ser. No. 670,826

Claims priority, application Germany, Apr. 5, 1975, 2514922

Int. Cl.² H01L *23/48, 29/40, 29/46, 29/62*

U.S. Cl. 357—65 **5 Claims**



1. In a semiconductor device including a disc of semiconductor material having at least one pn-junction and solderable contacting coatings on its opposed major surface which coatings are permanently connected in a direct planar manner with respective current conducting connections by means of a soft solder; the improvement wherein said soft solder is a tin solder containing 3 to 8% antimony, 0.1 to 2% nickel, remainder tin, or 3 to 8% antimony, 0.1 to 3% copper, 0.1 to 2% cadmium, remainder tin, or 1 to 6% silver, 0.1 to 2% cadmium, remainder tin; or a cadmium solder containing 10 to 25% zinc, 1 to 5% silver, remainder cadmium, or 10 to 25% zinc, 5% silver, 3% copper, remainder cadmium; or a zinc solder containing 10 to 25% cadmium, 0.1 to 3% copper, remainder zinc; or a lead solder containing 10 to 20% cadmium, 0.3 to 5% antimony, remainder lead, or 1 to 5% silver, 0.5 to 2% tin, 0.1 to 2% nickel, 0.1 to 3% copper, remainder lead, whereby a semiconductor device which is resistant against alternating thermal stresses is obtained.

4,005,455

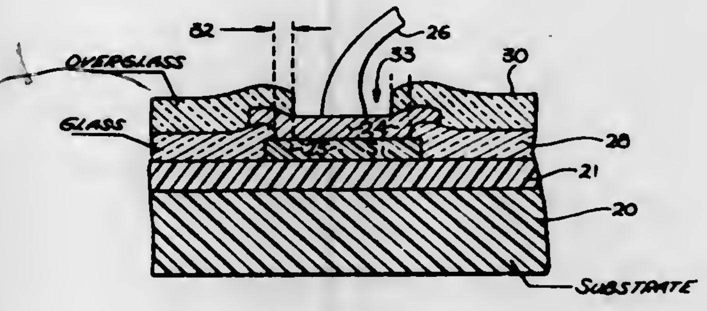
CORROSIVE RESISTANT SEMICONDUCTOR INTERCONNECT PAD

Willis George Watrous, Jr., Mountain View, and Robert T. Jenkins, Byron, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 21, 1974, Ser. No. 499,184

Int. Cl.² H01L *29/34, 29/04, 23/48, 23/28*

U.S. Cl. 357—71 **9 Claims**



1. In a semiconductor device having a substrate which includes at least a first insulative layer disposed thereon, a contact pad for providing electrical coupling between external leads, circuit interconnections and diffused regions contained within said substrate comprising:

- a semiconductor layer overlying at least a portion of said first insulative layer;
- a second insulative layer overlying said first insulative layer and contiguous with said semiconductor layer, wherein said second insulative layer may contain corrosive agents;
- a conductive layer overlying at least said semiconductor layer but having minimal contact with said second insulative layer;
- a third insulative layer overlying at least said second insulative layer and a portion of said conductive layer, said conductive layer being in substantial contact only with said third insulative layer and said semiconductor layer; and
- a lead member disposed on a central portion of said conductive layer so that said lead member is electrically coupled to said semiconductor layer even though electrical parameters of exposed portions of said conductive layer are substantially degraded;

thereby preventing corrosion due to impurities contained within said second insulative layer.

4,005,456

CONTACT SYSTEM FOR SEMICONDUCTOR ARRANGEMENT

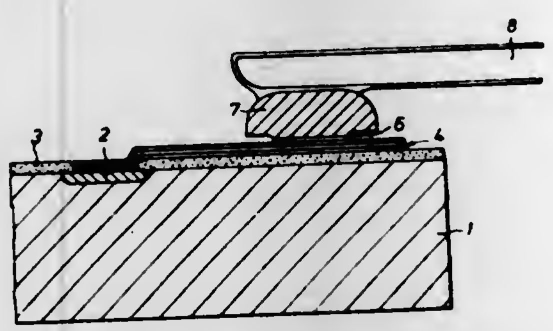
Leonhard Botzenhardt, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 10, 1975, Ser. No. 548,889

Claims priority, application Germany, Feb. 27, 1974, 2409312

Int. Cl.² H01L *23/48, 29/46*

U.S. Cl. 357—71 **7 Claims**



1. In a semiconductor arrangement including a semiconductor body, a metal layer arranged on a surface of said semiconductor body with said metal layer having, at least on the outside, a vapor deposited or sputtered layer of gold, and a connection region of gold deposited electrolytically on said metal layer and being thicker than said metal layer; the improvement wherein a layer of palladium is arranged between, and in direct contact with, said gold layer and said thicker connection region of gold.

4,005,457

SEMICONDUCTOR ASSEMBLY, METHOD OF MANUFACTURING SAME, AND BONDING AGENT THEREFOR

Michael Hill, Tarrytown, N.Y.; Josef Intrater, Englewood Cliffs, N.J., and Tugrul Yasar, El Paso, Tex., assignors to Semimetals, Inc., Westbury, N.Y.

Filed July 10, 1975, Ser. No. 594,707

Int. Cl.² H01L *33/00, 23/48, 29/44, 29/48*

U.S. Cl. 357—72 **27 Claims**

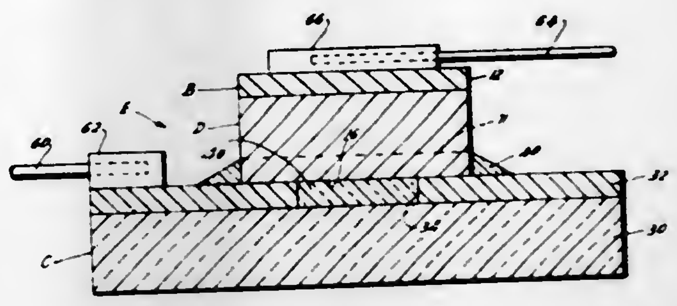
1. A semiconductor assembly comprising

A. a semiconductor having opposed first and second surfaces;

B. a substrate supporting said semiconductor, said substrate including a first electrode bonded to and in electrically conductive contact with said first surface;

C. a cover supported by said semiconductor, said cover comprising an electrically insulating layer and a second electrode comprising a pattern of metallization disposed on the surface of said insulating layer adjacent said semiconductor; and

D. cure-shrunk adhesive bonding means physically bonding



together said semiconductor and said second electrode, with said second semiconductor surface and said second electrode in electrically conductive contact, said semiconductor and said second electrode being bonded together essentially exclusively by said adhesive bonding means.

4,005,458

LIGHT MEASURING DEVICE FOR A SINGLE LENS REFLEX CAMERA WITH A PENTAGONAL PRISM

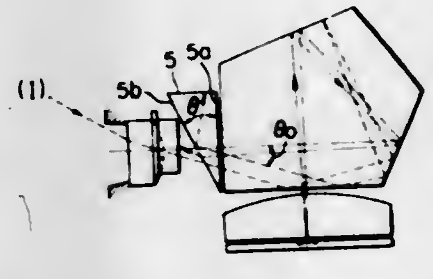
Youichi Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 288,444, Sept. 12, 1972, abandoned. This application Oct. 25, 1974, Ser. No. 518,160

Claims priority, application Japan, Sept. 16, 1971, 46-72073; Sept. 16, 1971, 46-72075; Sept. 16, 1971, 46-72074

Int. Cl.² G03B *19/12, 13/06*

U.S. Cl. 354—155 **15 Claims**



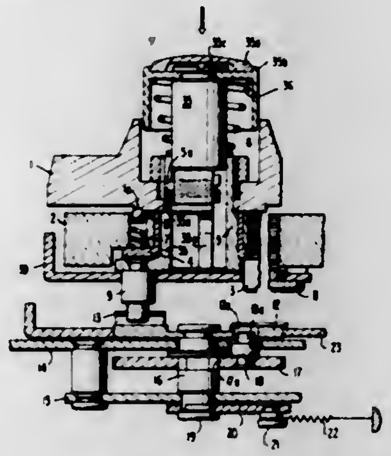
1. A single lens reflex camera comprising:

- a pentagonal roof prism having a plurality of surfaces including a light entrance surface and a light exit surface,
- optical means for directing light from an objective lens in the camera toward the entrance surface,
- said surfaces being arranged to cause light incident upon said entrance surface from said optical means to emerge from the exit surface,
- an eyepiece near the exit surface for receiving light emerging from said exit surface,
- a photosensitive device near said exit surface for receiving light emerging from said exit surface;
- an optical element positioned in the path of light emerging from the exit surface and arranged to guide light emerging from the exit surface, and travelling toward the photosensitive device from one group of directions, toward the photosensitive device, and to guide light emerging from the exit surface, and travelling toward the photosensitive device from another group of directions, away from the photosensitive device.

4,005,459

INTERLOCKED MANUAL STOP-DOWN AND MIRROR-UP MECHANISM FOR SINGLE LENS REFLEX CAMERA

Takumi Kobayashi, Asaka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed July 8, 1975, Ser. No. 594,178
Claims priority, application Japan, July 12, 1974, 49-80348
Int. Cl.² G03B *19/12*
U.S. Cl. 354—156 **6 Claims**

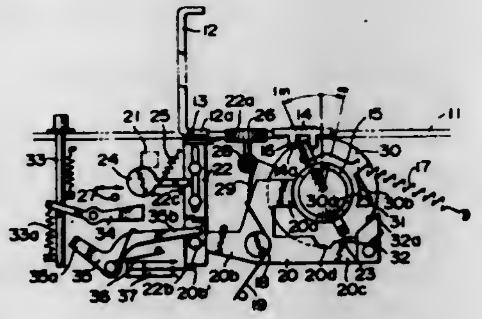


1. In a single lens reflex camera including a camera body, a self-timer mechanism within said body, a manual lens stopping-down mechanism within said body, and a mirror-up mechanism, the improvement wherein: said self-timer mechanism comprises a self-timer charging lever pivoted to said body for movement in a first direction between an initial, uncharged position and a charged position at an angle thereto and in a second direction between said initial position and a mirror-up position angularly displaced therefrom, and wherein a stop button is coaxially mounted at said self-charging lever pivot point for limited depression to effect a stopping-down operation when said self-timer charging lever is located at its initial position, and said camera comprises mechanical interlock means responsive to initial depression of said stop button with said self-timer charging lever at said initial position for preventing initiation of a mirror-up operation unless said stop button is initially depressed prior thereto, and to prevent a return movement of said stop button, after depression, unless said self-timer charging lever is manually rotated from said mirror-up position in the opposite direction to that achieving mirror-up action to said initial position, therefore terminating camera stop-down condition.

4,005,460

PHOTOGRAPHIC CAMERA WITH COVER FOR EXPOSURE CONDITIONS SELECTOR MEANS

Shigeo Mizukawa, Ageo, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed June 10, 1975, Ser. No. 585,653
Claims priority, application Japan, June 19, 1974, 49-69493
Int. Cl.² G03B *3/00*
U.S. Cl. 354—202 **8 Claims**

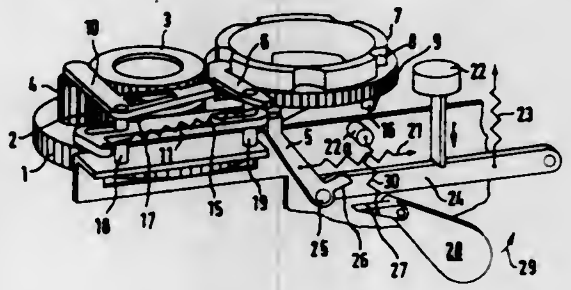


1. A photographic camera comprising a camera body, an exposure controlling means provided in the camera body for controlling exposure of film loaded in the camera body, an exposure condition selecting means provided on the camera body for selecting between normal exposure condition and other exposure condition, and a cover provided on the camera body movable between an open and a closed position, in which closed position the cover prevents said exposure condition selecting means from being manually operated and causes said exposure controlling means to operate in the state of normal exposure condition, and in the open position the cover allows said exposure condition selecting means to be manually operated.

4,005,461

DRIVING DEVICE FOR FILM TRANSPORT AND SHUTTER COCKING LEVER FOR A CAMERA

Karl Heinz Lange, Bunde, Germany, assignor to Balda-Werke Photographische Gerate & Kunststoff GmbH & Co. KG, Bunde, Germany
Filed Feb. 24, 1976, Ser. No. 660,758
Claims priority, application Germany, Mar. 12, 1975, 2510724
Int. Cl.² G03B *17/42*
U.S. Cl. 354—204 **13 Claims**



1. A drive device for a film transport and shutter cocking lever for a camera whose film is indexed once per frame and having a film transport wheel coupled to a spool core and a displaceable shutter cocking lever, comprising a first gear wheel concentrically connected with said film transport wheel and a second gear wheel mounted for free rotation relative to said first gear wheel; a displaceable carrier; a coupling gear wheel carried by said carrier for displacement between a first position at which said coupling gear wheel simultaneously engages said first and second gear wheels and a second position at which said coupling gear wheel is out of such engagement; a moving surface formed with notches therein and operatively coupled to said second gear wheel for displacement thereby, a pivotably mounted pawl; means for biasing said pawl against said moving surface to position said pawl in an inwardly position when resting in one of said notches and an outwardly position when out of said notches; and means selectively coupling said carrier, pawl and shutter cocking lever so that the position of said carrier in one of its first and second positions depends on the respective positions of said pawl and shutter cocking lever, said carrier being positioned in its first position at at least one position of each of said pawl and shutter cocking lever.

4,005,462

DOUBLE SLIDE FOCAL PLANE SHUTTER

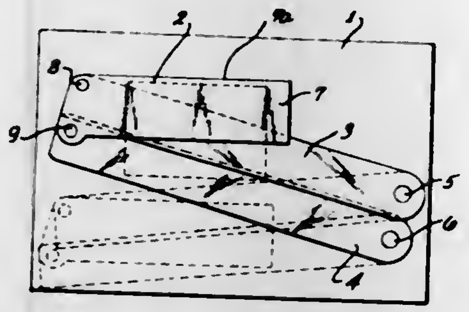
Friedrich Papke, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Dec. 3, 1975, Ser. No. 637,308
Claims priority, application Germany, Dec. 7, 1974, 2458005
Int. Cl.² G03B *9/20, 9/08*
U.S. Cl. 354—246 **6 Claims**

1. In a double slide focal plane shutter for photographic cameras, a multiple element slide disposed in front of an image aperture defined by partitioning means or the like in the cameras, the slide comprising:

a lamella covering only a portion of the image aperture in the camera, and having a slit defining edge;

a plurality of flat arms disposed in at least partially overlapping extension parallel to each other, at least two of the arms having one end pivotally linked to said lamella;

a plurality of spaced apart pivot points for pivotally mounting respectively one end of each of said arms, including the respective other ends of the said two arms, to a stationary portion of and in the camera housing, so that all of the arms being linked to the lamella operate as a parallelogram-like linkage for the lamella and the lamella is moved in front of the aperture whereby the edge retains its orientation; and

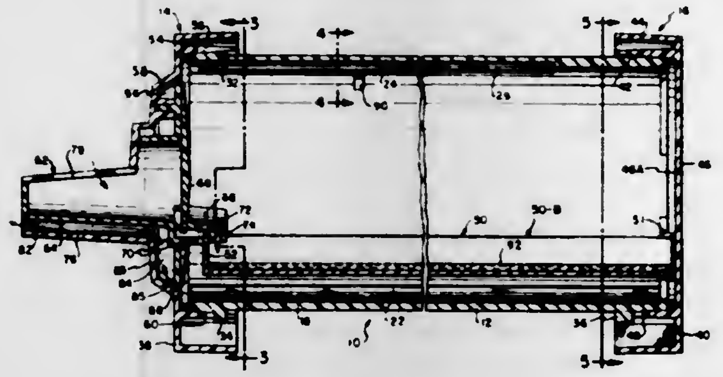


the arms together and in each position covering also that portion of the aperture opposite the said slit defining edge and not covered by the lamella when in front of the aperture, whereby each of said arms covers a portion of the aperture not covered by any of the other arms.

4,005,463

PHOTOGRAPHIC PROCESSING DRUM AND METHOD FOR USING

Charles J. Kowalski, New York, N.Y., assignor to Charles Beseler Company, Florham Park, N.J.
Filed July 8, 1975, Ser. No. 593,986
Int. Cl.² G03D *17/00*
U.S. Cl. 354—307 **19 Claims**



1. A photographic processing drum comprising a tubular body member,

a trough mounted within said body member and spaced apart from the interior surface thereof, the longitudinal axis of said trough being substantially parallel to the longitudinal axis of said body member,

a cap sealingly fitted to one end of said body member and bearing an outwardly projecting spout, and

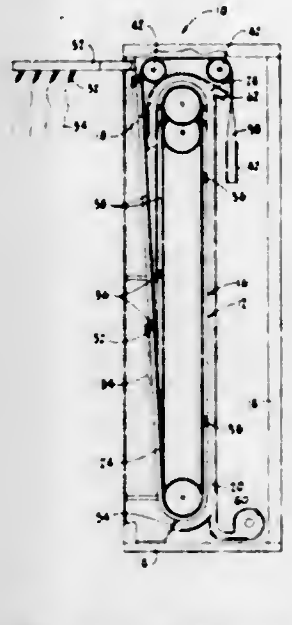
a fluid entry passageway in communication with said spout and with an orifice at the interior surface of said cap, the orifice being positioned over said trough to discharge in the trough fluid supplied to said spout when said drum is in a horizontal position,

said trough comprising means for holding the fluid received therein isolated from the interior surface of said drum when said trough is positioned to receive fluid from said orifice and also having an open top extending substantially parallel to the longitudinal axis of said body member for dispensing said fluid substantially simultaneously over a side wall of said trough in response to rotation of said drum about its horizontal axis.

4,005,464

APPARATUS AND METHOD FOR PROCESSING PHOTOGRAPHIC FILM

Vivian D. Krehbiel, Wichita, Kans., assignor to Kreonite, Inc., Wichita, Kans.
Filed Oct. 20, 1975, Ser. No. 623,729
Int. Cl.² G03D *3/12*
U.S. Cl. 354—322 **28 Claims**



1. A photographic film processing apparatus comprising:

a sequence of adjacent elongated chambers communicating with each other at their top and bottom portions and each adapted to contain a selected film treating fluid agent;

an infeed port communicating with a first terminal chamber of the sequence and a discharge port communicating with a second terminal chamber;

at least one carrier including a magnetic element carried thereon, said carrier dimensioned to traverse the inner surface of said chambers;

releasable grip means mounted on said carrier for releasably gripping one end of a length of film with the film maintained in a trailing relation to said carrier; and

magnetic belt means disposed adjacent the outer surface of said chambers and magnetically responsive to the magnetic element of said carrier, said belt means operative for guiding said carrier through the elongated lengths of said chambers thereby subjecting the film to a succession of the film treating fluid agents in predetermined order.

4,005,465

TUNNEL EMITTER PHOTOCATHODE

Brian S. Miller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 476,248, June 4, 1974, Pat. No. 3,913,218.
This application May 30, 1975, Ser. No. 582,545
Int. Cl.² H01L *49/02, 27/14*
U.S. Cl. 357—6 **5 Claims**

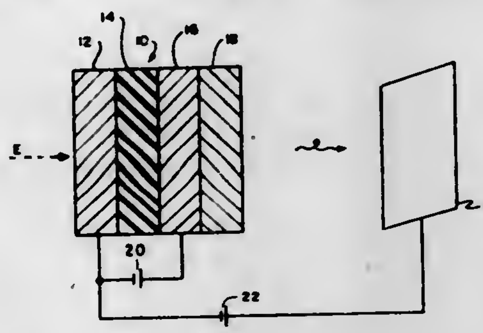
1. A tunnel emitter photocathode comprising:

a layer of semiconductor material that converts light to photoelectrons, said semiconductor material having an electrical contact attached thereto;

an amorphous aluminum oxide insulating layer contiguous with one side of said layer of semiconductor material;

a constant thickness metallic emitter layer contiguous with said insulating layer and having an electrical contact attached thereto;

a thin layer of low work function material contiguous with said metallic emitter layer; and a bias voltage source connected to electrical contacts attached to said semiconductor material and said metallic emitter layer wherein said bias voltage source produces an electric field across said insulating layer to tunnel electrons through said insulating layer and into said metallic emitter layer and out said thin layer of low work function material.



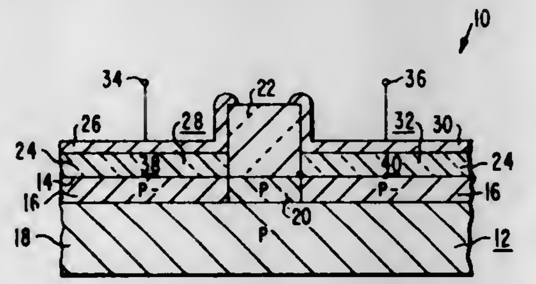
4,005,466
PLANAR VOLTAGE VARIABLE TUNING CAPACITORS

Robert Herman Dawson, Kingston, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,421

Int. Cl.² H01L *29/92, 29/78;* **H01G** *9/00, 9/18*

U.S. Cl. 357—14 **4 Claims**



1. A planar semiconductor device comprising:

a body of semiconductor material having one type conductivity and having a surface, said body having a first region and a second region therein, said first region being adjacent said surface and having a lower carrier concentration than said second region;

a third region of semiconductor material having said one type conductivity within said first region, said third region being adjacent said surface and extending through said first region to said second region, said third region having a carrier concentration on the order of that of said second region;

a layer of dielectric material overlying said first region;

a first electrode overlying a first portion of said layer of dielectric material; and

a second electrode overlying a second portion of said layer of dielectric material, said second electrode being insulatingly separated from said first electrode, said third region being in the electrical path between said first electrode and said second electrode.

4,005,467
HIGH-POWER FIELD-EFFECT TRANSISTOR AND METHOD OF MAKING SAME

Claude Vergnolle, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 412,785, Nov. 5, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,946

Claims priority, application France, Nov. 7, 1972, 72.39347

Int. Cl.² H01L *29/80*

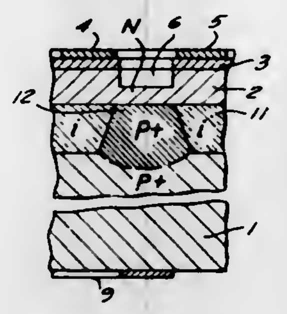
U.S. Cl. 357—22 **9 Claims**

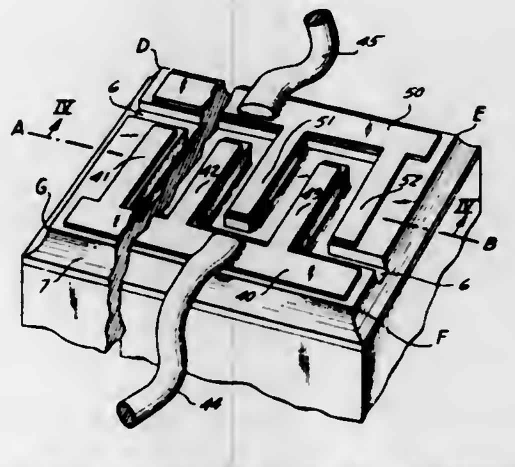
1. A field-effect transistor comprising:

a monocrystalline semiconductive substrate of one conductivity type forming a body with an upper and a lower surface;

a semiconductive layer of opposite conductivity type overlying said upper surface;

a semiconductive film of a resistivity and a thickness substantially less than those of said layer and of said opposite conductivity type disposed on said layer, said layer and film being provided with a trench cutting through said film and partly into said layer to leave a channel of controllable conductivity, said trench subdividing said layer and film into two semiconductive segments bounded by passivated surface areas;





a pair of metallic deposits respectively overlying said segments and forming a pair of main electrodes separated by said trench; and

a metallic gate electrode on said lower surface in line with said channel.

4,005,468
SEMICONDUCTOR PHOTOELECTRIC DEVICE WITH PLURAL TIN OXIDE HETEROJUNCTIONS AND COMMON ELECTRICAL CONNECTION

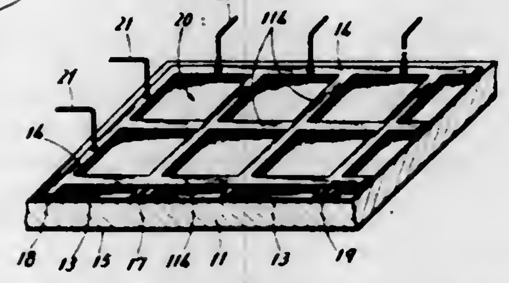
Shigeru Tanimura, Kyoto; Nobuaki Miura, and Mikizo Miyamoto, both of Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 3, 1973, Ser. No. 347,427

Claims priority, application Japan, Apr. 4, 1972, 47-34174; Sept. 30, 1972, 47-98248

Int. Cl.² H01L *29/90, 33/00, 31/12, 27/14*

U.S. Cl. 357—15 **42 Claims**



1. A semiconductor photoelectric device of increased light receiving area for providing increased photoelectric output current comprising:

a semiconductor substrate having a main surface,

a plurality of tin oxide films deposited on said main surface of said semiconductor substrate, said tin oxide films being spaced apart from each other by a narrow spacing between peripheral portions of adjacent tin oxide films, whereby a corresponding plurality of heterojunction barriers, each having a rectifying characteristic, is formed between said tin oxide films and said substrate, said narrow spacings between said tin oxide films reducing stresses at the respective barriers thereof,

means comprising a metal layer forming an electrically common connection to the separate tin oxide films, said metal layer being formed to include portions respectively extending along each said spacing and in electrical contact with the peripheral portions of all of said adjacent tin oxide films, thereby permitting incident light to be received by said tin oxide films,

an insulator on said substrate and extending at least within said narrow spacings for maintaining said metal layer in spaced, insulated relationship from said substrate, and

means for withdrawing a photoelectric conversion output from between said semiconductor substrate and said connecting means.

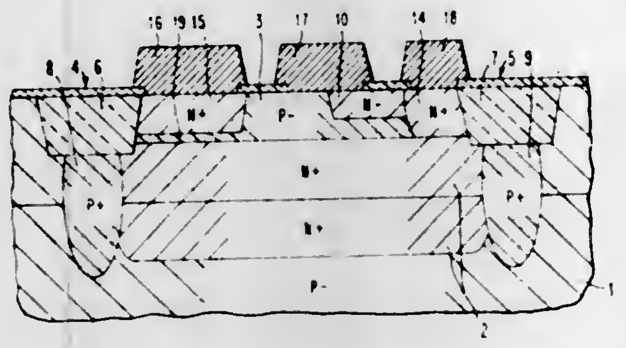
4,005,469
P-TYPE-EPITAXIAL-BASE TRANSISTOR WITH BASE-COLLECTOR SCHOTTKY DIODE CLAMP

Augustine Wei-Chun Chang, Wappingers Falls, and Vincent Joseph Lucarini, Pleasant Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 20, 1975, Ser. No. 588,918

Int. Cl.² H01L *29/48, 29/56, 29/64, 29/72*

U.S. Cl. 357—15 **7 Claims**



1. A Schottky diode clamped transistor comprising:

a heavily doped first layer of a first impurity type forming the collector of said transistor,

a lightly doped second layer of the other conductivity type over said first layer and forming the base of said transistor,

a heavily doped first region of said first conductivity type in the surface of said second layer and forming the emitter of said transistor,

a lightly doped second region of said first conductivity type in said surface of said second layer and separated from said first region,

a heavily doped reach-through region of said first conductivity type extending through said second layer and connecting said second region to said first layer, and

a contacting member on the surface of said second layer and extending across the boundary of said second region to establish ohmic contact with said second layer outside said second region and Schottky barrier contact with said second layer inside said second region.

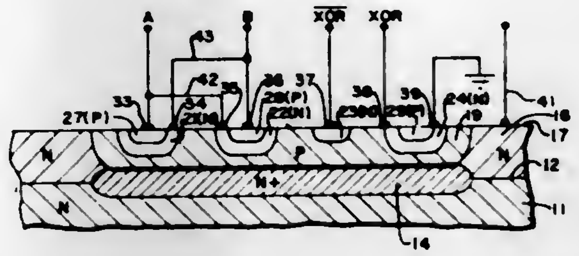
4,005,470
TRIPLE DIFFUSED LOGIC ELEMENTS

Patrick A. Tucci, Santa Clara, and Lewis K. Russell, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed July 15, 1974, Ser. No. 488,754

Int. Cl.² H01L *29/72*

U.S. Cl. 357—36 **14 Claims**



1. In a semiconductor logic structure, a semiconductor body of one conductivity type having a planar surface, a sole continuous first region of opposite conductivity type formed in said body and extending to said surface, spaced second, third and fourth regions of one conductivity type formed entirely within said sole continuous first region and extending to said surface, said second and third regions forming base regions, said fourth region forming a collector region in combination with said body and said first region to define a vertical transistor, fifth and sixth emitter regions of opposite conductivity respectively formed entirely within said second and third regions and extending to said surface.

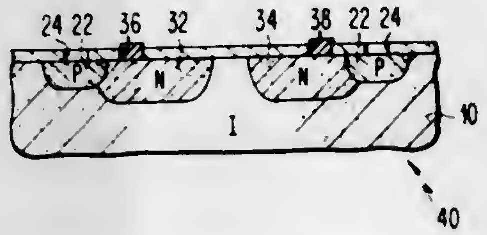
4,005,471
SEMICONDUCTOR RESISTOR HAVING A HIGH VALUE RESISTANCE FOR USE IN AN INTEGRATED CIRCUIT SEMICONDUCTOR DEVICE

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,276

Int. Cl.² H01L *27/02, 29/12;* **H01H** *37/38, 37/40*

U.S. Cl. 357—51 **10 Claims**



1. A high value resistor element for use in a semiconductor integrated circuit device comprising:

a semiconductor body

a high resistivity region in said semiconductor body, with a resistivity in excess of one ohm cm. and a first type background impurity;

at least two parallel elongated diffused regions in said high resistivity region of said semiconductor body extending inwardly from the surface, said diffused regions embodying a first type impurity, each having a central surface region with an impurity concentration sufficient to provide an ohmic contact, the boundaries of said surface diffused regions defined by the interface where the impurity concentration of the region is ten percent more than the impurity concentration of said first type background impurity, the impurity concentration in said diffused regions decreasing with distance in a radiating direction from the central surface region,

said diffused regions being spaced such that said boundaries intersect with each other, and ohmic contact terminals to each of said diffused regions located over said central surface regions.

4,005,472

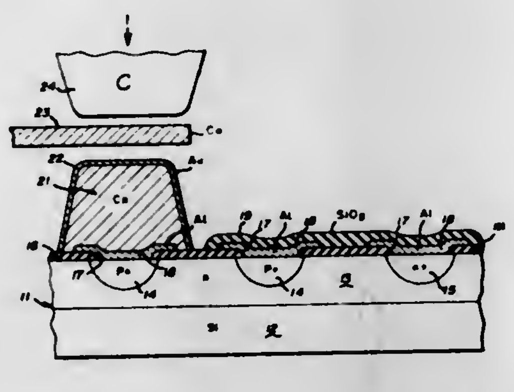
METHOD FOR GOLD PLATING OF METALLIC LAYERS ON SEMICONDUCTIVE DEVICES

James M. Harris, and William M. Gouin, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1975, Ser. No. 578,651

Int. Cl.^{2} H01L *29/46, 23/48*

U.S. Cl. 357—71 **6 Claims**



1. In a method for gold plating of an integrated circuit semiconductive device, of the type which includes a plurality of exposed copper thermal compression gang bonding bumps rising above the passivated surface of the semiconductive device and being connected at their bases to an underlying pattern of interconnect metallization, for providing an antioxidant coating of gold on the exposed copper gang bonding bumps without plating of gold nonmetallic portions of the device, the steps of:

applying as a final plating step an immersion gold plating solution to both the exposed copper gang bonding bumps and nonmetallic surface portions of the semiconductive device for plating out of the immersion gold plating solution by a process of oxidation-reduction reaction using the differences inherent in the electropotentials of the gold and the copper of the gang bonding bumps to be plated as the driving force for selectively plating the gold directly onto the copper gang bonding bumps; and

maintaining the copper gang bumps in contact with the immersion plating solution only so long as to plate gold onto the copper gang bonding bumps to a thickness less than 6000 angstroms so that the thickness of the gold plating is compatible with thermal compression gang bonding of the copper bumps through the gold plating layer to other lead structures.

4,005,473

METHOD AND APPARATUS FOR SYNCHRONIZING RECORD AND PLAYBACK OF VIDEO SIGNALS

Bernhard A. Hjortzberg, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 25, 1975, Ser. No. 571,705

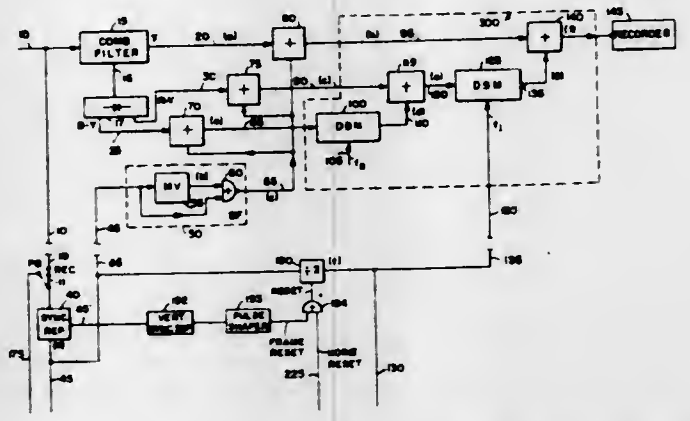
Int. Cl.^{2} H04N *9/46, 5/76*

U.S. Cl. 358—4 **13 Claims**

1. In a color video signal processing system which includes separating and demodulating said color video signal into its component signals of luminance information and chrominance information; producing from said component signals an encoded signal having a bandwidth of not more than approximately 3MHz, such that one half of the sum of two successive horizontal scan lines of information equals the luminance information of the color video signal and one half of the difference of two successive horizontal scan lines of information equals the chrominance information of the color video signal, said chrominance information being represented by a first chrominance signal and a second chrominance signal which are contained in two non-overlapping frequency regions; and recombining the processed luminance and chrominance signals prior to transmitting or recording of the encoded signal, a synchronizing arrangement comprising the steps of:

separating the horizontal sync signal from the color video signal;

generating an indicating signal under the control of the separated horizontal sync signal;



combining said indicating signal with each of said luminance and chrominance signals, and

prior to said recombining of the processed luminance and chrominance signals, amplitude modulating at least one of the chrominance signals as combined with said indicating signal.

4,005,474

RECORDING APPARATUS AND METHODS FOR A COLOR PICTURE/SOUND RECORD

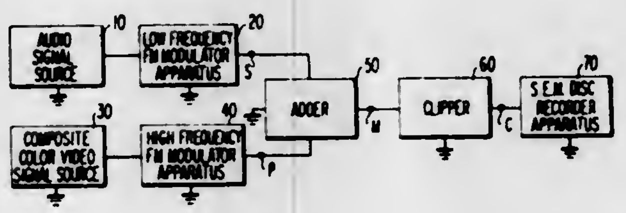
Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 531,138, Dec. 9, 1974, Pat. No. 3,972,064, which is a division of Ser. No. 441,069, Feb. 11, 1974, Pat. No. 3,911,476. This application Dec. 24, 1975, Ser. No. 644,156

Claims priority, application United Kingdom, Mar. 20, 1973, 13234/73

Int. Cl.^{2} H04N *9/02*

U.S. Cl. 358—4 **3 Claims**


AUDIO SIGNAL SOURCE
10
LOW FREQUENCY FM MODULATOR APPARATUS
20
S
COMPOSITE COLOR VIDEO SIGNAL SOURCE
30
HIGH FREQUENCY FM MODULATOR APPARATUS
40
P
ADDER
50
M
CLIPPER
60
C
S.E.M. DISC RECORDER APPARATUS
70

3. In a recording system for color picture/sound records, the method of developing a recording signal which comprises the steps of:

a. developing (1) a composite color video signal representative of color images to be recorded and including the combination of a luminance signal component occupying a given band of frequencies, and a chrominance signal component comprising a modulated color subcarrier, the sidebands of which extend over a midband portion of said given band of frequencies, and (2) an audio signal representative of a sound accompaniment for the color images to be recorded;

b. modulating the frequency of a first carrier over a relatively low frequency deviation range, below and spaced from said midband portion of said given band of frequencies, in accordance with said audio signal, while modulating the frequency of a second carrier over a relatively high frequency deviation range, above and spaced from said given band of frequencies, in accordance with said composite color video signal;

c. combining the first frequency modulated carrier with the second frequency modulated carrier to form a combination signal; and

d. doubly clipping said combination signal to form a recording signal comprising an impulse train having a repetition rate which varies in accordance with said composite color video signal, and having a duty cycle which varies at a frequency indicative of the amplitude of said audio signal.

4,005,475

METHOD FOR IMPROVING SHARPNESS WHEN RECORDING HALF-TONE PICTURES BY MODULATING A SHARPNESS SIGNAL

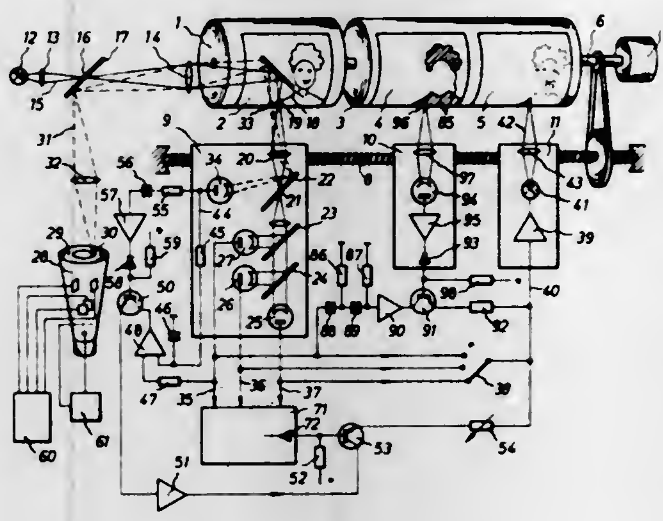
Hans-Georg Knop, Ascheberg, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Kiel, Germany

Division of Ser. No. 365,486, May 31, 1973. This application Feb. 12, 1975, Ser. No. 549,485

Claims priority, application Germany, June 2, 1972, 2226990

Int. Cl.^{2} G03F *3/08*

U.S. Cl. 358—80 **1 Claim**



1. In a method of recording half-tone pictures in which picture patterns are opto/electrically scanned to produce picture signals and the picture signals are superimposed for increasing sharpness during the recording process with a sharpness signal also produced during the scanning operation, the improvement therein of increasing the sharpness of the recording comprising the steps of: generating the sharpness signal in dependence on the picture contents of the picture pattern; superimposing the picture content dependent sharpness signal and the picture signals during recording; evaluating the picture signals to obtain a modulation signal; modulating the sharpness signal with said modulation signal; further evaluating the picture signals to determine the presence of a selected color signal; and blocking the sharpness signal in response to detection of said selected color signal.

4,005,476

CIRCUIT FOR COMPENSATING TIME ERRORS IN A TELEVISION SIGNAL, PARTICULARLY FROM A RECORDING INSTRUMENT

Gerhard Dickopp, Berlin; Lothar Oertel, Ulm (Danube), and Wolfgang Frey, Heilbronn, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

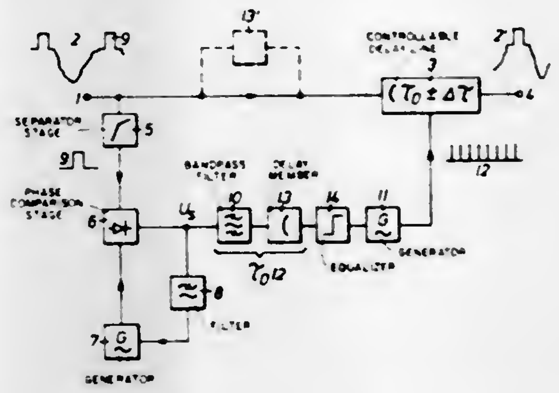
Filed Dec. 5, 1974, Ser. No. 530,145

Claims priority, application Germany, Dec. 11, 1973, 2361562

Int. Cl.^{2} H04N *5/795, 5/04*

U.S. Cl. 360—36 **4 Claims**

1. In a circuit for compensating time errors in a television signal, including means defining a first conducting path connected to conduct the television signal, means defining a second conducting path, a delay line presenting electronically controllable delay time connected in the first conducting path, and signal generating means connected in the second conducting path for producing a control signal to vary the delay time of the delay line from a basic delay time value Υ_0 by an amount $\pm\Delta\Upsilon$, the improvement comprising delay means connected in at least one of said conducting paths, said delay



means producing a signal time delay which causes the delay time effective in said second path to be one-half the basic delay time Υ_0, thereby to provide a more accurate compensation with respect to time errors which vary at higher rates.

4,005,477

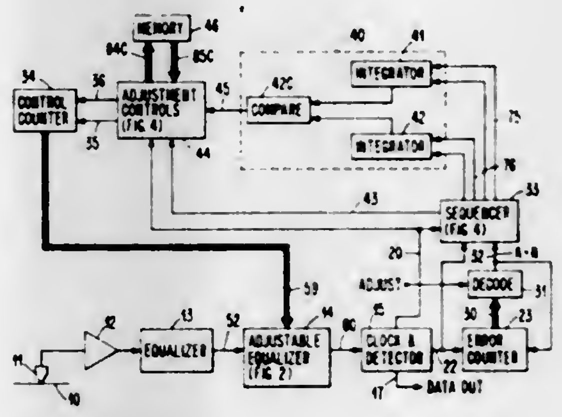
PHASE EQUALIZED READBACK APPARATUS AND METHODS

Hjalmar Holmboe Ottesen, Oslo, Norway, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,800

Int. Cl.^{2} G11B *5/02, 5/09*

U.S. Cl. 360—51 **14 Claims**



1. The method of operating a magnetic signal recorder supplying a readback signal having predetermined desired phase and frequency properties,

the steps of:

establishing a reference signal indicative of said predetermined properties;

comparing said reference signal and said readback signal and indicating deviations in said readback signal from said desired properties; and

phase adjusting said readback signal in accordance with said indication.

4,005,478

PROCESS AND ARRANGEMENT FOR REPRESENTING DIGITAL DATA BY BINARY SIGNALS

Manfred Beinhauer, Wolfratshausen, and Eckhart Scharkowitz, Krailling, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 23, 1975, Ser. No. 598,277

Claims priority, application Germany, Sept. 16, 1974, 2444218

Int. Cl.^{2} G11B *5/00*

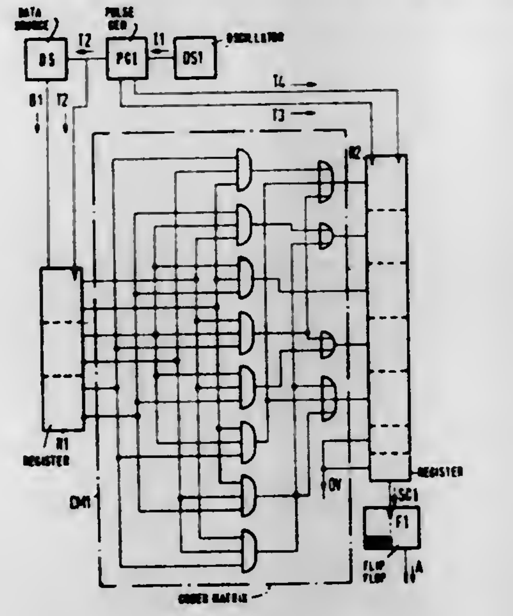
U.S. Cl. 360—40 **10 Claims**

1. A process for representing digital data by binary signals, in which the data are in the form of binary, ternary or higher

value coded characters, in which the characters are fed in the form of data signals to a transmitter which assigns binary signals to the characters, and in which the binary signals are transmitted over a transmission channel to a data receiver which regains the digital data from the binary signals, comprising the steps of:

assigning at least one combination of signal elements to each of the possible combinations of a given number of characters which form a group of characters;

each signal element combination formed by assigning first



signal elements to represent a first or a second amplitude value and assigning second signal elements to represent a change in the amplitude value;

the last-mentioned assignments of signal elements including the step of providing, in each arbitrary sequence of the groups of signal elements, at least a plurality of the first signal elements between two second signal elements;

dividing the characters fed to the transmitter into groups of the given number; and

representing the groups of characters, in accordance with the assignment by the groups of signal elements.

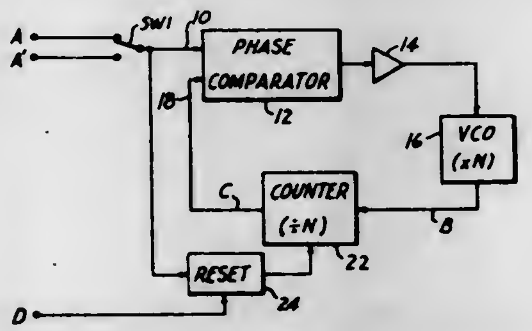
4,005,479
PHASE LOCKED CIRCUITS

Roger Hunnicutt, Bloomington, and Beat G. Keel, Prior Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 16, 1976, Ser. No. 649,953

Int. Cl.^{2} G11B *5/09*

U.S. Cl. 360—51 **8 Claims**



1. In a phase lock circuit having a phase comparator having a first input for receiving one of a plurality of signals each having the same frequency but whose phase may be different in relationship to each other, the improvement comprising: multiplier means connected to the output of said phase comparator for multiplying the frequency of the signal appearing at said first input by N, where N is a predetermined amount; resettable divide means connected to said multiplier means for dividing the multiplied signal from said multiplier means by N; reset means for resetting said divide means upon a change of selection of input signals to said first input of said phase comparator, whereby upon change of selection of input signals to said first input of said phase comparator, said divide means provides pulse signals at a frequency equal to said input signal and at a phase which differs from the phase of said input signal by an amount no greater than π/N radians; and means connecting the output of said divide means to a second input of said phase comparator.

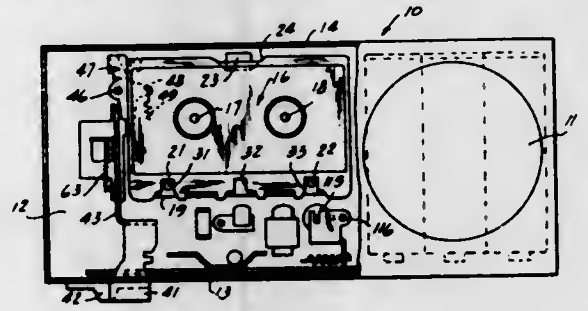
4,005,480
TAPE CASSETTE AND MACHINE

Isao Matsumoto, and Kenkichi Umeda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 3, 1975, Ser. No. 546,334

Int. Cl.^{2} G11B *15/04*; G06K *7/08*

U.S. Cl. 360—60 **3 Claims**



1. A tape machine for a tape cassette having recesses formed therein and selectively removable pins mounted in said recesses for preventing erasure of the tape cassette when said pins have been removed and to allow erasure of the tape cassette when said pins have not been removed, comprising an erase member slidably mounted on said tape machine, a manually operable push button mounted on one end of said slidable erase member, a pawl pivotally mounted on said tape machine and having a cassette engaging portion formed thereon and said pawl spring biased such that said cassette engaging portion is biased toward one of said pins and movable into one of said recesses, a notch formed in said pawl and said slidable erase member engageable with said pawl such that if one of said removable pins has been removed said slidable erase member engages said notch in said pawl to prevent substantial movement of said erase member and prevent erasure, and an erase enable switch directly engageable with said slidable erase member such that said slidable erase member actuates said switch when said erase enable switch is moved when said one of said pins has not been removed.

4,005,481
RECORDING AND/OR PLAYBACK APPARATUS WHICH PREVENTS ERASURE OF THE SYNCHRONIZATION TRACK

Robert Lackner, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 426,256, Dec. 19, 1973, abandoned. This application July 15, 1975, Ser. No. 596,204

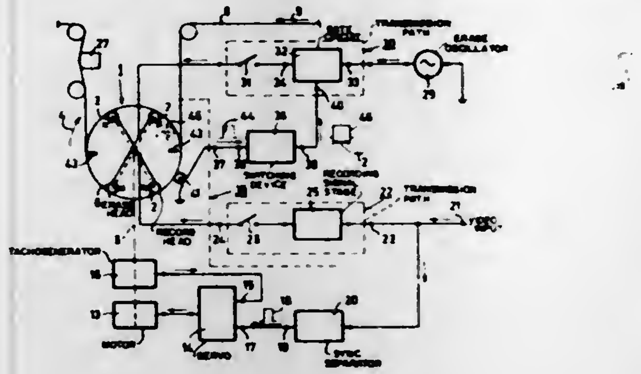
Claims priority, application Austria, Jan. 29, 1973, 743/73

Int. Cl.^{2} G11B *15/04*

U.S. Cl. 360—60 **3 Claims**

1. A recording and/or playback apparatus for video signals of the type wherein a rotary head system transversely scans the entire width of a record carrier in a plurality of parallel tracks, the rotary head system comprising a recording head and/or playback head and an erase head for transversely erasing a recorded video signal, the improvement wherein the apparatus further comprises an additional stationary recording and/or playback head longitudinally scanning the record carrier along an additional track that crosses the path of the transversely recorded tracks, means for phase locking field synchronization pulses of said video signal to the angular position of said rotary head, said erase head being angularly

displaced with respect to said recording head whereby the erase head initiates the scan of a first track on said carrier a predetermined first delay time after the recording head initiates the scan of a further track, terminal means for receiving timing pulses synchronized with the angular position of said rotary head system, delay means connected to said terminal means for converting said timing pulses into a blanking pulse



coincident with the scan of the erase head across said additional track, a source of erase signals, AND-gate means connecting said erase signal source to said erase head and connected to said delay means for conducting said erase signals to said erase head in the absence of said blanking pulse and for blocking said erase signals to said erase head in response to the presence of said blanking pulse.

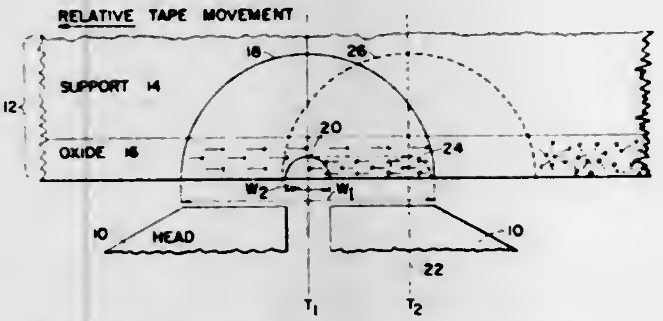
4,005,482
ASYMMETRIC ERASE ACROSS A ROTARY TRANSFORMER TO A ROTATING MAGNETIC HEAD

Fernando Castro, Longmont, and Richard Lewis O'Day, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 6, 1975, Ser. No. 584,546

Int. Cl.^{2} G11B *5/02*

U.S. Cl. 360—66 **10 Claims**



1. In a magnetic storage system, having a magnetic storage medium and a magnetic head for erasing the storage medium, and wherein there is relative motion between the magnetic head and the magnetic storage medium, improved apparatus for D.C. erasing the magnetic storage medium with a cyclic waveform comprising:

means electrically connected to said magnetic head for converting a time asymmetric cyclic waveform into an amplitude and time asymmetric cyclic waveform and applying said time and amplitude asymmetric waveform to said magnetic head;

means electrically connected to said conversion means for driving said conversion means with a time asymmetric waveform whereby said head through said conversion means is driven with a time and amplitude asymmetric waveform to perform the equivalent of a D.C. erase on the magnetic storage medium as the medium moves relative to said magnetic head.

4,005,483
AUTOMATIC RECORD CONTROL APPARATUS WITH MULTICHANNEL MEMORY

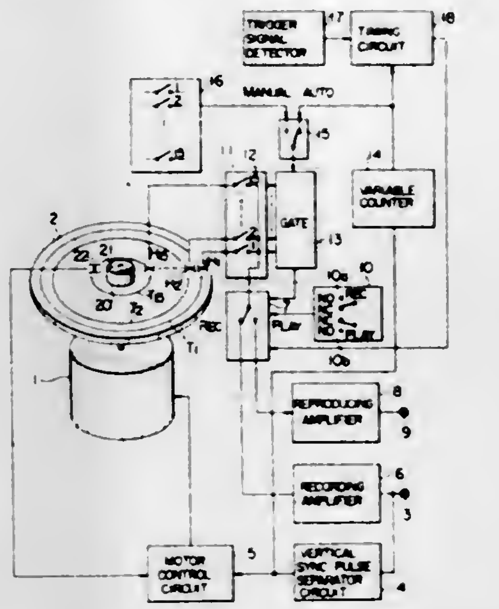
Takeshi Kuwano, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 15, 1974, Ser. No. 524,273

Claims priority, application Japan, Nov. 19, 1973, 48-129963

Int. Cl.^{2} G11B *15/14*; H04N *5/78*

U.S. Cl. 360—69 **7 Claims**



1. An automatic record control apparatus for a multichannel memory comprising:

a magnetic recording medium having multichannel tracks;

first means for recording video signals in said multichannel tracks one-track by one-track endlessly in such a manner that the track to be recorded is changed from one track to the next and returned to the first track from the last track for sequentially recording said video signals in a track-by-track fashion in response to pulses associated with vertical synchronizing pulses for said video signals, the period of said pulses associated with the vertical synchronizing pulses being selected so as to record all of the desired video signals of said video signals in said multichannel tracks;

a trigger signal detector;

an amplifier for amplifying said trigger signal detected by said trigger signal detector into a predetermined level; a gating device for passing said pulses associated with said vertical synchronizing signal from the instant of detecting said trigger signal;

a counter circuit for counting a predetermined even number of said pulses associated with said vertical synchronizing pulses, said counter circuit producing a first potential indicative of half of said even number when said half of said even number is reached, said counter circuit producing a second potential indicative of said predetermined even number when said predetermined even number is reached, said second potential being different from said first potential; and a control circuit including a resistor and a capacitor, said capacitor being charged with said first potential when said first potential is produced, said capacitor being discharged through said resistor when said second potential is produced, the recording in said multichannel being stopped at time of said discharge.

4,005,484
AUTOMATIC STOPPER FOR MULTITRACK RECORDER

Tadashi Fujita, Ishikawa, Japan, assignor to Electromechanics Research, Durham, N.C.

Filed May 28, 1975, Ser. No. 581,678

Int. Cl.^{2} G11B *15/02*

U.S. Cl. 360—74 **4 Claims**

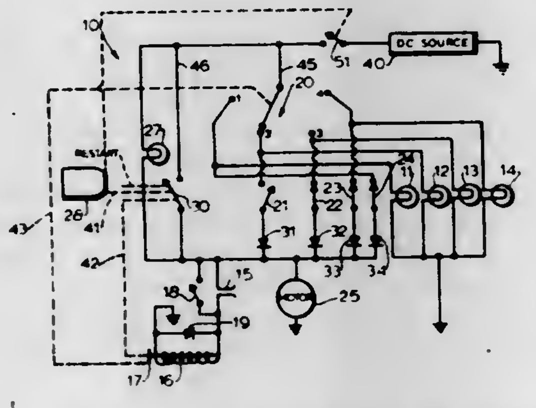
1. In a cartridge type player-recorder using a multi-track

forming multi-channel endless tape with detectable channel ends and having:

a. a magnetic tape head operatively associated with said tape at a position adjacent thereto;
b. shifting means for shifting said head from channel to channel;
c. drive means for driving said tape past said head;
d. automatic control means including means for sensing the end of each respective channel on said tape during movement thereof and actuator means operative in response thereto to actuate said shifting means in correspondence with sensing of each said channel end;
e. manual control means including manual switching and associated circuit means for operating said actuator and shifting means independent of said sensing means for shifting said head to a selected said channel;
f. a power source for powering said shifting, drive, automatic control, and manual control means; and
g. a first normally-open switch operable to being closed in response to insertion of said cartridge and being placed in series connection with said source;

an improved tape drive shut-off circuitry means comprising, in combination:

h. a set of parallel lines one being assigned for each said channel, each said line having an electrical connection on one side to said drive means;
i. sequential switching means operable with each operation of said actuator means for establishing and sequentially stepping a connection between the opposite side of each said line and said source through said first switch and in sequential correspondence with said head shifting from channel to channel;



j. a plurality of normally-closed manual channel stop selector switches each being in series with one of said lines, said selector switches being adapted for operating either all closed or one open enabling a selected one of such lines to be open circuited to prevent the playing of the channel corresponding thereto by opening the respective manual switch connected therein; and
k. an auxiliary switch connected on one side to said source through said first switch and on the opposite side to said drive means and operable for being closed in response to insertion of said cartridge and for being opened in response to withdrawal of said cartridge and independently to being opened in response to each operation of said actuator means without disturbing the inserted position of said cartridge thereby providing an auxiliary path for energizing said drive means from said source when said auxiliary switch is closed, one of said selector switches is open and said sequential switching means has stepped to the line connection having said open selector switch therein, whereby said player-recorder may be operated in a continuous mode by leaving all said selector swtiches closed and said cartridge depressed or in a mode in which said player-recorder is stopped at the end of a selected channel by opening the said selector switch in the line corresponding to the channel next following the last channel desired to be played and allowing said player-recorder to operate until said sequential switching means steps to the line connection having such open selector switch.

4,005,485

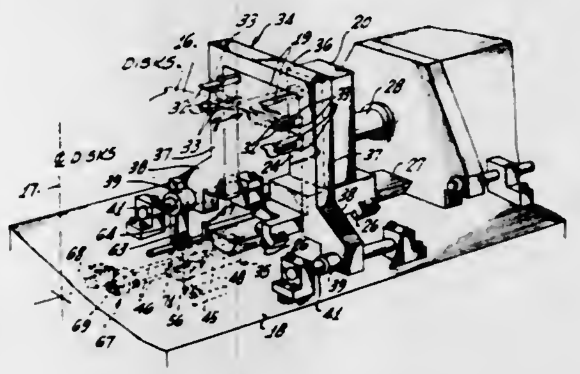
APPARATUS AND METHOD FOR LOADING AND UNLOADING TRANSDUCER HEADS

Willard J. Opocensky, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 393,325, Aug. 31, 1973, abandoned. This application July 31, 1975, Ser. No. 600,695

Int. Cl.² G11B *21/12, 21/22, 5/54*

U.S. Cl. 360—75 **16 Claims**



1. Apparatus for moving transducer heads into an operative position adjacent the surfaces of rotatable disks in a disk storage device, said apparatus comprising:

transducer head support means for supporting the transducer heads for movement across disk surfaces;
means for moving said transducer head support means parallel to the disk surfaces;
first mechanical means for moving the transducer heads in a direction toward and substantially perpendicular to the disk surfaces; and
second mechanical means adapted for movement radially inward and contacting said transducer head support means and said first mechanical means, and operative to then move in a reverse radial direction so as to automatically actuate said first mechanical means as said transducer head support means is moved radially inward through a preselected position with respect to the disk surfaces, whereby the transducer heads are moved to the operative position substantially inward of the disk peripheries, wherein said transducer head support means includes resilient means for urging the transducer heads toward corresponding disk surfaces; and said first mechanical means is moved by said second mechanical means in its inward radial movement with respect to said transducer head support means, between a first relative position restraning said resilient means and thereby restraining the transducer heads from contact with the disk surfaces and a second relative position when said second mechanical means begins its reverse radial movement allowing the heads to be uged into the operative position.

4,005,486

APPARATUS FOR DETECTING TAPE RUNNING IN A TAPE RECORDER

Ken Satoh, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 28, 1975, Ser. No. 581,624

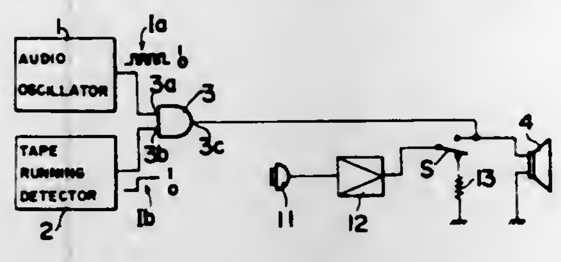
Claims priority, application Japan, June 3, 1974, 49-64264[U]; June 3, 1974, 49-64265[U]

Int. Cl.² G11B *15/06, 23/30, 31/00*

U.S. Cl. 360—79 **3 Claims**

1. An apparatus for detecting tape running in a tape recorder comprised of a pair of reels and a tape having at least its opposite ends connected to respective ones of said reels; a battery and tape driving means for driving said tape including

motor means being connectible to said battery for operating the driving means; the terminal end portions of the tape being different from the portion of the tape provided for recording signals; said detector means comprising means for producing an audio signal of a fixed frequency when connected to said battery, a tape running detector means for producing an output signal when it has detected the passage of a terminal end portion of the magnetic tape used in the tape recorder, an AND gate circuit for producing an output signal of an audio frequency corresponding to the fixed frequency of the audio signal producing means responsive to an output signal from the detector and a signal from the generator, and a loudspeaker contained within the tape recorder, the output signal from the AND circuit being applied to the loudspeaker for developing an audible alarm indicative of a tape end.



4,005,487

TAPE-OPERATING APPARATUS ADAPTED FOR USE EITHER WITH AN ENDLESS LOOP TYPE CARTRIDGE OR A COPLANAR TYPE CASSETTE

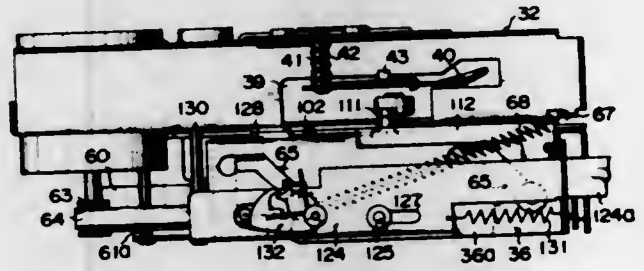
Satosi Asai, Annaka, and Isamu Matsuki, Maebashi, both of Japan, assignors to Matsuki-Seisakusho, Maebashi, Japan

Filed June 26, 1975, Ser. No. 590,477

Claims priority, application Japan, Oct. 31, 1974, 49-125766

Int. Cl.² G11B *15/00, 21/00*

U.S. Cl. 360—94 **3 Claims**



1. A magnetic tape recording and/or reproducing apparatus for selectively operating an endless type cartridge which has a substantially flat surface on the underside or a coplanar type cassette which has a thicker portion at the middle of its underside and a pair of thinner portions at the lengthwise sides of the underside, said apparatus comprising:

a main frame having a single space for receiving the cartridge or the cassette and a bottom plate defining the bottom of the space, said bottom plate having a pair of raised portions on both lengthwise sides for guiding the underside of the cartridge or the thinner portions of the cassette inserted in the space and a depressed portion defined between the raised portions for receiving the thicker portion of the cassette;
a movable frame fitted with a cassette-tape operating means including:
a magnetic head;
means mounting the movable frame on the main frame for movement between a first position where the cassette-tape operating means is within said space and in operative position with a cassette inserted in said space and a second position wherein the cassette-tape operating means is out of said space;
spring means urging the movable frame to the second position; and,
actuating means for shifting the movable frame to the first position against the spring means in response to the insertion of a cassette into the space, said actuating means including a first actuating member movably mounted on the depressed portion of the bottom plate and having a height not beyond the upper surfaces of the raised portions so that the first actuating member is moved by the thicker portion of the inserted cassette, thereby shifting the movable frame to the first position, but allows the free passage of the inserted cassette over the first actuating member, thereby maintaining the movable frame in the second position.

4,005,488

TAPE-OPERATING APPARATUS ADAPTED FOR USE EITHER WITH AN ENDLESS LOOP TYPE CARTRIDGE OR A COPLANAR TYPE CASSETTE

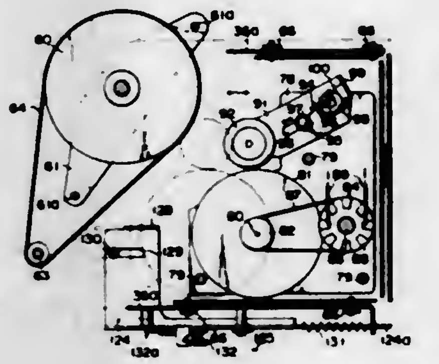
Satosi Asai, Annaka, and Isamu Matsuki, Maebashi, both of Japan, assignors to Matsuki-Seisakusho, Maebashi, Japan

Filed June 26, 1975, Ser. No. 590,476

Claims priority, application Japan, Oct. 31, 1974, 49-125768; Nov. 6, 1974, 49-127742

Int. Cl.² G11B *15/00*

U.S. Cl. 360—94 **7 Claims**



1. A magnetic tape recording and/or reproducing apparatus for selectively operating an endless type cartridge or coplanar type cassette, comprising:

a main frame having a single space for receiving a cartridge or cassette;
a cartridge operating means including cartridge tape transport means fixed to said main frame positioned to operate a cartridge inserted within said space;
a movable frame fitted with cassette operating means including cassette tape transport means having a first capstan and a pinch roller;
means mounting said movable frame on said main frame;
means guiding said movable frame for movement between a first position where the cassette tape operating means is in said space and in operative position with a cassette inserted in said space and a second position where the cassette tape operating means is out of said space;
a first spring means normally urging said movable frame to said second position;
actuating means for shifting said movable frame to said first position against said first spring means responsive to the insertion of a cassette into said space; and, said cassette transport means further including:
a motor mounted on said main frame;
a first wheel mounted on said main frame and driven by said motor;
a second wheel mounted on said movable frame and operatively coupled to said first capstan;
an idling wheel mounted on said movable whereby said first wheel and said second wheel are operatively coupled together when said movable frame is brought to said first position.

4,005,489

TAPE-OPERATING APPARATUS ADAPTED FOR USE EITHER WITH AN ENDLESS LOOP TYPE OR A COPLANAR TYPE CASSETTE

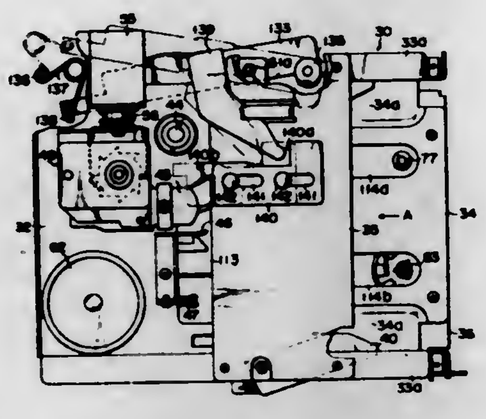
Satosi Asai, Annaka, and Isamu Matsuki, Maebashi, both of Japan, assignors to Matsuki-Seisakusho, Maebashi, Japan

Filed June 26, 1975, Ser. No. 590,474

Claims priority, application Japan, Oct. 31, 1974, 49-125766

Int. Cl.² G11B *15/00, 21/00*

U.S. Cl. 360—94 **5 Claims**



1. A magnetic tape recording and/or reproducing apparatus for selectively operating an endless type cartridge or coplanar type cassette, comprising:

a main frame having a single space for receiving a cartridge or cassette:

cartridge tape operating means mounted on said main frame and positioned to operate a cartridge inserted within said space, said cartridge tape operating means including cartridge tape transport means, a magnetic head, and head track changing means having a solenoid;

a movable frame fitted with cassette-tape operating means including cassette tape transport means and a magnetic head;

means mounting the movable frame on the main frame for movement between a first position where the cassette-tape operating means is in said space and in operative position with a cassette therein and a second position where the cassett-tape operating means out of said space;

spring means urging the movable frame to the second position;

actuating means for shifting the movable frame to the first position against the urging of the spring means responsive to the insertion of a cassette into the space;

locking means for keeping the movable frame in the first position when the movable frame is shifted to the first position by the actuating means;

releasing means connected to the solenoid to release the locking means and allow the movable frame to be urged back to the first position responsive to the solenoid being energized; and

an electric circuit means for energizing the solenoid.

4,005,490

MAGNETIC DISC MEMORY

Damon H. Duncan; Craig T. Herdman, and Terrance V. Littlejohn, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 15, 1975, Ser. No. 577,970

Int. Cl.² G11B *5/60, 25/04, 21/20*

U.S. Cl. 360—97 **9 Claims**

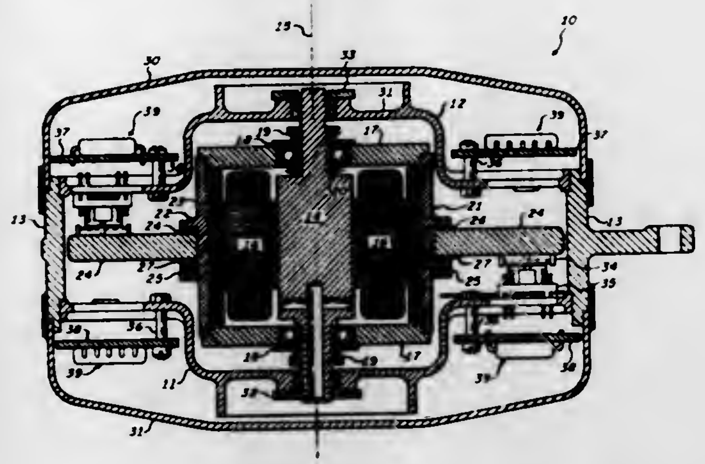
1. A magnetic disc memory comprising:

a symmetrical housing including a generally cylindrical-shaped frame and a pair of members bridging the ends of the cylindrical-shaped frame;

central support means, secured between said bridging members, and disposed to substantially coincide with the axis of symmetry of said housing;

motor means including a stator affixed to said central support means and a rotor surrounding said stator and journalled for rotation about said central support means;

disc means secured to and disposed in circumferential relationship to the outer periphery of said rotor and extending radially outward therefrom;



both annular surfaces of said disc means being magnetizable; and

at least one read/write head assembly mounted on each bridging member and extending toward a respective magnetizable surface of said disc means.

4,005,491

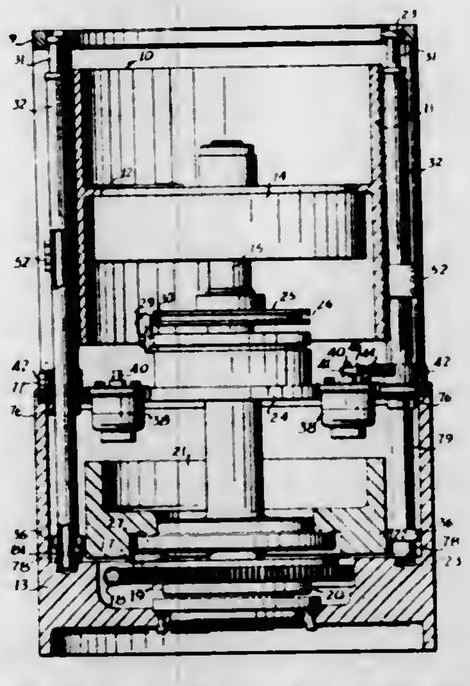
DAMPENED TRANSDUCER SUPPORT APPARATUS FOR MESSAGE ANNOUNCING SYSTEM

Walter P. Walker, Atlanta; Leary W. Smith, Chamblee; Frank H. Cofer, Jr., and Jack E. Lewis, both of Atlanta, all of Ga., assignors to The Audichron Company, Atlanta, Ga.

Division of Ser. No. 396,155, Sept. 11, 1973, Pat. No. 3,886,590, which is a continuation of Ser. No. 140,195, May 4, 1971, abandoned. This application May 23, 1975, Ser. No. 580,301

Int. Cl.² G11B *5/55, 5/76, 21/22*

U.S. Cl. 360—105 **2 Claims**



1. A message announcing apparatus comprising:

a recording medium having a vertical surface and a message path on said vertical surface;

transducer support means mounted for selective upward and downward movement along a predetermined path with respect to said vertical surface;

means selectably operative to move said transducer support means for controlled movement upwardly along said predetermined path so that said transducer support means traverses said message path, or to release said transducer support means for downward movement by gravity along said predetermined path;

a quantity of oil disposed beneath said recording medium; and

means connected to said transducer support means for said upward and downward movement therewith and extending downwardly into said quantity of oil for at least a portion of said downward movement to resist the free gravitational downward movement of said transducer support means when released, so as to dampen said downward movement of said transducer support means.

4,005,492

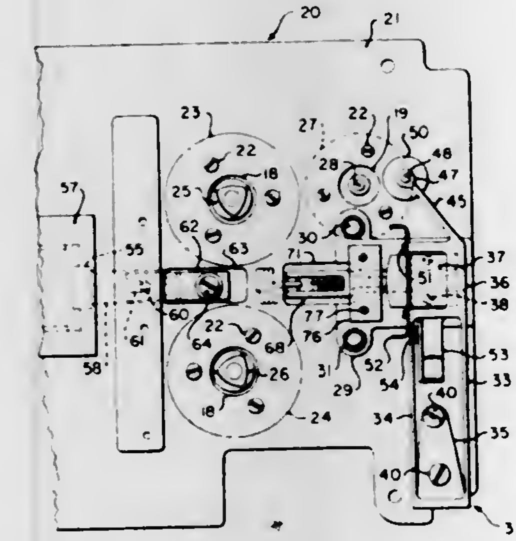
TRANSDUCER HEAD POSITIONING APPARATUS

Frank H. Kaufholz, Jr., Havertown, Pa., assignor to Computer Peripherals, Inc., Rochester, Mich.

Filed Aug. 21, 1975, Ser. No. 606,636

Int. Cl.² G11B *5/54, 21/22*

U.S. Cl. 360—105 **25 Claims**



1. In combination, means for moving a transducer head from an inoperative position away from a record medium to an operative position engaging the record medium including

a. a stationary support means position adjacent the record medium;

b. an elongated flexible support means having one end secured to said stationary support means:

c. transducer head means secured to the free end of said flexible support means;

d. and actuating means engaging the free end of said flexible support means to move the free end of the flexible support means in a direction perpendicular to the record medium when operated whereby the flexible support means will flex in a direction to move the transducer head means in a direction perpendicular to the record medium to a position engaging the record medium.

4,005,493

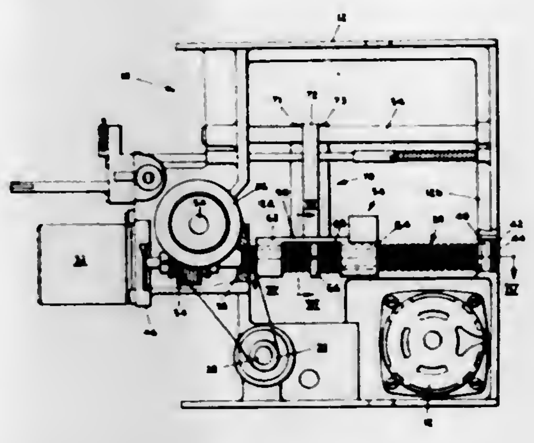
METHOD AND MEANS FOR MOVING RECORDING HEADS IN DISC-TYPE RECORDERS

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Feb. 25, 1975, Ser. No. 552,854

Int. Cl.² G11B *17/00, 5/54, 21/08*

U.S. Cl. 360—106 **22 Claims**



1. In a data recorder/reproducer apparatus having means for moving and positioning a transducing head with respect to a magnetic disc, said positioning means including a lead screw, drive means for rotating said lead screw, and a follower member coupled to said transducing head to move the latter upon movement of the follower and connected to said lead screw for movement along the same upon rotation thereof, the improvement comprising; said follower including a first member having at least a portion threadably received on said lead screw; a second member threadably received on said lead screw; biasing means between said first and second members for applying a force to said members acting generally axially of said lead screw and urging said first and second members into frictional engagement with said lead screw of a magnitude sufficient to constitute a friction brake, for securely holding said follower and said lead screw in fixed relative position and precluding undesired movement therebetween from causes other than powered actuation of said drive means.

DESIGN PATENTS

GRANTED JANUARY 25, 1977

ERRATA

For CLASS	See PATENT NO.
001-166	243,201
015-029	243,207

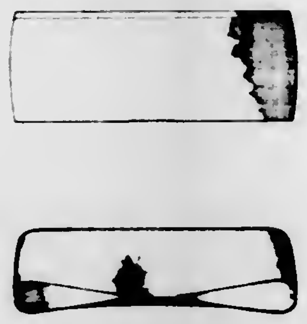
DESIGNS

JANUARY 25, 1977

243,126
BRIEFS

Jack Basseches, Guanabara, Brazil, assignor to I.C.M. Industria e Comercio de Malhas Ltda., Rio de Janeiro, Brazil
Filed Nov. 27, 1974, Ser. No. 527,753
Term of patent 14 years
Int. Cl. D2—*01*

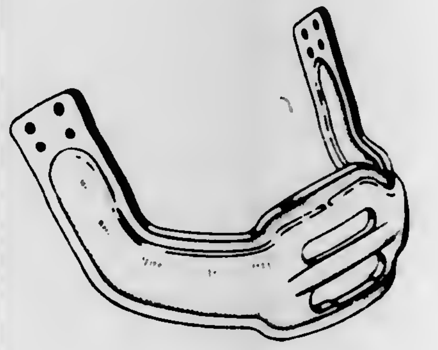
U.S. Cl. D2—1



243,127
MOUTH GUARD FOR A SPORTS HELMET

Charles R. Farquharson, Toronto, Canada, assignor to Canadian Cycle & Motor Company Limited, Weston, Canada
Filed Apr. 7, 1975, Ser. No. 565,503
Claims priority, application Canada, Oct. 7, 1974, 710743
Term of patent 14 years
Int. Cl. D2—*03*

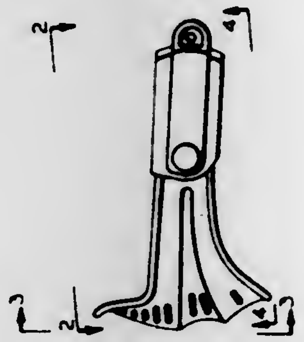
U.S. Cl. D2—233



243,128
FACE GUARD FOR A HELMET

Clyde R. Morgan, Boring, Oreg., assignor to Wheelsport Distributing Co.
Filed Oct. 14, 1975, Ser. No. 622,420
Term of patent 14 years
Int. Cl. D2—*03*

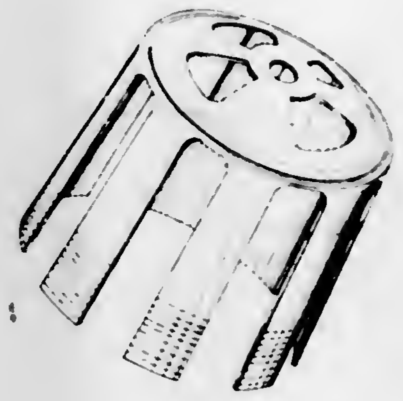
U.S. Cl. D2—233



243,129
SHRINERS FEZ STABILIZER

Steve Skapura Sheldon, 18 Steiner Blvd., Barboursville, W. Va. 25504
Filed May 16, 1974, Ser. No. 470,291
Term of patent 14 years
Int. Cl. D2—*04*

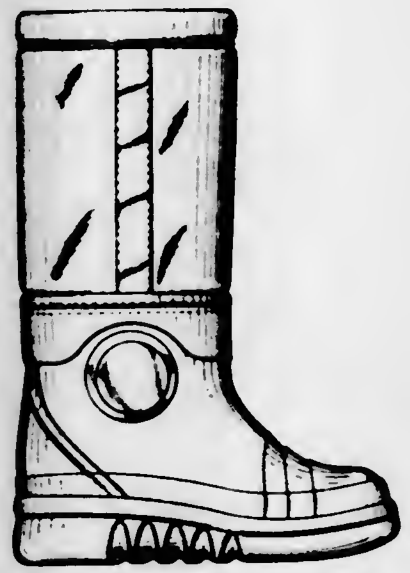
U.S. Cl. D2—260



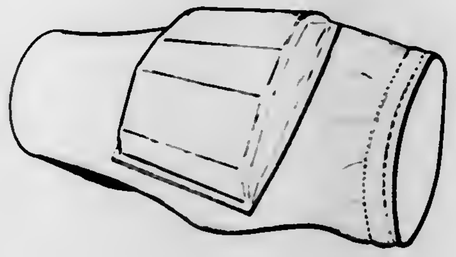
243,130
ORNAMENTAL DESIGN FOR A BOOT

Guy de Massacre, 124 Avenue des Champs-Elysees, Paris (Seine), France
Filed Aug. 26, 1975, Ser. No. 607,871
Claims priority, application France, Feb. 28, 1975, 75.37974
Term of patent 14 years
Int. Cl. D2—*04*

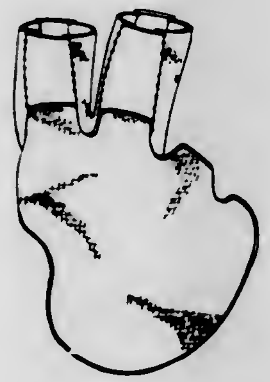
U.S. Cl. D2—272



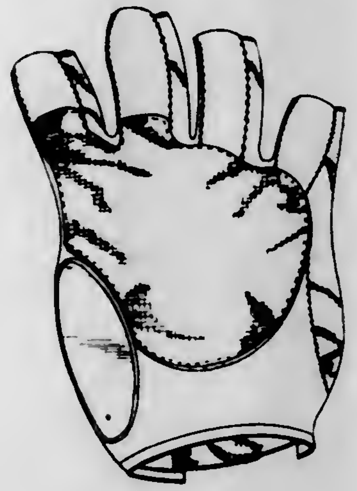
243,131
WEIGHTED BOWLING GLOVE
Lewis H. Wester, 6030 Sherry Lane, Dallas, Tex. 75225
Filed Apr. 28, 1975, Ser. No. 571,958
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



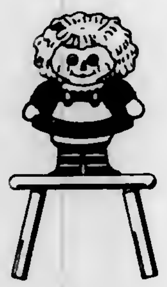
243,132
BASEBALL GLOVE INSERT
Cedric W. Lawrey, 4506 Wellington, Alexandria, La. 71301
Filed July 9, 1975, Ser. No. 594,388
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



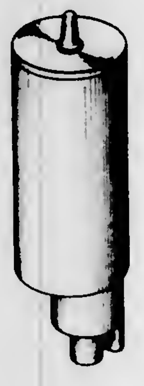
243,133
BASEBALL GLOVE PAD
Cedric W. Lowrey, 4506 Wellington, Alexandria, La. 71301
Filed July 9, 1975, Ser. No. 594,389
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



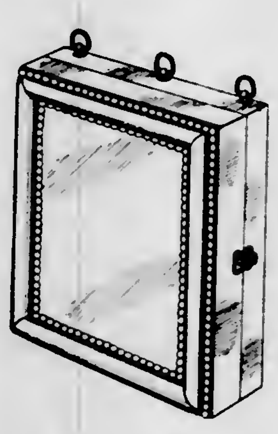
243,134
CHAIR
James A. Downey, 133 Tiller, Midwest City, Okla. 73110
Filed Sept. 2, 1975, Ser. No. 609,177
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—12



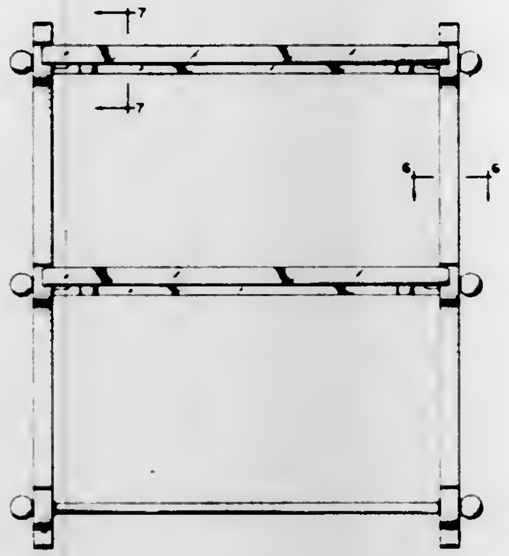
243,135
LIQUID DISPENSER
William E. Moritz, Pittsburgh, Pa., assignor to Victor G. Mollison, Sr., Donora, Pa.
Filed June 25, 1975, Ser. No. 590,280
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

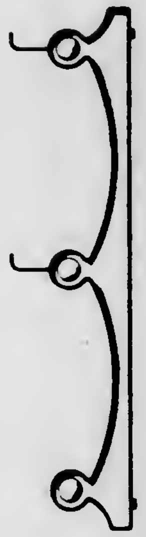


243,136
JEWELRY CABINET
Carolyn Blanche Foster, 2700 E. Valley Parkway, Space 266, Escondido, Calif. 92027
Filed June 11, 1975, Ser. No. 586,042
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

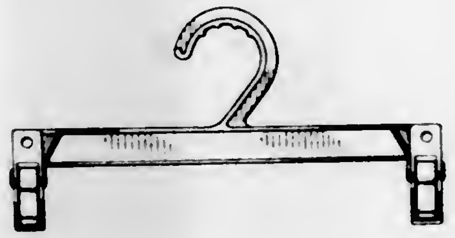


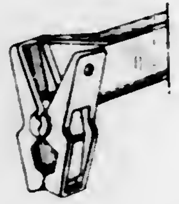
243,137
COMBINED SHELVES AND TOWEL RACK
Jerry A. Brown, 4014 San Jose Drive, Greenwood, Ind. 46142
Filed Feb. 9, 1976, Ser. No. 656,132
Term of patent 14 years
Int. Cl. D6—*04*; D23—*02*
U.S. Cl. D6—136



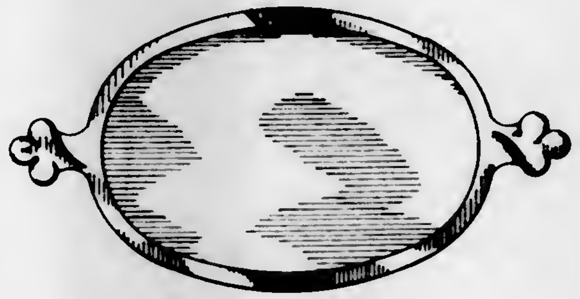


243,138
GARMENT HANGER
Herb Coon, New York, N.Y., assignor to Red Wing Products, Inc., New Hyde Park, N.Y.
Filed Dec. 11, 1975, Ser. No. 639,702
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—253





243,139
SERVING TRAY
Adeline M. Nicholas, 8746 Bamarcia Drive, Elk Grove, Calif. 95624
Filed June 4, 1975, Ser. No. 583,567
Term of patent 14 years
Int. Cl. D7—99
U.S. Cl. D7—21



243,140
MUG

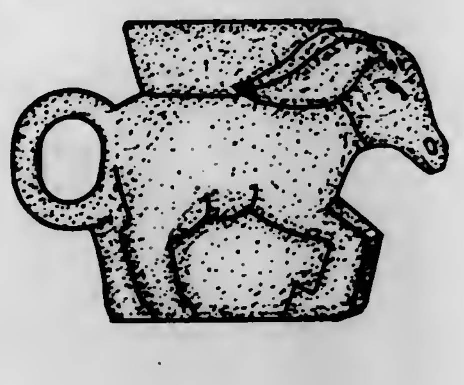
Joniece Frank, Sapulpa, Okla., assignor to Frankoma Pottery, Inc., Sapulpa, Okla.

Filed Aug. 13, 1975, Ser. No. 605,739

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—5



243,141
COFFEE MAKER

Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

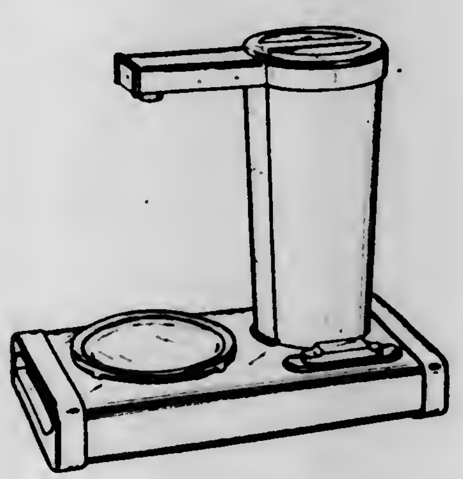
Filed June 23, 1975, Ser. No. 589,063

Claims priority, application France, Jan. 6, 1975, 73.484

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—41



243,142
COMBINED COASTER AND ASH TRAY

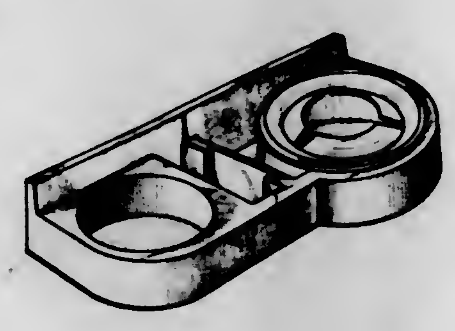
John F. Chmela, 1106 Beechwood Drive, Mount Prospect, Ill. 60056

Filed Apr. 24, 1975, Ser. No. 571,282

Term of patent 14 years

Int. Cl. D7—*06*; D27—*03*

U.S. Cl. D7—45



243,143
COMBINED CONDIMENT SHAKER SET AND TRAY THEREFOR

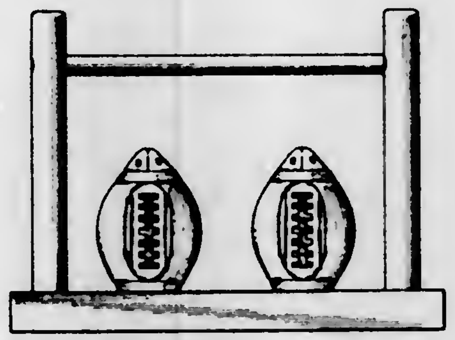
John P. Menzo, 2644 Daffodil St. NE., Canton, Ohio 44705

Filed Dec. 24, 1975, Ser. No. 644,415

Term of patent 14 years

Int. Cl. D7—*06*

U.S. Cl. D7—55



243,144
GRILL

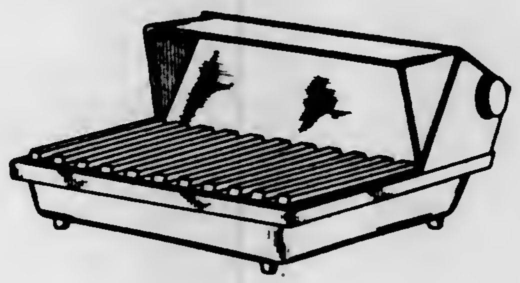
Louis J. Jean; Thomas R. Field, and Joseph J. Cerola, all of Indianapolis, Ind., assignors to Jenn-Air Corporation, Indianapolis, Ind.

Filed June 23, 1975, Ser. No. 589,035

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D7—110



243,145
COMBINED WATER RESERVOIR AND HOLDER FOR POTTED FLOWERS AND PLANTS

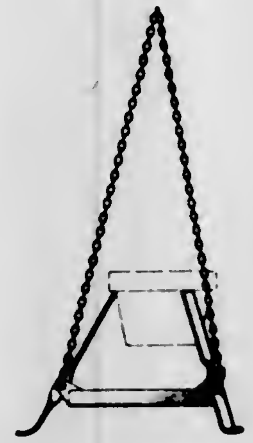
Albert E. Zipser, P.O. Box 778, Ceres, Calif. 95307

Filed Dec. 8, 1975, Ser. No. 638,441

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—113



243,146
ARTICLE OF FLATWARE

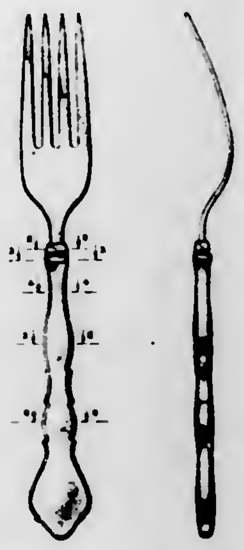
Robert J. King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.

Filed Apr. 25, 1975, Ser. No. 571,715

Term of patent 14 years

Int. Cl. D7—*03*

U.S. Cl. D7—137



243,147
SOLDERING IRON

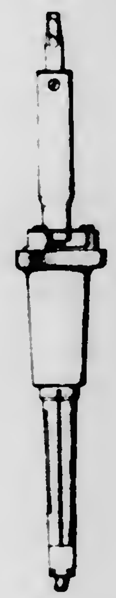
Joseph A. Sylvester, San Dimas, Calif., assignor to Solder Removal Co., Covina, Calif.

Filed Nov. 7, 1975, Ser. No. 629,721

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—30



243,148
DESK STAPLER

Monte L. Levin, New York, N.Y., assignor to Swingline, Inc., Long Island, N.Y.

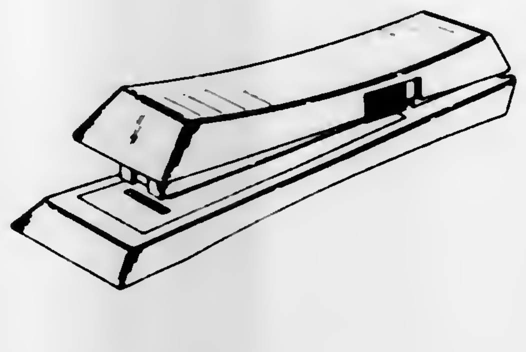
Filed Sept. 12, 1973, Ser. No. 396,377

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D8—50



243,149
WIRE STRIPPING TOOL

Zdzislaw Bieganski, Brushwood, Kingsbourne Green, Harpenden, Hertfordshire, England

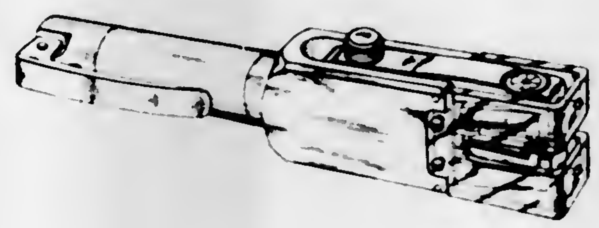
Filed Oct. 10, 1975, Ser. No. 621,386

Claims priority, application United Kingdom, Apr. 23, 1975, 97084/75

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—61



243,150
LOCK COVER

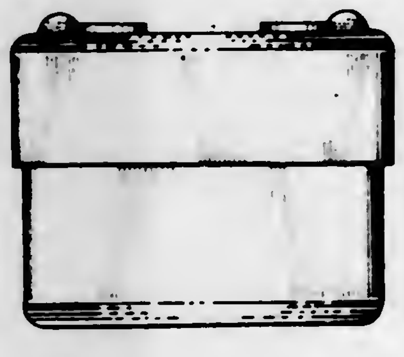
James R. Dykes, 540 E. 60th St., Savannah, Ga. 31405

Filed July 11, 1974, Ser. No. 487,674

Term of patent 14 years

Int. Cl. D8—*07*

U.S. Cl. D8—137



243,151
CABLE VIBRATION DAMPER

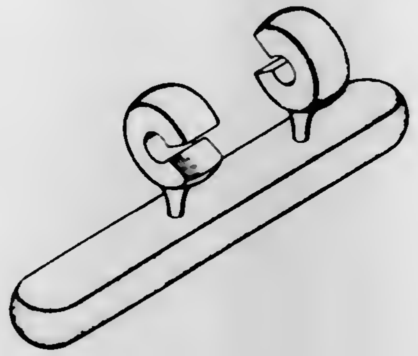
Raymond R. Bouche, 9419 Cordero Ave., Tujunga, Calif. 91042

Filed Feb. 23, 1976, Ser. No. 660,010

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—230



243,152
FILAMENT FASTENER

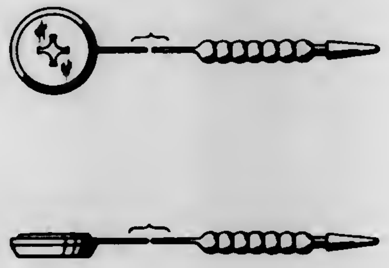
Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 20, 1975, Ser. No. 560,434

Term of patent 14 years

Int. Cl. D9—*06*

U.S. Cl. D8—243



243,153
ARTICLE HOLDER

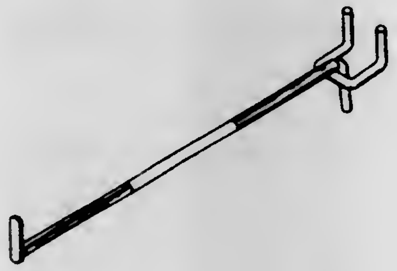
Horace Solomon, New York, N.Y., assignor to Solo Products, Corporation, Englewood, N.J.

Filed Feb. 26, 1976, Ser. No. 661,667

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—255



243,154
THREADED FASTENERS

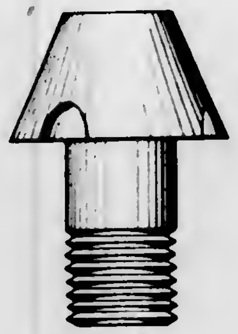
Hilmar K. Dieme, Westfield, N.J., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 416,440, Nov. 16, 1973. This application May 23, 1975, Ser. No. 580,412

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—267



243,155
PLASTIC DRUM

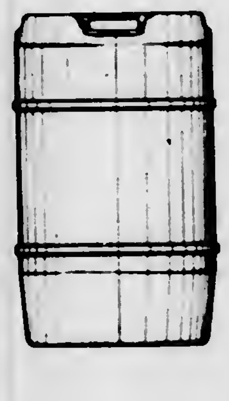
Richard L. Bonnett, Eldora, Iowa 50627

Continuation-in-part of Ser. No. 459,062, April 8, 1974. This application Oct. 8, 1975, Ser. No. 620,889

Term of patent 14 years

Int. Cl. D9—*02*

U.S. Cl. D9—170



243,156
TOOTHBRUSH CONTAINER

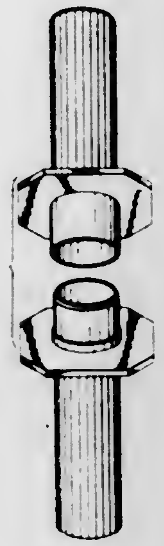
Charles S. Fentules, 15 Illinois Ave., Youngstown, Ohio 44505

Filed Aug. 8, 1975, Ser. No. 603,151

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—216



243,157
END CLOSURE FOR A CONTAINER

Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.

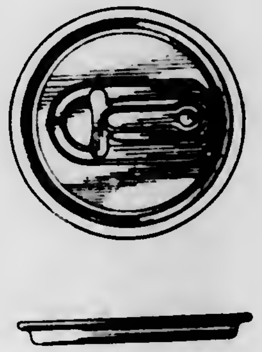
Filed Aug. 10, 1973, Ser. No. 387,337

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Term of patent 14 years

Int. Cl. D9—*07*

U.S. Cl. D9—255



243,158
FORM FOR FILLING BAGS

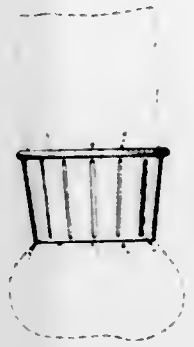
Edward J. Bolwell, Yonkers, N.Y., assignor to Topps-All Products of Yonkers, Inc., Yonkers, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,824

Term of patent 14 years

Int. Cl. D9—*99*

U.S. Cl. D9—294



243,159
SURVEY MONUMENT BASE

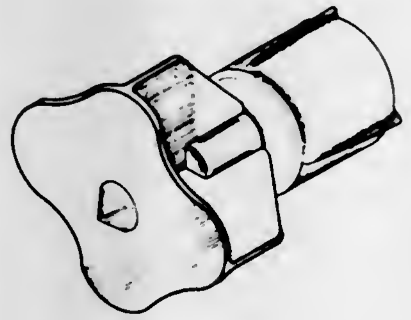
Peter Berntsen, and Phillip R. Peterson, both of P.O. Box 3025, Madison, Wis. 53704

Filed Sept. 19, 1975, Ser. No. 616,272

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—66



243,160
LINEAR DISTANCE MEASURING COMPUTER

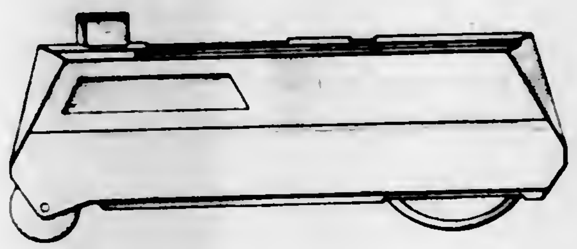
Hans Bud, 71 Northway, London, N.W. 11, England

Filed Mar. 13, 1975, Ser. No. 557,905

Term of patent 3½ years

Int. Cl. D10—*04*

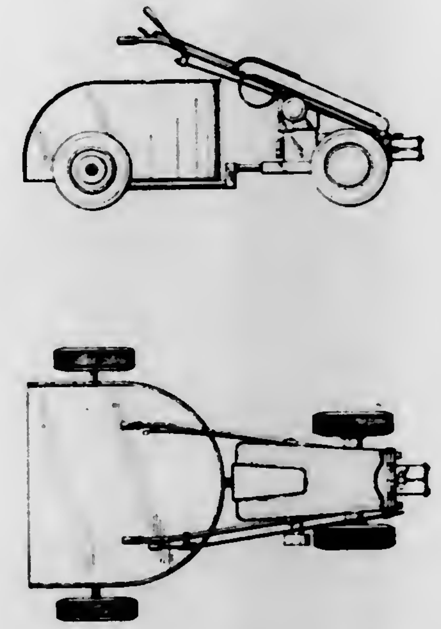
U.S. Cl. D10—70



243,161
MULTI-PURPOSE SELF-PROPELLED VEHICLE

Paul E. Tolar, 401 N. West St., Wichita, Kans. 67203
Filed Sept. 29, 1975, Ser. No. 617,275
Term of patent 14 years
Int. Cl. D12—*14*

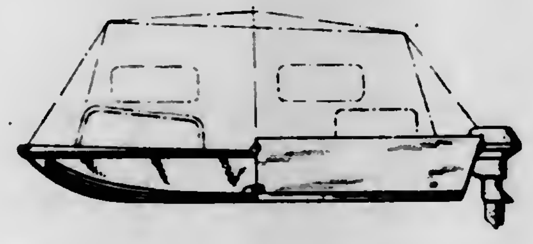
U.S. Cl. D12—1



243,162
COLLAPSIBLE TRAILER BOAT

Alexei Kirillovich Konstantinov, ulitsa Svobody, 15, kv. 86; Vladimir Vasilievich Volkov, ulitsa Svobody, 15, kv. 52; Nikolai Alexandrovich Pogorelov, ulitsa Svobody, 15, kv. 17; Viktor Petrovich Gaschenko, Bolshoi Prospekt, 46, kv. 45, and Igor Vladimirovich Lukashkov, Bolshoi Prospekt, 46, kv. 30, all of Taganrog, U.S.S.R.
Filed Feb. 12, 1975, Ser. No. 549,458
Term of patent 14 years
Int. Cl. D12—*06*

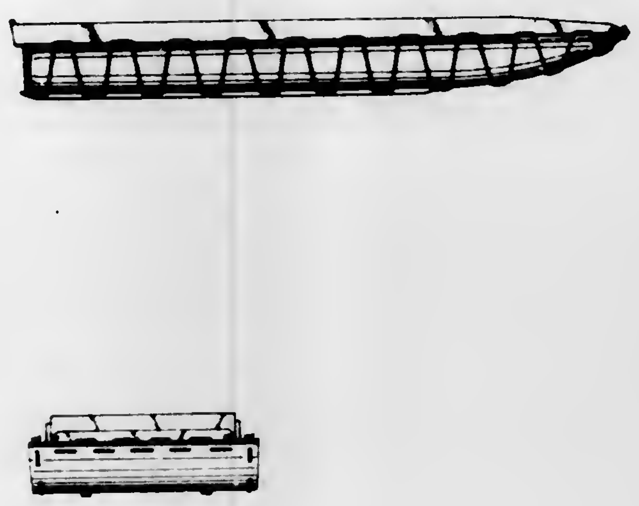
U.S. Cl. D12—2



243,163
RECREATIONAL BOAT OR THE LIKE

Max C. Sutton, Southfield, Mich., assignor to Henry H. Hook, Franklin, Mich., a part interest
Filed Sept. 19, 1975, Ser. No. 614,950
Term of patent 14 years
Int. Cl. D12—*06*

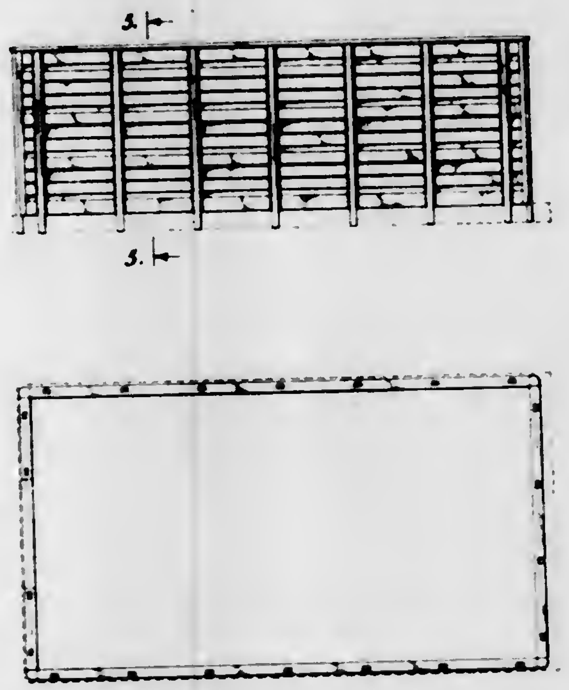
U.S. Cl. D12—62



243,164
TRUCK BED BODY

Harold W. Knapheide, III, Quincy, Ill., assignor to The Knapheide Manufacturing Co., Quincy, Ill.
Filed Aug. 13, 1975, Ser. No. 604,132
Term of patent 14 years
Int. Cl. D12—*16*

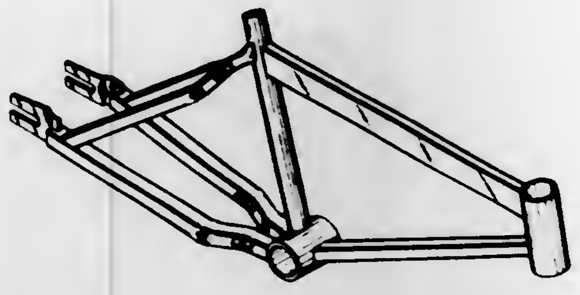
U.S. Cl. D12—98



243,165
BICYCLE FRAME

Marshall A. Wheeler, P.O. Box 1267, Downey, Calif. 90240
Filed Jan. 22, 1976, Ser. No. 651,490
Term of patent 14 years
Int. Cl. D12—*11*

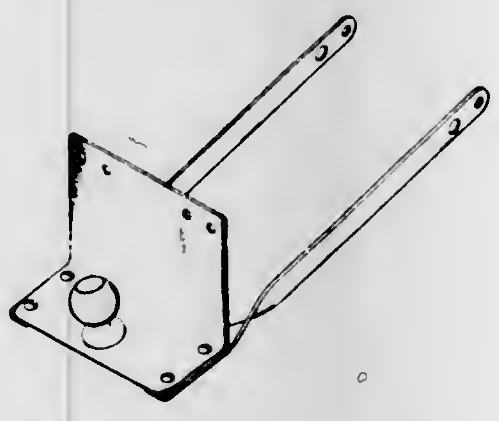
U.S. Cl. D12—111



243,166
MOTOR CYCLE HITCH

Larry E. Jones, Sherman, Tex., assignor to Randy W. Pettit and Larry E. Jones
Filed Nov. 13, 1975, Ser. No. 631,685
Term of patent 14 years
Int. Cl. D12—*11, 16*

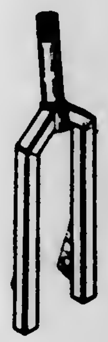
U.S. Cl. D12—114



243,167
FORK FOR FRONT BICYCLE WHEEL

Marshall A. Wheeler, P.O. Box 1267, Downey, Calif. 90240
Filed Jan. 22, 1976, Ser. No. 651,491
Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—118



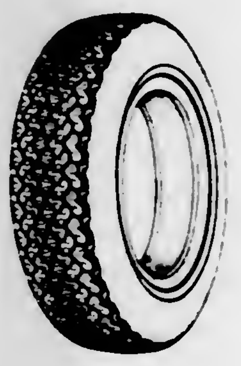
243,168
TIRE FOR A VEHICLE WHEEL

Claude Albert Hart, Sutton Coldfield; Brian Howard Holmes, Birmingham, both of England, and Karl Gebert, Klein, Auheim, Germany, assignors to Dunlop Limited, London, England
Filed July 22, 1974, Ser. No. 490,551
Claims priority, application United Kingdom, Jan. 22, 1974, 965383/74

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Term of patent 14 years
Int. Cl. D12—*15*

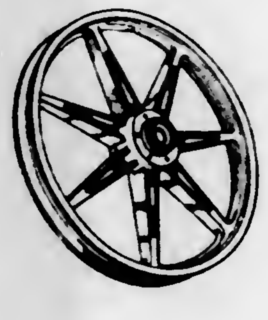
U.S. Cl. D12—146



243,169
MOTOR-CYCLE WHEEL

Toshiyuki Suzuki, Iwata, and Kenji Ekuan, Tokyo, both of Japan, assignors to Yamaha, Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Sept. 24, 1975, Ser. No. 616,150
Claims priority, application Japan, Mar. 27, 1975, 50-12199
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—205

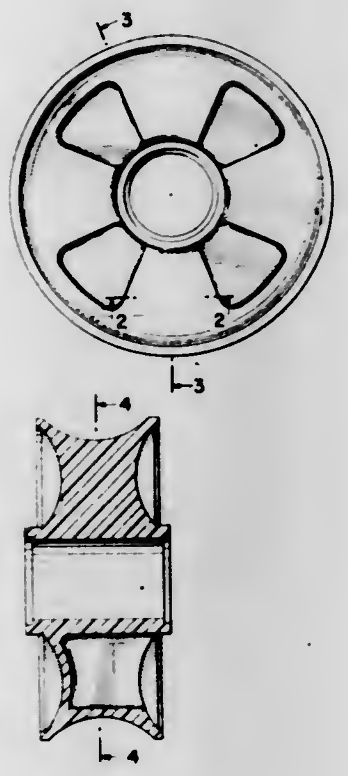


243,170
WHEEL CENTER

Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,834
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—211

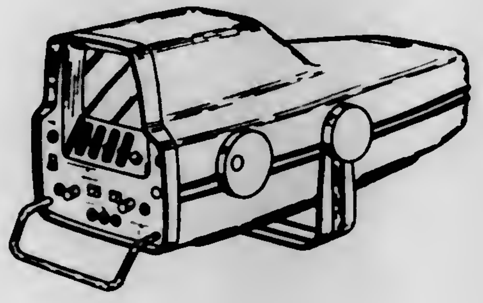


243,171
TELEVISION CAMERA

Kiyoshi Sakashita, Osaka, Japan, assignor to Sharp Corporation

Filed May 28, 1975, Ser. No. 581,629
Claims priority, application Japan, Nov. 29, 1974, 49-42790
Term of patent 14 years
Int. Cl. D16—*01*

U.S. Cl. D16—1

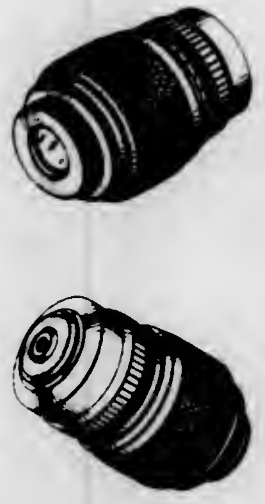


243,172
OBJECTIVE LENS FOR A MICROSCOPE

Toshifumi Uetake, and Tutomu Tojyo, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,285
Claims priority, application Japan, Apr. 14, 1975, 50-14731
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—63

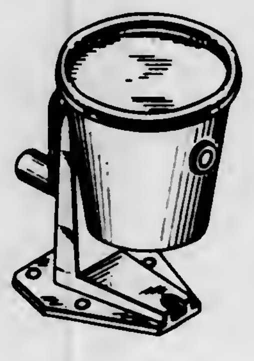


243,173
PENCIL SHARPENER

John M. Bitner, Williamsville, N.Y., assignor to American Can Company, Greenwich, Conn.

Filed June 2, 1975, Ser. No. 582,769
Term of patent 14 years
Int. Cl. D19—*06*

U.S. Cl. D19—74

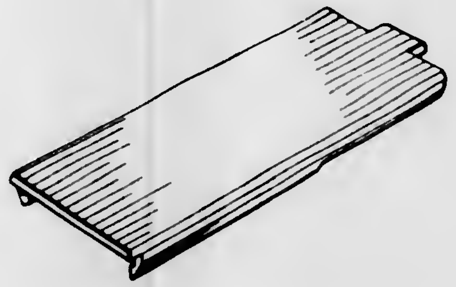


243,174
CARTRIDGE MAGAZINE COVER

Jacob Sofinowski, III, Baldwin, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Dec. 5, 1975, Ser. No. 637,907
Term of patent 14 years
Int. Cl. D22—*99*

U.S. Cl. D22—7

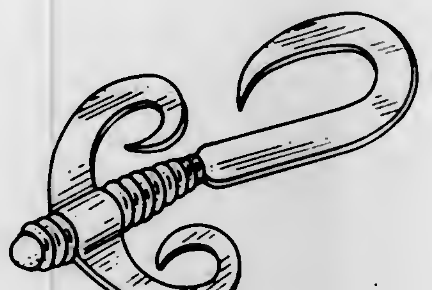


243,175
FISHING LURE

Robert Glynn Carver, P.O. Box 44, Athens, La. 71003

Filed Apr. 26, 1976, Ser. No. 680,205
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—27

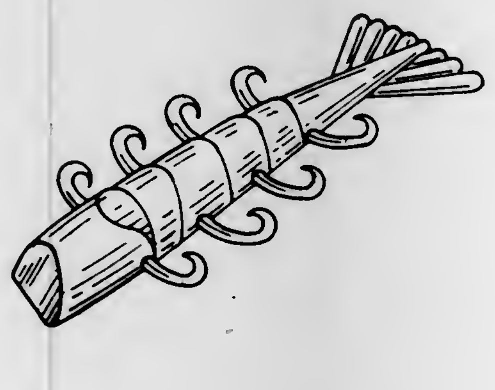


243,176
FISHING LURE

Robert Glynn Carver, P.O. Box 44, Athens, La. 71003, and Glen R. Welle, Rte. 1, Box 163, Minden, La. 71055

Filed Apr. 26, 1976, Ser. No. 680,206
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—27

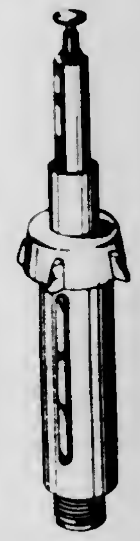


243,177
TROLLING WEIGHT

James A. Kammeraad, Holland, Mich., assignor to DFK Inc., Holland, Mich.

Filed Mar. 1, 1976, Ser. No. 662,697
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—30

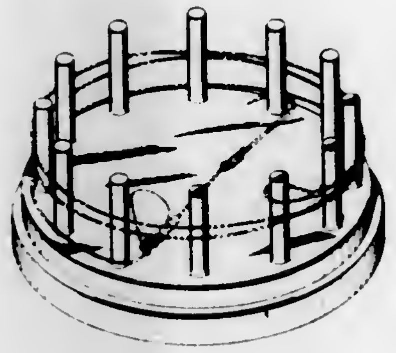


243,178
HOLDER FOR FISHING LURE AND LEADER

Henry P. Sahly, 11825 18th Ave. N., Plymouth, Minn. 55427

Filed May 2, 1974, Ser. No. 466,266
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—99

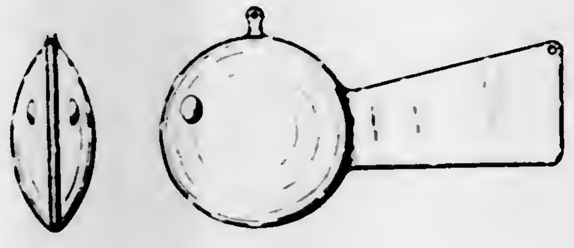


243,179
POP-UP SPRINKLER

Abraham Stephanus Le Roux Jooste, 13 Exmouth Road, Plumstead, Cape Town, Cape Province, and Jurgen Momsen, 21 Dell St., Tiervlei, Bellville, Cape Province, both of South Africa

Filed Dec. 22, 1975, Ser. No. 643,084
Claims priority, application South Africa, Oct. 6, 1975, 75/1375
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—7

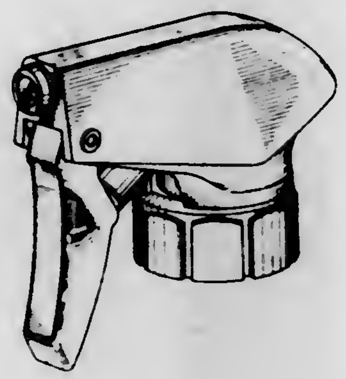


243,180
HAND SPRAYER

Joseph Benedict Federico, North Palm Beach; Walter Herbert Wesner, Ft. Lauderdale, and John Richard Cary, Miami Lakes, all of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Feb. 13, 1976, Ser. No. 657,809
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—17

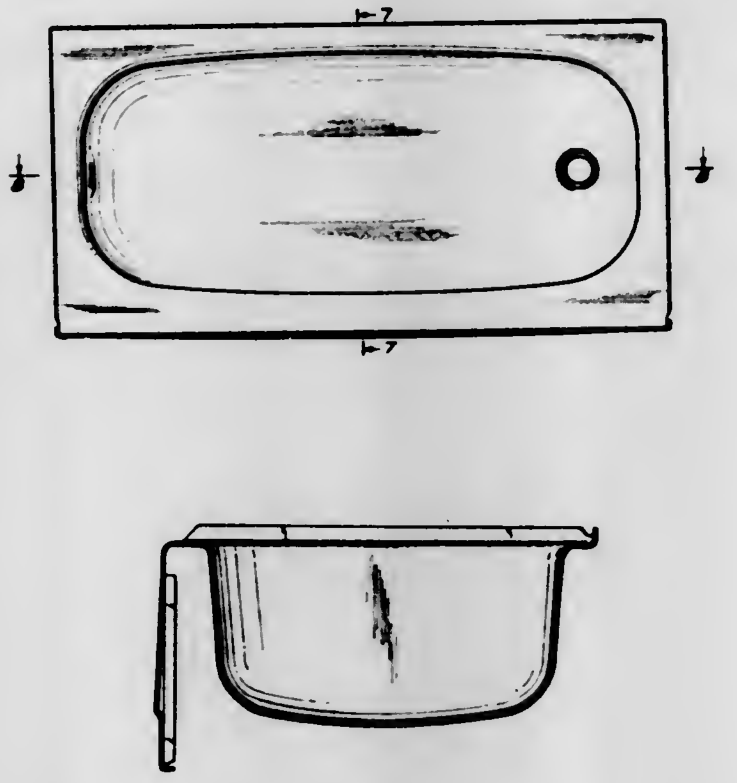


243,181
BATHTUB

Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard, Inc., New York, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,282
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—55

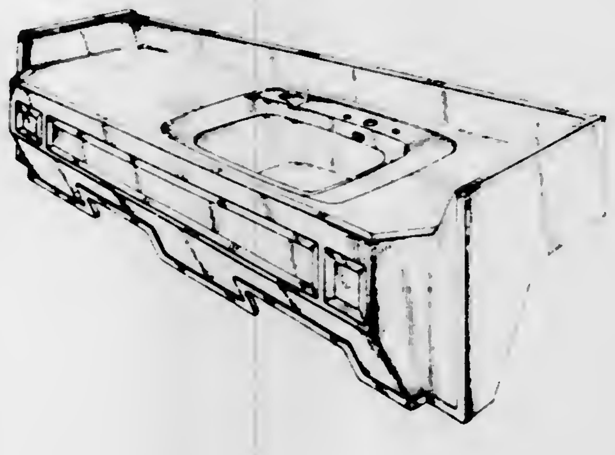


243,182
COMBINATION VANITY AND LAVATORY

Merritt W. Seymour, Sylvania, and David D. Tompkins, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 6, 1975, Ser. No. 620,480
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—59

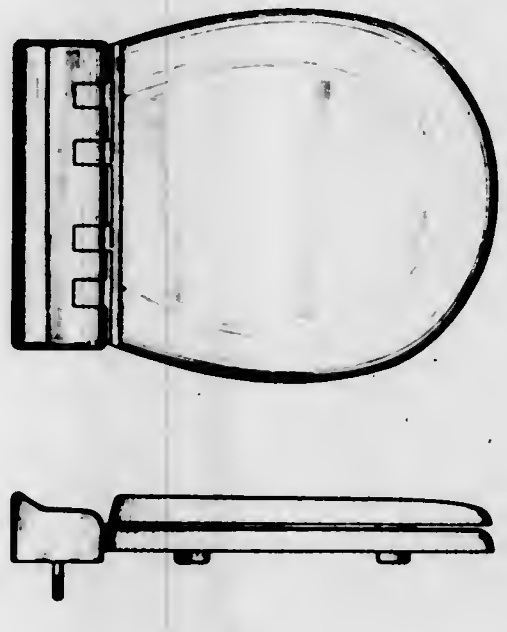


243,183
COMBINED HINGE UNIT, SEAT AND SEAT COVER FOR A WATER CLOSET

Charley Winfield Davis, Jr., 12 Wilmont Ave., White Plains, N.Y. 10605

Continuation-in-part of Ser. No. 515,536, Oct. 17, 1974, abandoned. This application Dec. 24, 1975, Ser. No. 644,032
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—71

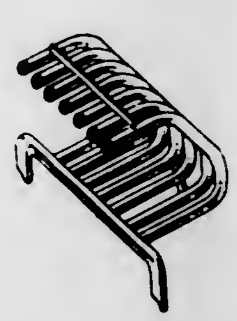


243,184
COMBINED FIREPLACE HEATER AND GRATE

Kenneth James Solinski, 1900 32nd St., Bay City, Mich. 48706

Filed Apr. 3, 1975, Ser. No. 564,764
Term of patent 14 years
Int. Cl. D23—*03*, D7—*08*

U.S. Cl. D23—94

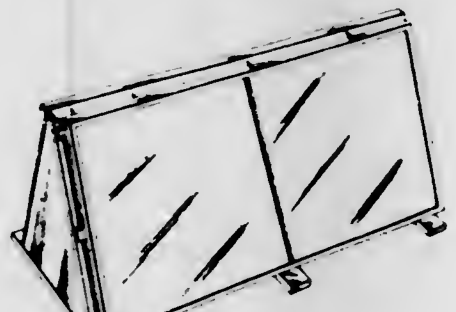


243,185
SELF-CONTAINED SOLAR HEATING SYSTEM MODULE

Kenneth E. Parker, 6121 Belen St., Long Beach, Calif. 90815, and Alvin L. Ottum, 296 Vista Conejo, Newbury Park, Calif. 91320

Filed Feb. 3, 1976, Ser. No. 655,009
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—127

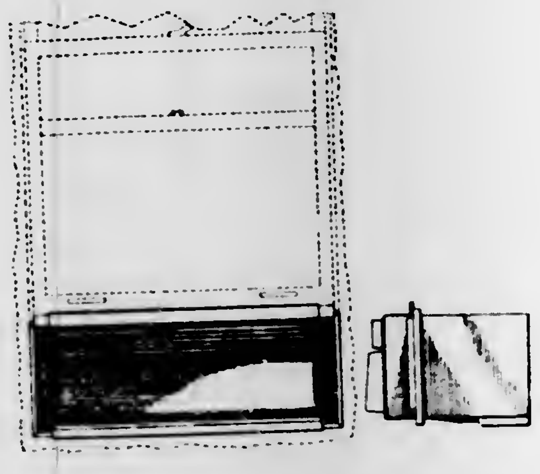


243,186
AIR CONDITIONER HOUSING FOR MOUNTING IN DOUBLE-HUNG WINDOWS

James W. Bruner, Sr., and George W. Sisk, Jr., both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 260,044, June 5, 1972. This application Nov. 15, 1974, Ser. No. 524,033
Term of patent 14 years
Int. Cl. D23—*04*

U.S. Cl. D23—141



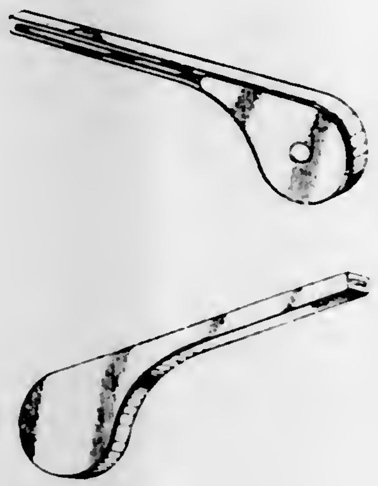
243,187
DENTAL FLOSS DISPENSER

William E. Bennington, 5 Fillmore Drive, Sarasota, Fla. 33577

Division of Ser. No. 367,953, June 7, 1973, Pat. No. Des. 237,498.

This application Aug. 22, 1975, Ser. No. 606,951
Term of patent 14 years
Int. Cl. D24—*99*

U.S. Cl. D24—11 D

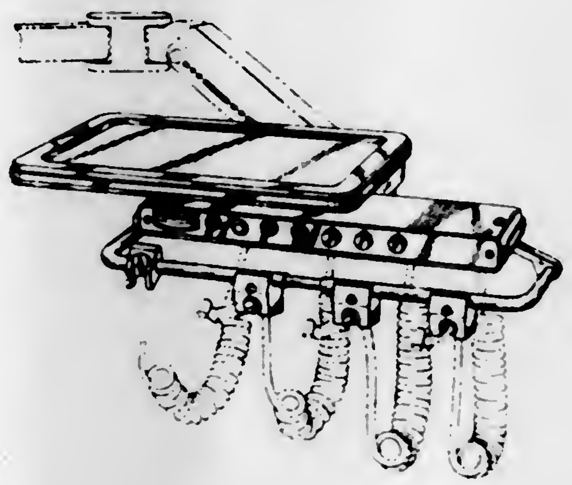


243,188
COMBINED DENTAL TRAY AND CONTROL UNIT THEREFOR

Robert H. Meyer, Newberg, Oreg., assignor to A-DEC, Inc., Newberg, Oreg.

Filed Feb. 11, 1976, Ser. No. 657,147
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D24—1 B



243,189
BUILDING BOARD

Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

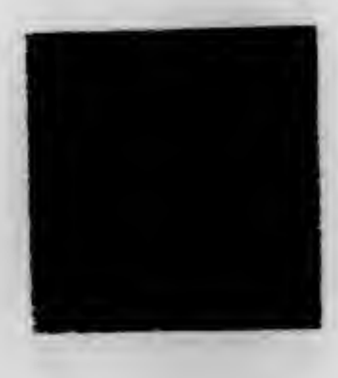
Filed Mar. 31, 1975, Ser. No. 563,833

Claims priority, application Japan, Dec. 26, 1974, 50-45198

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—84



243,190
EMISSION ELECTRODE HOLDER FOR ELECTROSTATIC PRECIPITATOR

Filip Knutsson, and Lars Bergstrom, both of Vaxjo, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

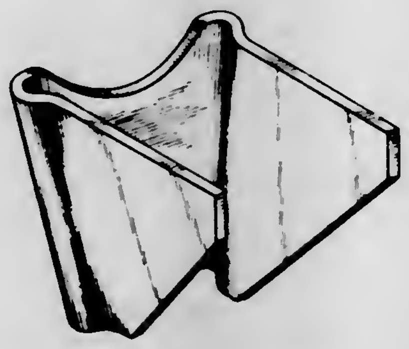
Filed May 29, 1975, Ser. No. 581,892

Claims priority, application Germany, Dec. 4, 1974, URA 808/74

Term of patent 14 years

Int. Cl. D8—*08;* D13—*03*

U.S. Cl. D26—1 R



243,191
CALCULATOR

John Hunter Pemberton, Cambridge, England, assignor to Sinclair Radionics Limited, Huntington, England

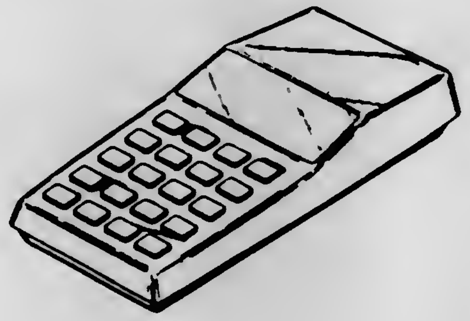
Filed June 25, 1975, Ser. No. 590,065

Claims priority, application United Kingdom, Jan. 15, 1975, 969439/75

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D26—5 C



243,192
ENCODER CONSOLE WITH REMOVABLE DESK TOP

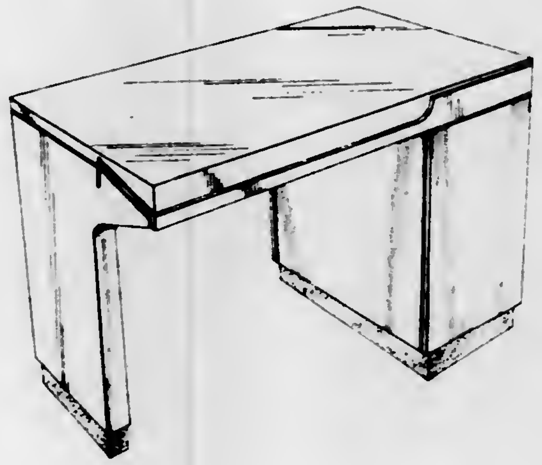
Richard G. Clayton, Detroit; Jerry J. Sims, Southfield; Gilbert L. McCauley, Detroit, and Thomas C. Abrahamsen, Birmingham, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 23, 1975, Ser. No. 570,668

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D26—5 C



243,193
DATA ENTRY KEY STATION

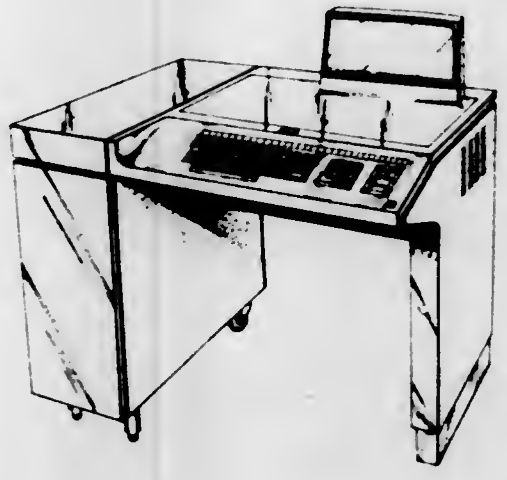
Richard G. Clayton, Detroit; Thomas C. Abrahamsen, Birmingham, both of Mich.; Jack K. Beduhn, Westlake Village, and Norman P. Guetschoff, Jr, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,487

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D26—5 C



243,194
CABLE TELEVISION CONVERTER CONTROL TERMINAL OR THE LIKE

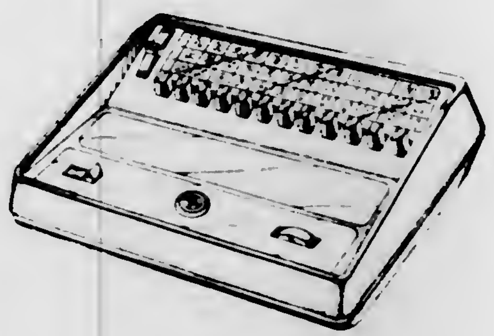
Svein T. Nordberg, and Donald R. Shaner, both of El Paso, Tex., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,968

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D26—14 K



243,195
LINING FOR ASH TRAY, DUST BIN AND THE LIKE

Alf B. Magnusson, Goteborg, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

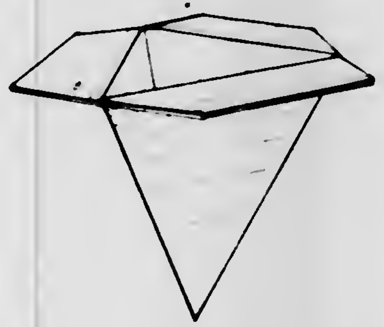
Filed June 17, 1974, Ser. No. 480,117

Claims priority, application Sweden, Jan. 11, 1974, 46/74

Term of patent 14 years

Int. Cl. D27—*03*

U.S. Cl. D27—8



243,196
LIGHTER

Franz Alban Stuetzer, Muhlheim (Main), Germany, assignor to Sunbeam Corporation, Chicago, Ill.

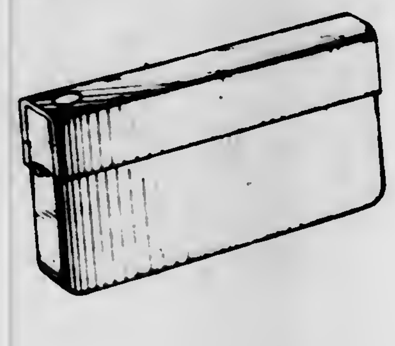
Filed Sept. 5, 1975, Ser. No. 610,585

Claims priority, application Germany, Mar. 19, 1975, 59860

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—36



243,197
LIGHTER

Franz Alban Stuetzer, Muhlheim (Main), Germany, assignor to Sunbeam Corporation, Chicago, Ill.

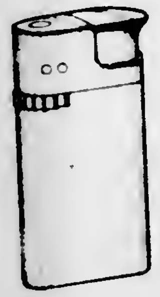
Filed Sept. 5, 1975, Ser. No. 610,596

Claims priority, application Germany, Mar. 19, 1975, 59860

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—42



243,198
LIGHTER

Franz Alban Stuetzer, Muhlheim (Main), Germany, assignor to Sunbeam Corporation, Chicago, Ill.

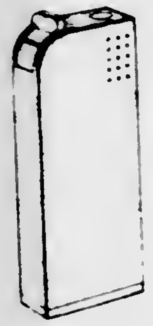
Filed Sept. 5, 1975, Ser. No. 610,597

Claims priority, application Germany, Mar. 19, 1975, 9860

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—42



243,199
LIGHTER

Franz Alban Stuetzer, Muhlheim (Main), Germany, assignor to Sunbeam Corporation, Chicago, Ill.

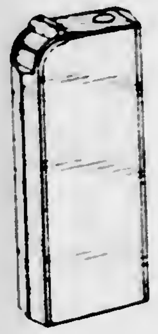
Filed Sept. 5, 1975, Ser. No. 610,598

Claims priority, application Germany, Mar. 19, 1975, 9860

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—42



243,200

LIGHTER

Franz Alban Stuetzer, Mulheim (Main), Germany, assignor to Sunbeam Corporation, Chicago, Ill.

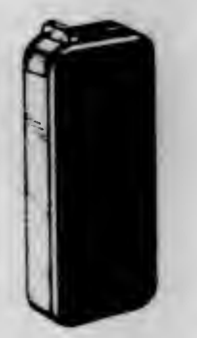
Filed Sept. 5, 1975, Ser. No. 610,599

Claims priority, application Germany, Mar. 19, 1975, 9860

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—42



243,201

COMBINED FLAG STAND AND GLOBE

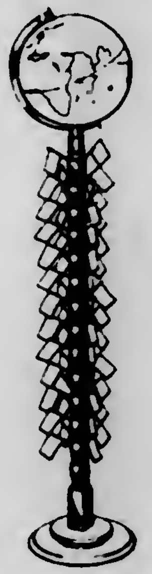
Matthew Edward Wrenn, 8711 63rd Ave., College Park, Md. 20740

Filed Feb. 6, 1976, Ser. No. 656,066

Term of patent 14 years

Int. Cl. D11—*02*; D19—*07*

U.S. Cl. D11—166



243,202

BOARD FOR A GAME

Richard Charles Peter Guignard, 38A, The Avenue, Radlett, Hertfordshire, England

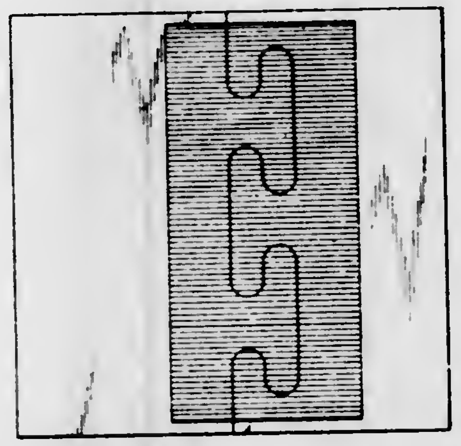
Filed July 8, 1975, Ser. No. 594,056

Claims priority, application United Kingdom, Jan. 9, 1975, 969329/75

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 SS



243,203

CIRCULAR GAME BOARD

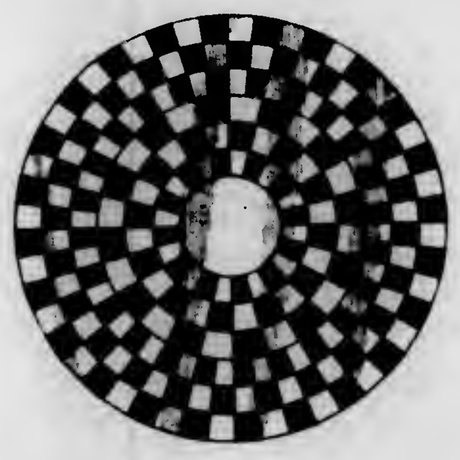
Joe Lewis Wilkins, 5252 Balboa Arms Drive, Apartment No. 283, San Diego, Calif. 92117

Filed Aug. 13, 1975, Ser. No. 604,240

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 SS



243,204

TOY CONSTRUCTION PIECE

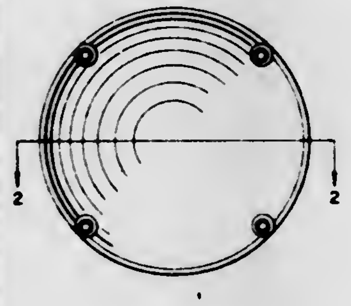
Lester V. Molenaar, Box 777, W. Highway 40, Willmar, Minn. 56201

Filed Feb. 18, 1975, Ser. No. 550,761

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 GG



243,205

SIMULATIVE TOY VEHICLE

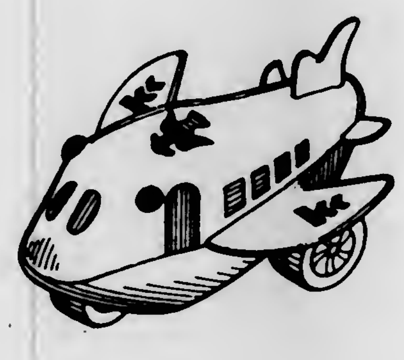
Yim Hei Joseph Yeung, Joylite Bldg. 99, Wai Yip St., Kwun Tong, Kowloon, Hong Kong

Filed Apr. 18, 1975, Ser. No. 569,200

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 AM



243,206

SKATE BOARD

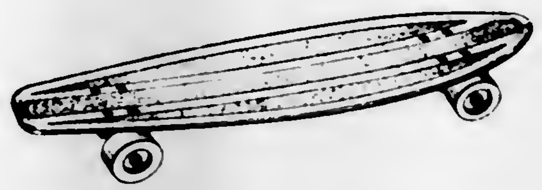
Kent N. Sherwood, Venice, Calif., assignor to Kent Sherwood, Venice, Calif.

Filed May 27, 1975, Ser. No. 581,268

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 AJ



243,207

CULTIVATOR TINE

Cornelius Van der Lely, 7, Bruschenrain, Zug, Switzerland

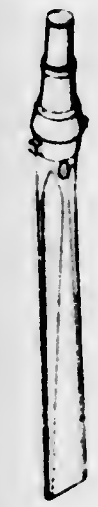
Filed Nov. 19, 1975, Ser. No. 633,565

Claims priority, application Belgium, May 27, 1975, 50257

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—29



243,208

GUITAR HEAD

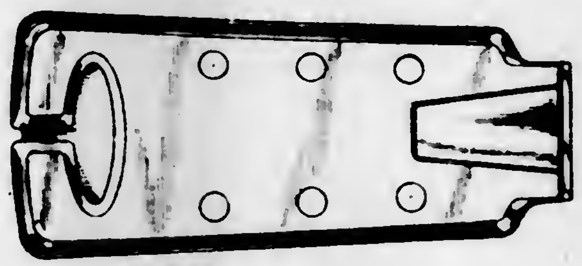
Hari Matsuda, Evanston, Ill., assignor to G. Leblanc Corporation, Kenosha, Wis.

Division of Ser. No. 370,772, June 18, 1973, Pat. No. 235,220. This application Sept. 23, 1974, Ser. No. 508,524

Term of patent 14 years

Int. Cl. D17—*03*

U.S. Cl. D56—1 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JANUARY, 1977

Note —Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See—*
  Tankersley, Robert Walker, Jr., 4,005,224.
A/S Akers Mek. Verksted: *See—*
  Oiern, Per Jorgen; and Osmundsvaag, Knut Helge, 4,004,535
A. Stucki Company: *See—*
  Wiebe, Donald; and Wagner, John H., 4,004,525.
AAI Corporation: *See—*
  Barr, Irwin R., 4,004,574.
Abbott Laboratories: *See—*
  Gendrich, Ronald Lee; Rippel, Riemond Henry; and Seely, John Hunter, 4,005,063.
  Johnson, Edwin Samuel, 4,005,194.
Abe, Akira: *See—*
  Yamamoto, Nobuo; Hori, Kiyotaka; Yoneyama, Masakazu; Nakayama, Yasuhiro, and Abe, Akira, 4,004,927.
Abramson, Paul; and Appel, Ulrich, to International Business Machines Corporation. Digital voice signaling with digital echo detection and voice activity compression used to cancel echo. 4,005,276, Cl. 179-170.200.
Acker, Laurent G., to Vestra-Union S.A. Apparatus for correcting the mutual orientation of the patterns on two layers of cloth. 4,004,527, Cl. 112-121.140.
Acker, Otto H. Piston-cylinder assembly. 4,004,557, Cl. 123-65.0VC.
Acorn Building Components, Inc.: *See—*
  DiFazio, Joseph, 4,004,389
Adamation, Inc.: *See—*
  Schuler, Stephen H., 4,004,682.
Adams, James E., Jr.: *See—*
  Haas, Werner E. L.; Adams, James E., Jr.; and Richter, Bela, 4,005,032.
Adams, Kenneth Douglas; and Ostapczuk, Edward Walter, to Singer Company, The. Heat sink for an appliance circuit board. 4,004,528, Cl. 112-218.00R.
Adamsky, Allan F.: *See—*
  Edgar, William D.; Sustarsic, John D.; and Adamsky, Allan F., 4,004,985
Adamus, Hans: *See—*
  Franzer, Wolfgang; and Adamus, Hans, 4,004,986.
Adelman, Albert H.: *See—*
  Nathan, Richard A.; Schwerzel, Robert E., Adelman, Albert H.; and Wyant, Robert E., 4,004,572.
Aeronutronic Ford Corporation: *See—*
  Schlacter, Michael M., 4,005,240.
Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
  Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, 4,004,979.
  Baruch, Pierre; Borel, Joseph; and Monnier, Joel, 4,004,950.
  Chapiro, Adolphe; and Mankowski, Zbigniew, 4,005,059.
  Thourel, Leo Y., 4,005,301.
AGFA-Gevaert, A.G.: *See—*
  Zangenfeind, Helmut; and Kustner, Gerhard, 4,004,724.
AGFA-GEVAERT N.V.: *See—*
  Van Besauw, Jan Frans; and Poot, Albert Lucien, 4,004,925.
  Vrancken, Marcel Nicolas; and Lassig, Wolfgang, 4,004,924.
  Willems, Jozef Frans; and Janssens, Wilhelmus, 4,004,926.
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  Gorike, Rudolf; Pless, Ernst; Fidi, Werner; and Fritz, Alexander, 4,005,267.
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  Stenstrom, Lennart Arvid, 4,004,553.
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Allen, Linus S., to Mobil Oil Corporation. Neutron-neutron logging. 4,005,290, Cl. 250-266.000.
Alleraid Company, Inc.: *See—*
  Geaney, Sheila A., 4,004,584.
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Amano, Yoshifumi, to Sony Corporation. Flat panel display apparatus 4,005,402, Cl. 340-324.00M.
Amberntsson, Jan Roger; Andersson, Rober Ingemar; and Sultan, Stig Bertil, to Facit Aktiebolag. Printing head for ink jet printer 4,005,440, Cl. 346-140.00A
Amelio, Armand F.; and Rosen, Kenneth M., to United Technologies Corporation. Infra-red suppressor for use with turbo-shaft engine. 4,004,416, Cl. 60-264.000.
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Anderson, Ralph F.; and Strombeck, Leo, to Anderson, Ralph F. Article wrapping machine. 4,004,400, Cl. 53-182.00R.
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- Ando, Kunio, to Fuji Photo Optical Co., Ltd. Automatic exposure control means. 4,005,445, Cl. 354-44.000.
- Ando, Masayasu: *See—*
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- Andrews, Peter. Electric incandescent lamp combination fixture device. 4,005,334, Cl. 315-208.000.
- Andronov, Mikhail Alexandrovich; Bakun, Anatoly Nikolaevich; Mezhevich, Felix Evgenievich; Petrov, Mikhail Ivanovich; Belov, Jury Ivanovich; Feldman, Alexandr Yakovlevich, deceased; and by Feldman, Raisa Alexandrovna, administratrix. Woven band. 4,004,616, Cl. 139-383.00R.
- Andrus, Joseph M., to Stauffer Chemical Company. Electrochemical removal of contaminants. 4,004,994, Cl. 204-149.000.
- Annegarn, Joseph Johannes Maria. Descaling bent rod with separated cleaning particles. 4,004,374, Cl. 51-5.00A.
- Antek, Inc.: *See—*
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- Anthony's Manufacturing Company, Inc.: *See—*
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- Aoki, Yukio; Wakita, Shizuo; Kato, Shoichi; and Ishida, Shuichi, to Nippon Kayaku Kabushiki Kaisha. Derivatives of propargyl or alkenyl phenyl ether and use thereof as acaricide. 4,005,148, Cl. 260-607.0AR.
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- Arbrook, Inc.: *See—*
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- Arimoto, Kyozo: *See—*
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- Arsenault, Guy P., to Massachusetts Institute of Technology. Ionization method for mass spectrometry. 4,005,291, Cl. 250-282.000.
- Arthur A. Collins, Inc.: *See—*
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- Aruanno, Angela, to Lamy S.r.l. Cassette magazine for motion-picture films. 4,004,746, Cl. 242-55.19A.
- Arumugham, Rangaswamy, to GTE Sylvania Incorporated. AFC circuit. 4,005,256, Cl. 358-195.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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  - Mori, Chiharu; and Kawasaki, Masahiro, 4,004,853.
- Asai, Satosi; and Matsuki, Isamu, to Matsuki-Seisakusho. Tape-operating apparatus adapted for use either with an endless loop type cartridge or a coplanar type cassette. 4,005,487, Cl. 360-94.000.
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- Ashland Oil, Inc.: *See—*
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  - Zehner, Lee R.; Sauer, Richard W., deceased; and Heffron, John J., executor, 4,005,128.
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- Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Preparation of active proteins cross-linked to inactive proteins. 4,004,979, Cl. 195-68.000.
- Aya, Masahiro; Miyamoto, Masao; Fukazawa, Nobuo; and Yamagishi, Masaaki, to Bayer Aktiengesellschaft. P-Chlorobenzyl N,N-hexamethylenethiolcarbamate. 4,005,071, Cl. 260-239.0BF.
- Aztec Manufacturing Company: *See—*
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- B.W.B. Controls, Inc.: *See—*
  - Theriot, Gerald F., 4,004,610.
- Baba, Yoshio; and Takashima, Akira, to Sumitomo Light Metal Industries, Ltd. Freely machinable aluminum alloy. 4,005,243, Cl. 428-469.000.
- Babcock & Wilcox Company, The: *See—*
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  - Matty, Robert E.; and Strom, Stephen S., 4,004,966.
- Bachelder, Patrick Eugene; and Sumner, William David, to Fisher Controls Company, Inc. Quick closing emergency valve. 4,004,601, Cl. 137-77.000.
- Back, Gerhard: *See—*
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- Balhorn, Milo G., to Old Fort International Inc. Block molding machine with feed drawer control means. 4,004,869, Cl. 425-159.000.
- Balkus, Carl E., Jr. Edge guide attachment for a paint brush. 4,004,318, Cl. 15-248.00R.
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- Bamberger, Carlos E.; and Richardson, Donald M., to United States of America, Energy Research and Development Administration. Thermochemical process for the production of hydrogen using chromium and barium compound. 4,005,184, Cl. 423-579.000.
- Bamberger, Carlos E.: *See—*
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- Banitt, Elden H.; and Bronn, William R., to Riker Laboratories, Inc. Antiarrhythmic method utilizing fluoroalkoxy-N-piperidyl and pyridyl benzamides. 4,005,209, Cl. 424-267.000.

- Barbieri, Joseph C., to W. H. Brady Co. Adhesive wire marker. 4,004,362, Cl. 40-316.000.
- Bardenhagen, Dietrich; and Schubert, Bernhard, to Hauni-Werke Korber & Co., KG. Method and machine for the production of hinged lid packs for groups of cigarettes or the like. 4,004,395, Cl. 53-3.000.
- Bargain, Michel, to Rhone-Poulenc S.A. Curing 1,2-epoxy with prepolymer based on polyamines and oligomers possessing imide groups. 4,005,154, Cl. 260-837.00R.
- Barker, Michael D.: *See—*
  - Isaac, Eirlys R.; and Barker, Michael D., 4,004,911.
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- Barr, Irwin R., to AAI Corporation. Solar energy concentrating and collecting arrangement with sun-follower and solar energy sensing power control and method. 4,004,574, Cl. 126-271.000.
- Bartholomew, Limited: *See—*
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- Baruch, Pierre; Borel, Joseph; and Monnier, Joel, to Agence Nationale de Valorisation de la Recherche (ANVAR); and Commissariat a l'Energie Atomique. Method for improving the doping of a semiconductor material. 4,004,950, Cl. 148-1.500.
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  - Buchel, Karl Heinz; Kramer, Wolfgang; Kaspers, Helmut; and Scheinpflug, Hans, 4,005,083.
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  - Eichenhofer, Kurt-Wilhelm; Schliebs, Reinhard; Brandl, Hermann; and Kohnen, Heinrich, 4,005,179.
  - Hack, Helmuth; Munz, Ferdinand; Eue, Ludwig; and Schafer, Werner, 4,004,913.
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  - Kolling, Heinrich; Thomas, Herbert; Widdig, Arno; and Wollweber, Hartmund, 4,005,123.
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- Beard, Wallace F.; Poppler, Jack H.; and Kienlen, Loren C., to Doormaid, Inc. Sliding door closer and method and apparatus for installing the same. 4,004,372, Cl. 49-404.000.
- Beaton, Stephen Peter; and Harbourne, David Alan, to Du Pont of Canada Limited. Treatment of lead sulphide. 4,004,921, Cl. 75-77.000.
- Beauchemin, Norman J., to Lodding Engineering Corporation. Paper machine drainage foil with wear-resistant insert. 4,004,969, Cl. 162-352.000.
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- Beavers, John Andrew, to Borg-Warner Corporation. Cable protector. 4,004,326, Cl. 24-81.0CC.
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- Beecham Group Limited: *See—*
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- Beedle, John H., to Kybe Corporation. Mounting for sapphire bladed tool. 4,004,317, Cl. 15-236.00A.
- Beffa, Fabio; and Back, Gerhard, to Ciba-Geigy Corporation. Unsymmetrical phenyl azo naphthyl chromium complex dyes. 4,005,065, Cl. 260-145.00A.
- Beinhauer, Manfred; and Scharkowitz, Eckhart, to Siemens Aktiengesellschaft. Process and arrangement for representing digital data by binary signals. 4,005,478, Cl. 360-40.000.
- Bekker, Gijsbertus A.: *See—*
  - Groenendaal, Willem; Taubert, Friedrich C.; Naber, Jaap E.; and Bekker, Gijsbertus A., 4,004,885.
- Belas, John J.; and Pellatiro, Leonard P., to Bethlehem Steel Corporation. Tunnelized burner for panel type furnace. 4,004,789, Cl. 266-87.000.
- Belfer, Warren B., to United States of America, Army. Constant recoil system. 4,004,495, Cl. 89-42.00B.
- Belke, Jack T., to Westran Corporation. Landing gear construction. 4,004,830, Cl. 280-763.000.
- Bell & Howell Company: *See—*
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- Bendix Corporation, The: *See—*
  - Gongwer, Calvin A., 4,004,308
  - Gongwer, Calvin A., 4,004,309.
- Bennett, Melvin R.; Bamberger, Carlos E.; and Kelmers, A. Donald, to United States of America, Energy Research and Development Administration. Method for converting UF5 to UF4 in a molten fluoride salt. 4,005,178, Cl. 423-259.000.
- Bennett, Robert B., to Dow Chemical Company, The. Method for insulation of curved surfaces. 4,004,394, Cl. 52-741.000.
- Beregovoi, Ivan Zakharovich: *See—*
  - Gavrilov, Anatoly Nikolaevich; Godin, Eduard Moiseevich; Kebets, Leonid Nikolaevich; Beregovoi, Ivan Zakharovich, Matskevich, Vladimir Ivanovich, Korf, Yakov Osherovich; and Dorofeev, Alexandr Grigorievich, 4,004,420.
- Berg, Christoph: *See—*
  - Knothe, Erich; Melcher, Franz Josef; and Berg, Christoph, 4,004,458.
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- Berger, Robert L., Hailey, William H.; Mallick, George, Jr.; Mannbeck, Donald H.; and Weight, Wilber J., to Western Electric Company, Inc. Voltage comparator and indicating circuit. 4,005,365, Cl. 324-133.000.
- Bergische Stahl-Industrie: *See—*
  - Rocholl, Hans; and Klein, Willi, 4,004,659.
- Bernier, Claude. Anti-skid boat. 4,004,536, Cl. 114-144.00R.
- Berns, Charles, to General Signal Corporation. Buzzer construction and method of adjusting the same. 4,005,413, Cl. 340-402.000.
- Berry, Arthur E. Adjustably mounted power fishing reel. 4,004,366, Cl. 43-27.400.
- Berry, Samuel M.: *See—*
  - Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., 4,004,335.
- Besenbruch-Hofmann, Inc.: *See—*
  - Hinojosa, Carlos R., 4,004,666.
- Best, James Jacob: *See—*
  - Agnew, Mark Charles; Best, James Jacob; and Gudgel, Willard Leon, 4,004,795.
- Bethlehem Steel Corporation: *See—*
  - Belas, John J.; and Pellatiro, Leonard P., 4,004,789.

  Kreiger, John W., 4,004,916.
  Szendroi, Imre, 4,004,702.
Bezsilko, Nicolas, to S.A. Vandeputte Fils a Cie (department electronique Velec Sefat). Machine for separating pieces of money or similar articles. 4,004,598, Cl. 133-1.00R.
Biblin, Daniel L.; and Preziosi, Joseph R., to Amerace Corporation. Self-sealing, self-locking threaded fastener. 4,004,626, Cl. 151-7.000.
Bickel, Hans; and Kump, Wilhelm, to Ciba-Geigy Corporation. Antibiotically active compounds. 4,005,077, Cl. 260-239.30P.
Bienvenu, Joseph O., to Petrolite Corporation. Isocyanated polyvalent metal salts of oxidized waxes. 4,004,932, Cl. 106-31.000.
Biersdorf Aktiengesellschaft: *See—*
  Petersen, Rudolf Theodor; and Fleck, Wolfgang, 4,005,096.
Bigley, William J.: *See—*
  Rawicz, Harris C.; Bigley, William J.; Cangiani, Gene L.; and Yohannan, Rene C., 4,004,729.
Billeruds Aktiebolag: *See—*
  Swan, Brita; and Gustavsson, Rune, 4,004,967.
Binder, William R. Candle mold. 4,004,773, Cl. 249-93.000.
Bingham, Henry: *See—*
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Biola, Georges; Fabre, Alain; and Schneider, Gerard, to Rhone-Poulenc Industries. Distillation of propylene oxide from propylene oxidation reaction product in mixture with a phosphoric acid ester. 4,005,114, Cl. 260-348.50L.
Birchall, James Derek; and Cassidy, John Edward, to Imperial Chemical Industries Limited. Solid complex phosphate of aluminum. 4,005,172, Cl. 423-300.000.
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Bison-werke Bahre & Greten GmbH & Co. KG: *See—*
  Bucking, Gunter, 4,005,162.
Blair, C. Lee, to Raymond Lee Organization, Inc., The, a part interest. Horizontally swingable golf tee. 4,004,814, Cl. 273-204.000.
Blair, Everett George, to Wallace-Murray Corporation. Fan drive secant pumping grooves. 4,004,668, Cl. 192-58.00B.
Blair, Raymond, to International Fence Alarm Corporation. Fence alarm. 4,005,397, Cl. 340-223.000.
Bland, Charles W. Hanger mechanism and sail engaging tool attached to tool bar thereby. 4,004,640, Cl. 172-710.000.
Blauschild, Robert A., to Signetics Corporation. Triple state to binary converter. 4,005,315, Cl. 307-209.000.
Blauth, Gary William: *See—*
  Lehr, Stanley; Coralnick, Philmore; and Blauth, Gary William, 4,005,266.
Bloomfield, David P., to United Technologies Corporation. Pressurized fuel cell power plant. 4,004,947, Cl. 429-17.000.
Blum, Rudolf, to Robert Bosch G.m.b.H. Voltage-regulated and overcurrent-protected power supply. 4,005,351, Cl. 321-14.000.
Bodnar, Ernest Robert. Scrap chopper. 4,004,479, Cl. 83-345.000.
Bodson, Fernand Jacques Joseph. Process for the elimination of chloride from zinc sulphate solutions. 4,005,174, Cl. 423-43.000.
Boehringer, John R. Safety interface for anesthesia vacuum scavenging. 4,004,585, Cl. 128-145.800.
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  George, Loyd William, 4,004,736.
  Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,004,756.
  McAvoy, John Jerome, 4,004,761.
Boenning, Robert A.; and Welden, George R., to Westinghouse Electric Corporation. Probe pin. 4,004,843, Cl. 339-108.0TP.
Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. O-(2-vinylphenyl)-thiol-phosphates. 4,005,158, Cl. 260-949.000.
Bohm, Walter; Kritzler, Helmuth; and Neumann, Lutz, to Bayer Aktiengesellschaft. Process for manufacturing aromatic diamines 4,005,143, Cl. 260-575.000.
Bohn, August C.; and Morse, Glenn B. Snap hook for fishing tackle. 4,004,328, Cl. 24-237.000.
Bokros, Jack C., to General Atomic Company. Carbon bearings via vapor deposition. 4,005,163, Cl. 264-81.000.
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  Meyer, Rolf; Martin, Manuel I.; and Bolton, Ronald A., 4,004,883.
Boltz, Chadwick C.: *See—*
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Bondarenko, Alexandr Sergeevich: *See—*
  Zverev, Anatoly Ivanovich; Bondarenko, Alexandr Sergeevich; Pudzinsky, Mikhail Antonovich; Sopryazhinsky, Vadim Mikhailovich; and Yakshin, Nikolai Alexeevich, 4,004,735.
Bonnefon, Alain; and Benard, Jack, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Production of polyolefin-reinforced rubber products. 4,005,054, Cl. 260-42.560.
Boone, Philip. Device for positioning a container of supplemental material adjacent to a toilet-tissue holder. 4,004,687, Cl. 206-233.000.
Booth, Jacqueline L. Yarn dispensing apparatus. 4,004,745, Cl. 242-54.00R.
Borel, Joseph: *See—*
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Boriss, Robert P.; and McNamara, Thomas F., to United States of America, Army. Method and apparatus for providing decelerated aircraft approach. 4,004,758, Cl. 244-17.130.
Borrello, Denis, to Foodways National, Inc. Packaging machine. 4,004,399, Cl. 53-180.00M.
Borries, John A., to Cooper Industries, Inc. Air tool with speed responsive shutoff. 4,004,859, Cl. 415-25.000.
Borsi, Jozsef: *See—*
  Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Csanyi, Endre; Pik, Katalin; and Wolf, Lajos, 4,005,089.
Boter, Pieter Abraham, to U.S. Philips Corporation. Rechargeable electrochemical cell. 4,004,943, Cl. 429-59.000.
Bottai, Gabriele: *See—*
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Botzenhardt, Leonhard, to Licentia Patent-Verwaltungs-G.m.b.H. Contact system for semiconductor arrangement. 4,005,456, Cl. 357-71.000.
Boulanger, Henry J., to Texas Instruments Incorporated. Pushbutton keyboard switch assembly having individual concave-convex contacts integrally attached to conductor strips. 4,005,293, Cl. 200-5.00A.
Boutin, Gilbert R. Conduit connectors. 4,004,831, Cl. 285-81.000.
Boward, James F., Jr. Aerating apparatus. 4,005,015, Cl. 210-220.000.
Boyd, Martin C., to Philadelphia Suburban Corporation. Fire-responsive tank top. 4,004,708, Cl. 220-224.000.
Braasch, Michael: *See—*
  Langheim, Franz; and Braasch, Michael, 4,004,880.
Braden, Denver, to Illinois Tool Works Inc. Radial leaded electrical components designed for automatic insertion into printed circuit boards. 4,004,688, Cl. 206-330.000.
Braeutigam, Hans: *See—*
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Brandin, Henry. Word game apparatus. 4,004,811, Cl. 273-135.00D.
Brandl, Hermann: *See—*
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Braun, Heinz; Dahl, Hans; Hefter, Jost; and Stotz, Wolf-Gunter, to Escher Wyss G.m.b.H. Consecutive multi-ply formers with an unencumbered doffer felt. 4,004,968, Cl. 162-304.000.
Brayley, Elwin J.; Brownlee, Allen L.; and Garen, John C., to Eltra Corporation. Ignition breaker point arrangement. 4,005,294, Cl. 200-19.00A.
Breer, Carl, II. Dispenser and applicator device. 4,004,854, Cl 401-205.000.
Breithach, Francis John, to Deere & Company. Snap ring tool. 4,004,338, Cl. 29-229.000.
Breitschwerdt, Werner; and Knoll, Heinz W., to Daimler-Benz Aktiengesellschaft. Device for the rapid disengagement of a retaining system in vehicles. 4,004,821, Cl. 280-744.000.
Brenneisen, Jorg, to BBC Brown Boveri & Company Limited. Arrangement for protection of self-controlled inverter fed from an intermediate d.c. voltage link. 4,005,350, Cl. 321-11.000.
Breslow, Jeffrey D., to Marvin Glass & Associates. Game apparatus with timer-controlled receptacle closure. 4,004,803, Cl. 273-1.00R.
Breton, Henri E.: *See—*
  Smola, Frank M.; and Breton, Henri E., 4,004,548.
Bretschneider, Hermann; Klotzer, Wilhelm; Bader, Gunther; and Lutz, August, to Hoffmann-La Roche Inc. Pyrazole-5-carboxamides. 4,005,100, Cl. 260-310.00R.
Breuer, Hermann: *See—*
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Brian, Michael A., to Oxy Metal Industries Corporation. Control system for conveying apparatus. 4,005,349, Cl. 318-569.000.
Brichard, Jean, to Solvay & Cie. Granules of salts of poly-α-hydroxyacrylic acids and a process for their manufacture. 4,005,136, Cl 260-535.00P.
Bridge, Frank; and Singh, Tej Kuldip, to Associated Paper Mills Limited, The. Apparatus for producing fibrous webs. 4,004,324, Cl 19-156.300.
Bridgestone Tire Company Limited: *See—*
  Takasuga, Yutaka; Nishimura, Seiichiro; and Suzuki, Masayoshi, 4,004,961.
  Tsuji, Naotaka; and Yamada, Koji, 4,004,693.
Briggs, Aubrey C., to Dravo Corporation. Material handling apparatus with load compensated counterweight system. 4,004,696, Cl. 212-49.000.
Briggs, George James; Buckler, Ernest Jack; and Wei, Yung-Kang, to Polysar Limited. Polymer-oil-black masterbatch. 4,005,053, Cl. 260-33.6AQ.
Brindisi, Frank A., Jr., to Enthone, Incorporated. Selectively stripping tin or tin-lead alloys from copper substrates. 4,004,956, Cl. 156-666.000.
British Railways Board: *See—*
  Shore, Anthony G. L.; Preston, Kevin S.; and Churchill, David A., 4,004,660.
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Brongo, Louis Joseph, to Metropolitan Wire Corporation. Mobile truck provided with improved removable racks for pans, trays and the like. 4,004,819, Cl. 280-79.300.
Bronn, William R.: *See—*
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Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, to Imperial Chemical Industries Limited. Oxyformamidates. 4,005,097, Cl. 260-295.00Q.

Broun, Georges: *See—*
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Brown, Alfred; Wu, Ching H., and Konopnicki, Daniel T., to Texaco Inc. Combined multiple solvent and thermal heavy oil recovery 4,004,636, Cl. 166-272.000.
Brown, Boveri & Cie A. G.: *See—*
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Brown, Edgar D., Jr.; and Traver, Frank J., to General Electric Company. Silicone fluid useful as a brake fluid 4,005,023, Cl 252-78.300.
Brown, Jack M., to Esterline Electronics Corporation Electrically conductive moveable support member for use in electrical switches 4,005,298, Cl. 200-153.00R.
Brownlee, Allen L.: *See—*
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Brungsberg, Josef-Heinrich, to Brown, Boveri & Cie A. G. Interrupter for the ignition system of internal combustion engines. 4,004,560, Cl. 123-148.00E
Brunner, Josef Klemens. Water-compatible solvents for film-forming resins and resin solutions made therewith. 4,005,051, Cl 260-29.40R.
Buchel, Karl Heinz, Kramer, Wolfgang; Kaspers, Helmut; and Scheinpflug, Hans, to Bayer Aktiengesellschaft Metal complexes of azolyl ethers. 4,005,083, Cl. 424-245.000.
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Bukatarevic, Dragan. Rotary piston internal combustion engine having a heat transfer phase 4,004,555, Cl. 123-8.050.
Bundy, Gordon L., to Upjohn Company, The. Phenyl-substituted prostaglandin-A type analogs. 4,005,115, Cl 260-410.90R.
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Bunnell, Frederick E., III; and Combs, Henry G., to Lockheed Aircraft Corporation. Articulated high "G" pilot S seat. 4,004,763, Cl. 244-122.00R.
Burdyn, Ralph F.; Chang, Harry L.; and Cook, Evin L., to Mobil Oil Corporation. Oil recovery by alkaline-surfactant waterflooding. 4,004,638, Cl. 166-273.000.
Burgdorf, Jochen, to ITT Industries, Inc. Dual circuit brake force regulating device 4,004,839, Cl. 303-6.00C.
Burklund, Vernon D.; Stone, W. James; and Schmidt, Joseph A., to United States of America, Navy. Drogue chute extraction 4,004,764, Cl. 244-149.000.
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  Stickney, Dwight R.; Simmons, William S.; Nichol, Charles A.; Hitchings, George H.; and Elion, Gertrude B., 4,005,204.
Burzlaff, Karl H.; and Sanchez, Carmelo, to Singer Company, The Wire matrix printhead having facility for enabling wirewear correction. 4,004,673, Cl. 197-1.00R.
Busch, Albert E. Weighing system. 4,004,646, Cl. 177-1.000.
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Butler, Tony W., Jr. Energy conversion system. 4,004,427, Cl. 60-698.000.
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Byrnes, Robert M., Sr. Protective glove constructed of flexible strands of metal wire and fiber yarn. 4,004,295, Cl. 2-161.00R.
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Calcagno, Benedetto; Piccolo, Luigi, Paolinelli, Antonio; Cozza, Giorgio, and Bottai, Gabriele, to Societa' Italiana Resine S.I.R. S.p.A. Process for the joint production of sodium tripolyphosphate and titanium dioxide 4,005,175, Cl. 423-83.000.
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- Chandra, Grish; and Griffiths, Brian John, to Dow Corning Limited. Catalysts and carriers therefor. 4,005,046, Cl. 252-428.000.
- Chaney, Elwood; and Crayton, John W., to Caterpillar Tractor Co. Weld fill height regulating system for arc welding apparatus. 4,005,308, Cl. 219-125.00R.
- Chang, Augustine Wei-Chun; and Lucarini, Vincent Joseph, to International Business Machines Corporation. P-type-epitaxial-base transistor with base-collector Schottky diode clamp. 4,005,469, Cl. 357-15.000.
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  - Bickel, Hans; and Kump, Wilhelm, 4,005,077.
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Beaton, Stephen Peter; and Haroourne, David Alan, 4,004,921.
Houston, Alvin John, 4,004,774.

Dubost, Gerard; and Havot, Henri Albert, to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Thick folded dipole which is tuneable within a frequency band of two octaves. 4,005,430, Cl. 343-747.000.

Ducasse, Joseph Christophe Victor, to Unice Machine Company. Multistage continuous vacuum pan. 4,004,964, Cl. 159-17.00C.

Dula-Werke Dustmann & Co.: *See—*
Wesseler, Gerhard, 4,004,856.

Duncan, Damon H.; Herdman, Craig T.; and Littlejohn, Terrance V., to Sperry Rand Corporation. Magnetic disc memory. 4,005,490, Cl. 360-97.000.

Dunks, Clifford Matthew, to Materials and Methods Limited. Process for the manufacture of cast iron. 4,004,630, Cl. 164-57.000.

Dunlop Limited: *See—*
Kenney, Michael John, 4,004,467.

Dunning, Kenneth G.: *See—*
Smith, Carleton H.; and Dunning, Kenneth G., 4,004,945.

Dunwald, Willi; Lewalter, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of polyhydantoins and polyparanic acids. 4,005,056, Cl. 260-77.5CH.

Du Pont de Nemours, E. I., and Company: *See—*
Faulhaber, Mark Edwin; and Smith, Edmund Haislett, Jr., 4,005,281.
Fuchs, Julius Jakob, 4,004,915.
Fukunaga, Tadamichi, 4,005,091.
Hawkins, William E., 4,004,738.
Krespan, Carl George, 4,005,104.
Singh, Gurdial; and von Rutte, Richard Edward, 4,005,057.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Compositions and methods for inhibiting H_2histamine receptors. 4,005,205, Cl. 424-251.000.

Durham, Roger Owen. Two-position pedal for bicycles. 4,004,468, Cl. 74-594.400.

Dvorak, Alfred: *See—*
Kugler, Jindrich; Dvorak, Alfred; and Elliott, Charles John, 4,005,352.

Dwyer, James F. Device for imprinting indicia on a flexible article. 4,004,503, Cl. 101-9.000.

Dykes, Dewey B.; Powers, E. Michael; Foster, T. Kenneth; and Rogers, Robert E., to Jim Dandy Company, The. Multiple nozzle dispenser head. 4,005,226, Cl. 426-281.000.

Dzus Fastener Co., Inc.: *See—*
Schenk, Peter, 4,004,486.

E. R. Squibb & Sons, Inc.: *See—*
Miyadera, Tetsuo; Breuer, Hermann; and Treuner, Uwe D., 4,005,081.

Eason, Donald, to Lawrence Peska Associates, Inc., a part interest. Surface washing tool. 4,004,312, Cl. 15-29.000.

Eastman Kodak Company: *See—*
Orvis, Roy L., 4,004,929.
Reynolds, George A., 4,005,092.
Smola, Frank M.; and Breton, Henri E., 4,004,548.

Ebara Manufacturing Co., Ltd.: *See—*
Machi, Sueo; Kawamura, Keita; Aoki, Shingi; Kawakami, Waichiro; and Hashimoto, Shoji, 4,004,995.

Ebauches S.A.: *See—*
Schneiter, Ali, 4,004,411.

Economics Laboratory, Inc.: *See—*
Mizuno, William G.; and Henderson, Iris N., 4,004,685.

Edamatsu, Tetsuo: *See—*
Sogabe, Yoji; Edamatsu, Tetsuo; and Oka, Takashi, 4,004,828.

Eddlemon, Cecil A.; Harris, Robert J.; and Hanson, George E., to H. C. Price Co. Method and apparatus for preparing and packaging mastic coating material. 4,004,619, Cl. 141-11.000.

Edgar, William D.; Sustarsic, John D.; and Adamsky, Allan F., to Koppers Company, Inc. System for quenching hot coke. 4,004,985, Cl. 202-230.000.

Eds Inc.: *See—*
Sjogren, Christer A., 4,004,694.

Edwards, Bryant, to Illinois Tool Works Inc. Tapered plastic preform for telescopic application. 4,005,245, Cl. 428-542.000.

Edwards, John A.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,005,202

Edwards, Thomas William: *See—*
Tshudy, Donald Richard; and Edwards, Thomas William, 4,004,954.

Eichenhofer, Kurt-Wilhelm; Schliebs, Reinhard, Brandl, Hermann; and Kohnen, Heinrich, to Bayer Aktiengesellschaft. Working up synthesis solutions obtained in production of hydrazine. 4,005,179, Cl. 423-407.000.

Eichhardt, Steven A.: *See—*
Lundquist, David E.; Hoffman, Paul R.; Su, Chauchang; Sung, Benjamin T.; and Eichhardt, Steven A., 4,005,435.

Eichweber, Kurt. Missile fire-control system and method. 4,004,487, Cl. 89-1.815.

Eide, Richard; and Golembeck, Gerald A., to United States Bedding Company, The. Compression tester 4,004,457, Cl. 73-94.000.

Elco Corporation: *See—*
Sochor, Jerzy R., 4,004,845.

Electromechanics Research: *See—*
Fujita, Tadashi, 4,005,484.

Electroprint, Inc.: *See—*
Watanabe, Akinori; and Ando, Takao, 4,004,513.

Eli Lilly and Company *See—*
Kukolja, Stjepan P; and Lammert, Steven R., 4,005,074.

Elion, Gertrude B.: *See—*
Stickney, Dwight R.; Simmons, William S.; Nichol, Charles A.; Hitchings, George H.; and Elion, Gertrude B, 4,005,203.
Stickney, Dwight R; Simmons, William S.; Nichol, Charles A, Hitchings, George H; and Elion, Gertrude B., 4,005,204.

Elk Manufacturing Company, Inc *See—*
Jones, Lloyd K; and Yanov, David A., 4,004,775.

Elkem-Spigerverket *See—*
Krogsrud, Harald, 4,005,252.

Ellin, Seymour, to Polaroid Corporation. Flash photographic system with camera inhibit feature. 4,005,449, Cl. 354-128.000.

Ellingson, Jerome B. Panels and the method of same for house construction. 4,004,387, Cl. 52-309.300.

Ellington, Thomas S., IV, to Western Electric Company, Inc. Bonding of leads 4,004,726, Cl 228-173.000.

Elliott, Charles John: *See—*
Kugler, Jindrich; Dvorak, Alf-ed; and Elliott, Charles John, 4,005,352.

Ellwood, Henry; and Rothwell, Maurice, to USM Corporation. Mixing and venting extruder. 4,004,787, Cl. 259-192.000.

Eltra Corporation: *See—*
Brayley, Elwin J., Brownlee, Allen L., and Garen, John C., 4,005,294.

Ely, Sherman S. Distal retraction clamp for rubber dam. 4,004,345, Cl. 32-36.000.

Emery, Alden H.; Lim, Henry C.; and Kolarik, Michael J., to Purdue Research Foundation. Enzyme entrappment with cellulose acetate formulations. 4,004,980, Cl. 195-68.000.

Emhart Industries, Inc.: *See—*
Rowe, George E., deceased, 4,004,906.

Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,005,205.

Empey, Robert M., to Allis-Chalmers Corporation. Hopper gate for self-unloading ships. 4,004,700, Cl. 214-15.00D.

Emtrol Corporation: *See—*
Kalen, Bodo, 4,004,898.

Endo, Tomio: *See—*
Utsumi, Isamu; Endo, Tomio; Kamata, Tadaaki; and Ando, Masayasu, 4,005,200.

Engdahl, Jean, to Societe Suisse pour l'Industrie Horologere Management Services S.A. Data entry and decoding system for scripted data. 4,005,400, Cl. 340-365.00R.

Engeler, William E., to General Electric Company. Conductivity coupled split capacitor signal processing device and apparatus therefor 4,005,377, Cl. 333-70.00T.

Engelhard Minerals & Chemicals Corporation: *See—*
Maxey, Van O., 4,004,378.
Maxey, Van O., 4,004,568.

Engelhardt, Roland: *See—*
Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,005,002.

English, Thomas Anthony. Femoral prosthesis. 4,004,300, Cl. 3-1.913.

Enthone, Incorporated: *See—*
Brindisi, Frank A., Jr., 4,004,956.

Environment/One Corporation: *See—*
Aker, Walter W.; and Naydan, Theodore T., 4,004,737.

Erdman, David M., to General Electric Company. Electronically commutated motor and method of making same. 4,005,347, Cl. 318-254.000.

Ernie Ball, Inc.: *See—*
Hiscott, Rolly R., 4,004,485.

Eschbach, Robert C.; and Colligan, John B., to Aztec Manufacturing Company. Extrusions for partitions, walls and enclosures. 4,004,373, Cl. 49-413.000.

Eschen, Robert M., Jr. Moveable barrier apparatus for roadway. 4,004,857, Cl. 404-6.000.

Escher Wyss G.m.b.H.: *See—*
Braun, Heinz; Dahl, Hans; Hefter, Jost; and Stotz, Wolf-Gunter, 4,004,968.

Esco Corporation: *See—*
Larson, Dean W., 4,004,445.

Estee Lauder, Inc.: *See—*
Gubernick, Joseph, 4,005,210.

Esterline Electronics Corporation. *See—*
Brown, Jack M., 4,005,298.
McDonald, Thomas Wayne, 4,005,420.

Esteve-Subirana, Antonio, to Laboratorios del Dr. Esteve, S.A. Hemostatic compositions comprising salts of substituted hydroquinone sulfonic acid. 4,005,220, Cl. 424-315.000.

Etablissements Rene Leduc & Fils: *See—*
Porel, Louis-Claude, 4,004,863.

Etat Francais: *See—*
Mechulam, Andre, Saintours-Payerne, Bruno M.; Gay-Chatain, Guillaume A.; and Montjallard, Paul R., 4,004,494.

Etat Francais represente par le Delegue Ministeriel pour l'Armement *See—*
Dubost, Gerard; and Havot, Henri Albert, 4,005,430.

Eue, Ludwig. *See—*
Hack, Helmuth; Munz, Ferdinand, Eue, Ludwig; and Schafer, Werner, 4,004,913.

Eustace, Terence Leslie: *See—*
Millward, Thomas Hughes; Eustace, Terence Leslie, and Thompson, Barrie Arthur, 4,004,472

Evans, Ralph K.; and Florian, Roy S., to Nickson Industries, Inc. Universal joint hanger for tailpipes and the like. 4,004,768, Cl 248-59.000.

Evers, Robert C, to United States of America, Air Force. Fluorocarbon ether bis(o-aminophenol) compounds 4,005,142, Cl 260-571.000.

Expert Industrial Controls Limited: *See—*
Marsden, John Thomas, 4,004,343.

F. L. Smidth & Co.: *See—*
Sylvest, Karl Jens, 4,004,876.

F. L. Smithe Machine Company, Inc. *See—*
Morgan, Gaylard M., 4,004,478.

Fabre, Alain: *See—*
Biola, Georges; Fabre, Alain; and Schneider, Gerard, 4,005,114.

Fabry, Gyorgy; Takacs, Istvan, and Kiszely, Gyorgy, to Richter Gedeon Vegyeszeti Gyar Rt. Material transmitting element for contacting streaming media of different phases or the same phase. 4,004,609, Cl. 137-512.150.

Facit Aktiebolag: *See—*
Amberntsson, Jan Roger; Andersson, Rober Ingemar; and Sultan, Stig Bertil, 4,005,440.

Faldi, Giovanni. Two stroke dredging plant. 4,004,357, Cl. 37-58.000.

Farmer, Ernest Leonard; and Findlay, Peter Michael, to Wildt Mellor Bromley Limited of Adelaide Works Pattern mechanism. 4,004,439, Cl. 66-154.00A.

Farmila Farmaceutici Milano S.p.A *See—*
De Ruggieri, Pietro, and Sighinolfi, Orazio, 4,005,079

Farrington, Gregory C; and Roth, Walter L., to General Electric Company Sealed lithium-chlorine cell 4,004,946, Cl. 429-72.000.

Faulhaber, Mark Edwin; and Smith, Edmund Haislett, Jr., to Du Pont de Nemours, E. I., and Company. Defect identification with normalizing of gain function in optical-electrical inspection. 4,005,281, Cl 235-151.300.

Faulkner, Hubert D., to Recognition Equipment Incorporated. Compact illumination system with light absorbing and reflecting walls 4,005,286, Cl. 250-216.000.

Faulstich, Albert J.; Johnson, James B.; and Winkler, Gerhard B., to United States of America, Navy. Marker buoy recovery aid 4,004,310, Cl. 9-9.000.

Fekl, Werner: *See—*
Mader, Helmut; Fekl, Werner; and Schultis, Klaus, 4,005,190

Feldman, Alexandr Yakovlevich, deceased: *See—*
Andronov, Mikhail Alexandrovich; Bakun, Anatoly Nikolaevich, Mezhevich, Felix Evgenievich; Petrov, Mikhail Ivanovich; Belov, Jury Ivanovich; Feldman, Alexandr Yakovlevich, deceased; and Feldman, Raisa Alexandrovna, administratrix, 4,004,616.

Feldman, Raisa Alexandrovna, administratrix: *See—*
Andronov, Mikhail Alexandrovich; Bakun, Anatoly Nikolaevich, Mezhevich, Felix Evgenievich; Petrov, Mikhail Ivanovich; Belov, Jury Ivanovich; Feldman, Alexandr Yakovlevich, deceased; and Feldman, Raisa Alexandrovna, administratris, 4,004,616.

Ferdelman, Donald Clarence. *See—*
Kong, Carlito Maristela; Wark, Emerson Lee; and Ferdelman, Donald Clarence, 4,004,432.

Fergusson, Robert Thomas, to Index, Incorporated. Electronic system for article identification. 4,004,904, Cl. 65-158.000.

Fernschild, Gunter; Rudolph, Werner; and Massonne, Joachim, to Kali-Chemie Aktiengesellschaft. Process for the recovery of antimony pentachloride from used catalyst solutions. 4,005,176, Cl. 423-87.000.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,004,772.

Fetter, Richard W., to United States of America, Navy. Simulator for doppler radar returns from precipitation. 4,005,424, Cl. 343-17.700.

Feuer, Mervyn L., to Robertshaw Controls Company. Multiple mode input analog controller having standby power supply and absence-of-input sensing. 4,005,409, Cl. 340-347.00C.

Ficalora, Peter J.; and Liu, Geoffrey Hao-Wen. Methods of increasing catalytic activity. 4,005,186, Cl. 423-659.000.

Fidi, Werner: *See—*
Gorike, Rudolf; Pless, Ernst; Fidi, Werner; and Fritz, Alexander, 4,005,267.

- Fields, Ellis K., to Standard Oil Company (Indiana). Silver catalysts. 4,005,049, Cl. 252-467.000.
- Fields, Ellis K.: *See*—
  - Cerefice, Steven A.; and Fields, Ellis K., 4,005,122.
- Fijisawa, Seiji; Meki, Norio; and Irie, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Brightness and contrast control for television receiver. 4,005,262, Cl. 358-168.000.
- Filipovich, Danny, to Bell & Howell Company. Dual beam rangefinder. 4,005,447, Cl. 354-166.000.
- Findlay, Peter Michael: *See*—
  - Farmer, Ernest Leonard; and Findlay, Peter Michael, 4,004,439.
- Findley, Gerald I., to International Business Machines Corporation. Merger and multiple translate tables in a buffered printer. 4,005,390, Cl. 340-172.500.
- Firestone Tire & Rubber Company, The: *See*—
  - Lawson, David Francis; and Kang, Jung Wong, 4,005,248.
- Firmenich & Cie: *See*—
  - Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,005,227.
- Fischer, Earl Lee; and Gould, Jay W., III, to Minnesota Mining and Manufacturing Company. Clip for supplying implant projectiles. 4,004,565, Cl. 124-45.000.
- Fischer, Earl Lee, to Minnesota Mining and Manufacturing Company. Clip and indexing mechanism for a gas-operated gun. 4,004,566, Cl. 124-59.000.
- Fischer, Hans Peter: *See*—
  - Foery, Werner; and Fischer, Hans Peter, 4,004,908.
  - Foery, Werner; and Fischer, Hans Peter, 4,004,909.
  - Foery, Werner; and Fischer, Hans Peter, 4,004,910.
- Fischer, Roman; Goetz, Norbert; and Mueller, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of α,β-unsaturated ketones. 4,005,147, Cl. 260-593.00R.
- Fisher Controls Company, Inc.: *See*—
  - Bachelder, Patrick Eugene; and Sumner, William David, 4,004,601.
- Fisk, Harold E. Trailer hitch adapter. 4,004,822, Cl. 280-415.00A.
- Flament, Ivon: *See*—
  - Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,005,227.
- Fleck, Wolfgang: *See*—
  - Petersen, Rudolf Theodor; and Fleck, Wolfgang, 4,005,096.
- Fleissner, Hans, to Vepa AG. Process for the treatment, particularly dyeing and printing of goods. 4,005,230, Cl. 427-354.000.
- Flesburg, Edward E., to Caterpillar Tractor Co. Winch and fluid control system therefor. 4,004,779, Cl. 254-187.400.
- Flibotte, George A.: *See*—
  - Hoffman, Louis S.; Patel, Navinchandra J.; and Flibotte, George A., 4,004,397.
- Floral Innovations, Inc.: *See*—
  - O'Connell, Donald L., 4,004,367.
- Florian, Roy S.: *See*—
  - Evans, Ralph K.; and Florian, Roy S., 4,004,768.
- Fluid Kinetics, Inc.: *See*—
  - Puthoff, Carl Fredrick; and Gardner, James John, 4,004,463.
- FMC Corporation: *See*—
  - Joseph, Craig L.; Caterina, Fred J.; and Cremer, Hans H., 4,004,648.
- Focus/Board Inc.: *See*—
  - Kundert, Robert L., 4,004,799.
- Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. β-Halogenoethyl-silanes as stimulators for latex flow. 4,004,908, Cl. 71-79.000.
- Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. Beta-halogenoethyl-silanes as fruit abscission, ripening and thinning agents. 4,004,909, Cl. 71-79.000.
- Foery, Werner; and Fischer, Hans Peter, to Ciba-Geigy Corporation. Beta-halogenoethyl-silanes as fruit ripening agents. 4,004,910, Cl. 71-79.000.
- Folgero, Kare; and Norberg, Lars-Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Metallurgical furnace having fluid injection means for a melt in the furnace. 4,004,792, Cl. 266-218.000.
- Foner, Simon. Magnetometer with out-of-phase correction. 4,005,358, Cl. 324-34.00R.
- Foodways National, Inc.: *See*—
  - Borrello, Denis, 4,004,399.
- Ford Motor Company: *See*—
  - Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, Kwansuh, 4,004,452.
  - Rado, William G.; and Turner, Allen H., 4,004,562.
- Formica Corporation: *See*—
  - Davis, Walter Thomas; and Kelly, Peter Bernard, 4,005,239.
- Forst, Donald Laverne; and Schrengauer, Edwin Benedict, to Babcock & Wilcox Company, The. Load cell arrangement. 4,004,647, Cl. 177-128.000.
- Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-A-Mousson S.A. Centrifugal casting machine casing and cooling apparatus. 4,004,632, Cl. 164-297.000.
- Fortino, Samuel S. Electrical circuit continuity tester. 4,005,362, Cl. 324-51.000.
- Foseco International Limited: *See*—
  - Ravault, Frank Ernest George, 4,004,933.
- Fosler, Dick E., Jr.; and Krocheski, Thomas L., to Sperry Rand Corporation. Compatible standby power driver for a dynamic semiconductor. 4,005,395, Cl. 340-173.0DR.
- Foster, Larry W., to Span-Deck, Inc. Apparatus for production of cast concrete members. 4,004,874, Cl. 425-438.000.
- Foster, T. Kenneth: *See*—
  - Dykes, Dewey B.; Powers, E. Michael; Foster, T. Kenneth; and Rogers, Robert E., 4,005,226.
- Fowler, John T.; and Key, William H., to Laitram Corporation, The. High pressure compass housing. 4,004,348, Cl. 33-364.000.
- Fox, Homer M.: *See*—
  - Hill, George R.; and Fox, Homer M., 4,005,181.
- Franch State, The: *See*—
  - Melchior, Jean; and Andre, Thierry, 4,004,414.
- Franzer, Wolfgang; and Adamus, Hans. Flue gas collector for regeneratively-heated coke ovens. 4,004,986, Cl. 202-254.000.
- Frechet, Daniel: *See*—
  - Gaignault, Jean-Cyr; Vacher, Jean; and Frechet, Daniel, 4,005,206.
- Freck, David Vernon; and Hall, John Anthony, to Central Electricity Generating Board. Gas cooled nuclear reactors. 4,004,971, Cl. 176-37.000.
- Fredericks, George: *See*—
  - List, Helmut; and Fredericks, George, 4,004,331.
- Freed, Paul S., to Sinai Hospital of Detroit. Magnetically aligned releasable connector. 4,004,298, Cl. 3-1.000.
- Freerksen, Enno, to Saarstickstoff-Fatol GmbH. Synergistic therapeutic composition for the treatment of mycobacterioses. 4,005,207, Cl. 424-263.000.
- Freese, Lennart Werner. Conduit arrangement with protection against rupture and leakage. 4,004,607, Cl. 137-486.000.
- Freimark, Max G. Birth control device. 4,004,591, Cl. 128-294.000.
- Frey, Wolfgang: *See*—
  - Dickopp, Gerhard; Oertel, Lothar; and Frey, Wolfgang, 4,005,476.
- Fried, John H.: *See*—
  - Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,005,202.
- Friedell, Morley V., to Martin Marietta Corporation. Swinging spherical gate valve and double seal quick disconnect coupling. 4,004,611, Cl. 137-614.000.
- Friedman, Harvey S., to Polaroid Corporation. Photographic film processing apparatus. 4,005,446, Cl. 354-86.000.
- Friedrichsfeld GmbH: *See*—
  - Heimke, Gunther; Griss, Peter; Von Andrian Werburg, Hanns; and Wachter, Paul, 4,004,581.
- Frieling, Donald H.; Talbert, Sherwood G.; and Nathan, Richard A., to Battelle Development Corporation. Process and apparatus for solar energy collection and retrieval. 4,004,573, Cl. 126-271.000.
- Fritz, Alexander: *See*—
  - Gorike, Rudolf; Pless, Ernst; Fidi, Werner; and Fritz, Alexander, 4,005,267.
- Frohnwieser, Bernhard: *See*—
  - Heilmann, Wolfgang; Groetzner, Kurt; and Frohnwieser, Bernhard, 4,005,380.
- Froloff, Helmut; and Tovar, Theodor, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Semiconductor device having a solderable contacting coating on its opposite surfaces. 4,005,454, Cl. 357-65.000.
- Fruehan, Richard J., to United States Steel Corporation. Method of producing low nitrogen steel. 4,004,920, Cl. 75-60.000.
- Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Herbicidal carbamates and thiolcarbamates. 4,004,915, Cl. 71-106.000.
- Fuji Photo Film Co., Ltd.: *See*—
  - Yamamoto, Nobuo; Hori, Kiyotaka; Yoneyama, Masakazu; Nakayama, Yasuhiro; and Abe, Akira, 4,004,927.
- Fuji Photo Optical Co., Ltd.: *See*—
  - Ando, Kunio, 4,005,445.
  - Mizukawa, Shigeo, 4,005,460.
- Fujio, Masaaki. Capsule or seal carrying a certificate stamp or the like therein. 4,004,705, Cl. 215-246.000.
- Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Digital display electronic timepiece. 4,004,407, Cl. 58-23.00R.
- Fujita, Tadashi, to Electromechanics Research. Automatic stopper for multitrack recorder. 4,005,484, Cl. 360-74.000.
- Fujiwara, Hideo; Ichinose, Yukio; Ichino, Kazuo; Orita, Isamu; Uesaka, Yasutaro; Itoh, Michiyasu; and Thuruoka, Hisashi, to Hitachi, Ltd. Digital displacement sensor with zigzag coils. 4,005,396, Cl. 340-196.000.
- Fukasawa, Noburu: *See*—
  - Inoue, Naohiko; Yanagishima, Takayuki; Nakamura, Hiromichi; and Fukasawa, Noburu, 4,005,398.
- Fukazawa, Nobuo: *See*—
  - Aya, Masahiro; Miyamoto, Masao; Fukazawa, Nobuo; and Yamagishi, Masaaki, 4,005,071.
- Fukunaga, Tadamichi, to Du Pont de Nemours, E. I., and Company. Substituted trimethylene cyclopropanes, salts thereof, intermediates and methods of making the same. 4,005,091, Cl. 260-286.00R.
- Fukuoka, Hiroshi; Kameyama, Teruhiko; Takahashi, Yuji; Nicho, Kenji; Misawa, Tatsuo; Inoue, Tsuneyuki; and Imai, Kimiaki, to Nissin Steel Co. Ltd.; and Japan Metals & Chemicals Co. Ltd. Method of treating waste produced during stainless steel making. 4,004,918, Cl. 75-11.000.
- Fukuroi, Takeo; and Hayashi, Moriyoshi, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener. 4,004,327, Cl. 24-205.13R.
- Fukuzawa, Sogo: *See*—
  - Muro, Tomio; Chihara, Yasuaki; Fukuzawa, Sogo; Ogawa, Kiyoshi; and Nakanishi, Akira, 4,005,084.
- Fulton Industries, Inc.: *See*—
  - Hockensmith, John L.; and Grove, John L., 4,004,695.
- Furlenmeier, Andre; and Quitt, Peter, to Hoffmann-La Roche Inc. Water-soluble amoxicillin salts. 4,005,214, Cl. 424-271.000.

- Furniss, Harry; and Grindrod, Jack, to Unit Wad Limited. Shot shell wadding. 4,004,522, Cl. 102-95.000
- Fusey, Pierre. Preparation of composition for converting hydrocarbons and fats into biodegradable aqueous emulsions. 4,005,043, Cl. 252-356.000.
- Futatsugi, Setsuo: *See*—
  - Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,004,756.
- G. D. Searle & Co.: *See*—
  - Meyer, Rolf; Martin, Manuel I.; and Bolton, Ronald A., 4,004,883.
  - Oesterlin, Donald L.; and Obrycki, Raymond F., 4,005,292.
- G.L.P. Company: *See*—
  - O'Donnell, John Francis, 4,004,545.
- Gaehde, Joachim; Gesierich, Adolf; and Loeschcke, Ingrid, to Akademie der Wissenschaften der DDR. Metallized articles and method of producing the same. 4,005,238, Cl. 428-313.000.
- Gahwiler, Hermann; and Schlaepfer, Hansjorg, to Contraves AG Direct indicator device for determining the cardiac output flow rate according to the thermodilution method. 4,004,576, Cl. 128-2.05F.
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  - Raby, Joseph M., 4,004,434.
- Gardner, James John: *See*—
  - Puthoff, Carl Fredrick; and Gardner, James John, 4,004,463.
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  - Cook, Newell C.; and Davis, Gary C., 4,005,102.
  - Dada, Abdul Gaffar, 4,005,042.
  - Dix, Joseph; Campbell, Norman; and Tonseth, Ivar Scott, Jr., 4,004,490.
  - Engeler, William E., 4,005,377.
  - Erdman, David M., 4,005,347.
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  - Ligon, Woodfin V., Jr., 4,004,881.
  - MacKenzie, Burton Thornley, Jr., 4,005,254.
  - Markezich, Ronald L., 4,005,134.
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  - Raleigh, William J., 4,005,044.
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  - Dolenga, Arthur; and Hill, John C., 4,005,324.
  - Dost, Richard W.; Hudson, James L.; and Jordan, Larry L., 4,004,955.
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  - Jacoby, Gerald B.; and Mathues, Thomas P., 4,004,423.
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  - Nagy, Louis L., 4,005,425.
  - Podolan, Edward G.; and Surhigh, Lawrence A., 4,004,371.
  - Scheibe, Elias W., 4,004,558
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- Graham, Curtis Michael, to Ashland Oil, Inc. Pressure sensitive adhesive compositions. 4,005,247, Cl. 526-15.000.
- Graham, Jerry P., to Sound Technology, Inc. Secure remote control communication systems. 4,005,428, Cl. 343-228.000.
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- Green, William J., to Watters, James P. Studded sole and heel plates for shoes. 4,004,356, Cl. 36-134.000.
- Greenberger, Joseph Irwin, to Wean United, Inc. Combination strip contacting device for use in a rolling mill. 4,004,459, Cl. 73-144.000.
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- Greenley, Henry R. Method of making a structural member. 4,004,334, Cl. 29-155.00R.
- Greiner, Richard William, to Hercules Incorporated. Low molecular weight copolymers. 4,005,250, Cl. 526-204.000.
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- Gubernick, Joseph, to Estee Lauder, Inc. Protein containing emollient composition for a skin moisturizer. 4,005,210, Cl. 424-359.000.
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- Hardy, Peter D., to Metal Box Limited. Conveyor systems. 4,004,678, Cl. 198-460.000.
- Harland, Philip W., to Ametek, Inc. Illuminated indicator gauge. 4,004,546, Cl. 116-129.00L.
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  - Chatigny, Raymond E., 4,004,364.
- Harrington, Timothy M., to MDH Industries, Inc. Digital circuit for measuring relative frequency in separate pulse trains. 4,005,364, Cl. 324-79.00D.
- Harris, Howard R., to Cabot Corporation. Preparation of pelletized carbon blacks. 4,005,170, Cl. 264-117.000.
- Harris, James M.; and Gouin, William M., to National Semiconductor Corporation. Method for gold plating of metallic layers on semiconductive devices. 4,005,472, Cl. 357-71.000.
- Harris, Robert J.: *See*—
  - Eddlemon, Cecil A.; Harris, Robert J.; and Hanson, George E., 4,004,619.
- Harrison, George H. Crab meat expressing machine and method. 4,004,321, Cl. 17-48.000.
- Hart, Alan H.: *See*—
  - Gold, Gary K.; and Hart, Alan H., 4,004,344.
- Hartel, Hagen, to Kind, Dieter. Apparatus for the current limiting interruption of currents at high voltages. 4,005,340, Cl. 317-11.00A.
- Hartman, William L., to Procter & Gamble Company, The. Scouring compositions. 4,005,027, Cl. 252-95.000.
- Hartmann, Hans-Joerg: *See*—
  - Kopke, Helmut, Hartmann, Hans-Joerg, Mayer, Dieter, and Motz, Herbert, 4,005,242.
- Hashimoto, Shoji: *See*—
  - Machi, Sueo; Kawamura, Keita, Aoki, Shingi; Kawakami, Waichiro, and Hashimoto, Shoji, 4,004,995.
- Hass, Ray C. Grave frame. 4,004,653, Cl. 182-128.000.
- Hauni-Werke Korber & Co., KG: *See*—
  - Bardenhagen, Dietrich, and Schubert, Bernhard, 4,004,395.
  - Kaeding, Heinz, and Nicolas, Alexandros, 4,004,593.
  - Wochnowski, Waldemar, Thiele, Willi; Hohm, Reinhard, and Schmidt, Herbert, 4,004,594.
- Havot, Henri Albert: *See*—
  - Dubost, Gerard, and Havot, Henri Albert, 4,005,430.
- Hawker Siddeley Aviation Limited: *See*—
  - Hooper, Ralph Spenser, 4,004,755.
- Hawkes, Charles Vivian, to Research Association for the Paper and Board Printing and Packaging Industries, The. Method for producing bookcovers. 4,005,165, Cl. 264-135.000.
- Hawkins, William E., to Du Pont de Nemours, E. I., and Company. Method of and apparatus for shredding a web of plastic film. 4,004,738, Cl. 241-29.000.
- Hayashi, Moriyoshi: *See*—
  - Fukuroi, Takeo; and Hayashi, Moriyoshi, 4,004,327.
- Haynes, Homer A.: *See*—
  - Scheier, Donald J., and Haynes, Homer A., 4,004,320.
- Hayssen Manufacturing Co.: *See*—
  - Procter, Brian, 4,005,164.
- Health Technology Laboratories, Inc.: *See*—
  - Muriot, Edward E., 4,004,590.
- Heaney, James J., to Anthony's Manufacturing Company, Inc. Insulated door mounting frame structure. 4,004,370, Cl. 49-70.000.
- Heath, James C.; Werner, Raymond E., Delaney, John W., and Crounse, Nathan N., to Sterling Drug Inc. Detergent compositions containing novel crystalline forms of optical brighteners. 4,005,026, Cl. 252-89.00B.
- Heckert, David C.; and Watt, David M., Jr., to Procter & Gamble Company, The. Organosilane-containing detergent composition. 4,005,028, Cl. 252-99.000.
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- Heckert, David C., and Watt, David M., Jr., to Procter & Gamble Company, The. Organosilane compounds. 4,005,117, Cl. 260-448.80R.
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- Heckert, David C., and Watt, David M., Jr., to Procter and Gamble Company, The. Organosilane compounds. 4,005,119, Cl. 260-448.80R.
- Heckert, David C.: *See*—
  - Rodriguez, Pedro A.; Heckert, David C.; and Watt, David M., Jr., 4,005,024.
- Heffner, George R.: *See*—
  - Shepard, Robert W.; and Heffner, George R., 4,004,392.
- Heffron, John J., executor: *See*—
  - Zehner, Lee R.; Sauer, Richard W., deceased; and Heffron, John J., executor, 4,005,128.
- Hefter, Jost: *See*—
  - Braun, Heinz; Dahl, Hans; Hefter, Jost, and Stotz, Wolf-Gunter, 4,004,968.
- Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
  - Jeschke, Willi, 4,004,512.
- Heier, Robert J.; and Pettibone, Wayne E., to Owens-Illinois, Inc. Line combining apparatus. 4,004,677, Cl. 198-452.000.
- Heilmann, Wolfgang; Groetzner, Kurt; and Frohnwieser, Bernhard, to Robert Bosch G.m.b.H. Clip-on inductive pulse pick-up. 4,005,380, Cl. 336-84.000.
- Heimke, Gunther; Griss, Peter; Von Andrian Werburg, Hanns; and Wachter, Paul, to Friedrichsfeld GmbH. Tool for forming a bed in a hip bone to receive an artificial acetabulum. 4,004,581, Cl. 128-92.00E.
- Heinemann, Otto; Schmits, Heinz-Herbert; and Baldus, Heinz Dieter, to Polysius AG. Roller crushing mill. 4,004,740, Cl. 241-52.000.
- Hektner, Thomas R.: *See*—
  - Christensen, John G.; Hektner, Thomas R., and Olson, Steven L., 4,004,586.
- Helding, Norman A., to Sun Chemical Corporation. Rotatable ultraviolet lamp reflector and heat sink. 4,005,135, Cl. 250-527.000.
- Helena Laboratories Corporation: *See*—
  - Golias, Tipton L.; and Butts, Gene A., 4,005,434.
- Hellerbach, Joseph; and Szente, Andre, to Hoffmann-La Roche Inc. Benzophenone derivatives. 4,005,085, Cl. 260-247.20B.
- Henderson, C. Glenn: *See*—
  - McKee, Chester W.; and Henderson, C. Glenn, 4,004,455.
- Henderson, Iris N.: *See*—
  - Mizuno, William G.; and Henderson, Iris N., 4,004,685.
- Henderson, Michael L. Apparatus and method for automatically propelling game balls for practice. 4,004,567, Cl. 124-61.000.

Hendrickson, Vergil P., to Caterpillar Tractor Co. Motor grader drawbar assembly with safety clutch mechanism. 4,004,641, Cl. 172-781.000.

Henig, Seymour: *See*—
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Henika, Richard G.: *See*—
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Henkel & Cie G.m.b.H.: *See*—
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Henrie, Darwin E. Game apparatus. 4,004,810, Cl. 273-134.0GM.

Henry, Woodrow, II. Equine training aid balancer. 4,004,403, Cl. 54-71.000.

Hensel, Roy E., to American Hoechst Corporation. Method of using a test film to measure developer activity. 4,004,923, Cl. 96-27.00R.

Hercules Incorporated: *See*—
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Herdman, Craig T.: *See*—
Duncan, Damon H.; Herdman, Craig T.; and Littlejohn, Terrance V., 4,005,490.

Hermann, Franz, to Klepper-Werke. Collapsible boat frame. 4,004,307, Cl. 9-2.00C.

Herring, William M.; and Walling, Dennis B., to Standard Oil Company. Computer control system. 4,005,387, Cl. 340-172.500.

Hess, Charles W., to Speco, Inc. Rotary meat grinder with bone-collecting facilities. 4,004,742, Cl. 241-82.500.

Hesse, Sarah; and Shapiro, Justin J. Graphics instrument. 4,004,347, Cl. 33-120.000.

Hewlett-Packard Company: *See*—
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Hexcel Corporation: *See*—
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Higgins, Francis J.; McGraw, Charles T.; and Sanderson, Edward L., to United States of America, Navy. Galvanic detector for detecting the cutting of a command wire. 4,004,540, Cl. 114-244.000.

Hilaire, Fernand, to Captocap Limited. Tamper-proof closure with safety means. 4,004,704, Cl. 215-220.000.

Hildreth, Thomas L., to Johnson Corporation, The. Control for cooling unit. 4,004,431, Cl. 62-228.000.

Hill, Billy R., to Cerco Tires Inc. Battery powered fluid transfer apparatus. 4,004,862, Cl. 417-234.000.

Hill, George R.; and Fox, Homer M., to Phillips Petroleum Company. Method to make carbon black utilizing polymers. 4,005,181, Cl. 423-449.000.

Hill, John; and Turczanki, Henry, to Comtelco (U.K.) Limited. Apparatus for reed switch manufacture. 4,004,337, Cl. 29-756.000.

Hill, John C.: *See*—
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Hill, Michael; Intrater, Josef; and Yasar, Tugrul, to Semimetals, Inc. Semiconductor assembly, method of manufacturing same, and bonding agent therefor. 4,005,457, Cl. 357-72.000.

Hille, Earl A.: *See*—
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Hilleman, Maurice R.: *See*—
Hurni, William M.; McAleer, William J.; and Hilleman, Maurice R., 4,004,981.

Himmler, Gunther, to Gebr. Hofmann KG Maschinenfabrik. Method and transducer and apparatus for selectively measuring oscillation components from an oscillation spectrum. 4,004,464, Cl. 73-462.000.

Hinojosa, Carlos R., to Besenbruch-Hofmann, Inc. Reversible socket wrench. 4,004,666, Cl. 192-44.000.

Hinrichs, Karl, to Dressen-Barnes Electronics Corporation. Switching circuitry. 4,005,317, Cl. 307-253.000.

Hinton, Melvin F., to Reed Irrigation Systems. Differential controller valve and sequencer. 4,005,013, Cl. 210-106.000.

Hirano, Reiji; Hanakata, Takayoshi; and Ito, Matsutoshi, to Canon Kabushiki Kaisha. Printing control device. 4,004,672, Cl. 197-1.00R.

Hiscott, Rolly R., to Ernie Ball, Inc. Mechanism for adjusting tension of an elongated filament. 4,004,485, Cl. 84-207.000.

Hitachi, Ltd.: *See*—
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Stickney, Dwight R.; Simmons, William S.; Nichol, Charles A.; Hitchings, George H.; and Elion, Gertrude B., 4,005,204.

Hjortzberg, Bernhard A., to BASF Aktiengesellschaft. Method and apparatus for synchronizing record and playback of video signals. 4,005,473, Cl. 358-4.000.

Ho, Pang-Ting; and Rosen, Arye, to RCA Corporation. Frequency tunable microwave apparatus having a variable impedance hybrid idler circuit. 4,005,372, Cl. 330-34.000.

Hockensmith, John L.; and Grove, John L., to Fulton Industries, Inc. Channel and plate telescopic crane boom. 4,004,695, Cl. 212-144.000.

Hodogaya Chemical Co., Ltd.: *See*—
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Hoffman, Louis S.; Patel, Navinchandra J.; and Flibotte, George A., to Diamond Crystal Salt Company. Apparatus and process for making disposable packet assemblies. 4,004,397, Cl. 53-29.000.

Hoffman, Paul R.: *See*—
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Bretschneider, Hermann; Klotzer, Wilhelm; Bader, Gunther; and Lutz, August, 4,005,100.
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Hofgen, Gunter, to International Standard Electric Corporation. Facility for monitoring the carrier-frequency and sideband signals radiated by a DVOR ground station. 4,005,427, Cl. 343-106.00D.

Hohm, Reinhard: *See*—
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Holmes, William H. Waterjet propelled planing hull. 4,004,542, Cl. 115-14.000.

Holstein, Frederick W. Carpenter's tool. 4,004,624, Cl. 145-46.000.

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Hooper, Ralph Spenser, to Hawker Siddeley Aviation Limited. VTOL aircraft with combined air brake and deflector door. 4,004,755, Cl. 244-12.500.

Hoorelbeke, Luc, to N.V. Bekaert S.A. Winding apparatus. 4,004,744, Cl. 242-25.00R.

Hoover Ball and Bearing Company: *See*—
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Hopkins, Wayne J., to United States of America, Navy. Projectile power generator. 4,004,519, Cl. 102-70.20G.

Hori, Kiyotaka: *See*—
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Horner, Donald E.; Mailen, James C.; and Posey, Franz A., to United States of America, Energy Research and Development Administration. Electrolytic trapping of iodine from process gas streams. 4,004,993, Cl. 204-131.000.

Horowitz, Victor, to Current Industries, Inc. High intensity discharge lamp with auxiliary light. 4,005,331, Cl. 315-92.000.

Horstmann, Harald: *See*—
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Houck, Theodore B., to Parker Drilling Company, Inc. Drilling apparatus for drilling small diameter bore holes deep into the earth. 4,004,470, Cl. 74-661.000.

Houston, Alvin John, to Du Pont of Canada Limited. Coated panel 4,004,774, Cl. 249-114.000.

Hsia, Tsang-Chen. Direct electromagnetic reciprocating motor. 4,005,346, Cl. 318-128.000.

Hubachek, Louis H. Key ring and/or chain holder. 4,004,325, Cl. 24-3.00K.

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Hughes, Gordon Alan; and Smith, Herchel, to Smith, Herchel. Dithioketal derivatives of 13-polycarbonalkylgon-4-en-3-ones. 4,005,078, Cl. 260-239.500.

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Humbs, Rolf; and Weinke, Robert, to Siemens Aktiengesellschaft. Arrangement for scanning a disc-shaped type carrier. 4,005,264, Cl. 178-34.000.

Hummel, Frank, Jr.; and King, Edmond B. Remote control for large-area sprinkler systems. 4,004,612, Cl. 137-624.110.

Hund, Roland, to Dornier System GmbH. Vertically-flying aircraft. 4,004,759, Cl. 244-17.170.

Hunger, Klaus; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Disazo compounds from diphenylene sulfones and acetoacetylbenzimidazolones. 4,005,068, Cl. 260-157.000.

Hunnicutt, Roger; and Keel, Beat G., to Control Data Corporation Phase locked circuits. 4,005,479, Cl. 360-51.000.

Hunt, Stephen M.: *See*—
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Huta Kosciuszko, Frzedsiebiorstwo Panstwowe: *See*—
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Ichino, Kazuo: *See*—
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Ikeda, Yoshi; Osada, Kenji; and Doi, Kazumi, to Nikkiso Eiko Co., Ltd. Pump with yieldable radial partitions and rotatable side plates. 4,004,865, Cl. 418-45.000.

Ikrath, Kurt; Kennebeck, William; Shaffer, Edward C.; and Pingitore, Peter J., to United States of America, Army. Camouflaged VHF antenna. 4,005,429, Cl. 343-713.000.

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Inoue-Japan Research Inc.: *See*—
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Institute of Nuclear Energy Research: *See*—
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Isaac, Otto, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for recovering the main sapogenins from the roots of rhizomes of helleborus. 4,004,976, Cl. 195-2.000.

Iseli, Pierre: *See*—
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Ishikawa, Masakazu; Ota, Takaaki; Ishigami, Noriakira; and Kozakai, Asao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electrical switch for a braking fluid pressure fault alarm device. 4,005,401, Cl. 340-52.00C.

Ishizaka, Otaharu. Method for hydrogen generation. 4,005,185, Cl. 423-648.000.

- Hendrickson, Vergil P., to Caterpillar Tractor Co. Motor grader drawbar assembly with safety clutch mechanism. 4,004,641, Cl. 172-781.000.
- Henig, Seymour: *See—*
  - Clewett, Merle E.; and Henig, Seymour, 4,004,681.
- Henika, Richard G.: *See—*
  - Craig, Theodore W.; Lopez, Juan; and Henika, Richard G., 4,005,225.
- Henkel & Cie G.m.b.H.: *See—*
  - Reese, Gunter; and Osberghaus, Rainer, 4,005,189.
- Henrie, Darwin E. Game apparatus. 4,004,810, Cl. 273-134.0GM.
- Henry, Woodrow, II. Equine training aid balancer. 4,004,403, Cl. 54-71.000.
- Hensel, Roy E., to American Hoechst Corporation. Method of using a test film to measure developer activity. 4,004,923, Cl. 96-27.00R.
- Hercules Incorporated: *See—*
  - Greiner, Richard William, 4,005,250.
- Herdman, Craig T.: *See—*
  - Duncan, Damon H.; Herdman, Craig T.; and Littlejohn, Terrance V., 4,005,490.
- Hermann, Franz, to Klepper-Werke. Collapsible boat frame. 4,004,307, Cl. 9-2.00C.
- Herring, William M.; and Walling, Dennis B., to Standard Oil Company. Computer control system. 4,005,387, Cl. 340-172.500.
- Hess, Charles W., to Speco, Inc. Rotary meat grinder with bone-collecting facilities. 4,004,742, Cl. 241-82.500.
- Hesse, Sarah; and Shapiro, Justin J. Graphics instrument. 4,004,347, Cl. 33-120.000.
- Hewlett-Packard Company: *See—*
  - Salesky, Emery; and Luehman, Kent W., 4,005,373.
- Hexcel Corporation: *See—*
  - Nelson, Arthur L., 4,004,867.
- Hicks, Harry H., Jr.: *See—*
  - Willis, Hilda, 4,005,269.
- Higashida, Susumu: *See—*
  - Murayama, Keisuku; Moriyama, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 4,005,094.
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- Higelin, Jean-Claude: *See—*
  - Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,005,002.
- Higgins, Francis J.; McGraw, Charles T.; and Sanderson, Edward L., to United States of America, Navy. Galvanic detector for detecting the cutting of a command wire. 4,004,540, Cl. 114-244.000.
- Hilaire, Fernand, to Captocap Limited. Tamper-proof closure with safety means. 4,004,704, Cl. 215-220.000.
- Hildreth, Thomas L., to Johnson Corporation, The. Control for cooling unit. 4,004,431, Cl. 62-228.000.
- Hill, Billy R., to Cerco Tires Inc. Battery powered fluid transfer apparatus. 4,004,862, Cl. 417-234.000.
- Hill, George R.; and Fox, Homer M., to Phillips Petroleum Company. Method to make carbon black utilizing polymers. 4,005,181, Cl. 423-449.000.
- Hill, John; and Turczanki, Henry, to Comtelco (U.K.) Limited. Apparatus for reed switch manufacture. 4,004,337, Cl. 29-756.000.
- Hill, John C.: *See—*
  - Dolenga, Arthur; and Hill, John C., 4,005,324.
- Hill, Michael; Intrater, Josef; and Yasar, Tugrul, to Semimetals, Inc. Semiconductor assembly, method of manufacturing same, and bonding agent therefor. 4,005,457, Cl. 357-72.000.
- Hille, Earl A.: *See—*
  - Daman, Lloyd W.; Hille, Earl A.; and Shamp, Donald E., 4,004,903.
- Hilleman, Maurice R.: *See—*
  - Hurni, William M.; McAleer, William J.; and Hilleman, Maurice R., 4,004,981.
- Himmler, Gunther, to Gebr. Hofmann KG Maschinenfabrik. Method and transducer and apparatus for selectively measuring oscillation components from an oscillation spectrum. 4,004,464, Cl. 73-462.000.
- Hinojosa, Carlos R., to Besenbruch-Hofmann, Inc. Reversible socket wrench. 4,004,666, Cl. 192-44.000.
- Hinrichs, Karl, to Dressen-Barnes Electronics Corporation. Switching circuitry. 4,005,317, Cl. 307-253.000.
- Hinton, Melvin F., to Reed Irrigation Systems. Differential controller valve and sequencer. 4,005,013, Cl. 210-106.000.
- Hirano, Reiji; Hanakata, Takayoshi; and Ito, Matsutoshi, to Canon Kabushiki Kaisha. Printing control device. 4,004,672, Cl. 197-1.00R.
- Hiscott, Rolly R., to Ernie Ball, Inc. Mechanism for adjusting tension of an elongated filament. 4,004,485, Cl. 84-207.000.
- Hitachi, Ltd.: *See—*
  - Fujiwara, Hideo; Ichinose, Yukio; Ichino, Kazuo; Orita, Isamu; Uesaka, Yasutaro; Itoh, Michiyasu; and Thuruoka, Hisashi, 4,005,396.
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  - Kuwano, Takeshi, 4,005,483.
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  - Stickney, Dwight R.; Simmons, William S.; Nichol, Charles A.; Hitchings, George H.; and Elion, Gertrude B., 4,005,204.
- Hjortzberg, Bernhard A., to BASF Aktiengesellschaft. Method and apparatus for synchronizing record and playback of video signals. 4,005,473, Cl. 358-4.000.
- Ho, Pang-Ting; and Rosen, Arye, to RCA Corporation. Frequency tunable microwave apparatus having a variable impedance hybrid idler circuit. 4,005,372, Cl. 330-34.000.
- Hockensmith, John L.; and Grove, John L., to Fulton Industries, Inc. Channel and plate telescopic crane boom. 4,004,695, Cl. 212-144.000.
- Hodogaya Chemical Co., Ltd.: *See—*
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- Hoechst Aktiengesellschaft: *See—*
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- Hoffman, Louis S.; Patel, Navinchandra J.; and Flibotte, George A., to Diamond Crystal Salt Company. Apparatus and process for making disposable packet assemblies. 4,004,397, Cl. 53-29.000.
- Hoffman, Paul R.: *See—*
  - Lundquist, David E.; Hoffman, Paul R.; Su, Chauchang; Sung, Benjamin T.; and Eichhardt, Steven A., 4,005,435.
- Hoffmann-La Roche Inc.: *See—*
  - Bretschneider, Hermann; Klotzer, Wilhelm; Bader, Gunther; and Lutz, August, 4,005,100.
  - Chodnekar, Madhukar Subraya, 4,005,216.
  - Furlenmeier, Andre; and Quitt, Peter, 4,005,214.
  - Guthrie, Robert William; and Kierstead, Richard Wightman, 4,005,086.
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  - Kienzle, Frank; and Rosen, Perry, 4,005,110.
  - Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,005,002.
  - Reiner, Roland, 4,005,073.
  - Surmatis, Joseph Donald, 4,005,031.
  - Widmer, Erich, 4,005,145.
  - Zdrodowski, Joseph John, 4,004,884.
- Hofgen, Gunter, to International Standard Electric Corporation. Facility for monitoring the carrier-frequency and sideband signals radiated by a DVOR ground station. 4,005,427, Cl. 343-106.00D.
- Hohm, Reinhard: *See—*
  - Wochnowski, Waldemar; Thiele, Willi; Hohm, Reinhard; and Schmidt, Herbert, 4,004,594.
- Holken, Norbert: *See—*
  - Plevak, Lubomir; and Holken, Norbert, 4,004,771.
- Holmes, William H. Waterjet propelled planing hull. 4,004,542, Cl. 115-14.000.
- Holstein, Frederick W. Carpenter's tool. 4,004,624, Cl. 145-46.000.
- Holt, James L.: *See—*
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- Honeywell Inc.: *See—*
  - Robillard, Gene A., 4,005,288.
- Hongu, Masayuki; and Tada, Masahiro, to Sony Corporation. Bias circuit for differential amplifier. 4,005,371, Cl. 330-30.00D.
- Hood, Murray C., to Curoco. Stairway unit. 4,004,384, Cl. 52-188.000.
- Hooker Chemicals & Plastics Corporation: *See—*
  - Gelfand, Samuel, 4,005,153.
- Hooper, Ralph Spenser, to Hawker Siddeley Aviation Limited. VTOL aircraft with combined air brake and deflector door. 4,004,755, Cl. 244-12.500.
- Hoorelbeke, Luc, to N.V. Bekaert S.A. Winding apparatus. 4,004,744, Cl. 242-25.00R.
- Hoover Ball and Bearing Company: *See—*
  - Mandusky, Jack C.; and Riddle, Neville L., 4,004,303.
- Hopkins, Wayne J., to United States of America, Navy. Projectile power generator. 4,004,519, Cl. 102-70.20G.
- Hori, Kiyotaka: *See—*
  - Yamamoto, Nobuo; Hori, Kiyotaka; Yoneyama, Masakazu; Nakayama, Yasuhiro; and Abe, Akira, 4,004,927.
- Hori, Sanji. Air-foam generating apparatus for bath. 4,004,302, Cl. 4-178.000.
- Horiuchi, Hideo: *See—*
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- Horizons Incorporated, a division of Horizons Research Incorporated: *See—*
  - Reynard, Kennard A.; and Gerber, Arthur H., 4,005,171.
- Horner, Donald E.; Mailen, James C.; and Posey, Franz A., to United States of America, Energy Research and Development Administration. Electrolytic trapping of iodine from process gas streams. 4,004,993, Cl. 204-131.000.
- Horowitz, Victor, to Current Industries, Inc. High intensity discharge lamp with auxiliary light. 4,005,331, Cl. 315-92.000.
- Horstmann, Harald: *See—*
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- Hosho, Yukio: *See—*
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- Houbiers, Johannes P. M.: *See—*
  - Gubbels, Jan M. H.; and Houbiers, Johannes P. M., 4,005,088.
- Houck, Theodore B., to Parker Drilling Company, Inc. Drilling apparatus for drilling small diameter bore holes deep into the earth. 4,004,470, Cl. 74-661.000.
- Houston, Alvin John, to Du Pont of Canada Limited. Coated panel. 4,004,774, Cl. 249-114.000.
- Hsia, Tsang-Chen. Direct electromagnetic reciprocating motor. 4,005,346, Cl. 318-128.000.
- Hubachek, Louis H. Key ring and/or chain holder. 4,004,325, Cl. 24-3.00K.
- Hudson, James L.: *See—*
  - Dost, Richard W.; Hudson, James L., and Jordan, Larry L., 4,004,955.
- Hug, Edward: *See—*
  - Pryor, Cabell N., Jr.; Hug, Edward; and Stripling, Michael H., 4,005,384.
- Hughes Aircraft Company: *See—*
  - Manoly, Arthur E., 4,005,329.
  - Nichols, Richard W., 4,005,333.
  - Tsuda, George I., 4,005,433.
- Hughes, Gordon Alan; and Smith, Herchel, to Smith, Herchel. Dithioketal derivatives of 13-polycarbonalkylgon-4-en-3-ones. 4,005,078, Cl. 260-239.500.
- Huige, Nicolaas J. J.: *See—*
  - Thijssen, Henricus A. C.; and Huige, Nicolaas J. J., 4,004,886.
- Hull, Howard L. Door lock device. 4,004,833, Cl. 292-288.000.
- Humbs, Rolf; and Weinke, Robert, to Siemens Aktiengesellschaft. Arrangement for scanning a disc-shaped type carrier. 4,005,264, Cl. 178-34.000.
- Hummel, Frank, Jr.; and King, Edmond B. Remote control for large-area sprinkler systems. 4,004,612, Cl. 137-624.110.
- Hund, Roland, to Dornier System GmbH. Vertically-flying aircraft. 4,004,759, Cl. 244-17.170.
- Hunger, Klaus; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Disazo compounds from diphenylene sulfones and acetoacetylbenzimidazolones. 4,005,068, Cl. 260-157.000.
- Hunnicutt, Roger; and Keel, Beat G., to Control Data Corporation. Phase locked circuits. 4,005,479, Cl. 360-51.000.
- Hunt, Stephen M.: *See—*
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- Hurni, William M.; McAleer, William J.; and Hilleman, Maurice R., to Merck & Co., Inc. Cell removing device. 4,004,981, Cl. 195-127.000.
- Huta Kosciuszko, Frzedsiebiorstwo Panstwowe: *See—*
  - Krol, Leszek; Gierek, Adam; Skoczkowski, Kazimierz; Bednarczyk, Stanislaw; Mandelka, Pawel; Nowak, Teodor; and Krzemien, Eugeniusz, 4,004,790.
- Hutchinson, Francis M. Match book. 4,004,686, Cl. 206-104.000.
- Hydrabind, Inc.: *See—*
  - Macke, Thomas F., 4,004,796.
- Hydro-Tech Corporation: *See—*
  - Onal, Hasan F., 4,004,541.
- Hyland, Francis B., to Gillette Company, The. Hair styling implement. 4,004,596, Cl. 132-37.00R.
- Ichino, Kazuo: *See—*
  - Fujiwara, Hideo; Ichinose, Yukio; Ichino, Kazuo; Orita, Isamu; Uesaka, Yasutaro; Itoh, Michiyasu; and Thuruoka, Hisashi, 4,005,396.
- Ichinose, Yukio: *See—*
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- ICI Australia Limited: *See—*
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- Ignatjev, Vladimir: *See—*
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- Iio, Toshimasa: *See—*
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- Ikeda, Takahide: *See—*
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- Ikeda, Yoshi; Osada, Kenji; and Doi, Kazumi, to Nikkiso Eiko Co., Ltd. Pump with yieldable radial partitions and rotatable side plates. 4,004,865, Cl. 418-45.000.
- Ikrath, Kurt; Kennebeck, William; Shaffer, Edward C.; and Pingitore, Peter J., to United States of America, Army. Camouflaged VHF antenna. 4,005,429, Cl. 343-713.000.
- Illinois Tool Works Inc.: *See—*
  - Braden, Denver, 4,004,688.
  - Edwards, Bryant, 4,005,245.
- Imai, Kimiaki: *See—*
  - Fukuoka, Hiroshi; Kameyama, Teruhiko; Takahashi, Yuji; Nicho, Kenji; Misawa, Tatsuo; Inoue, Tsuneyuki; and Imai, Kimiaki, 4,004,918.
- Imamura, Shosuke: *See—*
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- IMC Chemical Group, Inc.: *See—*
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- Imperial Chemical Industries Limited: *See—*
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  - Brooks, John Langshaw; Budziarek, Richard; Crook, James William; and Vickers, Edward Jervis, 4,005,097.
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  - Cumbers, David Charles, 4,005,169.
  - Dowden, Dennis Albert; Shannon, Ian Robertson; and Spencer, Michael Staines, 4,005,048.
  - Lunt, John, 4,005,010
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- Index, Incorporated: *See—*
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- Industrie Pirelli S.p.A.: *See—*
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- Ingersoll-Rand Research, Inc.: *See—*
  - Cumings, Francis J., and Kevorkian, Victor, 4,004,893.
- Innothera: *See—*
  - Robba, Max Fernand, and Aurousseau, Michel Emile Marie, 4,005,095.
- Inoue-Japan Research Inc.: *See—*
  - Inoue, Kiyoshi, 4,005,303.
- Inoue, Kiyoshi, to Inoue-Japan Research Inc. EDM parameter control system. 4,005,303, Cl. 219-69.00C.
- Inoue, Naohiko; Yanagishima, Takayuki; Nakamura, Hiromichi; and Fukasawa, Noburu, to Nissan Motor Co., Ltd. Method of determining the driver's sufficient alertness to drive a motor vehicle safely 4,005,398, Cl. 340-279.000.
- Inoue, Tsuneyuki: *See—*
  - Fukuoka, Hiroshi; Kameyama, Teruhiko; Takahashi, Yuji; Nicho, Kenji; Misawa, Tatsuo; Inoue, Tsuneyuki; and Imai, Kimiaki, 4,004,918.
- Insley, Robert H.: *See—*
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- Institut Francais du Petrole: *See—*
  - Chauvin, Yves; Commereuc, Dominique, Cruypelinck, Daniel, and Soufflet, Jean-Pierre, 4,005,047
- Institut Textile de France: *See—*
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- Institute of Nuclear Energy Research: *See—*
  - Chang, Chau-Ting, 4,004,987.
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- International Business Machines Corporation: *See—*
  - Abramson, Paul; and Appel, Ulrich, 4,005,276.
  - Agnew, Mark Charles; Best, James Jacob; and Gudgel, Willard Leon, 4,004,795
  - Castro, Fernando; and O'Day, Richard Lewis, 4,005,482.
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  - Findley, Gerald L., 4,005,390.
  - Gorey, Edward F.; and Schwuttke, Guenter H., 4,004,449.
  - Magdo, Ingrid E.; and Magdo, Steven, 4,005,471.
  - Morrin, Thomas Harvey, II, 4,005,411.
  - Ottesen, Hjalmar Holmboe, 4,005,477.
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- Isaac, Eirlys R.; and Barker, Michael D., to Shell Oil Company. Trihydric alcohol derivatives. 4,004,911, Cl. 71-88.000.
- Isaac, Otto, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for recovering the main sapogenins from the roots of rhizomes of helleborus. 4,004,976, Cl. 195-2.000.
- Iseli, Pierre: *See—*
  - Lenherr, Markus; and Iseli, Pierre, 4,004,520.
- Ishida, Kinya: *See—*
  - Niimi, Masayoshi, and Ishida, Kinya, 4,005,348.
- Ishida, Shuichi: *See—*
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- Ishikawa, Katsuji: *See—*
  - Iwata, Hiroshi; and Ishikawa, Katsuji, 4,005,448.
- Ishikawa, Masakazu; Ota, Takaaki; Ishigami, Noriakira; and Kozakai, Asao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electrical switch for a braking fluid pressure fault alarm device. 4,005,401, Cl. 340-52.00C.
- Ishizaka, Otaharu. Method for hydrogen generation. 4,005,185, Cl. 423-648.000.

Ito, Matsutoshi: *See—*
Hirano, Reiji; Hanakata, Takayoshi; and Ito, Matsutoshi, 4,004,672.
Ito, Yoshio; Kitajima, Tadayuki; and Touyama, Yoshikuni, to Canon Kabushiki Kaisha. Dry developing mechanism. 4,004,714, Cl. 222-41.000.
Ito, Yoshio; and Mashiko, Toshio, to Kao Soap Co., Ltd.; and Nippon Peroxide Co., Ltd. Stable sodium sulfate-hydrogen peroxide-sodium chloride adduct and process for preparing same. 4,005,182, Cl. 423-467.000.
Itoh, Michiyasu: *See—*
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Itoh, Tomo, to Hitachi, Ltd. Alarm device for use in exhaust gas recirculating system. 4,004,559, Cl. 123-119.00A.
ITT Industries, Inc.: *See—*
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Iwata, Hiroshi; and Ishikawa, Katsuji, to West Electric Company, Ltd. Programmed shutter. 4,005,448, Cl. 354-30.000.
J. Bobst & Fils S.A.: *See—*
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J. I. Case Company: *See—*
Beck, Michael J., 4,004,499.
J.I.P. Industries, Inc.: *See—*
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J. M. Huber Corporation: *See—*
Oder, Robin R., 4,005,008.
J. P. Stevens & Co., Inc.: *See—*
Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., 4,004,617.
J. Pfrimmer & Co.: *See—*
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Kraft, Joseph K.; Sette, Robert A.; and Jackson, Leigh F., 4,004,655.
Jackson, Morden A., to Maloney-Crawford Tank Corporation. Vertical flameless reboiler for reconcentrating liquid desiccant. 4,004,965, Cl. 159-27.00R.
Jacoby, Gerald B.; and Mathues, Thomas P., to General Motors Corporation. Package and kit for installation of master cylinder internal parts. 4,004,423, Cl. 60-533.000.
Jandacek, Ronald James, to Procter & Gamble Company, The. Compositions for treating hypercholesterolemia. 4,005,195, Cl. 424-180.000.
Jandacek, Ronald James; and Mattson, Fred Hugh, to Procter & Gamble Company, The. Vitaminized compositions for treating hypercholesterolemia. 4,005,196, Cl. 424-180.000.
Janssen, Marcel A. C.; and Sipido, Victor K., to Janssen Pharmaceutica N.V. Antiparasitic salicylanilide derivatives. 4,005,218, Cl. 424-304.000.
Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Device for reading a disk-shaped record carrier with time base correction. 4,005,260, Cl. 358-128.000.
Janssen Pharmaceutica N.V.: *See—*
Janssen, Marcel A. C.; and Sipido, Victor K., 4,005,218.
Marsboom, Robert P. H. M., 4,005,211.
Janssens, Wilhelmus: *See—*
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Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Kawamura, Keita; Aoki, Shingi; Kawakami, Waichiro; and Hashimoto, Shoji, 4,004,995.
Japan Gasoline Co., Ltd.: *See—*
Kusano, Kazuto; Ando, Hiroshi; Kagami, Takashi; Uchida, Azusa; Akiyama, Noboru; Ueda, Yoshihiro; and Akiba, Yoshio, 4,005,017.
Japan Metals & Chemicals Co. Ltd.: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Takahashi, Yuji; Nicho, Kenji; Misawa, Tatsuo; Inoue, Tsuneyuki; and Imai, Kimiaki, 4,004,918.
Jarret, Jacques: *See—*
Jarret, Jean; and Jarret, Jacques, 4,004,794.
Jarret, Jean; and Jarret, Jacques, to Societe d'Exploitation des Ressorts Auto-Amortisseurs Jarret. Spring formed of an elastomer mass including water. 4,004,794, Cl. 267-153.000.
Jastrzebski, Eugene C.: *See—*
Yates, Colin K.; and Jastrzebski, Eugene C., 4,005,323.
Jatczak, Chester F.; Burnett, Jesse A.; and Mohr, Terry W., to Timken Company, The. Carburized bearing members. 4,004,952, Cl. 148-39.000.
Jeanmart, Claude: *See—*
Debarre, Francois; Jeanmart, Claude; and Simon, Pierre Edouard, 4,005,212.
Jeffrey, William B., to Westinghouse Air Brake Company. Visual coupling indicator for automatic railway car couplers. 4,004,697, Cl. 213-75.00R.
Jenkins, David Conwil: *See—*
Berg, Samuel Sidney; Jenkins, David Conwil; Martin, George Christopher James; Phillipson, Ronald Frederick; and Thompson, Garth Molesdale, 4,005,217.
Jenkins, Robert T.: *See—*
Watrous, Willis George, Jr.; and Jenkins, Robert T., 4,005,455.
Jenkins, Stanley Frederick Noel, to Automotive Products Company Limited. Aircraft undercarriage with ride control means. 4,004,762, Cl. 244-104.0FP.
Jenkins, Victor Frederick: *See—*
Sampson, Keith George; Jenkins, Victor Frederick; and Bunker, Anthony John, 4,005,155.
Jennings, Don C.; and Dhondt, Roland O., to Union Oil Company of California. Superatmospheric pressure shale retorting process. 4,004,982, Cl. 201-29.000.
Jennings, Kirk E., to United States of America, Navy. Decometer: 4,005,282, Cl. 235-151.300.
Jensen, Carl F.: *See—*
Cordis, Nat, deceased; and Cordis, Gladys S., executrix, 4,004,602.
Jeppsen, Harvey I., to J.I.P. Industries, Inc. Machine for mixing aggregate and resin. 4,004,782, Cl. 259-3.000.
Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet transfer drum for printing presses. 4,004,512, Cl 101-410.000.
Jess, Thurman Sheldon, to Baxter Travenol Laboratories, Inc. Parenteral liquid administration set with non-air blocking filter. 4,004,587, Cl. 128-214.00R.
Jim Dandy Company, The: *See—*
Dykes, Dewey B.; Powers, E. Michael; Foster, T. Kenneth; and Rogers, Robert E., 4,005,226.
John, Ludwig: *See—*
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John Zink Company: *See—*
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Johnson, Arthur D.: *See—*
Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., 4,004,335.
Johnson, Clifford T.; McCubbin, Melvin J.; and Zulkoski, Thomas R., to United States of America, Navy. Fuze. 4,004,516, Cl. 102-24.00R.
Johnson Corporation, The: *See—*
Hildreth, Thomas L., 4,004,431.
Johnson, Curtis D.; and Skahill, Fred J., to United States of America, Army. Dual selective feed mechanism for automatic weapons. 4,004,489, Cl. 89-33.0SF.
Johnson, Daniel E. Restraining device. 4,004,583, Cl. 128-134.000.
Johnson, Edwin Samuel, to Abbott Laboratories. Treatment of prostatic hyperplasia. 4,005,194, Cl. 424-177.000.
Johnson, James B.: *See—*
Faulstich, Albert J.; Johnson, James B.; and Winkler, Gerhard B., 4,004,310.
Johnson, James Nelson, Jr. Trailer van adapted to transport compressible materials. 4,004,703, Cl. 214-82.000.
Johnson & Johnson: *See—*
Tunc, Deger C., 4,005,251.
Johnson Matthey & Co., Limited: *See—*
Knapton, Arthur George; Selman, Gordon Leslie; and Pearce, Stephen Lionel, 4,004,844.
Johnston, Gordon Boyd; and Strandberg, Hasse Eivind, to SKF Industrial Trading and Development Company, B.V. Bearing cage 4,004,840, Cl. 308-201.000.
Jones, Billy Joe; Linnstaedter, Donald James; and Monajjem, Freydoun, to General Tire & Rubber Company, The. Method and apparatus for producing better balanced tread components in pneumatic tires. 4,004,958, Cl. 156-128.00R.
Jones, J. Paul, to Procter & Gamble Company, The. Laundering adjunct. 4,005,029, Cl. 252-99.000.
Jones, Lloyd K.; and Yanov, David A., to Elk Manufacturing Company, Inc. Plug valve. 4,004,775, Cl. 251-310.000.
Jones, Norman Stewart, to Pneupac Limited. Gas valve mechanisms 4,004,603, Cl. 137-107.000.
Jones, Philip Graham: *See—*
Clifford, David Victor; Bell, Stephen William; Gordon, Stuart; and Jones, Philip Graham, 4,004,523.
Jordan, Larry L.: *See—*
Dost, Richard W.; Hudson, James L.; and Jordan, Larry L., 4,004,955.
Jorg, Albert: *See—*
Pichler, Peter; and Jorg, Albert, 4,004,381.
Joseph, Craig L.; Caterina, Fred J.; and Cremer, Hans H., to FMC Corporation. Multi-engine, articulated vehicle apparatus. 4,004,648, Cl. 180-14.00R.
Joynson, Reuben E.; Mundy, Joseph L.; and Banerji, Ranan, to General Electric Company. Pattern recognition machine for analyzing line orientation. 4,005,385, Cl. 340-146.3AE.
K-tel International, Inc.: *See—*
Koblick, Jeffrey M., 4,004,355.
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Knyazev, Jury Alexeevich; Makhalov, Sergei Fedorovich; Popov, Mikhail Ivanovich; Savonichev, Dmitry Nikolaevich; Shepelev, Dmitry Nikolaevich; Suvorov, Vladimir Nikolaevich; and Chalov, Vladimir Pavlovich. Apparatus for removal of glass sheet flash. 4,004,723, Cl. 225-103.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Kawamata, Toshiaki, 4,004,410.
Kabushiki Kaisha Hayashibara Seibutsukagaku Kenkyujo: *See—*
Kato, Koso; and Nomura, Tatsuo, 4,004,977.
Kabushiki Kaisha Suwa Seikosha: *See—*
Fujita, Kinji, 4,004,407.
Shibata, Shin; and Oguchi, Kikuo, 4,005,321.
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Masaki, Hideyuki, 4,004,937.
Kaeding, Heinz; and Nicolas, Alexandros, to Hauni-Werke Korber & Co., KG. Method and apparatus for classifying cigarettes or the like 4,004,593, Cl. 131-21.00R.
Kagami, Takashi: *See—*
Kusano, Kazuto; Ando, Hiroshi; Kagami, Takashi; Uchida, Azusa; Akiyama, Noboru; Ueda, Yoshihiro; and Akiba, Yoshio, 4,005,017.
Kaiser Aluminum & Chemical Corporation: *See—*
Dorsey, Geoffrey A., Jr., 4,004,951.
Goodrich, David G.; and John, Ludwig, 4,004,631.
Kajimoto, Hikokusu; and Shimada, Takafumi, to Mitsubishi Jukogyo Kabushiki Kaisha. Self-cleaning type stirring apparatus. 4,004,785, Cl. 259-104.000.
Kalen, Bodo, to Emtrol Corporation. Cyclone separator gas tube heat dissipator. 4,004,898, Cl. 55-267.000.
Kali-Chemie Aktiengesellschaft: *See—*
Fernschild, Gunter; Rudolph, Werner; and Massonne, Joachim, 4,005,176.
Musall, Reimar; and Wolsing, Wilhelm, 4,004,888.
Rudolph, Werner; and Massonne, Joachim, 4,005,137.
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Kalninsh, Arvid Janovich: *See—*
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Kamata, Tadaaki: *See—*
Utsumi, Isamu; Endo, Tomio; Kamata, Tadaaki; and Ando, Masayasu, 4,005,200.
Kamaya, Naoki, to Sony Corporation. Tape cassette. 4,004,752, Cl 242-198.000.
Kameyama, Teruhiko: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Takahashi, Yuji; Nicho, Kenji; Misawa, Tatsuo; Inoue, Tsuneyuki; and Imai, Kimiaki, 4,004,918.
Kaminsky, Manfred S.; Das, Santosh K.; and Rossing, Thomas D., to United States of America, Energy Research and Development Administration. Method and means of reducing erosion of components of plasma devices exposed to helium and hydrogen isotope radiation 4,004,890, Cl 29-182.300.
Kanazawa, Shigenori: *See—*
Kato, Masumi; Kanazawa, Shigenori; and Oshikawa, Kiyomitsu, 4,004,829.
Kandel, Walter. Multiple strip garment with stitched tape border and method of manufacturing same. 4,004,296, Cl 2-211.000.
Kane, Richard E.; and LeRow, Charles E., Jr., to Westinghouse Electric Corporation. Multi-phase gas-type circuit-interrupter substitution modular construction. 4,005,345, Cl 317-103.000.
Kane, Walter Harold, to Webster Spring Co. Inc. Box spring assembly. 4,004,304, Cl 5-267.000.
Kanebo, Ltd.: *See—*
Utsumi, Isamu; Endo, Tomio; Kamata, Tadaaki; and Ando, Masayasu, 4,005,200.
Kaneko, Haruo; Katagiri, Yoshio; and Yano, Kaoru, to Nippon Electric Company, Ltd. Digital-analog converter. 4,005,406, Cl 340-347.0DA.
Kaneko, Takeo, to Sony Corporation. Signal reproducing systems employing a semiconductive light source. 4,005,259, Cl 358-128.000.
Kang, Jung Wong: *See—*
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Kao Soap Co., Ltd.: *See—*
Ito, Yoshio; and Mashiko, Toshio, 4,005,182.
Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Substituted 10-ethynyldibenzo[b,f]thiepins and dibenz[b,f]oxepins 4,005,105, Cl. 260-327.00B.
Karass, Thomas J. Hook and hook assembly using a sling of band material. 4,004,770, Cl. 248-323.000.
Karim, Sultanali M. M. Use of prostaglandins to induce menstruation 4,005,221, Cl. 424-317.000.
Kashkina, Nadezhda Alexandrovna: *See—*
Pormale, Milda Jaovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Jaowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 4,005,070.
Kaspers, Helmut: *See—*
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Katagiri, Yoshio: *See—*
Kaneko, Haruo; Katagiri, Yoshio; and Yano, Kaoru, 4,005,406.
Kato, Akinori: *See—*
Akatsuka, Takeaki; Kato, Akinori; Kojima, Teiryo; Inaba, Sinji; and Higashino, Kohichi, 4,005,392.
Kato, Hisayoshi; and Ueno, Ryuhji, to Nihon Jescoal Industry Co., Ltd. Water cultivation method. 4,004,369, Cl. 47-62.000.
Kato, Koso; and Nomura, Tatsuo, to Kabushiki Kaisha Hayashibara Seibutsukagaku Kenkyujo. Method for purifying *pullulan* 4,004,977, Cl. 195-31.00P.
Kato, Masumi; Kanazawa, Shigenori; and Oshikawa, Kiyomitsu, to Nippondenso Co., Ltd. Passive seat belt system. 4,004,829, Cl. 280-745.000.
Kato, Shoichi: *See—*
Aoki, Yukio; Wakita, Shizuo; Kato, Shoichi; and Ishida, Shuichi, 4,005,148.
Kato, Yukio. Breeding aquarium having filtering chamber therein. 4,004,551, Cl. 119-5.000.
Kaufholz, Frank H., Jr., to Computer Peripherals, Inc. Transducer head positioning apparatus. 4,005,492, Cl 360-105.000.
Kaufman, Samuel. Eyelet arrangement for pools. 4,004,301, Cl 4-172.000.
Kaufman, William. Machine for the multiple grading of patterns from a master pattern. 4,004,346, Cl 33-17.00A.
Kawakami, Waichiro: *See—*
Machi, Sueo; Kawamura, Keita; Aoki, Shingi; Kawakami, Waichiro; and Hashimoto, Shoji, 4,004,995.
Kawamata, Toshiaki, to Kabushiki Kaisha Daini Seikosha. Fluid-tight watchcase and improved ring gasket for the same. 4,004,410, Cl 58-90.00R.
Kawamura, Keita: *See—*
Machi, Sueo; Kawamura, Keita; Aoki, Shingi; Kawakami, Waichiro; and Hashimoto, Shoji, 4,004,995.
Kawasaki, Masahiro: *See—*
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Kawulka, Paul: *See—*
Veltman, Herbert; Mould, Geoffrey James Julien; and Kawulka, Paul, 4,004,991.
Kebets, Leonid Nikolaevich: *See—*
Gavrilov, Anatoly Nikolaevich; Godin, Eduard Moiseevich; Kebets, Leonid Nikolaevich; Beregovoi, Ivan Zakharovich; Matskevich, Vladimir Ivanovich; Korf, Yakov Osherovich; and Dorofeev, Alexandr Grigorievich, 4,004,420.
Keel, Beat G.: *See—*
Hunnicutt, Roger; and Keel, Beat G., 4,005,479.
Keeling, Kermit B., Sr., to General Electric Company. Adjustable fastening means between related members. 4,004,570, Cl. 126-214.00B.
Keeton, J. Herbert. Method and a panel for pre-fabricating buildings 4,004,391, Cl 52-584.000.
Keizer, Eugene Orville, to RCA Corporation. Recording apparatus and methods for a color picture/sound record. 4,005,474, Cl. 358-4.000.
Kellar, Paul Roderick Noel: *See—*
Michael, Peter Colin; and Kellar, Paul Roderick Noel, 4,005,410.
Kelly, Donald V. Frameless sliding window assembly. 4,004,629, Cl. 160-90.000.
Kelly, Peter Bernard: *See—*
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Kelmers, A. Donald: *See—*
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Kennebeck, William: *See—*
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Kennecott Copper Corporation: *See—*
Pemsler, J. Paul; and Litchfield, John K., 4,005,173.
Kennedy, John B., Jr.: *See—*
Rarey, Kenneth W.; and Kennedy, John B., Jr., 4,004,508.
Kenney, Michael John, to Dunlop Limited. Conveyor belting 4,004,467, Cl 74-233.000.
Keough, Laurence J., to Texas Instruments Incorporated. Electrical contact member having low electrical resistance. 4,005,299, Cl 200-159.00B.
Keske, Frank E., to Caterpillar Tractor Co. Differential with spherical bearing supported pinions. 4,004,471, Cl 74-714.000.
Ketobi Associates: *See—*
Cowans, Kenneth W., 4,004,421.
Kevorkian, Victor: *See—*
Cumings, Francis J.; and Kevorkian, Victor, 4,004,893.
Key, William H.: *See—*
Fowler, John T.; and Key, William H., 4,004,348.
Kidratschky, Hermann: *See—*
Wagner, Alfred; and Kidratschky, Hermann, 4,005,255.
Kiemle, Horst, to Siemens Aktiengesellschaft, DT. Holographic storage device. 4,005,394, Cl. 340-173.0LM.
Kienlen, Loren C.: *See—*
Beard, Wallace F.; Poppler, Jack H.; and Kienlen, Loren C., 4,004,372.
Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 2H-Cyclopenta(b)furan-2-ones. 4,005,110, Cl 260-343.30R.
Kienzle Uhrenfabriken GmbH: *See—*
Siefert, Roland; Seckinger, Hans; and Krosche, Herbert, 4,004,408.
Kierstead, Richard Wightman: *See—*
Guthrie, Robert William; and Kierstead, Richard Wightman, 4,005,086.
Kiess, Helmut Gustav: *See—*
Kleinknecht, Hans Peter; and Kiess, Helmut Gustav, 4,005,436.
Kikuchi, Shintaro: *See—*
Yurugi, Shojiro; and Kikuchi, Shintaro, 4,005,201.
Kikuchi, Yoshikazu: *See—*
Suzuki, Hirotsugu; Ogawa, Yo; Kikuchi, Yoshikazu; and Kitazawa, Shin-ichi, 4,004,406.
Kilthau, Gustave F.; and Loftin, Diana R., to Data Diagnostic Corporation. Diagnostic test method. 4,005,187, Cl. 424-1.500.
Kind, Dieter: *See—*
Hartel, Hagen, 4,005,340.
King, Clarence J., to Straits Steet & Wire Co. Detachable rack anchor 4,004,526, Cl. 108-114.000.

King, Edmond B.: *See—*
Hummel, Frank, Jr.; and King, Edmond B., 4,004,612.

Kinoshita, Mototaka; Sekiguchi, Yoshimitu; and Ando, Susumu, to Lion Fat & Oil Co., Ltd. Method of treating waste water containing surfactant and heavy metals. 4,005,009, Cl. 210-44.000.

Kinstedt, George Carl, to Procter & Gamble Company, The. Organosilane-containing anionic detergent composition. 4,005,025, Cl. 252-89.00R.

Kish, Arthur S., to Murray Corporation. Suction throttling valve. 4,004,608, Cl. 137-510.000.

Kishino, Shigeo; Kudamatsu, Akio; and Sumi, Shozo, to Bayer Aktiengesellschaft. Combating insects, acarids and nematodes with S-alkoxyethyl-phenyl-di- and tri-thiophosphonic acid esters. 4,005,197, Cl. 424-216.000.

Kiszely, Gyorgy: *See—*
Fahry, Gyorgy; Takacs, Istvan; and Kiszely, Gyorgy, 4,004,609.

Kitajima, Tadayuki: *See—*
Ito; Yoshio; Kitajima, Tadayuki; and Touyama, Yoshikuni, 4,004,714.

Kitazawa, Shin-ichi: *See—*
Suzuki, Hirotsugu; Ogawa, Yo; Kikuchi, Yoshikazu; and Kitazawa, Shin-ichi, 4,004,406.

Klauke, Erich: *See—*
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; and Hammann, Ingeborg, 4,005,223.

Kleid, Robert Eugene, to Pitney-Bowes, Inc. Sealing machine. 4,004,962, Cl. 156-475.000.

Klein, Willi: *See—*
Rocholl, Hans; and Klein, Willi, 4,004,659.

Kleinknecht, Hans Peter; and Kiess, Helmut Gustav, to RCA Corporation. Apparatus for making a recording of an electrostatic charge pattern. 4,005,436, Cl. 346-153.000.

Klepper-Werke: *See—*
Hermann, Franz, 4,004,307.

Klip, Johan, to Konijn Machinebouw B.V.; and Bagger-En Constructiebedrijf Johan Klip B.V. Mouthpiece for a suction dredger. 4,004,359, Cl. 37-66.000.

Klochko, Viktor Alexandrovich: *See—*
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,004,450.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Stern, Hans, deceased; and Strauss, Werner, 4,004,615.

Klotzer, Wilhelm: *See—*
Bretschneider, Hermann; Klotzer, Wilhelm; Bader, Gunther; and Lutz, August, 4,005,100.

Klug, Robert F., to Dale Electronics, Inc. Slide potentiometer. 4,005,381, Cl. 338-119.000.

Knapton, Arthur George; Selman, Gordon Leslie; and Pearce, Stephen Lionel, to Johnson Matthey & Co., Limited. Electrical connector. 4,004,844, Cl. 339-118.00R.

Knight, Charles E., Jr.: *See—*
Dritt, William S.; Gerth, Howard L.; Knight, Charles E., Jr.; and Pardue, Robert M., 4,005,233.

Knobel, David. Vibratory massage apparatus. 4,004,580, Cl. 128-32.000.

Knoll, Heinz W.: *See—*
Breitschwerdt, Werner; and Knoll, Heinz W., 4,004,821.

Knop, Hans-Georg, to Dr. -Ing. Rudolf Hell GmbH. Method for improving sharpness when recording half-tone pictures by modulating a sharpness signal. 4,005,475, Cl. 358-80.000.

Knothe, Erich; Melcher, Franz Josef; and Berg, Christoph, to Sartorius-Werke GmbH (und. vorm. Gottinger Prazisionswaagenfabrik GmbH). Electromagnetically compensated balance or dynamometer. 4,004,458, Cl. 73-141.00R.

Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., to Monsanto Company. L-Dopa process and intermediates. 4,005,127, Cl. 260-479.00R.

Knyazev, Jury Alexeevich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Knyazev, Jury Alexeevich; Makhalov, Sergei Fedorovich; Popov, Mikhail Ivanovich; Savonichev, Dmitry Nikolaevich; Shepelev, Dmitry Nikolaevich; Suvorov, Vladimir Nikolaevich; and Chalov, Vladimir Pavlovich, 4,004,723.

Kobayashi, Takumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Interlocked manual stop-down and mirror-up mechanism for single lens reflex camera. 4,005,459, Cl. 354-156.000.

Koblick, Jeffrey M., to K-tel International, Inc. Shoe device and method of attaching a strap to a shoe member. 4,004,355, Cl. 36-122.000.

Koch, Franklin O., Jr.: *See—*
Nerstad, Karl A.; Koch, Franklin O., Jr.; and Chadwick, Curtis E., III, 4,004,670.

Koch, Frederick William; and Musser, Jerry Lee, to Lubrizol Corporation, The. Hydroxy containing phosphonates. 4,005,159, Cl. 260-953.000.

Koch, Werner, to Sandoz Ltd. Substituted 2-imidazolin-5-ones. 4,005,080, Cl. 260-240.00F.

Koepernik, Karl Hermann: *See—*
Weidenbach, Guenther; Koepernik, Karl Hermann; and Braeutigam, Hans, 4,005,177.

Kohkoku Chemical Industry Co., Ltd.: *See—*
Sogabe, Yoji; Edamatsu, Tetsuo; and Oka, Takashi, 4,004,828.

Kohnen, Heinrich: *See—*
Eichenhofer, Kurt-Wilhelm; Schliebs, Reinhard; Brandl, Hermann; and Kohnen, Heinrich, 4,005,179.

Kojima, Teiryo: *See—*
Akatsuka, Takeaki; Kato, Akinori; Kojima, Teiryo; Inaba, Sinji; and Higashino, Kohichi, 4,005,392.

Kolarik, Michael J.: *See—*
Emery, Alden H.; Lim, Henry C.; and Kolarik, Michael J., 4,004,980.

Koller, Thomas J., to Machlett Laboratories, Incorporated, The. Rotating anode target structure. 4,005,322, Cl. 313-60.000.

Kolling, Heinrich; Thomas, Herbert; Widdig, Arno; and Wollweber, Hartmund, to Bayer Aktiengesellschaft. Substituted phenylisothioureas and processes for their preparation and use. 4,005,123, Cl. 260-470.000.

Kollonitsch, Janos, to Merck & Co., Inc. Fluorination of organic compounds. 4,004,996, Cl. 204-158.0HA.

Kondo, Yutaka; and Usugi, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gas bag safety apparatus. 4,004,827, Cl. 280-742.000.

Kondur, Nicholas, Jr., to I.RC, Inc. Wire matrix print head. 4,004,671, Cl. 197-1.00R.

Kong, Carlito Maristela; Wark, Emerson Lee; and Ferdelman, Donald Clarence, to General Motors Corporation. Humidifier kit for room air conditioner. 4,004,432, Cl. 62-262.000.

Konijn Machinebouw B.V.: *See—*
Klip, Johan, 4,004,359.

Konopnicki, Daniel T.: *See—*
Brown, Alfred; Wu, Ching H.; and Konopnicki, Daniel T., 4,004,636.

Konstruktiewerkhuizen DeMets N.V.: *See—*
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Kooi, Else: *See—*
Le Can, Claude Jan Principe Frederic; Kooi, Else; and Steinmaier, Walter, 4,005,453.

Kopke, Helmut; Hartmann, Hans-Joerg; Mayer, Dieter; and Motz, Herbert, to BASF Aktiengesellschaft. Magnetic recording medium containing lubricants. 4,005,242, Cl. 428-425.000

Koppers Company, Inc.: *See—*
Calistrat, Michael M., 4,004,433.
Edgar, William D.; Sustarsic, John D.; and Adamsky, Allan F., 4,004,985.

Korf, Yakov Osherovich: *See—*
Gavrilov, Anatoly Nikolaevich; Godin, Eduard Moiseevich; Kebets, Leonid Nikolaevich; Beregovoi, Ivan Zakharovich; Matskevich, Vladimir Ivanovich; Korf, Yakov Osherovich; and Dorofeev, Alexandr Grigorievich, 4,004,420.

Kortschot, Cornelis; and Miller, James Joseph, to Corporate Foods Limited. Process for cooked potato products. 4,005,139, Cl. 426-550.000.

Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, to Nissan Motor Co., Ltd. Fuel converting method and apparatus. 4,004,554, Cl. 123-3.000.

Kossiakoff, Alexander; and Austin, James R., to United States of America, Navy. Automated radar data processing system 4,005,415, Cl. 343-5.0VQ.

Koster, Roland; and Bellut, Hans, to Studiengesellschaft Kohle m.b.H. Process for reacting trialkyl boranes with compounds containing protons. 4,005,132, Cl. 260-502.300.

Kosuge, Momotoshi. Building structure using concrete blocks. 4,004,385, Cl. 52-259.000.

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Koudelka, Vojtech: *See—*
Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,004,944.

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Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Ethynyl-substituted aromatic ortho diamines and method of synthesis. 4,005,144, Cl. 260-578.000.

Kowalski, Charles J., to Charles Beseler Company. Photographic processing drum and method for using. 4,005,463, Cl. 354-307.000.

Kozakai, Asao: *See—*
Ishikawa, Masakazu; Ota, Takaaki; Ishigami, Noriakira; and Kozakai, Asao, 4,005,401.

Kraft, Joseph K.; Sette, Robert A.; and Jackson, Leigh F., to Westinghouse Electric Corporation. Elevator system including door operator having an enclosure which forms track for door rollers. 4,004,655, Cl. 187-52.00R.

Kraft, Joseph K., to Westinghouse Electric Corporation. Escalator with non-jaming step. 4,004,676, Cl. 198-326.000.

Krall, Thomas J.; and Uhlig, Albert R., to Owens-Illinois, Inc. Apparatus for blow molding plastic articles. 4,004,872, Cl. 425-326.00B.

Krallinger, Robert E.; Ignatjev, Vladimir; Rand, Ralph K.; and Costello, Matthew Joseph, to Graphic Sciences, Inc. Facsimile transceiver. 4,005,257, Cl. 358-256.000.

Kramer, Wolfgang: *See—*
Buchel, Karl Heinz; Kramer, Wolfgang; Kaspers, Helmut; and Scheinpflug, Hans, 4,005,083.

Kraska, John L., to National Can Corporation. Electrocoating apparatus and method. 4,005,000, Cl. 204-181.000.

Krause, Erich: *See—*
Schieber, Hans; Radl, Franz; Krause, Erich; and Schimko, Reinhold, 4,004,437.

Krehbiel, Vivian D., to Kreonite, Inc. Apparatus and method for processing photographic film. 4,005,464, Cl. 354-322.000.

Kreiger, John W., to Bethlehem Steel Corporation. Method for agglomerating wet-collected fume for use in metallurgical furnaces and agglomerates produced thereby. 4,004,916, Cl. 75-3.000.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-6-acyloxytetrahydropyrimidinone herbicides. 4,004,912, Cl 71-90.000.

Kreonite, Inc.: *See—*
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Krespan, Carl George, to Du Pont de Nemours, E. I., and Company Products from the reaction of sulfur trioxide with acyclic internal vic-dialkoxypolyfluoroalkenes. 4,005,104, Cl. 260-327.00H

Kressel, Henry: *See—*
Martinelli, Ramon Ubaldo; and Kressel, Henry, 4,005,451.

Kristensson, Nils Lars Ove, to Landstingens Inkopscentral Lic, Ekonomisk Forening. Chair with tiltable spring biased back-rest. 4,004,836, Cl. 297-354.000.

Kritzler, Helmuth: *See—*
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Krocheski, Thomas L.: *See—*
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Krogsrud, Harald, to Elkem-Spigerverket. Apparatus for gas collection in open electric smelting furnaces. 4,005,252, Cl. 13-33.000.

Krol, Leszek; Gierek, Adam; Skoczkowski, Kazimierz; Bednarczyk, Stanislaw; Mandelka, Pawel; Nowak, Teodor; and Krzemien, Eugeniusz, to Huta Kosciuszko, Frzedsiebiorstwo Panstwowe. Plate-type radiator suitable for shaft furnaces, particularly for blast furnaces, and a method for fabrication of this radiator. 4,004,790, Cl. 266-193.000.

Krosche, Herbert: *See—*
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Krzemien, Eugeniusz: *See—*
Krol, Leszek; Gierek, Adam; Skoczkowski, Kazimierz; Bednarczyk, Stanislaw; Mandelka, Pawel; Nowak, Teodor, and Krzemien, Eugeniusz, 4,004,790.

Kubicek, Donald H., to Phillips Petroleum Company. Mercaptans by hydrogen sulfide-cleavage of organic sulfides in presence of carbon disulfide. 4,005,149, Cl. 260-609.00R.

Kudamatsu, Akio: *See—*
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Kugler, Jindrich; Dvorak, Alfred; and Elliott, Charles John, to Northern Telecom Limited. Protection circuit for magnetically controlled d-c to d-c converter. 4,005,352, Cl. 321-19.000.

Kukolja, Stjepan P.; and Lammert, Steven R., to Eli Lilly and Company. Process for cleaving an imido side chain from penicillins and cephalosporins. 4,005,074, Cl. 260-239.100

Kump, Wilhelm: *See—*
Bickel, Hans; and Kump, Wilhelm, 4,005,077.

Kundert, Robert L., to Focus/Board Inc. Reconstructible karate board 4,004,799, Cl. 272-8.00N.

Kunstle, Gerhard; and Siegl, Herbert, to Wacker-Chemie GmbH. Process for making dialkoxiboracetylacetonate containing mixtures. 4,005,120, Cl. 260-462.00R.

Kupchan, S. Morris; and Court, William A., to Research Corporation. Novel anti-leukemic diterpenoid triepoxides. 4,005,108, Cl. 260-343.30R.

Kupperman, Dennis I.: *See—*
Kupperman, Sam; and Kupperman, Dennis I., 4,004,597.

Kupperman, Sam, and Kupperman, Dennis I., to RB Toy Development Co. Means for supporting a strip or length of dental floss in tensioned and taut condition for ready use. 4,004,597, Cl. 132-84.00A.

Kurata, Noboru: *See—*
Kusunoki, Shigeru; Takano, Teruhisa; Yoshimura, Hirofumi; and Kurata, Noboru, 4,005,370.

Kuroiwa, Satoshi: *See—*
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Kurumada, Tomoyuki: *See—*
Murayama, Keisuku; Moriyama, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 4,005,094.

Kusano, Kazuto; Ando, Hiroshi; Kagami, Takashi; Uchida, Azusa, Akiyama, Noboru; Ueda, Yoshihiro; and Akiba, Yoshio, to Japan Gasoline Co., Ltd. Contacting apparatus. 4,005,017, Cl. 210-284.000.

Kustner, Gerhard: *See—*
Zangenfeind, Helmut; and Kustner, Gerhard, 4,004,724.

Kusunoki, Shigeru; Takano, Teruhisa; Yoshimura, Hirofumi; and Kurata, Noboru, to Matsushita Electric Industrial Co., Ltd. Power supply means for magnetron. 4,005,370, Cl. 328-267.000.

Kuwano, Takeshi, to Hitachi, Ltd. Automatic record control apparatus with multichannel memory. 4,005,483, Cl. 360-69.000.

Kuzarov, Encho Janaki, to Warn Industries, Inc. Winch. 4,004,780, Cl. 254-187.400.

Kwake, John P. Double walled inflatable structures. 4,004,380, Cl 52-2.000.

Kybe Corporation: *See—*
Beedle, John H., 4,004,317.

Kyburz, Emilio: *See—*
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L.S. Love & Associates Limited: *See—*
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Laboratoires Andre Guerbet: *See—*
Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, 4,005,188.

Laboratorios del Dr. Esteve, S.A.. *See—*
Esteve-Subirana, Antonio, 4,005,220.

Laboy-Alvarado, Samuel. Portable bridge structure. 4,004,652, Cl. 182-118.000.

Lackner, Robert, to U.S. Philips Corporation. Recording and/or playback apparatus which prevents erasure of the synchronization track 4,005,481, Cl. 360-60.000.

Laing, Nikolaus. Thermal prime mover. 4,004,426, Cl. 60-659.000

Laitram Corporation, The: *See—*
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Laker, Kenneth R.. *See—*
Slobodnik, Andrew J., Jr ; and Laker, Kenneth R , 4,005,378.

Lakodey, Pierre. *See—*
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Lakoma, Henry J.. *See—*
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Kukolja, Stjepan P ; and Lammert, Steven R., 4,005,074.

Lamprecht, Adolf, to Rowenta-Werke GmbH. Circuit for producing a spark discharge. 4,005,343, Cl 317-96.000

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Lancini, Giancarlo: *See—*
Cricchio, Renato; and Lancini, Giancarlo, 4,005,076

Landstingens Inkopscentral Lic, Ekonomisk Forening: *See—*
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Lange, Karl Heinz, to Balda-Werke Photographische Gerate & Kunststoff GmbH & Co. KG. Driving device for film transport and shutter cocking lever for a camera 4,005,461, Cl. 354-204.000.

Langheim, Franz; and Braasch, Michael, to Chemische Werke Huls Aktiengesellschaft. Method and apparatus for cushioning continuous exothermal reactions. 4,004,880, Cl. 23-230.00A

Laponsky, Alfred B . *See—*
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Laporte Industries Limited *See—*
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Lardner, George E . *See—*
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Lark Luggage Corporation: *See—*
Pelavin, Joseph Y., Spiegelman, Seymour, and Rastocny, John S , 4,004,664.

Larson, Dean W., to Esco Corporation Rope bending device 4,004,445, Cl. 72-389.000.

Larsson, Lars Goran, and Sundberg, Sture Ingemar, to Aktiebolaget Platmanufaktur. Equipment for packaging pulverized material 4,004,398, Cl 53-112.00A.

Lassig, Wolfgang. *See—*
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Lauber, Jean-Louis: *See—*
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Laud, Kamlakar R.: *See—*
Logothetis, Eleftherios M , Laud, Kamlakar R , and Park, Kwansuh, 4,004,452

Laudick, Richard D. Machine for forming a locator pin. 4,004,377, Cl 51-232.000.

Lautrou, Jean: *See—*
Tilly, Guy; Hardouin, Michel Jean Charles, and Lautrou, Jean, 4,005,188.

Law, S. Edward, to Research Corporation. Electrostatic spray nozzle system. 4,004,733, Cl. 239-3.000.

Lawrence Peska Associates, Inc. *See—*
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Giarritta, Ninfa R., 4,004,690.
Olivier, Lynn, 4,004,722

Lawson, David Francis, and Kang, Jung Wong, to Firestone Tire & Rubber Company, The. Smoke-inhibited polymer compositions 4,005,248, Cl 526-20.000

Leander, Bo Ingvar, to Aktiebolaget Ljungmans Verkstader. Apparatus for transferring information between electronic display devices and means for transmitting and receiving information and for supplying operating current to the electronic display devices. 4,005,412, Cl. 340-380.000.

Le Can, Claude Jan Principe Frederic; Kooi, Else; and Steinmaier, Walter, to U.S. Philips Corporation. Semiconductor device with isolated circuit elements and method of making. 4,005,453, Cl 357-49.000.

Ledley, Robert S., to Georgetown University. Diagnostic X-ray systems. 4,005,311, Cl. 250-445.00T.

Ledru, Pierre, to Rhone-Poulenc Industries. Unsaturated polyester with polyimide-ammonia prepolymers as thermosetting laminate 4,004,959, Cl. 156-331.000

Lee, Richard J., to Standard Oil Company (Indiana). Oil-soluble reaction products of (a) a high molecular weight olefin polymer, acrylonitrile, chlorine, an amine and maleic anhydride, with (g) an aliphatic amines; and lubricant compositions containing the same. 4,005,021, Cl. 252-51.50A.

Lehr, Stanley; Coralnick, Philmore; and Blauth, Gary William, to Singer Company, The. Method and apparatus for synchronizing master and local time base systems. 4,005,266, Cl. 178-69.100.

Lemaire, Gilbert, to Saft-Societe des Accumulateurs Fixes et de Traction; and Compagnie Royale Asturienne des Mines. Method for

recovering potassium hydroxide and zinc oxide from potassium zincate solutions. 4,005,061, Cl. 423-102.000.
Lemelson, Jerome H. Electro-optical circuits and manufacturing techniques. 4,005,312, Cl. 250-551.000.
Lenherr, Markus; and Iseli, Pierre, to Mefina S.A. Time fuse. 4,004,520, Cl. 102-78.000.
Lenkey, Steven Charles. Mechanical shovels. 4,004,679, Cl. 198-509.000.
Leonhart, Xaver. Table ball game. 4,004,807, Cl. 273-41.000.
Leotromelt Corporation: *See—*
Gray, Ronald D., 4,004,793.
Lerner, David S., to Lockheed Electronics Co., Inc. Performance assurance apparatus for phased antenna array drives. 4,005,361, Cl. 324-51.000.
Lerner, David S., to Lockheed Electronics Co., Inc. R.F. power distribution network for phased antenna array. 4,005,379, Cl. 333-6.000.
LeRow, Charles E., Jr.: *See—*
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Les Fils d'Auguste Scheuchzer S.A.: *See—*
Scheuchzer, Fredy; and Buhler, Fritz, 4,004,524.
Lesk, Israel Arnold, to Motorola, Inc. Method of making silicon solar cells. 4,004,949, Cl. 148-1.500.
Leslie Metal Arts Company, Inc.: *See—*
Vander Ley, Robert J., 4,004,841.
Leszak, Edward H., to Grumman Aerospace Corporation. Process for modifying capillary grooves. 4,004,441, Cl. 72-75.000.
Le Van, Wayne P., to Van Allyn, Inc. Method and apparatus for utilizing moving traffic for generating electricity and to produce other useful work. 4,004,422, Cl. 60-533.000.
Levatter, Jeffrey I.; and Lin, Shao-Chi, to Xonics, Inc. Pulsed gas laser with low-inductance flow-through electrodes. 4,005,374, Cl. 331-94.5PE.
Levin, Gerd. Egg incubating tray with rack and slide. 4,004,552, Cl. 119-43.000.
Levy, Sidney. Magnetic imaging method for photocopying. 4,005,439, Cl. 346-74.100.
Lewalter, Jurgen: *See—*
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Lewis, Jack E.: *See—*
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Daman, Lloyd W.; Hille, Earl A.; and Shamp, Donald E., 4,004,903.
Libit, Lawrence. Preparation of prostaglandin intermediates. 4,005,109, Cl. 260-343.30R.
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Botzenhardt, Leonhard, 4,005,456.
Dickopp, Gerhard; Oertel, Lothar; and Frey, Wolfgang, 4,005,476.
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Pormale, Milda Jaovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Jaowich, Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 4,005,070.
Ligon, Woodfin V., Jr., to General Electric Company. Apparatus for generating carrier gas-test specimen vapor mixtures for delivery into a gas chromatograph. 4,004,881, Cl. 23-232.00C.
Liljekvist, Bernt Soren; and Persson, Anders, to Sandvik Aktiebolag. Roller cutter. 4,004,644, Cl. 175-364.000.
Lim, Henry C.: *See—*
Emery, Alden H.; Lim, Henry C.; and Kolarik, Michael J., 4,004,980.
Lin, Ching San; and Smith, James Thomas, to GTE Sylvania Incorporated. Superalloys containing nitrides and process for producing same. 4,004,891, Cl. 29-182.500.
Lin, Shao-Chi: *See—*
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Linnstaedter, Donald James: *See—*
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Lion Fat & Oil Co., Ltd.: *See—*
Kinoshita, Mototaka; Sekiguchi, Yoshimitu; and Ando, Susumu, 4,005,009.
Lionetti, Fabian J.; and Hunt, Stephen M., to United States of America, Navy. Method of isolating and cryopreserving human white cells from whole blood. 4,004,975, Cl. 195-1.800.
Lisiecki, Hieronim L.: *See—*
Scholin, Harold W.; and Lisiecki, Hieronim L., 4,004,497.
List, Ferdinand; Uhlenbrock, Wilfried; Wilke, Norbert; and Wember, Kurt, to Chemische Werke Huls Aktiengesellschaft. Process for recovering the mother liquor produced by the esterification of terephthalic acid with methanol. 4,005,124, Cl. 260-475.00R.
List, Helmut; and Fredericks, George, to AVL AG. Method of manufacturing multi-wire oxygen electrode. 4,004,331, Cl. 29-25.150.
Litchfield, John K.: *See—*
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Littlejohn, Terrance V.: *See—*
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Logothetis, Eleftherios M.; Laud, Kamlakar R.; and Park, Kwansuh, to Ford Motor Company. Air/fuel ratio sensor for air/fuel ratios in excess of stoichiometry. 4,004,452, Cl. 73-23.000.
Lohr & Bromkamp GmbH: *See—*
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London, Joe F., Jr.; and Lauber, Jean-Louis, to Burlington Industries, Inc. Yarn interlacing air jet. 4,004,329, Cl. 28-1.400.
Long, William W. Isolation clamp for transmission tube. 4,004,766, Cl. 248-55.000.
Lopez, Juan: *See—*
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Loveland, Winton, to Loveshaw Corporation, The. Automatic carton closing machine side guide rails holding mechanism providing clearance for all cartons of one alleged size with accommodation of small degrees of variances. 4,004,401, Cl. 53-374.000.
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LRC, Inc.: *See—*
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Lu, Chin H., to Xerox Corporation. Constant viscosity inks. 4,004,931, Cl. 106-30.000.
Lubrizol Corporation, The. *See—*
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Lucarini, Vincent Joseph: *See—*
Chang, Augustine Wei-Chun; and Lucarini, Vincent Joseph, 4,005,469.
Lucas Industries Limited: *See—*
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Ludwig, Martin, to Siemens Aktiengesellschaft. Tabulator device for typewriters and the like. 4,004,675, Cl. 197-176.000.
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Lundquist, David E.; Hoffman, Paul R.; Su, Chauchang; Sung, Benjamin T.; and Eichhardt, Steven A., to Burroughs Corporation. Liquid jet droplet generator. 4,005,435, Cl. 346-1.000.
Lundqvist, Bengt Oscar Bruno, to U.S. Philips Corporation. Arrangement in a printer. 4,004,504, Cl. 101-93.030.
Lunt, John, to Imperial Chemical Industries Limited. Method of packing media in a tower or bed. 4,005,010, Cl. 210-17.000.
Lutz, August: *See—*
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Lutz, Paul H. Domino type game. 4,004,812, Cl. 273-137.00C.
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Lynnworth, Lawrence C., to Panametrics, Inc. Ultrasonic measuring system with isolation means. 4,004,461, Cl. 73-194.00A.
Mabuchi, Kenichi, and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co Ltd. Battery-powered electric motor assembly. 4,005,320, Cl. 310-40.0MM.
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Mach, Wolfgang; and Scheuermann, Horst, to BASF Aktiengesellschaft. Fluorescent dyes. 4,005,111, Cl. 260-345.200.
Machi, Sueo; Kawamura, Keita; Aoki, Shingi; Kawakami, Waichiro, and Hashimoto, Shoji, to Ebara Manufacturing Co., Ltd.; and Japan Atomic Energy Research Institute. Process for removing nitrogen oxides and sulfur dioxide from effluent gases. 4,004,995, Cl. 204-157.10H.
Machlett Laboratories, Incorporated, The: *See—*
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Mackal, Glenn H.; Lardner, George E.; and Maz, Joseph, to Halkey-Roberts Corporation. Tether for captive plug of inflation device. 4,004,614, Cl. 138-89.200.
Macke, Thomas F., to Hydrabind, Inc. Caliper-stitch and trim machine. 4,004,796, Cl. 271-94.000.
MacKenzie, Burton Thornley, Jr., to General Electric Company. Pressureless cure system for chemically cross-linking ethylene containing

polymers, and product formed thereby. 4,005,254, Cl. 174-110.0PM.
MacPherson, Alastair George, to Burroughs Corporation. Peripheral interrupt priority resolution in a micro program data processor having plural levels of subinstruction sets. 4,005,391, Cl. 340-172.500.
Maddagiri, Aswath, to Bechtel International Corporation. Method for limiting back pressure on steam turbine. 4,004,424, Cl. 60-646.000.
Maddock, Robert Brent: *See—*
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Mader, Helmut, Fekl, Werner, and Schultis, Klaus, to J. Pfrimmer & Co. Infusion solution for parenteral feeding. 4,005,190, Cl. 424-127.000
Magdo, Ingrid E., and Magdo, Steven, to International Business Machines Corporation. Semiconductor resistor having a high value resistance for use in an integrated circuit semiconductor device. 4,005,471, Cl. 357-51.000.
Magdo, Steven: *See—*
Magdo, Ingrid E., and Magdo, Steven, 4,005,471
Magnenet, Jean Georges, to Compagnie Honeywell Bull (Societe Anonyme). Electromagnetic striker mechanism for a printer. 4,004,505, Cl. 101-93.480.
Mago nee Karacsony, Erzsebet, Borsi, Jozsef, Csanyi, Endre, Pik, Katalin, and Wolf, Lajos, to Richter Gedeon Vegyeszeti Gyar Rt. Compounds with ergoline skeleton. 4,005,089, Cl. 260-285.500
Magosch, Karl-Heinz, and Ruter, Jorn, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of pilling-resistant fiber products from polyesters. 4,004,878, Cl. 8-115.500
Maher, George G., to United States of America, Agriculture. Foamed and solid rubber-starch graft copolymer compositions and method of preparation. 4,005,040, Cl. 260-17.4GC
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- Morley, Richard E.; and Schwenk, George G., to Termiflex Corporation. Hand-held interactive terminal. 4,005,388, Cl. 340-172.500
- Morozowich, Walter, to Upjohn Company, The. PGF_2 , L-Arginine salt. 4,005,133, Cl 260-501.110
- Morrin, Thomas Harvey, II, to International Business Machines Corporation. Compression of gray scale imagery to less than one bit per picture element. 4,005,411, Cl 340-347.0DD.
- Morris, Robert B., to Westinghouse Air Brake Company. Multi-brake shoe means for a multi-braking surface braked assembly 4,004,656, Cl. 188-52.000.
- Morris, Ronald G., to Beaver-Advance Corporation. Adjustable heighth shoring 4,004,393, Cl 52-637.000
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- Mott, Roger Eugene, to Deere & Company. Drive line safety shield. 4,004,436, Cl. 64-32.00R.
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- Mumford, Eustace Harold, to Owens-Illinois, Inc. Safety lock for forming machine blowhead. 4,004,905, Cl. 65-159.000.
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- Muriot, Edward E., to Health Technology Laboratories, Inc. Medical/-surgical suction equipment. 4,004,590, Cl. 128-276.000.
- Muro, Tomio; Chihara, Yasuaki; Fukuzawa, Sogo; Ogawa, Kiyoshi;

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Nekula, Ronald M., to Xerox Corporation. Cleaning method for automatic document handler. 4,004,941, Cl. 134-15.000.
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Nelson, Arthur L., to Hexcel Corporation. High voltage cable splice apparatus. 4,004,867, Cl. 425-11.000.
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- Parlette, Joseph N., to L.S. Love & Associates Limited. Gravitational separator. 4,005,019, Cl. 210-525.000.
- Pase, Hugh H., to Mimco Incorporated. Portable wrench for rotary members. 4,004,475, Cl. 81-57.140.
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- Pearce, Shairyl I.; Ireland, Gerald B.; and Windish, Willis E., to Caterpillar Tractor Co. Broad range fluid and mechanical power transmission for vehicles or the like. 4,004,473, Cl. 74-759.000.
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- Reynard, Kennard A.; and Gerber, Arthur H., to Horizons Incorporated, a division of Horizons Research Incorporated. Catalytic preparation of soluble poly(dichlorophosphazenes). 4,005,171, Cl. 423-300.000.
- Reynolds, George A., to Eastman Kodak Company. Pyrylium dyes having a fused, rigidized nitrogen-containing ring. 4,005,092, Cl. 260-287.00P.
- Reynolds, Thomas J., to Western Gear Corporation. Riser tension system for floating platform. 4,004,532, Cl. 114-256.000.
- Rezabek, Karel: *See—*
  - Semonsky, Miroslav; Cerny, Antonin; Nemecek, Oldrich; Rezabek, Karel; Seda, Miroslav; Trcka, Vaclav; and Grimova, Jaroslava, 4,005,090.
- Rheem Manufacturing Company: *See—*
  - Velarde, Clyde R., 4,004,339.
- Rhodes, Melvin H., to Rockwell International Corporation. Squaring circuit apparatus. 4,005,283, Cl. 235-194.000.
- Rhodes, Melvin H., to Rockwell International Corporation. Analog signal to duty cycle conversion apparatus. 4,005,284, Cl. 235-194.000.
- Rhone-Poulenc Industries: *See—*
  - Biola, Georges; Fabre, Alain; and Schneider, Gerard, 4,005,114.
  - Ledru, Pierre, 4,004,959.
- Rhone-Poulenc S.A.: *See—*
  - Bargain, Michel, 4,005,154.
  - Debarre, Francois; Jeanmart, Claude; and Simon, Pierre Edouard, 4,005,212.
- Rials, Elbert O. Support device for use with a towel or the like. 4,004,315, Cl. 15-209.00R.
- Rice, Jeffrey Clarus: *See—*
  - Tucker, Terry Allen; and Rice, Jeffrey Clarus, 4,005,416.
- Richard, Gerard Yves, to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Process and apparatus for cleaning particulate materials. 4,004,942, Cl. 134-25.00R.
- Richardson, Donald M.: *See—*
  - Bamberger, Carlos E.; and Richardson, Donald M., 4,005,184.
- Richter, Bela: *See—*
  - Haas, Werner E. L.; Adams, James E., Jr.; and Richter, Bela, 4,005,032.
- Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
  - Fabry, Gyorgy; Takacs, Istvan; and Kiszely, Gyorgy, 4,004,609.
  - Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Csanyi, Endre; Pik, Katalin; and Wolf, Lajos, 4,005,089.
- Richter, Julian. Lockable cover for push button telephones. 4,005,279, Cl. 179-189.00D.
- Ricoh Co., Ltd.: *See—*
  - Yamauchi, Satoshi, 4,004,354.
- Riddle, Neville L.: *See—*
  - Mandusky, Jack C.; and Riddle, Neville L., 4,004,303.
- Riedel, Guenther: *See—*
  - Gottschalk, Peter; Schoellig, Alfred; and Riedel, Guenther, 4,005,066.
- Rieter Machine Works, Ltd.: *See—*
  - Graf, Felix; and Wirz, Armin, 4,005,302.
  - Weber, Kurt, 4,004,820.
- Riker Laboratories, Inc.: *See—*
  - Banitt, Elden H.; and Bronn, William R., 4,005,209.
- Rios, Donald J. Lamp-starting device. 4,005,338, Cl. 315-362.000.
- Rippel, Riemond Henry: *See—*
  - Gendrich, Ronald Lee; Rippel, Riemond Henry; and Seely, John Hunter, 4,005,063.
- Ritzmann, Horst: *See—*
  - Rohrbach, Rudolf; and Ritzmann, Horst, 4,004,938.
- Robba, Max Fernand; and Aurousseau, Michel Emile Marie, to Innothera. Substituted thienyl-acetic acid esters. 4,005,095, Cl 260-293.680.
- Robert Bosch G.m.b.H.: *See—*
  - Blum, Rudolf, 4,005,351.
  - Heilmann, Wolfgang; Groetzner, Kurt; and Frohnwieser, Bernhard, 4,005,380.
- Roberts, James L.: *See—*
  - Gale, Preston Lee; and Roberts, James L., 4,004,889.
- Robertshaw Controls Company: *See—*
  - Feuer, Mervyn L., 4,005,409.
- Robillard, Gene A., to Honeywell Inc. Photodetector mounting and connecting. 4,005,288, Cl. 250-239.000.
- Robins Industries Corporation: *See—*
  - Post, Herman D.; and Scher, Seymour, 4,004,314.
- Roch, Roger, to J. Bobst & Fils S.A. Equipment for introduction of a strip of paper, cardboard or similar material into a printing machine 4,004,510, Cl. 101-228.000.
- Rocholl, Hans; and Klein, Willi, to Bergische Stahl-Industrie. Closure for brake jaw holder for disc brakes. 4,004,659, Cl. 188-244.000.
- Rockwell International Corporation: *See—*
  - Beccario, Michael J., 4,005,432.
  - Pentecost, Eugene E., 4,004,852.
  - Quintana, Leo J., 4,004,957.
  - Rhodes, Melvin H., 4,005,283.
  - Rhodes, Melvin H., 4,005,284.
- Roder, Kurt: *See—*
  - Nusslein, Ludwig; Pieroh, Ernst Albrecht; and Roder, Kurt, 4,005,213.
- Roderick, Zachary A., to Galgon Industries, Inc. Clutch assembly with floater plate and shock canisters. 4,004,669, Cl. 192-70.170.
- Rodriguez, Pedro A.; Heckert, David C.; and Watt, David M., Jr., to Procter & Gamble Company, The. Rinse aid composition containing an organosilane. 4,005,024, Cl. 252-89.00R.
- Rogers, Robert E.: *See—*
  - Dykes, Dewey B.; Powers, E. Michael; Foster, T. Kenneth; and Rogers, Robert E., 4,005,226.
- Rohr Industries, Inc.: *See—*
  - Shepard, Robert W.; and Heffner, George R., 4,004,392.
- Rohrbach, Rudolf; and Ritzmann, Horst, to Polysius AG; and Rohrbach, Rudolf. Method and apparatus for manufacturing cement clinker. 4,004,938, Cl. 106-100.000.
- Rolfe, Nicholas: *See—*
  - Colebourne, Neville; Rolfe, Nicholas; and McAloon, Kevin Thomas, 4,005,232.
- Rollei-Werke Franke & Heidecke: *See—*
  - Papke, Friedrich, 4,005,462.
- Ronner, Fritz, to BUSS Aktiengesellschaft. Mixing and kneading machine. 4,004,788, Cl. 259-191.000.
- Roosild, Sven A.; Shepherd, Freeman D., Jr.; and Yang, Andrew C., to United States of America, Air Force. Low beam velocity retina for Schottky infrared vidicons. 4,005,327, Cl. 313-367.000.
- Rorrer, Robert J.: *See—*
  - Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., 4,004,617.
- Rosen, Arye: *See—*
  - Ho, Pang-Ting; and Rosen, Arye, 4,005,372.
- Rosen, George, to Sun Chemical Corporation. Photopolymerizable compounds and compositions comprising the product of the reaction of a hydroxy-containing ester and a monocarboxy-substituted benzophenone. 4,004,998, Cl. 204-159.220.

- Rosen, Kenneth M.: *See—*
  - Amelio, Armand F.; and Rosen, Kenneth M., 4,004,416.
- Rosen, Perry: *See—*
  - Kienzle, Frank; and Rosen, Perry, 4,005,110.
- Rosen, Sidney. Fluid filling machine. 4,004,620, Cl. 141-137.000.
- Rosenfeld, Marvin L. Dental floss holder. 4,004,599, Cl. 132-92.00R.
- Ross, Daniel Louis; and Barton, Lucian Anthony, to RCA Corporation. Method of recording information in which the electron beam sensitive material contains 4,4'-bis(3-diazo-3-4-oxo-1-naphthalene sulfonyloxy)benzil. 4,005,437, Cl. 346-165.000.
- Ross, Jackson E. Collapsible coat hanger. 4,004,721, Cl. 223-89.000.
- Rossing, Thomas D.: *See—*
  - Kaminsky, Manfred S.; Das, Santosh K., and Rossing, Thomas D., 4,004,890.
- Roth, Walter L.: *See—*
  - Farrington, Gregory C.; and Roth, Walter L., 4,004,946.
- Rothwell, Maurice: *See—*
  - Ellwood, Henry; and Rothwell, Maurice, 4,004,787.
- Roussel-UCLAF: *See—*
  - Gaignault, Jean-Cyr; Vacher, Jean; and Frechet, Daniel, 4,005,206.
  - Goffinet, Bernard, 4,005,146.
- Rowe, George E., deceased (by Rowe, Selma S., executrix), to Emhart Industries, Inc. Glassware forming machine of the I. S. type for upright press and blow process. 4,004,906, Cl 65-239.000.
- Rowe, Selma S., executrix: *See—*
  - Rowe, George E., deceased, 4,004,906.
- Rowenta-Werke GmbH. *See—*
  - Lamprecht, Adolf, 4,005,343.
- Rowland-Hill, Edward W., and Thomas, Louis R., Jr., to Sperry Rand Corporation. Rotary combine with improved concave. 4,004,404, Cl. 56-14.600.
- Rubin, Arnold D., to Schnadig Corporation. Sleeper sofa and mattress combination. 4,004,305, Cl. 5-352.000
- Rubin, Wolfgang, to Lohr & Bromkamp GmbH. Device for non-rotatably securing the outer member of a joint to a flange or shaft 4,004,435, Cl. 64-32.00R.
- Ruch, Heinz, to Albert Obrist AG. Method for molding plastic covers for containers. 4,005,101, Cl. 264-318.000.
- Rudolph, Werner; and Massonne, Joachim, to Kali-Chemie Aktiengesellschaft. Process for the purification and separation of perhaloalkanoic acids from mixtures thereof with perhaloalkanes 4,005,137, Cl. 260-539.00R
- Rudolph, Werner: *See—*
  - Fernschild, Gunter; Rudolph, Werner; and Massonne, Joachim, 4,005,176.
- Runge, Thomas M. Cardiac replacement and assist devices 4,004,299, Cl. 3-1.700.
- Russell, Lewis K.: *See—*
  - Tucci, Patrick A.; and Russell, Lewis K., 4,005,470.
- Ruter, Jorn: *See—*
  - Magosch, Karl-Heinz; and Ruter, Jorn, 4,004,878.
- Ryan, James; and Vandenberg, Robert W., to Gerber Products Company. Machine fillable envelope. 4,004,728, Cl 229-76.000.
- Rygalin, Viktor Georgievich: *See—*
  - Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,004,450.
- Saab-Scania Aktiebolag: *See—*
  - Gardell, Lars Johan; and Wilhelmsson, Bertil Lennart, 4,004,650.
  - Nilsson, Jan; and Swanson, Rune, 4,005,319.
- Saarstickstoff-Fatol GmbH: *See—*
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- Sabacky, Milton J.: *See—*
  - Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., 4,005,127.
- Sackenreuter, Hans; and Politzer, Anton, to DIEHL. Rotatable cartridge chamber for firearm type weapon. 4,004,363, Cl. 42-9.000.
- Saeman, Walter C., to Olin Corporation. Spray graining technique for preparing granular hydrated alkali metal dihaloisocyanurate. 4,005,087, Cl. 260-248.00C.
- Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
  - Lemaire, Gilbert, 4,005,061.
- Saintours-Payerne, Bruno M.: *See—*
  - Mechulam, Andre; Saintours-Payerne, Bruno M.; Gay-Chatain, Guillaume A.; and Montjallard, Paul R., 4,004,494.
- Salesky, Emery; and Luehman, Kent W., to Hewlett-Packard Company. Transient elimination circuit. 4,005,373, Cl. 330-51.000.
- Salve S.A.: *See—*
  - Palmius, Kjell Hubert, 4,004,578.
- Sampson, Keith George; Jenkins, Victor Frederick; and Bunker, Anthony John, to Laporte Industries Limited. Polymeric compositions. 4,005,155, Cl. 260-851.000.
- Sanchez, Carmelo: *See—*
  - Burzlaff, Karl H.; and Sanchez, Carmelo, 4,004,673.
- Sandco Ltd.: *See—*
  - Guttinger, Manfred; and Schermutzki, Konrad, 4,004,870.
- Sanden, Gertrud Marianne: *See—*
  - Sanden, Stig Ingemar; and Sanden, Gertrud Marianne, 4,004,813.
- Sanden, Stig Ingemar; and Sanden, Gertrud Marianne. Lottery-ticket assembly 4,004,813, Cl. 273-139.000.
- Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, to Prazska akumulatorka, narodni podnik. Electrode material for accumulators and other electrochemical sources of current. 4,004,944, Cl. 429-215.000.
- Sanderson, Edward L.: *See—*
  - Higgins, Francis J.; McGraw, Charles T.; and Sanderson, Edward L., 4,004,540.
- Sandiford, Burton B., to Union Oil Company of California. Selectively plugging the more permeable strata of a subterranean formation. 4,004,639, Cl. 166-292.000.
- Sandoz Ltd.: *See—*
  - Dore, Jacky, 4,005,067.
  - Koch, Werner, 4,005,080.
  - Zirngibl, Ulrich, 4,005,069.
- Sandstrom, Paul H.; and Lal, Joginder, to Goodyear Tire & Rubber Company, The. Pneumatic tire with sidewall composition 4,004,627, Cl. 152-355.000.
- Sandvik Aktiebolag: *See—*
  - Liljekvist, Bernt Soren; and Persson, Anders, 4,004,644.
- Sankyo Company Limited: *See—*
  - Murayama, Keisuku; Moriyama, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu, Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 4,005,094.
- Sanneman, Douglas D.; Stalder, Ernest, and Chaffee, Robert C., to Gilmore-Tatge Manufacturing Co., Inc. Grain drying apparatus. 4,004,351, Cl. 34-52.000.
- Sano, Ryuichi: *See—*
  - Tsukamoto, Kenkichi, Matsumura, Yusuke, and Sano, Ryuichi, 4,004,997.
- Saphir, Johannes R., to Carl Brehmer & Sohn. Hair dye and its use 4,004,877, Cl 8-10.000.
- Sarnoff, Stanley J., to Survival Technology, Inc. Method of treating heart attack patients prior to the establishment of qualified direct contact personal care. 4,004,577, Cl. 128-2.06R.
- Sarstedt, Walter, to Walter Sarstedt Kunststoff-Spritzgusswerk. Apparatus for loading blood extracting devices. 4,004,575, Cl. 128-2.00F.
- Sartorius-Werke GmbH (und. vorm. Gottinger Prazisionswaagenfabrik GmbH): *See—*
  - Knothe, Erich, Melcher, Franz Josef, and Berg, Christoph, 4,004,458.
- Sato, Fumihiko: *See—*
  - Shibayama, Kyoichi; Sato, Fumihiko; and Takahama, Takashi, 4,004,999.
- Sato, Hiroki; and Takahashi, Hiroh, to Sony Corporation. Method and apparatus for producing a composite still picture of a moving object in successive positions. 4,005,261, Cl. 358-83.000.
- Satoh, Ken, to Olympus Optical Co., Ltd. Apparatus for detecting tape running-in a tape recorder. 4,005,486, Cl. 360-79.000
- Sauer, Richard W., deceased: *See—*
  - Zehner, Lee R.; Sauer, Richard W., deceased; and Heffron, John J., executor, 4,005,128.
- Saunders, Leonard M.; and Sieger, Earl W., to United States Steel Corporation. Preshaped blast furnace hearth construction. 4,004,791, Cl. 266-197.000
- Sautton, Guy, to Hotchkiss Brandt Sogeme. Envelope indexing head and an indexing apparatus equipped with same 4,004,507, Cl. 101-93.420.
- Savage, Donald D., to Powell, B. J., a part interest. Vehicle hub assembly. 4,004,838, Cl. 301-105.00R.
- Savioli, Giulio V., to United States of America, America. Disintegrable cartridge link. 4,004,492, Cl. 89-35.00A.
- Savla, Manilal: *See—*
  - Miron, Jerry; Savla, Manilal, and Skeist, Irving, 4,005,055.
- Savonichev, Dmitry Nikolaevich: *See—*
  - Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Knyazev, Jury Alexeevich, Makhalov, Sergei Fedorovich; Popov, Mikhail Ivanovich; Savonichev, Dmitry Nikolaevich, Shepelev, Dmitry Nikolaevich, Suvorov, Vladimir Nikolaevich; and Chalov, Vladimir Pavlovich, 4,004,723.
- Schafer, Werner: *See—*
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- Schappel, Robert Edouard: *See—*
  - Marquaire, Roger Andre Marie, Curtis, Michel Georges August; and Schappel, Robert Edouard, 4,004,635.
- Scharkowitz, Eckhart: *See—*
  - Beinhauer, Manfred; and Scharkowitz, Eckhart, 4,005,478.
- Schechter, Robert; and Winslade, Douglas W., to Western Electric Company, Inc. Methods and apparatus for wrapping a wire on a terminal. 4,004,743, Cl. 242-7.030.
- Scheibe, Elias W., to General Motors Corporation. Hydraulic lash adjuster oil metering valve. 4,004,558, Cl. 123-90.350.
- Scheier, Donald J.; and Haynes, Homer A., to Gordon Johnson Company. Apparatus for use in evisceration of poultry. 4,004,320, Cl. 17-11.000.
- Scheinpflug, Hans: *See—*
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- Schellhammer, Carl-Wolfgang: *See—*
  - Dorlars, Alfons; Schellhammer, Carl-Wolfgang; and Wirth, Wolf-Dieter, 4,005,098.
- Schenk, Peter, to Dzus Fastener Co., Inc. Quick release fastener. 4,004,486, Cl. 85-64.000.
- Schepp, Edwin F.; and Coffey, Ronald B., to Monsanto Company. Kitchen ware cleaning device. 4,004,376, Cl. 51-181.00R.
- Scher, Seymour: *See—*
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- Schering Aktiengesellschaft: *See—*
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- Schermutzki, Konrad: *See—*
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- Scheuchzer, Fredy; and Buhler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Method of renewal of a railroad track and train therefor. 4,004,524, Cl. 104-2.000.
- Scheuermann, Horst: *See—*
  - Mach, Wolfgang; and Scheuermann, Horst, 4,005,111.
- Schibbye, Lauritz Benedictus, to Svenska Rotor Maskiner Aktiebolag. Method for modifying a compressing apparatus unit. 4,004,864, Cl. 418-1.000.
- Schieber, Hans; Radl, Franz; Krause, Erich; and Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Flat knitting machine. 4,004,437, Cl. 66-78.000.
- Schiffer, Stephen F.; and DiPasquale, Renato, to Yardney Electric Corporation. Reserve-type cell. 4,005,246, Cl. 429-94.000.
- Schimko, Reinhold: *See—*
  - Schieber, Hans; Radl, Franz; Krause, Erich; and Schimko, Reinhold, 4,004,437.
- Schlacter, Michael M., to Aeronutronic Ford Corporation. Germanium device passivation. 4,005,240, Cl. 428-333.000.
- Schlaepfer, Hansjorg: *See—*
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- Schliebs, Reinhard: *See—*
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- Schlumberger Technology Corporation: *See—*
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- Schmelow, Harald Martin: *See—*
  - Weman, Per Olaf; and Schmelow, Harald Martin, 4,004,751.
- Schmerling, Louis, to Universal Oil Products Company. Preparation of haloalkyl esters. 4,005,125, Cl. 260-476.00R.
- Schmerling, Louis, to Universal Oil Products Company. Preparation of haloalkyl esters. 4,005,126, Cl. 260-476.00R.
- Schmerling, Louis, to Universal Oil Products Company. Cycloalkenynes and a method for the preparation thereof. 4,005,152, Cl. 260-648.00R.
- Schmerling, Louis, to Universal Oil Products Company. Novel flame retardant compositions of matter. 4,005,156, Cl. 260-880.00R.
- Schmid, Wolfgang, to Ciba-Geigy Corporation. Arylisothiocyanate for the regulation of plant growth. 4,004,907, Cl. 71-72.000.
- Schmidt, Herbert: *See—*
  - Wochnowski, Waldemar; Thiele, Willi; Hohm, Reinhard; and Schmidt, Herbert, 4,004,594.
- Schmidt, Joseph A.: *See—*
  - Burklund, Vernon D.; Stone, W. James; and Schmidt, Joseph A., 4,004,764.
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- Schneider, Gerard: *See—*
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- Schneiter, Ali, to Ebauches S.A. Counting mechanism for timepiece. 4,004,411, Cl. 58-116.00M.
- Schnell, Philip G., to Standard Oil Company (Indiana). Process of preparing water-soluble whippable extract from microorganism protein material. 4,005,062, Cl. 260-112.00R.
- Schoellig, Alfred: *See—*
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- Scholin, Harold W.; and Lisiecki, Hieronim L., to Scholin Industries, Inc. Automatic systems programmer. 4,004,497, Cl. 91-36.000.
- Scholin Industries, Inc.: *See—*
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- Schoonman, Marten Leonard. Wave responsive hatch cover locking and sealing mechanism. 4,004,538, Cl. 114-201.00R.
- Schoppee, Lawrence W., to Package Machinery Company. Gum slab feed apparatus. 4,004,797, Cl. 271-136.000.
- Schotz, Larry A.: *See—*
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- Schramm, Jurgen: *See—*
  - Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; and Hammann, Ingeborg, 4,005,223.
- Schreiber, Gerald A., to Bartholomew, Limited. Board game apparatus. 4,004,809, Cl. 273-134.00C.
- Schrengauer, Edwin Benedict: *See—*
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- Schubert, Bernhard: *See—*
  - Bardenhagen, Dietrich; and Schubert, Bernhard, 4,004,395.
- Schuerba, Reinhard, to Siemens Aktiengesellschaft. Bipolar semiconductor memory with recharging circuit for capacitively loaded lines. 4,005,393, Cl. 340-173.0FF.
- Schukin, Vitaly Sergeevich: *See—*
  - Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Knyazev, Jury Alexeevich; Makhalov, Sergei Fedorovich; Popov, Mikhail Ivanovich; Savonichev, Dmitry Nikolaevich; Shepelev, Dmitry Nikolaevich; Suvorov, Vladimir Nikolaevich; and Chalov, Vladimir Pavlovich, 4,004,723.
- Schuler, Stephen H., to Adamation, Inc. Type S chain. 4,004,682, Cl. 198-852.000.
- Schultis, Klaus: *See—*
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- Schulze, Wilhelm, to Maschinenbau Greene GmbH & Co., KG. Winding apparatus. 4,004,747, Cl. 242-56.500.
- Schwarz, Gail B., to Measuregraph Company, The. Apparatus for dispensing fabric from a bolt. 4,004,748, Cl. 242-62.000.
- Schwenk, George G.: *See—*
  - Morley, Richard E.; and Schwenk, George G., 4,005,388.
- Schwerzel, Robert E.; and Nathan, Richard A., to Battelle Development Corporation. Isomerization for photochemical solar energy storage. 4,004,571, Cl. 126-270.000.
- Schwerzel, Robert E.: *See—*
  - Nathan, Richard A.; Schwerzel, Robert E.; Adelman, Albert H.; and Wyant, Robert E., 4,004,572.
- Schwuttke, Guenter H.: *See—*
  - Gorey, Edward F.; and Schwuttke, Guenter H., 4,004,449.
- Scollins, John A., to United States of America, Navy. Fuze protector cap. 4,004,684, Cl. 206-3.000.
- Scott, Lewis A.: *See—*
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- Scott Paper Company: *See—*
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- Seagrave, Earl M., Jr., to Antek, Inc. Method and apparatus for controlling the stock tension as it is withdrawn from a coil. 4,004,750, Cl. 242-75.430.
- Seckinger, Hans: *See—*
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- Seda, Miroslav: *See—*
  - Semonsky, Miroslav; Cerny, Antonin; Nemecek, Oldrich; Rezabek, Karel; Seda, Miroslav; Trcka, Vaclav; and Grimova, Jaroslava, 4,005,090.
- Seeling, Ernest Richard, to United States of America, Army. Plastic ammunition belt. 4,004,491, Cl. 89-35.00R.
- Seely, John Hunter: *See—*
  - Gendrich, Ronald Lee; Rippel, Riemond Henry; and Seely, John Hunter, 4,005,063.
- Segurens, Louis: *See—*
  - Gavinet, Jean; and Segurens, Louis, 4,004,443.
- Seki, Mitsuaki; and Nakazawa, Tamotu, to Canon Kabushiki Kaisha. Clearing system. 4,005,386, Cl. 340-172.500.
- Sekiguchi, Yoshimitu: *See—*
  - Kinoshita, Mototaka; Sekiguchi, Yoshimitu; and Ando, Susumu, 4,005,009.
- Sekmakas, Kazys, to DeSoto, Inc. Aqueous polymerization of unsaturation carboxylic acid monomers using anionic surfactant mixed with the monomer and polyhydric alcohol prior to reaction. 4,005,052, Cl. 260-29.6TA.
- Seko, Maomi; Ogawa, Shinsaku; Yoshida, Mitsuo; and Nakamura, Akira, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrode coating consisting of a solid solution of a noble metal oxide, titanium oxide, and zirconium oxide. 4,005,004, Cl. 204-290.00F.
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  - Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, 4,004,979.
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  - Froloff, Helmut; and Tovar, Theodor, 4,005,454.
- Semimetals, Inc.: *See—*
  - Hill, Michael; Intrater, Josef; and Yasar, Tugrul, 4,005,457.
- Semonsky, Miroslav; Cerny, Antonin; Nemecek, Oldrich; Rezabek, Karel; Seda, Miroslav; Trcka, Vaclav; and Grimova, Jaroslava, to Spofa United Pharmaceutical Works. 8-(β-aminoethyl)ergolines-I. 4,005,090, Cl. 260-285.500.
- Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Process for the preparation of oligocarbonates with two catalysts. 4,005,121, Cl. 260-463.000.
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  - Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,004,756.
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- Shaffer, Edward C.: *See—*
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- Shaievitz, Sidney: *See—*
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- Shamp, Donald E.: *See—*
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- Shell Oil Company: *See—*
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  - Isaac, Eirlys R.; and Barker, Michael D., 4,004,911.
  - Plantard, Maurice, 4,005,339.
  - Whipps, Sydney L., 4,004,460.
- Shepard, Robert W.; and Heffner, George R., to Rohr Industries, Inc. Molded plastic key molded joint and method of forming same. 4,004,392, Cl. 52-436.000.
- Shepelev, Dmitry Nikolaevich: *See—*
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- Shore, Anthony G. L.; Preston, Kevin S.; and Churchill, David A., to British Railways Board. Control system for hydrokinetic brakes. 4,004,660, Cl. 188-271.000.
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  - Stickney, Dwight R.; Simmons, William S., Nichol, Charles A., Hitchings, George H.; and Elion, Gertrude B., 4,005,204.
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- Singer, Leonard Sidney, to Union Carbide Corporation. High modulus, high strength carbon fibers produced from mesophase pitch. 4,005,183, Cl. 423-447.200.
- Singh, Gurdial, and von Rutte, Richard Edward, to Du Pont de Nemours, E. I., and Company. Antistatic composition containing an N-alkyl polycarbonamide and a phosphonium salt. 4,005,057, Cl. 260-78.00S.
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- Sjogren, Christer A., to Eds Inc. Extractor assembly for extracting and/or diverting a selected number of signatures from a stream. 4,004,694, Cl. 209-111.70R.
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- Slavinski, Antoni. Hair rollers. 4,004,595, Cl. 132-40.000.
- Slobodnik, Andrew J., Jr.; and Laker, Kenneth R., to United States of America, Air Force. Surface acoustic wave filter. 4,005,378, Cl. 333-72.000.
- Smith, Carleton H., and Dunning, Kenneth G. Battery plate grid. 4,004,945, Cl. 429-244.000.
- Smith, Charles, to Dow Corning Limited. Treatment of fibres. 4,005,231, Cl. 427-387.000.
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- Smith, Warren K., to United States of America, Navy. Paint-on thermocouple. 4,004,948, Cl. 136-201.000.

Smith, William E., to General Electric Company. Multistep method for preparation of tetrahydrofuran starting from propylene, oxygen and a carboxylic acid. 4,005,112, Cl. 260-346.10R.
Smith, William E., to General Electric Company. Multi-step process for preparation of tetrahydrofuran starting from propylene, oxygen and a carboxylic acid. 4,005,113, Cl. 260-346.10R.
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Smoot, William N. Resonant frequency measuring device for gauging coating thickness. 4,005,359, Cl. 324-34.0TK.
Snodgrass, Robert E.; and Tyler, Michael N., to United States of America, Army. M16A1 Burst control. 4,004,496, Cl. 89-129.00B.
Snyder, George E., to General Motors Corporation. Fluid baffle in master cylinder reservoir. 4,004,707, Cl. 220-22.000.
Sochor, Jerzy R., to Elco Corporation. High density electrical connector employing male blade with offset portions. 4,004,845, Cl. 339-258.00P.
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Sorm, Frantisek; Svoboda, Miroslav; Zavada, Jiri; Slama, Karel; and Arnold, Zdenek, to Ceskoslovenska akademie ved. Phenyl ethers having juvenile hormone activity. 4,005,150, Cl. 260-613.00D.
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Squires, Arthur M. Filtering dusty gas in improved panel bed. 4,004,897, Cl. 55-96.000.
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Stefanik, John E., to PPG Industries, Inc. Window panel edge construction. 4,004,388, Cl. 52-398.000.
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Stephens, Paul B. Method and apparatus for removing set mortar from recovered building bricks. 4,004,569, Cl. 125-26.000.
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Suetsuna, Airi; and Iio, Toshimasa, to Sumitomo Metal Mining Co., Limited. Process for separating and recovering nickel and cobalt. 4,004,990, Cl. 204-113.000.
Suga, Shigeru. Carbon electrode for emitting light similar to sunshine for light-fastness testing. 4,005,325, Cl. 313-352.000.
Suga, Shigeru. Electrode mounting in an arc lamp for use in light fastness testers. 4,005,326, Cl. 313-357.000.
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- Tanaka, Akio, to Zenith Radio Corporation. Memory tuning system with automatic two speed display. 4,005,368, Cl. 325-455.000.
- Tanaka, Shunji: *See—*
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- Tankersley, Robert Walker, Jr., to A. H. Robins Company, Incorporated. Method of combating influenza type A and B and parainfluenza type 3 viruses with aminospiranes and aminoalkylspiranes 4,005,224, Cl. 424-325.000.
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- Tazawa, Shunsuke; and Okabe, Kazuo, to Nitto Chemical Industry Co., Ltd. Process for stabilizing soil. 4,004,428, Cl. 61-36.00C.
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- Thackery, Russell H. Power tool. 4,004,623, Cl. 144-193.00R.
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- Thijssen, Henricus A. C.; and Huige, Nicolaas J. J., to Stamicarbon B.V. Two stage continuous process and apparatus for crystallization. 4,004,886, Cl. 23-273.00F.
- Thivellier, Daniel; Seraphin, Leon; and Tricot, Roland, to Ugine Aciers. Free machining steel. 4,004,922, Cl. 75-123.0AA.
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- Tsuji, Naotaka; and Yamada, Koji, to Bridgestone Tire Company Limited. Apparatus for inspecting the disposition of steel ply cords in pneumatic tires 4,004,693, Cl. 209-81.00R
- Tsukamoto, Kenkichi, Matsumura, Yusuke, and Sano, Ryuichi, to Shimada, Seiko; Takahashi, Teizo, and Nishida, Mitso. Process of curing a polymerizable composition containing a magnetized powered ferromagnetic material with radioactive rays 4,004,997, Cl. 204-159.140
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- Tully, Paul Raymond, to Cabot Corporation. Agricultural soil compositions 4,004,368, Cl. 47-58.000
- Tunc, Deger C., to Johnson & Johnson. Process for preparation of alkali cellulose ester sulfates. 4,005,251, Cl. 536-59.000.
- Tung, Chi Fang, to Minnesota Mining and Manufacturing Company. Fluid composition for forming retroreflective structures. 4,004,930, Cl. 106-19.000.
- Tung, Pham Ngu, to Thomson-CSF. Method of manufacturing field-effect transistors designed for operation at very high frequencies, using integrated techniques 4,004,341, Cl. 29-571.000
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CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560.	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec 28, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct 12, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 390,408	3,992,426	Feb 3, 1976	Nov 16, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 391,473	3,988,370	Mar 2, 1976	Oct 26, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec 28, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 391,844	3,999,165	Mar 16, 1976	Dec. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep 21, 1976	B 392,798	3,996,249	Mar 30, 1976	Dec 7, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 394,248	3,989,764	Jan 27, 1976	Nov. 2, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 395,554	3,998,156	Mar 9, 1976	Dec 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 396,164	3,989,590	Feb 3, 1976	Nov. 2, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct 19, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 397,674	3,998,438	Mar 16, 1976	Dec. 21, 1976
B 214,925	3,997,648	Mar. 9,.1976	Dec 14, 1976	B 398,084	3,996,239	Feb 3, 1976	Dec. 7, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 231,416	4,000,054	Mar 30, 1976	Dec. 28, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 236,342	4,001,182	Feb 10, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep 28, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec 14, 1976	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov 30, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov 16, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec 7, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct 12, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 288,757	4,001,072	Mar 30, 1976	Jan 4, 1977	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 302,160	3,985,774	Feb 3, 1976	Oct. 12, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct 12, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov 30, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov 23, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 308,659	3,981,947	Jan. 27, 1976	Sep 21, 1976	B 405,726	3,981,241	Jan 13, 1976	Sep 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 406,546	D 242,966	Mar 16, 1976	Jan. 11, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar 23, 1976	Oct. 26, 1976	B 407,737	3,992,546	Feb 3, 1976	Nov 16, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 409,848	3,983,270	Jan 27, 1976	Sep. 28, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 410,694	3,995,530	Mar 23, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 411,471	3,982,933	Feb 17, 1976	Sep. 28, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov 2, 1976	B 411,624	4,001,205	Mar 16, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 411,765	3,993,428	Feb 24, 1976	Nov 23, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan 4, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov 23, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov 23, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 414,481	3,982,979	Jan 20, 1976	Sep. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec 21, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov 9, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov 2, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov 9, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 417,014	3,981,851	Jan 13, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar 30, 1976	Nov 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov 2, 1976	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan 25, 1977	B 419,582	3,989,681	Mar. 2, 1976	Nov 2, 1976
B 364,797	3,996,131	Feb 17, 1976	Dec. 7, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 420,321	3,990,645	Mar 30, 1976	Nov 9, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov 2, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 369,221	3,985,834	Feb 24, 1976	Oct 12, 1976	B 421,373	4,001,326	Mar 23, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 371,912	3,995,738	Mar 2, 1976	Dec. 7, 1976	B 423,365	3,996,186	Feb 17, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 423,404	3,990,958	Mar 2, 1976	Nov. 9, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 372,722	3,998,925	Mar 9, 1976	Dec. 21, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 373,354	3,989,870	Jan 27, 1976	Nov. 2, 1976	B 423,883	3,986,871	Jan 27, 1976	Oct. 19, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct 12, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov 23, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep 21, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan 4, 1977	B 425,193	4,002,107	Mar 23, 1976	Jan. 11, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct 12, 1976	B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976	B 426,639	3,992,539	Feb 3, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov 30, 1976	B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976	B 427,883	3,982,277	Jan 20, 1976	Sep. 21, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep 21, 1976	B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976	B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 386,828	3,992,440	Feb 3, 1976	Nov. 16, 1976	B 428,877	3,984,649	Jan 27, 1976	Oct. 5, 1976
B 387,337	D 243,157	Mar 16, 1976	Jan. 25, 1977	B 429,018	3,990,061	Feb 10, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan 13, 1976	Oct 12, 1976
B 477,481	3,991,076	Feb 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov 23, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov 16, 1976
B 479,175	3,985,700	Feb 17, 1976	Oct 12, 1976
B 479,242	3,983,074	Feb 17, 1976	Sep 28, 1976
B 479,502	3,999,030	Mar 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar 16, 1976	Dec 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan 4, 1977
B 480,114	4,001,327	Mar 2, 1976	Jan 4, 1977
B 480,292	3,994,011	Mar 16, 1976	Nov 23, 1976
B 480,350	3,994,164	Feb 10, 1976	Nov 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec 21, 1976
B 481,600	3,981,235	Jan 27, 1976	Sep 21, 1976
B 481,737	3,982,057	Jan 13, 1976	Sep 21, 1976
B 481,778	4,001,385	Mar 30, 1976	Jan 4, 1977
B 481,930	3,992,717	Feb 24, 1976	Nov 16, 1976
B 482,058	4,001,398	Mar 2, 1976	Jan 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb 24, 1976	Oct 12, 1976
B 482,907	3,984,811	Jan 20, 1976	Oct 5, 1976
B 483,247	4,001,889	Apr 13, 1976	Jan 4, 1977
B 483,256	3,981,723	Feb 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan 27, 1976	Oct 19, 1976
B 483,615	3,988,637	Jan 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan 13, 1976	Oct 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep 28, 1976
B 484,067	3,992,374	Feb 17, 1976	Nov 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar 16, 1976	Dec 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb 17, 1976	Sep 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan 27, 1976	Oct 12, 1976
B 485,575	3,996,565	Feb 24, 1976	Dec 7, 1976
B 486,280	3,983,130	Feb 3, 1976	Sep 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan 27, 1976	Nov 2, 1976
B 487,260	3,990,610	Jan 27, 1976	Nov 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep 28, 1976
B 487,423	3,998,810	Mar 2, 1976	Dec 21, 1976
B 487,427	3,995,788	Mar 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar 16, 1976	Nov 16, 1976
B 489,290	3,998,081	Feb 17, 1976	Dec 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb 17, 1976	Dec 7, 1976
B 489,550	4,000,710	Mar 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb 24, 1976	Oct 5, 1976
B 490,067	3,986,600	Jan 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb 3, 1976	Nov 30, 1976
B 491,032	3,981,892	Feb 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov 9, 1976
B 491,501	3,984,914	Jan 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar 9, 1976	Dec 21, 1976
B 491,673	3,994,770	Feb 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar 23, 1976	Jan 18, 1977
B 492,120	3,995,692	Feb 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan 13, 1976	Sep 21, 1976
B 492,688	3,983,415	Jan 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar 2, 1976	Dec 21, 1976
B 492,774	4,001,843	Mar 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov 23, 1976
B 492,946	3,991,303	Jan 27, 1976	Nov 9, 1976
B 493,370	3,984,792	Mar 16, 1976	Oct 5 1976
B 493,501	3,988,061	Feb 3, 1976	Oct. 26, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov 2, 1976
B 493,981	3,990,165	Mar 9, 1976	Nov 9, 1976
B 494,234	3,983,808	Feb 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar 16, 1976	Jan 4, 1977
B 494,383	3,991,289	Feb 3, 1976	Nov 9, 1976
B 494,669	3,991,104	Feb 3, 1976	Nov 9, 1976
B 494,691	3,987,457	Mar 16, 1976	Oct 19, 1976
B 494,806	3,989,210	Feb 3, 1976	Nov 2, 1976
B 494,944	3,992,469	Feb 17, 1976	Nov 16, 1976
B 495,185	3,999,166	Mar 9, 1976	Dec 21, 1976
B 495,331	4,000,456	Mar 16, 1976	Dec 28, 1976
B 495,402	3,983,988	Feb 17, 1976	Oct 5, 1976
B 495,408	4,000,222	Feb 3, 1976	Dec 28, 1976
B 495,489	3,984,571	Feb 3, 1976	Oct 5, 1976
B 495,550	3,993,666	Feb 3, 1976	Nov 23, 1976
B 495,554	3,993,665	Feb 3, 1976	Nov 23, 1976
B 495,759	3,989,998	Feb 3, 1976	Nov 2, 1976
B 495,993	3,995,997	Feb 17, 1976	Dec 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov 9, 1976
B 496,431	3,985,894	Jan 13, 1976	Oct 12, 1976
B 496,487	3,982,261	Jan 20, 1976	Sep 21, 1976
B 496,500	3,985,962	Feb 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan 20, 1976	Oct 19, 1976
B 496,792	3,999,959	Feb 17, 1976	Dec 28, 1976
B 496,964	3,999,219	Apr 20, 1976	Dec 21, 1976
B 496,999	3,983,804	Jan 27, 1976	Oct 5, 1976
B 497,021	3,985,039	Jan 13, 1976	Oct 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb 3, 1976	Nov 9, 1976
B 497,584	3,988,184	Feb 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec 7, 1976
B 497,780	3,997,500	Feb 24, 1976	Dec 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan 20, 1976	Nov 9, 1976
B 498,208	4,001,480	Apr 13, 1976	Jan 4, 1977
B 498,775	3,993,868	Mar 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan 20, 1976	Sep 21, 1976
B 498,775	3,993,868	Mar 2, 1976	Nov 23, 1976
B 498,820	3,996,670	Mar 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan 27, 1976	Sep. 21, 1976
B 499,718	3,990,058	Jan 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar 30, 1976	Dec 14, 1976
B 500,176	3,995,316	Feb 3, 1976	Nov 30, 1976
B 500,408	D 242,721	Mar 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb 24, 1976	Dec 14, 1976
B 500,981	3,984,681	Jan 27, 1976	Oct 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep 21, 1976
B 501,181	3,984,761	Feb 10, 1976	Oct 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,127	3,996,201	Feb 17, 1976	Dec 7, 1976
B 521,128	3,997,511	Feb 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan 13, 1976	Sep 28, 1976
B 521,600	3,981,458	Jan 27, 1976	Sep 21, 1976
B 521,612	4,000,251	Mar 9, 1976	Dec 28, 1976
B 521,620	3,983,749	Jan 27, 1976	Oct 5, 1976
B 521,643	3,997,567	Mar 2, 1976	Dec 14, 1976
B 521,711	3,989,835	Feb 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb 17, 1976	Sep 28, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep 21, 1976
B 522,009	3,995,444	Feb 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb 3, 1976	Nov 23, 1976
B 522,227	3,992,904	Mar 30, 1976	Nov 23, 1976
B 522,309	3,991,603	Feb 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct 12, 1976
B 522,446	4,001,194	Mar 30, 1976	Jan 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec 28, 1976
B 522,567	3,996,238	Feb 17, 1976	Dec 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec 21, 1976
B 522,577	3,982,123	Jan 27, 1976	Sep 21, 1976
B 522,629	4,001,155	Mar 16, 1976	Jan 4, 1977
B 523,696	3,986,071	Jan 13, 1976	Oct 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct 26, 1976
B 524,026	3,992,206	Feb 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan 13, 1976	Oct 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb 24, 1976	Oct 12, 1976
B 525,961	3,985,557	Jan 13, 1976	Oct 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov 2, 1976
B 526,190	3,982,129	Feb 17, 1976	Sep 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov 16, 1976
B 526,388	3,992,017	Feb 3, 1976	Nov 16, 1976
B 526,445	3,984,978	Jan 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan 20, 1976	Nov 2, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep 21, 1976
B 527,171	3,998,248	Mar 9, 1976	Dec 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep 21, 1976
B 528,297	4,001,138	Mar 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb 10, 1976	Nov 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb 3, 1976	Nov 9, 1976
B 528,761	3,982,221	Feb 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb 24, 1976	Nov 2, 1976
B 529,156	3,989,158	Jan 13, 1976	Nov 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,659	3,996,875	Feb 24, 1976	Dec 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov 30, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb 24, 1976	Nov 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct 12, 1976
B 530,569	3,999,865	Mar 16, 1976	Dec 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan 4, 1977
B 530,605	3,989,064	Feb 3, 1976	Nov 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb 17, 1976	Jan 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov 16, 1976
B 532,140	4,001,299	Mar 2, 1976	Jan 4, 1977
B 532,319	3,990,292	Feb 3, 1976	Nov 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov 23, 1976
B 532,424	D 242,292	Feb 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov 23, 1976
B 532,901	3,984,318	Jan 13, 1976	Oct 5, 1976
B 532,969	3,981,706	Jan 13, 1976	Sep 21, 1976
B 532,976	4,000,837	Mar 23, 1976	Jan 4, 1977
B 533,056	3,983,969	Jan 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb 3, 1976	Sep 21, 1976
B 533,652	4,000,196	Mar 23, 1976	Dec 28, 1976
B 533,734	3,984,799	Jan 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan 27, 1976	Oct 19, 1976
B 534,016	3,983,381	Feb 3, 1976	Sep 28, 1976
B 534,313	3,981,675	Jan 27, 1976	Sep 21, 1976
B 534,314	3,981,786	Feb 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar 16, 1976	Dec 14, 1976
B 534,443	3,989,970	Jan 27, 1976	Nov 2, 1976
B 534,574	3,995,624	Feb 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov 9, 1976
B 534,767	3,982,180	Feb 3, 1976	Sep 21, 1976
B 534,991	3,983,517	Jan 27, 1976	Sep 28, 1976
B 535,076	3,981,718	Jan 20, 1976	Sep 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan 4, 1977
B 535,256	3,999,150	Mar 23, 1976	Dec 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec 21, 1976
B 535,386	3,981,150	Jan 13, 1976	Sep 21, 1976
B 535,391	3,981,386	Jan 27, 1976	Sep 21, 1976
B 535,411	3,990,543	Feb 24, 1976	Nov 9, 1976
B 535,437	3,997,555	Feb 24, 1976	Dec 14, 1976
B 535,448	3,997,123	Mar 16, 1976	Dec 14, 1976
B 535,466	3,981,309	Jan 27, 1976	Sep 21, 1976
B 535,813	3,981,819	Jan 27, 1976	Sep 21, 1976
B 535,928	3,981,466	Jan 13, 1976	Sep 21, 1976
B 536,009	3,982,112	Jan 27, 1976	Sep 21, 1976
B 536,082	3,997,783	Mar 16, 1976	Dec 14, 1976
B 536,322	4,001,272	Mar 23, 1976	Jan 4, 1977
B 536,403	3,998,341	Mar 23, 1976	Dec 21, 1976
B 536,511	3,995,989	Mar 9, 1976	Dec 7, 1976
B 536,675	3,985,773	Jan 20, 1976	Oct 12, 1976
B 536,935	3,985,729	Jan 13, 1976	Oct 12, 1976
B 537,058	4,000,969	Mar 23, 1976	Jan 4, 1977
B 537,102	3,981,829	Jan 13, 1976	Sep 21, 1976
B 537,709	3,981,368	Jan 13, 1976	Sep 21, 1976
B 537,711	3,985,748	Jan 13, 1976	Oct 12, 1976
B 537,722	3,985,423	Feb 3, 1976	Oct 12, 1976
B 537,903	3,986,492	Jan 20, 1976	Oct 19, 1976
B 538,472	3,992,884	Feb 3, 1976	Nov 23, 1976
B 538,491	3,982,928	Feb 17, 1976	Sep 28, 1976
B 538,686	3,982,199	Jan 13, 1976	Sep 21, 1976
B 538,753	3,993,642	Feb 10, 1976	Nov 23, 1976
B 539,374	3,996,229	Mar 9, 1976	Dec 7, 1976
B 539,746	3,983,423	Feb 17, 1976	Sep 28, 1976
B 540,078	3,984,701	Jan 13, 1976	Oct 5, 1976
B 540,218	3,986,108	Feb 10, 1976	Oct 12, 1976
B 540,632	3,981,600	Jan 13, 1976	Sep 21, 1976
B 540,767	3,986,010	Mar 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan 20, 1976	Sep 21, 1976
B 541,015	3,993,208	Jan 27, 1976	Nov 23, 1976
B 541,376	3,981,690	Feb 17, 1976	Sep 21, 1976
B 541,415	3,982,080	Feb 3, 1976	Sep 21, 1976
B 541,464	3,995,424	Feb 17, 1976	Dec 7, 1976
B 541,496	3,982,232	Jan 27, 1976	Sep 21, 1976
B 541,517	3,986,156	Jan 13, 1976	Oct 12, 1976
B 541,710	3,994,472	Feb 24, 1976	Nov 30, 1976
B 542,135	3,986,939	Feb 10, 1976	Oct 19, 1976
B 542,158	3,981,886	Jan 13, 1976	Sep 21, 1976
B 542,226	3,993,748	Feb 24, 1976	Nov 23, 1976
B 543,078	3,995,687	Feb 17, 1976	Dec 7, 1976
B 543,941	3,985,528	Jan 13, 1976	Oct 12, 1976
B 544,034	3,997,175	Feb 17, 1976	Dec 14, 1976
B 544,476	3,993,585	Feb 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan 13, 1976	Sep 28, 1976
B 545,050	3,982,073	Jan 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb 24, 1976	Jan 4, 1977
B 545,464	3,992,387	Feb 10, 1976	Nov 16, 1976
B 545,630	3,981,337	Jan 27, 1976	Sep 21, 1976
B 545,777	4,004,906	Jan 27, 1976	Jan 25, 1977
B 545,935	3,990,337	Jan 27, 1976	Nov 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov 30, 1976
B 546,097	3,999,309	Mar 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan 20, 1976	Oct 19, 1976
B 546,426	3,982,063	Jan 27, 1976	Sep 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct 5, 1976
B 546,665	3,990,062	Jan 20, 1976	Nov 2, 1976
B 546,911	3,981,058	Jan 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct 26, 1976
B 547,016	3,999,741	Mar 23, 1976	Dec 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 197
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 848,336	3,993,752	Mar 30, 1976	Nov. 23, 1976				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JANUARY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice)

- American Radionic Co., Inc.: *See*—
  - Stockman, Robert Michael, Re. 29,126
- Christie, Craig Eugene: *See*—
  - Malm, Donald Irwin; Christie, Craig Eugene, and Rojohn, Claire Eugene, Re. 29,123
- Deere & Company: *See*—
  - Hook, Richard Wayne, and Jackson, William Wayne, Re. 29,121
  - Hook, Richard Wayne, and Zaun, Richard David, Re. 29,122.
  - Malm, Donald Irwin, Christie, Craig Eugene; and Rojohn, Claire Eugene, Re. 29,123
- Hook, Richard Wayne; and Jackson, William Wayne, to Deere & Company. Storage tank and recleaning apparatus for root crop harvesters. Re. 29,121, Cl. 171-58.000.
- Hook, Richard Wayne, and Zaun, Richard David, to Deere & Company. Root crop harvester. Re. 29,122, Cl. 171-58.000.
- Hudson, Frederick W., to Xerox Corporation. Sheet transport system. Re. 29,124, Cl. 355-3.00R.
- International Shoe Machine Corporation: *See*—
  - Vornberger, Walter, Re. 29,120
- Jackson, William Wayne: *See*—
  - Hook, Richard Wayne, and Jackson, William Wayne, Re. 29,121
- Kornylak, Andrew T.; and Tabler, Charles P., to Kornylak Corporation. Continuous molding conveyor with side clamping and release. Re. 29,125, Cl. 425-115.000.
- Kornylak Corporation: *See*—
  - Kornylak, Andrew T., and Tabler, Charles P., Re. 29,125
- Malm, Donald Irwin, Christie, Craig Eugene, and Rojohn, Claire Eugene, to Deere & Company. Vibration isolated unitary cab and control console construction for a tractor. Re. 29,123, Cl. 296-35.00R.
- Rojohn, Claire Eugene: *See*—
  - Malm, Donald Irwin, Christie, Craig Eugene, and Rojohn, Claire Eugene, Re. 29,123
- Stockman, Robert Michael, to American Radionic Co., Inc. Wound capacitor. Re. 29,126, Cl. 317-260.000.
- Tabler, Charles P.: *See*—
  - Kornylak, Andrew T., and Tabler, Charles P., Re. 29,125
- Vornberger, Walter, to International Shoe Machine Corporation. Cement lasting the side and heel portions of a shoe assembly. Re. 29,120, Cl. 12-145.000.
- Xerox Corporation: *See*—
  - Hudson, Frederick W., Re. 29,124
- Zaun, Richard David: *See*—
  - Hook, Richard Wayne, and Zaun, Richard David, Re. 29,122

LIST OF PLANT PATENTEES

- Bailey, Dorothy Jean Searles, to San Joaquin Rose Co. Rose plant. 4,011, 1-25-77, Cl. 3.000.
- Bailey, Dorothy Jean Searles, to San Joaquin Rose Co. Rose plant. 4,012, 1-25-77, Cl. 11.000.
- San Joaquin Rose Co.: *See*—
  - Bailey, Dorothy Jean Searles, 4,011
  - Bailey, Dorothy Jean Searles, 4,012

LIST OF DESIGN PATENTEES

- A-DEC, Inc.: *See*—
  - Meyer, Robert H., 243,188.
- AAI Corporation: *See*—
  - Sofinowski, Jacob, III, 243,174
- Abrahamsen, Thomas C.: *See*—
  - Clayton, Richard G.; Sims, Jerry J.; McCauley, Gilbert L., and Abrahamsen, Thomas C., 243,192.
  - Clayton, Richard G., Abrahamsen, Thomas C.; Beduhn, Jack K.; and Guetschoff, Norman P., Jr. 243,193.
- AFA Corporation, The: *See*—
  - Federico, Joseph Benedict; Wesner, Walter Herbert, and Cary, John Richard, 243,180.
- Aktiebolaget Svenska Flaktfabriken: *See*—
  - Knutsson, Filip, and Bergstrom, Lars, 243,190
- Amerace Corporation: *See*—
  - Dieme, Hilmar K., 243,154
  - May, Joseph R.; and Morgan, Donald F., 243,170
- American Can Company: *See*—
  - Bitner, John M., 243,173
- American Standard, Inc.: *See*—
  - Stairs, Henry M., Jr., 243,181.
- Basseches, Jack, to I.C.M. Industria e Comercio de Malhas Ltda. Briefs. 243,126, 1-25-77, Cl. D2-1.000.
- Beduhn, Jack K.: *See*—
  - Clayton, Richard G.; Abrahamsen, Thomas C., Beduhn, Jack K., and Guetschoff, Norman P., Jr. 243,193
- Bengt Petersson New Products Investment AB: *See*—
  - Magnusson, Alf B., 243,195.
- Bennington, William E. Dental floss dispenser. 243,187, 1-25-77, Cl. D24-1.00D.
- Bergstrom, Lars: *See*—
  - Knutsson, Filip; and Bergstrom, Lars, 243,190
- Berntsen, Peter; and Peterson, Phillip R. Survey monument base. 243,159, 1-25-77, Cl. D10-66.000.
- Bieganski, Zdzislaw. Wire stripping tool. 243,149, 1-25-77, Cl. D8-61.000.
- Bitner, John M., to American Can Company. Pencil sharpener. 243,173, 1-25-77, Cl. D19-74.000.
- Bolwell, Edward J., to Topps-All Products of Yonkers, Inc. Form for filling bags. 243,158, 1-25-77, Cl. D9-294.000
- Bonnett, Richard L. Plastic drum. 243,155, 1-25-77, Cl. D9-170.000
- Bouche, Raymond R. Cable vibration damper. 243,151, 1-25-77, Cl. D8-230.000
- Brown, Jerry A. Combined shelves and towel rack. 243,137, 1-25-77, Cl. D6-136.000.
- Bruner, James W., Sr.; and Sisk, George W., Jr., to Whirlpool Corporation. Air conditioner housing for mounting in double-hung windows. 243,186, 1-25-77, Cl. D23-141.000.
- Bud, Hans. Linear distance measuring computer. 243,160, 1-25-77, Cl. D10-70.000
- Burroughs Corporation: *See*—
  - Clayton, Richard G., Sims, Jerry J.; McCauley, Gilbert L., and Abrahamsen, Thomas C., 243,192
  - Clayton, Richard G., Abrahamsen, Thomas C., Beduhn, Jack K., and Guetschoff, Norman P., Jr. 243,193.
- Canadian Cycle & Motor Company Limited: *See*—
  - Farquharson, Charles R., 243,127.
- Carver, Robert Glynn. Fishing lure. 243,175, 1-25-77, Cl. D22-27.000
- Carver, Robert Glynn, and Welle, Glen R. Fishing lure. 243,176, 1-25-77, Cl. D22-27.000.
- Cary, John Richard: *See*—
  - Federico, Joseph Benedict, Wesner, Walter Herbert; and Cary, John Richard, 243,180
- Cerola, Joseph J.: *See*—
  - Jenn, Louis J.; Field, Thomas R.; and Cerola, Joseph J., 243,144
- Chmela, John F. Combined coaster and ash tray. 243,142, 1-25-77, Cl. D7-45.000.
- Clayton, Richard G.; Sims, Jerry J.; McCauley, Gilbert L.; and Abrahamsen, Thomas C., to Burroughs Corporation. Encoder console with removable desk top. 243,192, 1-25-77, Cl. D26-5.00C
- Clayton, Richard G.; Abrahamsen, Thomas C.; Beduhn, Jack K., and Guetschoff, Norman P., Jr. to Burroughs Corporation. Data entry key station. 243,193, 1-25-77, Cl. D26-5.00C

- Coon, Herb, to Red Wing Products, Inc. Garment hanger. 243,138, 1-25-77, Cl. D6-253.000
- Davis, Charley Winfield, Jr. Combined hinge unit, seat and seat cover for a water closet. 243,183, 1-25-77, Cl. D23-71.000
- de Massacre, Guy. Ornamental design for a boot. 243,130, 1-25-77, Cl. D2-272.000
- DFK Inc.: *See*—
  - Kammeraad, James A., 243,177
- Dieme, Hilmar K., to Amerace Corporation. Threaded fasteners. 243,154, 1-25-77, Cl. D8-267.000
- Downey, James A. Chair. 243,134, 1-25-77, Cl. D6-12.000
- Dunlop Limited: *See*—
  - Hart, Claude Albert, Holmes, Brian Howard, and Gebert, Karl, 243,168
- Dykes, James R. Lock cover. 243,150, 1-25-77, Cl. D8-137.000
- Ekuan, Kenji: *See*—
  - Suzuki, Toshiyuki, and Ekuan, Kenji, 243,169
- Farquharson, Charles R., to Canadian Cycle & Motor Company Limited. Mouth guard for a sports helmet. 243,127, 1-25-77, Cl. D2-233.000
- Federico, Joseph Benedict, Wesner, Walter Herbert, and Cary, John Richard, to AFA Corporation, The. Hand sprayer. 243,180, 1-25-77, Cl. D23-17.000
- Fentüles, Charles S. Toothbrush container. 243,156, 1-25-77, Cl. D9-216.000
- Field, Thomas R.: *See*—
  - Jenn, Louis J., Field, Thomas R., and Cerola, Joseph J., 243,144
- Foster, Carolyn Blanche. Jewelry cabinet. 243,136, 1-25-77, Cl. D6-127.000
- Frank, Joniece, to Frankoma Pottery, Inc. Mug. 243,140, 1-25-77, Cl. D7-5.000
- Frankoma Pottery, Inc.: *See*—
  - Frank, Joniece, 243,140
- G. Leblanc Corporation: *See*—
  - Matsuda, Hari, 243,208
- Gaschenko, Viktor Petrovich: *See*—
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CLASS 139	
383 R	4,004,616
416	4,004,617
CLASS 140	
93 2	4,004,618

CLASS 141

11 4,004,619
137 4,004,620
392 4,004,621

CLASS 144

3 D 4,004,622
193 R 4,004,623

CLASS 145

46 4,004,624

CLASS 148

1.5 4,004,949
4,004,950
6 27 4,004,951
39 4,004,952
172 4,004,953
174 4,004,954

CLASS 150

7 4,004,625

CLASS 151

4,004,626

CLASS 152

355 4,004,627
383 4,004,628

CLASS 156

3 4,004,955
128 R 4,004,958
331 4,004,959
4,004,960
421 4,004,961
475 4,004,962
583 4,004,963
643 4,004,957
666 4,004,956

CLASS 159

17 C 4,004,964
27 R 4,004,965

CLASS 160

90 4,004,629

CLASS 162

30 R 4,004,966
65 4,004,967
304 4,004,968
352 4,004,969

CLASS 164

57 4,004,630
250 4,004,631
297 4,004 632

CLASS 165

9 1 4,004,633
155 4,004,634

CLASS 166

.6 4,004,635
272 4,004,636
273 4,004,637
4,004,638
292 4,004,639

CLASS 171

58 Re.29,121
Re.29,122

CLASS 172

710 4,004,640
781 4,004,641

CLASS 174

37 4,005,253
110 PM 4,005,254
126 CP 4,005,255

CLASS 175

4.5 4,004,642
321 4,004,643
364 4,004,644
373 4,004,645

CLASS 176

16 4,004,970
37 4,004,971
81 4,004,972
84 4,004,973

CLASS 177

1 4,004,646
128 4,004,647

CLASS 178

34 4,005,264
69.1 4,005,266

CLASS 179

1 J 4,005,267
4,005,268
2 C 4,005,269
6 E 4,005,270
6 R 4,005,271
15 AQ 4,005,272
15 BL 4,005,273
15.55 R 4,005,274
100.3 G 4,005,275
170.2 4,005,276
4,005,277
181 R 4,005,278
189 D 4,005,279

CLASS 180

14 R 4,004,648

CLASS 181

36 C 4,004,649
42 4,004,650
117 4,004,651

CLASS 182

118 4,004,652
128 4,004,653

CLASS 187

16 4,004,654
52 R 4,004,655

CLASS 188

52 4,004,656
71.3 4,004,657
73.5 4,004,658
218 XL 4,004,661
244 4,004,659
271 4,004,660
284 4,004,662
332 4,004,663

CLASS 190

49 4,004,664

CLASS 192

4 A 4,004,665
44 4,004,666
56 R 4,004,667
58 B 4,004,668
70.17 4,004,669
105 A 4,004,670

CLASS 195

1 3 4,004,974
1.8 4,004,975
2 4,004,976
31 P 4,004,977
51 R 4,004,978
68 4,004,979
4,004,980
127 4,004,981

CLASS 197

1 R 4,004,671
4,004,672
4,004,673
4,004,674
176 4,004,675

CLASS 198

326 4,004,676
452 4,004,677
460 4,004,678
509 4,004,679
732 4,004,680
796 4,004,681
852 4,004,682

CLASS 200

5 A 4,005,293
19 A 4,005,294
61.62 4,005,295
85 R 4,005,296
144 B 4,005,297
153 R 4,005,298
159 B 4,005,299
296 4,005,300

CLASS 201

29 4,004,982

CLASS 202

142 4,004,983
173 4,004,984
230 4,004,985
254 4,004,986

CLASS 204

1.5 4,004,987
95 4,004,988
99 4,004,989
113 4,004,990
119 4,004,991
129.55 4,004,992
131 4,004,993
149 4,004,994
157.1 H 4,004,995
158 HA 4,004,996
159 14 4,004,997
159.22 4,004,998
181 4,004,999
4,005,000
195 P 4,005,002
195 S 4,005,001
290 F 4,005,003
4,005,004

CLASS 206

3 4,004,683
4,004,684
.5 4,004,685
104 4,004,686
233 4,004,687
330 4,004,688
387 4,004,689
425 4,004,690
459 4,004,691
486 4,004,692

CLASS 208

11 LE 4,005,005
89 4,005,006
111 4,005,007

CLASS 209

81 R 4,004,693
111 7 R 4,004,694
223 R 4,005,008

CLASS 210

17 4,005,010
18 4,005,011
23 H 4,005,012
44 4,005,009
106 4,005,013
192 4,005,014
220 4,005,015
268 4,005,016
284 4,005,017
386 4,005,018
525 4,005,019

CLASS 212

49 4,004,696
144 4,004,695

CLASS 213

75 R 4,004,697

CLASS 214

1 BB 4,004,698
6 C 4,004,699
15 D 4,004,700
16 4 A 4,004,701
35 R 4,004,702
82 4,004,703

CLASS 215

220 4,004,704
246 4,004,705

CLASS 217

2 J 4,005,339

CLASS 219

10 55 A 4,005,301
10 61 4,005,302
69 C 4,005,303
69 D 4,005,304
72 4,005,305
76 4,005,306
109 4,005,307
125 R 4,005,308
146 4,005,309
227 4,005,310

CLASS 220

3 4,004,706
22 4,004,707
224 4,004,708
257 4,004,709
306 4,004,710

CLASS 221

63 4,004,711
150 A 4,004,712
211 4,004,713

CLASS 222

30 4,004,715
41 4,004,714
145 4,004,716
255 4,004,717
366 4,004,719
386 4,004,718

CLASS 223

57 4,004,720
89 4,004,721

CLASS 224

45 P 4,004,722

CLASS 225

103 4,004,723

CLASS 226

91 4,004,724

CLASS 228

49 4,004,725
173 4,004,726

CLASS 229

4.5 4,004,727
76 4,004,728

CLASS 235

61.11 R 4,005,280
61 5 S 4,004,729
151.3 4,005,281
4,005,282
194 4,005,283
4,005,284

CLASS 236

14 4,004,730

CLASS 237

51 4,004,731

CLASS 239

2 S 4,004,732
3 4,004,733
58 4,004,734
79 4,004,735
102 4,004,736
4,004,737

CLASS 241

29 4,004,738
34 4,004,739
52 4,004,740
55 4,004,741
82.5 4,004,742

CLASS 242

7.03 4,004,743
25 R 4,004,744
54 R 4,004,745
55.19 A 4,004,746
56.5 4,004,747
62 4,004,748
75 4 4,004,749
75 43 4,004,750
107.4 A 4,004,751
198 4,004,752

CLASS 243

19 4,004,753

CLASS 244

3.16 4,004,754
12.5 4,004,755
17 13 4,004,756
4,004,757
4,004,758
17.17 4,004,759
53 B 4,004,760
100 A 4,004,761
104 FP 4,004,762
122 R 4,004,763
149 4,004,764

CLASS 246

118 4,004,765

CLASS 248

55 4,004,766
58 4,004,767
59 4,004,768
188.1 4,004,769
323 4,004,770
357 4,004,771
430 4,004,772

CLASS 249

93 4,004,773
114 4,004,774

CLASS 250

208 4,005,285
216 4,005,286
239 4,005,287
4,005,288
253 4,005,289
266 4,005,290
282 4,005,291
364 4,005,292
445 T 4,005,311
527 4,005,135
551 4,005,312

CLASS 251

310 4,004,775
315 4,004,776

CLASS 252

8 55 B 4,005,020
51.5 A 4,005,021
62.1 L 4,005,022
78 3 4,005,023
89 B 4,005,026
89 R 4,005,024
4,005,025
95 4,005,027
99 4,005,028
4,005,029
140 4,005,030
186 4,005,031
299 4,005,032
301 1 R 4,005,042
356 4,005,043
358 4,005,044
373 4,005,045
428 4,005,046
429 R 4,005,047
432 4,005,048
467 4,005,049
521 4,005,050

CLASS 254

51 4,004,777
142 4,004,778
187.4 4,004,779
4,004,780

CLASS 256

10 4,004,781

CLASS 259

3 4,004,782
72 4,004,783
4,004,784
104 4,004,785
107 4,004,786
191 4,004,788
192 4,004,787

CLASS 260

2.5 AJ 4,005,034
2.5 AK 4,005,035
2.5 B 4,005,033
2.5 F 4,005,036
4 AR 4,005,037
17 R 4,005,038
17.3 4,005,039
17 4 GC 4,005,040
18 TN 4,005,041
29.4 R 4,005,051
29.6 TA 4,005,052
33.6 AQ 4,005,053
42.56 4,005,054
47 UA 4,005,055
77.5 CH 4,005,056
78 S 4,005,057
78.41 4,005,058
97.7 4,005,060
112 R 4,005,062
112.5 LH 4,005,063
143 4,005,064
145 A 4,005,065
4,005,066
151 4,005,067
156 4,005,069
157 4,005,068
239 BF 4,005,071
239 E 4,005,072
239.1 4,005,073
4,005,074
4,005,075
239 3 P 4,005,076
4,005,077
239.5 4,005,078
239.55 D 4,005,079
240 F 4,005,080
243 C 4,005,081
244 R 4,005,082
247 1 P 4,005,084
247 2 A 4,005,086
247.2 B 4,005,085
248 C 4,005,087
284 4,005,088
285.5 4,005,089
4,005,090
286 R 4,005,091
287 P 4,005,092
293.62 4,005,093
293 66 4,005,094
293 68 4,005,095
294.9 4,005,096
295 Q 4,005,097
308 A 4,005,098
309 4,005,099
310 R 4,005,100
326 N 4,005,102
326.5 CA 4,005,103
327 B 4,005,105
327 H 4,005,104
340.9 4,005,106
343.2 R 4,005,107
343.3 R 4,005,108
4,005,109
4,005,110
345.2 4,005,111
346.1 R 4,005,112
4,005,113
348.5 L 4,005,114
410.9 R 4,005,115
448.2 N 4,005,116
448.8 R 4,005,117
4,005,118
4,005,119
462 R 4,005,120
463 4,005,121
468 G 4,005,122
470 4,005,123
475 R 4,005,124
476 R 4,005,125
4,005,126
479 R 4,005,127
485 R 4,005,128
4,005,129
4,005,130
4,005,131
501 11 4,005,133
502 3 4,005,132
520 E 4,005,134
535 P 4,005,136
539 R 4,005,137
543 F 4,005,138
553 A 4,005,140
556 F 4,005,141
571 4,005,142
575 4,005,143
578 4,005,144
586 R 4,005,145
4,005,146
593 R 4,005,147
607 AR 4,005,148
609 R 4,005,149
613 D 4,005,150
623 R 4,005,151
648 R 4,005,152
650 R 4,005,153
837 R 4,005,154
851 4,005,155
880 R 4,005,156
897 C 4,005,157
949 4,005,158
953 4,005,159
970 4,005,160

CLASS 261

44 R 4,005,161

CLASS 264

25 4,005,162
81 4,005,163
97 4,005,164
103 4,005,168
4,005,169
117 4,005,170
135 4,005,165
154 4,005,166
318 4,005,101
329 4,005,167

CLASS 266

87 4,004,789
193 4,004,790
197 4,004,791
218 4,004,792
236 4,004,793

CLASS 267

153 4,004,794

CLASS 271

10 4,004,795
94 4,004,796
136 4,004,797
172 4,004,798
174 4,004,802

CLASS 272

8 N 4,004,799
101 4,004,800
120 4,004,801

CLASS 273

1 R 4,004,803
5 R 4,004,804
29 R 4,004,805
4,004,806
41 4,004,807
108 4,004,808
134 C 4,004,809
134 GM 4,004,810
135 D 4,004,811
137 C 4,004,812
139 4,004,813
204 4,004,814

CLASS 274

1 A 4,004,815
10 R 4,004,816
23 R 4,004,817

CLASS 280

11.37 H 4,004,818
79.3 4,004,819
103 4,004,820
415 A 4,004,822
615 4,004,823
636 4,004,824
654 4,004,825
718 4,004,826
742 4,004,827
743 4,004,828
744 4,004,821
745 4,004,829
763 4,004,830

CLASS 285

81 4,004,831
333 4,004,832

CLASS 292

288 4,004,833

CLASS 294

19 R 4,004,834
86 29 4,004,835

CLASS 296

35 R Re 29,123

CLASS 297

354 4,004,836

CLASS 301

37 P 4,004,837
105 R 4,004,838

CLASS 303

6 C 4,004,839

CLASS 307

10 R 4,005,313
110 4,005,314
209 4,005,315
247 A 4,005,316
253 4,005,317
304 4,005,318

CLASS 308

201 4,004,840

CLASS 310

8 3 4,005,319
9 1 4,005,321
40 MM 4,005,320

CLASS 312

342 4,004,841

CLASS 313

60 4,005,322
105 CM 4,005,323
222 4,005,324
352 4,005,325
357 4,005,326
367 4,005,327
487 4,005,328

CLASS 315

3 5 4,005,329
57 4,005,330
92 4,005,331
112 4,005,332
173 4,005,333
208 4,005,334
224 4,005,335
239 4,005,336
241 S 4,005,337
362 4,005,338

CLASS 316

1 4,004,842

CLASS 317

11 A 4,005,340
15 4,005,341
16 4,005,342
31 4,005,344
96 4,005,343
103 4,005,345
260 Re 29,126

CLASS 318

128 4,005,346
254 4,005,347
373 4,005,348
569 4,005,349

CLASS 321

11 4,005,350
14 4,005,351
19 4,005,352

CLASS 323

22 R 4,005,353
51 4,005,354

CLASS 324

5 F 4,005,355
15 4,005,356
32 4,005,357
34 R 4,005,358
34 TK 4,005,359
4,005,360
51 4,005,361
4,005,362
58 5 B 4,005,363
79 D 4,005,364
133 4,005,365

CLASS 325

67 4,005,366
352 4,005,367
455 4,005,368
4,005,369

CLASS 328

267 4,005,370

CLASS 330

30 D 4,005,371
34 4,005,372
51 4,005,373

CLASS 331

94 5 PE 4,005,374

CLASS 333

6 4,005,379
21 R 4,005,375
30 R 4,005,376
70 T 4,005,377
72 4,005,378

CLASS 336

84 4,005,380

CLASS 338

119 4,005,381

CLASS 339

108 TP 4,004,843
118 R 4,004,844
258 P 4,004,845
263 R 4,004,846

CLASS 340

1 R 4,005,382
3 R 4,005,383
15 4,005,384
52 C 4,005,401
146 1 AL 4,005,405
146 3 AE 4,005,385
172 5 4,005,386
4,005,387
4,005,388
4,005,389
4,005,390
4,005,391
4,005,392
173 DR 4,005,395
173 FF 4,005,393
173 LM 4,005,394
196 4,005,396
223 4,005,397
279 4,005,398
310 R 4,005,399
324 M 4,005,402
336 4,005,403
4,005,404
347 AD 4,005,407
4,005,410
347 C 4,005,409
347 DA 4,005,406
347 DD 4,005,411
347 P 4,005,408
365 R 4,005,400
380 4,005,412
402 4,005,413

CLASS 343

5 SA 4,005,414
4,005,417
5 VQ 4,005,415
4,005,416
6 8 R 4,005,418
7 4 4,005,419
7 5 4,005,420
16 M 4,005,421
17 1 R 4,005,422
17 2 PC 4,005,423
17 7 4,005,424
4,005,425
100 LE 4,005,426
106 D 4,005,427
228 4,005,428
713 4,005,429
747 4,005,430
771 4,005,431
792 5 4,005,432
819 4,005,433

CLASS 346

1 4,005,434
4,005,435
74 1 4,005,439
140 A 4,005,440
153 4,005,436
158 4,005,438
165 4,005,437

CLASS 350

160 LC 4,004,848
160 R 4,004,849
161 W 4,004,847
299 4,004,850
311 4,004,851

CLASS 354

23 R 4,005,441
25 4,005,442
4,005,443
27 4,005,444
30 4,005,448
44 4,005,445
86 4,005,446
128 4,005,449
155 4,005,458
156 4,005,459
166 4,005,447
202 4,005,460
204 4,005,461
246 4,005,462
307 4,005,463
322 4,005,464

CLASS 355

3 R Re 29,124

CLASS 356

1 4,004,852
226 4,004,853

CLASS 357

6 4,005,465
14 4,005,466
15 4,005,468
4,005,469
22 4,005,467
23 4,005,450
35 4,005,451
36 4,005,470
49 4,005,452
4,005,453
51 4,005,471
65 4,005,454
71 4,005,455
4,005,456
4,005,472
72 4,005,457

CLASS 358

4 4,005,473
4,005,474
80 4,005,475
83 4,005,261
112 4,005,258
128 4,005,259
4,005,260
145 4,005,265
168 4,005,262
195 4,005,256
227 4,005,263
256 4,005,257

CLASS 360

36 4,005,476
40 4,005,478
51 4,005,477
4,005,479
60 4,005,480
4,005,481
66 4,005,482
69 4,005,483
74 4,005,484
75 4,005,485
79 4,005,486
94 4,005,487
4,005,488
4,005,489
97 4,005,490
105 4,005,491
4,005,492
106 4,005,493

CLASS 401

205 4,004,854

CLASS 403

158 4,004,855
186 4,004,856

CLASS 404

6 4,004,857

CLASS 408

153 4,004,858

CLASS 415

25 4,004,859

CLASS 416

2 4,004,860
41 4,004,861

CLASS 417

234 4,004,862
271 4,004,863

CLASS 418

1 4,004,864
45 4,004,865
61 B 4,004,866

CLASS 423

24 4,005,173
43 4,005,174
83 4,005,175
87 4,005,176
102 4,005,061
213 5 4,005,177
259 4,005,178
300 4,005,171
4,005,172
407 4,005,179
446 4,005,180
447 2 4,005,183
449 4,005,181
467 4,005,182
579 4,005,184
648 4,005,185
659 4,005,186

CLASS 424

1 5 4,005,187
5 4,005,188
47 4,005,189
127 4,005,190
154 4,005,191
157 4,005,192
168 4,005,193
177 4,005,194
180 4,005,195
4,005,196
216 4,005,197
227 4,005,198
228 4,005,199
243 4,005,200
245 4,005,083
248 57 4,005,201
250 4,005,202
251 4,005,203
4,005,204
4,005,205
263 4,005,206
4,005,207
267 4,005,208
4,005,209
4,005,211
270 4,005,212
4,005,213
271 4,005,214
282 4,005,216
300 4,005,217
304 4,005,218
305 4,005,219
315 4,005,220
317 4,005,221
319 4,005,222
322 4,005,223
325 4,005,224
359 4,005,210

CLASS 425

11 4,004,867
115 Re 29,125
130 4,004,868
159 4,004,869
224 4,004,870
243 4,004,871
326 B 4,004,872
335 4,004,873
438 4,004,874

CLASS 426

21 4,005,225
281 4,005,226
537 4,005,227
550 4,005,139
586 4,005,228

CLASS 427

304 4,005,229
354 4,005,230
387 4,005,231

CLASS 428

35 4,005,232
4,005,233
36 4,005,234
4,005,235
72 4,005,236
195 4,005,237
313 4,005,238
315 4,005,239
333 4,005,240
335 4,005,241
425 4,005,242
469 4,005,243
480 4,005,244
542 4,005,245

CLASS 429

17 4,004,947
59 4,004,943
72 4,004,946
94 4,005,246
215 4,004,944
244 4,004,945

CLASS 431

9 4,004,875

CLASS 432

14 4,004,876

CLASS 474

273 4,005,215

CLASS 526

15 4,005,247
20 4,005,248
60 4,005,249
204 4,005,250
259 4,005,059

CLASS 536

59 4,005,251
66 4,005,070

CLASSIFICATION OF DESIGNS

D2—	1	243,126	D7—	5	243,140		267	243,154		118	243,167		17	243,180		14 K	243,194
	233	243,127		21	243,139	D9—	170	243,155		146	243,168		55	243,181	D27—	8	243,195
		243,128		41	243,141		216	243,156		205	243,169		59	243,182		36	243,196
	260	243,129		45	243,142		255	243,157		211	243,170		71	243,183		42	243,197
	272	243,130		55	243,143		294	243,158	D15—	29	243,207		94	243,184			243,198
	361	243,131		110	243,144	D10—	66	243,159	D16—	1	243,171		127	243,185			243,199
		243,132		137	243,146		70	243,160		63	243,172		141	243,186			243,200
		243,133	D8—	30	243,147	D11—	166	243,201	D19—	74	243,173	D24—	1 B	243,188	D34—	5 SS	243,202
D6—	12	243,134		50	243,148	D12—	1	243,161	D22—	7	243,174		1 D	243,187			243,203
	95	243,135		61	243,149		2	243,162		27	243,175	D25—	84	243,189		15 AJ	243,206
	113	243,145		137	243,150		62	243,163			243,176	D26—	1 R	243,190		15 AM	243,205
	127	243,136		230	243,151		98	243,164		30	243,177		5 C	243,191		15 GG	243,204
	136	243,137		243	243,152		111	243,165		99	243,178			243,192	D56—	1 A	243,208
	253	243,138		255	243,153		114	243,166	D23—	7	243,179			243,193			

CLASSIFICATION OF PLANTS

P.—	3	4,011		11	4,012

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PATENTS

1	4,004,754		4,004,690		4,005,473	15	4,004,501		4,005,052		4,004,869
	4,004,769		4,004,719		4,005,485		4,004,964		4,005,062		4,005,283
	4,004,838		4,004,763	8	4,004,541		4,005,282		4,005,063		4,005,284
	4,005,226		4,004,764		4,004,611	16	4,004,745		4,005,109		4,005,432
4	4,004,583		4,004,800		4,004,612	17	4,004,305		4,005,122	20	4,004,351
	4,004,721		4,004,801		4,004,904		4,004,306		4,005,125		4,004,377
	4,004,778		4,004,812		4,005,482		4,004,312		4,005,126		4,004,766
	4,004,782		4,004,825	9	Re 29,126		4,004,379		4,005,135		4,005,253
	4,004,949		4,004,845		4,004,318		4,004,382		4,005,152		4,005,464
	4,005,335		4,004,847		4,004,353		4,004,400		4,005,156	21	4,004,303
	4,005,342		4,004,849		4,004,412		4,004,417		4,005,194		4,004,391
	4,005,490		4,004,852		4,004,475		4,004,448		4,005,236		4,004,570
5	4,004,405		4,004,857		4,004,606		4,004,455		4,005,245	22	4,004,429
	4,004,565		4,004,867		4,004,686		4,004,471		4,005,268		4,004,531
	4,004,566		4,004,882		4,004,768		4,004,473		4,005,292		4,004,610
6	4,004,308		4,004,948		4,004,831		4,004,482		4,005,295		4,004,619
	4,004,309		4,004,951		4,004,906		4,004,497		4,005,308		4,005,170
	4,004,311		4,004,957		4,004,939		4,004,508		4,005,344	23	4,005,414
	4,004,325		4,004,982		4,004,947		4,004,530		4,005,356	24	4,004,301
	4,004,336		4,005,008		4,004,956		4,004,545		4,005,367		4,004,310
	4,004,347		4,005,012		4,004,962		4,004,569		4,005,368		4,004,344
	4,004,365		4,005,013		4,005,003		4,004,586		4,005,369		4,004,433
	4,004,370		4,005,072		4,005,022		4,004,587		4,005,387		4,004,440
	4,004,373		4,005,163		4,005,246		4,004,597		4,005,424		4,004,517
	4,004,378		4,005,202		4,005,254		4,004,602		4,005,442		4,004,519
	4,004,380		4,005,225		4,005,257		4,004,618		4,005,447		4,004,533
	4,004,384		4,005,240		4,005,316		4,004,641	18	Re 29,121		4,004,574
	4,004,392		4,005,269		4,005,322		4,004,665		4,004,646		4,004,577
	4,004,415		4,005,270		4,005,357		4,004,667		4,004,668		4,004,620
	4,004,421		4,005,275		4,005,413		4,004,670		4,004,717		4,004,681
	4,004,424		4,005,289	10	4,004,756		4,004,689		4,004,814		4,004,789
	4,004,462		4,005,298		4,004,915		4,004,709		4,004,833		4,004,834
	4,004,465		4,005,304		4,004,973		4,004,725		4,004,860		4,004,843
	4,004,468		4,005,309		4,005,057		4,004,742		4,004,955		4,005,020
	4,004,484		4,005,310		4,005,091		4,004,748		4,004,978		4,005,311
	4,004,485		4,005,315		4,005,104		4,004,750		4,004,989		4,005,359
	4,004,515		4,005,317		4,005,250		4,004,765		4,005,074		4,005,383
	4,004,516		4,005,329		4,005,281		4,004,779		4,005,198		4,005,384
	4,004,542		4,005,333	11	4,004,895		4,004,803		4,005,222		4,005,415
	4,004,550		4,005,364	12	4,004,334		4,004,811		4,005,347		4,005,421
	4,004,568		4,005,374		4,004,483		4,004,883	19	Re 29,122		4,005,423
	4,004,582		4,005,381		4,004,540		4,004,889		Re 29,123	25	Re 29,120
	4,004,599		4,005,382		4,004,579		4,004,890		4,004,338		4,004,304
	4,004,613		4,005,390		4,004,694		4,004,896		4,004,352		4,004,317
	4,004,621		4,005,399		4,004,796		4,004,912		4,004,418		4,004,348
	4,004,629		4,005,409		4,005,279		4,004,994		4,004,436		4,004,364
	4,004,631		4,005,411		4,005,452		4,005,000		4,004,489		4,004,368
	4,004,639		4,005,418	13	4,004,477		4,005,005		4,004,491		4,004,403
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13	243,150
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